

**DEVELOPMENT OF A MODEL TO ADDRESS THE CONTENT,
PROCESS AND COMMUNICATION ASPECTS OF EMERGENCY
CENTRE HANDOVER**

by

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MKKAND001

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ABSTRACT

Introduction:

The emergency centre forms the first formal interaction between the prehospital and in-hospital phases of the patient care continuum. There are several variables that have the potential to affect handover efficacy. Poor handover has been associated with an increase in sentinel events and a risk to patient safety. This thesis aimed to investigate the perceptions of the practice of patient handover between prehospital emergency care providers and the emergency centre. This information was used to generate a model that addresses identified aspects of the emergency centre handover, namely content, process, and communication.

Methods:

The methodology followed a sequential, explanatory, mixed-methods design. Data were collected from prehospital emergency care personnel (PECP) and emergency centre personnel (ECP) in the Johannesburg area of South Africa. Study One and Study Two formed the quantitative and qualitative data collection phases respectively.

Study One formed the quantitative component of the study using a survey that utilised a cross-sectional, convenience design. Questionnaires were compiled de novo using data sourced from a search of major databases and were pilot tested prior to distribution. Questionnaires contained a mix of Likert-type, forced binary and open-ended questions. Questionnaires were distributed using a purposive, convenience strategy where potential participants were approached at their place of work. Data were analysed descriptively and reported on. The responses to the open-ended questions were used to compile the interview schedule used in Study Two.

Study Two formed the qualitative approach of the thesis and used a qualitative descriptive design. Questions for Study Two were compiled using the results of the coding, analysis and interpretation of the responses to the open-ended questions from the paper-based questionnaire. Data were collected from 15 PECP and 15 ECP using face-to-face, semi-structured interviews. Participants were approached using a purposive strategy and, where consent was obtained, were interviewed in a location that was conveniently available and afforded an adequate amount of privacy. Interviews were transcribed and then analysed using Computer-Assisted Qualitative Data Analysis Software Atlas.ti. Data were read and reread, coded and analysed to identify categories and themes that were then reported. A code-recode strategy ensured trustworthiness.

Results:

Handover content variables were ranked according to the perceived level of importance by prehospital emergency care and ECP. Physiological variables dominated the ten most important variables for both PECP and ECP. Handover quality was perceived by both PECP and ECP as requiring improvement. Less than half of both PECP and ECP had been exposed to formal handover training. Mnemonic knowledge was generally poor, and the most familiar mnemonic used by PECP was unfamiliar to the ECP. The same was true for the mnemonic most familiar to the ECP.

Process factors that had the potential to affect the efficacy of emergency centre handover included repetition of information and having to hand over multiple times. The busyness of the emergency centre and the noisy environment associated with it were linked to compromised patient privacy and a distractive environment in which to hand over. Understaffing and overworked staff were identified as barriers to an effective handover process and contributors to some of the identified issues related to poor emergency centre handover.

There were several communication factors identified by both PECP and ECP that negatively affected handover efficacy. Verbal, non-verbal and paraverbal cues were identified as having the potential to act as facilitators of or barriers to effective emergency centre handover. Listening skills were identified as a barrier to effective handover by both PECP and ECP. Interprofessional communication and relationships were identified as important for effective emergency centre handover.

Using the data, a novel model was developed using an iterative process. The model proposes solutions to some of the content, process and communication problems that were identified in this thesis. The model sees handover as comprising of five phases of information flow and unlike many previous models, recognises the bidirectional nature of communication within the handover process.

Conclusion:

Emergency centre handover between PECP and ECP needs improvement. The novel model proposed in this thesis divides handover into phases, each of which has identified factors that have the potential to act as facilitators of or barriers to effective handover. The model has potential to be implemented in emergency centre handover environments and may also have relevance in other patient handover environments.

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LIST OF KEY ABBREVIATIONS

Abbreviations in this list are limited to those considered key abbreviations. Full terms have been used throughout the thesis. Where necessary, additional explanations are provided in the text.

ALS	Advanced Life Support. This is usually a categorisation of South African prehospital emergency care personnel who have a relatively extensive scope of practice. This usually includes prehospital emergency care personnel registered with the HPCSA in one of the following categories: ECP, ANT, ECT
BLS	Basic Life Support. This includes prehospital emergency care personnel registered with the HPCSA in the Basic Ambulance Assistant (BAA) category
EMT	Emergency Medical Technician. A generic term used to refer to prehospital emergency care personnel
HIV	Human immunodeficiency virus
HPCSA	Health Professions Council of South Africa
ILS	Intermediate Life Support. This includes prehospital emergency care personnel registered with the HPCSA in the Ambulance Emergency Assistant (ANA) category

CHAPTER 1 : INTRODUCTION

1.1 Introduction

The journey that a patient travels within a healthcare system, from the first contact to final discharge, may be a long, protracted process. There are several situations within the care continuum where the patient may be transferred from one caregiver or facility to another. Some examples of intra-facility transfer include those between healthcare providers, facilities, areas within facilities, and between shifts within the facilities.¹⁻⁹ Settings in which the transfer of patient care may occur include, but are not limited to, prehospital/roadside care,¹⁰ primary to secondary care,¹¹ outpatient care,¹² emergency care,¹³ intensive care,¹⁴ surgical care¹⁵ and rehabilitation.¹⁰ At each point of care transition the patient is handed over from the transferring provider/facility to the receiving provider/facility, and what is perceived to be the correct and relevant information is communicated between the two parties.

Handover has been explored from several perspectives. Emergency centre handover has become the focus of several studies exploring different aspects related to the handover process.^{3,16-20} Much of this focus has been as a result of increased awareness of the consequences of poor handover practice. Poor handover was highlighted as an issue of concern in 2001 when the Institute of Medicine described inadequate handover as slowing down care and decreasing rather than improving safety; it was also determined that inadequate handover is an area where safety often fails first.²¹ There is a general paucity of literature related to the resource-constrained healthcare system, and this is particularly true of handover. As an emergency care practitioner within a resource-constrained healthcare system, I have observed that the handover aspect of patient care within the local emergency centre environment has been a poorly performed area in the continuum of ensuring continuity of care. This prompted me to develop an interest in handover and undertake research in this specific area of patient care.

1.2 Study setting: Healthcare in South Africa and Gauteng

1.2.1 Background: Geographical information

South Africa is a country located at the southern tip of the African continent (Figure 1-1). Northern neighbours are Namibia, Botswana, Zimbabwe and Mozambique. Two land-locked countries are recognised within the borders of South Africa, namely Lesotho and Swaziland. Despite almost 26 years having passed since the dawn of its democracy, South Africa remains a country with a wide disparity in access to resources.²² This is often most pronounced in the

healthcare sector where underfunding and poor allocation of financial resources within the state facilities remain a significant challenge.



Figure 1-1: The position of South Africa within Africa²³

1.2.2 Background: Population demographics

In 2017, Statistics South Africa estimated the mid-year population at 56.5 million with 11 recognised official languages. Of this total, approximately 51% (28.9 million) were female with the overall national population growth rate estimated at 1.6%.²⁴ Gauteng Province, the province where this study took place, is the smallest South African province by area (17 010 km²),²⁵ yet the most populous, with an estimated population of 14.3 million (25.3%).²⁴ The provincial population is dynamic and is affected by migrational demographic processes. Estimates indicate that between 2016 and 2021, Gauteng was expected to have a migrational inflow of more than 1 500 000.²⁴

Two of the challenges faced by the South African healthcare system are the infant mortality rate and prevalence of the human immunodeficiency virus (HIV). The infant mortality rate was estimated at 32.8 per 1000 live births, and approximately 7.06 million people were living with HIV. This represented approximately 12.6% of the South African population. The fact that

almost one-fifth of South African women of reproductive age (15-49 years) were HIV positive, further compounded this problem.²⁴

In 2015 there were 460 236 deaths in South Africa, of which 409 009 (88.9%) deaths were natural and 51 277 (11.1%) were from unnatural causes. There has been a steady increase in the incidence of unnatural deaths from 2010 (8.7%) to 2015 (11.1%). It was interesting to note that population groups most affected by unnatural deaths were those between 15-19 years (44.7%) and 20-24 years (46.3%).²⁶ The ten leading underlying natural causes of death in South Africa in 2015 were tuberculosis, diabetes mellitus, cerebrovascular diseases, other forms of heart disease, HIV, influenza and pneumonia, hypertensive diseases, other viral diseases, chronic lower respiratory diseases and ischaemic heart diseases.²⁶

1.2.3 Background: Healthcare system staffing

This burden of disease is compounded by critical shortages in the healthcare sector. These shortages relate to many factors, including facilities, equipment and human resource shortages. There are three areas of human resource shortages of relevance to this study, namely medical doctors, nurses and prehospital emergency care personnel (PECP). Each of these has been identified as being in a state of relative crisis due to staff shortages and training issues.

In 2013, the world average for medical doctors was 152 doctors per 100 000 citizens; the South African average for the same year was 60 doctors per 100 000 citizens.²⁷ No updated and validated data could be sourced citing more recent statistics. Interestingly, the number of registered doctors is not necessarily an accurate representation of the number of practicing doctors. Econex quote the Health Professions Council of South Africa (HPCSA) as having 36 512 registered doctors in 2010, and yet could find evidence of only 27 432 doctors in practice.²⁸ This number included specialist medical practitioners. There is also a significant discrepancy between private and public healthcare sectors; in 2013, the private healthcare sector had an estimated 92.5 doctors per 100 000 beneficiaries, whereas the public sector had 25.1 doctors per 100 000 citizens dependent on the public sector. There is also a provincial variation in doctor numbers as well as an urban/rural distribution that serves to further exacerbate this situation.²⁷ In the absence of a clear policy or target determining a norm, it is difficult to comment statistically on undersupply or oversupply of doctors. However, there are multiple and ongoing reports related to doctor shortages within the South African healthcare sector that serve as sufficient evidence that there is a shortage of doctors.²⁹⁻³¹

The general shortage of nurses within the South African healthcare sector is well documented.^{32,33} The nursing profession in South Africa has been described as facing a crisis characterised by staff shortages, a declining interest in nursing as a profession, a lack of an ethos of caring, and a disjuncture between nurses and the communities they serve.³² There seem to be no published national ratio norms,³³ but the ongoing reporting of crisis situations in hospitals cannot be ignored.^{34,35} There are an estimated 270 437 registered nurses in South Africa, and a corresponding shortfall of approximately 44 780 professional nurses. Moreover, with less than 3 600 registered students in nursing degree programmes countrywide, this disparity is unlikely to be resolved in the near future.³⁶ Further complicating the staffing issue is that up to 18% of registered nurses within South Africa are not practicing.³⁷ The South African nursing population is also an ageing one, with almost half of all licensed nurses aged 50 or over, and only 5% under 30 years old.³⁷ The shortage of nurses, coupled with that of doctors, means that the healthcare system is in dire straits; patients are thus unlikely to receive adequate care when engaging with the South African healthcare system.

There is limited information related to the numbers of PECP within the South African healthcare system. The National Emergency Care Education and Training (NECET) Policy was the first document to provide detailed information related to prehospital qualifications and registration numbers.³⁸ These are summarised in Table 1-1. The majority (80%, n=52 531) of registered healthcare providers registered with the HPCSA's Professional Board for Emergency Care (PBEC) fall into the 'Basic Ambulance Assistant' (BAA) category. This qualification is a four-week short course that is not aligned to the National Qualifications Framework (NQF).³⁸ This means that the backbone of service provision is carried out by persons with a four-week qualification and very limited scope. It is important to be cognisant of the fact that these are registered numbers and not necessarily practicing personnel. There is evidence to suggest that up to half of all persons registered in certain advanced life support categories may be working outside of South Africa.³⁹

Table 1-1: Prehospital emergency care provider registration descriptions and numbers

Registration category	Course name	Course description	Registrations per category
Basic Ambulance Assistant	Basic Ambulance Assistant (BAA)	Four-week short course	52 531

Registration category	Course name	Course description	Registrations per category
Ambulance Emergency Assistant	Ambulance Emergency Assistant (AEA)	Three-month short course	9 575
Paramedic	Critical Care Assistant (CCA)	Nine-month short course	1 581
	National Diploma: Emergency Medical Care	Three-year qualification	
Emergency Care Technician	Diploma: Emergency Care	Two-year qualification	1 108
Emergency Care Practitioner	B Tech: Emergency Medical Care	One-year qualification (Post National Diploma)	520
	Bachelor's Degree: Emergency Medical Care	Four-year qualification	

The NECET Policy identifies that many registered personnel do not appear to be gainfully employed in the appropriate healthcare sector. This serves to compound the issue related to shortages of appropriate staff, specifically that related to advanced life support capabilities. The NECET Policy document estimated that there were only 102 emergency care practitioners currently employed in the South African public and private sectors combined. The addition of paramedics, and perhaps emergency care technicians who are classified as advanced life support, results in a total of 1 170, making up less than 7% of the total prehospital care employees.³⁸ These figures translate into slightly more than two advanced life support practitioners per 100 000 citizens, representing in a critical shortage of appropriately qualified emergency care personnel and potentiating sub-optimal patient care and transport.

Handover is a component of the patient management process that has the potential to have both positive and negative effects within the healthcare system. The emergency centre handover forms the first interaction between the prehospital emergency care worker and the emergency centre. The emergency centre is often the patient's entry point into the system of hospital-based care. The resource-constrained environment that characterises the South

African healthcare system requires judicious use of available resources. The burden of disease and high unnatural mortality rates place a significant strain on the healthcare system. Any strategy that can improve efficiency and patient safety should be explored and evaluated for its potential benefits to both system and patient. Errors made in this environment have the potential to result in long-term effects that may be negative to the patient's recovery continuum. Ineffective handover has been associated with several adverse events that could increase the cost of patient care and the risk of litigation. Improving the handover process has the potential to realise tangible results that directly affect the healthcare system and its effective operation.

1.3 Handover

Handover has been defined in several different ways.^{40–47} Many of these are related to the environment in which handover takes place. Handover is recognised as a major determinant of patient safety,⁴⁰ and one of the descriptions of handover, contextualising its importance, is the following by Apker, Mallak and Gibson: “In many ways, handoffs can be considered the “glue” that holds the health care continuum together”.⁴³ This definition highlights how important handover is within the healthcare continuum, implying that without effective handover, things have the potential to fall apart. Several handover definitions are expounded upon in the literature review.

Commonly recognised definitions of handover fail to adequately recognise its status as both a compound noun and a phrasal verb. This required a more comprehensive definition of handover, which was derived from the literature review in Chapter Two:

Handover is a patient-centred process that presents adequate and contextually relevant patient-specific information from one medical professional to another. The information is presented in a structured format that facilitates optimal information transfer and recall as well as creating a shared understanding of the patient's condition to ensure ongoing continuity of care. Handover serves to transfer responsibility and accountability for continuity of care from one medical professional to another. The handover process is complete once the receiving medical professional indicates (verbally or in writing) that they have taken over responsibility for the patient.

There is a danger that handover information may become diluted, altered or misinterpreted, and that this may lead to adverse events or poor patient outcomes.¹⁷ Information dilution may result in dilution of care, and an appropriate handover is essential to ensuring continuity of

care.⁴⁸ Continuity of care is achievable only by continuous well-coordinated interaction between different health professionals,⁷ and errors in handover could be costly to the continuity of care.⁴⁸ Potential costs include increased incidence of clinical error, delayed treatment, longer patient stay, and unnecessary use of clinical resources.^{49–53} These costs are not only from a human perspective, but also have a knock-on economic effect. This may be a particular concern given the South African resource-constrained context. An improvement in handover practice therefore has the potential to decrease adverse events.⁵⁴ This thesis uses the data gathered to provide a model aimed at improving handover within the emergency centre.

1.4 Problem statement

There is a paucity of literature related to handover in the resource-constrained environment. This is particularly true of emergency centre handover where, even in resource-rich healthcare systems, this aspect of patient care appears relatively poorly researched. This presents a complex research situation, where there is little by way of guidance as to what areas of emergency centre handover require particular attention, specifically within the resource-constrained environment. A resource-constrained healthcare system requires more effective processes to ensure maximum benefit from each monetary unit spent. In South Africa, where healthcare functions within a constraint of both skills and finances, effective processes have the potential to offset some of the shortcomings in other areas.

Handover is an important component in ensuring continuity of patient care and could reduce patient adverse events. That said, handover appears to be a generally poorly performed aspect of patient care, and ineffective handover has been linked to an increase in adverse events. Adverse events might increase the general cost of per-patient healthcare from several perspectives, including extraneous factors such as litigation. Handover is made up of several aspects that have the potential to affect the efficacy of information transfer; these include handover content, processes involved in handing over, and communication aspects related to the handover. These aspects could positively or negatively affect how effective a handover is. The development of a model to address aspects of emergency centre handover may provide some of the answers to improve health system efficacy and result in better patient care.

1.5 Aim

This thesis aimed to investigate, explore and describe the perceptions of the practice of patient handover between PECP and the emergency centre within the resource-constrained

healthcare environment. This information was used to generate a model that addresses content, process and communication aspects of the emergency centre handover that are relevant to the resource-constrained environment.

1.6 Objectives

The objectives of the study are depicted as questions below:

1. What information do prehospital emergency care personnel (PECP) consider most valuable for inclusion in the handover to the emergency centre, and what are prehospital emergency care providers' opinions related to the current handover practice?
2. What information do emergency centre personnel (ECP) consider most valuable for inclusion in the handover from PECP, and what are ECP's opinions related to the current handover practice?
3. What knowledge and opinions do PECP and ECP knowledge have related to handover adjuncts and quality of handover?
4. How can the data collected for these objectives be analysed and interpreted for generating appropriate themes to construct a model that will address three specific areas within handover. This model aims to:
 - a. address issues related to the *content* of prehospital to emergency department handovers within the resource-constrained environment,
 - b. address issues related to *processes* within prehospital to emergency department handovers within the resource-constrained environment, and
 - c. address issues related to *communication* in prehospital to emergency department handovers within the resource-constrained environment.

1.7 Brief summary of the design and methodology

The design chosen for this study was a mixed-methods research design. Mixed-methods research involves collecting both quantitative and qualitative data. An explanatory sequential mixed-methods design was chosen for this study and involved an observational study (Phase One) that collected data using paper-based questionnaires, followed by a qualitative study (Phase Two). Phase Two collected data using face-to-face, semi-structured interviews and served to explore the results and specific themes identified in Study One. Phase Two was followed by a third phase, where the model development took place.

The study gathered data from PECP and ECP populations within the Johannesburg area. Data were collected in two phases for each population. The first phase aimed to quantitatively collect and analyse data and then to use a second, qualitative phase to explain certain of the results obtained in the first phase.⁵⁵ Phase One followed a quantitative design and involved the compilation and distribution of a questionnaire. The questionnaire was compiled by reviewing literature related to handover. Abstracts of articles were read, and relevant articles that had been identified were included in the material studied to generate the questionnaire.

The questionnaire was compiled de novo using extracted themes identified in the literature and was made up of two sections. Section A comprised of fixed-response questions using Likert-type scales and forced binary responses. Section B consisted of open-ended questions exploring respondents' views, experiences and opinions related to handover in the emergency department. The questions in Section B were specific to the prehospital and emergency centre populations. Data from Section B were captured verbatim into Atlas.ti (v7.5.12; ATLAS.ti Scientific Software Development GmbH, Berlin, Germany) for analysis and coding. Moreover, the coding processes followed inductive and deductive coding strategies. The results of the analysis and coding of Section B were used to compile the questions that were used in the semi-structured, face-to-face interviews. The questions, like Section B of the questionnaire, were specific to the prehospital and emergency centre populations.

A pilot study was conducted to determine the face validity of the questionnaire.⁵⁶ There were no notable comments nor trends observed during this phase. Questionnaires were distributed to PECP at their places of work. In total, 175 completed questionnaires were collected from PECP. Emergency centre staff were approached in their respective places of work, and 50 completed questionnaires were collected. Likert-type and other restricted response questions were analysed using existing descriptive functions in Microsoft Excel[®]. Open-ended questions were transcribed verbatim into Atlas.ti[®], analysed and coded. Coding was inductive and deductive, and identified codes and themes that were used to compile the questions for the semi-structured, face-to-face interviews. Interviews were conducted in venues convenient to both interviewer and interviewee, recorded and transcribed. Transcriptions were imported into Atlas.ti[®] for analysis and coding. A qualitative descriptive methodology was employed where inductive and deductive coding formed the basis of the identification of codes, categories and themes. Codes were grouped together to form categories and, where relevant, were grouped into themes, analysed, interpreted and reported on. The results of data analysis were used to develop a model that addressed the issues related to content, process and communication within emergency centre handover.

The research design and methodology are described in detail in Chapter Three.

1.8 Layout of the thesis

Chapter One introduced the study and provided information related to the background of the study. Chapter Two provided a review of the literature and included relevant information that served to contextualise the study. Chapter Three introduced Phase One of the study, which represented the quantitative data gathering and analysis processes. The section of Chapter Three relating to Phase One followed the 'strengthening the reporting of observational studies in epidemiology' (STROBE) guidelines for reporting observational research.⁵⁷ This included the study design, the setting of the study, data collection methods and how data were analysed. Inclusion/exclusion criteria were also highlighted, as well as ethical considerations and related good practice. Chapter Three also introduced Phase Two of the study. Phase Two represented the qualitative data gathering and analysis processes. The section of Chapter Three relating to Phase Two followed the 'consolidated criteria for reporting qualitative research' (COREQ) guidelines.⁵⁸ This included the study design, the setting of the study, data collection methods and how data were analysed. Further to this, inclusion/exclusion criteria were highlighted as well as ethical considerations and related good practice.

Chapter Four presented the data collected in Phases One and Two of the study. Data were reported on using tables and figures for the observational data. Data from the interviews were reported on using tables that depicted themes, categories and quotes. Chapter Five discussed the data presented in Chapter Four. The meaning of important and significant findings was explained and related to those of similar studies. The relevance of the findings within the context of the study's aims was expounded upon and contextualised within the framework of model development. Where relevant, the STROBE and COREQ guidelines were carried over from Chapters Three and Four. Chapter Six used the information from Chapter Five to develop the handover model. The dissertation is concluded in Chapter Seven, where the study's recommendations, limitations and future study are detailed.

CHAPTER 2: LITERATURE REVIEW

2.1 Introduction

Chapter One provided the context to the study and described the resource-constrained setting in which South African healthcare providers operate. Chapter Two expands on these handover themes through an in-depth review of the literature. The various aspects related to handover are explored in the form of questions that provide information relevant to the thesis and its aims.

2.2 Structure of the Literature Review

It is important for information to be organised and structured so that it follows a logical progression. A literature review often follows a chronological structure to organise the information.⁵⁹ Basic mind-mapping techniques are useful when chronologically organising information. In structuring this literature review, the Five-W, One-H principle was followed as a mind-mapping technique.⁶⁰ The H is often considered to be a part of one or more of the Ws,⁶¹ but this is not the case within the context of the structure of this thesis. The H (How?) is included in this review as an integral part of understanding handover. In addition, this literature review required a sixth W, 'Which'. Figure 2.1 depicts the process of reviewing handover.

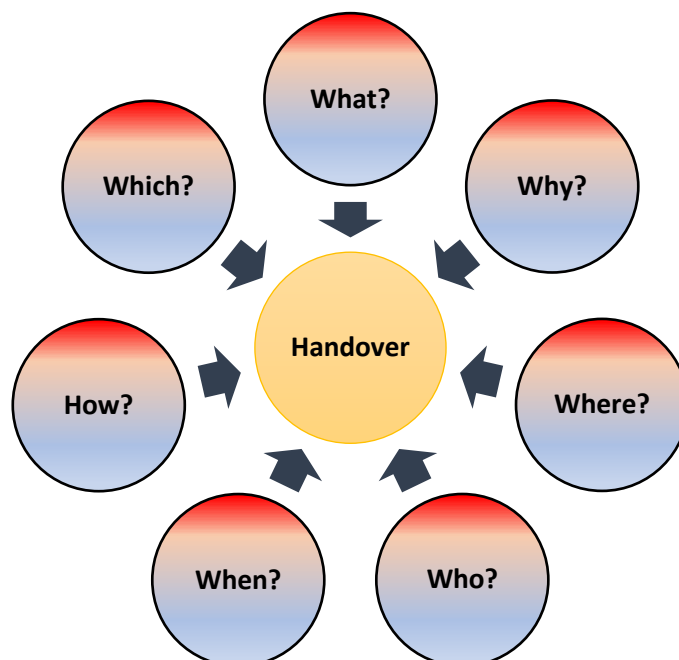


Figure 2-1: Adapted Five-W, One-H principle for structuring the literature review

The review sequence is structured to answer questions in chronological order that best makes sense of handover. Handover, in itself, is a story of the patient and the sequence seeks to present a story-like explanation and account of handover. Each question is answered under a heading, and relevant sub-questions are included to provide better context or more detailed explanations. The basic questions that relate to the single words are summarised in Table 2-1.

Table 2-1: Clarification of one-word questions

Question	Clarification statement
What?	What is handover?
Why?	Why is handover important?
Where?	Where does handover take place?
Who?	Who performs handover?
When?	When does handover take place?
Which?	Which handover information is important?
How?	How does handover occur?

2.3 Search strategy and evaluation criteria

A literature search to determine existing handover research, as well as areas where knowledge may have been lacking, was commenced. The primary search method used to identify appropriate sources was the Pubmed[®] electronic database. Terms that were searched included 'handover', 'hand over', 'handoff', 'hand-off' as well as variations of these that included the word 'patient'. The terms used were generic to the point where adding terms related to mnemonics and other handover variables did not produce any additional papers and were therefore not outlined here. The titles of identified articles were read to determine appropriateness and, if deemed appropriate, the abstract was accessed and read. In the event that the abstract appeared to have relevance to the research study, the entire article was accessed where possible. Accessibility to identified sources was determined using the UJoogle search engine (© Innovative Interfaces, Inc. Emeryville, CA). UJoogle is a search engine that uses federated search technology, meaning that it allows for simultaneous searching of multiple library sources and databases. These databases included, but were not limited to, EBSCO Host, Elsevier eLibrary, McGraw Hill, Sage Journals Online, SpringerLink, and Wolters Kluwer. Each accessible article was then downloaded, read and classified according to relevance. Where articles were not available via the UJoogle domain, the

University of Johannesburg's Faculty of Health Sciences librarian was asked to attempt access. Despite this, some sources remained unavailable.

Inclusion criteria for available sources stipulated English language, and sources available in a published book, peer-reviewed journal or conference proceeding. There was no limit placed on the publication date of sources. Exclusion criteria included the source not being available in English, the source not being of sufficient relevance, the full-text version being unavailable, and the source being of questionable nature.

Handover within the hospital, specifically shift or inter-unit handover between nursing staff, appeared well-researched and described. However, handover between the prehospital and emergency centre yielded limited information. The keywords 'South African handover' produced 3736 hits. Article titles were read and classified for relevance. Where relevance was perceived to be high, abstracts were reviewed. Despite the initial hit-rate, there were no South African studies found that directly explored handover between prehospital care providers and the emergency centre.

2.4 What is Handover?

2.4.1 What is the difference between handover and hand over?

In pure or business English, the spelling of 'handover' or 'hand over' determines what it refers to. When spelt 'handover', it is a compound noun and when spelt 'hand over' it becomes a phrasal verb.⁶² In other words, handover (noun) refers to the **process** of giving responsibility for something to someone else⁶³ and hand over to the actual **act** of giving something (in this case the patient) to someone.⁶⁴ Interestingly, literature related to patient handover and hand over does not seem to make a clear contextual distinction between the two. Some basic terms used in the literature include "handover",^{4,65} "hand over",⁶⁶ "hand-off",^{67,68} "handoff",^{69,70} "sign-out",^{71,72} and "sign-over".⁷¹

It is important to differentiate the two aspects of handover but the use of the different spellings may result in further confusion. Considering this, the spelling 'handover' will be used throughout this thesis. In the literature review, and elsewhere in the thesis, where specific reference is made to handover as a noun or verb, this will be specified appropriately.

2.4.2 How is handover (noun) described in the literature?

The range of conceptual and environmental differences means that handover is contextual and therefore difficult to define.^{15,73,74} Although no universally accepted definition for

'handover' seems to exist, that postulated by the British Medical Association (BMA) seems to enjoy rather widespread citation: "transfer of professional responsibility and accountability for some or all aspects of care for a patient, or groups of patients, to another person or professional group on a temporary or permanent basis".⁴⁰ The BMA definition focuses on handover as a compound noun as it is primarily concerned with the process of handover. Cohen and Hilligoss attempted to provide a definition of handover as "the exchange between health professionals of information about a patient accompanying either a transfer of control over, or of responsibility for, the patient".⁴¹ This too focuses on handover as a process. Table 2-2 summarises components of definitions that relate to handover as a process.

Table 2-2: Handover as a process

Authors	Descriptor
Patterson and Wears (2010) ⁴²	A process of transferring primary authority and responsibility for providing clinical care to a patient from one departing caregiver to one oncoming caregiver.
Apker, Mallak and Gibson (2007) ⁴³	The 'glue' that holds the healthcare continuum together.
Wood, <i>et al</i> (2015) ⁴⁴	A complex process that can involve a number of different people, professionals, patients and the public.

Bruce and Suserud relate the following to the emergency centre handover: "the emergency nurse was able to collate a holistic picture of the patient to inform his or her triage function. The information relayed was patient-focussed, with identifiable problems clearly stated".⁴⁵ Handover has also been described as ensuring an accurate understanding of the needs of the patient as well as expected trajectory and anticipatory guidance related to potential changes in clinical status.⁷⁵ One of the aspects related to an effective handover process is the actual information that is handed over within the process. This is discussed under the Section 2.11, entitled "Which Elements of Handover Information Are Considered Most Important for Inclusion in Handover?"

2.4.3 How is hand over (verb) described in the literature?

Hand over (verb) refers to the actual act of handing over. In the context of this thesis, this refers to any aspect relating to handover that is connected to the physical handover itself. One of the primary functions of handing over involves the physical transfer of responsibility and accountability for the patient.⁷⁶

Table 2-1 summarises components of definitions that relate to hand over as a verb.

Table 2-1: Hand over as a verb

Authors	Descriptor
Bruce and Suserud (2005) ⁴⁵	The physical handover of the patient accompanied by a verbal account of what had taken place and passing on of any written documentation.
Hoban (2003) ⁴⁶	A means of two-way communication between the emergency centre and ambulance service where information will facilitate consistency and continuity of care.
Jensen, Lippert and Østergaard (2013) ⁴⁷	Situations in which the responsibility for a patient's diagnosis, treatment and care is handed over – completely or partly, temporarily or permanently – from one healthcare professional to another.

The fact that handover can be seen as both a noun and a verb potentially creates confusion as to what handover actually is. The emphasis in a verbal definition and that of a noun would fail to encapsulate a single definition of handover, which is what is needed. Handover (noun) and hand over (verb) are inescapably linked to the point where a single definition that combines both should be sought.

2.4.4 What contributes to effective handover?

Effective handover has been described as “critical to achieving the optimum management of all patients”.⁷⁷ One of the aims of effective handover has been defined as the “seamless transfer of information between care providers”.⁷⁸ Effective handover is also referred to as “integral for the continuity of patient care”.⁷⁹ Some of the aspects associated with an effective paramedic-to-hospital handover have been described by Evans *et al* and include; having experience, confidence and being succinct, and having the emergency centre staff actively listening.¹⁸ One of the questions in the questionnaire in Study One explored contributors to effective emergency centre handover by asking PECP participants “List five things that you do that you believe make your handovers ‘good’” and asking ECP participants “List five aspects of what you think contribute to a ‘good’ handover”.

2.4.5 What happens when handover is not effective?

Handover serves to prepare healthcare providers for potential incidents or complications. Borowitz *et al* found that almost a third of residents in a paediatric acute care ward experienced an incident for which they were not adequately prepared while on call.⁸⁰ Often, these residents had not received information that could have potentially been helpful and may have assisted in anticipating adverse events. The authors described handover between resident physicians as often being inadequate and incomplete. It was significant that the quality of handover was the only variable found to affect the residents' perception of their preparedness for night shift. This particular study highlighted that inadequate handovers pose a major risk to patient care. The importance of handovers being comprehensive and including critical information was also a significant finding. Providing sufficient information during handover assists incoming teams in adequately preparing for their shift. The study's findings highlighted a need for changes aimed at improving handover and patient safety.⁸⁰

The handover quality and process may be associated with malpractice claims and other litigation. In a 2007 investigation of ten years' worth of USA malpractice claims, Singh *et al* found that of the 240 analysed cases, 70% involved errors resulting from a breakdown of teamwork. Of the errors involving teamwork problems, 13% (n=83) of non-trainee errors and 19% (n=46) of trainee errors could be directly attributed to handover. Handover communication problems seemed complex, and there were multiple communication breakdowns.⁸¹ Handover was found to pose a significant risk to patient safety and there was an apparent higher risk of errors within trainee handover.⁸¹ What is important to consider is that without the required training, errors made by trainees would potentially continue into their independent practice. One could therefore infer that without adequate training, practitioners may perpetually hand over in a manner consistent with that of a trainee. This perpetual trainee-like handover would carry with it the associated risks to patient safety.

Ineffective handover practices that contribute to dysfunctional handover can lead to discontent. Although not technically a direct risk related to poor handover practice, discontent related to the handover process may result in decreased efficacy of handover.⁸² Some issues identified during a small-scale literature review as potential causes of discontent, include an unreasonably long period spent handing over; non-essential and irrelevant information being included; lack of accuracy; patient documentation not being referred to; subjective information; vague statements; trivial conversation; retrospective not prospective information; and

unreliable information based on memory.⁸² The sources of discontent seem to relate very closely to factors that affect the efficacy of the handover itself. Other authors also link many of the identified sources of discontent to poor handover.^{17,82–86} One of the questions in the questionnaire in Study One explored contributors to ineffective handover by asking PECP participants “Please briefly discuss some aspects that can make the act of handing a patient over a ‘bad’ experience for you when you hand over in the Emergency Centre.” and asking ECP participants “Please briefly discuss some aspects that make a handover ‘bad’”. One of the challenges is that no model exists that explores what factors have the potential to negatively affect emergency centre handover efficacy within the resource constrained environment.

2.4.6 Handover defined

Currently, most handover definitions do not adequately emphasise the link between the two. To provide a more comprehensive definition that contextualises both the compound noun and phrasal verb properties of handover, the following is suggested:

“Handover is a patient-centred process that presents adequate and contextually relevant patient-specific information from one medical professional to another. Handover information is presented in a structured format that facilitates optimal information transfer and recall, as well as establishing a shared understanding of the patient’s condition, to ensure ongoing continuity of care. Handover serves to transfer responsibility and accountability for continuity of care from one medical professional to another. The handover process is complete once the receiving medical professional indicates (verbally or in writing) that they have taken over responsibility for the patient.”⁸⁷

2.5 Why is Handover Important?

The Joint Commission is an independent, not-for-profit organisation whose mission is to continually improve health care for the public.⁸⁸ The Joint Commission refers to patient safety as the central aim of quality.⁸⁹ Handover has been linked to patient safety with the assumption that poor handover may result in missing or inaccurate information and sub-optimal patient care. The implication is that if a critical piece of information were omitted or incorrectly handed over, this might result in an adverse event. It is difficult to associate a specific adverse event to handover because no studies seem to exist where the link has been irrefutably made.^{50,90–93} Possible adverse events associated with handover that appear directly relevant to the emergency centre are included in Table 2-4.^{42,51,94–98}

Within the South Africa context, the rights of the patient are enshrined within the Patient Rights Charter. This Charter is discussed in the relevant Health Professions Council of South Africa (HPCSA) documents.⁹⁹ Regarding continuity of care, the following is defined in Section 2.11 of the relevant document: “No one shall be abandoned by a health care professional who or a health facility which initially took responsibility for one’s health without appropriate referral or hand-over”.⁹⁹ Section 2.11 therefore suggests that a lack of appropriate communication related to handover can be deemed abandonment and a factor negatively affecting patient safety. Appropriate handover is imperative to patient safety and the rights of the patient to appropriate healthcare.

Table 2-2: Possible adverse events related to handover

Possible adverse event	Example of possible causes of adverse events related to handover
Delays in diagnosis and treatment	Failure in handing over test results or important diagnostic information may result in the repetition of tests and associated delays. Delays with the handover itself will result in resultant delays in treatment.
Wrong treatment	Incorrect information handed over may result in an incorrect diagnosis and subsequent inappropriate treatment.
Life-threatening adverse events	Inadequate information handed over may result in the omission of critical treatment.
Complaints from patients	Patients may feel disconnected from their own care or may be dissatisfied with the manner in which their information is communicated. Patients may not like the manner in which their medical details are discussed. The handover environment may breach confidentiality.
Increased expenditure on healthcare	Additional tests and long-term adverse effects increase the burden on the healthcare system.
Increased length of hospital stay	Inappropriate handover can result in adverse events, inappropriate treatment and delays in appropriate management. These, in turn, contribute to increased healing time. Increased healing time contributes to increased length of hospital stay.

2.6 Where Does Handover Take Place?

There are some who argue that the healthcare system is made up of essential building blocks or units of work. The context of this thesis fits in with this assumption of there being essential building blocks. These building blocks are referred to as 'clinical microsystems';¹⁰⁰ those small, functional, front-line units that provide the majority of health care to the majority of people. The clinical microsystem is where the patient and the healthcare providers meet.¹⁰⁰ Clinical microsystems are the smallest units of work where clinicians and other staff work together with a shared clinical purpose of providing health care for patients.¹⁰⁰ The effective clinical microsystem is defined by Wasson, *et al* as "a productive interaction between an informed, activated patient and a prepared, proactive practice staff".¹⁰¹ It is between and within the multiple clinical microsystems that handover takes place. Figure 2-2 is a self-drawn chronological summary of areas or specialities where emergency centre-related handover has the potential to take place.

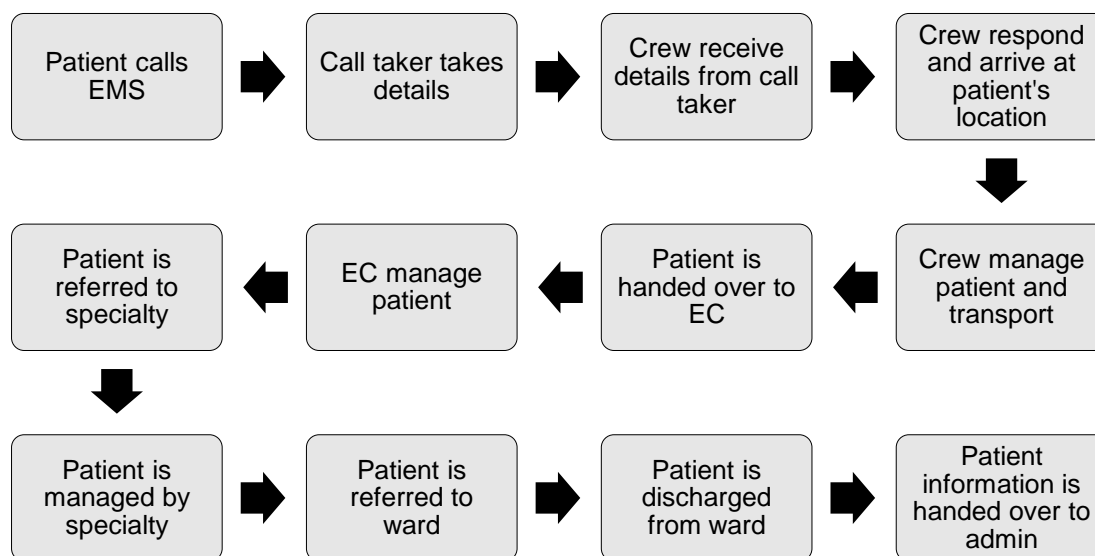


Figure 2-2: Potential handover areas

2.6.1 What are the characteristics of the environment in which emergency centre handover takes place?

The emergency centre is an area of the healthcare facility that is unique for several reasons. The emergency centre has a higher patient turnover than other areas of a hospital. This high turnover is further complicated by an unpredictable patient flow and a greater number of nursing interventions per patient per unit of time. Patients within the emergency centre often

have high-acuity injury or illness, resulting in a greater likelihood of their condition changing within short timeframes. This requires rapid decision-making within unfavourable time constraints and a more rapid evolution of disposition and care plans. Patients are often cared for by a variety of healthcare professionals, which increases the incidence of handover and resultant information dilution.¹⁰² This information dilution is not dissimilar to the phenomenon where information is lost each time a new person becomes involved in the information transfer process.⁶⁷

The emergency centre is a fluid space where patients and medical professionals come and go on a continual basis. It is a place where the quiet environment usually associated with a hospital seems to be absent. There is a constant buzz, perpetual movement and ongoing personal interactions between patients and healthcare professionals, healthcare professionals and their colleagues, and healthcare professionals and machinery. It is this environment where the prehospital care provider usually has their interactions with the hospital microsystem. It is also out of this environment that the emergency centre staff greet the prehospital care provider.

Within the emergency centre, handovers of often critically ill patients tend to be verbal and occur rapidly. Receiving healthcare professionals are frequently engaged in patient monitoring and evaluation activities, as well as patient treatment, while they are also trying to listen to the handover. Often, communication is unidirectional from the prehospital care provider to the emergency centre staff member and there is limited time allocated to questioning. It is important to understand this unique environment and the challenges it presents to the healthcare professionals who are required to interact and work together within its walls.

Table 2-3 provides a summary of some terms used to describe the emergency centre within the context of handover.

Table 2-3: Descriptors of the emergency centre handover environment

Authors	Descriptor
Delrue (2013) ¹⁰³	<ul style="list-style-type: none"> • “This environment is chaotic and fluid...where there are multiple demands and constant interruption...”
Owen (2009) ³	<ul style="list-style-type: none"> • “Emergency centres are chaotic and complex environments...”
Bost, <i>et al</i> (2010) ²⁰	<ul style="list-style-type: none"> • “...an environment of busyness”

Authors	Descriptor
Cram, <i>et al</i> (2017) ¹⁰⁴	<ul style="list-style-type: none"> • "...loud and chaotic environment..."
Klim, <i>et al</i> (2013) ¹⁰²	<ul style="list-style-type: none"> • "...increased unpredictability and disruptions...requiring to multitask and staff attending to patients with diverse and disparate needs."
Coiera, <i>et al</i> (2004) ¹⁰⁵	<ul style="list-style-type: none"> • "...a setting that can be chaotic, crowded, and rife with distractions"
Redley, <i>et al</i> (2017) ¹⁰⁶	<ul style="list-style-type: none"> • "...complex, high-risk clinical environments where interprofessional teams of doctors, nurses and allied health staff care for a wide range of patients in settings of uncertainty, where time and resource constraints can impact communication effectiveness."
Kalyani, <i>et al</i> (2017) ¹⁰⁷	<ul style="list-style-type: none"> • "... a lot of noises such as screaming, shouting, using obscene language..."

Jenkin *et al* studied the phenomenon of handover between an ambulance service and the emergency centre using a descriptive, non-experimental cross-sectional survey.¹⁶ Their study identified several issues related to handover, some of which have been discussed under the appropriate headings elsewhere in this literature review. One of the first aspects of the prehospital to emergency centre handover relates to these patients having non-specific characteristics generally not found in other types of patient handover. Emergency centre patients were identified as reflecting all sections of society, being of non-specific age categories ("can be of any age") and presenting with a variety of chief complaints or acute minor or major injuries ("many different acute or chronic illnesses").¹⁶ In the hospital environment, patients are usually grouped together based on specific criteria, often related to disease profile.

Moreover, there is an emphasis on the potential breach of patient confidentiality in some handover environments.^{16,108,109} The emergency centre is an area where the handover environment itself does not lend itself to patient confidentiality. Jenkins *et al* described non-priority patients being handed over in a corridor that was "also a thoroughfare for ancillary staff, other patients, relatives and members of the public. Information of a sensitive nature can be and is overheard".¹⁶ Confidential patient information is often overheard by non-medical

persons in close enough proximity to the handover. Thus, the communication environment should not only be conducive to effective interpersonal communication but should also take confidentiality into account. Within the resource-constrained environment, many ECs have been repurposed from existing areas and are not configured for effective handover. Some phrases used to describe where patients are placed include “in the corner” or “next to the broom cupboard”.¹¹⁰ The resource-constrained South African EC is not dissimilar to that described by Kalyani, Fereidouni, Sarvestani *et al* where up to ten people were near the patient during handover.¹⁰⁷

2.7 Who Performs Handover?

2.7.1 Who is usually involved in emergency centre handover?

Wood *et al* identify different people, professionals, patients and the public as being involved in handover.⁴⁴ Within the emergency centre, interprofessional handover usually takes place between the PECP and the ECP.^{111–113} The persons typically involved in emergency centre handover include the PECP, nursing personnel, doctors and specialists. These interactions often take the form of verbal exchanges between the person delivering the handover and the person receiving the handover. Persons involved are usually determined by factors such as staff availability⁴⁴, patient acuity¹⁰ and local protocols. Handing over to a doctor has been linked to improved handover¹¹⁰ but within the resource-constrained EC doctors are not commonplace.²⁷ The lack of EC personnel available to receive handover within the resource-constrained environment has also been highlighted by Jamshidi, Jazani and Alibabaei *et al*.¹¹⁴

2.7.2 What affects interprofessional communication?

Interprofessional communication is one of the cornerstones of handover within the emergency centre. There are clinicians from multiple disciplines working independently but performing complementary roles within the delivery of care to a single patient.¹⁰⁶ Interprofessional and intraprofessional communication is often affected by cultural, organisational, environmental and behavioural factors.¹¹⁵ There are also differences in clinician expectations and perspectives, professional sensitivities, interprofessional relationships and contexts of care delivery.⁶⁸ These differences in clinician expectations have the potential to decrease the efficacy of interprofessional communication at handover.

Interprofessional communication in the emergency centre has been described as predominately “ad hoc” and “opportunistic”.¹⁰⁶ Interprofessional communication can also be described as synchronous or asynchronous.¹¹⁶ Synchronous communication is

communication occurring in real time, such as during verbal handover. Asynchronous communication refers to communication that does not occur in real time, including notes on whiteboards or written notes, such as those in a written handover document.¹¹⁶ Interprofessional handover is a potential area within the handover process where communication failure is at a high risk of prevalence.^{20,73}

Barriers to interprofessional communication may occur within and/or between disciplines. There is a broad range of education, training, skills and experience in the emergency centre. The prehospital care providers have qualifications that may range from a four-week qualification obtained at a private training facility, to a four-year, NQF level 8 qualification, obtained from a higher education institution. The prehospital care providers holding a four-week qualification, commonly termed basic ambulance assistants (BAA), make up the bulk of those registered with the Professional Board for Emergency Care (PBEC). This has the potential to create significant discord within the emergency centre where the treatment and handover information expectation may far surpass the ability of the BAA. This is compounded by the fact that within the ranks of the emergency centre staff, the minimum qualification is significantly higher and at minimum is likely to be a two-year nursing diploma. The end result is that interprofessional communication between the prehospital care provider and the emergency centre may be hampered from the outset. Communication issues between PECP and the EC have been described in the resource-constrained environment by de Lange *et al.*¹¹⁷ This communication in the EC and the relevant challenges that results are explored in both Study One and Study Two.

Meisel *et al*¹¹⁰ studied the perspectives of prehospital care providers related to prehospital to emergency centre transitions. Prehospital care providers identified themselves as patient advocates during the prehospital to emergency centre transition. Two barriers to their ability to advocate on behalf of the patient were cultural and structural barriers. Study participants felt that direct communication, increased interdisciplinary feedback and transparency would help improve handover and transition. In addition, the need for a shared understanding of scopes of practice between prehospital and in-hospital healthcare professionals was highlighted.¹¹⁰ Cultural and ethnical diversity, such as that found in South Africa, serves to compound communication issues. O'Daniel and Rosenstein¹¹⁵ identified several common barriers to interprofessional communication and collaboration, summarised in Table 2-4.

Table 2-4: Common barriers to interprofessional communication and collaboration

Common barriers to interprofessional communication and collaboration

- Personal values and expectations
 - Personality differences
 - Hierarchy
 - Disruptive behaviour
 - Culture and ethnicity
 - Generational differences
 - Gender
 - Historical interprofessional and intraprofessional rivalries
 - Differences in language and jargon
 - Differences in schedules and professional routines
 - Varying levels of preparation, qualifications, and status
 - Differences in requirements, regulations, and norms of professional education
 - Fears of diluted professional identity
 - Differences in accountability, payment, and rewards
 - Concerns regarding clinical responsibility
 - Complexity of care
 - Emphasis on rapid decision making
-

Healthcare practitioners are also trained differently. An example is the difference between nurses and physicians, where nurses are trained to be highly descriptive, and physician training focuses on being succinct.¹¹⁸ The same is true of the training of prehospital care providers and their emergency centre counterparts. This is a potential source of frustration and can negatively affect interprofessional communication. Several of the presented barriers are pertinent in the prehospital to emergency centre interprofessional communication environment. Some strategies that have been suggested to enhance communication and collaboration are “for different groups to just get together”, encouraging open dialogue and creating interdisciplinary committees who are able to discuss problem areas.¹¹⁹ In essence, the emergency centre handover should take place in an environment that is cooperative as opposed to one that is competitive, with the primary agenda to benefit patient care.¹¹⁹

2.8 When in the Patient Care Continuum Does Handover Take Place?

The handover of patient information begins at the first contact that the patient has with the healthcare system. The call taker, who receives this information, attempts to decode the information to decipher the needs of the patient. This encoding/decoding process occurs at each step within the healthcare system where the patient is handed over to another practitioner or department. Figure 2-2 depicted a simple pathway that a patient may follow within the healthcare system. Each arrow represented an area where handover may occur, and it is important to be cognisant of the fact that multiple handovers may occur at each stage.

Handover of a patient may occur in a variety of areas within the healthcare system. Each of these areas may have differing handover practices, complicating the efficacy of interdepartmental handover. This is also true of the intradepartmental handover where staff themselves may have their own preferred way of handing over as opposed to a generally accepted standardised method. Within the emergency centre, continuity of patient care often requires frequent handovers between clinicians whereby responsibility for ongoing patient care is transferred.¹⁰⁶

2.9 How Does Handover Occur?

2.9.1 What is the role of communication in handover?

Communication involves three basic components, namely verbal, non-verbal and paraverbal communication. Verbal communication relates to the actual words that are used, non-verbal communication relates to cues such as body language and facial expressions, and paraverbal communication is the way in which the words are said; this includes voice tone and volume. The combination of verbal and non-verbal communication is often termed 'metacommunication'.¹²⁰

Communication is one of the embedded functions of handover. 'Good' or 'bad' communication strategies can affect handover efficacy. As mentioned, handover relies heavily on interpersonal communication and there are various studies that explore the communication theory behind handover and similar processes.^{121–123} Moreover, since handover and communication are intricately linked, communication shortcomings are contributors to ineffective handover.^{51,95,115,124–128} Within the Joint Commission's collection of sentinel events (near-misses and adverse events), communication problems have been shown as a root cause in many of these cases.¹²⁹ The patient handover entails information exchange, and therefore has communication at its core; it may very well be at the heart of these 'sentinel

events'. The Joint Commission further estimates that 80% of serious medical errors involve miscommunication among healthcare practitioners during the transfer of patients.¹³⁰

Communication during handover is important in areas other than healthcare. Lardner¹³¹ performed an extensive review of the root causes of high-risk industrial adverse events. Ineffective communication of good information and effective communication of poor information were both found to be root causes of analysed adverse events.¹³¹ The resource-constrained EC is often staffed by personnel who speak different languages and this has the potential to negatively affect communication.¹³² This highlights the important link between information transfer and communication. Also, there is a strong link between miscommunication and poor patient outcome.¹²⁹

Patterson and Woods¹³³ studied shift turnovers at the National Aeronautics and Space Administration (NASA) mission control. There were three major communication issues found to affect not only the receipt of information but also how this information was used. Not being told information, not understanding the information that was given, and forgetting information were communication errors associated with several complications. These complications included a lack of awareness of critical data, a lack of preparation for consequences resulting from previous events, an inability to anticipate future events, and shifts in goals, decisions and plans that could not be anticipated.¹³³ Many of these communication issues are relevant to patient handovers in the resource constrained EC. Communication barriers to emergency centre handover within the resource constrained setting were explored in both Study One and Study two.

2.9.2 What about the two-way nature of communication?

Some literature has viewed handover as a unidirectional transfer of information.^{42,115} This fails to acknowledge the two-way nature of communication and a linear communication model was suggested by Hasan *et al* to describe handover communication.⁶⁹ Sender/receiver handover models have been described in a number of texts.^{134–136} A more detailed model describes three separate potential error areas: transmitter/sender (encoding), channel, and receiver (decoding).¹³⁷ The role of the sender and receiver differ significantly and yet are interchangeable, dependant on who is doing the talking.

Encoding and decoding practices are critical to effective handover communication. The encoding process involves the sender encoding the information they wish to transmit into words. The decoding process involves the receiver decoding the message into what they

believe it to mean. Both encoding and decoding processes may be negatively affected by poor communication practices as well as a lack of handover experience on the part of the sender or receiver. An additional factor to take into account is the effect that noise can have on communication.

Internal noise is an additional source of encoding error and can manifest as psychological, physiological and semantic noise.¹³⁷ Physiological noise includes factors such as sleepiness, hunger, thirst, the necessity to void, and pain. Psychological noise includes factors such as personal relationship barriers and hierarchy barriers. External noise within the handover is a further complicating factor to the quality of handover communication. Noise has the potential to affect the ability of the receiving practitioner to adequately receive and interpret the handover.¹³⁷

There is a paucity of research on the role of the receiving practitioner. Some behaviours that have been observed in receiving practitioners include asking clarifying questions, suggestions, disagreements and repeat-back statements.⁹ In essence, the receiver engages in active understanding and discussion about patients and treatment. Receiver interaction has been observed to be limited and there were no questions asked at all in 59% of observed handovers. Where there was disagreement, this was usually raised indirectly and not overtly.⁹ Apker *et al* found that handover from the emergency centre was characterised by limited space for collaboration or questioning. They describe verbal handover communication as being comprised of information-giving utterances, information-seeking utterances, and information-verifying utterances. Regarding language form, information-giving utterances (90.7%) far exceeded information-seeking utterances (8.8%), and only 0.4% of observed utterances were for the goal of information verification.¹³⁸ This highlights the one-way communication that is prevalent in handover. This dominant one-way communication may be as a result of the passive nature of the handover receiver. This requires further investigation and may be directly linked to interprofessional communication or the hierarchical nature of interactions during handover. Handover is a social interaction and the one-way communication model does not lend itself to the social negotiation thereof.

The suggestion is that handover should to be viewed as a team activity with shared responsibility.^{42,115} In other words, communication should move from a 'transferer' and 'receiver' framework, to a 'we-frame' where there is two-way communication and a feeling of shared responsibility.¹³⁹ The advantage of two-way communication is that there is feedback between the two persons involved in handover. This feedback allows both sender and receiver to confirm that the meaning of the transmitted information has been adequately understood.

This has been termed 'closing the loop' and serves to minimise misunderstanding between the person giving and the person receiving the handover.¹⁴⁰ The shared responsibility approach offers opportunities to discuss the patient from different perspectives, thereby gaining new insights into the patient.⁴² The transferring and receiving care provider model does not make allowances for the different tasks and resulting information needs between the two healthcare providers. This results in their having different notions of what is relevant and what is important, and their use of different standards of practice and vocabulary.¹⁴¹ The shared model offers a compromise where the needs of both healthcare providers are overcome by sensitising deliverers and receivers to their respective perspectives and roles along with their handover expectations.¹³⁹ A better understanding of the perceived barriers to shared responsibility shall provide insight into methods of overcoming the one-way model that is currently prevalent.

Addressing the one-way interprofessional communication model is an aspect of handover that needs to be explored. Foster and Manser suggest that a communication training programme should clarify the roles of the transferrer and receiver, as well as raising the awareness that receivers should play a more active role.¹³⁹ Expectations of both transferrers and receivers should be clarified as well as the information needs of the receiver. Finally, it is important to teach receivers to speak up.¹³⁹

2.9.3 What are the common communication methods used to hand over?

The 'How' of handover is as important as the five Ws because if the handover is performed in a manner that is ineffective, the information contained in the handover is lost. Effective and appropriate communication is essential during handover to ensure patient safety and continuity of care.¹⁴² There are four primary methods of communication related to patient handover, namely verbal, written, bedside, and recorded.¹⁴³ Bedside and recorded handover are rarely performed in the emergency centre. This is particularly true when handover between the PECP and ECP occurs in the emergency centre environment. The discussion that follows centres around the two most common handover strategies in use between PECP and ECP; verbal and written handover.

2.9.3.1 Verbal handover?

Verbal handover involves a verbal presentation of the relevant information pertaining to the patient. Evans *et al* described the most comprehensive type of verbal handover as being that of the face-to-face report to the team in the emergency centre.⁷⁸ Verbal handovers have been

termed 'conversational' in nature and are sometimes described as two-way communication.¹⁴⁴ Despite this, questioning the person handing over is a phenomenon that occurs infrequently.¹³⁹ This suggests that handover is more of a report than a conversation.⁹

Evans *et al* identified two primary types of error associated with verbal handover, including information being handed over but not documented, and information being documented but not handed over.⁷⁸ Yong *et al* found that 67% of emergency centre staff sometimes, often or always felt that key information was missing from verbal handover.⁵⁴ There is also evidence to suggest that data loss is most significant when only verbal handover is used. Pothier *et al* demonstrated a total loss of data after three cycles of purely verbal handover. Note-taking resulted in a 31% data retention after five cycles of handover, and a combination of verbal and written formats resulted in minimal data loss after five handover cycles.¹⁴⁵

One advantage linked to the verbal report has been the ability of the practitioner handing over to identify the most pertinent information of relevance to the receiving practitioner.¹⁴⁴ In addition, the practitioner handing over was able to summarise the most critical information to make the handover brief and highlight the reasons for specific interventions or why something needed to be done.¹⁴⁴

The verbal handover, while sometimes associated with information loss, has several other roles to play. Verbal handover plays a social role and has been described as 'informal and chatty' where experiences could be shared and common complaints discussed. Verbal handovers also present an opportunity for teaching and an opportunity to identify errors where the receiving practitioner presents a fresh perspective.¹⁴⁴ Handover is often learnt informally in the clinical learning environment. This results in substantial variability in both verbal and written handovers. These variabilities are often institution or facility specific.¹⁴⁶

2.9.3.2 Written handover?

The written handover is usually provided by means of a patient care record that the prehospital care provider completes and then hands to the emergency centre. Some advantages of written communication are that it can be accessed after the prehospital care provider has left, it can follow the patient throughout their progression through the healthcare system, it is a permanent record and does not rely on memory.¹⁴⁷ It could be argued that the written handover report is a more reliable source of information than the verbal handover. Despite this, there is evidence to suggest that only 50% of emergency clinicians actually use the patient care record as a source of information.⁵⁴

One of the challenges associated with written handover is information discordance.⁷⁸ The source of this discordance is the practice of first handing over the patient verbally on arrival at the emergency centre and then completing the written documentation once the verbal handover is complete. This means that emergency centre staff would not have immediate access to the written report. Often, PEEP record clinical notes and patient variables on their gloves during the transit period. These gloves are frequently discarded after the handover and before writing the clinical notes. This potentiates recall bias due to time lapse, lack of accurately recorded details, and physical distance from the patient.⁷⁸ This practice of preceding completion of ambulance documentation with verbal handover has also been described by Yong, Dent and Weiland. Their study demonstrated that this practice occurred more than three-quarters of the time,⁵⁴ delaying the documentation being made available to the emergency centre staff.

Trauma events are complex⁴⁵, interventions are often time-critical and the unavailability of comprehensive information due to missing documentation increases the risk of information loss or misinterpretation.¹⁸ Often, the PEEP completes this documentation in a location separate from the patient, meaning that the emergency centre team is unable to engage verbally nor access the paper-based patient information. This results in a transient total information loss, apart from that memorised during the verbal handover.⁷⁸ Talbot and Bleetman suggest that unless handover information is documented, members of the trauma team are unlikely to retain the information handed over.¹⁴⁸ However, one of the challenges associated with written handover notes is that of illegible handwriting,¹⁴⁹ meaning that without the author, the information has little value as it cannot be decoded.

There are thus limitations to the efficacy of the written report as a means of handover. The advantages of the written handover are sometimes eclipsed by those of the verbal handover, and the opposite is true, dependant on the focus of the criticism. A potential solution suggested in the literature has been to combine the two formats.^{145,150} The written document, often referred to as a patient care record, serves as a permanent record of the prehospital patient interaction and can assist in guiding the verbal handover. Patient improvement or deterioration trends would be available for accurate reporting and the person handing over would not need to rely on memory. If the practitioner handing over were able to make the PCR available on commencement of the verbal handover, the receiving facility would be able to begin relevant administrative processes such as opening a patient file. Persons other than the receiving practitioner would also be privy to important information that they could use to categorise and triage the patient. In addition, staff would be able to immediately seek clarification in cases where handwriting was illegible or where there were ambiguous statements.

2.10 What about the standardised handover as a means to improving handover?

Studies related to handover between the prehospital care provider and the emergency centre suggest a lack of consistency. This lack of consistency has been related to the different methods used to hand over, the language used during the handover, and the education and experience levels of those involved in the handover.^{3,16,54} A standardised approach to handover is a concept that has been recommended or explored quite extensively in literature.^{3,16,78,151–153} Standardised clinical handover aims to improve communication effectiveness and mitigate the risk for handover miscommunication during transitions of care.¹¹⁵

The perceived need for a standardised approach to handover is a viewpoint common in literature.^{53,154–157} Standardising the handover process and specifying the content of handover have been shown to improve accuracy and reduce content omissions.¹⁵⁸ One particular study that echoes the perceived need for a standardised approach is that by Jenkin *et al.*¹⁶ A lack of structured process during interdepartmental handover was identified as a potential hindrance to effective sharing of information.¹⁵⁹ Exploring handover of care by anaesthetists, the majority view was that it would be valuable to have national guidelines, or standardisation regarding handover of care.¹⁶⁰ Ferran *et al* found that the implementation of a standardised preform improved data transfer by approximately 20%.¹⁵² Yet despite the calls for standardisation, it appears as if this is a reality that is still to be realised. Budd *et al*'s study, exploring handover practice, found that only 39.4% of emergency department responders felt that land ambulance crews used a 'standardised' structure for handover. This was in contrast to 53.3% of ambulance service responders who felt that they practiced a standardised handover.¹⁶¹ This disparity in perception may be an indicator that what is considered 'standardised handover' by some, is not considered as such by others. Abraham *et al* suggest that standardised handovers should be flexible and reflect content that is most appropriate in fostering a shared understanding.¹⁶²

Standardised frameworks impose information organisation by way of a list of elements that has to be communicated. Two commonly used frameworks are the problem-based model and the body system-based model.¹⁶³ The problem-based model supports structuring information around key patient problems. The body system-based model supports structuring information by body/organ systems. The handover structure, as suggested by Oakley, is an example of a body system-based model.¹⁶⁴ These model frameworks have given rise to a variety of tools aimed at supporting the handover. Some of these tools have used checklists,⁶⁸ while others have had templates¹⁶⁵ as their focus. In an attempt to determine the perceptions of participants

related to standardised handovers a question was asked in the questionnaire used in Study One related to the use of standardised handovers. Participants were asked a Likert-type question “Handing over using a mnemonic (DeMIST, SBAR, SOAP) is the best way to ensure that all the important information is handed over?”

One method of ensuring that items within the framework are not excluded is the use of mnemonics. The term ‘mnemonic’ stems from the name of the Greek goddess of memory, Mnemosyne.¹⁶⁶ Two basic types of mnemonics exist; those focussed on remembering facts (fact mnemonics) and those focussed on remembering rules and procedures (process mnemonics).¹⁶⁷ The use of both fact and process mnemonics has been advocated in an effort to ensure that important information is included in the handover.⁹³ Mnemonics have been, and are currently being, used within the medical environment to assist practitioners in remembering critical components of complex or important processes. Mnemonics have been observed to improve consistency of handover, reduce questioning by ECP, and increase the transfer of information considered important.¹⁶⁸ In addition, mnemonics have also been observed to increase the number of elements communicated during the handover process.¹⁶⁹

2.10.1 The use of mnemonics?

There are many mnemonics in use within medicine and Riesenber, Leitzsch and Little identified 24 mnemonics reported on in literature relating specifically to handover.⁹³ In an attempt to try and focus this study, only those most pertinent to the emergency centre were included. The nature and different content of each mnemonic necessitate that these are discussed separately. Each mnemonic may also have advantages and disadvantages depending on the environment in which it is used. Some mnemonics have enjoyed more widespread use while others can be practitioner-specific or limited to only certain environments. Various mnemonics have been evaluated and implemented across a variety of domains, yet the reasons for the choice of a specific mnemonic are often poorly explained. The mnemonics included below are those perceived to be the most often used within the context of handover.

2.10.1.1 The MIST and DeMIST mnemonic

The MIST and DeMIST mnemonics are similar in that the DeMIST mnemonic is an adaptation and inclusive of the MIST mnemonic. Although technically two separate mnemonics, only the DeMIST mnemonic will be discussed. The inference is that the reader will be able to discern

the MIST as a component of the DeMIST mnemonic. The DeMIST mnemonic is summarised in Table 2-5.

Table 2-5: Elements of DeMIST mnemonic

Element	Description
De	Demographics
M	Mechanism of injury/illness
I	Injuries (sustained or suspected)
S	Signs, including observations and monitoring
T	Treatment given

The demographics element of the mnemonic has been poorly defined. Evans *et al* include the past medical history, medications taken and allergy status.⁷⁸ Cohen *et al* allocate the 'De' element as pertaining to 'Details'. The elements contained within 'Details' are not specified.¹⁷⁰ It is possible that practitioner differences in opinions on what should be included in the 'De' element may decrease the effectiveness of this mnemonic as a whole.

Talbot and Bleetman found that using the DeMIST mnemonic actually decreased information recall by emergency centre staff.¹⁴⁸ One suggested reason for this decrease was ambulance staff's unfamiliarity with the DeMIST handover structure. A suggested improvement was appropriate training for ambulance staff.¹⁴⁸ Similar results related to knowledge of MIST have also been mentioned in other studies. An Australian study found that 20% (n=2) of paramedic staff and 53% (n=17) of trauma team members were familiar with the MIST mnemonic.¹⁸ In addition, there appeared to be a general consensus that using a template was good, and that 'MIST' included appropriate data elements for handover.¹⁸ These results may be somewhat overstated as the sample size was limited.

The DeMIST mnemonic is a potential strategy for improvement. The DeMIST fact mnemonic has been adopted by the Emergency Medicine Society of South Africa (EMSSA) as a guideline for handover.^{171,172} By implication, DeMIST is the preferred handover mnemonic within the South African emergency centre. Adoption of this mnemonic, as suggested by EMSSA, may be the first step towards broad-based handover standardisation within the South African emergency centre.

2.10.1.2 The ASHICE mnemonic

The fact mnemonic 'ASHICE' is used in a number of environments. The elements of the ASHICE mnemonic are summarised in Table 2-6:

Table 2-6: Elements of ASHICE mnemonic

Element	Description
A	Age
S	Sex
H	History
I	Injuries
C	Condition
E	Expected time of arrival

ASHICE has been recommended as the preferred method of handover by the North West Ambulance Service (NWAS) for its primary percutaneous coronary intervention (PPCI) programme.¹⁷³ Budd *et al* studied trauma alert criteria and handover practice in England and Wales using a postal questionnaire.¹⁶¹ The survey included 100 emergency departments and all 32 ambulance service trusts in England and Wales. Participants were asked about their familiarity with the MIST and ASHICE mnemonics for the rapid transmission of alerting/handover information. Only 27% of emergency department respondents indicated that they were familiar with the MIST handover mnemonic, and 46% were familiar with the ASHICE mnemonic. Neither mnemonic was known to more than 50% of the sample. Answering the same question regarding their knowledge of the MIST and ASHICE mnemonics, ambulance service responders had a slightly different familiarity profile. Of the ambulance service responders who returned their questionnaires, only 15% indicated that they were familiar with the MIST mnemonic. Conversely, almost 87% of ambulance service respondents were familiar with the ASHICE mnemonic.¹⁶¹ This particular study highlights the different handover mnemonic familiarity between ambulance service responders and hospital respondents, which could be an important area of communication breakdown within the handover process.

2.10.1.3 The SOAP mnemonic

The SOAP mnemonic has been described as "commonly used"¹⁷⁴ and one with which physicians are "readily familiar".¹⁷⁵ On the surface, SOAP appears to be a widely used

handover tool.^{6,48,93,176} Yet the literature seems to be somewhat sparse in its descriptions of this tool and its use. The elements of the SOAP mnemonic are summarised in Table 2-7.

Table 2-7: Elements of SOAP mnemonic

Element	Description
S	Subjective information about the patient
O	Objective information related to the problem
A	Assessment of the patient's condition
P	Plan of what has or should be done for/with the patient

There are authors who suggest that the SOAP mnemonic should, in fact, be expanded to include an additional "S" (Safety), becoming SOAPS.¹⁵⁶ No studies could be found that evaluated the improvement or lack thereof after implementing the SOAPS mnemonic. The way in which the SOAP mnemonic organises patient information has been found to be easy to comprehend and use for insurance and reimbursement purposes by billing staff.¹⁷⁴ This highlights just how far-reaching a handover can be and also demonstrates that appropriate structures can have positive effects for the patient that extend beyond the reach of the EC or ward.

2.10.1.4 The CUBAN mnemonic

The CUBAN process mnemonic, as proposed by Currie,¹⁷⁷ aimed to improve handover quality by providing criteria that the handover should adhere to as opposed to content. The elements of the CUBAN mnemonic are summarised in Table 2-8.

Table 2-8: Elements of CUBAN mnemonic

Element	Description
C	Confidential
U	Uninterrupted
B	Brief
A	Accurate
N	Named personnel

The aims behind this mnemonic were not so much based on handover content but rather on the actual handover act. In other words, the CUBAN mnemonic relates to handover as a verb. The author suggested that adoption of this process mnemonic may improve consistency,

accuracy and focus of handover although these were not defined within the context of the study. The hypothesis was that improving the handover elements would result in improvements in the quality of nursing care.¹⁷⁷ The CUBAN mnemonic is less widely described than other mnemonics, but this does not detract from its importance within patient handover. In fact, this mnemonic highlights that handover is not only related to content but also reliant on process.

2.10.1.5 The SBAR mnemonic

Prompted by the 1999 report by the Institute of Medicine estimating the toll of medical error on human lives, a patient safety workgroup within Kaiser Permanente began consulting on human factors intervention to mitigate medical error. During one of the brainstorming sessions, the vice-president of safety management, formerly a safety officer on a nuclear submarine, described the process of handing off a situation to the captain or officer of the deck. The breakdown of identified core elements by the workgroup resulted in the birth of the SBAR mnemonic.^{178,179} The elements of the SBAR mnemonic are summarised in Table 2-9.

Table 2-9: Elements of SBAR mnemonic

Element	Description
S	Situation: What is actually going on with the patient?
B	Background: What is the clinical background or context?
A	Assessment: What is the problem?
R	Recommendation: What needs to be done to correct it?

In its current format, the SBAR content mnemonic is interpreted in several ways, but the basic information remains consistent.^{143,165,180} The SBAR mnemonic has also been described in literature as a handover communication tool, primarily for use in the hospital environment.¹⁶⁵ SBAR has been identified as effective in bridging the gap in communication styles by providing a common and predictable structure to handover communication.¹⁸⁰

SBAR seems to have enjoyed reasonably widespread acceptance and promotion.^{178,181–183} The German Association of Anaesthesiology and Intensive Care Medicine has recommended the use of this mnemonic to facilitate a standardised handover.¹⁸⁴ The SBAR mnemonic has been associated with improved interprofessional communication, an improved safety climate and a reduction of communication error-induced incidents.¹⁸¹ Further to this, SBAR has been

linked to a dramatic improvement in communication.¹⁸² Increased use of the SBAR handover mnemonic has therefore been linked to a decrease in adverse events.¹⁶⁵

One challenge identified with this mnemonic is that the components are somewhat generic and lack patient or environmental specificity. 'SBAR' shares genericity as a common characteristic with other handover mnemonics. Local standardisation of the content under each heading has been suggested to improve its relevance.^{41,179} Wilson *et al* demonstrated that telephonic communication was improved by implementing standard SBAR training for interfacility transport of infants. There was no evidence, however, that there was a decrease in communication failures or improved clinical outcomes.¹⁸⁵

The implementation of the SBAR mnemonic in nurse-obstetrician handover has been shown to improve the climate of teamwork, safety, job satisfaction and working conditions.¹⁸⁶ Implementation of the SBAR mnemonic during handover among nurses in a tertiary care hospital has also been shown to be effective.¹⁸⁷ This mnemonic has proven to improve communication but there is a paucity of evidence linking its use to improved patient outcome. The SBAR mnemonic's use has been limited within the emergency centre environment,¹⁶⁵ which implies that SBAR fails to cross the divide between in-hospital and prehospital handover.

2.10.2 Mnemonics in handover

Mnemonics are widely described as aids in improving handover. As mentioned, the aims of adopting standardised practices are to improve practice, yet there is evidence to suggest a lack of standardisation within handover. Further, studies have suggested that standardisation may not improve information transfer or recall. Some studies also propose that handover tools alone are not adequate to improve handover.¹⁸⁸ Targeted strategies are thus needed to improve handover and information transfer. Perhaps the key lies in adequate teaching of appropriate mnemonics as well as incorporating other methods related to effective handover.

One strategy to address the challenges of multiple handover content is to identify and evaluate content similarities between professions involved in emergency centre handover. One of the aims of this study is to explore aspects related to the standardised handover, its content and shared understanding.

The questionnaire used in Study One asked a group of Likert-type questions related to participant knowledge and use of the mnemonics described above. The aim was to determine

which of the above mnemonics were most commonly used and familiar to both PECP and ECP.

2.11 Which Elements of Handover Information Are Considered Most Important for Inclusion in Handover?

A number of texts have attempted to determine what can be considered the 'ideal handover'; not too short, not too long and containing all the relevant information, without omitting important points, nor containing unimportant content.^{45,189} One of the challenges of handover is the determination of what elements are considered important to include. Additionally, there are several methods or memory aids that may be used to facilitate handover. The aim of handover facilitation is to ensure that the relevant information is appropriately communicated, and that handover is effective.

Information exchange is the core function of a handover and one of the challenges central to an effective handover is the determination of what content is contextually appropriate.^{43,51} Patients have a variety of chief complaints and information deemed 'important' differs markedly from patient to patient. The penchant of individual healthcare personnel to have personal preferences related to the structure or content of handover cannot be avoided; it has the potential to negatively affect the efficacy of handover. Standardised approaches such as mnemonics may therefore assist in mitigating the level of personal preference, thereby improving the efficacy of handover.

Studying the degradation of information in the trauma patient handover, Carter *et al* identified 16 key prehospital elements that were known to impact patient outcome¹⁹⁰ (See Table 2-10). The primary focus of this study was how effective information transfer occurred from emergency medical services (EMS) personnel to the clinicians in the EC receiving the patient. This study was important in that it based the importance of information not on the perceptions of practitioners, but rather on elements that affected patient outcomes. Elements that have been shown to affect patient outcome become critical to include in a handover. The results indicated that there were disparities between which information elements were considered important and which were not. There were also differences in the effectiveness of each element's transfer from transmission to reception. The reasons for this were not explored within the study, but do open up debate as to why this occurred.¹⁹⁰ The inference is that the omission of certain handover variables has the potential to result in an adverse effect on the patient. The incidence of omission of relevant information and the rate of effective information transmission between the PECP and the ECP are important points for consideration.

Table 2-10: Carter *et al*'s 16 important handover elements

Carter <i>et al</i> 's 16 important handover elements
<ul style="list-style-type: none">• Prehospital hypotension• GCS score• Patient age• End tidal CO₂ value• Pulse rate• Respiratory rate• Oxygen saturation• Blood loss in the field (quantity)• Death of an occupant in the same compartment• Mechanism of injury• Intrusion• Extrication time• Estimated crash speed• Anatomic location of injury• Pre-existing disease• Prehospital intubation

Jenkin *et al* explored various aspects of the handover process between ambulance staff and the EC. One of the areas included in this study was what EC staff (doctors and nurses) considered essential items in a patient handover. All respondents (n=38) identified the following as essential: reason for patient attendance, history of events, problems that may require immediate intervention, treatment carried out since onset of event and significant or relevant previous medical history.¹⁶ Conversely, items that were not perceived to be of an essential nature (identified by only a few respondents) were the patient's name (n=2), the time of the event (n=1), time of administration of medication (n=2), suspected injuries/illness (n=3) and allergies (n=3).¹⁶ Patient allergies in this study were not considered important, but there are several handover strategies that include this as standard information.^{148,150,191} Certain information was requested in addition to that on the PRF; 47.3% of requests for further information (n=18) were for patients' social history. The exact mechanism and circumstances of the accident or event leading to admission were requested 28.9% (n=11) of the time. Some of the identified items were not directly related to patient care, such as who had contacted the ambulance and what they had witnessed, as well as details of 'down times'.¹⁶ This highlights the differences in opinions of what is important and what is not to be included in handover. Perhaps patient information handed over has context outside of the isolated element itself.

The 2007 study conducted by McFetridge *et al* identified a list of patient data that was considered complete by including what ICU nurses felt they required and what ED nurses felt they should share. This list includes 17 elements and highlights similarities and differences between perceptions of what was considered 'important'.¹⁵⁹ The 17 elements are depicted in Table 2-11.

Table 2-11: Key content of patient handover

Key content of patient handover
<ul style="list-style-type: none"> • Patient's name • Date of birth • Age • Sex • Mechanism of injury • Presenting condition • Past history • Medications and reactions • Observations/haemodynamics/Glasgow Coma Scale • Treatment to date and response • Investigations • Chest X-ray • Relatives contact details • Property accompanying the patient • Intake and output • Airway management • Available documentation

In a similar study within the emergency centre, Ye *et al* conducted a multifaceted study comprising critical observation of patient handovers.⁸³ The study involved a post-handover survey of EC doctors who had received patients and a general survey of emergency centre doctors in Melbourne, Australia. Registrars (n=17) and consultants (n=33) completed a purpose-designed questionnaire that explored perceived problems regarding the handover processes within the emergency centre. Information poorly handed over and minimum information thought necessary for inclusion into the handover was also explored.⁸³ The study identified the most common information considered as the minimum by the registrars and consultants within the sample to be included within the handover process. The elements

identified are depicted in Table 2-12, and provide insight regarding information considered important for handover.

Table 2-12: Items of information handed over

Items of information handed over ⁸³
<ul style="list-style-type: none">• Sex• Presenting complaints Patient name• Cubicle number• Usual medication/treatment• Investigations results• Patient age• Past medical history• Examination findings• Inpatient unit contacted• Investigations ordered• Inpatient registrar contacted• Bed arranged• Time of ED presentation• Inpatient specialist contacted• Follow-up arranged

It must be borne in mind that handover is often contextual. Some of the information contained in Table 2-12 considered important would potentially not be included in the prehospital to emergency handover as these would not yet have been defined or measured. Items commonly identified as a minimum, may not necessarily have a high level of importance assigned to them. In saying this, it should be considered that ‘weightings of importance’ of specific information would, in all likelihood, differ from patient to patient, and indeed, between practitioners.

Some handovers are structured around the patient’s chief complaint or provisional diagnosis. Within the hospital environment, handover has been described as often lacking structure with high variability in the type of information provided between wards by individual nurses.¹⁹² Kessler *et al* recommend a set of elements considered important to hand over in the stroke patient. The following points were recommended for inclusion in a handover that was “structured and brief”:¹⁹³ time of symptom onset or last point in time without the new deficit, type of complaint, relevant concomitant diseases, information regarding pre-morbid state,

phone number of relatives for immediate contact regarding detailed patient history as well as current medication. The information for inclusion is surprisingly not very 'stroke-specific'. Genericity, it seems, could be compatible with several possible specific scenarios.

Interhospital transfers have common ground with the typical prehospital to emergency centre handover. The primary similarity is that once the patient has been handed over, the only information that the treating practitioner has is that which they physically have with them. Oakley, in studying the interhospital transfer of trauma patients, made several observations and recommendations, and considered several points to be of importance in the handover.

Table 2-13 depicts the handover template suggested by Oakley. This template provides generic headings followed by specific variables for inclusion under each heading. This provides a more comprehensive list of handover variables than many other guides. However, one of the challenges with this template remains the inherent patient-specificity of a handover and the contextual nature of each handover variable. In other words, the amount of detail per system would depend on the patient and their chief complaint.¹⁶⁴

Table 2-13: Handover template suggested by Oakley

Handover template suggested by Oakley ¹⁶⁴
<ul style="list-style-type: none"> A. Immediate information <ul style="list-style-type: none"> 1. Self-introduction 2. Patient introduction 3. Patient priority B. Case presentation <ul style="list-style-type: none"> 1. Presentation: Mechanism of injury 2. Problems: simple list of injuries and other major problems 3. Procedures: simple list of major interventions and investigations 4. Progress: System review <ul style="list-style-type: none"> a. Respiratory – relating to oxygenation and ventilation b. Circulatory – relating to haemodynamic status and transfusions c. Nervous system – relating to level of consciousness and sedation/paralysis d. Metabolic – relating to urine output and blood glucose
Host defence – relating to temperature, antibiotics

To address the content aspect of EC handover, the questionnaire used in Study One aimed to determine what content variables of emergency centre handover were considered most important. A list was compiled using the information above and that below as a base and where relevant, scope-specific variables were omitted where these were not available to the majority of PECP participants.

2.11.1 What about mechanism of injury and misinterpretation of information?

Not only are patient parameters deemed important for inclusion, very often incident details also have significance. Specific mechanisms of injury have been associated with the potential to produce life-threatening injuries. Should the potential exist for a life-threatening injury based on the mechanism of injury, then the incident details become more important. Specific mechanisms identified within literature are depicted in Table 2-14.

Table 2-14: Mechanisms associated with life-threatening injuries

Mechanisms associated with life-threatening injuries
<ul style="list-style-type: none"> • Ejection from any vehicle • Death of another occupant in the same passenger compartment • Falls from a height of more than 6 metres (or three times the patient's height) • Vehicle rollover (unrestrained occupant) • High-speed road traffic collision • Vehicle-pedestrian collision • Motorcycle crash and • Penetrating wounds to the head, chest or abdomen.

The importance of the mechanism of injury is directly linked to the potential that the mechanism has to produce life-threatening injuries. Often, high-acuity patients with potentially life-threatening injuries may not appear unstable. This lack of obvious acuity may result in under-triaging. The difference between actual and perceived acuity and information losing accuracy and becoming fragmented has been referred to in literature.^{18,148,192} This has been likened to children playing a game where information is transferred between multiple persons and becomes distorted with each interaction. The English equivalent of this game is 'broken

telephone'. Within handover, this refers specifically to the delivering practitioner's ability to create a shared understanding of the patient's acuity. Creating this shared picture presents a real challenge for the delivering practitioner who needs to emphasise and adequately contextualise why they believe the patient may be of higher acuity than they appear at face value.⁶⁷ Information related to the patient is therefore not only patient-specific but also becomes contextual. In other words, the person handing over may recognise that the patient is of higher acuity than they appear at face value. They would then assign a higher acuity to the patient based on their personal opinion. The receiving practitioner would initially not share this opinion. This difference in perception of acuity may be referred to as 'contextual acuity'. Contextual acuity may prompt the transferring practitioner to focus on the explanation of non-obvious acuity rather than actual patient data. It therefore becomes important that contextually relevant data are highlighted within the structured handover process. The highlighted data ensure that the receiving person is aware of any actual or potential risk to patient safety.

To gather information related to mechanism of injury, a section was included in the questionnaire used in Study One. This section focussed specifically on what information was considered important related to mechanism of injury or nature of illness.

2.11.2 What vital signs should be included in handover?

Vital signs are variables often included in handover. Vital signs have been described as the primary measures used to communicate health status and assist in risk stratification.¹⁹⁴ There are several physiological variables that are grouped together under the vital signs heading. However, there is a paucity of literature classifying the importance and inclusion of each vital sign within the context of handover. Venkatesh *et al* found that communication related to hypotension or hypoxia was omitted in nearly one in seven emergency department handovers. Omission of relevant data is also comparable to the inclusion of irrelevant data; both scenarios result in important information being lost. Omission simply loses the information where irrelevant inclusion has the potential to dilute the relevance of other data. It is important to determine which handover items are most significant so that tools can be developed to ensure their inclusion.

The primary issue with including vital signs is that each physiological variable has context. An example would be in the hypothermic patient where temperature is a critical variable; the contextual value of temperature is significantly greater in this patient than it would be in a patient with a fractured radius. The argument against including all vital signs as standard variables for handover relates to greater amounts of irrelevant information having the potential

to eclipse the more important variables. By the same token, there are vital signs that are critical indicators of patient acuity, such as blood pressure in the hypovolaemic patient. The contextual nature of vital signs means that their inclusion is an important part of a comprehensive handover, but their contextual nature must be taken into account when determining which to include and which to exclude.

There have been recommendations that baseline observations should be included in a verbal handover,¹⁶ but there have been no clear indications of what a baseline vital sign constitutes. There is currently no evidence to suggest whether or not vital signs are actually used to guide clinical decision-making, nor what their perceived role and value are in handover.¹⁹⁵

To gather information related to the perceived importance of commonly measured vital signs, a section was included in the questionnaire used in Study One. This section focussed specifically on the participants' perception of the relative importance of commonly measured vital signs.

2.12 What is the Role of Handover Education?

There appears to be a lack of clarity on the specific need for handover training in medical education and a shortage in the validation of training methods.¹⁹⁶ There seems to be no agreement on what core handover areas should be addressed, and what instructional methods to apply within the construct of formal handover training.¹⁹⁷ Handover is often not taught within formal education programmes and, even when it is, it usually lacks a systematic approach or standardisation.^{96,198} Handover training is often viewed as something that is 'learnt on the ward'.¹⁹⁹ There is thus a lack of adequate training related to handover,^{2,67,198,200–203} and there is a need for the development and implementation of formal training related to handover.^{115,200,201,204,205}

Ensuring consistency involves having structured systems in place. Horwitz *et al* investigated patient handover (sign-out) between resident physicians.² The study found that despite increasing transfers of care, few internal medicine residency programmes were observed to have comprehensive transfer of care systems in place. In addition, most programmes did not provide formal training on handover skills. An interesting statistic from this study was that less than half of the programmes provided formal handover training. Horwitz *et al* identified handover as a significant point of risk for patient care. The study also highlighted the lack of appropriate education and training pertaining to handover.² Lack of training and systems might thus be a contributing factor to poor handover quality.

Structured education is the cornerstone of the success of any process. Jenkins *et al* found that 74% (n=59) of respondents had learnt how to hand over “through listening to colleagues”. Seven doctors and seven nurses indicated that their only source of education pertaining to handover was from courses such as advanced trauma life support (ATLS). Interestingly, paramedics were significantly more likely to have received training by way of a formal course than doctors or nurses.¹⁶ Formal training requires a structured approach to identify themes that need to be addressed. Stoyanov *et al* studied 105 declarative statements about handover training interventions and used concept mapping to conclude that there were at least three important handover training themes to address, namely standardisation of practice, communication, and coordination of activities.¹⁹⁷ These themes provide interesting insight into the perceived shortcomings in current handover training.

There is strong evidence to suggest that current handover training practices are inadequate. Practitioners have indicated a lack of preparedness for handover due to insufficient training related to handover communication.^{2,67} The South African PECP are primarily characterised by personnel with a four-week qualification³⁸ making medical knowledge and training a potential problem from the outset. This is further complicated by the shortages of doctors and nurses which complicate any proposed training and development.^{28,32,33} There is thus an urgent need for the development and implementation of formal training related to handover. The challenge lies in the determination of appropriate strategies and how best to implement widespread acceptance of these proposed strategies.

To gather information related to the perceived importance of education within the context of EC handover, participants were asked “What do you think could be done to improve the standard of handover within the Emergency Centre?” The aim with this question was to establish whether or not education and training would be identified as an improvement strategy by participants. The answers to these questions generated further data that were used to structure the questions related to the semi-structured, face-to-face interviews.

2.13 What Negatively Affects Handover Efficacy?

There are several factors that have the potential to negatively affect the efficacy of a handover, including problems related to the process and people. Some of these are discussed under the appropriate headings.

To gather information related to what could potentially negatively affect EC handover efficacy a question was asked that directly related to this in the questionnaire from Study One. PECP

participants were asked: *“Please briefly discuss some aspects that can make the act of handing a patient over a ‘bad’ experience for you when you hand over in the Emergency Centre”* and ECP participants were asked the following question *“Please briefly discuss some aspects that make a handover ‘bad’”*. The answers to these questions generated further data that were used to structure the questions related to the semi-structured, face-to-face interviews

2.13.1 How do interruptions occur in the emergency centre and what is their effect on handover?

Interruptions are a significant element in handover,²⁰⁶ and have been attributed to patients, their significant others or other staff.¹⁰² Other sources of interruptions have been identified as pager bleeps, discussions related to teaching, and the use of electronic devices not directly related to handover.⁶⁹ The incidence of handover interruption varies, however some texts have found that at least one interruption occurs per handover event.²⁰⁷ Interruption during handover has been linked to communication breakdown and wrong or omitted patient information.¹²¹ The frequency of interruption during handover has also been identified as a major cause for concern,²⁰⁶ and has been observed to be as high as 10%.²⁰⁸ Interruptions have been associated with miscommunication and contributing to adverse events.²⁰⁹

Questions related to this section were derived from the open-ended questions in Study One. PECP participants were asked the following in the face-to-face, semi-structured interviews in Study Two “Another emerging theme was handover interruptions and multiple handovers. How often do you experience either of these? What effect, if any, does this have on your handover?”

2.13.2 How do multiple handovers occur in the emergency centre and what is their effect on handover?

Multiple or repeated handovers have been shown to contribute to information loss.^{3,16,18,20,45,54,168,210} Incidences of paramedics having to hand over up to three times have been recorded. This contributed to inconsistencies in the handover.³ Patient acuity has also been found to affect the number of times a prehospital care provider performs handover.^{16,54} This is often due to the escalation of expertise associated with the high-acuity patient. An example would be the initial handover to a nurse, who may alert the doctor to the patient’s seriousness who may, in turn, request assistance from a senior medical officer who may, in turn, request specialist intervention. At each of these points of escalation, a handover would

be required and paramedics have been linked with handing over at least twice 91% of the time.²⁰ Multiple handovers have the potential to adversely affect patient safety, therefore causes and solutions should be investigated.

2.13.3 The effect of interprofessional relationships

The relationship between the professionals involved in the handover process has the potential to affect the quality of handover. The wide range of qualifications involved in emergency centre handover could also strain interprofessional relationships. Hasan *et al* demonstrated that the quality of both the delivery and reception of handover was positively affected by a good relationship between the source (sender) and receiver. This relationship was found to directly correlate with the overall handover process score. This correlation was true for both positive and negative scores.⁶⁹ Some suggestions related to improving interprofessional handover within the emergency centre include standardising processes and practices, and enhancing team interactions. Practices such as interprofessional educational activities and getting to know each other have been shown to enhance the quality and safety of interprofessional communication activities and should be adopted.²¹¹ Particularly, these are useful in mitigating miscommunication risks and support effective handover.¹⁰⁶

Prehospital to emergency handover is unique and contains its own set of challenges as patients handed over here lack specificity. Thakore and Morrison investigated perceptions among staff regarding prehospital to emergency centre handover.¹⁵¹ Results indicated that the perception of handover seemed positive among both groups. However, medical staff were slightly less positive about handovers, specifically with self-poisoning and chest pain. In addition, medical staff were generally less positive about the quality of vital signs reported during the handover. Sixty-nine percent of medical staff indicated that there was a great degree of variation in the quality of handovers between ambulance crews.¹⁵¹ Thakore and Morrison's study further found that both groups exhibited a notable lack of confidence regarding paediatric handovers. Only 19% (n=13) of ambulance staff had received formal training in presenting a handover and 83% (n=44) of those who had not received formal training felt that there was a need for training. Most ambulance staff (73%) felt that they had sufficient time to provide adequate handover, however more than three-quarters of ambulance staff felt that medical staff did not pay attention to their handovers, which could be a potential point of major communication barrier within the handover environment.¹⁵¹ This study highlights that although the perception of handover was generally positive, there were important areas where this was not the case. The perception of professionals involved in handover can differ

within the emergency centre; creating a common understanding of handover may thus contribute to an improved handover process.

2.14 How Can Handover be Improved?

There is a widespread renewed focus on the handover process within literature. Many authors have concluded that the process of handover requires improvement. Several factors have contributed to this increased emphasis, some of which include:

- The importance of effective clinical handover being recognised as a major determinant of patient safety.⁴⁰
- The danger that information may become altered or misinterpreted leading to adverse events or poor patient outcomes.¹⁷
- A number of international bodies have recognised that a key to minimising the risk of patients experiencing adverse effects is to implement strategies that improve information exchange between healthcare professionals.⁵⁴

The Joint Commission has suggested a targeted solutions model to improve handover represented by the SHARE mnemonic. The SHARE mnemonic focuses on emphasising key information, developing standardised systems and tools, interrogation of data by receivers, monitoring compliance, and the development of improvement strategies, education and training. A brief description of the SHARE mnemonic is depicted in Table 2-15.¹³⁰

Table 2-15: Elements of the SHARE mnemonic

Element	Description
S	Standardise critical content
H	Hardwire within your system
A	Allow opportunity to ask questions
R	Reinforce quality and measurement
E	Educate and coach

The standardisation of critical content involves providing information on patient history, emphasising key information and synthesising patient information from different sources prior to passing this on to the receiver.¹³⁰ Hardwiring involves the creation of standardised forms, methods and tools, as well as the identification of new and existing technologies aimed at promoting successful handover. Questioning facilitates scrutinisation of the data,

implementation of critical thinking, and the sharing and receiving of information as an interdisciplinary team. Reinforcing quality and measurement is achieved by promoting accountability, monitoring compliance and using data to drive improvement strategies. Education and coaching involve standardising training and the provision of real-time feedback.¹³⁰ Improvement strategies such as the SHARE mnemonic should be evaluated for relevance and potential implementation where this can improve handover practice.

Many potential improvement strategies therefore exist for handover. Most of these have been discussed within the relevant sections of this literature review, yet few of the related studies have been performed in the resource-constrained setting. This study aimed to identify and explore handover within the South African setting, and the information was used to generate a model aimed at improving handover within the resource-constrained setting.

To gather information related to possible improvement strategies within the context of EC handover, participants were asked “What do you think could be done to improve the standard of handover within the Emergency Centre?” The aim with this question was to establish whether or not PECP and ECP participants identified common areas where improvement could be implemented.

2.15 Conclusion

Handover is defined as a noun and a verb and is a complex process with several functions, although these remain ill-defined. Handover within the emergency centre has several unique challenges not generally found elsewhere in the healthcare continuum. A definition has been suggested for handover in this chapter that encapsulates emergency centre handover. The importance of handover has also been discussed from the perspective of patient safety. The potential for ineffective handover has been linked to the potential for adverse events. Moreover, the environment in which emergency centre handover takes place has been described, as well as the persons most commonly involved in delivering and receiving these handovers. Interprofessional communication and relationships were explored as contributors to handover efficacy, along with processes related to handover, communication and standardisation. Commonly used mnemonics have been evaluated for efficacy and their use in the emergency centre; this was linked to handover variable importance and the contextual nature of vital signs in the handover.

Handover standardisation has been explored previously, but the results of mnemonic use have been conflicting. Existing standardised mnemonics do not place any specific levels of

importance on information transferred during a handover. This means that unimportant information may be prioritised above more important information simply because it appears higher in the chronology of the mnemonic. Training and education related to handover thus have the potential to improve practice, but there is little evidence to guide how this should be carried out. The factors that contribute to effective or ineffective handover appear to be poorly defined and contextual to the environment in which the handover occurs. The handover environment itself can be a contributor to ineffective handover, and it is important to identify the factors in the emergency centre that can be addressed to ensure more effective handovers. Interprofessional communication is affected by various aspects, and a better understanding of the phenomenon from both sides of the handover may assist in improving handover communication.

This chapter sought to identify and evaluate the available literature relevant to emergency centre handover, to contextualise and critically analyse this information to identify gaps in current knowledge. Chapter Three focusses on describing the research design and methodology chosen. The selection of the sequential explanatory mixed-methods design is described, as are data collection, analysis and interpretation processes.

CHAPTER 3: DESIGN AND METHODOLOGY

3.1 Introduction

Chapter Two provided the literature background to the thesis. This chapter details the mixed-methods research design and methodology used in this study. It begins by defining relevant terms used in the context of this study and motivates the use of a mixed-methods, sequential explanatory design. The chapter then separates the two phases of the mixed-methods research design into a quantitative and qualitative study for ease of reference. Each of these studies is then further separated into two data collection sections: the PECP data, and the ECP data collection. The quantitative and qualitative studies are reported on using recognised guidelines. The reporting of the quantitative design followed the STROBE guidelines as set out by Kelley *et al*¹² and the reporting of the qualitative design followed the COREQ guidelines as set out by Tong, Sainsbury and Craig.⁵⁸ The chapter concludes with a summary of the important design points.

3.2 Study Design Summary

A mixed-methods design was used for this study. The specific design was sequential explanatory, which is described in detail later in this thesis. The two phases of this design are reported on as Study One and Study Two. Study One involved the collection and analysis of quantitative data whereas Study Two involved the collection and analysis of qualitative data. Study One used a cross-sectional design that collected data by employing a convenience recruitment strategy using paper-based questionnaires. Study Two used a qualitative descriptive design that used a purposive recruitment strategy to gather data from face-to-face, semi-structured interviews.

The rationale for choosing a sequential explanatory mixed-methods design was that neither quantitative nor qualitative approaches to the research problem would have been able to comprehensively explore solutions to the research problem. The mixing of the two studies, with the aim of developing a model, is what gave rise to the sequential explanatory mixed-methods design used in this thesis.

3.2.1 Definitions

For the purposes of this thesis, the definitions in Table 3-1 are adapted from those of Creswell.²¹³

Table 3-1: Research definitions used in this thesis

Term	Definition
Quantitative design	Is described as a means for testing objective theories. This is achieved by examining relationships among the variables. There is a process of measurement, which facilitates the analysis of numbered data using statistical procedures. There are a number of important aspects of quantitative research. These include the assumptions that are made about deductive testing of theories. Protections need to be built in to reduce bias, and controls should be considered for alternate explanations. Finally, the findings should have generalisability and be replicable.
Qualitative design	Is described as a means for exploring and understanding the meaning that individuals or groups may ascribe to social or human problems. Emerging questions and procedures form the basis for the research process. Data collection typically takes place in the participant's setting. An inductive process of data analysis builds themes from the particular to the general. Interpretations of the meaning of the data are carried out by the researcher. There is a focus on individual meaning and the importance of rendering the complexity of a situation.
Mixed-methods design	Is an enquiry approach that combines or associates both quantitative and qualitative research forms. Quantitative and qualitative approaches are mixed within the study. The process extends beyond simple data collection and analysis. The two approaches are used in tandem to increase the overall strength of the study so that the results are greater than either quantitative or qualitative research. Terms often used to describe this approach include integrating, synthesis, quantitative and qualitative methods, multimethod and mixed methodology.

3.2.2 Motivation for using a mixed-methods design

Mixed-methods research has been increasing in popularity in recent years.^{214,215} The application thereof has grown within the health sector for several reasons;²¹⁵ it provides a multi-perspective view of health problems and allows better contextualisation of information. Mixed-methods research also allows researchers to develop a more complete understanding of the problem, to provide illustrations of the context for trends, and to examine processes and experiences along with outcomes, and capture a macro picture of a system.²¹⁵ There are several generic advantages perceived to be associated with adopting mixed-methods research. This approach has been associated with having the ability to provide stronger inferences than a single method and provides the opportunity for an assortment of divergent and/or complementary views. These divergent views and findings may lead to a re-examination of the conceptual framework or assumptions underlying each of the qualitative and quantitative strands.²¹⁶

The model developed in this thesis relates to three aspects of handover: content, process and communication. The content section addresses the relevant aim and objectives by having participants rank handover variables according to perceived importance for inclusion. This addresses objectives one and two of the thesis. To develop a more complete understanding of the problem, the questionnaire identified areas that were perceived to affect handover efficacy. This addressed the remaining data from objective two and objective three and was achieved by using a combination of forced binary, Likert-type and open-ended questions. The responses to the questionnaire generated questions for face-to-face, semi-structured interviews. It was this qualitative phase that explained the results from the questionnaire and that served as the foundation for the mixed-methods design. The final objective, objective four, used the data from the interviews and combined this with the data from the questionnaires to formulate a more complete understanding of the problem. The formulation of a complete understanding facilitated the development of a model that addresses the three aspects of emergency centre handover identified in this thesis, namely content, process and communication. Some of the reasons for choosing a mixed-methods design for this thesis are summarised in Table 3-2.⁵⁵

Table 3-2: Reasons for choosing a mixed-methods design

Reason for mixing methods	Explanation
Greater validity (Triangulation)	The combination of quantitative and qualitative research designs might triangulate findings that may be mutually corroborated.
Offset	Quantitative and qualitative research designs each have their own strengths and weaknesses. The combination of the two allows the offsetting of the relevant weaknesses and being able to draw on the strengths of both.
Completeness	Using both a quantitative and qualitative design provides the researcher with a more comprehensive account of the inquiry area. One reason for this is that data can be explored from two differing perspectives.
Different research questions	There is an argument that different research questions can be answered by both quantitative and qualitative research. Although there was only one primary research question in this study, approaching it from different perspectives answers the same question in different ways.
Explanation	One research design can be used to explain the findings generated by the other.
Credibility	There are suggestions that the integrity of the generated findings are enhanced by using both approaches. In addition, the researcher may feel that one data source is inadequate. Results from the qualitative and quantitative data may be contradictory, a fact that would not be known if only one type of data were collected.
Illustration	Qualitative data are used to provide an illustration of the findings generated by quantitative research. It provides a picture of the numbers and helps to explain them. This has been referred to as putting 'meat on the bones'.

Mixed-methods research designs are varied, and there may be differing opinions on what this design actually entails. Indeed, there are several mixed methods approaches described in the literature, each with its own specific application and associated advantages and disadvantages. The method deemed most appropriate for this study was that of a sequential

explanatory design. This design has been described by Creswell and Clark as beginning with a quantitative phase that is followed up by a second qualitative phase exploring specific results.⁵⁵ This second phase is implemented to explain the initial results in greater depth.

The term 'sequential', when used in the context of mixed-methods research, refers to the fact that one dataset builds on the results of a previous dataset. The term 'explanatory' refers to the fact that the first set of data is explained in more depth using a different dataset.²¹⁷ In this thesis, the initial dataset generated data by means of quantitative analysis of the responses to the questionnaires. The qualitative data from the face-to-face, semi-structured interviews helped to explain the mechanisms that underlay the quantitative results in more depth. It is the sequential nature of the design and its focus on explaining results that are reflected in the design name. Another name used to describe this design is the qualitative follow-up approach.⁵⁵

3.2.3 Rationale for choosing a sequential explanatory mixed-methods design

The sequential explanatory design is most useful when trends and relationships of quantitative data need to be assessed, and where the mechanism or reasons behind these trends or relationships need to be explained. The sequential explanatory design was chosen for this thesis because:

- I was aware of the important variables and had access to quantitative instruments to measure the constructs of primary interest;
- I would have the ability to return for a second round of data collection;
- I had the time to conduct the research in two phases;
- There were limited resources and I required a research design where only one type of data needed to be collected at a time; in other words, I would be able to collect one set of data, analyse it and then begin with the collection of the next dataset;
- I realised that there would be a need to develop new qualitative questions that would be based on the questionnaire results as these would not have been answerable with the quantitative data.⁵⁵

Like most research designs, the sequential explanatory design has both advantages and disadvantages. These were carefully considered prior to adopting this design for this project. Some of the advantages described by Creswell that were included in making the decision to adopt an explanatory approach included:⁵⁵

- The design often appeals to quantitative researchers. As a primarily quantitative researcher, the appeal of this design was obvious to me.
- The two phases makes for reasonably easy implementation. This is due to the methods being conducted separately and only one datatype being collected at a time. This means that a single researcher can conduct the entire project within the design. This was important to me as I had limited resources at my disposal.
- The design lends itself to an emergent approach where the first (quantitative) phase provides data upon which the second (qualitative) phase is based.

The sequential explanatory design used in this thesis is depicted as a visual model in Figure 3.1. based on the design of Ivankova, Creswell and Stick,²¹⁸ with supplemental information from Glover-Kudon.²¹⁹

3.2.4 Explanation of terms used to describe the research process

There are four main decisions related to a mixed-methods approach, including the level of integration, priority, timing, and mixing. The level of integration refers to the stage where the mixing or integration of the quantitative and qualitative methods occurs. Priority refers to which approach, quantitative or qualitative (or both), the researcher assigns the most weight throughout data collection and analysis phases. Timing refers to the relationship, usually temporary, between the quantitative and qualitative strands of the study. Mixing of the data refers to the combination and integration of the one dataset into the other.²¹³

Integration between the first and second study was interactive and there was a direct interaction between the quantitative and qualitative study strands. This meant that the two methods were mixed before the final interpretation. In this sequential explanatory design, integration was characterised by the qualitative strand being dependent on the results of the quantitative strand.

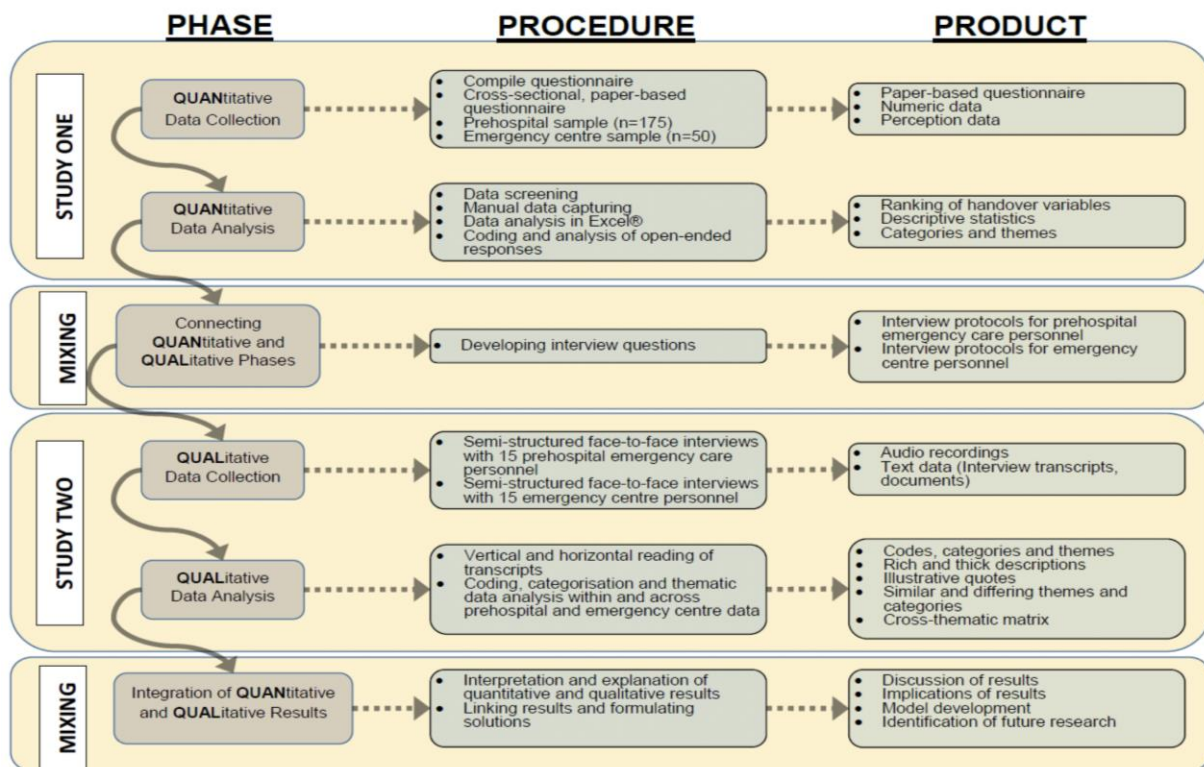


Figure 3-1: Visual model for sequential explanatory design

Priority is also referred to as establishing methodological dominance.²¹⁹ Each strand has a priority, decided upon either implicitly or explicitly. Weighting decisions can depend on factors such as the researcher's interests, the study's audience and/or what the researcher seeks to emphasise in the study.²¹³ Although the two strands in this study were interactive, given the design of the study, each was weighted the same. This equal priority acknowledged the fact that each strand played a similarly important role in addressing the research problem. This decision to equally weight the two strands was taken at the start of the study. This was done due to the two strands exploring different, but equally important, aspects related to handover.

The timing of the two strands was also a consideration that had importance. Timing refers to the relationship, usually temporary, between the quantitative and qualitative strands of the study. This study followed a sequential timing design. This design was characterised by the implementation of the strands in two distinct phases; quantitative data collection and analysis preceded the collection and analysis of the qualitative data.

Mixing of the data has also been referred to as combining and integrating. To adequately understand the process of mixing and its timing, two concepts are useful: that of the point of interface and mixing strategies. The point of interface has also been termed the stage of integration and is the point where the two strands are mixed. There are four possible points

during the research process where mixing can occur; during interpretation, data analysis, data collection or during design.⁵⁵ This study used a strategy where the collection of the second set of data was connected to and dependent on the analysis of the first set of data.

3.3 Study One: QUANTitative Phase – Questionnaire Compilation, Distribution, Collection and Analysis

Published literature guided the compilation of the paper-based questionnaire. This was followed by a pilot study to evaluate the reliability and validity of the questionnaire content. The questionnaire was then distributed, collected and the data captured and analysed. The sequential explanatory nature of the thesis design resulted in mixing the data at this point. The mixed data led the research project into Study Two.

3.3.1 Quantitative approach adopted in Study One

Study One followed a cross-sectional, convenience design, and through a survey, aimed to provide a numeric description of trends, attitudes or opinions of a population.²¹³ The survey research design has been described as a non-experimental approach that is used to gather information on the incidence and distribution of, and the relationships existing between, variables in a predetermined population.²²⁰ This approach allowed specific inferences about the study population to be made using the data gathered from the study. Using a survey design has several advantages that contributed to this design being adopted within this thesis. Some of the advantages associated with questionnaires were the rapid turnaround time, the relevant ethical advantages and their efficiency.^{212,213,221}

3.3.2 Questionnaire compilation

3.3.2.1 Demographics

Respondent demographics related to qualification and years of experience. At the time of data collection, there were six possible qualifications that PECP may have had. These have been described in Table 1-1. Given the broad possible qualification mix within both the prehospital emergency medical care and emergency department samples, this was an important variable to consider. Levels of experience were linked to qualification. The reason that experience was important was that the short-course qualifications were sequential. In other words, a BAA would study further to become an AEA who would be eligible to study towards a CCA qualification. Prior to the full-time bachelor's degree being offered, a three-year National Diploma preceded the BTech degree. This meant that PECP's years of experience might far

have exceeded the time that they were qualified at their current level. In addition, the BAA may have qualified and then been unable to find meaningful employment within the EMS for some time, as indicated in the NECET Report.³⁸ Responses were categorised based on qualification or HPCSA registration category and reported on appropriately.

A similar scenario existed within the emergency centre, where personnel may have studied towards previous qualifications before engaging in employment in the emergency centre. Unlike the PECP who would have been employed exclusively in the prehospital environment, ECP may have worked in other areas of the hospital prior to their engagement in the emergency centre. This created a similar situation to that of the PECP, where years of experience were not necessarily related to total experience.

3.3.2.2 Questions

When compiling the questions in Section A that related directly to handover, a literature search was conducted to determine the most important elements for inclusion in the questionnaire. An extensive literature search to determine existing handover research, as well as areas where knowledge may be lacking, was commenced. Handover within the hospital, specifically shift or inter-unit handover between nursing staff, appeared well-researched and described. Handover between the prehospital and emergency centre yielded limited information. The keywords "South African handover" produced 3736 hits on MEDLINE®. Article titles were read and classified for relevance; many of these were related not to patient handover but to systems handover in information technologies. Where relevance was perceived to be high, abstracts were reviewed. Despite the initial hit-rate, there were no South African studies found that directly explored handover between prehospital care providers and the emergency centre.

No literature could be found where the relative importance of specific handover elements had been evaluated. It became increasingly difficult to isolate the most important aspects pertaining to handover. The differences between in-hospital and prehospital practices created further challenges in defining essential and less important items of information. Including all information items that may have been considered necessary could have resulted in an overly laborious questionnaire. This would have been too lengthy and may have resulted in participant unwillingness to complete the questionnaire. Ultimately, it was decided that the content of handover for all sets of participants would remain the same. This meant that some elements of handover identified in literature, such as prehospital intubation, would be omitted to ensure that all levels of qualifications were able to rate most handover elements that were included. A review of common mnemonics, literature from international studies and factors

affecting mortality and morbidity were included in the final list of handover elements. The elements considered for inclusion in the questionnaire were compiled by referring to published literature to determine the most commonly listed items deemed important within the handover context. An Excel® sheet was compiled and the most common elements were determined by a simple count of their appearance in the consulted sources.

The compilation of the questionnaire followed the guidelines specified by Kelley *et al.*²¹² Focus was placed on the questionnaire being clear and well presented. Upper case letters were only used where necessary, questions were numbered and questions exploring similar themes were grouped together. A four-point Likert-type scoring system was used to classify the importance of each handover element, as described in Section 3.3.2.3. Where relevant, forced binary and additional Likert-type response scales were included, and these are described in Section 3.3.2.4. This scoring system was deemed to be clear and interpretable when the questionnaire was compiled. This was confirmed by the participants from the pilot study who did not comment on having any difficulty in deciphering nor answering the relevant questions.

The final set of questions were open-ended. This questioning strategy allowed participants to provide rich data related to their own perceptions and opinions of emergency centre handover. Questions were slightly different for the PECP and ECP to cater for their differing experience as deliverers and receivers of handover.

3.3.2.3 Likert-type questions for prehospital emergency care and emergency centre personnel questionnaire exploring the perceived importance of handover variables

The questionnaire was a purpose-designed, non-validated set of questions aimed at exploring a variety of items related to handover. The questionnaire was comprised of several Likert-type scaled, forced binary and open-ended questions. Likert-type questions for the PECP were formulated to explore the perceived levels of importance of certain handover variables, as well as aspects related to knowledge and opinions of certain handover aspects. These questions were not aimed at substantiating the responses in the ranking of importance. The content of the questionnaire related to the importance of specific elements in handover is contained in Table 3-.

This was followed by a section that used Likert-type and forced binary questions to explore several aspects related to emergency centre handover. Open-ended questions concluded the questionnaire and were chosen to provide rich data on participant opinions or experiences

that were used to drive the formulation of relevant questions for the semi-structured, face-to-face interviews.

Table 3-3: Handover variables included in the questionnaire

<ul style="list-style-type: none"> • Mechanism of Injury/ Nature of Illness ^{148,159,168,172,177,190,222} • Approximate impact speed ^{78,190} • Restrained / Unrestrained ^{78,190,223} • Airbag deployment ⁷⁸ • Damage to car / Intrusion ¹⁹⁰ • Time since incident ^{150,190} • Death of an occupant in the same compartment ¹⁹⁰ • Injuries sustained ¹⁴⁸ • Type of major injuries ¹⁶⁸ • Anatomical location of major injuries ¹⁹⁰ • Patient priority ¹⁶⁴ • Vital signs ^{168,177} • Pulse rate ¹⁹⁰ • Blood Pressure ²²² • Respiration Rate ¹⁹⁰ • SpO₂ (Oxygen saturation)^a ^{4,143,182,190,224} • Temperature ^{18,172,182,190} 	<ul style="list-style-type: none"> • Capillary Refill ^{225,226} • Glasgow Coma Score ^{159,168,190,222} • End tidal CO₂^b ^{164,190} • ECG^c analysis²²⁷ • Hypotensive episode prehospital ¹⁹⁰ • Patient Mobility ¹⁷² • TEWS^d Score ¹⁷² • History ^{10,159,227} • Allergies ^{159,168,227} • Medications ^{159,168} • Past Medical History ^{168,177,190} • Past Surgical History ¹⁶⁸ • Last meal/drink consumption^{159,168,177} • Demographics ^{10,148} • Age ^{159,177,190,227} • Gender ^{9,159,228}
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^aSpO₂= Blood oxygen saturations measured with a non-invasive pulse oximeter, ^bCO₂= Carbon dioxide, ^cECG= Electrocardiograph, ^dTEWS = Triage Early Warning Score

3.3.2.4 Likert-type and forced binary questions for prehospital emergency care and emergency centre personnel exploring aspects related to emergency centre handover

Likert-type questions for the PECP and ECP were formulated to explore similar factors related to knowledge and perceptions of certain handover aspects within the emergency centre. These questions were not aimed at substantiating the responses in the ranking of importance.

Instead, the focus was on exploring specific aspects relating to handover within the emergency centre.

The aspects of emergency centre handover explored for PECP included their opinions on the quality of handovers that they observed within the emergency centre, the length and quality of their own handovers, and whether or not they had had training related to handover. In addition, opinions on mnemonics and knowledge related to commonly used mnemonics were explored. The levels of formal training related to handover and the effect that ECP's qualification had on how they received handover were also investigated.

The aspects of emergency centre handover explored for ECP included their opinions on the general quality of handovers that they observed within the emergency centre, the accuracy and relevance of the information delivered, and the length of observed handovers. In addition, opinions on mnemonics and knowledge related to commonly used mnemonics were reviewed. The levels of formal training related to handover and the relationship between PECP qualification and quality of handovers that were delivered were also explored. A motivation was requested for their response to the question relating to qualification and handover quality.

3.3.2.5 Open-ended questions for prehospital emergency care and emergency personnel questionnaire

Open-ended questions aimed to gather data from participants related to their perceptions of emergency centre handover. The questions were phrased slightly differently for the PECP and ECP to cater for the deliverer/receiver perspectives.

PECP were asked to list five aspects that they believed contributed to a 'good' handover, and to discuss aspects that they believed contributed to the experience of handing over in the emergency centre being 'bad'. Personnel were requested to describe what they believed could be done to improve the standard of handover within the emergency centre.

ECP were asked to list five aspects that they believed contributed to a 'good' handover, and to discuss aspects that they believed contributed to a handover being 'bad'. Personnel were asked to describe what they believed could be done to improve the standard of handover within the emergency centre.

3.3.3 Sample: Study One

The purpose of the research was to use a sample to generalise the views of the sampled populations. The identified populations were PECP who took patients to hospital and handed them over, and the ECP who accepted the patient along with relevant handover. These samples are reported on next.

3.3.3.1 Prehospital emergency care personnel sample

South African PECP register with the HPCSA. Qualification and scope of practice are directly related to the registration category. Training for PECP was offered by private training providers, state-aligned training providers and higher education institutions. A detailed description of prehospital qualifications and registration categories is available in Table 1-1.

PECP were usually either employed by the public sector or the private sector. The public sector included provincial ambulance services as well as local authority ambulance services. The private sector consisted of several for-profit ambulance services. These services were of varying sizes and were often area-specific in the context of which patients they served, but not necessarily limited to specific hospitals. At the time of the study, there were no accurate data available related to how many PECP were operationally employed by either the public or private sector in the data collection area. The sample was drawn from one public and two private-sector emergency medical care providers in the Johannesburg metropolitan area within the Gauteng Province.

The public sector emergency service was a municipal combined ambulance and fire service that functioned within the study area. Ten operational stations were used to gather data from both day and night shifts that were present at the time of data collection. Three of these stations were to the North of the city, three within the central area, two in the East, one in the South and one in the West. In addition to the operational stations, data were collected from persons attending training at the affiliated training facility. The two private ambulance services used to collect data were from the largest recognised private ambulance services within the study area. There were four data collection sites used from private service A and four used from private service B. The four data collection sites from private service A were geographically in the South (n=1), North (n=2) and West (n=1) of the study area. The four data collection sites for private service B were geographically situated in the North (n=1), South (n=1) and East (n=1) of the study area and were supplemented by data collected from the affiliated training facility.

3.3.3.2 Emergency centre personnel sample

The South African healthcare system is comprised of both public and private-sector hospitals. The emergency centre is usually staffed by a mix of nursing staff and medical practitioners. Nursing staff who may be involved in receiving handovers are usually qualified as either nursing assistants, enrolled nurses or registered nurses. Medical practitioners may be busy with rotations, further studies in emergency medicine, or may be specialists or sub-specialists involved in the treatment of specific patients. The sample was drawn from two private-sector hospitals and one public sector hospital.

The public sector hospital was geographically in the South of the study area and was the largest state-funded healthcare facility in the study area. This hospital was chosen due to its size and the relatively large staff contingent present in the emergency centre. Both private hospitals were from the same private hospital group, with one in the North of the sample area and one in the West. These hospitals were chosen based on their high-level emergency centre status and their wide geographic distribution from each other.

3.3.4 Study setting: Study One

3.3.4.1 Prehospital emergency care personnel study setting

The PECP sample was spread between public and private-sector EMS within the data collection area. Permission was received from the relevant authorities, management and supervisors for data collection to occur at the workplaces of potential respondents. This meant that data collection incorporated several geographical locations within the City of Johannesburg. These locations included the bases of private emergency services, as well as those of municipal emergency management services. Other data collection sites included training facilities of both private and municipal emergency services where personnel were engaged in a variety of learning and continuing professional development activities. The geographical locations of each of the data collection sites have previously been described in Section 3.3.3.1.

3.3.4.2 Emergency centre personnel study setting

The emergency centre sample was spread between public and private emergency centres. Permission was received from the relevant authorities and supervisors for data collection to occur at the workplaces of potential respondents. This meant that data collection incorporated

several geographical locations within the hospital itself. These locations included the emergency centre doctor and nursing stations, tea rooms and staff lounges of both private and public medical facilities.

3.3.5 Sample size: Study One

3.3.5.1 Prehospital emergency care personnel sample size

At the commencement of data collection, there were no accurate data available related to the number of PECP operationally employed within South Africa. During data collection, the NECET Policy became available.³⁸ This was the first report in South Africa that sought to provide accurate data pertaining to the numbers of PECP. These numbers have been tabulated previously in Table 1-1. The total number of employed PECP in South Africa, according to the NECET Policy, was 17 894.³⁸ Data collection was already underway when the NECET Policy was released. Using the numbers available in the NECET Policy and an online sample size calculation tool (<https://surveysystem.com/sscalc.htm#two>), a required sample size was calculated. Using a confidence limit of 99% and a confidence interval (margin of error) of 10%, the calculated sample size was 165. This sample size would be representative for the national PECP population.

When determining a sample size for the province in which the study took place, the same formula and values were used with the revised number of 1 427 PECP.³⁸ The calculated sample size was 150. There were no available numbers for the sample area. There were also no data available for the private service numbers within the Gauteng province, nor for the specific geographical area in which the study took place. The private sector employed more PECP than any one provincial service, and there were no data available on the geographical distribution of their staff within South Africa.

At the time that the NECET data became available and the relevant calculations were performed, 175 questionnaires had been collected. Given that this exceeded the sample size that had been calculated, data collection was concluded. An additional factor taken into account when deciding to conclude data collection was that the collected sample number had already exceeded 10% of the province's total PECP population,³⁸ despite being limited to a specific geographical area.

3.3.5.2 Emergency centre personnel sample size

The emergency centre sample size was more difficult to determine. All PECP are inferentially involved in handing over in the emergency centre. In contrast, only a small portion of registered medical practitioners was employed within the emergency centre. The numbers of registered specialist emergency physicians have remained low, and in 2019 there were a total of 138 specialist emergency physicians registered with the HPCSA.²²⁹ There were no data available on their geographical areas of practice nor whether they were engaged in the private or public health sectors. The same was true of nursing staff, where only a small proportion of the total nursing staff employed at a hospital was employed in the emergency department. As with the medical practitioners, there were no available data on how many nurses were employed in South African emergency centres.

Data collection continued at the relevant sites for a period of four weeks from commencement at that specific site. During this time, active recruitment continued and the research was introduced to personnel who were not yet aware of the project. After four weeks, no new questionnaires were completed at any of the sites and data collection was concluded. A total of 50 questionnaires had been collected by that time.

3.3.6 Data collection: Study One

Data collection was carried out slightly differently for the two populations. Although both populations were approached at their places of work, the differing environments in which the potential respondents worked necessitated population-specific data collection approaches. These are reported on in separate sections below.

3.3.6.1 Prehospital emergency care personnel data collection

The PECP sampled population included all qualification levels from both private and state prehospital emergency service providers. The workplaces of these persons differed somewhat in that public sector personnel were primarily based at fire stations and private-sector personnel were either based at hospital facilities or had a building allocated to them as a base. In addition to these environments, some potential respondents were approached while continuing professional development activities were being conducted at a variety of locations. Questionnaires were self-completed, meaning that a generic, staged recruitment procedure was followed. Data collection commenced in January 2013 and was concluded in April 2015.

The study was introduced and a short description of the motivation for the study was provided, as well as what was to follow. The information document was distributed to all PECP present. Personnel were given adequate time to read through the document. A verbal summary of the contents was provided, as well as an opportunity to ask questions. Questionnaires and consent documentation were distributed. Where requested, potential respondents were provided with pens. Potential respondents were given adequate time to complete the questionnaire after which the completed questionnaires were collected; these documents were placed in a box for transport. Completed questionnaires were categorised by HPCSA registration category and filed accordingly. Consent documentation was filed separately.

There were instances where potential respondents requested the documentation be left at their place of work for completion at a later time. Where requested, documentation was left at the location for completion and collected within a day or two. Enough questionnaires were left to cater for additional respondents who had not yet completed the questionnaire. There were ten blank questionnaires left at each station, which included the potential participants who had indicated a willingness to participate. Upon follow-up for questionnaire collection, it was found that there were instances where a different shift was on duty. Where this was the case, the process of questionnaire distribution was repeated. In all, there were six stations within the state-funded emergency service where two sets of ten questionnaires were distributed and four where only one set of ten was distributed. Fifty questionnaires were distributed during educational activities. The total number of questionnaires distributed in the state-funded emergency service was 210. Within the private emergency services, ten questionnaires were distributed at each of the four bases within each service, totalling 80 questionnaires. The response rate was 175/290, or 62%.

3.3.6.2 Emergency centre personnel sample data collection

Data collection was undertaken by approaching potential participants at their place of work and requesting they complete the questionnaire. An information sheet and consent form were supplied with the questionnaire, detailing the study to ensure that consent was informed. In most instances, potential respondents requested that questionnaires be left at the unit for their completion at a later stage. Some reasons provided for this were related to workload within the unit and the lack of time to complete the questionnaire during working hours. Additionally, some potential respondents indicated that staying after their normal working hours would have a significant effect on their transport arrangements and in light of this, they would prefer to complete the questionnaire at home/in their private time. Attrition rates appeared lower in this group, however, two of the unit managers at private hospitals mentioned during independent

informal discussions that agency staff appeared unwilling to complete the questionnaire for undetermined reasons. Data collection commenced in July 2013 and was concluded in April 2015.

The study was introduced to the unit manager. A short description of the motivation for the study was provided, as well as what was to follow. The information document was distributed to all emergency personnel not engaged with patient management. Personnel were given adequate time to read through the document. A verbal summary of the contents was provided, as well as an opportunity to ask questions. Questionnaires were distributed as well as consent documentation. Where requested, pens were provided. Since many ECP members were busy with other tasks, blank questionnaires were left in an area discussed with the unit manager. Potential respondents were given adequate time to complete the questionnaire after which completed questionnaires were collected; these documents were placed in a box for transport. For questionnaires left in the emergency centre, an empty box was placed next to the questionnaires where completed questionnaires could be deposited, and this box was emptied weekly. Completed questionnaires were categorised according to nursing or medical practitioner personnel for data analysis. Consent documentation was filed separately. Data collection commenced in July 2013 and was concluded in April 2015.

3.3.7 Data analysis: Study One

Data analysis for both prehospital and emergency centre data were carried out using the same strategy. Data analysis for Section A focussed on determining levels of perceived importance for handover variables specified in the questionnaire. Data analysis for Section B was carried out in two stages. The first phase involved a quantitative analysis of the Likert-type question responses, and the second involved qualitative description analysis of the open-ended questions. Each of these phases is reported on below.

3.3.7.1 Questionnaire: Section A - Analysis of Likert-type questions

All questionnaire responses were manually captured into an Excel® (Microsoft Office, Microsoft Corporation, Redmond, WA) spreadsheet. Demographics were described by cross-tabulating participants' registration category with their field experience. The median and interquartile range for the levels of experience were calculated using existing functions in Excel®. Responses for the Likert-type questions in the questionnaire were recorded and frequencies calculated for each response using existing functions in Excel®. The perceived importance of each element was calculated using the four-point Likert-type scale responses.

The available options were “Critically important”, “Important”, “Somewhat important” and “Unimportant”. Responses were manually captured into Excel® (Microsoft Office, Microsoft Corporation, Redmond, WA) per HPCSA registration category for analysis. Data for the handover variables were used to determine percentage responses for each handover variable’s level of importance. The percentage of responses were used to determine which handover elements had the highest percentage of “Critically important” responses. Handover variables were ranked from most to least important using the percentage of responses that had indicated the variable was critically important. “No response” responses were excluded from the dataset and resultant calculations.

Data from the remaining Likert-type and forced binary question responses were reported on using descriptive statistics, calculated using existing Excel® functions. Data were reported on by registration category and then combined.

3.3.7.2 Questionnaire: Section B - Analysis of open-ended questions

Section B aimed to explore PECP and ECP respondents’ opinions and experiences of emergency centre handover. Section B contained open-ended questions that were used to guide the questions for the interviews in Study Two.

3.3.7.2.1 The process of qualitative data analysis

Qualitative data analysis often follows a stepwise approach. Each step involves a specific interaction with the data and a related output to better understand the original dataset. Figure 3-2 is an adaptation of the Data Analysis in Qualitative Research figure, suggested by Creswell.²¹³

3.3.7.2.2 Step One: Raw Data

Written responses from the open-ended questions were captured verbatim into a Microsoft Word® document and imported into a Computer-Assisted/Aided Qualitative Data Analysis Software (CAQDAS) package (Atlas.ti®) to perform data analysis and assist in organising coding and related patterns.

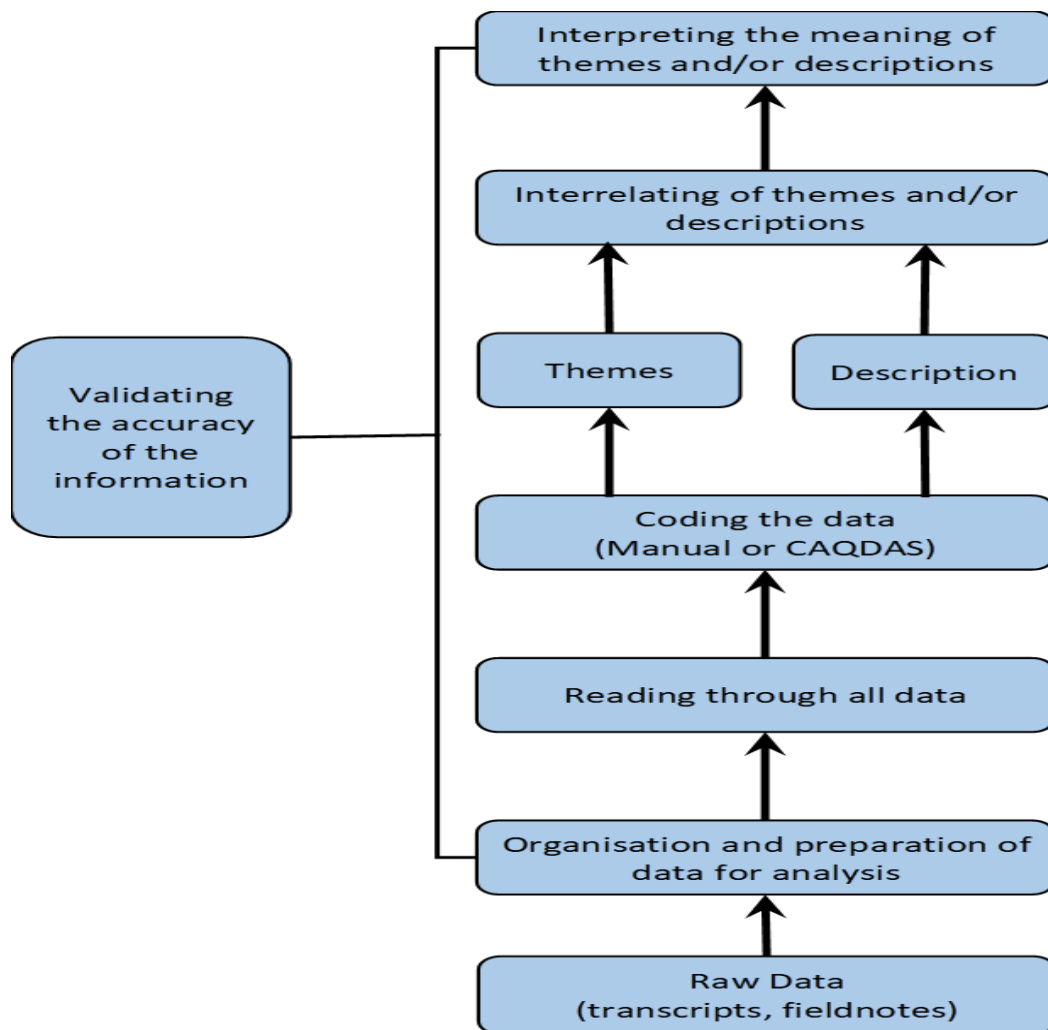


Figure 3-2: Data analysis in qualitative research (adapted from Creswell)

3.3.7.2.3 Step Two: Organisation and preparation of data for analysis

This step corresponds with the “Selecting material” step as described by Margrit Schreier.²³⁰ The responses to each question were grouped together and a separate file was created for each question. Transcription records were imported into Atlas.ti® for analysis. Transcriptions were read, and a random sample was compared to the original questionnaire responses to confirm the accuracy of the transcription.

3.3.7.2.4 Step Three: Reading through all the data

Prior to transcribing the data, all responses were read per questionnaire. This was done to obtain a general sense of the information and to allow for reflection of the overall meaning of the data. A general idea was formed relating to what the participants were saying and the tone of their responses. Once responses were separated into their respective questions and

grouped accordingly, these were read and reread. This allowed for better immersion into and contextualisation of the data and for the development of a better idea of what each question's most pertinent issues were.

3.3.7.2.5 Step Four: Coding the data and building the coding frame

Coding of qualitative data, otherwise known as qualitative coding, is a process where segments of data are identified as relating to or being a type of, a more general idea, instance, category or theme.²³¹ Coding has also been described as “the operations by which data are broken down, conceptualized and put back together in new ways”.²³² During the coding process, segments of data spanning the whole dataset were placed together, sometimes called ‘tagging’, with the aim of making them retrievable at a later stage. This process resulted in the building of a coding system or frame that organised the data and the ideas around it. In other words, coding contributed to the management and ordering of the data and enabled easier searching for similarities, anomalies, differences, relationships and patterns. This meant that coding formed an integral part of the process of analysis, yet it was not in itself an analysis.²³¹ The generated codes gave rise to categories and sub-categories that were related to the broad theme explored in each question.

The decision to use CAQDAS was driven by the perceived advantages that it offered within this project. The CAQDAS tools have been associated with more rigorous data analysis that is less time-consuming than traditional methods.^{233,234} Various types of CAQDAS software were evaluated and Atlas.ti was deemed to be the most suitable. When using CAQDAS, a code was applied to a specific data segment, and this created a link within the CAQDAS between the segment and the code. This link enabled quick retrieval of material and allowed segments to be linked based on the codes that had been assigned to them.²³¹ The process of coding was viewed as central to the qualitative method, and although CAQDAS packages are not analysis methods, they aim to facilitate a variety of analytic processes using the range of tools that they offer.²³¹

Many of the responses were relatively brief and primarily short phrase or single sentence in nature. This meant that the complexity of the data was relatively low, and data analysis strategies were consequently reasonably uncomplicated. The primary strategy used to code the data was that of inductive coding. The general principle that underlies inductive coding is the desire to prevent existing theoretical concepts from over-defining the analysis.²³¹ Abrahamson describes the inductive approach as beginning with researchers ‘immersing’ themselves in the documents so that they can identify the themes or dimensions that seem

meaningful to the producers of each message.²³⁵ This immersion process was achieved by reading and rereading the responses within each of the question-specific documents. Data were coded in two phases: open and axial.

The process followed was typical of an open-coding strategy.²³¹ Open coding involved considering small segments of data in detail and assigning codes to a code label using the relevant function in Atlas.ti®. The nature of the data, having been sourced from specific questions, meant that the questions were separated into single documents to facilitate more focussed coding. This type of data classification and coding is often referred to as creating horizontal cuts across the whole (or parts of the) dataset.²³⁶ Where descriptors did not yet exist, these were created in Atlas.ti® and added to the coding frame. The data segments that made up the codes varied in size from single words to sentences or short phrases. Several initial codes were identified that were then compared with one another. The nature of the data meant that some codes were descriptive and some conceptual, some were precise, and some were general. Code labels were defined by assigning labels that best described the message. In some instances, this involved *in vivo* coding where terminology used in the code labels was used as the code label.²³¹

After the initial analysis and open coding, axial coding followed.²³¹ A second pass through the data was undertaken and all codes from the open-coding phase were reconsidered. Code labels and the relevant data linked to them were rethought in terms of differences and similarities. Where relevant, code labels were changed to provide congruence within similar concepts and codes were merged into higher-level categories. The axial coding phase explored the relationships identified between the codes that they represented and served to bring together the fragmented data segments that had been identified in the open-coding phase.²³¹ Categories and resultant themes were generated by observation of regularities and searches for internal convergence and external divergence. In other words, the search was not so much for exhaustive and mutually exclusive categories, but instead aimed to identify salient, grounded categories of meaning held by the participants.²³²

The data extracted from the coding processes described above gave rise to dominant themes, which were used to compile the questions for the face-to-face, semi-structured interviews for Study Two. This process constitutes Steps Five, Six and Seven, and forms part of the results and relevant discussion areas.

3.3.8 Reliability and validity: Study One

Reliability refers to the repeatability of the measurement procedure, and validity to how well it measures what it claims to measure.²³⁷ The reliability and validity, and the measures taken to determine these characteristics of the questionnaire, are described below.

The questionnaire was purpose-designed, and responses were anonymous, which meant that performing many recognised reliability tests was impractical. A pilot study was carried out to address the validity of the questionnaire.⁵⁶ The pilot study for the PECP sample was made up of a selection of participants with different training backgrounds. The pilot study included two persons registered on the ECP register, two persons registered on the ANT register, three persons registered on the ANA register, and three persons registered on the BAA register. Each was asked to complete the questionnaire and then report any specific comments or suggestions to improve it. Completed pilot questionnaires were also analysed for trends in completion. Possible trends that were considered and searched for related to consistent omissions, multiple responses to single-option questions and appropriateness of responses to open-ended questions. All questionnaires were completed appropriately without any significant discrepancies being noted, and without any significant comments from the pilot study sample. These questionnaires from the pilot study were thus included in the final dataset. The initial questionnaire was deemed to be correct, did not require any changes and was distributed as described.

The pilot study for the emergency centre sample was comprised of ten participants. Participants were recruited as part of the normal recruitment process. Five medical practitioners and five nurses made up the pilot study. When questionnaires were handed in, the same process was followed as for the PECP related to comments and possible trends in completion. All questionnaires were completed appropriately without any significant discrepancies and without any significant comments from the pilot study sample. These questionnaires from the pilot study were included in the final dataset. The initial questionnaire was deemed to be correct, did not require any changes and was distributed as described.

3.3.9 Ethical considerations: Study One

The ethical considerations for both PECP and ECP were the same. For this reason, the two are not reported on under separate headings.

Ethical approval was obtained for my initial Master's study from the University of Cape Town Human Research Ethics Committee (Ref: 624/2012) and is attached as [Appendix 1](#). Permission was obtained for all data collection areas by approaching the relevant persons and committees for permission within each domain. After the recommendation for an upgrade to a PhD, a motivation was submitted to the University of Cape Town Human Research Ethics Committee and the Doctoral Degrees Board for approval. Approval for the upgrade was granted by the Doctoral Degrees Board ([Appendix 2](#)). Each year that data collection was active, an application for extension was submitted to the University of Cape Town Human Research Ethics Committee. These applications were all approved before any data collection commencing for that specific year. An information document ([Appendix 3](#)) was attached to the questionnaire to ensure that potential participants were in possession of appropriate information to provide informed consent. Potential respondents were required to complete a consent form indicating that they consented to participation in the study. The consent form was attached to the questionnaire by means of a standard paperclip so that it could be easily removed and submitted separately to the completed questionnaire to further ensure anonymity.

The demographic information required on the questionnaire was non-specific, and there were no personal identification data required. Questionnaires were anonymous and there was no identifying data observable that may have resulted in participant identification. After collection, questionnaires were placed in a steel cupboard in an access-controlled office at my place of work. This location was locked at all times except when I was present in the office.

3.4 Study Two: QUALitative Phase - Compilation of Interview Questions, Conducting Interviews and Data Analysis

3.4.1 Qualitative descriptive approach to Study Two

There are many approaches to qualitative research; so much so, that Margarete Sandelowski refers to "methodological acrobatics".²³⁸ She goes on to describe how the prevailing negative perception of descriptive research within the quantitative domain has affected how it has been perceived in the qualitative domain. She links the perceived need of qualitative researchers to adopt a specific designation of their research (phenomenology, grounded theory, ethnography or narrative) in search of a degree of what has been referred to as "epistemological credibility". The result is what is often termed 'posturing'. Posturing usually involves assigning a specific term to a study where, in fact, the study follows a qualitative descriptive methodology and does not necessarily make any theoretical or methodological contributions, and often only has overtones of the methodology specified. Qualitative description has been described as low-

inference interpretation. In other words, there is a greater probability of consensus among researchers related to what was described.²³⁸ Qualitative description research is founded in existing knowledge, thoughtful linkages to the work of others, and the clinical experience of the researcher(s).²³⁹ The qualitative description methodology is claimed unashamedly in this thesis without the need to resort to methodological acrobatics.²³⁸

Qualitative description differs from other qualitative methods in several ways. The aim of analysis in qualitative description is neither theory development (such as ethnography), thick description (such as grounded theory), nor interpretive meaning of an experience (such as phenomenology). Rather, qualitative description aims to provide a rich, straight description of an experience or event. Essentially, the researcher using qualitative description stays closer to the data in the analytical process and data presentation. The final product of qualitative description is an account of informants' experiences in a language that is similar to the informants' own language as opposed to other qualitative approaches that often aim to develop concepts and analyse data in reflective or interpretive interplay with existing theories.²³⁹

Despite being different from grounded theory, ethnographic, phenomenological or narrative studies, qualitative descriptive studies often have textures, tones, hues and approaches from these four methods embedded within them. To highlight this, several authors have referred to their studies as having the feel, look or sound of other approaches, sometimes termed 'overtones'.²³⁸ This study followed a qualitative description design, but there are certainly areas where overtones of other qualitative methodologies may be apparent.

3.4.2 Domain One: Research team and reflexivity

3.4.2.1 Personal characteristics - My position as a researcher

At the time of the study, I was employed as a lecturer within the Department of Emergency Medical Care at the University of Johannesburg. Having worked as an operation prehospital emergency care provider within the City of Johannesburg and internationally, I had my own experiences and perceptions of emergency centre handover. The motivation for this study was, in fact, rooted in my personal experiences of handover as an insider of the handover process.

My insider experience was an advantage in that it meant I was able to relate to the research interviewees and their views. Conversely, my insider position meant that I had my own personal biases and opinions related to emergency centre handover. In saying that, being in

the education sector had somewhat dampened my own opinions and allowed me to better focus on the study and curb my bias as the centre point. I maintained a constant awareness of my potential biases and focussed on listening carefully to interviewees.

Qualitative descriptive research is founded in existing knowledge, thoughtful linkages to the work of others, and the clinical experience of the researcher(s).²³⁹ In light of this, I was cognisant that it was my existing knowledge related to emergency centre handover that was the inspiration for the research project. The review of existing literature ensured that I was able to thoughtfully link what I thought I knew to what had actually been accumulated in the knowledge pool related to emergency centre handover. In addition, my own clinical experience was limited and indeed defined by my own perceptions and experiences of emergency centre handover. These experiences were generally limited to a small subset of the total potential emergency centre experiences, and I remained cognisant that my experiences were not necessarily the quintessential emergency centre handover experience. Essentially, I tried to put aside my personal biases while, at the same time, tapping into my existing knowledge and experiences of emergency centre handover.

My perception that handovers were generally poorly performed had the potential to influence the research project, data collection and analysis. I remained cognisant of this potential bias throughout this research project. In fact, during the interviews I often found myself reflecting on how skewed some of my opinions were, and at the same time, how correct many of my assumptions had been.

3.4.3 Domain Two: Study design

3.4.3.1 Sampling

There are several sampling strategies available, including purposive, snowball and convenience.²⁴⁰ Purposive sampling is also known as judgement, subjective or selective sampling. Purposive sampling involves the researcher relying on his or her judgement when choosing which members of the population should participate in the study. The ideal participant for inclusion in this study was a healthcare professional who had been exposed to either delivering or receiving handover within the South African emergency centre. Given that emergency centre handovers involve a broad range of healthcare professionals from both PECP and ECP, all qualifications, specialities and experience levels were included to provide the best overall spread of data.

Most purposive sampling techniques are appropriate for qualitative descriptive studies.²³⁸ Perhaps the most useful is that of maximum variation sampling, which involves the purposeful selection of participants who have a wide range of dimensional variation related to the topic of interest.²⁴¹ The selection of participants with a diversity of views and perspectives has the potential to challenge preconceived and even emerging conceptualisations. In this study, maximum variation was achieved by selecting a range of qualifications and experience from the PECP population. Within the emergency centre, both nursing and medical practitioner staff with differing levels of experience were selected to provide a diversity of views.

The maximum variation sampling strategy used in this study allowed for the exploration of the common and unique manifestations of the target population across a broad range of demographically and phenomenally varied cases. The aim was to describe the phenomenon of emergency centre handover as it tended to appear, or even as it may have appeared uncommonly. In qualitative studies, the goal of purposive sampling is to ultimately obtain cases deemed information-rich for the study purposes. The choice of a range of PECP and the mix of medical and nursing practitioner personnel was seen as a method to ensure sufficient exploration of the various manifestations of participant experiences related to emergency centre handover.

3.4.3.1.1 Method of approach: Prehospital emergency care personnel

Potential participants were approached at their places of work and during continuing professional development training. Potential interviewees who were at their places of work were approached face-to-face, and a short verbal introduction to the study was provided. Relevant documentation was presented and, where consent was provided, the interview was commenced in an appropriate venue. Where potential participants were attending training at a formal facility, an appointment was made to address the group undergoing training. Information documentation was distributed to attendees, and a short verbal presentation was conducted. After the presentation, an invitation was extended to attendees to become involved in the project. A venue was made available where individual interviewees were able to report for the interview. Interviews were conducted between June 2018 and October 2018.

3.4.3.1.2 Method of approach: Emergency centre personnel

A purposive selection strategy was employed where specific participants were approached in a variety of environments, all related to their place of work. Participants were either

approached in the emergency centre where they worked or at an appropriate education function.

Medical practitioners were approached face-to-face using various platforms. Registrars were approached during a teaching session, and a short presentation was given on the research project. In addition, emergency centre doctors were approached prior to the morning emergency centre round and a short verbal presentation was given. Documentation was handed out to those present at both presentations (Annexure 4-5). Consenting persons completed the document, and these details were then used to contact potential interviewees and arrange a meeting point and time. Initial contact was made via WhatsApp® message, followed by either additional messaging or telephonic communication.

Nursing staff were approached in the emergency centre during their shift. There was a short introduction on a face-to-face basis, and the relevant documentation was then given to the potential interviewee for them to read at a convenient time. A venue was set aside in the emergency centre where the potential interviewee was able to report to should they have wished to be interviewed at a time convenient to them. A venue was made available where individual interviewees were able to report for the interview as and when they either had time or felt comfortable. Prior to the interview, the relevant information and consent documents (Appendix 5-8) were distributed and completed. Interviews were conducted between June 2018 and October 2018.

3.4.3.2 Sample size

3.4.3.2.1 Sample size: Prehospital emergency care personnel

Fifteen prehospital interviews were conducted. Seven ECP-registered, three ANT-registered, one ECT-registered, three ANA-registered and one BAA-registered PECP were interviewed. Ultimately, the sample size was driven by the need to satisfy data saturation requirements. This process of data saturation determination is discussed under the relevant heading (3.4.4.2 Data saturation).

3.4.3.2.2 Sample size: Emergency centre personnel

Fifteen emergency centre interviews were conducted. Nine medical practitioners, one clinical associate and five nursing personnel were interviewed. Ultimately, the sample size was driven by the need to satisfy data saturation requirements. This process of data saturation determination is discussed under the relevant heading (3.4.4.2 Data saturation).

3.4.3.3 Setting

3.4.3.3.1 Setting of data collection: Prehospital emergency care personnel

Interviews were conducted in a variety of settings, determined by a combination of interviewee requests and convenience, and availability of appropriate venues. In many cases, potential interviewees requested specific times and venues that were convenient to them. PECP interviews were conducted in environments where it was believed confidentiality would be ensured. These included administrative offices of interviewees, my office, and vacant offices at the interview sites. The nature of the data collection determined the setting as described.

3.4.3.3.2 Setting of data collection: Emergency centre personnel

ECP interviews were conducted in environments where it was believed confidentiality would be ensured to a point of satisfaction for the interviewee and interviewer. The setting was determined by a combination of interviewee requests and convenience, and availability of appropriate venues. This meant that interviews took place in environments such as vacant consulting rooms in the emergency centre, and public places such as a fast-food restaurant or the cafeteria at the nearby medical school.

3.4.3.4 Data collection

Techniques used in qualitative descriptive studies to collect data usually include minimally to moderately structured open-ended individual and/or focussed group interviews.²³⁸ In this study, face-to-face, semi-structured individual interviews were used to collect data.

3.4.3.4.1 Interview schedule

The interview schedule included several predetermined questions that were designed to engage the participant. These questions were sourced from the coding, analysis and interpretation of the responses to the open-ended questions from the paper-based questionnaire. This process was described in Study One. Each question was carefully considered to ensure that wording was explicit and clear, and questions were grouped under generic headings that had emerged from the analysis and coding. A copy of the interview guide was given to the participant in the event that they may have wanted to read the question(s) themselves. The interview guides are attached as [Appendix 9](#) for prehospital and [Appendix 10](#) for emergency centre interviews.

The questionnaire was pilot-tested by having a discussion with the first two interviewees from each sample. This discussion was not recorded, and opinions were asked of the interviewees related to whether or not there were any areas of ambiguity, unclear questions or any other comments related to improvement. There were no significant comments raised by the persons interviewed, thus data from the pilot interviews were included in the dataset.

3.4.3.4.2 Audio/visual recording

All interviews were audio-recorded. Potential interviewees were required to sign consent documentation before the commencement of the interview. Consent documentation is attached as [Appendix 5 to Appendix 7](#). Two devices were used to record the interviews to proactively mitigate initial data loss as a result of poor acoustics or subsequent data loss as a result of equipment failure. Interviews were recorded using a Sony voice recorder (Model ICD-SX734, Sony Corporation, Tokyo, Japan) as well as an Apple iPhone 6S (Apple Inc, Cupertino, CA, USA). Audio files were uploaded onto a password-protected device and then transferred to the transcription company for transcription via a secure link. The confidential nature of the interviews meant that there were no participant identifiers in the field notes or the interview transcripts. It was therefore not possible to trace the interviewees for them to check their own interview transcripts.

3.4.3.4.3 Field notes

Field notes were taken related to the way in which the interviewee presented and the environment in which the interview took place. There were no notes taken related to the content of the interview. The fact that the interviews were being recorded allowed focus to be placed on conducting the interview and a better establishment of rapport and interaction with the interviewee as opposed to the distraction of constant note-taking. Field notes were used during the interview listening process. This helped set the tone when an interview was listened to during transcription checking or, where necessary, during coding. All interviewees appeared relaxed and willing to engage in the interview. Scanned copies of field notes are available at <https://www.dropbox.com/sh/bmq1ya5j8xki0kf/AABXLOhibEm4A8dou9amEjhKa?dl=0> .

3.4.3.4.4 Transcription

Interviews were conducted in a manner that assured confidentiality of recordings. To this end, there were no personal or contact details recorded during the interview that could link the interviewee with the transcription. A professional transcription service

(www.toptranscriptions.co.za) was used for the transcription of the interviews. The transcription service consulted offered a service that included independent proof-reading. An overreliance on the transcriptions was mitigated by listening and re-listening to each interview while checking the transcription document for errors. This was done prior to coding to ensure deep immersion into the data and to check the transcriptions for errors. There were some common errors found where the transcriber mistakenly allocated the incorrect medical terminology; an example was the use of the word 'incubate' instead of the word 'intubate'. These errors were corrected where relevant. In addition to this, ongoing and repeated listening was carried out during the coding processes. Despite the interviews being recorded on two devices, there were instances where sections of some interviews were unclear. Background noise, low volume of responses and unclear pronunciation were reasons identified as contributing to the unclear words or phrases. Where responses were unclear in the transcriptions, those sections of the interview were relistened to and, where necessary, adjustments were indicated in the quotations. Where these remained unclear, this was indicated by [inaudible].

Transcriptions were received in .doc format via a unique download link. Once interviews had been transcribed, each was allocated a specific file name corresponding to the qualification code of the respondent and saved in two locations – on the study laptop (Dell®) which was password protected in my Onedrive® (OneDrive, Microsoft Corporation, Redmond, WA) folder, and on an external hard drive stored at my place of employment in an access-controlled area.

3.4.4 Domain three: Analysis and findings

3.4.4.1 Qualitative data analysis

Qualitative data are described as subjective, rich, and consist of in-depth information normally presented in the form of words.²⁴² Analysing qualitative data often entails reading numerous transcripts looking for similarities or differences in the data, and subsequently identifying themes and developing categories. The most common form of qualitative data analysis involves using a general inductive approach.²⁴³ Some reasons for using a general inductive approach include condensing the extensive and varied raw text data into a summary format, the establishment of clear links between the summary findings and the research aims and objectives, and the development of a model or theory about the underlying structure of experiences or processes evident in the raw data.²⁴³

To ensure better immersion into the data, each interview was listened to at least twice and compared to the transcriptions that had been received. Where relevant, changes were made

as described previously. The decision was made to use Computer-Assisted/Aided Qualitative Data Analysis Software (CAQDAS) to assist in organising the data, resultant coding and related patterns. The CAQDAS capabilities for coding and retrieval were the primary drivers for its use, and the CAQDAS did not dictate whether, why or how to generate or apply the codes.²³¹ A process of evaluation identified Atlas.ti software as the most appropriate tool. Coding and analysis of the transcriptions was therefore carried out using Atlas.ti[®] CAQDAS software. It is important to note that CAQDAS was not the driver of coding; rather, it served as an adjunct and facilitated better organisation of the data.

3.4.4.1.1 The process of qualitative data analysis

Qualitative data analysis often follows a stepwise approach. Each step involves a specific interaction with the data and an output related to better understanding the original dataset. This stepwise approach is depicted in Figure.

3.4.4.1.2 Step One: Raw Data

Audio recordings were transcribed as described under the relevant heading ([3.4.3.4.4 Transcription](#)) and transferred as described under the same heading. The transcription documents were imported into a CAQDAS package (Atlas.ti[®]) to aid data analysis and assist in organising coding and related patterns.

3.4.4.1.3 Step Two: Organisation and preparation of data for analysis

This step corresponds with the “Selecting material” step as described by Margrit Schreier.²³⁰ In line with the recommendations of Schreier, transcripts were complete and included all questions asked. In addition, there were no areas of any interviews excluded because they may have seemed ‘unimportant’.²³⁰ This despite the fact that, to avoid cognitive overload, there have been suggestions that typically only part of the material is used in building the coding frame.²³⁰ Given the relative importance of all aspects of the collected data within the whole concept of handover being explored, all the data were used in the coding frame. Interview transcriptions were labelled according to the qualification of the interviewee and assigned a unique identifier based on the chronological order in which the interviews had taken place. Two projects were created in Atlas.ti[®], one for the PECP interviews and one for the ECP interviews. Each interview transcript was imported into the relevant Atlas.ti[®] project folder and data analysis and coding carried out within each project. This was done to separate

the codes, categories and themes from each sample to ensure that there was no inadvertent mixing of themes.

3.4.4.1.4 Step Three: Reading through all the data

Prior to coding the data, all responses were read and reread. This was done to obtain a general sense of the information and allow for reflection of the overall meaning of the data. Data were read both vertically and horizontally. Vertical reading involved reading an entire interview transcript from top to bottom and reflecting on the interview in its entirety in a sequential manner.²³⁶ This allowed for better immersion into and contextualisation of the data, and for the development of a better idea of what each interviewee's most pertinent issues were. Horizontal reading involved opening all transcripts in Atlas.ti® and reading across questions between interviews.²³⁶ This comprised reading the responses to a specific question from one interviewee and then moving to the following transcript and reading the same question's responses from a different interviewee. A general idea was formed related to what the participants were saying and the tone of their responses in general, as well as to specific questions.

3.4.4.1.5 Step Four: Coding the data and building the coding frame

Coding of qualitative data, otherwise known as qualitative coding, is a process where segments of data are identified as relating to, or being a type of, a more general idea, instance, category or theme.²³¹ Coding has also been described as "the operations by which data are broken down, conceptualized and put back together in new ways".²³² During the coding process, segments of data spanning the whole dataset were placed together, sometimes called 'tagging', with the aim of making them retrievable at a later stage. This process resulted in the building of a coding system or frame that organised the data and the ideas around it. In other words, coding contributed to the management and ordering of the data and enabled easier searching for similarities, anomalies, differences, relationships and patterns. This meant that coding formed an integral part of the process of analysis; however, it was not in itself an analysis.²³¹ The generated codes gave rise to categories and sub-categories that were related to the broad theme explored in each question.

The decision to use CAQDAS was driven by the perceived advantages that it offered within this project. The CAQDAS tools have been associated with more rigorous data analysis that is less time-consuming than traditional methods.^{233,234} Various types of CAQDAS software were evaluated, and Atlas.ti was determined to be the most suitable. When using CAQDAS,

a code was applied to a specific data segment, which created a link within the CAQDAS between the segment and the code. This link enabled quick retrieval of material and allowed segments to be linked based on the codes that had been assigned to them.²³¹ The process of coding was viewed as central to the qualitative method, and although CAQDAS packages are not analysis methods, they aim to facilitate a variety of analytic processes using the range of tools that they offer.²³¹

The primary strategy used to code the data was that of inductive coding. The general principle that underlies inductive coding is the desire to prevent existing theoretical concepts from over-defining the analysis.²³¹ Abrahamson describes the inductive approach as beginning with researchers 'immersing' themselves in the documents so that they can identify the themes or dimensions that seem meaningful to the producers of each message.²³⁵ This immersion process was achieved by reading and rereading the responses within each of the question-specific documents. Data were coded in two phases; open and axial. Similar to the strategy used for immersive reading, both vertical and horizontal coding was conducted. Vertical coding involved assigning codes within single interviews and horizontal coding involved coding within question responses across the sample.²³¹ Horizontal coding has also been termed 'question-based coding'.²³¹

The initial coding process was typical of an open-coding strategy.²³¹ Open coding involved considering small segments of data in detail and assigning codes to a code label using the relevant function in Atlas.ti®. The nature of the data, having been sourced from specific questions, meant that the questions were separated into single documents to facilitate more focussed coding. This type of data classification and coding is often referred to as creating horizontal cuts across the whole (or parts of) dataset.²³⁶ Where descriptors did not yet exist, these were created in Atlas.ti® and added to the coding frame. The data segments that made up the codes varied in size from single words to sentences or short phrases. Initial codes were identified that were then compared with one another. The nature of the data meant that some codes were descriptive and some conceptual, some were precise and some were general. Code labels were defined by assigning labels that best described the message. In some instances, this involved *in vivo* coding where terminology used in the code labels was used as the code label.²³¹

After the initial analysis and open coding, axial coding was followed.²³¹ A second pass through the data was undertaken and all codes from the open-coding phase reconsidered. Code labels and the relevant data linked to them were rethought in terms of differences and similarities. Where relevant, code labels were changed to provide congruence within similar concepts and

codes were merged into higher-level categories. The axial coding phase explored the relationships identified between the codes that they represented and served to bring together the fragmented data segments that had been identified in the open-coding phase.²³¹ Categories and resultant themes were generated by observing regularities and searches for internal convergence and external divergence. In other words, the search was not so much for exhaustive and mutually exclusive categories, but instead aimed to identify salient, grounded categories of meaning held by the participants.²³²

It is necessary to evaluate the coding frame for consistency and validity.²³⁰ The evaluation of consistency and validity of codes was driven by the code/recode strategy. Codes from the second round of coding were compared to those in the first round. There was a high consistency between the two rounds and, where discrepancies existed, these were primarily related to codes being worded slightly differently but still falling under the same category. Where relevant, these codes were collapsed into one related code.²³⁶ Validity relates to the extent to which categories provide adequate descriptions for the materials and concepts. The generally high coding frequencies in main categories was indicative of validity.²³⁰

3.4.4.1.6 Step Five: Identification of themes

Schreier describes the identification of categories and themes as “structuring”, which refers to the creation of the main categories, relevant sub-categories and dominant themes for each main category.²³⁰ The process of structuring and generating was undertaken in both a concept-driven and a data-driven way. The concept-driven way involved using previous knowledge to link the codes within the coding frame to form categories; in this case, the interview questions and the resultant codes formed the initial basis for category formation. The data-driven way involved reading and rereading the material until relevant concepts became apparent and then checking whether or not these concepts had already been created within the coding frame.²³⁰ If they had been, the concept was subsumed under the respective sub-category. If they had not been, a new sub-category was created and linked to the relevant main category. The same process was followed in the identification of themes from categories and sub-categories.

3.4.4.2 Data saturation

Qualitative studies focus more on the richness and quality of data as opposed to the number of participants.²⁴⁴ Theoretical data saturation in qualitative research has been described as the point in time when a researcher determines that additional interviews will no longer reveal

fresh insights.²⁴⁵ Data saturation has also been described as the point where no new information is gained.¹⁰⁷

Interview data were viewed in terms of its richness and thickness, where richness referred to quality and thickness to quantity. The challenge was to obtain adequate amounts of both. The requirements for data saturation summarised by Fusch and Ness were used to guide the process of determining data saturation.²⁴⁶ The number of interviews conducted and the range of interviewee characteristics were indicative of enough information having been gathered to replicate the study. The depth and richness of the data from the interviews and the ongoing coding meant that as new codes became less and less prevalent, the ability to obtain new additional information had been realised, and there was no longer feasibility for additional coding.²⁴⁶

The number of interviews required to reach data saturation has been referred to as one that cannot be quantified, but rather that researcher's take what they can get.²⁴⁷ The apparent paucity of methodological guidance related to saturation was addressed by Hennink, Kaiser and Marconi, who described code saturation versus meaning saturation in the determination of interview saturation.²⁴⁴ Guest, Bunce and Johnson used data from a West African study to document the progression of theme development. Their conclusion was that saturation of themes was achieved after 12 interviews.²⁴⁸ This was used as a departure point to suggest that a potential 'saturation number' may be in the region of 12 interviews. Both prehospital and emergency centre interview numbers exceeded this suggested base of 12 as a minimum and further took the data and its analysis into account when deciding that data saturation had been adequately reached after 15 interviews from each sample.

3.4.4.3 Trustworthiness

It is essential to evaluate the quality of research to ensure that the results are indeed what they present themselves to be. Qualitative research has frequently been criticised as lacking in scientific rigour.²⁴⁹ Other criticisms have included poor justification of methods, lack of transparency in analytical procedures, and that the findings may merely be a collection of opinions subject to the researcher's bias.²⁴⁹ Despite many of the criticisms directed at qualitative research, the findings that are generated are increasingly being acknowledged as important.²⁵⁰ The terms 'reliability' and 'validity' are often confined to use in quantitative research; in light of this, Guba suggested four criteria that should be considered in qualitative research to ensure trustworthiness.²⁵¹ These criteria are deemed important in ensuring that a study is trustworthy. Ensuring trustworthiness of the data emerging from the interviews

involved addressing criteria related to credibility, transferability, dependability and confirmability.²⁵¹ Each of these criteria was addressed using strategies or actions that were aimed at contributing to improved trustworthiness.

3.4.4.4 Credibility

Credibility refers to the establishment that the results of qualitative research are credible or believable from the perspective of the participants in the research to convincingly rule out alternative explanations.²¹⁶ Credibility seeks to ensure that what is being measured is indeed what was intended.²⁵¹ Credibility has also been referred to as “capturing and portraying a truly insider perspective”.²⁵² Conducting interviews with a range of qualifications from both the PECP and ECP meant that a holistic perspective was captured and portrayed. The inclusion of all data from interviews ensured that the full interviewee perspective was explored in a manner that was able to rule out significant alternate explanations. The fact that the interview questions were generated from a previous round of data gathering, analysis and interpretation, meant that what the interviews measured was indeed what was intended to be measured.

3.4.4.5 Transferability or truth value

Transferability seeks to address the extent to which the findings of a study are applicable to other situations.^{241,249,251,253} Within the qualitative framework, the findings are usually specific to a small number of individuals or specific environments. The truth value recognises that multiple realities exist.²⁴⁹ In the context of this study, handover within the emergency centre was recognised as a reasonably generic process, which therefore had transferability to many other emergency centres where handovers occur. The detailed descriptions provided in this thesis related to the manner in which each phase of the relevant data collection, analysis and interpretation were carried out, address many of the aspects related to transferability.

The thick and rich descriptions of the emergency centre handover enable readers to adequately understand the research processes and conclusions.²⁵⁴ This, in turn, enables the reader to compare and understand the research and the findings described in the report with their own emergent experiences. The aspirant researcher who wishes to undertake a similar study would be able to replicate this study by following the detailed descriptions provided in this thesis.

3.4.4.6 Dependability

Dependability is related to the stability of the research findings over time.²⁵⁴ Several strategies were incorporated to improve dependability within this thesis. Code-recode strategies involved a process of recoding the data. An initial coding was carried out, and the data were then reviewed after a gestation period and new codes generated. The results of the code-recode were compared for congruency. This strategy is also termed 'code agreement'.²⁵⁴ Data were coded on more than one occasion for all sets of interview data. This was done due to the timelines associated with data collection as well as the fact that both sets of interviews needed to be compared.

PECP interviews were read and reread, analysed and coded. Transcripts were then listened to again and codes revised to ensure that these were indeed the correct codes. The same process was followed for the ECP interviews. Prior to the combined analysis of the codes, all interviews from each sample population were relistened to and codes checked for congruency.

3.4.4.7 Confirmability

Confirmability relates to the researcher's ability to show that the data from the research project are representative of the participants' responses and not of the researcher's biases or viewpoints.²⁵³ This has been achieved by carefully describing all processes relating to how interpretations and conclusions were arrived at. In addition, the qualitative descriptive methodology used in this thesis lent itself not so much to the interpretation of my perceived meaning but rather to presenting participant responses as they were. Descriptions of processes linked the findings directly with the data and used rich, thick quotes from participants to depict and expound upon codes, categories and themes. These concepts and data analysis are explained in detail elsewhere in the relevant section of this thesis ([3.4.4.1 Qualitative data analysis](#)).

3.4.4.8 Authenticity

Authenticity relates to the ability and extent to which the emotions and feelings related to the participants' experiences are expressed in a faithful manner.²⁵³ Use of a qualitative descriptive approach to generate thick and rich verbatim quotes from participants demonstrated the emotions and feelings of the participants in their own words. The thickness and richness of the quotes used further added to the authenticity of the interpretation of the participants' experiences.

3.5 Conclusion

The design and methodology followed in this thesis were explored and explained in this chapter. The sequential explanatory approach used in this thesis provided a more comprehensive understanding of the problem than may have been the case should a single methodology have been used. Quantitative data were analysed to produce a ranking list of handover variable importance, and information on certain aspects of emergency centre handover. Responses from open-ended questions were used to generate the interview guides for the PECP and the ECP. The qualitative data were collected using face-to-face, semi-structured interviews. Qualitative data were coded, analysed and interpreted using a qualitative descriptive strategy. The following chapter presents the data analysis and interpretation described in this chapter.

CHAPTER 4: RESULTS

4.1 Introduction

Chapter Three provided information related to the sequential explanatory mixed-methods design and methodology used in the study. This chapter presents the results obtained from Study One and Study Two. The data collected from the paper-based questionnaires in Study One were analysed and interpreted. This was done separately for the PECP and ECP. Open-ended questions were coded, analysed and interpreted to guide the formulation of questions for the semi-structured, face-to-face interviews. The data from Study Two were sourced from the semi-structured, face-to-face interviews, which were recorded, transcribed, coded, analysed and interpreted.

The results of the study provided information about handover practice within the two study samples. Despite potential differences in the two samples, emergency centre handover is a process that is shared. Reporting of the data took cognisance of this, and data are reported in two sections:

- Prehospital emergency care personnel (PECP), and
- Emergency centre personnel (ECP).

4.2 Prehospital emergency care personnel: Study One - Quantitative

A total of 175 completed questionnaires were collected from 75 (43%) BAA, 49 (28%) ANA, 15 (9%) ECT, 16 (9%) ANT and 20 (11%) ECP respondents. The data collection process is described in [3.3.6.1 Prehospital emergency care personnel data collection](#). The total number of questionnaires distributed in the state-funded emergency service was 210. Within the private emergency services, ten questionnaires were distributed at each of the four bases within each of the two services surveyed, presenting a total of 80 questionnaires (10 x 4 x 2=80). The response rate was 175/290, or 62%.

4.2.1 Demographics

4.2.1.1 Years of experience

Eighty-seven (60%) PECP respondents had between five and 15 years of experience, 51 (35%) had between five- and ten-years' experience, and 36 (25%) had between ten and 15 years of experience in the emergency services. Twenty-five (17%) PECP respondents had more than 15 years of experience. Years of PECP respondent experience are depicted in Table 4-1.

Table 4-1: Prehospital emergency care personnel experience in the emergency services

HPCSA register	< 5 years n= (%)	5 to 10 years n= (%)	10 to 15 years n= (%)	> 15 years n= (%)	Median (IQR) ^a
BAA	20 (38%)	24 (46%)	6 (12%)	2 (4%)	6 (6)
ANA	4 (9%)	11 (25%)	17 (39%)	12 (27%)	13 (8)
ECT	3 (21%)	5 (36%)	4 (29%)	2 (14%)	10 (7.25)
ANT	1 (6%)	5 (31%)	4 (25%)	6 (38%)	14.5
ECP	4 (22%)	6 (33%)	5 (28%)	3 (17%)	6.5 (7)
Total	32 (22%)	51 (35%)	36 (25%)	25 (17%)	

^a IQR= Interquartile range: calculated as the difference between 75th and 25th percentiles

4.2.1.2 Years with current qualification

One hundred and eighteen PECP respondents (81%) had less than ten years of experience at their current qualification, with 63 (43%) having less than five, and 55 (38%) between five and ten years of experience at their current qualification. One ECP respondent indicated that they had been qualified for 18 years at the ECP level; this is not possible as the qualification did not exist 18 years prior to the start of data collection. There was one emergency care technician (ECT) respondent who indicated that he had been qualified at the ECT level for 15 years, which is also not possible for the same reason. Both were removed from the relevant dataset. Table 4-2 depicts the years of experience at the current qualification level.

Table 4-2: Prehospital emergency care provider years at current qualification

HPCSA register	< 5 years n= (%)	5 to 10 years n= (%)	10 to 15 years n= (%)	> 15 years n= (%)	Median (IQR) ^a
BAA	15 (24%)	35 (56%)	9 (15%)	3 (5%)	7.5 (5.0)
ANA	10 (20%)	15 (31%)	5 (10%)	8 (16%)	9 (8.5)
ECT	11 (85%)	2 (15%)	0 (0%)	0 (0%)	4 (0.0)
ANT	11 (73%)	2 (13%)	2 (13%)	0 (0%)	3 (2.5)
ECP	16 (89%)	1 (6%)	1 (6%)	0 (0%)	1 (1.0)
Total	63 (43%)	55 (38%)	17 (12%)	11 (8%)	

^a IQR= Interquartile range: calculated as the difference between 75th and 25th percentiles

4.2.2 Handover questionnaire data analysis

4.2.2.1 Levels of importance of handover variables

Using the method described in Chapter Three ([3.3.7.1 Questionnaire: Section A- Analysis of Likert-type questions](#)), handover information variables were classified from most to least important. Table 4-3 depicts the importance ranking of handover information variables for the PECP population sampled. Since rankings were based on percentage, percentages have been used as the initial value depicted in the table.

Table 4-3: Importance of handover information variables ranked from most to least important

Rank	Information variable	Critically important % (n=)	Important % (n=)	Somewhat important % (n=)	Unimportant % (n=)
1	Blood Pressure	73% (127)	26% (45)	1% (2)	0% (0)
2	Type of major injuries	68% (114)	29% (49)	1% (2)	1% (2)
3	Anatomical location of major injuries	64% (103)	32% (51)	4% (7)	0% (0)
4	Vital signs	64% (37)	36% (21)	0% (0)	0% (0)
5	Pulse rate	64% (111)	33% (57)	2% (4)	1% (1)
6	Respiration Rate	63% (109)	34% (60)	3% (5)	0% (0)
7	History	63% (34)	31% (17)	6% (3)	0% (0)
8	Glasgow Coma Score	59% (99)	36% (61)	5% (8)	0% (0)
9	Injuries sustained	58% (33)	40% (23)	0% (0)	2% (1)
10	Patient priority	55% (42)	41% (31)	4% (3)	0% (0)
11	SpO ₂ (Oxygen saturation) ^a	51% (87)	43% (73)	4% (7)	2% (3)
12	Allergies	51% (88)	44% (75)	3% (6)	2% (3)

Rank	Information variable	Critically important % (n=)	Important % (n=)	Somewhat important % (n=)	Unimportant % (n=)
13	Mechanism of Injury/ Nature of Illness	49% (50)	43% (44)	8% (8)	1% (1)
14	Hypotensive episode prehospital	48% (77)	44% (72)	5% (8)	3% (5)
15	ECG ^b analysis	43% (71)	45% (74)	8% (13)	4% (7)
16	Medications	42% (71)	51% (87)	5% (9)	1% (2)
17	Time since incident	41% (68)	48% (78)	9% (14)	2% (4)
18	Death of an occupant in the same compartment	40% (62)	42% (64)	12% (18)	6% (10)
19	Restrained / Unrestrained	36% (60)	50% (82)	10% (16)	4% (7)
20	End tidal CO ₂ ^c	36% (55)	44% (68)	14% (22)	6% (9)
21	Past Medical History	36% (62)	56% (96)	6% (10)	1% (2)
22	Patient Mobility	35% (58)	47% (77)	15% (25)	2% (4)
23	Capillary Refill	32% (56)	47% (81)	19% (33)	2% (3)
24	Past Surgical History	32% (52)	52% (85)	13% (22)	3% (5)
25	Approximate impact speed	31% (51)	49% (81)	18% (30)	2% (4)
26	Airbag deployment	29% (46)	52% (83)	16% (25)	4% (7)
27	Damage to car / Intrusion	29% (49)	43% (73)	20% (33)	8% (14)
28	Temperature	27% (46)	50% (86)	21% (36)	2% (3)
29	Demographics	25% (11)	43% (19)	23% (10)	9% (4)
30	TEWS ^d Score	21% (30)	47% (66)	16% (23)	15% (21)
31	Age	21% (35)	56% (94)	20% (34)	3% (5)
32	Last meal/drink consumption	19% (22)	50% (58)	26% (30)	4% (5)
33	Gender	14% (22)	47% (75)	30% (48)	9% (15)

^a SpO₂= Blood oxygen saturations measured with a non-invasive pulse oximeter, ^b ECG= Electrocardiograph, ^c CO₂= Carbon dioxide, ^d TEWS = Triage Early Warning Score

4.2.2.2 Opinion on quality of handover observed in the emergency centre

Eighty-two (47%) PCEP respondents indicated that the general quality of the emergency centre handovers that they observed were average. Thirty-one (17%) respondents indicated that the quality of observed handovers was above average or excellent, and 60 (34%) shared that handover quality was below average or poor. The results are depicted in Table 4-4.

Table 4-4: What do you think the general quality is of the handovers that you observe within the emergency centre environment?

HPCSA register	No response n= (%)	Poor n= (%)	Below average n= (%)	Average n= (%)	Above average n= (%)	Excellent n= (%)
BAA	2 (3%)	4 (5%)	8 (11%)	33 (44%)	10 (13%)	18 (24%)
ANA	0 (0%)	7 (14%)	14 (29%)	26 (53%)	1 (2%)	1 (2%)
ECT	0 (0%)	4 (27%)	4 (27%)	6 (40%)	0 (0%)	1 (7%)
ANT	0 (0%)	4 (25%)	2 (13%)	10 (63%)	0 (0%)	0 (0%)
ECP	0 (0%)	7 (35%)	6 (30%)	7 (35%)	0 (0%)	0 (0%)
Total	2 (1%)	26 (15%)	34 (19%)	82 (47%)	11 (6%)	20 (11%)

4.2.2.3 Opinion on the quality of own handover

One hundred and thirty-one (76%) PECP respondents indicated that their own handovers were accurate and provided relevant information often or always. Forty-one (24%) PECP respondents indicated that their own handovers were rarely or sometimes accurate and provided relevant information about the patient. The results are depicted in Table 4-5.

Table 4-5: How often do you think that handovers that you perform are accurate and provide relevant information about the patient?

HPCSA register	No response n= (%)	Never n= (%)	Rarely n= (%)	Sometimes n= (%)	Often n= (%)	Always n= (%)
BAA	0 (0%)	0 (0%)	2 (3%)	22 (29%)	22 (29%)	29 (39%)
ANA	1 (2%)	0 (0%)	0 (0%)	9 (18%)	27 (55%)	12 (24%)
ECT	0 (0%)	0 (0%)	0 (0%)	6 (40%)	9 (60%)	0 (0%)
ANT	0 (0%)	0 (0%)	0 (0%)	1 (6%)	6 (38%)	9 (56%)
ECP	0 (0%)	0 (0%)	1 (5%)	0 (0%)	13 (65%)	6 (30%)
Total	1 (1%)	0 (0%)	3 (2%)	38 (22%)	77 (44%)	56 (32%)

4.2.2.4 Opinion on the length of own handover

One hundred and one (58%) PECP respondents indicated that their handovers were of appropriate length. Thirty-nine (22%) respondents indicated that their handovers were too

short, and 32 (18%) indicated that their handovers were too long. The results are depicted in Table 4-6.

Table 4-6: Do you think that your handovers are generally:

HPCSA register	No response n= (%)	Too short n= (%)	Of	
			appropriate length n= (%)	Too long n= (%)
BAA	2 (3%)	21 (28%)	40 (53%)	12 (16%)
ANA	1 (2%)	12 (24%)	31 (63%)	5 (10%)
ECT	0 (0%)	3 (20%)	7 (47%)	5 (33%)
ANT	0 (0%)	1 (6%)	12 (75%)	3 (19%)
ECP	0 (0%)	2 (10%)	11 (55%)	7 (35%)
Total	3 (2%)	39 (22%)	101 (58%)	32 (18%)

4.2.2.5 Opinions on use of mnemonics to ensure handovers are comprehensive

Ninety-three (53%) PECP respondents agreed or strongly agreed that using a mnemonic was an appropriate method of ensuring that all important information was handed over. Nineteen (11%) PECP respondents did not agree that using a mnemonic was an appropriate method of ensuring that all important information was handed over. The results are depicted in Table 4-7.

Table 4-7: Handing over using a mnemonic (DeMIST, SBAR, SOAP) is the best way to ensure that all the important information is handed over

HPCSA register	No response n= (%)	Strongly Disagree n= (%)	Disagree n= (%)	Unsure n= (%)	Agree n= (%)	Strongly Agree n= (%)
BAA	6 (8%)	2 (3%)	5 (7%)	32 (43%)	19 (25%)	11 (15%)
ANA	3 (6%)	2 (4%)	3 (6%)	14 (29%)	21 (43%)	6 (12%)
ECT	0 (0%)	0 (0%)	1 (7%)	5 (33%)	6 (40%)	3 (20%)
ANT	0 (0%)	0 (0%)	0 (0%)	2 (13%)	10 (63%)	4 (25%)
ECP	0 (0%)	0 (0%)	6 (30%)	1 (5%)	12 (60%)	1 (5%)
Total	9 (5%)	4 (2%)	15 (9%)	54 (31%)	68 (39%)	25 (14%)

4.2.2.6 Familiarity with commonly used handover mnemonics

The MIST mnemonic was familiar to and used by 81 (46%) PECP respondents, followed by the DeMIST mnemonic which was familiar to and used by 37 (21%) PECT respondents. Ninety-seven (55%) respondents had never heard of SOAP, 117 (67%) had never heard of SBAR, 124 (71%) had never heard of CUBAN, and 129 (74%) had never heard of ASHICE. The PECP respondents' familiarity with commonly used mnemonics is depicted in Table 4-8.

Table 4-8: Please indicate by making a cross which of the following handover mnemonics you are familiar with

Mnemonic	No response n= (%)	Have never heard of it n= (%)	Unfamiliar, but have heard of it n= (%)	Familiar and use it myself when I hand over n= (%)
DeMIST	21 (12%)	83 (47%)	34 (19%)	37 (21%)
SOAP	23 (13%)	97 (55%)	34 (19%)	21 (12%)
SBAR	24 (14%)	117 (67%)	26 (15%)	8 (5%)
CUBAN	24 (14%)	124 (71%)	23 (13%)	4 (2%)
ASHICE	25 (14%)	129 (74%)	15 (9%)	6 (3%)
MIST	12 (7%)	49 (28%)	33 (19%)	81 (46%)

4.2.2.7 Exposure to formal handover training

Eighty-four (48%) PECP respondents had been exposed to formal handover training, and 89 (51%) had not had any exposure to formalised handover training. The results are depicted in Table 4-9.

Table 4-9: Have you ever received formal training on how to hand over?

HPCSA register	No response n= (%)	No n= (%)	Yes n= (%)
BAA	1 (1%)	43 (57%)	31 (41%)
ANA	1 (2%)	19 (39%)	29 (59%)
ECT	0 (0%)	8 (53%)	7 (47%)
ANT	0 (0%)	8 (50%)	8 (50%)
ECP	0 (0%)	11 (55%)	9 (45%)
Total	2 (1%)	89 (51%)	84 (48%)

4.2.2.8 Opinion on the effect of emergency centre qualification on handover reception

Eighty-two (47%) PECP respondents indicated that the qualification of the ECP receiving the handover had a significant effect on how the handover was received. Fifty-six (32%) PECP respondents indicated that qualification had some effect on how well handover was received, and 26 (15%) PECP respondents indicated that qualification had little to no effect on how well handovers were received. The results are depicted in Table 4-10. PECP respondents were requested to clarify their response in an open-ended question, the results of which are depicted in Section 4.2.2.9.

Table 4-10: To what extent do you think that qualification of the EC staff that you hand over to has a direct effect on how well they receive your handover?

HPCSA register	No response n= (%)	No effect n= (%)	Small effect n= (%)	Some effect n= (%)	Significant effect n= (%)
BAA	8 (11%)	6 (8%)	10 (13%)	23 (31%)	28 (37%)
ANA	2 (4%)	3 (6%)	1 (2%)	24 (49%)	19 (39%)
ECT	0 (0%)	1 (7%)	2 (13%)	2 (13%)	10 (67%)
ANT	1 (6%)	0 (0%)	1 (6%)	1 (6%)	13 (81%)
ECP	0 (0%)	0 (0%)	2 (10%)	6 (30%)	12 (60%)
Total	11 (6%)	10 (6%)	16 (9%)	56 (32%)	82 (47%)

4.2.2.9 The extent to which emergency centre personnel qualification had an effect on how well they received handover

PEPC respondents were asked to motivate their responses in Table 4-10. The dominant theme was that higher qualification was associated with better attentiveness and quality of handover reception. There were four categories identified under the dominant theme; higher qualification was associated with better attentiveness, PECP preferred handing over to a doctor, lower qualifications were sometimes unable to contextualise the handover content, attentiveness varied, and reception by ECP of prehospital handover was generally poor. The categories and related quotes are depicted in Table 4-11.

Table 4-11: Categories related to the effect that qualification had on emergency centre personnel reception of prehospital emergency care handover

Category	Respondent quotes
Higher qualification associated with better attentiveness	<ul style="list-style-type: none"> • “EC staff with higher qualifications tend to listen more intently as they know how important pre-hospital circumstances and conditions as well as patient treatment and priority are. They are more receptive to a good handover.” • “I have noticed that junior nursing staff are prone to disregarding handovers while senior nurses will take more time and pay more attention.” • “In general the lower qualified the receiving health care worker is the less interested they are in a full handover.”
Preference for handing over to a doctor	<ul style="list-style-type: none"> • “Handing over to the receiving doctor is best they give the impression of attaching more importance to information and will ask for more” • “...is better when the doctor has to take hand over” • “Handing over to a doctor is better for the patient and also you only handover once!!”
Lower qualifications unable to contextualise handover content	<ul style="list-style-type: none"> • “The lower qualifications don’t always understand, the critical aspects and information given to them.” • “If the EC has a lower qualification as the handing over personnel then there is a greater chance of the handover turning into a case of broken telephone due to the receiving staff member not understanding the injuries or illnesses of the patient which has a ripple effect when receiving personal handover.” • “...handing over to someone lower qualified than you he/she does not understand the importance of giving certain information.”
Attentiveness by emergency centre staff to prehospital handover was generally poor	<ul style="list-style-type: none"> • “Some do listen to you when doing handover and prompt other information that you might have omitted, but others just show the face of not interested in your handover.” • “Some do listen to handover some do not.” • “Some staff ... generally disregard your handover, regardless of the quality thereof.” • “When you handover sometimes you see the doctor is not interested with your handover. They sometimes look down on

Category	Respondent quotes
	<p>EMT's "Some staff ... generally disregard your handover, regardless of the quality thereof."</p> <ul style="list-style-type: none"> • "Some do listen to you when doing handover and prompt other information that you might have omitted, but others just show the face of not interested in your handover." • "Some EC staff just look at you, like you don't mean nothing and some don't even want to hear anything you say, they are just not interested in your handover."

A theme was identified (not linked to the original question) that tried to link qualification to quality of handover reception. It was determined that there was a general lack of acknowledgement of the value of PECP. This was supported by two categories; ECP having a generally poor perception of PECP, and a blasé attitude towards prehospital handovers. Relevant categories and quotes are depicted in Table 4-12.

Table 4-12: Emergency centre staff project a poor perception of prehospital emergency care personnel

Category	Respondent quotes
Emergency centre staff have a generally poor perception of prehospital emergency care personnel	<ul style="list-style-type: none"> • "They sometimes look down on EMT's." • "They do not see emergency operational staff as a recognized qualification to be competent enough to treat patient fortunately not all casually staff but must hospitals have the same mentality." • "They still take us as Ambulance drivers so to say." • "Some EC staff just look at you, like you don't mean nothing and some don't even want to hear anything you say, they are just not interested in your handover."
ECP have a generally blasé attitude towards prehospital handovers	<ul style="list-style-type: none"> • "... because sometimes you give them the handover you find that they are not concentrating to you, or sometimes neglect you..." • "Some staff they don't even care when you handover." • "Some doctors don't even give you a chance to get done with a hand-over they just stop and sign." • "Some they don't care." • "Sometimes they do not give you their all undivided attention."

Category	Respondent quotes
	<ul style="list-style-type: none"> • “... they never want listen but just copy / refer to your information without even bothering to ask why you have performed such procedure.”

4.2.3 Prehospital emergency care personnel open-ended responses

The analysis and coding of responses to open-ended questions was carried out as described in the methods section ([3.3.7.2. Questionnaire: Section B- Analysis of open-ended questions](#)).

4.2.3.1 The factors that prehospital emergency care providers felt contributed to their own handovers being good

Respondents were asked to list five things that they thought made their own handovers ‘good’. Data were coded, categorised, analysed and interpreted as described in the relevant section ([3.3.7.2. Questionnaire: Section B- Analysis of open-ended questions](#)). There were three themes identified that respondents felt contributed to good handover, namely the handover process, handover communication factors, and handover content. Each of these had several categories, as summarised in Table 4-13. Categories and quotes are depicted in Table 4-14 and Table 4-15.

Table 4-13: Contributors to effective handover identified by prehospital emergency care personnel

Dominant theme	Categories
Handover process factors	• Concise
	• Mnemonic use
	• Self-introduction
	• Structure
Handover communication factors	• Appropriate language
	• Clear talking and adequate volume
	• Confident
	• Adequate eye contact
	• Friendly and professional
Handover content	• Two-way communication
	• Vital signs

Dominant theme	Categories
	<ul style="list-style-type: none"> • Signs and symptoms • Treatment or interventions performed • Patient response to treatment • Medical history • Chief complaint or findings • Demographics • Mechanism of injury or Nature of illness

4.2.3.1.1 Process factors as contributors to good deliverer handover

Process factors that respondents considered as contributing to their own handovers being good included the conciseness of the handover, the use of mnemonics, self-introduction and the structure of the handover. The categories and related quotes are depicted in Table 4-14.

Table 4-14: Process factors contributing to good handover

Category	Respondent quotes
Concise	<ul style="list-style-type: none"> • “Clear and concise, to the point” • “It is stated clear and concise to other practitioners.” • “I keep it short and to the point...”
Mnemonic use	<ul style="list-style-type: none"> • “Using the correct mnemonics” • “Using the mnemonic demist and mist”
Self-introduction	<ul style="list-style-type: none"> • “Introduce yourself and level of qualifications” • “Introduce myself and qualification” • “Introduce myself then my patient” • “Greeting or introduction (myself and patient) to the receiving practitioner”
Structure	<ul style="list-style-type: none"> • “They are clearly structured” • “Structured delivery of information” • “I try to structure my handover in a manner that follows a logical sequence”

4.2.3.1.2 Communication factors as contributors to good deliverer handover

Communication factors that respondents considered as contributing to their own handovers being good included the use of appropriate language, clear talking and adequate volume, the use of adequate eye contact, being friendly and professional, and taking cognisance of the two-way nature of communication. The categories and related quotes are depicted in Table 4-15.

Table 4-15: Communication factors contributing to good handover

Category	Respondent quotes
Appropriate language	<ul style="list-style-type: none"> • “Using proper medical terminology” • “Use of appropriate medical terms” • “Proper use of language... use simple terms” • “Not using terms such as ‘round about’ or ‘more of less’.” • “Not over ‘Jargony’”
Clear talking and adequate volume	<ul style="list-style-type: none"> • “Speak loud and clearly” • “I speak loud enough and at a reasonable pace” • “...clear pronunciation.” • “Clear speech and well-rehearsed”
Adequate eye contact	<ul style="list-style-type: none"> • “...make eye contact with whomever would be taking a handover” • “Look the person you handover to in the eye.” • “...ensure casually good eye contact”
Friendly and professional	<ul style="list-style-type: none"> • “Friendly with hospital staff” • “Be polite, friendly, smile...” • “No joking around, I am professional during handover”
Two-way communication	<ul style="list-style-type: none"> • “I look for non-verbal clues from [emergency centre] staff” • “Make sure the person you hand over to is paying attention” • “Make sure that I get this person's undivided attention when handing over to him/her”

4.2.3.1.3 Content factors as contributors to good deliverer handover

Content factors that respondents considered as contributing to their own handovers being good included the inclusion of patients’ vital signs, signs and symptoms, treatment and interventions, patient response to treatment, patients’ medical history, the chief complaint or

findings, patients' demographics, and mechanism of injury or nature of illness. The categories and related quotes are depicted in Table 4-16.

Table 4-16: Handover content factors contributing to good handover

Category	Respondent quotes
Vital signs	<ul style="list-style-type: none"> • “Full set of vital signs” • “Provide baseline vitals and last taken vitals” • “Give all sets of vital signs.”
Signs and symptoms	<ul style="list-style-type: none"> • “Signs and symptoms that the patient presents with” • “Signs and symptoms you have found” • “Explaining the signs and symptoms.”
Treatment or interventions performed	<ul style="list-style-type: none"> • “Focus on prehospital treatments already performed” • “...how we intervened, how the patient reacted to the interventions and how the patient presents currently.” • “Proper investigation, observation and treatment of patient during pre-hospital treatment. State any drug administered.”
Patient response to treatment	<ul style="list-style-type: none"> • “Changes about the patient each and every five minutes” • “Reaction of patient along the way” • “How the patient responded to the treatment given.” • “Treatment given and how patient reacted to treatment”
Medical history	<ul style="list-style-type: none"> • “Past and present history” • “Explain about [SAMPLE] history” • “Give a detailed history of the patient”
Chief complaint or findings	<ul style="list-style-type: none"> • “Start handover with chief complaint to draw their attention.” • “Major patient complaints or concerns” • “Nature of complaints of patients”
Demographics	<ul style="list-style-type: none"> • “Tell doctor name and age of patient” • “Name of the patient, age, gender” • “Mention patient's name and age.”
Mechanism of injury or Nature of illness	<ul style="list-style-type: none"> • “Focus on detailed mechanism of injury” • “I look at the mechanism/nature to determine what information is relevant” • “Mechanism of injury if it is trauma” • “Mechanism of injuries (nature of illness).”

4.2.3.2 The factors that prehospital emergency care personnel felt contributed to a negative handover experience in the emergency centre

Respondents were asked to briefly discuss some aspects that could make the act of handing a patient over a ‘bad’ experience for them when handing over in the emergency centre. Data were coded, categorised, analysed and interpreted as described in the relevant section ([3.3.7.2. Questionnaire: Section B- Analysis of open-ended questions](#)). There were two themes identified, namely communication barriers, and process barriers. Each of these had several categories as depicted in Table 4-17.

Table 4-17: Barriers to effective handover identified by prehospital emergency care personnel

Theme	Categories
Communication barriers	<ul style="list-style-type: none"> • Lack of interest from receiving ECP • Lack of knowledge by ECP related to prehospital qualifications and scopes of practice • Lack of respect or a bad attitude by ECP towards PECP • Lack of general understanding between prehospital and emergency centre staff due to qualification differences • Poor or negative body language by receiving ECP
Process barriers	<ul style="list-style-type: none"> • Appropriate emergency centre staff not available to hand over to • The emergency centre was an inherently busy and understaffed place • Receiving emergency centre staff were distracted during PECP handovers • PECP were interrupted during handover • PECP were required to repeat information or hand over multiple times • Emergency centre staff questioned PECP about the appropriateness of their patient management

4.2.3.2.1 *Communication factors identified by prehospital emergency care personnel as contributors to a bad experience when handing over in the emergency centre*

Communication factors identified by PECP as contributors to a bad experience when handing over in the emergency centre included a lack of interest from the receiving ECP, a lack of knowledge by ECP related to prehospital qualifications and scopes of practice; a lack of respect by ECP towards PECP; a lack of general understanding between prehospital and emergency centre staff due to qualification differences; and poor or negative body language by receiving ECP. The categories and related quotes are depicted in Table 4-18.

Table 4-18: Communication factors identified as contributors to a bad experience when handing over in the emergency centre

Category	Respondent quotes
Lack of interest from receiving ECP	<ul style="list-style-type: none"> • “Some of the nurses don't show any interest course their will just say carry on in listening no attention to a paramedic/patient.” • “It's when the person/s that receiving the patient seems not care of what I am first said, -or leaving the patient unattended after giving a handover.” • “Bad handovers for me happen when the staff handing over are in a rush just want go get it over with, when that happens patients loose (sic) out, shows that there is no pride or passion and to her bad handover is when a patient is handed by staff that does not know because has not ever worked with the patient.”
Lack of knowledge by ECP related to prehospital qualifications and scopes of practice	<ul style="list-style-type: none"> • “There are still medical personal who believe that the emergency care practitioners are ambulance drivers not skilled in patient treatment.” • “Not knowing protocols.” • “Uneducated staff that don't know the capabilities of EMS provider.” • “They think we are ambulance drivers with no intellect.” • “When I am looked at as if I just drive an ambulance and disregarded before I even start handing over.” • “When they look down upon your qualification.”

Category	Respondent quotes
Lack of respect or a bad attitude by ECP towards prehospital emergency care personnel	<ul style="list-style-type: none"> • “It is when the other health practitioner or the EC disrespect you.” • “Negative reception on arrival, negative criticism.” • “Rude doctors who feel superior and glorified.” • “A bad experience for me is when you arrive at EC and are treated like rubbish before you have even spoken a word to anyone.” • “When I am looked at as if I just drive an ambulance and disregarded before I even start handing over.” • “Lack of professionalism of the receiving practitioner, disrespect.” • “I hate the attitude towards me when handing over patient.”
Lack of general understanding between prehospital and emergency centre staff due to qualification differences	<ul style="list-style-type: none"> • “When the staff at the ED are not trained and don't comprehend what I have just said.” • “Handing over to staff that are unqualified to interpret in a meaningful way the information you are providing” • “If I had to handover the pt to someone that is low (sic) qualified than me, it always makes things difficult for me and the patient because I will waste more time explaining each and everything that will delay treatment to the patient”
Poor or negative body language by receiving emergency centre personnel	<ul style="list-style-type: none"> • “When the person receiving the handover does not actively listen or make eye contact.” • “...lack of eye contact, dismissing body language.” • “Body language and tone, negative” • “When the person receiving the handover does not actively listen or make eye contact.” • “Poor body language”

4.2.3.2.2 Process factors identified by prehospital emergency care personnel as contributors to a bad experience when handing over in the emergency centre

Process factors identified by PECP as contributors to a bad experience when handing over in the emergency centre included that appropriate ECP were not available to hand over to; the emergency centre was an inherently busy and understaffed place; receiving ECP were distracted during handovers; PECP were interrupted during handover; PEPC were required

to repeat information or hand over multiple times; and emergency centre staff questioned PEPC about the appropriateness of their patient management. The categories and related quotes are depicted in Table 4-19.

Table 4-19: Process factors identified by prehospital emergency care personnel as contributors to a bad experience when handing over in the emergency centre

Category	Respondent quotes
Appropriate emergency centre staff not available to hand over to	<ul style="list-style-type: none"> • “No person for handover to.” • “If the ER is busy and you have to wait for handover plus then have to explain to the patient why he/she has to wait, incompetent staff!!” • “When arriving at hospital with a patient and told by a sister to go through, then all doctors stay away from you.” • “A doctor not present.” • “Bay units with no staff available or triage officers to late handover.” • “No doctor present at handover.”
The emergency centre was an inherently busy and understaffed place	<ul style="list-style-type: none"> • “Busy personnel that cannot give you undivided attention when handing over” • “When casualty / ED are too busy and staff can't listen.” • “Busy trauma centres which distract staff from listening to paramedics busy handing over.” • “We sometimes spend 3 hrs on hospitals only for handover of the patients because of the Doctor who is still busy attending to other critical patients.” • “Understaffed [emergency centres] resulting in waiting for someone to handover to.”
Receiving ECP were distracted during PECP handovers	<ul style="list-style-type: none"> • “When the staff get distracted” • “People talking while I handover” • “Busy personnel that cannot give you undivided attention when handing over” • “Handovers become of no use once the person that you are handing over to, walks away, turns his/her back on you,

Category	Respondent quotes
PECP were interrupted during handover	<p>starts talking to someone else before the handover is completed”</p> <ul style="list-style-type: none"> <li>• “... about the patient and say go get the file before you handover and I will sign your TPH and go back to your station.” <li>• “Handovers become of no use once the person that you are handing over to, walks away, turns his/her back on you, starts talking to someone else before the handover is completed.” <li>• “Being interrupted for information that you have already given.” <li>• “When I am interrupted by the individuals asking questions, especially if I am getting to it that I have already mentioned it).” <li>• “Practitioners that start assessing patients whilst you are still talking.”
PECP were required to repeat information or hand over multiple times	<ul style="list-style-type: none"> <li>• “Staff repeatedly ask same question, staff write down minor injuries such as lacerations but omit out the possibility of head injuries etc.” <li>• “... having to repeat yourself multiple times as well as when the nurse takes handover but doesn't communicate with her friend and have to repeat again.” <li>• “Repeating yourself more than 3 times.” <li>• “Multiple handovers (handovers to nursing staff, then to another doctor).” <li>• “Being requested to handover multiple times to multiple people.” <li>• “When ED staff change between or during a handover and you need to repeat.”
ECP questioned PECP about the appropriateness of their patient management	<ul style="list-style-type: none"> <li>• “One other thing is emergency centre personnel does not trust my treatment that acts as a bad experience.” <li>• “Being questioned about management and patient care that seems fit.” <li>• “Undermining your patient care, or abilities.”

Category	Respondent quotes
	<ul style="list-style-type: none"> • “... questions your treatment even when you have treated the patient perfectly.” • “Question my treatment before hearing the whole story.” • “In addition questioning interactions/clinic decision in front of the patients is in my opinion inappropriate.”

4.2.3.3 The factors that prehospital emergency care personnel identified as being potential contributors to improved emergency centre handover

Respondents were asked to provide suggestions related to what they believed could be done to improve the standard of handover within the emergency centre. Data were coded, categorised, analysed and interpreted as described in the relevant section ([3.3.7.2. Questionnaire: Section B- Analysis of open-ended questions](#)). There were four themes identified from the transcripts; the need for education and training, and three that were directly related to the aims of the project. These three themes were related to emergency centre handover content, the handover process and handover communication. The relevant themes and categories are depicted in Table 4-20.

Table 4-20: Themes and categories that prehospital emergency care personnel identified as being potential contributors to improved emergency centre handover

Theme	Categories
General need for handover training	<ul style="list-style-type: none"> • There was a general need for handover training • There was a need for more formalised handover training • Handover training could follow CPD or workshop-based training formats • Training programmes should involve both prehospital emergency care and ECP
Handover content	<ul style="list-style-type: none"> • There should be a standardised approach to handover between PECP and the emergency centre • Emergency centre staff should have a say in determining what PECP include in their handovers
Handover process	<ul style="list-style-type: none"> • There should be an appropriate or dedicated person available for handover delivery

Theme	Categories
Handover communication	<ul style="list-style-type: none"> • There should be an ongoing evaluation of handover practices
	<ul style="list-style-type: none"> • There was a need for improvement of interprofessional relationships
	<ul style="list-style-type: none"> • Communication should be bidirectional
	<ul style="list-style-type: none"> • Suggestions on how handover should be received by the ECP

4.2.3.3.1 Education and training factors identified by prehospital emergency care personnel as potential strategies to improve handover quality between prehospital emergency care and emergency centre personnel

The need for handover training was a theme that generated four categories. The first category related to education and training as a means of improving emergency centre handover. Identified categories included a general need for handover training; there was a need for more formalised handover training; handover training could follow CPD or workshop-based training formats; and that training programmes should involve both prehospital emergency care and ECP. The categories and related quotes are depicted in Table 4-21.

Table 4-21: Education and training factors identified by prehospital emergency care personnel as potential strategies to improve handover quality between prehospital emergency care and emergency centre personnel

Category	Respondent quotes
There was a general need for handover training	<ul style="list-style-type: none"> • “Give classes about patient handover help with practicing handover learn from the experienced EC worker.”
	<ul style="list-style-type: none"> • “Skill development needed daily training of the staff about handover.”
	<ul style="list-style-type: none"> • “I think people should be taught at a BAC level, the sequence of doing handover. They should be showed the importance of doing the handover to the hospital staff. I believe in educating people before criticizing them.”
	<ul style="list-style-type: none"> • “Firstly our EMS staff should be trained to handover properly though most have given up due to EC staff disregarding them.”

Category	Respondent quotes
	<ul style="list-style-type: none"> • “All courses should provide training on how handovers should be performed” • “Training, many pre-hospital staff do not know how to handover (nor do they care), training many help decrease apathy”
<p>There was a need for more formalised handover training</p>	<ul style="list-style-type: none"> • “I think they must have a formal training to teach all personnel.” • “Proper training on correct way and what vital information should be given on handover” • “We must have to do formal training concerning handing over so that every emergency care provider within the emergency will have confidence, and be sure that he/she handover the correct information about the patient” • “Formal training to EMC staff for proper handovers. Formal training to EC staff of how to receive a patient” • “Formal teaching of how to structure a handover (taking into consideration that this often requires clinical reasoning)” • “Formally train ED staff how to accept a handover”
<p>Handover training could follow CPD or workshop-based training formats</p>	<ul style="list-style-type: none"> • “Personnel needs to be refreshed on how to handover as it has been long qualified and things has been changing from HPCSA, protocol and treatment.” • “Have CPD lectures on relevant handovers or perhaps workshops on how to ask and obtain information on order to handover effectively” • “Educating the EC staff. Run some workshops. Run some road shows. Have some newsletters.”
<p>Training programmes should involve both prehospital emergency care and emergency centre personnel</p>	<ul style="list-style-type: none"> • “Inter-department training between the handing over and receiving staff” • “It will improve if all of the pre-hospital service and EC practitioner have joined workshops regularly known the type of work we are doing both of us.” • “First professional training should be given to all those who work within the department. Secondly the staff receiving the

Category	Respondent quotes
	<p>patient should also be taught how to receive and listen to handovers”</p> <ul style="list-style-type: none"> • “Formal training to be introduced for both EC and EMS members.” • “Training to all staff members even the nurses and doctors at hospitals.”

4.2.3.3.2 Content factors identified by prehospital emergency care personnel as potential strategies to improve handover quality between prehospital emergency care and emergency centre personnel

Two content factors were identified by PECP as potential strategies to improve handover quality between PECP and ECP; there should be a standardised approach to handover between PECP and the emergency centre, and emergency centre staff should have a say in determining what PECP include in their handovers. The categories and respondent quotes for the handover content theme are depicted in Table 4-22.

Table 4-22: Content factors identified by prehospital emergency care personnel as potential strategies to improve handover quality between prehospital emergency care and emergency centre personnel

Category	Respondent quotes
There should be a standardised approach to handover between PECP and the emergency centre	<ul style="list-style-type: none"> • “There should be a standard handover system which is understood by EMS staff and by emergency room staff for medical and trauma patients which should be circulated nationally and taught as a standard at all EMS colleges nationally.” • “As the HPCSA have pharmacological protocols, a standardized form of handover procedure should be taught to relevant professions / students. The protocol should be nationally standardized and be used as a guideline from which or to which relevant or irrelevant information can be left out or added during the handover”

	<ul style="list-style-type: none"> • “There should be a standardised approach / method for handing over a patient and ED staff need to listen and take the handover properly”
	<ul style="list-style-type: none"> • “Training of ‘paramedics’ as to how doctors in EC want handovers done, specific to local hospitals and all hospitals to conform to same standard private and government.”
ECP should have a say in determining what PECP include in their handovers	<ul style="list-style-type: none"> • “I think we should communicate [so that] us and the doctors have an understanding what they expect from us and what to give them” • “Information on what specific info the EC staff wanted to be handed over to them.” • “Unilateral standardisation of handover / information required by ED staff.”

4.2.3.3.3 Process factors identified by prehospital emergency care personnel as potential strategies to improve handover quality between prehospital emergency care and emergency centre personnel

Two process factors were identified by PECP as potential strategies to improve handover quality between PECP and ECP, namely that there should be an appropriate or dedicated person available for handover delivery, and there should be an ongoing evaluation of handover practices. The categories and respondent quotes for the handover process theme are depicted in Table 4-23.

Table 4-23: Process factors identified by prehospital emergency care personnel as potential strategies to improve handover quality between prehospital emergency care and emergency centre personnel

Category	Respondent quotes
There should be an appropriate or dedicated person available for handover delivery	<ul style="list-style-type: none"> • “Must be special a doctor to hand over to reserved only for EMS personnel.” • “There must always be someone who is ready to receive pt [<i>patient</i>], e.g. triage area” • “Dedicated appropriately qualified person available to handover to.” • “One member of the EC team must be allocated to receive a comprehensive handover without distractions”

Category	Respondent quotes
There should be an ongoing evaluation of handover practices	<ul style="list-style-type: none"> • “Subjecting handovers to critical review with feedback.” • “Monitoring the guys to see if they doing the right thing.” • “Regular assessments of staff in regards to handover.” • “Occasionally complete a survey / assessment of handovers in the departments.”

4.2.3.3.4 Communication factors identified by prehospital emergency care personnel as potential strategies to improve handover quality between prehospital emergency care and emergency centre personnel

Three communication factors were identified by PECP as potential strategies to improve handover quality between PECP and ECP. These included a need for improvement of interprofessional relationships, communication should be bidirectional, and there were suggestions on how handover should be received by the ECP. The categories and respondent quotes for the handover content theme are depicted in Table 4-24.

Table 4-24: Communication factors identified by prehospital emergency care personnel as potential strategies to improve handover quality between prehospital emergency care and emergency centre personnel

Category	Respondent quotes
There was a need for improvement of interprofessional relationships	<ul style="list-style-type: none"> • “Developing an atmosphere in which crews and facility staff work together not at cross purposes” • “We should be calm and try by all means that we listen to one another then things will go well” • “We should display our professionalism and change the perception that we are merely ‘ambulance drivers”” • “Incorporating to warm welcome on arrival at hospital, decent systems for both pre-hospital and EC staff to know how to handover a patient in a good manner also for us all to learn how to work together, respect each other, have manners and work as a team for the best interest of patients.” • “Good relationship kept between EC and pre-hospital.” • “Improvement of attitudes both trusted”

	<ul style="list-style-type: none"> • “Improved relationships between pre-hospital staff and ED staff.”
<p>Communication should be bidirectional</p>	<ul style="list-style-type: none"> • “The personnel whom the patient is handed over and the emergency care practitioner should be on the same page in terms of understanding each other” • “Better communication between pre-hospital care providers and EC staff as to what is expected from both parties during a handover.” • “There needs to be clear lines of communication between ED staff and pre-hospital staff” • “... that indicates what happens on both sides during a handover”
<p>Suggestions on how handover should be received by the emergency centre personnel</p>	<ul style="list-style-type: none"> • “Smile!!!” • “Some respect shown to EMS personnel and to listen to handover.” • “One person handover, it is easier to listen to one person. Multiple person handover can create confusion” • “Respect and practice patience.” • “Hospital willing to hear from the EMT care provider (Good communication).” • “Emergency Centre staff need to pay more attention to pre-hospital personnel with handover” • “... they must be patient with us” • “... listen and respect what the paramedic has to say and acknowledge each other that handover is complete” • “Proper listening, proper asking of relevant questions” • “Appropriate training and qualification of staff so that listen to you when speak” • “When individuals listen carefully” • “ED staff need to listen and take the handover properly.”

4.3 Prehospital emergency care personnel: Study Two - Qualitative

4.3.1 Demographics

A total of 15 face-to-face, semi-structured interviews were conducted. There were seven ECP-registered interviewees, three ANT-registered, one ECT-registered, three ANA-registered and

one BAA-registered interviewees. The HPCSA registration category and experience demographics of the interviewees are depicted in Table 4-25.

Table 4-25: Demographics of prehospital emergency care personnel interviewees

Interview number	Interviewee registration category	Years qualified at current qualification (years)	Total prehospital experience (years)	Interview length
ECP01	ECP	3	23	17 min 39 sec
ECP02	ECP	4	10	28 min 15 sec
ECP03	ECP	3	7	21 min 29 sec
ECP04	ECP	3	15	14 min 38 sec
ECP05	ECP	2	9	21min 54 sec
ECP06	ECP	5	19	21 min 43 sec
ECP07	ECP	2	6	15 min 36 sec
CCA01	ANT	25	35	15 min 38 sec
CCA02	ANT	7	25	18 min 06 sec
CCA03	ANT	2	9	26 min 30 sec
ECT01	ECT	5	18	25 min 30 sec
ANA01	ANA	11	15	11 min 41 sec
ANA02	ANA	26	28	13 min 39 sec
ANA03	ANA	1	4	16 min 05 sec
BAA01	BAA	5	4	14 min 46 sec

Interviews were conducted in a variety of locations determined by the interviewee’s availability. The transcripts for the prehospital interviews are available at the following link:

<https://www.dropbox.com/sh/fj8swfse6vxf98o/AABdaoKfDcJTfbLKIBUYoKDAa?dl=0>

The code report from Atlas.ti® is available at:

<https://www.dropbox.com/s/cljuzv5fgpemsb4/PREHOSPITAL%20CODES.doc?dl=0>

4.3.2 Themes, categories, codes and quotes from prehospital emergency care personnel interviews

Respondents were interviewed using the relevant interview protocol ([Appendix 9 Prehospital emergency care personnel interview protocol](#)). Data were coded, categorised, analysed and interpreted as described in the relevant section ([3.4.4.1 Qualitative data analysis](#)). Data were read both vertically and horizontally. Vertical reading involved reading an entire interview

transcription from top to bottom and reflecting on the interview in its entirety in a sequential manner.²³⁶ This allowed for better immersion into and contextualisation of the data and for the development of a better idea of what each interviewee's most pertinent issues were. Horizontal reading involved opening all transcripts in Atlas.ti® and reading across questions between interviews.²³⁶ This comprised reading the responses to a specific question from one interviewee and then moving to the following transcript and reading the same question's responses from a different interviewee.

Given that themes would be most likely to occur within specific question responses, horizontal reading and coding were the primary coding method employed. Where vertical reading identified codes related to other questions, these codes were assigned to the appropriate theme or category. A tabular document was used to keep track of coding by question in the interviews and those analysed under the question themes.

Codes were grouped into categories and further analysed to produce dominant themes. The dominant themes related directly to the aims of the study and categories were grouped under the themes, Content, Process and Communication. A further theme that was identified related to improvement strategies for emergency centre handover. The themes and categories are depicted in Table 4-26.

Table 4-26: Themes and categories related to prehospital emergency care personnel interview data

Theme	Sub-theme
Handover process	• Lack of appropriate staff available in the emergency centre for PECP to hand over to
	• Interruptions during PECP handover
	• PECP having to provide multiple handovers
	• Handing over directly to a doctor
	• The standardised approach
	• ECP questioning patient management during handover
Handover communication	• Lack of understanding of prehospital environment and associated challenges
	• Lack of knowledge related to prehospital qualifications and scope
	• Relationship between PECP and ECP

	<ul style="list-style-type: none"> • Respect • Disinterest in handover • Existing relationships affect handover • Pre-existing strained relationship • Attentiveness linked to qualification
Handover improvement	<ul style="list-style-type: none"> • Interprofessional collaboration as a means to improving the prehospital/emergency centre handover • Educating ECP about prehospital emergency care qualifications and scope • Interprofessional collaboration • The standardised handover as a possible solution

4.3.2.1 Theme One: Emergency centre handover process factors identified by prehospital emergency care personnel

The theme relating to handover process emerged from codes and categories that were associated with the process of patient handover within the emergency centre. Within the emergency centre handover process, seven sub-themes were identified as challenges to effective handover. Categories under each sub-theme were expounded upon using quotations from the interview transcripts. A summary of the categories and related sub-categories is depicted in Table 4-27.

Table 4-27: Sub-themes and categories related to prehospital emergency care personnel handover process

Sub-theme	Category
Lack of appropriate staff available in the emergency centre for PECP to hand over to	<ul style="list-style-type: none"> • Incidence of not having appropriate staff to hand over to • Interruptions during handover • Reasons for lack of appropriate staff being available to hand over to • Effects on prehospital emergency care provider when appropriate staff are not available
Interruptions during PECP handover	<ul style="list-style-type: none"> • Incidence of PECP being interrupted while handing over in the emergency centre

Sub-theme	Category
	<ul style="list-style-type: none"> • Reasons postulated for interruptions to PECP handovers • Effects on prehospital emergency care provider when their handovers are interrupted
PECP having to provide multiple handovers	<ul style="list-style-type: none"> • Reasons postulated for PECP having to provide multiple handovers • Effects on prehospital emergency care provider having to provide multiple handovers
Handing over directly to a doctor	<ul style="list-style-type: none"> • Reasons postulated for PECP preferring to hand over to a doctor • Sometimes handing over to a doctor is not preferable
The standardised approach	<ul style="list-style-type: none"> • Advantages of the standardised approach • Disadvantages of the standardised approach • Development of an emergency centre-specific handover
ECP questioning patient management during handover	<ul style="list-style-type: none"> • Emergency centre staff question patient management during handover
Inconsistent reception at emergency centres	<ul style="list-style-type: none"> • Differences between privately funded and public healthcare hospital reception of handover

4.3.2.1.1 *Lack of appropriate staff available in the emergency centre for prehospital emergency care personnel to hand over to*

The sub-theme of personnel unavailability in the emergency centre emerged as having a negative impact on the process of emergency centre handover. There were three categories identified that related to the unavailability of ECP; incidence, reasons and effects of the appropriate person not being available to handover to.

The incidence of the appropriate person being unavailable varied. Some interviewees merely agreed with the statement or did not provide context, while others provided some detail on how often they experienced not having the appropriate person to hand over to. The dominant

reasons postulated by interviewees for the lack of appropriate staff being available was the inherent busyness of the emergency centre, staff shortages and the high workloads of staff. The effects of not having appropriate staff to hand over to centred on having to hand over to an inappropriate or under-qualified emergency centre staff member. The respondent quotes associated with each category are depicted in Table 4-28.

Table 4-28: Lack of appropriate staff available in the emergency centre for prehospital emergency care personnel to hand over to: category quotes

Category	Respondent quotes
Incidence of not having appropriate staff to hand over to	<ul style="list-style-type: none"> • “About ninety percent of the time.” • “It happens regularly, often you'll get a sister or something when you prefer to handover to a doctor.” • “Yes, I usually get that most of the time...” • “I think it’s maybe on the resource of the health facility that you are handing over to...” • “Multiple times.” • “Probably more than eighty percent of the case I’m just, very often, you can say about eighty percent of the cases.” • “it happens a few times.”
Reasons for lack of appropriate staff being available to hand over to	<ul style="list-style-type: none"> • “Sometimes they’re busy in for example [deleted], busy at resus bay 1 or 2 and they can’t attend and then they’re just put in the cubicle, and we’ll attend to it now, but you can’t leave your patient, because then they will come back to you and... because it’s not the priority at this stage, according to them.” • “I think first of all it is just, they’re over-worked.” • “I think the system is understaffed, often and I use [deleted] as a good example. [deleted] there's one or two doctors and maybe three RN's, and they are inundated with all the other responsibilities particularly administrative and patient movement.” • “It’s probably lack of the doctors. It could be the fact that they’re busy with other patients and it could just be the system of that facility.”

Category	Respondent quotes
Effects on prehospital emergency care provider when appropriate staff are not available	<ul style="list-style-type: none"> • “... they usually send the lowest qualified person to do the triage and hand over and from the Government the State point of view the staff just don’t appear to be interested.” • “...you end up having to hand over to the next best thing so to speak.” • “... so then the lower qualified staff end up taking handovers from new patients because everybody else is actually busy.” • “Sometime then you can only get basically like the nurses or other qualified people that’s lower qualified than you, to do the handover.”

4.3.2.2.2 Interruptions during prehospital emergency care personnel handover

The category of interruptions during emergency centre handover emerged as having a negative impact on the process of emergency centre handover. Three themes were identified that related to interruptions in emergency centre handover, namely incidence, reasons, and effects of the appropriate person not being available to handover to.

The incidence of the appropriate person being unavailable varied. Some interviewees merely agreed with the statement or did not provide context, while others provided some detail on how often they experienced not having the appropriate person to hand over to. The dominant reasons postulated by interviewees for interruptions related to the emergency staff requesting additional information, or the fact that the initial handover was done to an inappropriate person, or that further details were requested. The effects of interruptions varied between feelings of frustration and irritation, to having to start the handover again, or even pre-empting the interruption and changing the format of their handovers. The quotes associated with each category are depicted in Table 4-29.

Table 4-29: Interruptions during prehospital emergency care personnel handover: category quotes

Category	Respondent quotes
Incidence of PECP being interrupted while handing over	<ul style="list-style-type: none"> • “Not a lot. It all depends where, which hospital you hand over to...”

Category	Respondent quotes
in the emergency centre	<ul style="list-style-type: none"> • “So, but most of the cases it’s not significant or a major thing.” • “I think that happens almost every time nowadays.” • “It happens all the time.” • “Repeatedly at the non-private facilities, the governmental facilities.” • “I feel like it happens quite often I wouldn't say all of the time but definitely often enough to be memorable.” • “Not that often but I would say, say for instance in a shift I would say six patients handover of those six patients about I would be interrupted about three out of the six.” • “It is common that you are interrupted.”
Reasons postulated for interruptions to PECP handovers	<ul style="list-style-type: none"> • “you are interrupted either because another patient becomes more serious than the one you are trying to hand over and that obviously you have to give way to.” • “... because you’re handing over to the lowest qualified person who’s doing a triage then you got to walk through and hand over to the nursing staff again and then the doctor inevitably comes and interrupts.” • “In terms of the interruptions it is because sometimes you are having a P2 in the hospital and the doctor come with a P1 priority patient maybe escorted by a helicopter then they only have to rush and they will have to leave you because of that situation.”
Effects on prehospital emergency care provider when their handovers are interrupted	<ul style="list-style-type: none"> • “... because you get irritated, so your handover becomes more, I suppose in the beginning you know you’re going to have to handover three times, so in the beginning you just say this is a really sick patient that needs to go here and then you keep the handovers very very brief and then when the doctor eventually arrives then you can give him a good history so ya I think the first person you see you often don’t give enough information to.” • “The other thing that I find that’s very frustrating is that when you at a crucial point of a handover and then the doctor

Category	Respondent quotes
	<p>starts giving instructions, but you haven't finished something so the instructions are premature. I actually had, had two patients die because of that during the handover phase where the doctor hasn't finished letting me finish handing over, has given an order that's been detrimental to the patient and in my attempt to try and intervene I've actually been thrown out of the casualty."</p> <ul style="list-style-type: none"> • "It makes me lose my train of thought so sometimes I have to start again from my sake, sometimes I see that they weren't paying attention or you know they lost that first bit so I started getting for their sake so it does affect it yes."

4.3.2.2.3 Prehospital emergency care personnel having to provide multiple handovers

The category of having to perform multiple handovers on the same patient emerged as having a negative impact on the process of emergency centre handover. The responses from interviewees were, in many cases, given in conjunction with that relating to handover interruptions. Two categories were identified relating to multiple handovers within the emergency centre, reasons postulated and effects of multiple handovers. The primary reason was that the initial handover was given to an inappropriate person and then had to be repeated when the appropriate person became involved. Repeating handovers was associated with changing information with each successive handover; sometimes more information was provided and other times less. Feelings of irritation or frustration were also linked to having to repeat handovers. The categories and related quotes are depicted in Table 4-30.

Table 4-30: Prehospital emergency care personnel having to provide multiple handovers: category quotes

Category	Respondent quotes
Reasons postulated for PCEP having to provide multiple handovers	<ul style="list-style-type: none"> • "And I often find myself handing over three or four times because of that first line person then you halfway through handing over and then the RN comes, and then the doctor comes and then, then, then... I find that hard." • "... because in the casualties the nurses are only available at first and then the doctors are on call and what happens is you end up handing over to the nurse first because they

Category	Respondent quotes
	<p>want to see where you put the patient and then they only call the doctor and you end up handing over twice because then the doctor arrives. So ya I think it's just because doctors aren't available."</p> <ul style="list-style-type: none"> • "... that will happen in a situation where you know the sister will want you to hand over so you hand over to the sister then based on that handover the sister realises okay wait we need to get a doctor involved then you hand over to that doctor then perhaps the head of the Unit comes in or a consultant comes in and they want to hear a handover from you as well so that's now three handovers that you've done."
Effects on prehospital emergency care provider having to provide multiple handovers	<ul style="list-style-type: none"> • "Well when I repeat myself sometimes I do find that I am, end up leaving out something between let's say handover A, B and C and then hand, then person A, person B and person C see that they've got a bit of a different fact and it discredits my handover and they kind of just write me out of the equation." • "... but I have learnt to not handover until the doctor is there so I will wait with the patient by the stretcher and even if the nurse wants to know any information I refuse, I say to them I'm only handing over once. Which then obviously gets people very upset but the time, then the doctor comes within a reasonable time to hear and I handover once. Because to be interrupted is also not the best... you either said the handover three or four times so they've missed information or they haven't been listening so you did give the information and then it's even more frustrating because they're asking you questions and you think but I've told you this."

4.3.2.2.4 Handing over directly to a doctor

Some PECP felt that it was better to hand over to a doctor as opposed to other emergency centre staff. Some reasons postulated for this preference related to decreased delays

associated with handing over directly to a doctor, and the fact that a doctor was able to directly deal with the high-acuity patient. Directly handing over to a doctor was also perceived to decrease the incidence of multiple handover. Some respondents did not feel that it was compulsory to hand over to a doctor. This was attributed to the acuity of the patient being more appropriate for a nursing scope and the nurses being capable of dealing with the patient. One interviewee mentioned doctors having a potential lack of interest in the handover as a result of their wish to perform procedures or do their own diagnostic tests. The categories and related quotes are depicted in Table 4-31.

Table 4-31: Prehospital emergency care personnel indicating a preference to handover to a doctor: category quotes

Category	Respondent quotes
<p>Reasons postulated for PECP preferring to hand over to a doctor</p>	<ul style="list-style-type: none"> • “I think the doctor can absorb the information, process it and then analyse it and make an informed educated decision on what’s wrong with the patient based on what you have told him and they also tend to believe you a little bit more and the nursing staff there’s always been this fight against us or not I wouldn’t say a fight but just a, we ambulance drivers and that’s all we know whereas you start speaking to a doctor he processes information better and he’s got a very clinical judgement and he listens to you or him.” • “... because the doctors the one that’s is going to take over from you in terms of management, decisions, management. The nurses follow their protocol and they, they follow what they need to fill out on the form in a resus situation. They’re not making decisions so you’ve been the deciding practitioner so hand over to another person who’s going to decide also saves, makes sense because the nurse doesn’t actually make a decision. She just, he or she just does the paperwork and what needs to be done according to the resus paperwork.”
<p>Sometimes handing over to a doctor is not preferable</p>	<ul style="list-style-type: none"> • “... as long as it’s either a registered nurse or a doctor, it’s fine. If you look at your enrolled nurses or your staff nurses, they don’t always understand what you’re talking about, so I prefer either registered nurse or a doctor. But it’s not to say it has to be a doctor every time. It makes it better and

Category	Respondent quotes
	<p>easier because the nurse also goes and hands over. But either or, is fine for me.”</p> <ul style="list-style-type: none"> • “Obviously your P3, your P2 patients your stable patients perhaps those patients it is acceptable to hand over to a primary care health care nurse or a registered nurse who’s specialized in that field because it’s within the scope of practice. So no not all patients need to be handed over to a doctor but I think an appropriate level needs to be met by the appropriate qualified person.”

4.3.2.2.5 The standardised approach

The standardised approach was identified as having both positive and negative aspects associated with its use. An additional theme was the need for a more emergency centre-specific handover strategy. Themes that were identified within the quotes related to both positive and negative aspects of the standardised process. Advantages associated with using the standardised approach included that it would allow a common understanding or expectation of what the PECP was going to deliver, and what the ECP were going to receive. Standardised handover had the potential to cater for the differences in prehospital levels of training and qualification, and was seen as particularly beneficial to less qualified personnel. Negative aspects of using a standardised process included the fact that standardised processes failed to take the contextual nature of the patient into account, and important information was not necessarily presented first. This had the potential to result in patients being ‘fitted’ into the mnemonic being used. The standardised approach and its role in emergency centre handover is a theme discussed in different contexts within other relevant sections of the thesis. The categories and related quotes are depicted in Table 4-32.

Table 4-32: Prehospital emergency care personnel perceptions related to using a standardised approach within emergency centre handover

Category	Respondent quotes
Advantages of the standardised approach	<ul style="list-style-type: none"> • “... having a standardised way of doing things always helps especially if it’s across, because there’s not much that’s standardised between prehospital and in-hospital. So if the handover were to be standardised then everyone in the

Category	Respondent quotes
	<p>hospital would know what to be listening for and pre-hospital you would know what to be giving.”</p> <ul style="list-style-type: none"> <li>• “Mnemonics is, in my opinion for something like this it would actually be brilliant because you’ve got the most basic of basics four-week qualifications... what, how are they gonna remember to do it? You give them a four-letter mnemonic and they will remember that forever and ever and that’s what they will follow. Sometimes keeping it simple is the easiest way to actually do it.” <li>• “... but I do think standardised approach is always a good way to teach people but to expect people to stick to it every time you know that’s a little bit... I think that defeats the point.”
Disadvantages of the standardised approach	<ul style="list-style-type: none"> <li>• “It’s a hard question. You see mnemonics not every patient fits into a mnemonic a mnemonic is a, is a backwards way of thinking so you trying to fit the patient into saying, fitting in, which letter of the mnemonic.” <li>• “I’m personally not a fan of a mnemonic because I feel that it can make you narrow-minded in what you think you should hand over. And also without meaning it can also relate into your treatment whereby you focusing your treatment on the things that you would report on.” <li>• “I suppose if everybody was taught in the same way this is how we hand over every time but I find that sometimes that you know the most important information doesn't start at the beginning of the mnemonic...”

4.3.2.2.6 Emergency centre personnel questioning patient management during handover

PECP identified being questioned about their patient management as a negative aspect of emergency centre handover. One of the themes related to this line of questioning was that it tended to be punitive rather than constructive. The importance of shared knowledge about the patient within the construct of questioning was recognised as a strategy for improving patient management. Importantly, this was identified as being practitioner-dependent. The categories and related quotes are depicted in Table 4-33.

Table 4-33: Prehospital emergency care personnel perceptions related to their patient management being questioned by emergency centre personnel

Category	Respondent quotes
Punitive rather than constructive questioning	<ul style="list-style-type: none"> • “No, I think the majority, if I think back now, the majority of those type of interrogations was more on the critical not really on trying to gather more information.” • “They’re fixated. What they do is they become... For instance, I come in with a head injury patient and he’s on a spine board but he doesn’t have a collar on, so they fixated as why I didn’t put a collar on.” • “... that would especially happen in your high-acuity patients. That they will really not that they will put out all the stops but they will be very critical of your interventions on why you did something. Especially if you intervened on quite a high level on a patient they would in a way be derogatory you know make derogatory statements but why did you do this and why did you not do that, as if in a way that they can do a lot better.”
Shared knowledge about the patient within the construct of questioning	<ul style="list-style-type: none"> • “... to a large part it can be practitioner dependent, for me if I hand over to the right person and by the right person I mean someone who I know has a reputable opinion, who knows what they're talking about, I will ask them you know any suggestions for improvement, anything you think could have been done better or different and they will give it or they won't. So in that environment I think it’s academic and it’s driven by a fact that they do know more and they can help me upskill, they can help me to learn more.” • “... but you get certain, like I said, certain hospitals and certain doctors that, ja but why haven’t you done this? Why haven’t you done that? And then you try to explain to him or her, at that stage that wasn’t the priority. The priority was sorting out airways management instead of suspending the leg. Yes, we’ve experienced it sometimes. And sometimes they do understand and then they come back and apologise, ja, sorry, I need to apologise, because I know

Category	Respondent quotes
	airways, you need to sort out the airway and thereafter, the fractured leg.”

4.3.2.2 Theme Two: Emergency centre handover communication factors identified by prehospital emergency care personnel

The theme relating to handover communication emerged from codes and categories that were associated with the process of patient handover within the emergency centre. Within emergency centre handover communication, four sub-themes were identified as challenges to effective handover. Categories under each sub-theme were expounded upon using quotations from the interview transcripts. Communication themes were related to the factors that had the potential to affect communication between the deliverer and receiver of handover. This included ECP’s engagement in the handover, perceptions around respect, pre-existing perceptions and relationships, as well as ECP’s knowledge related to PECP qualifications and working environments. A summary of the categories and related sub-categories are depicted in Table 4-34.

Table 4-34: Categories and themes related to prehospital emergency care personnel emergency centre handover communication

Sub-theme	Category
ECP lack engagement in the handover process	<ul style="list-style-type: none"> • Disinterest by ECP in prehospital emergency care handovers • Reasons postulated for possible inattentiveness to handover • Attentiveness linked to qualification level of deliverer or receiver of handover
PECP felt disrespected by ECP	<ul style="list-style-type: none"> • PECP were perceived as being just ambulance drivers by ECP • PECP were treated poorly in the emergency centre • Previous experiences by ECP may contribute to pre-existing disrespect • Lack of interprofessional respect between emergency centre and prehospital emergency care • Respect identified as a two-way street

Sub-theme	Category
	<ul style="list-style-type: none"> • There was context from the emergency centre side
The effect that relationships between the PECP and ECP have on handover	<ul style="list-style-type: none"> • The state of the prehospital/emergency centre relationship was strained • Existing relationships between the PECP and ECP affected how handovers were received • Despite existing relationships, reception is still less than ideal • Some negative experiences affected future interactions • The relationship between the PECP and the emergency centre has deteriorated over time
A lack of knowledge related to the working environment was identified as one of the barriers to effective handover	<ul style="list-style-type: none"> • Lack of knowledge related to the prehospital working environment • Lower qualified PECP sometimes did not have access to higher qualified personnel
A lack of knowledge related to the prehospital emergency care qualification structure and related scopes was identified as one of the barriers to effective handover	<ul style="list-style-type: none"> • Lack of ECP knowledge related to the prehospital qualifications and scope • Lack of knowledge related to prehospital emergency care qualifications can have a negative effect on handover

4.3.2.2.1 Emergency centre personnel lack engagement in the handover process

There was general consensus that there was a disinterest displayed by ECP to PECP handover. Several reasons were postulated for this disinterest in prehospital handovers, but primarily it related to the busyness of the emergency centre. This theme emerged in other areas of this research as well. A sub-category within the reasons for inattentiveness was a perceived poor attitude of emergency centre staff. Attentiveness to handover was linked to the

qualification of both the deliverer and receiver of the handover. The underlying theme suggested that more qualified PECP provided better handovers. Interestingly, one interviewee linked handing up or down relative to qualification as a challenge. Another interesting observation was that ECP might have been exposed to long-term poor standards of handover and, as a result, may not be interested due to the expectation of receiving a poor handover. The categories and related quotes are depicted in Table 4-35.

Table 4-35: Emergency centre personnel have a lack of engagement in handover process

Category	Respondent quotes
Disinterest by ECP in prehospital emergency care handovers	<ul style="list-style-type: none"> • “I’ll give you an example in [deleted] handover is done in a takeover handover room with a triage nurse. It’s usually an enrolled nurse or just a staff nurse that’s a student. They do a set of vital signs, they don’t take your vital signs into consideration and then they tell you, right, you can leave your patient in the queue. So you tend to just do that, you know, otherwise you’ll sit the whole day there waiting for a doctor to come and actually listen to what you say. They never really take any notes from you, they just want to know what’s wrong with the patient, what time you picked up the patient and they do their own vital signs. They don’t take a copy of your PRF or anything.” • “Because sometimes you bring the patient you do handover and they get a different set of vital signs, they get a different...you said ja, it was a possible fracture of the humerus but there’s nothing, and so ja, sometimes they don’t believe you, sometimes they believe you. Like I said, it all depends where or what institution or what hospital you go into. Some are more prone to, yes, I’m listening, what? And giving more feedback and others are yes, just put him in a cubicle.”
Reasons postulated for possible inattentiveness to handover	<ul style="list-style-type: none"> • “...I think that plays a big role, sometimes they are just overworked and they’re just, they’re just run off their feet, overworked, understaffed.” • “... you’ve seen it when you go to the end of the month to [deleted], they so overwhelmed and understaffed that you

Category	Respondent quotes
Attentiveness linked to qualification level of deliverer or receiver	<p>really need, you need to come out with a guy that's got like a decapitated head who's still talking and then they'll stop and look at you because they just so overwhelmed with everything that's happening."</p> <ul style="list-style-type: none"> • "I think either they are understaffed or the hospitals they are overworked or they're over, they've got too many patients during the day, they, it's like with interest maybe, they just there to because they receive a salary." • "I think staff in provincial services are very, very overworked."
	<ul style="list-style-type: none"> • "Also, if you're a higher qualified handing over to a lower qualified, then they have no idea what you're actually saying. So it goes both ways of the board. With a qualification, I think it's easier to try and get someone who understands on your level, because otherwise, your information will get lost along the way. That's majorly the point I think." • "... the majority of the staff pre-hospital that they deal with are unfortunately lower qualified so their handover is a direct reflection of what they've done for the patient which is really nothing and I think the staff are exposed to that more and then when we come in with emergency care and ECP comes in and wants to do a proper handover with a proper patient, the staff, the ED staff are like agh just another ambulance driver. So they brush us off and they don't take, I suppose they don't take into consideration that well we may be doing more for the patient."

4.3.2.2.2 *Prehospital emergency care personnel felt disrespected by emergency centre personnel*

Respect was seen as a significant contributor to the relationship between ECP and PECP. Unfortunately, the dominant theme was an underlying lack of respect between the two. One of the reasons suggested for the perceived lack of respect was that ECP viewed PECP as "just ambulance drivers". This was related to the fact that most of the persons delivering

handover had lower qualifications, which contributed to the general emergency centre view of the prehospital profession as a whole. One of the interviewees mentioned that this perception went beyond the emergency centre and that his father also had a prevailing low opinion of the work of PECP. The categories and related quotes are depicted in Table 4-36.

Table 4-36: Prehospital emergency care personnel felt disrespected by emergency centre personnel

Category	Respondent quotes
PECP were perceived as being just ambulance drivers by ECP	<ul style="list-style-type: none"> • “They think you are just an ambulance driver because, like I said, from previous experiences, you’ll come in, you’re trying to be polite and they’re just... Agh ja, [deleted] people again.” • “ Also historically there has always been this how can I say this layman’s perception that people go into the fire brigade and the ambulance department just because they couldn’t do anything else. It’s like a job for ‘dorphies’ so to speak I mean that, I mean I’ve noticed that with my parents I mean my father I had to convince him for a long time. I actually had to bring him on the road and he had to do some calls with me, before he actually fully said okay it’s okay that you didn’t become a doctor.”
PECP were treated poorly in the emergency centre	<ul style="list-style-type: none"> • “What I’m saying is you arrive at the hospital, you get treated like a piece of dirt, you’re fighting for your patient... They are treating your patient... because they don’t respect you or they don’t respect your qualification.” • “So when you try and explain that to them they think you’re a wombat. They really do. So what I’m saying is that when you arrive there and you’re getting screamed and shouted at and sworn at and abused by the doctors, by the nurses, you have to stand up for your patient. Because if that’s how they’re treating you, this is how they’re gonna treat your patient, and they’re gonna punish your patient. And then you’re up against this wall. So you have to fight the system to get your patient... so it becomes a cycle.”
Previous experiences by	<ul style="list-style-type: none"> • “... maybe it also comes down to the same thing you know, eighty percent of the people that they deal with are lower

Category	Respondent quotes
ECP may contribute to pre-existing disrespect	<p>qualified, who are job seekers and they don't really care about the patients, they come in, they drop the patient off and they run away. And that breeds contempt between them and us, the pre-hospital. Then again you come in with a real patient, you want to talk to them intellectually and they just brush you off and I think then we see that as disrespectful towards us. Which it probably is but you can't justify it."</p> <ul style="list-style-type: none"> <li>• "I think pre-hospital is some of the things that we've also, that I've noticed in terms of arriving at ED's and that is unfortunately the arrogance of some of the pre-hospital providers and the nursing staff in the ED is they can't teach me anything so when errors or concerns and that are highlighted, it's the heat of the moment, you stressed because you've got a critical patient that you need somebody to take over from, take a patient over from you, so you're stressed, you're working hard, you are on a type A overdrive, they're waiting for this patient and then there's that ego that you can't tell me what I've done wrong."
Lack of interprofessional respect between emergency centre and prehospital emergency care	<ul style="list-style-type: none"> <li>• "... because that doctor wouldn't do that to a fellow doctor...because he sees the value in the fellow doctor. But there's no value seen in us so it's kind of, who the hell do you think you are talking to me about this." <li>• "So I do think some pre-hospital guys bring that upon themselves however there are cases when the emergency department staff will also have an attitude and no matter how humble you are in your handovers they'll still show you a lack of respect." <li>• "Sometimes I think they get irritated. They may get irritated with the way you presented yourself. Don't forget that it is on both sides of the fence the paramedic tends to be cocky and thinks he knows everything. And then he turns around because of this and this and this then they start having an argument."

A sub-category that emerged under respect was that respect was a ‘two-way street’. Interviewees linked disrespect on one side as contributing to disrespect from the other, and conversely, that respect would also be reciprocal. The categories and related quotes are depicted in Table 4-37.

Table 4-37: Prehospital emergency care personnel felt that respect was a two-way street

Category	Respondent quotes
Respect is a two-way street	<ul style="list-style-type: none"> • “But again because of why, I suppose if you disrespect me I’m going to disrespect you, it’s just childish but it happens unfortunately.” • “... because you need to have bilateral respect for each other basically, so what you want to do, you want the respect from somebody else and you need to give respect to somebody else. It needs to be from both sides basically.” • “I think it goes both ways as well. I find that if I’m very friendly then I often get treated in a friendly manner back.” • “But it goes both ways, because I’ve seen it where I come in, I have no problem with the staff. They come to me and it’s a mutual respect. Another person comes in and they just start shouting, and you see the doctors and they’re like, okay now they’re not really interested in this person. Because if you don’t respect them, they’re not going to respect you.”
There was context from the emergency centre side	<ul style="list-style-type: none"> • “I’ve seen it because when I’ve worked overtime in casualty I’ve seen the way that they interact with the staff and I’ve watched it from the other side and that, I think that was the first time I actually realised that especially the guys with the lower qualifications and the pre-hospital environment tend to not be as professional all round and that carries through in the handover.” • “But you know when you are an incompetent knuckle dragger taking patients to the hospital and you are acting in an incompetent way in showing very little care for the patient doing nothing for the patient then you, you just proving your own worth to the staff there and obviously if

Category	Respondent quotes
	that how you're going to treat the patient there's no real big question how you going to treat the staff you handing over to which is probably in the same way."

4.3.2.2.3 *The effect that relationships between the prehospital emergency care and emergency centre personnel have on handover*

Relationships were identified as being important within the context of emergency centre handover. Interviewees highlighted that there was an apparent strained nature to the relationship between the ECP and PECP. In addition, there was a perception that existing relationships between these two groups affected how handovers were received. Despite existing relationships, there were instances where PECP found their reception at the emergency centre to be less than ideal. PECP also identified previous negative experiences as affecting future interactions with the emergency centre. The categories and related quotes are depicted in Table 4-38.

Table 4-38: Prehospital emergency care personnel perceptions of a strained relationship between themselves and the emergency centre personnel

Category	Respondent quotes
The state of the prehospital/emergency centre relationship was strained	<ul style="list-style-type: none"> • "... it does seem to be a bit of a strange relationship you know there's a lot of competition and nurses putting paramedics down and vice versa. So it does seem to be strained but I'm hesitant to actually generalise it because you know there are some really good situations as well and people who are really passionate about their job who, who will take things as they come and not give you a hard time about it so, so there are some good relationships as well." • "And then also the area you work in, different hospitals at the time you give, you make relationships so I don't know if there... the tension is maybe what you make of it, ja if you have a good relationship then there's no tension, if you have a terrible relationship then you already arrive so you may go to one casualty where, for whatever reason the staff there are abrupt and that might not work well with you in another area you may have a very good relationship."

Category	Respondent quotes
Existing relationships between the PECP and ECP affected how handovers were received	<ul style="list-style-type: none"> • “So you have to build that communication. And once you have that relationship or that communication with that casualty unit, they’ll...if you come in, they’ll run to you and come and help you. You know, they’re eager to help and they listen to you, because they actually now know you. So it’s about building relationships and respect with one another and once you have that, you’re sorted.” • “It’s almost like, they do respect you but you almost have to earn their respect after bringing multiple patients to them so you could go to a shift where you’ve never seen any of them before and then you, ja you have to prove yourself with the way you hand over the patient and you must gain their respect when, because they just... ja. If you know the shift and you know the people over time then you’ve earned their respect and then they do listen so... I... ja it depends what shift, you can feel not respected.” • “... you go to the same hospital over and over again so eventually you do get to know some of the staff. They will listen to you differently because you now have a better relationship with them and it is important to keep a good relationship with them.”
Despite existing relationships, reception was still less than ideal	<ul style="list-style-type: none"> • “... and there certain EDs you can walk into and their staff look at you ‘Howzit?’, ‘How’s it going?’ and you have a good relationship, a good handover and you walk out of there feeling great. You come back two days later and it’s the total opposite.” • “I think you almost have to prove yourself every single time you go to hand over, if they don’t know you they don’t take you seriously until you start talking and then if you making some sense and you make almost like an impression then they’ll start taking you more and more seriously.”
Some negative experiences affected future interactions	<ul style="list-style-type: none"> • “I think one of the major reasons for one of the big centres that we go to now was the nursing staff had a personal issue with another paramedic from another service and from there they apparently refused to receive handovers from

Category	Respondent quotes
	<p>paramedic or EMS staff and then the doctors had to step in and take the hand over.”</p> <ul style="list-style-type: none"> • “Even with that relationship, every now and then I’ll hit a brick wall. So before, I really spent a lot of time with them – buying them cake, buying them coke. I mean why do I have to romance them to get them to treat my patient? They getting paid a job just like me. No one romances me...No one gives me flowers and cake for a job well done. So why should I have to do it? Is it a... inbuilt thing, a cultural thing... you know that it’s a... we must get extra preferential treatment because... I don’t know.”

One of the interviewees mentioned that there was a perception that the relationship had degenerated over time. This was attributed to the fact that there was not much interprofessional collaboration compared to the past. This theme also emerged, and is discussed in greater detail, under the theme relating to improvement strategies related to emergency centre handover. The category and related quote are depicted in Table 4-39.

Table 4-39: The relationship between the prehospital emergency care personnel and the emergency centre has deteriorated over time

Category	Respondent quotes
The relationship between the PECP and the emergency centre has deteriorated over time	<ul style="list-style-type: none"> • “I think that we’ve distanced ourselves, we the pre-hospital setting is just... because we’ve grown so much in the private sector, there’s so much competition for patients in the private sector. The government, I think we’ve just become apathetic where and I use the example of when we started and I know, I always hate it when we say, I start speaking like that, we were based at hospitals. So you had your office where you picked up your ambulance and then you went to a hospital and you interacted with the staff the whole time. When you were working on the heli[copter] you sat in the ED and you worked with the doctors, the surgeons, the nursing staff and that, then you built that relationship. In the last five or ten years there’s been no effort from either side to continue those relationships. So I’d

Category	Respondent quotes
	honestly say it's just because of our apathy that we've, that that relationship has become distant and as a result of that strain."

4.3.2.2.4 *A lack of knowledge related to the prehospital working environment was identified as one of the barriers to effective handover*

The prehospital emergency care environment is very different from that of the emergency centre. PECP identified ECP as having a poor understanding of the austere environments they were required to work in. One respondent mentioned that the lack of higher qualified personnel for support was a problem. The categories and related quotes are depicted in Table 4-40.

Table 4-40: Lack of knowledge related to the prehospital working environment

Category	Respondent quotes
Lack of knowledge related to the prehospital working environment	<ul style="list-style-type: none"> • "... they sometimes say why did you not do this or that? But you were not in that situation to know what we had done and how we could have done it. We were upside down in the mud type of thing, so sometimes you get that." • "They don't really understand what we do. The thing is, how can I say? I think what the reason for that could be most probably they, that used to controlled environment and we are not in a controlled environment so we do. We do things quickly and we need to sort out problems quickly and we need to get those, I don't know, maybe it's just a lack of I don't know background information or what EMS is all about." • "... it's misunderstanding of they don't understand what we do and we don't understand what they do. And I think some of us are also to blame in that you get there and people are being rude and disrespectful. So the whole communication thing I think is the biggest problem as to why people look at you and like agh, just another paramedic." • "... because we all believe each other's job is worse than everybody else's and I think if the doctors can come to us,

Category	Respondent quotes
	see the environment that we work in... understand why I didn't worry about the cut toe because I had to worry about the airway and that my response time was nine minutes from the time I arrive to the time I get to hospital with a P1 patient."
Lower qualified PECP sometimes did not have access to higher qualified personnel	<ul style="list-style-type: none"> • "... especially like if the ALS is busy because the ALS are few within our department maybe they are working in [deleted] and he has got a patient maybe he has got a declaration there waiting for SAPS to some and he will explain to the phone that I am having a problem with 1,2,3 and so I will just explain the vitals over the radio or over the phone. Then I have to transport and when I get the hospital and then the problem is that they would need an IV line or drugs put into a patient. That is going to be the frustration I am going with the patient to the hospital."

4.3.2.2.5 A lack of knowledge related to the prehospital emergency care qualification structure and related scopes was identified as one of the barriers to effective handover

PECP identified a lack of knowledge related to the prehospital emergency care qualification structure and related scopes as one of the barriers to effective handover. Two categories were identified, namely a lack of ECP knowledge related to prehospital qualifications and scope, and a lack of knowledge related to prehospital emergency care qualifications can have a negative effect on handover. The categories and related quotes are depicted in Table 4-41.

Table 4-41: Lack of knowledge related to the prehospital qualifications and scope

Category	Respondent quotes
Lack of ECP knowledge related to the prehospital qualifications and scope	<ul style="list-style-type: none"> • "Because they don't know what's on our scope of practice. They don't know what we can do." • "They don't really understand the concept or the qualifications of pre-hospital environment and they think that we don't know what we're talking about." • "In the old days the nursing staff and the doctors knew exactly what we did, what our capabilities were and how

Category	Respondent quotes
	competent we were at those specific thing. Now they don't even know what levels of qualifications we are."
Lack of knowledge related to prehospital emergency care qualifications can have a negative effect on handover	<ul style="list-style-type: none"> • "I think that it might just be a lack of understanding in the hospitals from the level of qualifications because you see the doctors get their backs up the minute the BAC says: 'Oh I didn't do this, it's not in my scope'. The doctor doesn't wanna listen anymore."

4.3.2.3 Theme Three: Emergency centre handover improvement strategies identified by prehospital emergency care personnel

Interviewees were asked what strategies they would suggest for improving emergency centre handover. This theme emerged from codes and categories that were associated with the suggestions from interviewees on what could be done to improve emergency centre handover. Within emergency centre handover improvement strategies, four sub-themes were identified as challenges to effective handover. A summary of the sub-themes and related categories are presented in Table 4-42. Some of these improvement strategies have been discussed elsewhere in the results.

Table 4-42: Sub-themes and categories related to prehospital emergency care personnel suggestions on improving emergency centre handover

Sub-theme	Category
Interprofessional collaboration as a means to improving the prehospital/emergency centre handover	<ul style="list-style-type: none"> • There was a perceived disparity between PECP exposure to emergency centres and ECP exposure to the prehospital emergency care environment • Mutual understanding and the results of interprofessional collaboration
Educating ECP about prehospital emergency care qualifications and scope	<ul style="list-style-type: none"> • ECP require education related to prehospital emergency care scope • ECP require education related to prehospital emergency care qualification structure • Education programmes should be reciprocal

Sub-theme	Category
	<ul style="list-style-type: none"> • There needs to be a willingness from ECP to learn • The staff involved in emergency centre handover should be involved in formulating the solutions
Interprofessional collaboration	<ul style="list-style-type: none"> • The development and improvement of interprofessional relationships • Relationships were often built outside of the working environment
The standardised handover as a possible solution	<ul style="list-style-type: none"> • Development of an emergency centre-specific handover

4.3.2.3.1 *Interprofessional collaboration as a means of improving the prehospital/emergency care handover*

The theme of ECP not having adequate knowledge related to the prehospital emergency care working environment, qualification structure and relevant scopes is one that was identified in other areas of this thesis. One of the themes for improving emergency centre handover identified interprofessional training and collaboration as an appropriate strategy. Prehospital interviewees perceived their levels of exposure to emergency centres as greater than that of emergency centre staff's exposure to the prehospital emergency care environment. The categories and related quotes are depicted in Table 4-43.

Table 4-43: Interprofessional collaboration as a means of improving the prehospital/emergency care handover

Category	Respondent quotes
There was a perceived disparity between PECP exposure to emergency centres and ECP exposure to the prehospital emergency care environment	<ul style="list-style-type: none"> • "I do feel that the pre-hospital training is far more committed to exposing their students or their learners to the in-hospital environment than the in-hospital environment is committed to exposing their learners to the pre-hospital environment. And so I think from a point of view of understanding although we couldn't fully understand their place because we're not in their shoes I think we have a better understanding of them than they do of us purely because our training forces requires that of us. I mean we are put through the hospitals, then the casualties then the clinics

Category	Respondent quotes
Mutual understanding and the results of interprofessional collaboration	<p>and... but they not really they put through one or two shifts on the road it's not enough and if you have two quiet shifts the idea is for a bunch of guys drive around drinking coffee and you know having a good time instead of seeing the true challenges you know which I don't have to elaborate.”</p> <ul style="list-style-type: none"> • “Okay well first of all from medics and paramedics we know, we have a lot of in-hospital training. So some of the relationships are built up, we understand the process and how the system works in the shortfalls; we understand that. But we don't get doctors and nurses coming to work with us pre-hospital.”
	<ul style="list-style-type: none"> • “I am sure that's the thing that I mentioned earlier with the emergency registrars that is rotating in our vehicle. There is immediately a professional relationship and a friendship that started up, so as soon as you go to the facility they like but oh we know you, welcome back how are you doing. They are actually interested to find out, instead of looking past the whole work relationship it is actually a friendship that has developed so I think that, that is maybe the way to go.” • “They used to send those nurses out with us on the road and they worked with us. Then they understood where we are coming from that we are not in a controlled environment we are in like throwing stones and bricks and stuff like that and all that type of things.” • “...we need to help understand how they work and they need to understand how we work and what we're capable of. And I think that will cancel out a lot of the miscommunication and problems.”

4.3.2.3.2 *Educating emergency centre personnel about prehospital emergency care qualifications and scope*

The theme of ECP not having adequate knowledge related to the prehospital emergency care working environment, qualification structure and relevant scopes is one that was identified in

other areas of this thesis. One of the themes for improving emergency centre handover included interprofessional training and collaboration as an appropriate strategy. The categories and related quotes are depicted in Table 4-44.

Table 4-44: Educating emergency centre personnel about prehospital emergency care qualifications and scope

Category	Respondent quotes
ECP require education related to prehospital emergency care scope	<ul style="list-style-type: none"> • “I think in provincial services it would probably be quite difficult but think one of the big things would be education around what our scope is because like you say the AEA that gets lambasted because the patient isn’t intubated. You know that’s the doctor that doesn’t what a AEA can do so I think if people know what our scope is that would be a helpful thing.”
ECP require education related to prehospital emergency care qualification structure	<ul style="list-style-type: none"> • “well it has to start off with obviously being visible though because you, we have to know whose what so you walk up and then they’ve got different [lapel] plates or something like that you will know okay it’s an EN or a RN and then within ourselves maybe on our courses we’re supposed to be trained for what scope is an RN what scope is an EN. Because then it’s up to them to wear their identification so that you can then get the respect maybe, that you have earned with your qualification.”

There was also a category that related to the perception that education should be a reciprocal undertaking that involved both PECP and ECP. The categories and related quotes are depicted in Table 4-45.

Table 4-45: Education about qualification and scopes should be reciprocal

Category	Respondent quotes
Education programmes should be reciprocal	<ul style="list-style-type: none"> • “Maybe it’s time that the nurses, the doctors and the paramedical pre-hospital environment needs to learn this together.” • “I think that maybe it might be a good idea to have some type of cross pollination of having the emergency centre

Category	Respondent quotes
There needs to be a willingness form ECP to learn	<p>staff working on the road and vice versa us in the emergency centres.”</p> <ul style="list-style-type: none"> • “I think you know it would be helpful if they worked some pre-hospital shifts with us and experience what we experience on the road. At the same time I think it would be helpful if it was the other way around if, if we perhaps worked in more situations that they are involved in.”
	<ul style="list-style-type: none"> • “Maybe it’s we need to have a look at how and why is the staff so overburdened, maybe it’s the wrong type of staff that is in that facility. Because if you want to have those staff exposed to a pre-hospital setting they need to be willing and able to actually get in there and how many of the emergency centre staff is really I feel is willing to spend a day out on the road and see where it is coming from but also then the same argument goes how many emergency staff you know EMS workers are willing to go and spend a day in an emergency centre? So, I think while maybe education is important the exposure is important, I think we just need to test the willingness of the parties to listen we are sitting with a problem let’s see how we can sort the problem out.”
The staff involved in emergency centre handover should be involved in formulating the solutions	<ul style="list-style-type: none"> • “... the problem is not going to be sorted out on high-level meetings with the big bosses, it needs to be, the minions need to realize there is a problem and how are we going to fix this problem.”

4.3.2.3.3 *The development and improvement of interprofessional relationships*

The importance of relationships has been discussed earlier in this thesis ([4.3.3.3 The effect that relationships have on handover](#)). The observation was also made that relationships had eroded over time. Categories related to PECT and ECP relationships included the development and improvement of interprofessional relationships, and that relationships were

often built outside of the working environment. The categories and related quotes are depicted in Table 4-46.

Table 4-46: The development and improvement of interprofessional relationships

Category	Respondent quotes
The development and improvement of interprofessional relationships	<ul style="list-style-type: none"> • “Another big thing from both sides that would help is, there’s always a problem with ego, if people would just drop the attitude and just realise that we’re here to treat the patient, I think that would go a long way as well. And unfortunately the only way that’s a personnel thing for each person so education and training can do so much, but that’s a personal thing that people need to change themselves.” • “Once they understand also what you are all about and you know, what you do and what you bring and what your value is, then everything goes well. Then they don’t have issues, then we help them out in casualty if they have a problem. Like, oh well, no fine and if we come in, they will make time and place for us to say okay, just bring the patient, we’ll help you quickly. And yes, it goes both ways, it’s about how you approach and how you build those relationships”.
Relationships were often built outside of the working environment	<ul style="list-style-type: none"> • “Everyone likes a good party, you can always, I don’t know, the guys were trying to get the EMS pub up and running but there is always only the certain the specific type of people that frequent those type of get togethers. I think maybe if you start with the guys working in the ED and the guys working on the EMS maybe if you start working with that and instead of making it once a year or once every two years, you can maybe make it like once a month or once every three months, so that there can actually be a relationship and actually friendships that can be developed. Because you know years ago when you go to [deleted] you normally knew the doctor or the nursing sisters, you knew them. Now you don’t know anyone there. And no one is interested in getting to know each other.”

4.3.2.3.4 The standardised handover as a possible solution

The standardised handover was identified as a possible solution to many of the issues currently affecting handover. Several categories also emerged related to how the standardised handover may be implemented. The development of an emergency centre-specific handover was a suggestion to improve the prehospital to emergency centre handover. Interviewees suggested a specific programme be developed. They also highlighted the importance of any standardisation, including both prehospital and emergency centre perspectives. The categories and related quotes are depicted in Table 4-47.

Table 4-47: Prehospital emergency care personnel perceptions related to the development of an emergency centre-specific handover

Category	Respondent quotes
Development of an emergency centre-specific handover	<ul style="list-style-type: none"> <li>• “... you’re gonna need one person to actually approach all the institutes and just to bring it in and say ‘this is what we wanna do, we wanna standardise it.’ Maybe sit in a...get all the top lecturers from each department saying ‘this is what we use, what would you like us to use?’ and go from there.” <li>• “But if you could make a standard thing throughout the country for instance that everybody says you are going to hand over the patient. You are going to talk about this, talk about that and talk about that, so that it is more standardized it might work out.” <li>• “But then we need the actual doctors that are working in the trauma unit and the medics that are working in the field. There’s no point in getting the guys that used to be medics twenty years ago, and they are now in an administration role, to sit and work out a system. It needs to be the guys that are actively involved in the field both sides.” <li>• “I think the real structure comes into the way paperwork is handed over that I think is where the structure would assist if there was one standardised, across the board, prehospital form that was between us prehospital and in-hospital. That form there I think would be the way that a structure could be identified and put into place.”

4.4 Emergency centre personnel: Study One - Observational data

A total of 50 questionnaires were collected from 23 (46%) medical practitioners and 27 (54%) nursing personnel. The data collection process is described in [3.3.6.2. Emergency centre personnel sample data collection](#).

4.4.1 Demographics

4.4.1.1 Years of experience

Six (39%) emergency centre doctor respondents had between five and 15 years of experience, with seven (39%) had between five and ten years, and six (33%) had between ten and 15 years. Six (38%) emergency centre nursing respondents had less than five years of experience, four (25%) had between ten and 15 years, and five (31%) had more than 15 years of experience. The results are depicted in Table 4-48.

Table 4-48: Emergency centre personnel years of experience

EC Staff category	< 5 years n= (%)	5 to 10 years n= (%)	10 to 15 years n= (%)	> 15 years n= (%)	Median (IQR) ^a
EC	2 (11%)	7 (39%)	6 (33%)	3 (17%)	10 (5.75)
EC Nurse	6 (38%)	1 (6%)	4 (25%)	5 (31%)	10 (13)
Total	8 (24%)	8 (24%)	10 (28%)	8 (24%)	

^a IQR= Interquartile range: calculated as the difference between 75th and 25th percentiles

4.4.1.2 Years of emergency centre experience

Seven (39%) emergency centre doctor respondents had less than five years of experience in working in the emergency centre, six (33%) had between five and ten years of experience in the emergency centre, three (17%) had between 10 and 15 years of experience in the emergency centre, and two (17%) had more than 15 years of experience working in the emergency centre. Eight (47%) emergency centre nurse respondents had less than five years of experience working in the emergency centre, two (12%) had between five and ten years of experience in the emergency centre, one (6%) had between 10 and 15 years of experience in the emergency centre, and two (17%) had more than 15 years of experience in working in the emergency centre. The results are depicted in Table 4-49.

Table 4-49: Emergency centre staff experience in the emergency centre

EC Staff category	< 5 years n= (%)	5 to 10 years n= (%)	10 to 15 years n= (%)	> 15 years n= (%)	Median (IQR) ^a
EC	7 (39%)	6 (33%)	3 (17%)	2 (11%)	5 (7.25)
EC Nurse	8 (47%)	2 (12%)	1 (6%)	6 (35%)	7 (17.75)
Total	43% (15)	23% (8)	4 (11%)	8 (23%)	

^a IQR= Interquartile range: calculated as the difference between 75th and 25th percentiles

4.4.2 Handover questionnaire data analysis

4.4.2.1 Levels of importance of handover variables

Handover information variables were classified from most to least important. Levels of importance were determined using the percentage of respondents who assigned a critical level of importance to each information variable. No responses were excluded from the dataset. The importance ranking of handover information variables for the emergency centre respondents is depicted in Table 4-50. Since rankings were based on percentage, percentages have been used as the initial value depicted in the table.

Table 4-50: Importance of handover information variables ranked from most to least important: Emergency centre personnel

Rank	Information variable	Critically important % (n=)	Important % (n=)	Somewhat important % (n=)	Unimportant % (n=)
1	Glasgow Coma Score	92% (44)	2% (1)	6% (3)	0% (0)
2	Pulse rate	84% (42)	16% (8)	0% (0)	0% (0)
3	Vital signs	83% (25)	17% (5)	0% (0)	0% (0)
4	Blood Pressure	82% (41)	18% (9)	0% (0)	0% (0)
5	Patient priority	81% (22)	19% (5)	0% (0)	0% (0)
6	SpO ₂ (Oxygen saturation) ^a	78% (39)	20% (10)	2% (1)	0% (0)
7	Type of major injuries	77% (37)	23% (11)	0% (0)	0% (0)
8	Respiration Rate	76% (38)	20% (10)	4% (2)	0% (0)
9	Anatomical location of major injuries	73% (36)	27% (13)	0% (0)	0% (0)
10	Mechanism of Injury/ Nature of Illness	69% (25)	22% (8)	6% (2)	3% (1)
11	Injuries sustained	69% (18)	27% (7)	4% (1)	0% (0)
12	Time since incident	65% (32)	29% (14)	4% (2)	2% (1)
13	Hypotensive episode prehospital	58% (28)	40% (19)	2% (1)	0% (0)

Rank	Information variable	Critically important % (n=)	Important % (n=)	Somewhat important % (n=)	Unimportant % (n=)
14	Death of an occupant in the same compartment	55% (23)	24% (10)	19% (8)	2% (1)
15	Allergies	54% (27)	44% (22)	2% (1)	0% (0)
16	Approximate impact speed	53% (26)	29% (14)	12% (6)	6% (3)
17	Damage to car / Intrusion	51% (24)	28% (13)	11% (5)	11% (5)
18	Temperature	50% (24)	35% (17)	15% (7)	0% (0)
19	Capillary Refill	49% (24)	39% (19)	10% (5)	2% (1)
20	Restrained / Unrestrained	47% (23)	43% (21)	6% (3)	4% (2)
21	Medications	46% (23)	52% (26)	2% (1)	0% (0)
22	Past Medical History	46% (23)	48% (24)	6% (3)	0% (0)
23	Airbag deployment	45% (22)	33% (16)	12% (6)	10% (5)
24	Patient Mobility	44% (21)	48% (23)	6% (3)	2% (1)
25	TEWS ^b Score	41% (17)	37% (15)	17% (7)	5% (2)
26	Past Surgical History	39% (19)	49% (24)	12% (6)	0% (0)
27	History	38% (6)	63% (10)	0% (0)	0% (0)
28	Age	38% (18)	50% (24)	13% (6)	0% (0)
29	ECG ^c analysis	35% (17)	53% (26)	10% (5)	2% (1)
30	End tidal CO ₂ ^d	34% (16)	45% (21)	17% (8)	4% (2)
31	Last meal/drink consumption	31% (11)	44% (16)	22% (8)	3% (1)
32	Gender	26% (12)	48% (22)	26% (12)	0% (0)
33	Demographics	13% (2)	69% (11)	13% (2)	6% (1)

^a SpO₂= Blood oxygen saturations measured with a non-invasive pulse oximeter, ^b TEWS = Triage Early Warning Score, ^c ECG= Electrocardiograph, ^d CO₂= Carbon dioxide

4.4.2.2 Emergency centre personnel perceptions of the quality of handovers observed in the emergency centre

None (0%) of ECP respondents indicated that the handovers that they observed were excellent. Seven (14%) ECP respondents indicated that the handovers they observed were above average, 32 (64%) respondents indicated that the handovers they observed were average, three (6%) respondents indicated that the handovers they observed were below average, and three (6%) doctor respondents indicated that the handovers they observed were poor. The results are depicted in Table 4-51.

Table 4-51: What do you think the general quality is of the handovers that you observe within the emergency centre environment?

EC personnel category	No response n= (%)	Poor n= (%)	Below average n= (%)	Average n= (%)	Above average n= (%)	Excellent
EC Doctor	1 (4%)	1 (4%)	2 (9%)	14 (61%)	5 (22%)	0 (0%)
EC Nurse	2 (7%)	2 (7%)	1 (4%)	18 (67%)	2 (7%)	2 (7%)
Total	3 (11%)	3 (6%)	3 (6%)	32 (64%)	7 (14%)	2 (4%)

4.4.2.3 Emergency centre personnel perceptions of how often handovers observed were accurate and provided relevant information about the patient

None (0%) of the ECP respondents indicated that the handovers they observed always provided accurate and relevant information, and none (0%) of the ECP respondents indicated that the handovers they observed never provided accurate and relevant information. Nineteen (38%) ECP respondents indicated that the handovers they observed often provided accurate and relevant information, 29 (58%) respondents indicated that the handovers they observed sometimes provided accurate and relevant information, and one (2%) respondent indicated that the handovers they observed rarely provided accurate and relevant information. The results are depicted in Table 4-52.

Table 4-52: How often do you think that handovers that you observe are accurate and provide relevant information about the patient?

Respondent category	No response n= (%)	Never n= (%)	Rarely n= (%)	Sometimes n= (%)	Often n= (%)	Always n= (%)
EC Doctor	0 (0%)	0 (0%)	0 (0%)	15 (65%)	8 (35%)	0 (0%)
EC Nurse	1 (4%)	0 (0%)	1 (4%)	14 (52%)	11 (41%)	0 (0%)
Total	1 (2%)	0 (0%)	1 (2%)	29 (58%)	19 (38%)	0 (0%)

4.4.2.4 Emergency centre personnel perceptions of the length of observed handovers

Two (9%) ECP respondents indicated that the handovers they observed were too long, 24 (48%) ECP respondents indicated that the handovers they observed were of appropriate length, and 23 (46%) respondents indicated that the handovers they observed were too short. The results are depicted in Table 4-53.

Table 4-53: Do you think that handovers are generally

Respondent category	No response n= (%)	Too short n= (%)	Of	
			appropriate length n= (%)	Too long n= (%)
EC Doctor	0 (0%)	14 (61%)	7 (30%)	2 (9%)
EC Nurse	1 (4%)	9 (33%)	17 (63%)	0 (0%)
TOTAL	1 (2%)	23 (46%)	24 (48%)	2 (4%)

4.4.2.5 Emergency centre personnel perceptions of using mnemonics to ensure that handovers are comprehensive

Eleven (22%) ECP respondents strongly agreed that using mnemonics ensured that handovers were comprehensive. Thirteen (26%) ECP respondents agreed, six (12%) disagreed, and one (2%) strongly disagreed that using mnemonics ensured that handovers were comprehensive. The results are depicted in Table 4-54.

Table 4-54: Handing over using a mnemonic (DeMIST, SBAR, SOAP) is the best way to ensure that all the important information is handed over?

Respondent category	No response n= (%)	Strongly Disagree n= (%)	Disagree n= (%)	Unsure n= (%)	Agree n= (%)	Strongly Agree n= (%)
EC Doctor	1 (4%)	0 (0%)	6 (26%)	4 (17%)	9 (39%)	3 (13%)
EC Nurse	6 (22%)	1 (4%)	0 (0%)	8 (30%)	4 (15%)	8 (30%)
Total	7 (14%)	1 (2%)	6 (12%)	12 (24%)	13 (26%)	11 (22%)

4.4.2.6 Emergency centre personnel familiarity with commonly used mnemonics

The SOAP mnemonic was familiar to and used by 31 (62%) ECP respondents. Thirty (60%) ECP respondents had never heard of DeMIST, 34 (68%) had never heard of SBAR, 36 (72%) had never heard of CUBAN, 34 (68%) had never heard of ASHICE and 28 (56%) had never heard of the MIST mnemonic. The ECPs' familiarity with commonly used mnemonics are depicted in Table 4-55.

Table 4-55: Please indicate, by making a cross, with which of the following handover mnemonics you are familiar

Mnemonic	No response n= (%)	Have never heard of it n= (%)	Unfamiliar, but have heard of it n= (%)	Familiar and use it myself when I hand over n= (%)
DeMIST	9 (18%)	30 (60%)	6 (12%)	5 (10%)
SOAP	2 (4%)	9 (18%)	8 (16%)	31 (62%)
SBAR	9 (18%)	34 (68%)	4 (8%)	3 (6%)
CUBAN	9 (18%)	36 (72%)	4 (8%)	1 (2%)
ASHICE	10 (20%)	34 (68%)	5 (10%)	1 (2%)
MIST	9 (18%)	28 (56%)	9 (18%)	4 (8%)

4.4.2.7 Emergency centre personnel exposure to formal handover training

Thirty-three (66%) ECP respondents had no formal handover training, and 16 (32%) had been exposed to formal handover training. The results are depicted in Table 4-56.

Table 4-56: Have you ever received formal training on how to hand over?

Respondent category	No response n= (%)	No n= (%)	Yes n= (%)
EC Doctor	0 (0%)	17 (74%)	6 (26%)
EC Nurse	1 (4%)	16 (59%)	10 (37%)
Total	1 (2%)	33 (66%)	16 (32%)

4.4.2.8 Emergency centre personnel perceptions of the effect of prehospital emergency care personnel qualification on handover quality

Thirty-eight (76%) ECP respondents indicated that the qualification of PECP had a significant effect on the quality of their handovers. Eight (16%) ECP respondents indicated that the qualification of PECP had some effect on the quality of their handovers, and two (4%) respondents indicated that the qualification of PECP had a small effect on the quality of their handovers. The results are depicted in Table 4-57.

Table 4-57: To what extent do you think that qualification of the Ambulance Crew has a direct effect on the quality of handover?

Respondent category	No response n= (%)	No effect n= (%)	Small effect n= (%)	Some effect n= (%)	Significant effect n= (%)
EC Doctor	0 (0%)	0 (0%)	0 (0%)	5 (22%)	18 (78%)
EC Nurse	2 (7%)	0 (0%)	2 (7%)	3 (11%)	20 (74%)
Total	2 (4%)	0 (0%)	2 (4%)	8 (16%)	38 (76%)

4.4.2.9 Emergency centre personnel perceptions of how prehospital emergency care personnel qualification had an effect on how well they delivered handover

Respondents were asked to motivate their responses in Table 4- above. ECP linked the qualification of PECP with the quality of their handovers. Three themes were identified that related to the link between qualification and handover quality; there was a link between higher qualification and better handover quality, handover quality was linked to levels of experience, and higher qualification improved the deliverer’s levels of understanding and insight. It was interesting to note that one doctor respondent mentioned that lower qualifications provided more concise handovers. The categories and related quotes are depicted in Table 4-58.

Table 4-58: Emergency centre personnel perceptions of how prehospital emergency care personnel qualification had an effect on how well they delivered handover

Category	Respondent quotes
Link between higher qualification and better handover quality	<ul style="list-style-type: none"> • “Junior crews (BLS) usually give poor handovers possibly due to lack of experience. Senior crews (ALS) have more insight into patient care and thus tend to give more accurate handover.” • “The more qualified ambulance crew will give more effective and accurate handover.” • “A CCA or B Tech crew will do a thorough hand over and one that can usually be trusted. The basic ambulance crew often have very little information and look confused when you ask things.” • “An advance life support provider provides me with more information, not necessarily unnecessary things.”

Category	Respondent quotes
	<ul style="list-style-type: none"> • “If the ambulance crew is well trained, e.g. ALS, they provide critical information about the patient's injuries, objective data and what was done to the patient.”
Lower qualification (sometimes) provided more summarised handovers	<ul style="list-style-type: none"> • “Paradoxically - sometimes lower-level EMS (e.g. BAA) provide summarised crux of info - however may also be inadequate. And sometimes advanced level EMS (e.g. ALS) provide long-winded/irrelevant info - however most vital info can be extracted!”
Handover quality linked to levels of experience	<ul style="list-style-type: none"> • “In general, higher qualifications tend to provide more efficient and relevant handovers with more insight - however, probably more related to experience than level of qualification.” • “More experienced/advanced crew will give most if not all the information you need as a doctor, will even mention important negative findings.” • “I believe that the insight and experience of the ambulance crew will enhance the process.”
Higher qualification improved the deliverer's levels of understanding and insight	<ul style="list-style-type: none"> • “I find that ECPs have a greater understanding of injuries and disease and provide more relevant information. They do so with very little histrionics. CCAs tend to be histrionic. BLS are generally poor. ILS are variable.” • “The recipient's ability to understand the importance of specifically what information is being handed over. If a understanding, or even own medical knowledge is only basic, they will not fully interpret the significance of details being transferred.” • “Emergency care personnel who have some idea of physiology and some anatomical significance of injury are more succinct in their handover. They are concise, present relevant data, relevant [prehospital] interventions and this help[s] us process pts more efficiently.”

4.4.3 Emergency centre personnel open-ended responses

The analysis and coding of responses to open-ended questions was carried out as described in the methods section ([3.3.7.2. Questionnaire: Section B- Analysis of open-ended questions](#)).

4.4.3.1 The factors that emergency centre personnel felt contributed to ‘good’ handover

Respondents were asked to list five things they felt contributed to a handover being ‘good’. Data were coded, categorised, analysed and interpreted as described in the relevant section ([3.3.7.2. Questionnaire: Section B- Analysis of open-ended questions](#)). Some responses were only assigned single words, and for contextual purposes, these have been included. The themes and categories are depicted in Table 4-59.

Table 4-59: Contributors to effective handover identified by emergency centre personnel

Theme	Categories
Handover process factors	<ul style="list-style-type: none"> • Emergency centre handovers should be concise • PECP do not have appropriate equipment • Ongoing involvement in patient care • Patient privacy • Pre-notification for high-acuity patient • Self-introduction • Structure is important for a handover to be good • Training levels of PECP
Handover communication factors	<ul style="list-style-type: none"> • Attitude contributes to a good handover • Friendly and professional demeanour • Clear communication contributes to a good handover
Handover content	<ul style="list-style-type: none"> • Accuracy • Allergies • Demographics • Injuries • Mechanism of injury • Chronic medications • Patient history • Time frame

Theme	Categories
	<ul style="list-style-type: none"> • Treatment and interventions performed • Vital signs

4.4.3.1.1 *Process factors identified by emergency centre personnel as contributors to good deliverer handover*

Process factors that ECP respondents considered as contributing to PECP handovers being good included; conciseness, PECP should stay on in the emergency centre after handover to remain involved in patient care, patient privacy, and the emergency centre should be pre-notified of high-acuity patients who were en-route. In addition, structure was identified as contributing to a good handover, as were PECP who introduced themselves and the training level of PECP. Equipment, although not directly related to handover, related more to the shortage of equipment in the prehospital setting. This related to an apparent resultant inability of the PECP to perform tasks considered important by the receiving ECP. The categories and related quotes are depicted in Table 4-60.

Table 4-60: Process factors contributing to good handover

Category	Respondent quotes
Emergency centre handovers should be concise	<ul style="list-style-type: none"> • “Concise - summarised ... handover.” • Relevant info only - and can answer/provide info further requested by hospital ED staff if needed.” • “Good handover report must be sharp and to the point.” • “Clear concise handover when the receiving team are ready.”
PECP do not have appropriate equipment	<ul style="list-style-type: none"> • “Equipment (Inadequacy).” • “Equipment - if ambulance crew can have all necessary equipment (e.g. not taking HGT when you asks I don't have HGT machine).” • “Not enough equipment.” • “No stock.” • “No equipment.” • “They don't have equipments.”
Ongoing involvement in patient care	<ul style="list-style-type: none"> • “Although not part of handover - assistance with logroll etc.” • “Working with nurses to get the patient settled in the unit , not just standing and watching, e.g. With and MVA – help expose the patient and get patient onto unit's equipment.”

Category	Respondent quotes
	<ul style="list-style-type: none"> • “Participation in the care of patient.”
Patient privacy	<ul style="list-style-type: none"> • “Privacy (Maintaining it).” • “Privacy.”
Pre-notification for high-acuity patient	<ul style="list-style-type: none"> • “NB. Informing ED/Resus room of priority 1 patients (P1) arrival PRIOR (ETA) - in order for ED to prepare adequately ito clearing of bed, equipment needed, general management plan, investigations etc.”
Self-introduction	<ul style="list-style-type: none"> • “Incl. introduction of who you are/rank etc.” • “Greet staff.”
Structure is important for a handover to be good	<ul style="list-style-type: none"> • “... organized.” • “Algorithmic.” • “Organised, not haphazard” • “Uses a constructive method of handover, starting with mechanism and working outwards” • “Structural handover.”
Training levels of prehospital emergency care personnel	<ul style="list-style-type: none"> • “Highly qualified EMS.” • “A well-trained ambulance crew.” • “Level of training.” • “Level of experience.” • “Knowledge.”

4.4.3.1.2 Communication factors identified by emergency centre personnel as contributors to good deliverer handover

Communication factors that respondents considered as contributing to PECP handovers being good included; the attitude of the PECP deliverer of handover, a friendly and professional demeanour and clear communication (both verbal and written). A good, friendly and professional attitude was identified as a contributor to good handover. Clear communication included clarity of information, talking clearly, as well as providing clear written records. The categories and related quotes are depicted in Table 4-61.

Table 4-61: Communication factors contributing to good handover

Category	Respondent quotes
Attitude contributes to a good handover	<ul style="list-style-type: none"> • “Good attitude of ‘teamwork/approach’ by EMS - no cheek/attitude/arrogance or (vs) defeatist/‘inferiority’/aloof attitude.” • “Mutual respect.” • “Attitude between both people, respect.” • “Attitude - if people given each other report can have good attitude towards each other.” • “No attitude from any staff, or comments that can spark an attitude.” • “Professionalism. Tolerance from both sides.”
Friendly and professional demeanour	<ul style="list-style-type: none"> • “Pleasant demeanour when handing over.” • “Professionalism.” • “An ambulance crew must be friendly and easy to talk to.” • “Interpersonal skills, i.e. Friendly manner.”
Clear communication contributes to a good handover	<ul style="list-style-type: none"> • “Talk clearly, systematically and present your case hand over confidently.” • “Clarity of speech.” • “Good communication skills.” • “Communicating between crews and hosp.” • “Clear explanation of the case by paramedics.” • “Speaks clearly.” • “Clearly written records are often used in retrospect and give vital information once ambulance crew gone.”

4.4.3.1.3 Content factors identified by emergency centre personnel as contributors to good deliverer handover

Content factors identified by ECP as contributors to good deliverer handover included the accuracy of the handover as well as several patient variables for inclusion into emergency centre handover. The patient variables included allergies, patient demographics, patient injuries, the mechanism of injury or nature of illness, chronic medications, patient history, time

frames, treatment and interventions performed, and response to these statements and vital signs. The categories and related quotes are depicted in Table 4-62.

Table 4-62: Handover content factors contributing to good handover

Category	Respondent quotes
Accuracy	<ul style="list-style-type: none"> • “Accurate.” • “DO NOT confabulate information - if you didn’t do it, say so, or if you don't know.” • “Accuracy.” • “Correctness.”
Allergies	<ul style="list-style-type: none"> • “Patient’s allergies.” • “Allergies.”
Demographics	<ul style="list-style-type: none"> • “Start handover at pt demographics, confirming name, gender, age and working diagnosis.” • “Age etc.” • “Age.” • “Demography, Age, Sex.” • “Demography: Age, sex.”
Injuries	<ul style="list-style-type: none"> • “Type of injuries sustained.” • “Types of major injury.” • “Clear understanding of the injury/disease entity.” • “Anatomical location of major injuries.” • “Ambulance crew must properly examine patient's injuries prior to transportation.” • “Anatomical injuries, e.g. fractures.” • “Injuries identified.”
Mechanism of Injury or Nature of illness	<ul style="list-style-type: none"> • “Clear description of priority, injury/illness, and mechanism of injury.” • “Description of event at the scene.” • “Mechanism of injuries elicited appropriately and clearly.” • “I must add that photographs of the vehicle the patient has been in or a photo that represents the scene is very helpful. I think it needs to be looked at as part of handover, where possible.” • “Give full and accurate mechanism of injury.”

Category	Respondent quotes
Chronic medications	<ul style="list-style-type: none"> • “Medications pt is taking.” • “If patient brought from home - bring medication along.” • “Present illness and if there are any medications taken.” • “What medication is the pt getting.”
Patient history	<ul style="list-style-type: none"> • “Good proper history taken on scene.” • “Old notes in case of known chronic patients.” • “Present history and examination findings.” • “Comorbidities.” • “Complete knowledge of pt's history.” • “Good history.” • “Ambulance crew must get proper history from the patient or families or witnesses.”
Time frame	<ul style="list-style-type: none"> • “Time of event.” • “Accurate timing (every patient who has arrested on the way to hospital has always done so exactly as the ambulance arrives at the hospital!).” • “Time frames NB. Ask if any queries.” • “Time since incident.” • “Time of extrication.” • “If its poison what time incident occur.” • “Time.”
Treatment and interventions performed and response to these treatments	<ul style="list-style-type: none"> • “All procedure and medication administered.” • “Current treatment of acute event.” • “All done to patient before ED and not done.” • “Causation, - Pathogenesis, - Recognition, - Treatment.” • “Presentation/clinical findings/prehosp interventions.” • “What the patient's condition was on arrival at scene and progress during travel to hospital, highlighting important changes in patient's condition.” • “Give important positive and NEGATIVE findings.”
Vital signs	<ul style="list-style-type: none"> • “Vital signs / BP / Pulse ? Resp rate ? Temp / SpO₂. Glas Coma Score.” • “Accurate vital signs.” • “Is able to note changes in vitals on scene.”

Category	Respondent quotes
	<ul style="list-style-type: none"> • “Vitals mentioned.” • “Pre-hospital vitals/info - well documented for later reference/perusal prn.”

4.4.3.2 The factors that emergency centre personnel felt contributed to a ‘bad’ prehospital emergency care handover

ECP respondents were asked to briefly discuss some aspects that could make a handover ‘bad’. Data were coded, categorised, analysed and interpreted as described in the relevant section ([3.3.7.2. Questionnaire: Section B- Analysis of open-ended questions](#)). Some of the contributors to bad handover were linked to the opposite of those mentioned in the factors contributing to good handover. One respondent’s response highlighted this when he/she said “Opposite of the previous answers”. Responses were identified as barriers to effective handover and classified within the three primary aims of the study; process, communication, and content of emergency centre handover. Themes and categories are summarised in Table 4-63.

Table 4-63: The factors that emergency centre personnel felt contributed to a ‘bad’ prehospital emergency care handover

Category	Respondent quotes
Handover process factors	<ul style="list-style-type: none"> • PECP rushed their handovers • ECP were critical of the level of patient care provided by PECP • PECP did not have appropriate equipment • Compromising of patient privacy • Lack of knowledge related to emergency centre practices • PECP did not pre-notify the emergency centre when bringing in high-acuity patients
Handover communication factors	<ul style="list-style-type: none"> • PECP had a generally poor attitude • PECP had poor communication skills • PECP had poor listening skills
Handover content	<ul style="list-style-type: none"> • PECP exhibited a lack of knowledge about the patient • PECP’s handovers were incomplete and were missing information • PECP provided unclear or irrelevant information

Category	Respondent quotes
	<ul style="list-style-type: none"> • PECP's handovers were of inappropriate length • There was a lack of structure to PECP handovers

4.4.3.2.1 Process factors identified by emergency centre personnel as contributors to bad handover by prehospital emergency care personnel

Process factors that ECP respondents considered as contributing to PECP handovers being bad included: PECP rushed their handovers; ECP were critical of the level provided by patient care by PECP; PECP did not have appropriate equipment; and that patient privacy was compromised during the handover process. In addition, PECP lacked knowledge related to emergency centre practices and did not pre-notify the emergency centre when bringing in high-acuity patients. The categories and related quotes are depicted in Table 4-64.

Table 4-64: Process factors identified by emergency centre personnel as contributors to bad handover by prehospital emergency care personnel

Category	Respondent quotes
PECP rushed their handovers	<ul style="list-style-type: none"> • "A rushed handover and if important details regarding the patient's condition and mechanism of injury are omitted for example." • "Not waiting for completion of primary survey in P1 cases." • "When a handover becomes a "Dumping time"." • "Paramedics disappear." • "When paramedics are in a hurry, saying that they are about to knock off." • "They always come in a hurry stating that they are called somewhere."
ECP were critical of the level of patient care provided by PECP	<ul style="list-style-type: none"> • "Poor assessment and management on scene eg HGT not done while patient is diabetic." • "Patients comes with hypoglycaemia no line, or low blood pressure nothing has been done, scoop and drive." • "When they come with the patient that is having no drip but having severe dehydration – telling you that it is not their scope." • "Understanding that patient if dehydrated need to have a drip. When telling they say it's not in their scope of practice."

Category	Respondent quotes
	<ul style="list-style-type: none"> • “Patient diabetic, no drip inserted, no backup – not qualified to put up a drip.” • “Patient hypotensive but having a blue Jelco and a 60 dropper.”
PECP did not have appropriate equipment	<ul style="list-style-type: none"> • “No proper equipment.” • “Lack of knowledge and lack of resources.” • “Dirty equipment e.g. Scoop has old blood or mud on it; head blocks that are grubby.”
Compromising of patient privacy	<ul style="list-style-type: none"> • “Privacy of patient when invaded.” • “Lack of privacy.” • “Discussing personal issues of the patient, in front of other patients.”
Lack of knowledge related to emergency centre practices	<ul style="list-style-type: none"> • “Lack of knowledge/uninformed re. hospital/triage policies, e.g. P3 (Green) patients to correct facilities. not seen at all L1 (quaternary/tertiary) hospitals.” • “Lack of info re ‘Hospital divert/closure’ policies - need to transfer P1 to another facility once stabilised, etc: knowledge of which priority patients hospital is closed to.” • “Not knowing how to prioritise their patients, e.g. P1, P2, P3.”
PECP did not pre-notify the emergency centre when bringing in high-acuity patients	<ul style="list-style-type: none"> • “No notification prior to ED arrival for P1 patients! (Often no available bed, equipment previously used etc...) Incorrect sense of ‘urgency/emergency’”

4.4.3.2.2 Communication factors identified by emergency centre personnel as contributors to bad deliverer handover

A poor attitude by PECP was identified as a contributor to bad handover. ‘Arrogance’ and ‘rudeness’ were terms used to describe what a bad handover entailed. Additional identified categories included that PECP had poor communication skills and poor listening skills. The categories and related quotes are depicted in Table 4-65.

Table 4-65: Communication factors contributing to bad handover

Category	Respondent quotes
PECP had a generally poor attitude	<ul style="list-style-type: none"> • “Obstructive and petty attitudes (and condescending approach).” • “Comments that are made whilst we are busy with patient (often not constructive).” • “Attitude = between two people taken report and between nurses.” • “Attitude of both the paramedics and nurses.” • “Bad attitude and derogative comments, e.g. ‘Not the hospital of our choice’.” • “Being loud and obnoxious. Being impatient with crews or nursing staff member when one is not on the same intellectual level. Personal vendettas caused by prior altercations.” • “Some act like taxi drivers, is it not important to combine, like you cannot put same category on same ambulance is just quantity not quality.”
PECP had poor communication skills	<ul style="list-style-type: none"> • “Lack of good communication between nurses, doctors and paramedics.” • “Rudeness / unpleasantness when speaking.” • “Poor knowledge in English.” • “Argument over the patient condition.” • “Communication, e.g. Language.” • “Poor body language. Body odour, including halitosis. Communication error / language barrier.” • “No eye contact, mumbling, speaking softly. Language barrier: Some individuals are clearly not comfortable speaking English so you can end up with poor info or they speak their home language.”
PECP had poor listening skills	<ul style="list-style-type: none"> • “Bad listening skills.” • “Poor listening skills when taking history.” • “Poor listening skills.”

4.4.3.2.3 Content factors identified by emergency centre personnel as contributors to bad deliverer handover

Lack of knowledge about the patient and missing information were identified as contributors to bad PECP handover. Although closely linked, these were categorised separately. Additional categories identified included PECP who exhibited a lack of knowledge about the patient; PECP’s handovers were incomplete and missing information; PECP provided unclear or irrelevant information; PECP’s handovers were of inappropriate length; and there was a lack of structure to PECP handovers. The categories and related quotes are depicted in Table 4-66.

Table 4-66: Handover content factors contributing to bad handover

Category	Respondent quotes
PECP exhibited a lack of knowledge about the patient	<ul style="list-style-type: none"> • “We’ve a couple of EMS who came with patient in ED without knowing anything about the patient.” • “When the ambulance crew actually don't know what is going on with the patient.” • “Lack of knowledge/info re patient - cannot provide necessary/useful info.” • “No / little knowledge of important information described before.” • “Inconclusive assessment.” • “Poor assessment and management on scene e.g. HGT not done while patient is diabetic.” • “Patient classified as 'unknown' when the GCS is 15/15 patient talking.” • “Not even having vital data on pt and waiting for nurses to do vitals in order to write them for your notes.” • “Unable to answer question relating to the patient’s condition/injury, e.g. Mechanism of injury.”
PECP’s handovers were incomplete and were missing information	<ul style="list-style-type: none"> • “A handover is bad when it doesn’t contain the critically important information about regarding the pt.” • “Not knowing the vital signs of the patients.” • “Not knowing the GCS of a patient. Vital signs not recorded.” • “Lower category having to transport patient and then missing important information of patient.”

Category	Respondent quotes
	<ul style="list-style-type: none"> • “Not having written down (? Done) vital data, waiting for us to do it to fill out their documentation.”
PECP provided unclear or irrelevant information	<ul style="list-style-type: none"> • “Waffling.” • “Irrelevant details.” • “Lists of irrelevant history / clinical findings.” • “Irrelevant information.” • “They sing their report. Can they please talk straight forward and leave medical terms out.” • “Referral letter they don’t understand the patient sickness.” • “When they just read the referral letter and says they don’t understand some terms that are used.”
PECP’s handovers were of inappropriate length	<ul style="list-style-type: none"> • “Too short or too long.” • “Too long.” • “Hand over report that is too short.” • “Time spent on handover too short.”
There was a lack of structure to PECP handovers	<ul style="list-style-type: none"> • “Poorly structured.” • “Unstructured handover.” • “Lack of knowledge on formal handover training.”

4.4.3.3 The factors that emergency centre personnel identified as being potential contributors to improved emergency centre handover

Respondents were asked to provide suggestions related to what they believed could be done to improve the standard of handover within the emergency centre. Data were coded, categorised, analysed and interpreted as described in the relevant section ([3.3.7.2. Questionnaire: Section B- Analysis of open-ended questions](#)). There were four themes identified from the transcripts, namely the need for education and training, and three that were directly related to the aims of the project. These three themes were related to emergency centre handover content, handover process and handover communication. The relevant themes and categories are depicted in Table 4-67.

Table 4-67: Themes and categories that emergency centre personnel identified as being potential contributors to improved emergency centre handover

Theme	Categories
Education and training had the potential to improve emergency centre handovers	<ul style="list-style-type: none"> • There was a general need for handover training • PECP required training • Interprofessional collaboration as an educational strategy to improve emergency centre handover
There were improvement opportunities within handover process	<ul style="list-style-type: none"> • There should be a standardised approach to emergency centre handover • One person should be involved in the delivery and one person involved in the receipt of emergency centre handover
Strategies to improve handover communication	<ul style="list-style-type: none"> • An environment of mutual respect needs to be cultivated between PECP and ECP • Communication strategies with the potential to improve emergency centre handover
Handover content could be improved	<ul style="list-style-type: none"> • Handover content identified by ECP whose inclusion would improve emergency centre handover • Written documents augment verbal content

4.4.3.3.1 Education and training factors identified by emergency centre personnel as potential strategies to improve handover quality between prehospital emergency care and emergency centre personnel

The need for handover training was a theme that generated three categories, namely a general need for handover training; that PECP required training; and that interprofessional collaboration was an educational strategy that could be used to improve emergency centre handover. The categories and related quotes are depicted in Table 4-68.

Table 4-68: Education and training factors identified by emergency centre personnel as potential strategies to improve handover quality between prehospital emergency care and emergency centre personnel

Category	Respondent quotes
There was a general need for handover training	<ul style="list-style-type: none"> • “Training: Proper and adequate of ambulance crew and doctors and nurses, porters and security guards. Everybody should know about the information of transporting a critical patient.” • “Training of all individuals (nurses, doctors) in the department are taught the basic concepts of handover in practical manner to allow the unit to be a coherent well functioned unit.” • “Formal education/training on handover.” • “Ensure EMS & ED staff taught/familiarised with these policies - also educating hospital staff re recognition (scope and practice) of different EMS levels and vice versa.” • “Training and experience go hand in hand as less experienced and poorly trained personnel give poorer handovers than those that are highly skilled, experienced and trained.”
PECP required training	<ul style="list-style-type: none"> • “Regular training of ambulance crews.” • “Proper training of paramedics in respect to history taking and handover.” • “Some formal guidance as to the bare minimum information required during handover for beginners.”
Interprofessional collaboration as an educational strategy to improve emergency centre handover	<ul style="list-style-type: none"> • “Cross exposure between fields, e.g. Drs in pre-hosp environments as compulsory part of rotation as well as nurses, with training of Drs and nurses about differences in scope of practice of ECP, ECT etc.” • “Understanding of disciplines.” • “Nursing staff members needs to do ‘road’ shifts to get a better understanding of the struggles of working on the road and vice versa.”

4.4.3.3.1 Handover process factors identified by emergency centre personnel as potential strategies to improve handover quality between prehospital emergency care and emergency centre personnel

Handover process factors identified by ECP as potential strategies to improve handover quality between PECP and ECP comprised the inclusion of a standardised approach to emergency centre handover, and that one dedicated person should be involved in the delivery or receipt of the emergency centre handover. The categories and related quotes are depicted in Table 4-69.

Table 4-69: Handover process factors identified by emergency centre personnel as potential strategies to improve handover quality between prehospital emergency care and emergency centre personnel

Category	Respondent quotes
There should be a standardised approach to emergency centre handover	<ul style="list-style-type: none"> • “Everyone should use a standard pro-forma type for handover.” • “Consensus and use of a nationwide, single designed handover form/regime, including all immediately relevant details.” • “Standardised protocols for handover so that relevant information is not overlooked.”
One person should be involved in the delivery and one person involved in the receipt of emergency centre handover	<ul style="list-style-type: none"> • “One person should give a handover.” • “One paramedic must understand her/his patient before handing over. E.g. vitals, history and other.” • “There must be one person who is responsible of taking report to paramedics.” • “One person should give a handover.”

4.4.3.3.1 Handover communication factors identified by emergency centre personnel as potential strategies to improve handover quality between prehospital emergency care and emergency centre personnel

ECP identified handover communication factors as potential strategies to improve handover quality between PECP and ECP, including that an environment of mutual respect needed to be cultivated between these two groups. In addition, respondents suggested some generic

communication strategies that had the potential to improve emergency centre handover communication. The categories and related quotes are depicted in Table 4-70.

Table 4-70: Handover communication factors identified by emergency centre personnel as potential strategies to improve handover quality between prehospital emergency care and emergency centre personnel

Category	Respondent quotes
An environment of mutual respect needs to be cultivated between PECP and ECP	<ul style="list-style-type: none"> • “Cultivating and ‘ideal’ attitude of ‘Teamwork’ & willingness to participate/assist in ‘team’ as needed - not just ‘dumping’ patients and inappropriately transferring patients to incorrect facility... etc.” • “Mutual respect between EMS and hospital staff members.” • “There must be mutual respect from ambulance crew and staff at hospital.” • “Ego management.” • “Positive view – don’t judge people, don’t let past history affect your attitude today.” • “All staff need to respect one another’s profession.”
Communication strategies with the potential to improve emergency centre handover	<ul style="list-style-type: none"> • “Nursing must show respect, i.e. listen to handover, don’t interrupt, make eye contact, positive body language (a smile!). Paramedics should also respect nurses by also making eye contact, remaining professional and not roll their eyes at one another when they think a nurse is ‘stupid’.” • “Open communication channels.” • “Communication between staffs (nurses, paramedics, doctors).”

4.4.3.3.1 Handover content factors identified by emergency centre personnel as potential strategies to improve handover quality between prehospital emergency care and emergency centre personnel

Handover content factors identified by ECP as potential strategies to improve handover quality between PECP and ECP included the inclusion of specific information, and written documents had the potential to augment verbal content. The categories and related quotes are depicted in Table 4-71.

Table 4-71: Emergency centre handover content factors identified by emergency centre personnel as potential strategies to improve handover quality between prehospital emergency care and emergency centre personnel

Category	Respondent quotes
Handover content identified by ECP whose inclusion would improve emergency centre handover	<ul style="list-style-type: none"> • “Take proper history.” • “State all the procedure done, bring in some instance proof of drug overdose content.” • “Good history taking from the scene/patient and relatives.” • “Old file in the case of known chronic patients.” • “Importance of taking the initial vital signs of the injured patient.” • “Keeping their records up to date, e.g. Vital signs.”
Written documents augment verbal content	<ul style="list-style-type: none"> • “Well designed and completed documents assist with handover.” • “The document that remains with patient should also be completed in full and remains with the pt.” • “Hard copy of documents used (PRF).” • “Receiving a complete filled PRF.”

4.5 Emergency centre personnel: Study Two - Qualitative

4.5.1 Demographics

A total of 15 face-to-face, semi-structured interviews were conducted. Nine interviewees were medical practitioners, one was a clinical associate, and five were nursing personnel. The interviewee category and experience demographics of the interviewees are depicted in Table 4-72.

Table 4-72: Emergency centre interviewee demographics

Interview number	Interviewee qualification	Years qualified	Total EC experience	Further studies	Interview length
ECDR01	EC Doctor	7 years	3 years	Registered: MMed	55 min 22 sec
ECDR02	EC Doctor	20 years	12 years	None	19 min 56 sec
ECDR03	EC Doctor	6 years	3 years	Diploma: Emergency Care	28 min 00 sec
ECDR04	EC Doctor	8 years	6 years	Registered: MMed	24 min 34 sec

Interview number	Interviewee qualification	Years qualified	Total EC experience	Further studies	Interview length
ECDR05	EC Doctor	9 years	6 years	MMed	22 min 58 sec
ECDR06	EC Doctor	4 years	6 months	Registered: MMed	26 min 38 sec
ECDR07	EC Doctor	7 years	5 years	Registered: MMed	18 min 30 sec
ECDR08	EC Doctor	7 years	5 years	Registered: MMed	15 min 23 sec
ECDR09	EC Doctor	9 years	6 years	Registered: MMed	34 min 33 sec
CLAS01	Clinical Associate	5 years	5 years	Registered Honours: Emergency	27 min 30 sec
ECNS01	Professional	2 years	2 years	None current	29 min 07 sec
ECNS02	Professional	2 years	2 years	None current	18 min 16 sec
ECNS03	Enrolled nursing assistant	4 years	4 years	Registered MBChB	28 min 30 sec
ECNS04	Professional	5 years	5 years	None	12 min 51 sec
ECNS05	Registered	8 years	6 years	Registered BCur	23 min 48 sec

Interviews were conducted in a variety of locations determined according to the availability of the interviewee. The transcripts for the prehospital interviews are available at the link:

https://www.dropbox.com/sh/oggvderprsltm9n/AAB_AgQIKJhJOW9X0a6ASeRa?dl=0

The code report from Atlas.ti® is available at:

<https://www.dropbox.com/s/fqgkdkdu34dsk5p/EMERGENCY%20CENTRE%20CODES.doc?dl=0>

4.5.2 Themes, categories, codes and quotes from prehospital emergency care personnel interviews

Respondents were interviewed using the relevant interview protocol ([Appendix 9 Emergency centre personnel interview questions](#)). Data were coded, categorised, analysed and interpreted as described in the relevant section ([3.4.4.1 Qualitative data analysis](#)). Data were read both vertically and horizontally. Vertical reading involved reading an entire interview transcription from top to bottom and reflecting on the interview in its entirety in a sequential manner.²³⁶ This allowed for better immersion into and contextualisation of the data and for the development of a better idea of what each interviewee's most pertinent issues were. Horizontal reading involved opening all transcripts in Atlas.ti® and reading across questions between interviews.²³⁶ This comprised reading the responses to a specific question from one interviewee and then moving to the following transcript and reading the same question's

responses from a different interviewee. Given that themes would be most likely to occur within specific question responses, horizontal reading and coding were the primary coding method employed. Where vertical reading identified codes related to other questions, these codes were assigned to the appropriate theme or category. A tabular document was used to keep track of coding by question in the interviews and which had been analysed under the question themes.

Codes were grouped into categories and further analysed to produce dominant themes. The dominant themes related directly to the aims of the study and grouped the categories under the themes, Content, Process and Communication. A further theme that was identified related to improvement strategies for emergency centre handover. The themes and categories are depicted in Table 4-73.

Table 4-73: Themes and categories related to prehospital emergency care personnel interview data

Theme	Sub-theme
Handover process	<ul style="list-style-type: none"> • PECP did not assess nor manage their patients appropriately prior to taking them to the emergency centre • ECP indicated that PECP had a tendency to rush their handovers in the emergency centre • ECP indicated that they would appreciate assistance from PECP in the ongoing care of a patient • ECP indicated that they would appreciate pre-notification especially when PECP were bringing in high-acuity patients • ECP indicated that PECP sometimes demanded preference to deliver their handover • ECP indicated that there was a difference in handover quality between PECP employed by the private and state-funded services • PECP left without handing over their patient appropriately
Handover communication	<ul style="list-style-type: none"> • ECP indicated that respect was bidirectional and that interprofessional relationships were important

Theme	Sub-theme
	<ul style="list-style-type: none"> • ECP indicated that the attitude or PECP was a contributor to handover • ECP indicated that there was a lack of knowledge related to PECP's scopes of practice
Handover content	<ul style="list-style-type: none"> • ECP indicated that handover quality was linked to the qualification of the person delivering the handover • ECP indicated that PECP with higher qualifications were better able to contextualise the patient • ECP identified specific aspects of a prehospital emergency care handover that made a handover good • ECP indicated that detailed information from the scene was an important information source • ECP indicated that PECP handovers where information was missing presented challenges related to ongoing patient care
Handover improvement	<ul style="list-style-type: none"> • ECP indicated that interprofessional collaboration and education was an important strategy towards improving emergency centre handover • ECP indicated that it was time for the development of a handover that was specifically developed for the emergency centre • ECP indicated that non-specific standardisation was a potential strategy for emergency centre handover improvement

4.5.2.1 Theme One: Emergency centre handover process factors identified by emergency centre personnel

The theme relating to emergency centre handover processes emerged from codes and categories that were associated with the process of patient handover within the emergency centre. Seven sub-themes were identified as challenges to effective handover. Categories under each sub-theme were expounded upon using quotations from the interview transcripts. A summary of the categories and related sub-categories is depicted in Table 4-74.

Table 4-74: Emergency centre handover process sub-themes and categories identified by emergency centre personnel

Sub-theme	Category
PECP did not assess nor manage their patients appropriately prior to taking them to the emergency centre	<ul style="list-style-type: none"> • PECP did not assess their patients appropriately • One component of poor assessment was poor history taking • Poor prehospital assessment may be linked to austere environment in which they work • Experience had the potential to improve quality of patient assessment • PECP did not manage their patients appropriately • Lower qualified PECP lacked the knowledge or scope to adequately contextualise or manage patients
ECP indicated that PECP had a tendency to rush their handovers in the emergency centre	<ul style="list-style-type: none"> • PECP rushed their handovers because they had outstanding cases to attend to or needed to go back to base or home • The rush for prehospital personnel to leave was attributed to a lack of knowledge about their patient • The rush was not necessarily related to the handover itself, rather the focus was on having the process of handing over concluded • Rushed handovers were primarily attributed to lower qualified PECP • PECP were not prone to rushing their handovers • ECP also leave at shift change • The effect of a rushed or inaccurate handover on ECP • PECP handovers were most rushed around shift change
ECP indicated that they would appreciate assistance from PECP in the ongoing care of a patient	<ul style="list-style-type: none"> • ECP were appreciative of the assistance offered by PECP who remained after handover to assist with patient management • PECP staying in the emergency centre may present them with the opportunity to better their practice • Assisting with ongoing patient care was identified by ECP as contributing to building better relationships

Sub-theme	Category
	<ul style="list-style-type: none"> • The willingness of PECP is affected by their reception in the emergency centre • Higher qualified PECP usually have higher acuity patients and are more willing to help • Some PECP refused to assist
<p>ECP indicated that they would appreciate pre-notification especially when PECP were bringing in high-acuity patients</p>	<ul style="list-style-type: none"> • Lack of pre-notification negatively affects emergency centre preparedness for high-acuity patients • Lack of pre-notification compounds understaffing issues and delays
<p>ECP indicated that PECP sometimes demanded preference to deliver their handover</p>	<ul style="list-style-type: none"> • ECP indicated that PECP sometimes demanded preference to deliver their handover despite the emergency centre being a busy place
<p>ECP indicated that there was a difference in handover quality between PECP employed by the private and state-funded services</p>	<ul style="list-style-type: none"> • ECP perceived privately employed PECP as better than those employed by state-funded services • Emergency centre staff had a higher expectation from private as opposed to state-funded PECP
<p>PECP left without handing over their patient appropriately</p>	<ul style="list-style-type: none"> • ECP indicated that PECP sometimes ‘dumped’ patients in the emergency centre without handing over • Better understanding of delays for delivery of handover in the emergency centre was linked to higher qualification

4.5.2.1.1 Prehospital emergency care personnel did not assess nor manage their patients appropriately prior to taking them to the emergency centre

ECP indicated that PECP did not adequately assess their patients, and prehospital management of the patient was often inadequate. This was not necessarily scope dependent, but was sometimes attributed to general disinterest in appropriately managing patients. History taking was identified as one of the primary areas of patient assessment that was lacking. This specifically related to chronic conditions and resultant misdiagnosis as a result of the poor history obtained. One of the complications of inadequate prehospital patient assessment was that the emergency centre was required to perform potentially unnecessary confirmatory tests. In addition, the lack of information – that would have been available had the patient been assessed appropriately – resulted in delays in diagnosis or admission to the inappropriate facility. The respondent quotes associated with each category are depicted in Table 4-75.

Table 4-75: Prehospital emergency care personnel did not assess nor manage their patients appropriately prior to taking them to the emergency centre

Category	Respondent quotes
PECP did not assess their patients appropriately	<ul style="list-style-type: none"> • “Like I said the BLS drivers, ambulance drivers, they really don’t even know what to look for, so then the assessment of a patient would be very, very poor, they’ll come here give you one thing, you ask them what is the GCS, and then the other one told me they don’t have a GCS machine.” • “You know, some conditions they do look alike, like we once had a patient who had a traumatic brain injury, who was shouting and doing everything, but when they brought him here they said the patient is psychotic. Yes, the patient is a psych patient.”
One component of poor assessment was poor history taking	<ul style="list-style-type: none"> • “Generally, they don’t usually mention if the patient is on any chronic medication, they don’t ask the relatives most of the time if the patient is like attending some sort of clinic or anything of that sort, they don’t ask most of the time.” • “History’s usually quite brief, I mean they usually just say they picked them up he’s been confused for few days and that’s it. Like nothing else, like I would like to know what happened that day you know what leading up to it and

Category	Respondent quotes
	<p>sometimes they don't think about it ... that sort of general background like what I really need to know is the chronicity of it. You know that's about it, sometimes they're just a little bit too brief."</p>
<p>Poor prehospital assessment may be linked to austere environment in which they work</p>	<ul style="list-style-type: none"> • "I think we get the same complaints from the in-hospital crew with regard to the emergency centre assessment, so what I always try and remind myself is, and I mean I've only stopped at the pre-hospital a couple of times and it's a completely different environment. So, yes there are time that you'll have an incomplete assessment, but your assessment is based on what you had at that moment in time. That's why I don't fault the guys when they come in with the drip they can't put up or whatever, I have much better lighting than they do." • "As I said, with my experience of knowing and being on the road it's very difficult to get a good assessment. I think the emphasis on the history that they get from where they're at, that lays a solid crux on what actually happens."
<p>Experience had the potential to improve quality of patient assessment</p>	<ul style="list-style-type: none"> • "Actually, I'm not sure how to answer that one because I know the ones that I was with and I was involved in generally they have good assessments, they have you know, they've been assessed relatively well. I think the mistakes that get made are generally from, not so much lack of knowledge but lack of experience. You know, attributing things to something that somebody's written in a textbook rather than actually taking it picked up from experience with working with a lot of patients, but, I personally haven't had really much in that sort of way."
<p>PECP did not manage their patients appropriately</p>	<ul style="list-style-type: none"> • "I don't think they, and some of them I don't know, I think there's no insight to it and I mean maybe some people are not interested but a lot of them either they don't know and they feel insecure or they just don't care. Which sometimes is a bit hard to tell and then when you ask them for "why didn't you do this" and they get very defensive and the EMS, they're not interested. ... some of them are just really not

Category	Respondent quotes
	<p>interested at all, they just think like they're being judged because they didn't think about it."</p> <ul style="list-style-type: none"> • "Yes, we've once had an incident where a patient was hypoglycaemic, we were like why didn't you insert any drip, why didn't you give sugar? Even though you can't, just give sugar you know via an orange, they'll be like no don't tell us what to do, you know what, you know like they give you some sort of ridiculous explanations and then you go, why I was just asking, and then they just fight you, like okay." • "... instead off a patient coming in as a P1, maybe the patient could have come in as a P2, but because you didn't intervene or do anything, now you're bringing a patient who's worse than what they could have been. So, now it's going to be more work for us because now we have to do extra."
<p>Lower qualified PECP lacked the knowledge or scope to adequately contextualise or manage patients</p>	<ul style="list-style-type: none"> • "Like I'm saying with the BLS, they are not exposed to all those sort of things. They need to have that interest of knowing how to do things that can help the patient in the long run, the basic things. I know IV line, it's on the intermediate level but I think basic life support people should be able to learn those simple things. I've met a couple of them, when they are in a resus, that they are not sure what they are doing."

4.5.2.1.2 Emergency centre personnel indicated that prehospital emergency care personnel had a tendency to rush their handovers in the emergency centre

ECP indicated that PECP had a tendency to rush their handovers. Some reasons postulated for this practice were that PECP often had outstanding cases that they needed to attend to and the rush for prehospital personnel to leave was attributed to a lack of knowledge about the patient they had handed over. Rushed handovers were primarily attributed to less qualified PECP and the rush was not necessarily related to the handover itself; instead, the focus was on having the process of handing over concluded. Rushed or inaccurate handovers resulted in frustration and conflict for ECP and PECP. One respondent indicated that PECP were, in fact, not prone to rushing their handovers and another that ECP were also guilty of leaving

tasks undone during shift change. There was an underlying perception that handovers were most rushed around shift change. The categories and quotes are depicted in Table 4-76.

Table 4-76: Prehospital emergency care personnel had a tendency to rush their handovers in the emergency centre

Category	Respondent quotes
<p>PECP rushed their handovers because they had outstanding cases to attend to or needed to go back to base or home</p>	<ul style="list-style-type: none"> • “Yes sometimes because they will tell you that they have other calls, they have to rush somewhere to fetch another patient somewhere you know, mostly they tell us that...That they have to rush somewhere so they can’t wait for so long.” • “Yes, no I find that’s always the main issue that you know what, we need to handover this patient and then we need to go, we have another call waiting. ... So yes I’ve had points where they just ‘we just want to drop off this patient and go’. ‘We’ve got another call’.” • “There’s general but mostly they become more impatient close to knockoff time because they’ll tell you that they still have to go back to base and leave the ambulance.” • “Yes, it’s almost all the time. It’s handovers, it’s we want to, we want to get out of here as fast because we a knocking off or we... say I’m knocking off at five, but I happen that I am bringing the patient now at half past four, I know that I’ll be stuck in traffic and I need to get home and all those things. So, it’s... actually handovers is always like that.”
<p>The rush for prehospital personnel to leave was attributed to a lack of knowledge about their patient</p>	<ul style="list-style-type: none"> • “... but to me I would only duck if I didn’t know what was going on, that’s the only time I would duck but I you know what’s going on you would stand and say hey this is what’s going on with my patient and this is what’s important, this is what I’m expected to do, but also levels of qualification and just the subjective nature of how an individual sees their profession. You’ve got people that are absolutely professional to the team, come hail or thunder and you’ve got people that just say hey my job is

Category	Respondent quotes
	<p>to bring the patient to the hospital, I brought the patient to the hospital.”</p> <ul style="list-style-type: none"> • “... with the confidence and what not, [they] want to try to get out the situation as fast as possible. If the patient is not well, people tend to be scared. They start off coming to be hands on and can tell the patient is dying, you’re trying to take your problems and give it to someone else, and yes stay away from it.” • “Yes so it has happened but I normally find people rush when they actually don’t know what’s going on and they’re unsure of themselves and they...Those are the type of times when I feel that they rush, sometimes yes. Yes because they don’t want to yes, phase in and then once or twice when you’ve seen the same guy five or six times, shame I think they also start feeling a bit bad. And the handovers become shorter and shorter as the night goes on.” • “Most of them they get here maybe at around half past six or quarter to seven, you get there and you like what’s wrong with the patient? ... Yes, around about shift change, they don’t play, they don’t play.”
<p>The rush was not necessarily related to the handover itself, rather the focus was on having the process of handing over concluded</p>	<ul style="list-style-type: none"> • “The ALSs don’t because yes, they’re waiting for the next call. I don’t know, it didn’t feel that way. It didn’t feel like they rush it, ... All they care about for me most of the time, the EMS system is that they want you to sign so they can open a file like you know? The system wants them to do, okay get it over and done with and move on and yes, they don’t really, not interested, yes.” • “Since we are used to them we try to get them to give us information first before they go, because sometimes we triage the patient and then we give them that triage paper to take it to the clerks there so that they can just open a file. And then they bring the papers back to us, so if they got the signature from the doctor because there’s only one. In their paper so that they can show their

Category	Respondent quotes
	<p>management or something they've got a signature, they will just leave. They don't care what's happening, they just leave without getting that paper to the clerks."</p>
<p>Rushed handovers were primarily attributed to lower qualified PECP</p>	<ul style="list-style-type: none"> • "... as I've said I've had experiences with that and as I've said to be honest, it's more with the BLS guys. I'm guessing it's because they are on the frontlines and they receive more calls than the guys who are ILS and ALS hence they're more in a rush and everything, because it's quite rare to get that with your ALS guys and ILS guys, it is more with your BLS guys and everything."
<p>PECP were not prone to rushing their handovers</p>	<ul style="list-style-type: none"> • "It depends really, I know that we sometimes take delay in terms of receiving their handover because we're busy with other stuff and then maybe they also get a bit tiffed up with regards to that but generally even when it's like seven o'clock you know they're not to rush it. I haven't had experience with that a lot or I haven't noticed that a lot."
<p>ECP also leave at shift change</p>	<ul style="list-style-type: none"> • "... that definitely happens [around shift change], and again that's across the board because even in the hospital setting, come shift change people go missing, things are left undone, it's always chaotic, and it's a mess. But again, if it's a professionally run department or a professionally run team, loopholes like that are never left as loopholes, they are always readdressed at every shift to say this is how we're doing this, as a team"
<p>The effect of a rushed or inaccurate handover on ECP</p>	<ul style="list-style-type: none"> • "Eish...we just, most of the time it takes us a step back instead of taking us forward because you... but with this factor one two three four five, you are lying, then they start getting all worked up and then they get angry at you, then it's you know we're giving each other piece of our mind, just because of that." • "How does it affect us? Us as nurses because it's also our handover time, you have to know each and every patient as a shift leader, I'm a shift leader sometimes, yes. You have to know each and every patient, it's the peak time

Category	Respondent quotes
	for us that time, so we usually have resusses, relatives, psych patients are all going 'deurmekaar' and everything, so now you have to triage that patient, you have to know each and every patient in the ward and be able to give report, a proper report regarding that patient and what's going to happen, the plan and everything. So, now they are here they're rushing you, they're like no do this, do that, and we're like... we become frustrated. Yes, and then you end up being angry and pissed off and then the fight starts again, exactly."
PECP handovers were most rushed around shift change	<ul style="list-style-type: none"> • "Especially around six o'clock, or towards seven o'clock, that's when they rush, that's the rush time and they're like no, take the patient, hey, hey, hey, hey, and I'm like... yes. Yes, it happened quite often, yes. It's shift time, yes."

4.5.2.1.3 *Emergency centre personnel indicated that they would appreciate assistance from prehospital emergency care personnel in the ongoing care of a patient*

ECP indicated that they would appreciate assistance from PECP in the ongoing care of a patient. One of the advantages of PECP remaining after handover was that they were able to observe emergency centre patient management and potentially use this as a learning experience to better their practice. Should they remain to assist, PECP would also be available to give information that may have been omitted or appeared irrelevant during the initial handover. PECP assisting with patient management after handover was perceived to be an important facilitator to building better relationships and their willingness to assist was affected by how they were received in the emergency centre. ECP perceived higher qualified PECP as being more willing to assist, but this may have been related to the higher acuity of the patients that they brought into the emergency centre. One of the respondents gave an example of PECP who had refused to assist in moving a stroke patient to the CT scanner as it was not their job. The relevant categories and quotes are depicted in Table 4-77.

Table 4-77: Emergency centre personnel indicated that they would appreciate assistance from prehospital emergency care personnel in the ongoing care of a patient

Category	Respondent quotes
ECP were appreciative of the assistance offered by PECP who remained after handover to assist with patient management	<ul style="list-style-type: none"> <li>• “That is absolutely awesome because that has actually happened with me in the sense the ED has been busy, doctors have been busy, and it’s me and the patient, and I need help with cutting clothes off and as much we’ve got nurses and sisters to assist, they are also busy sometimes, it’s not like they’re just sitting but everyone’s busy, and you’re like I need an extra set of hands. The paramedic who or the team or the duo that actually says listen what can we help you with, cut off clothes, put up lines, bag a patient, that always helps a lot because even while that’s happening you can still talk to them and say, okay guys more things are coming up, things that you are thinking of as you are looking at the patient, as you are looking at the patient’s vitals and what’s going on, more questions are coming up and you’ve got the people right there to ask and to say, how did you find the patient, what happened, what are the history, is there any more information? You’re probing and getting a more complete picture.” <li>• “They usually actually help you because when you have a really heavy patient the people you know generally help you or private people tend to stay around for a bit, they tend to help you to get certain procedures done before they leave ... But that’s when you get a bit of a, develop a bit of a relationship. Like every time even my colleagues especially when they see the people they know and that they’re friendly, you’re usually very friendly with them when they handover. And that they usually joke around but that is generally the private people that always comes and then they help a bit.” <li>• “...and we’re not forcing them, but we’d be much appreciated if they do help us. If we are resuscitating, they

Category	Respondent quotes
PECP staying in the emergency centre may present them with the opportunity to better their practice	<p>help out with resuscitating, we do... we'd appreciate that actually."</p> <ul style="list-style-type: none"> <li>• "Because at least it gives them an idea of, sometimes you find that there should have been something that like for instance putting up a drip on a child. It should have been something they would have done at the scene or at home or something like that so. They see the importance of not having or doing things as soon as possible." <li>• "I've actually noticed that but it helps so much when they offer to help us and also just to see the progress of management of the patient that they brought in." <li>• "... you even teach them, you even go an extra length in saying, okay this what happens, this is what you're supposed to do if you get a case like this."
Assisting with ongoing patient care was identified by ECP as contributing to building better relationships	<ul style="list-style-type: none"> <li>• "Yes, it is very, very important because it's not speaking just from working and interacting with paramedics but even interdepartmental relationships. ... It's saying, we are a team and we are all here for this one patient, and we are all going to do our very best to make sure that this patient is taken care of. So, the same would apply to the relationship between the ED staff and the paramedics that are coming into that."
The willingness of PECP is affected by their reception in the emergency centre	<ul style="list-style-type: none"> <li>• "Yes it does, so much and you know it also, I've seen where doctors bring out that superior complex over the paramedics where they're like: 'Why are you doing this, you shouldn't be doing it this way' or whatever and they wouldn't admit when they need help or when they're wrong but also I've seen situations where on the other side, they were wrong but they were not accepting to be corrected where they made the mistake but when they come and help, it makes a lot of difference and I suppose not all of them are open to that they're guided by the response of the doctor, their reaction to them that they'll be willing to help or not."
Higher qualified PECP usually have	<ul style="list-style-type: none"> <li>• "For those high qualified guys, they come with more critical patients and when they come in they have to go like to

Category	Respondent quotes
higher acuity patients and are more willing to help	resuscitation and try and tube, sometimes fast, fast and then they wait there until they finish intubating the patient and sometimes they help us. To do other things, if they're coming to resuscitate they say 'we have to resuscitate, compress'. If the patient wakes up or...They call off, sometimes they wait there and others sometimes they even ask to intubate."
Some PECP refused to assist	<ul style="list-style-type: none"> • "Yes, you know what we've once had an incident where ... so now there was this patient, the paramedics, they brought him in, had a CVA, he was left with like an hour, so we're like 'No, please take the patient to CT scan and then bring the patient here'. They actually refused. Yes, they were like 'No, why? It's your job to do that'."

4.5.2.1.4 Emergency centre personnel indicated that they would appreciate pre-notification especially when prehospital emergency care personnel were bringing in high-acuity patients

The category of PECP not providing some form of pre-notification specifically for high-acuity patients was identified as having a negative impact on the process of emergency centre handover. One respondent used the term 'ambushed' to describe how this was perceived and highlighted that high-acuity patients required not only physical preparation related to equipment and personnel resources, but that there was a mental preparation aspect as well. Telephonic pre-notification was also identified as having the potential to begin a process of consultation and information transfer. This could be perceived as a pre-handover information exchange whose aim is to allow the emergency centre to adequately prepare. Lack of pre-notification was associated with delays in patient handover due to the ECP not being aware of the acuity of the patient and the patient being subjected to the regular triage processes. The respondent quotes associated with each category are depicted in Table 4-78.

Table 4-78: Emergency centre personnel indicated that they would appreciate pre-notification especially when prehospital emergency care personnel are bringing in high-acuity patients

Category	Respondent quotes
Lack of pre-notification negatively affected emergency centre preparedness for high-acuity patients	<ul style="list-style-type: none"> <li>• “I think it’s just to start from the beginning, it’s always nice when we get a call to tell us that they have a priority one patient coming through, history, signs and symptoms, what they think it is, how they’re managing it for now, it gives us at least a time to prepare, I think that’s the most important thing.” <li>• “But most of the time we are ambushed. We are ambushed. That’s why I don’t think we have a good communication system like I would like it to be, but I would like to be warned that sometimes you just call, oh we have a P1 coming... But if we know that there’s a patient coming in arrest, we can get all the drugs ready, we’ll get the team ready, we allocate people that okay guys you are going to go now to do one, two three the moment the patient comes you are on top of things, if it’s busy and it’s chaos and someone... things that you even... you create even more chaos when things like that happen ... Yes. But they don’t understand that we need to be prepared mentally as well ... check there in the cupboard they usually stay there, but sometimes they finish in a busy night, in a very busy night and you find that you don’t know where things are, but if you know a patient was coming, you have an anticipation that I might need one, two three and you get everything ready and get your team ready, allocate tasks, I’m going to need you to do this, assess this when the patient comes, assess this when the patient comes. So, it makes it smooth because I’m saying a patient who just rocks up unannounced, as much as that what they do with every day, it’s not a nice environment when you are ambushed.” <li>• “Well obviously if the patient is very sick, a telephonic prior arrangement is much better. So that at least the way, especially in a pre-hospital, hospital handover the prior

arrangements is much better so that people can be ready...
 Expecting the patient when he comes in so that there's no
 delay in the management of the patient. When he arrives
 and if there was no prior arrangement then the pre-hospital
 staff must be knowing immediately how to handover a
 patient that they are handing over a very sick patient they
 know that they need to be attended to immediately and
 there shouldn't be any delay in such cases so yes, triaging
 a patient pre-hospital is very important."

Lack of pre- notification compounded understaffing issues and delays	<ul style="list-style-type: none"> • "... we're understaffed sometimes and then you'd find that maybe you're busy with something and they are coming with a P1, if they get here they notify us that it's a P1 patient and then they do this and that, we appreciate that most of the time."
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4.5.2.2.5 Emergency centre personnel indicated that prehospital emergency care personnel sometimes demanded preference to deliver their handover

ECP remarked that PECP sometimes demanded preference to deliver their handover. This was despite the fact that the emergency centre may have been busy at that specific time and PECP being aware of that fact. There was an underlying perception that some PECP arrived at the emergency centre ready to fight. The category and related quotes are depicted Table 4-79.

Table 4-79: Emergency centre personnel indicated that prehospital emergency care personnel sometimes demanded preference to deliver their handover

Category	Respondent quotes
PECP demanded preference to deliver their handover despite the emergency centre being a busy place	<ul style="list-style-type: none"> • "I believe some EMSs they feel that when they come in okay fine, they want first preference which I totally agree yes, they are on a roll but some they need to understand that at the time you may have okay 'You know what, I'm quite caught up with this patient and I know you're here but if you can be patient with me and everything I will attend to your handover'. So it's unfortunate that sometimes that you don't

Category	Respondent quotes
	<p>get that speedy handover that they want to have and want to get.”</p> <ul style="list-style-type: none"> • “It’ll be those attitudes that in the, well I have been accused of you know what, I’m here to drop off a patient so you must quickly just take the handover and there’s no such thing as a quick handover. As much as we try to speed it up but there’s no such thing as a, there has to be a good handover and if patients need to be cleared they need to be cleared. And if a patient needs to be transported from your stretcher to another’s, that’s another waiting time so it’s stemming from all those problems that you see here like and you get this attitude of but I’m just going to leave this patient and just go.” • “It’s like ‘doctor I’m here, I’m supposed to be attended to immediately, I’m not supposed to wait’. And then yes, we’ve had a couple of rude people. Yes and then there’s because you know it depends on the person really, because if they see that we saw them coming in but we are busy with patients that you know require some stabilisation, before we can actually attend to them then you know they understand that but then there are those who come in to be like ‘we want to be attended right now. We don’t care what you’re doing, just come and take this patient right now’ so we do get those yes.” • “Sometimes the paramedics they just come and it’ll be like they already waiting for the fight you know. They’ll be standing there because here you know [deleted], we triage the patient near to the doorway coming in. So they’ll be like, they’ll come in, maybe they’ll rest for a few seconds or few minutes and they’ll be like ‘why are you not assisting us, we are here, we’ve been waiting for so long, why is there no one who’s coming to help us here, do we have to triage this patient by ourselves?’ so obviously when the person is talking like that you’ll be waiting to fight.”

4.5.2.1.6 *Emergency centre personnel indicated that there was a difference in handover quality between prehospital emergency care personnel employed by the private and state-funded services*

ECP perceived personnel from privately funded prehospital emergency care services as being of a generally higher quality than those from state-funded prehospital emergency care services. There was an underlying perception that privately funded prehospital emergency care services tended to employ higher qualified personnel. It was interesting to note that one respondent mentioned that despite there being a marked difference between lower qualified PECP, this difference was not apparent among the higher qualified (advanced life support) personnel. ECP had a higher expectation of private versus state-funded PECP, although this was linked to the corresponding facility where state-funded facilities tended to be busier than private facilities. Categories and corresponding quotes are depicted in Table 4-80.

Table 4-80: Emergency centre personnel indicated that there was a difference in handover quality between prehospital emergency care personnel employed by the private and state-funded services

Category	Respondent quotes
ECP perceived privately employed PECP as better than those employed by state-funded services	<ul style="list-style-type: none"> • “But I don’t understand because I don’t really know where they train but I mean private is quite different and maybe I don’t know are there BLS in private or are there more the intermediate ones, I’m not sure, but a lot of public ones are just I don’t know, the BLSs sometimes it feels like they just don’t care, they’re just the driver and it’s like and we quite often say the taxi that day, she wasn’t the taxi, they just dropped them at the front gate and let them walk up. Yes but that’s some of the public ones that are really bad and private ones are generally quite good.” • “... because when we’re working here a lot of the private people come and then they’re quite eager to learn, and that’s very different from the BLS in public. They’re just drivers, that’s what they are, they’re just drivers and they just dump patients and they don’t really care.” • “So, one thing I’ve noticed, sorry I don’t mean to be rude, I’ve always find a BLS from private and a BLS from government, it’s like you’re talking two different people. It’s

Category	Respondent quotes
	like a BLS from private, it will be like you're talking to an ILS in government in terms of their knowledge. And I've... yes, I often mention that, and they really get offended because they will always say I'll compare you. Then also I work in private as well. So, yes, I work at [deleted], so yes, I get to deal with [private service] a lot. So yes, I don't know, I don't know if, do they get to be more... I don't know in private, do they get more in-service training than the government? I don't know, really, I don't know. I haven't really established where is the problem because then when you're dealing with a government ALS, they're just at the same par as you private ALS so you really don't know like where is that gap now with more junior ER personnel, I don't know, but yes."
Emergency centre staff had a higher expectation from private as opposed to state-funded prehospital emergency care personnel	<ul style="list-style-type: none"> • "Yes. I think the private guys are, I don't know maybe they you know in Zulu [foreign language] you know? Like status or whatever you know? ... I mean the state guys also sometimes don't go through but yes I think it is more pressure on the private guys because we expect more there's a better expectation like 'no man, you should've done something about this thing'."

4.5.2.1.6 Prehospital emergency care personnel left without handing over their patient appropriately

ECP indicated that PECP sometimes left patients in the emergency centre without handing them over appropriately, if at all. A word that was used that aptly described this practice was 'dumped'. There was an association with the practice of not handing over and qualification; where lower qualified PECP were perceived to do this more often, possibly because they had more stable patients in their care. An association was also made between higher qualification and a better understanding of delays for delivery of handover in the emergency centre. Categories and quotes are depicted in Table 4-81.

Table 4-81: Emergency centre personnel indicated that prehospital emergency care personnel sometimes ‘dumped’ patients in the emergency centre without handing over

Category	Respondent quotes
<p>PECP leave without handing over appropriately</p>	<ul style="list-style-type: none"> • “I remember at some point, we’ve seen a lot of patients, we say ‘dumped’. Because they’re literally dumped where a paramedic comes in they say this is what this patient has and as soon as you sign that book of theirs they’re gone.” • “Like often they will leave without even having their book signed hey, they would just leave the patient here, we sort ourselves out, but yes, it’s just one of those, especially the government, really very rare with the private guys.” • “That’s why I’m saying, sometimes the EMS just comes, put the patient on the bed and that was it, they disappear, the next thing you don’t know who this patient is, the patient is on the bed with an ambulance form, you can’t even trace who the person is, nothing is clear on the form and it becomes a problem.” • “... there are instances of certain crews dropping off patients and disappearing or getting to the door on say walk in, so that’s... they can facilitate their handover so that they don’t have to wait.” • “And you find some EMSs just come there they feel that they’ve waited too much, no one has attended to them and they just drop the patient off, then they leave without their handover which fine, we try understanding it as a set.”
<p>Better understanding of delays for delivery of handover in the emergency centre was linked to higher qualification</p>	<ul style="list-style-type: none"> • “But once I believe that once some of them they get older and more qualified in this profession they begin to understand the dynamics of what goes on in the emergency department, that it’s not all the time that you’re going to get a speedy handover and someone’s going to come and say ‘okay guys, let’s quickly’. ‘And let’s do this so that you go off’ you know but sometimes it’s just going to take time.”

4.5.2.1.7 *There was a perception that prehospital emergency care personnel did not understand triage and referral processes*

ECP indicated that PECP did not understand triage and referral processes and were prone to sometimes delivering inappropriate patients to specialist facilities. This was perceived as a practice that had the potential to create conflict between the emergency centre and the PECP. Categories and quotes are depicted in Table 4-82.

Table 4-82: Emergency centre personnel indicated that prehospital emergency care personnel did not understand triage and referral processes

Category	Respondent quotes
There was a perception that PECP did not understand triage and referral processes	<ul style="list-style-type: none"> • “With other ones, I think they are called BLS students or something, they just bring patients from home even if a patient... like it’s fit to go to a [deleted] clinic, or start at another clinic or a lower-level hospital, so they bring them here and when they bring them here it’s like we get overloaded with work and then they’re going to tell us, no I won’t take the patient back, they even had attitude because they’d you like they don’t know what to do with the patients, so they fight us, yes as a form of... as a form of I think as I’ve said because they don’t know what to do that’s why they fight us.”

4.5.2.2 Theme Two: Emergency centre handover communication factors identified by emergency centre personnel

The theme relating to handover communication emerged from codes and categories that were associated with the process of patient handover within the emergency centre. Within emergency centre handover communication, four sub-themes were identified as challenges to effective handover. Categories under each sub-theme were expounded upon using quotations from the interview transcripts. Communication themes were related to the factors that had the potential to affect communication between the deliverer and receiver of handover. This included factors related to ECP’s perceptions around respect, PECP’s attitudes and interprofessional knowledge related to qualifications and working environments. A summary of the categories and related sub-categories are depicted in Table 4-83.

Table 4-83: Emergency centre handover communication factors identified by emergency centre personnel

Sub-theme	Category
ECP indicated that respect was bidirectional and that interprofessional relationships were important	<ul style="list-style-type: none"> • Respect of the person is important and should be reciprocal • A pre-existing relationship contributed to a better handover experience • Negative interactions usually ended up being bidirectional • Previous negative interactions were sometimes perpetuated
ECP indicated that the attitude or PECP was a contributor to handover	<ul style="list-style-type: none"> • Prehospital emergency care personnel's attitude was more closely linked to personality than to qualification • PECP attitude was linked to qualification • PECP attitude was based on a combination of qualification and personality • Confidence on the part of the deliverer of handover was linked to a more positive attitude • The attitude of PECP was generally positive • Negative attitude also originated from ECP, sometimes due to the emergency centre's busyness • Poor attitude by PECP elicited feelings of frustration in ECP • Personal interactions were important for creating better rapport
ECP indicated that there was a lack of knowledge related to prehospital emergency care personnel's scopes of practice	<ul style="list-style-type: none"> • ECP acknowledged not having sufficient knowledge related to PECP scopes of practice • There was a need for ECP to learn about prehospital emergency care personnel's scopes

4.5.2.2.1 Emergency centre personnel indicated that respect was bidirectional and that interprofessional relationships were important

Respect was identified as important, as was the fact that there should be reciprocal respect from both the deliverer and receiver of emergency centre handover. A failure to respect each

other potentiated conflict. Respect for the other person as a human being, regardless of demographics such as title or qualification, was also mentioned as being important. In addition, the patient and other personnel involved in the emergency centre also deserve respect and to be recognised as human beings. An existing relationship between the receiver and deliverer of handover was perceived to contribute to a more amicable handover. In addition, there was a better platform for questioning without the perception that the questioning was a negative reflection on the deliverer’s handover or prehospital management of the patient. The categories and relevant quotes are depicted in Table 4-84.

Table 4-84: Emergency centre personnel indicated that respect was bidirectional and that interprofessional relationships were important

Category	Respondent quotes
Respect of the person is important and should be reciprocal	<ul style="list-style-type: none"> <li>• “Both ways, definitely both ways. So, I think if you anticipate an antagonistic relationship on either end, you’re probably going to interact in that way. ... So, yes there are definitely pre-hospital guys who can be rude but also you don’t know what situation they’re coming from and there’s definitely the doctors at the emergency centre that can be equally as rude. Interestingly enough I think it actually has probably the more junior the doctor probably the greater the attitude potentially.” <li>• “Yes you know what I sometimes think that we get caught up into our titles and stuff that we forget one thing, to be human and once we start to remove that aspect in the equation, that’s when the discourse begins to happen. One, I need to understand that when you come in whether you are a nurse or a doctor or a cleaner or whatever, the number one thing that you are, you are a human being and by virtue of that you deserve respect. That’s primary, by virtue of you being a human being I need to respect you, I need to respect that you’ve got your own issues, you’ve got a lot of things on your mind, you’re also stressed in your work and everything so you’ve got a whole lot of aspects and if I see you as a human being rather than the title that you carry then I begin to have a different approach and then that’s where things will start to get better if I say okay the

Category	Respondent quotes
	<p>people that are coming in, they're human beings regardless of whatever title or level of education they have... Treating and how I treat other people. That should not be, it should not be that way. It should never be that way."</p>
<p>A pre-existing relationship contributed to a better handover experience</p>	<ul style="list-style-type: none"> <li>• "Building relationships would bridge that gap and in terms of let's say a new doctor's on the floor, a new clinical associate or whoever's on the floor, has never worked with the paramedic and there is another doctor in the environment who has, that other doctor will be able to say oh hey buddy, this is whoever, whoever, this is you know, and then it goes well." <li>• "You're happy because you feel like... and as much as we don't work in the same environment twenty-four seven, this is somebody I know, this is somebody I've spoken to, and it also facilitates a better way of... how do I put this, correcting each other where one might feel you've done something wrong and you feel I've done something wrong, we can correct each other without it being taken as 'Stop trying to tell me how to do my job, you weren't in the same class as me'." <li>• "So you know the problem is, I tend to get along with most of them but I also think it's because you know I enjoy the interaction a lot more and I think the communication thing but I also think when a friendly face is greeting you it's a hell of a lot nicer. And you know because I think ultimately, naturally an EMS guy is always going to you know feel like he's climbing onto someone else's turf and that's intimidating when we have the same when we refer to surgeons you know and I'm sure they have the same when they refer to their consultants so you know yes, I don't even think it's rocket science you know, it's about putting a smile on your face being, just common decency ... Greet them, ask them how their day was and then yes take it from there, and it goes both ways I think, I actually think it's a lot harder to approach a doctor in general than what it is so I think a

Category	Respondent quotes
	<p>lot of the fault lies with the doctors, I don't think, I generally find the EMS guys to be very respectful, very nice.”</p> <ul style="list-style-type: none"> • “Yes to communicate with the person yes because like me, I'm not trying to say maybe I'm a nice person sometimes, most of them I'm used to them right? I'm friends with them because they say I'm nice to them so even if they come here, they'll just come to me: 'Please come and help us here' and if all the nurses or other people there then come to me and say 'ah please come and help us, we have a patient like this'.”
<p>Negative interactions usually end up being bidirectional</p>	<ul style="list-style-type: none"> • “Yes, they do. It's both ways, sometimes it's us, sometimes it's them because sometimes you're so busy that you don't give them attention, they wait here for a very long time and they become furious, it happens. And, sometimes because as I've explained that they don't know what to do with the patient, then we ask them why didn't you do this, why didn't you do that, and then they're like... they become rebellious and they get angry and all that kind of stuff, you know.” • “I think it's true but I don't want to be like more into them because even us as nurses, sometimes we're being rude to them being overwhelmed with the work you know so, interacting. I think we must respect each other so that we can give much.” • “I find most of the EMS guys like they generally, like there's a nice vibe, they tend to not just... You know if you engage them, they'll engage you. You know if you treat them crap, you know you'll get it back in return.” • “Yes, and then the doctor's trying to prove that he's better than the other guys and then the ECP is trying to prove the same thing.”
<p>Previous negative interactions are sometimes perpetuated</p>	<ul style="list-style-type: none"> • “Sometime probably, you had a... like you had a fight, a mini fight with that person about a patient a long time ago, they still carry that with them, they come here with that same attitudes like no, this one I know here or this one I know

Category	Respondent quotes
Personal interactions were important for creating better rapport	<p>him, and then that's where they come with that attitude already."</p> <ul style="list-style-type: none"> • "... there's a big difference between a guy that says 'hey how are you doing?' you know, 'remember the call was really bad last week, how did you cope?'. You know versus just 'hi I've got a patient' you know, so yes, I absolutely, just basic human communication you know, just a bit of a high-five or a something and again I think the whole emergency setup is geared towards that, I think you're working with the whole bunch of other people you know you're not just a surgeon in a theatre, so absolutely you know, a little bit of chit-chat, a little bit of banter whatever, yes it goes a long way." • "I think its goes from person to person. So, it's like these people you know, they're just hell-bent that you know what, I'm just here to work, that's how they say it actually, like you know I'm just here to work, but I'm like greeting a person... so, just maybe a slight pep talk or like how are you? I'm fine thanks. How was your weekend? Oh, my weekend was okay. Then we start with the handover. I think it would maybe what can I say, it will be set a rapport for us to get just a relationship, so that I know when you come in, I'll be like, even if I'm sitting, they're not like oh it's not my turn to do triage I continue with whatever, I'll just put my pen down and I get there, what's wrong?"

4.5.2.2.2 Emergency centre personnel indicated that the attitude of prehospital emergency care personnel was a contributor to handover

ECP identified personal characteristics of the PECP delivering the handover as opposed to qualification as drivers of attitude. ECP perceived personality traits as more significant contributors to PECP's attitude than qualification. Some respondents linked both qualification and personality to attitude, although personality was perceived to be the more dominant influence. The perception was that PECP had positive attitudes and that the ECP were sometimes contributors to poor attitude. The reason for the perceived poor attitude from the

ECP was the busyness of the emergency centre that resulted in frustration on their part. This had the potential to have a negative effect on the attitudes of the deliverer of handover. The perception of ECP related to the deliverer of handover having a good or positive attitude was linked to his/her levels of confidence. Conversely, low confidence levels were linked to poor attitude. Categories and related quotes are depicted in Table 4-85.

Table 4-85: Emergency centre personnel indicated that the attitude of prehospital emergency care personnel was a contributor to handover

Category	Respondent quotes
<p>Prehospital emergency care personnel's attitude was more closely linked to personality than to qualification</p>	<ul style="list-style-type: none"> • "I would say some of them it's just simply how the person is. It doesn't go according with your qualification because I would say that professionalism is taught once you are still... while you are still employed, while you still on probation if I may say, the moment you're employed you're on probation, they teach you etiquette, this is how we do things, this is how we dress, this is how we present ourselves to the community because you're not only representing yourself, you are representing our company. So, I think it goes according to the person because they have taught etiquette, even if I don't like you, you come here you give me handover, I will gladly take the patient and I'm doing my job, what I'm supposed to do, then you leave, I leave, you understand? But, with attitude I will say it is just how that person is...it's not by qualification." • "Because you don't know, it depends on the individual really. If you want to do a proper handover you'll do it, if you're not interested in it you won't do it. So yes, it depends on the individual." • "It's the same, yes it's the same. I mean obviously I know the ALS guys like they really want to prove themselves and everything else, but it's, even the BLS guys also try to do something as well."
<p>PECP attitude was linked to qualification</p>	<ul style="list-style-type: none"> • "I don't know like the more senior they are, they seem to be friendlier, like you just greet each other and you know each other."

Category	Respondent quotes
PECP attitude was based on a combination of qualification and personality	<ul style="list-style-type: none"> <li>• “I don’t know like the more senior they are, they seem to be friendlier, like you just greet each other and you know each other, when they usually bring patients.” <li>• “It’s a bit of both because I feel like your qualification basically says, this is the level of professionalism I’m going to be accountable for in terms of what I know, and also your personal attitude tells you that in as much as I’m not the smartest or the brightest bulb in the class, I can do this perfectly and I am going to do it perfectly and correctly versus just saying well it’s the end of shift, my time is here, I am leaving whether there is somebody here or not.” <li>• “It would be qualification dependent sometimes, but I feel it’s more person dependent because like I said, you’ve got qualified doctors that still make a muck and a mess of everything, and you’ve got a paramedic who will sometimes give a better history than a doctor.”
Confidence on the part of the deliverer of handover was linked to a more positive attitude	<ul style="list-style-type: none"> <li>• “No I wouldn’t say it’s qualification dependant but and I think it’s a medical thing across the board, I think it’s very intimidating when you’re dealing with things that are maybe out of your knowledge spectrum if I can call it like that. And it’s very difficult I think you know when you’re not confident about a certain topic. I don’t think the attitude is linked to the, [qualification]. Yes I don’t think the attitude is linked to the qualification but I also think the more you know and the more experienced you get, I think naturally there will be a bit of an attitude, in you know, like a good attitude linked to that ... So I would say it is more confidence linked, than yes, attitude.” <li>• “So, attitude is based on who you are going to present to and it can create enough in the situation and between confidence as well, but when you have confidence, you try to stay away but confidence as well, that’s if number one if you don’t know what you’re doing to begin with, that’s another big problem as well. so, but sometimes there are people who what they are doing, they know what they are

Category	Respondent quotes
	<p>doing but then because they are faced with someone who knows... okay this guy knows a lot of maybe he shouts a lot and then these things can be bad on that confidence.”</p>
<p>The attitude of PECP was generally positive</p>	<ul style="list-style-type: none"> • “Most of the ones that I’ve worked with I’ve never had an issue with. I can sort of understand where that might come around because I mean, let’s face it, even the emergency medicine guys, not everybody’s the same. The same for the ECP’s, some guys on both sides of the fence could be very arrogant, maybe some guys are not as knowledgeable as they think they are and then they’re just trying to prove themselves and, I haven’t personally experienced anything and I’ve never had a disrespectful ECP.”
<p>Negative attitude also originated from ECP, sometimes due to the emergency centre’s busyness</p>	<ul style="list-style-type: none"> • “I actually think a lot of the blame lies on doctors and I know myself and when I’m angry and you know I’ve had a rough night and I’m irritated, the last thing you want to see is an EMS person. It’s like a dentist you know when you have to see the dentist but the poor dentist has done nothing wrong. And I think there’s a lot of that so it is difficult. Yes so, yes we are just people. You know we’re all just trying to do our job. We’re all trying to make the world a better place and we should just respect that as well.” • “Yes I’ve experienced it and as a doctor I believe I’m partly responsible... I would love to take the entire blame on myself but yes also you do carry EMS personnel who come out in the wrong way and on the wrong foot and you get quite different views and disagreements on that so yes, I think it comes out in both parties and it takes one as they go along their career they begin to understand okay but not every EMS is the same.” • “Incidences like that, I’ve experienced them in cases where in the emergency department we’re already at full capacity saying maybe we’re quite busy. We’re full, we don’t have space to put patients in and the paramedics come in with a very sick patient, obviously well it’s not their fault that this patient is sick but on the other hand, do we as human

Category	Respondent quotes
	beings we tend to, you find a subject to lash out on. So in that case if it's us doctors lashing out at paramedics, they become the easy targets and the paramedics also get frustrated on the other hand because you find that in a busy weekend or a busy night for instance, the other hospitals are closed and the time to get somewhere where they can have this patient seen or admitted so they're already having that that preconceived idea that they shouldn't chase us away or where they shouldn't tell us that the hospital is closed or something like that so the clashes usually come in there."
Poor attitude by PECP elicited feelings of frustration in emergency centre personnel	<ul style="list-style-type: none"> • "I think it's when [paramedics] are angry, when they're rude to the paramedics it's generally because [paramedics] just seem like they don't care. I mean if they seemed more eager and interested, I don't, that would be a very different thing and, and especially junior doctors I think it's frustrating I mean when you're a senior doctor you just go 'okay'."

4.5.2.2.3 Emergency centre personnel indicated that there was a lack of knowledge related to prehospital emergency care personnel's scopes of practice

ECP acknowledged that many of them did not have adequate knowledge related to prehospital emergency care scopes of practice. ECP identified a need for gaining knowledge on relevant prehospital scopes. They felt this could result in more realistic and qualification-dependent expectations from ECP related to PECP's patient management and interventional expectations. The categories and relevant quotes are depicted in Table 4-86.

Table 4-86: Emergency centre personnel indicated that there was a lack of knowledge related to prehospital emergency care personnel's scopes of practice

Category	Respondent quotes
ECP acknowledged not having sufficient knowledge related	<ul style="list-style-type: none"> • "But, I will also say that perhaps this is where a qualification might come around, I think a lot of doctors don't understand the different tiers of the pre-hospital guys that they'll be seeing, so a BLS crew assessment is never going to be a thorough as a doctor who studied an X number of years

Category	Respondent quotes
to PECP scopes of practice	<p>with experience, an ALS's assessment is not going to be the same as a BLS assessment."</p> <ul style="list-style-type: none"> • "Especially non-emergency medicine guys, absolutely have no idea. They think the basic sort of ambulance, bus driver, AEA, is the exact same thing as an ECP, 'No! you all work on an ambulance you know, you all have the same skills', it's not. That that could result in that sort of, why doesn't this patient have a drip? Why doesn't this patient have this? Why didn't you do this? Meanwhile it's not conducive to what the patient actually needed, it's not about the patient's level of care, it's you should have done something now I have to do it." • "Yes. I'll tell you why because I once referred to a BAA as a paramedic because generally that's what we call all of them, a 'paramedic' and one of them said 'I'm not a paramedic' and I was like 'What do you mean, You're not a paramedic?' and then she went on to explain: There's BAA, there's I don't know [AEA] and then explain also like what their scope is. So after understanding that it made sense why you know some patients will come into hospital with an IV line if they're like dehydrated or had a seizure or whatever whereas others are not. So that, I suppose if you don't understand those different categories you'd expect everyone to perform the same way which is why I think because I've seen some of my colleagues asking 'why didn't you put up a drip, why don't you'. Because if you honestly knew then you wouldn't question some of the things they didn't do."
There was a need for ECP to learn about prehospital emergency care personnel's scopes	<ul style="list-style-type: none"> • "So, there is an expectation, but I feel like as healthcare professionals we actually need to take the time, I'm not going to lie, I'm not perfect if knowing who does what and what happens, and it's something that I feel it needs to be reinforced, that if we're going to be working with paramedics, we need to understand their different roles,

Category	Respondent quotes
	<p>their different qualifications, what it is that they're allowed to do and what entails.”</p> <ul style="list-style-type: none"> • “So I think us as nurses and doctors, it's very important that we know what qualification does one entails in terms of what questions can you and not ask them because really felt it was... it was unfair for them, they're BLS.”

4.5.2.3 Theme Three: Emergency centre handover content factors identified by emergency centre personnel

The theme relating to handover content emerged from codes and categories that were associated with the content of patient handover within the emergency centre. Within this theme, ECP linked handover quality with PECP's qualification and a better patient contextualisation. There were certain aspects of handover performed by PECP that were perceived to improve the quality of handovers. ECP highlighted the importance of PECP eliciting detailed information from the scene where the patient was found. In addition, missing information or information not handed over presented challenges to ECP's ongoing patient care. The categories and relevant quotes are depicted in Table 4-87.

Table 4-87: Emergency centre handover communication factors identified by emergency centre personnel

Sub-theme	Category
ECP indicated that handover quality was linked to the qualification of the person delivering the handover	<ul style="list-style-type: none"> • The quality of the handover was linked to the qualification of the deliverer of the handover • Handover quality was not always linked to qualification • On-scene information was considered by ECP as important for better contextualisation of the patient
ECP indicated that PECP with higher qualifications were better able to contextualise the patient	<ul style="list-style-type: none"> • PECP with higher qualifications were better able to contextualise the patient • PECP with higher qualifications were better able to integrate into the multidisciplinary team

Sub-theme	Category
ECP identified specific aspects of a prehospital emergency care handover that made a handover good	<ul style="list-style-type: none"> • A good handover was concise and contextually relevant • A good handover was contextually comprehensive • The language of handover was important • A good handover took into account the busyness and general environment of the emergency centre • A good handover was confident • A good handover included a comprehensive history • Pre-notification of high-acuity patient arrival was linked to good handover
ECP indicated that detailed information from the scene was an important information source	<ul style="list-style-type: none"> • Detailed information from the scene was an important information source • Information about the patient that was only available on scene was important to emergency centre staff holistically evaluating the patient • Having on-scene information that would not be available in the hospital with respects to the patient improved certain areas of the patient care continuum
ECP indicated that PECP handovers where information was missing presented challenges related to ongoing patient care	<ul style="list-style-type: none"> • Missing information was either not available initially or could be obtained from the delivering PECP if they were asked • The quantity of information handed over has to do with the attitude of the deliverer • Missing information had the potential to create conflict situations

4.5.2.3.1 Emergency centre personnel indicated that handover quality was linked to the qualification of the person delivering the handover

ECP linked higher qualification to better handover quality. Some factors identified as contributing to better handovers were related to the content and structure of the handover as well as the scope of the deliverer of handover and acuity of the patient. There was also an underlying link to the quality of patient management and assessment when comparing qualification level, although qualification was not always the determinant of handover quality. Personal interest in the patient was a factor identified as a determinant of handover quality.

There was also reference to the difference in handover quality between private and state-funded prehospital emergency services. The categories and relevant quotes are depicted in Table 4-88.

Table 4-88: Emergency centre personnel indicated that handover quality was linked to the qualification of the person delivering the handover

Category	Respondent quotes
The quality of the handover was linked to qualification of the deliverer of the handover	<ul style="list-style-type: none"> <li>• "... it is a very safe assumption because the higher qualified guys have got an in-depth analysis of what exactly is happening with your patient and they give you more information that is structured appropriately. Whereas the BLS guys, usually just tell you, this is what we found, these are the vitals, here's the patient." <li>• "So, you'll see they [BLS] don't know what I'm talking about, so their handover is going to be poor because they don't know. If you ask them questions, they don't know what you're asking them." <li>• "Yes, so most of the time with the much qualified guys they give much, much, much handover, and if even if the patient, they didn't do like much for the patient, because I would say like it depends from company to company if that patient, if they do have enough resources for example, but they will give you a much handover and then they would even be willing to get here, ... So, I would say with the qualification, the higher qualified guys they give much better handover." <li>• "Yes the ALSs usually are a lot better but they usually come in with sicker patients which you need to know a lot more as well, but also their handover is more comprehensive you know, it's what you want to know and what's important and yes whereas the BLS, it depends also, private and public is very different for me. I think so it's like they are compulsory to do certain things and that they are more thorough because they have to take certain information and I don't know why it is that there is such a standard difference."
Handover quality was not always	<ul style="list-style-type: none"> <li>• "Obviously the guys that are perhaps little bit better qualified might have a better system in place but that's not always

Category	Respondent quotes
linked to qualification	true. We've had great handovers from... I actually think the guys that are probably more intermediate give good handovers like the ILS guys, I mean I also find that you get different grades of the BLS guys, some it's horrible and the other guys are good, I think you just have to be linked to listen, which is they're only taken time to learn."

4.5.2.3.2 *Emergency centre personnel indicated that prehospital emergency care personnel with higher qualifications were better able to contextualise the patient*

ECP linked PECP's qualification with an improved ability to contextualise the patient. This improved contextualisation was linked to a better quality of handover. In addition, PECP with higher qualification were better able to integrate into the multidisciplinary approach to patient care. The relevant categories and quotes are depicted in Table 4-89.

Table 4-89: Emergency centre personnel indicated that prehospital emergency care personnel with higher qualifications were better able to contextualise the patient

Category	Respondent quotes
PECP with higher qualifications were better able to contextualise the patient	<ul style="list-style-type: none"> • "In a sense if you qualify more, you have a better perspective and understanding of the patient in front of you and what's going on and what information to necessarily to give to the doctor and the emergency department. So you have a better view and a better perspective of the patient and the condition and what's going on with the patient and what information to give to the doctor and what's not necessary and so forth." • "I think it's like they understand more about the conditions, so that's why they are able to give more information and they know which information they're supposed to give us, so that we can continue the workout of the patient." • "I think if you have knowledge, you know what you're dealing with, you know different diagnosis, and you know the symptoms how the patient's present with, and taking proper history from the people outside, the people giving

Category	Respondent quotes
	you history or the people that were witnesses to whatever happened, yes. And being able to listen to the patient because sometimes they refuse to listen to the patient, they just bring the patient in like no keep quiet, keep quiet, don't say this, don't say that, we'll do all the talking and that delays the patient."
PECP with higher qualifications were better able to integrate into the multidisciplinary team	<ul style="list-style-type: none"> • "I think those who... like those who.... Like I said, those who are well informed, their knowledge is much more broader they're not just... like they know how to handle other people, other the multidisciplinary team because their knowledge is broad. So, I think if your knowledge is narrow, then you tend to think that everything must work according to you when you don't just broaden your knowledge."

4.5.2.3.3 Emergency centre personnel identified specific aspects of a prehospital emergency care handover that made a handover good

ECO identified several aspects related to what they considered a good handover. Conciseness and contextual relevance, as well as comprehensiveness, were considered important aspects contributing to a good handover. One respondent provided a detailed description of considerations to comprehensiveness that were closely linked to contextual handover variables. The language of handover was important and the underlying theme was that it should be understandable by both parties. A good handover took into account the busyness of the emergency centre and that there was also a contextual aspect to handing over high-acuity patients within an environment of busyness. A handover from PECP that was delivered in a confident manner was considered superior to one that was not. Pre-notification of high-acuity patients en-route to the emergency centre was considered a contributor to a good handover. The categories and relevant quotes are depicted in Table 4-90.

Table 4-90: Emergency centre personnel indicated that handover quality was linked to the qualification of the person delivering the handover

Category	Respondent quotes
A good handover was concise and	<ul style="list-style-type: none"> • "Well, I've tried to teach a couple of your guys from [deleted] as well, what I like with the handover and that sort of thing is it's concise because I mean the ED's busy, I can't sit

Category	Respondent quotes
contextually relevant	<p>there and listen to a twenty minute history of the patient had breakfast at seven fifteen this morning, it was two eggs and... I prefer it when it's nice it's concise."</p> <ul style="list-style-type: none"> • "And yes it's patient-dependent, some of the information it's not important in that patient presenting with that particular problem, some information is important, it's important if it's a patient who is presenting with hypothermia, yes this patient was in the cold undressed and everything, that's important information for me to know versus somebody who's coming with chest pain and telling me it's quite a bad living condition, they don't have food and everything and okay fine, it's important down there but it's not important to this patient so but it could be important in an elderly patient that tells me their [inaudible 0:08:22] environment is bad because that tells me about the cognitive level function of that patient, how serious that is and everything so that's quite important. How you're going to package it yes."
A good handover was contextually comprehensive	<ul style="list-style-type: none"> • "You need to know your patient, you need to understand the patient. I mean a handover, a handover, you need to tell me how much you know about this patient, you need to convince me that this patient is safe in your hands, you know what I mean?" • "It depends on the information you get, because like let's make an example, if the patient is confused and they can't give you information and there's no relative who can give us information. So it's hard to work with that patient right? It's better if there's information so that we can know maybe if there's a previous history of this condition or, so having much information helps to treat the patient in a better way."
The language of handover was important	<ul style="list-style-type: none"> • "Okay, I can say like the language of communication right? First it's very important because other guys they come here I think they are used to the hospital because they always come here. They will just give information like they handover in a vernacular language. So they don't care if you understand or you don't, if you want to talk like in

Category	Respondent quotes
	<p>English with them, it would be like you're being, like you are overpowering them or you think you are better than them or something. So firstly it's language."</p> <ul style="list-style-type: none"> <li>• "... our fellow colleagues, some of them they cannot give like a proper handover, like a formal handover with those from drastic areas medical words, so it would be better if you give me with your own comfortable language, with your own comfortable what can I say...style of giving a handover, then at least we'll get to the point of getting what's actually wrong with the patient." <li>• "Because in communication I know if when you're doing communication there's an issue about like the barriers and the language to use and the distance when you talk with the other person much more and there's something I wanted to say on communication, I've forgotten. But like barriers mostly because you can find that in the paramedics they give you handover and there's lots of noise here because in casualty there's always noise, they'll give you a handover and the person is talking so slow and you're supposed to ask him 'what?'. And he'll be talking so slowly and talking vernacular language and yes so also communication plays a role in giving a handover."
<p>A good handover took into account the busyness and general environment of the emergency centre</p>	<ul style="list-style-type: none"> <li>• "I think when it's busy and chaotic it's hard to... you want to sort of dodge certain information as quickly as possible when you have a huge patient load. And the obviously around the patient, it can also be difficult. So, I mean, unstable patients that come in, people tend to defer proper handovers because they just want to sort of get into it."
<p>A good handover was confident</p>	<ul style="list-style-type: none"> <li>• "I think basically a good handover is if someone gives you a handover and they sound like they know what they're talking about, they're not just regurgitating whatever they were told from where ever they come from with the patient and then just say it back to you. When the person sounds like they know what they're talking about, at least you know exactly you're getting the correct information because you

Category	Respondent quotes
	can see that the person is well informed than a person who's just telling you things and then when you assess the patient it's totally different."
A good handover included a comprehensive history	<ul style="list-style-type: none"> • "A good handover it's you know it's mostly with the history ... So for me the most important things is for them to like give the history, whatever history that they have from the patient or the relatives or the clinic that they took the patient from because everything else can follow, but without a proper history you really don't know what's happening ... So history for me is very important." • "If they can give a bit of background history and then what they present with now but then obviously relevant and what they found and the vitals are very important."
Pre-notification of high-acuity patient arrival was linked to good handover	<ul style="list-style-type: none"> • "When they arrive [after notification] obviously as we've discussed in terms of them having had all the information and what they think it is in the meantime, what investigations could have been done in the meantime, what's available for them, besides the vitals, ECG, it's always nice. So that information it's quite useful it makes it a nicer handover, but yes, the first step is knowing that the patient is coming through and then us at least having time to prepare for it and then receiving it, yes and just getting a bit of a summary basically. We don't need a whole bunch of details we just want to know summary of what is important clinically available and how we can apply it and how it's going to change our management in the end."

4.5.2.2.4 Emergency centre personnel indicated that detailed information from the scene was an important information source

ECP indicated that information from the scene where the patient was found was important for them to holistically evaluate the patient. This information would only be available to the attending PECP on scene, and was an important information source for the ECP. In a patient with decreased cognition, the on-scene information became critical and was perceived to

improve certain aspects of the patient care continuum. The categories and related quotes are depicted in Table 4-91.

Table 4-91: Emergency centre personnel indicated that detailed information from the scene was an important information source

Category	Respondent quotes
On-scene information was considered by ECP as important for better contextualisation of the patient	<ul style="list-style-type: none"> • “So it’s more appreciating what they can get from the history of the patient and what the context of it and the patient rather than what they see clinically. Because clinically it can be a basically anything at the end of the day. [Information] that they could have got on scene, yes. That’s the whole point you know. Not the whole point but that’s where their power actually lies. I’ve seen what was at the scene there. I mean massive MVA car severely damaged they see the patient, the patient looks well, you know what I mean? I cannot appreciate, do you know what I mean? So that emphasis. It helps a lot like okay no, even though the patient looks well, even though I don’t see anything grossly high mechanism this is a priority one patient. Let me keep my eyes out besides what I’m seeing. Because what I’m thinking could be completely different from what they actually saw.” • “Yes, if a patient here and they’re not responsive, we’re relying on them to tell us what they were told, like patient is on chronic medication, or the patient can’t tell us really, they need to come with that information from home, that okay this is whatever old patient, known on this treatment, that helps us a lot because now if we know if the patient is hypertensive, maybe it could be a bleed you know, you give us clue of what could be wrong with the patient, so we really rely on them to tell us what they got from the scene.”
Detailed information from the scene was an important information source	<ul style="list-style-type: none"> • “It is very important, it is very important, because I believe treatment starts from the scene, and as I’m not there, I need that information, so I can... it’s you know, I believe that healthcare, emergency, medicine, it’s continuous. You start at pre-hospital, I continue in the emergency, someone will

Category	Respondent quotes
Information about the patient that was only available on scene was important to emergency centre staff holistically evaluating the patient	<p>continue in the ward. So, when I go to handover in the ward mind you, I have to start from pre-hospital, apparently this is what happened pre-hospital, this is what happened in the emergency rooms, you're taking over from here, it's continuous, it's continuous."</p> <ul style="list-style-type: none"> <li>• "But, if you've got a paramedic that says, this is what the relative said, this is what the patient took, this is what was found on scene, it saves you that bit of time of trying to see how actually this patient is going progress and how it's going to play out." <li>• "Yes whoever is around because yes, not everyone will know what's going on with you, but there is that little information that they know and if a patient now comes to us post ictal or confused and you can't get anything from them that little information that they have is going to help. So if there's nothing at all then it becomes a problem." <li>• "Where the patient was found, what was happening on scene, like this is just the basic, because I wasn't there I need to know. I found the patient walking. Okay it was a PVA, but on scene the patient was walking, you know like such things, I need to know what happened before the patient was brought to me. It's a psych patient, patient was aggressive, we had to restrain him down, patient was given Etomine the patient was given Atavan or what... so I mean that's important." <li>• "Yes, I think that would be the most loveliest information ever because they would get to get info... just those critical information like for example, no my father is either he's diabetic or he's epileptic or... then you'd actually have an idea of what's going on with the patient, then they would be able to act on what... most what they are given....so, I think that's what would actually help them also." <li>• "Yes, but it's a two-way street because from my experience, usually if they are bringing a patient from somewhere if a family member... a family member is usually around, unless

Category	Respondent quotes
Having on-scene information that would not be available in the hospital with respects to the patient improved certain areas of the patient care continuum	<p>maybe it's an accident where they can't even get access of that same information. But usually if they're getting someone from home, usually there is always a family member from my experience who is always accompanying them, unless the person stays alone, and they can't get hold of that information. But in other incidences like maybe accidents or mass disaster, I think that they need to try and get as much information as they can to help us try to figure out. So, it's important that they are acquire as much information as they can."</p> <ul style="list-style-type: none"> • "It makes it more difficult because most of the time our patients are regular patients, so as soon as they come here the unknown, instead of putting them under their names, as soon as you put them on the system it picks up all the previous files. ... When you look on the system CT scans were done or maybe even worse, the patient was at the clinic the day before."

4.5.2.2.5 Emergency centre personnel indicated that prehospital emergency care personnel handovers where information was missing presented challenges related to ongoing patient care

ECP indicated that PECP handovers where information was missing presented challenges related to ongoing patient care. In certain cases, this information may not have been available on scene to the initial PECP, or was, in fact, available should the receiving ECP have asked for this information. The quality and quantity of information handed over was related to the attitude of the deliverer of handover, and missing information had the potential to create conflict situations. The categories and related quotes are depicted in Table 4-92.

Table 4-92: Emergency centre personnel indicated that prehospital emergency care personnel handovers where information was missing presented challenges related to ongoing patient care

Category	Respondent quotes
<p>Missing information was either not available initially or could be obtained from the delivering PECP if they were asked</p>	<ul style="list-style-type: none"> <li> <p>• “I’d say from the experience it wasn’t a matter of there is information that’s missing per se, it was a matter of okay how this patient was presented and what needed to come forth and what information needed to be given forth and more of what’s expected of the EMS guys ... So they can tell you this is a patient who came from where, presenting with this problem and we got their details and we brought the patient, that’s as much as the BLS guys can tell me. ‘So what did you do?’, ‘no we just gave oxygen’. That’s all they can do or ‘what did you do, you just gave the sugar powder’, that’s all they can do. There’s nothing much. So as I’ve said, from as much as I can remember I’ve always gotten the, especially from the ALS guys, I’ve always gotten the picture that I want and the information that I needed from the EMS personnel, and as I said it was not a matter of what was not given, it was a matter of what was presented and how it was packaged. So yes I don’t think there was ever any missing information.”</p> <li> <p>• “Like I mean it happens where they are picked up next to the side of the road and they just get out of there and what’s bad is there’s very often so I know the classic example that we always at [deleted] got banged into us is that a patient that’s dislocated his knee and then it popped back on the way you know they could have an arterial injury you know? And if you don’t know something like that, yes I mean if the EMS guy is not telling you that you know then, I think the things that are staring them straight in the face, I mean you can’t blame a guy for not knowing a guy’s medical history and when the last time he had an operation but for instance you know, the guy that gets picked up passed out next to the side of the road. You know there’s never, I’m again trying to think of someone who’s done it but I can’t, you</p>

Category	Respondent quotes
	<p>know what was in his pockets, what was he lying you know, maybe ask two observers that were in the vicinity. You know its stuff like that and I think those are the things that occasionally, you just want a little bit more information. You know than 'I found the guy passed out next to the side of the road'. So I think it's those things that are literally staring you in the face in the vicinity of the patient which gets left out which yes can become frustrating sometimes."</p>
<p>The quantity of information handed over has to do with the attitude of the deliverer</p>	<ul style="list-style-type: none"> • "So don't know if it's something extra that they have to do but if you're probably not making you know accurate assessments, it probably is a knowledge thing, but again to me it just boils way more down to attitude, and your approach to things because as I said it's you know, even with this question I can see the EMS guys come in and have a proper discussion with you and they're interested and they know what they're doing versus the guys that just kind of drop and get out of there."
<p>Missing information had the potential to create conflict situations</p>	<ul style="list-style-type: none"> • "We become work overloaded, we become irritated, and we even like there's disputes between us, we end up exchanging verbal words verbally, that those that are just... yes they are just like that and you know what, there's bad vibes at the end of the day and it's not good because if the patient is drunk and you have to give the report and everything and now you're going on like no don't do this, not you do that, and then it's bad you know that we're acting unprofessionally both of us, it's a problem, you know." • "And two, with us also nurses and doctors, what happens is if ever the paramedics come here, and they give us like maybe like your basic information, they can't give us more information regarding the patient, at the same time we give them attitude because we know that you know what, you're not going to help us with anything."

4.5.2.3 Theme Four: Handover improvement strategies

Interviewees were asked what strategies they would suggest for improving emergency centre handover. The theme relating to handover improvement strategies emerged from codes and categories that were associated with the suggestions from interviewees. ECP indicated that interprofessional collaboration and education was an important strategy towards improving emergency centre handover, and that it was time for the development of a handover that was specifically developed for the emergency centre. However, ECP also indicated that non-specific standardisation was a potential strategy for emergency centre handover improvement. Sub-themes and categories are depicted in Table 4-93.

Table 4-93: Handover improvement strategies identified by emergency centre personnel

Sub-theme	Category
ECP indicated that interprofessional collaboration and education was an important strategy towards improving emergency centre handover	<ul style="list-style-type: none"> • Interprofessional collaboration and education had the potential to give ECP a better understanding of the prehospital emergency care environment • PECP working in the emergency centre would better understand the complexities of the emergency centre • Interprofessional collaboration could assist ECP to better understand prehospital scopes of practice and their limitations • Technology could be used to facilitate interprofessional communication and improved relationships • Not all personnel who work in the emergency centre would be interested in working in the prehospital environment • Interprofessional education had the potential to create a shared expectation
ECP indicated that it was time for the development of a handover that was specifically developed for the emergency centre	<ul style="list-style-type: none"> • An emergency centre-specific format had the potential to improve interprofessional handover • Existing handover formats fail to cater for the unique emergency centre environment • An emergency centre-specific handover may not be the final solution • Implementation of a new handover format may be a challenge

Sub-theme	Category
ECP indicated that non-specific standardisation was a potential strategy for emergency centre handover improvement	<ul style="list-style-type: none"> • Standardisation would assist newly qualified personnel as well as ensuring comprehensive handovers • Standardised handovers would create a shared expectation

4.5.2.2.1 Emergency centre personnel indicated that interprofessional collaboration and education was an important strategy towards improving emergency centre handover

ECP indicated that interprofessional collaboration and education was an important strategy towards improving emergency centre handover. They also shared that interprofessional collaboration had the potential to give ECP a better understanding of the prehospital emergency care environment. The perception of ECP was that PECP working in the emergency centre would allow them to better understand the complexities of the emergency centre. In addition, interprofessional collaboration had the potential to assist ECP in better understanding prehospital scopes of practice and their limitations. ECP who knew of similar practices had a perception that technology could be used to facilitate interprofessional communication and improved relationships. One of the potential challenges to implementing interprofessional collaboration was that not all ECP would be interested in working in the prehospital environment. Interprofessional education had the potential to create a shared expectation between the deliverer and receiver of handover. The categories and relevant quotes are depicted in Table 4-94.

Table 4-94: Emergency centre personnel indicated that interprofessional collaboration and education was an important strategy towards improving emergency centre handover

Category	Respondent quotes
Interprofessional collaboration and education had the potential to give	<ul style="list-style-type: none"> • “Absolutely, so I’ve never been on the road but from what I’ve heard the guys on the road face so you can only really appreciate it once you’ve actually been there and done ... You know when you’re in the middle of traffic and you’re

Category	Respondent quotes
ECP a better understanding of the prehospital emergency care environment	<p>dealing with emergencies. It's a completely different vibe from being in a building with four big walls around you. I survived one strike so yes."</p> <ul style="list-style-type: none"> • "I think that would be very beneficial because it gives you an orientation of what actually happens out on the road, because how you manage a patient on the side of road versus how you manage a patient in an emergency department are of totally, totally different and also, just orientating yourself with what's actually in the back of an ambulance." • "Yes that's actually a good idea because until I walk in that person's shoes, I may never fully understand what goes on." • "I think that will be a brilliant idea, because then I think I would understand your frustrations and you'll understand my frustrations you know... No, like it will be a great exposure because we would be able to understand what happens in the world."
PECP working in the emergency centre would better understand the complexities of the emergency centre	<ul style="list-style-type: none"> • "Yes. I think they would need to because then that also gives them a better understanding of the team dynamics and what's expected in an ED, and how they would be better.... how do I put it, better primed to fit in because in as much as every ED is different, the layout and the equipment is usually more or less the same?" • "And it would be important for the paramedics as well to know what we do here because then they will know an emergency, because some of them they don't know this is actually an emergency. Yes, and know how to deal with them and to be able to use some of the things that we use... we do here on the scene or in the streets or wherever."
Interprofessional collaboration could assist ECP to better understand prehospital scopes	<ul style="list-style-type: none"> • "Then you go but you've seen it and once we come this side we understand okay you know what there's different grades and the people who are doing most of the groundwork are actually a BLS and you can't expect miracles from them ... So you begin to understand that and you begin to

Category	Respondent quotes
of practice and their limitations	<p>become...to be more lenient and more understanding when that happens, it's not their fault, it's the fault of the system, there's nothing else they can do, yes."</p> <ul style="list-style-type: none"> • "It is, it is important. And not just from the nursing, from the doctors as well because then they will understand more what really... what is the difference between BLS and you know, then they would really start stop asking questions that are really out of the guy's world and they are so sweating they don't even know what to say, it's terrible."
Technology could be used to facilitate interprofessional communication and improved relationships	<ul style="list-style-type: none"> • "... if each one could meet with the ED staff that they primarily go to, build a relationship, for example I think it's at [hospital 1] and at [hospital 2] where there's a WhatsApp group where the paramedics, and the doctors, and the staff are in one WhatsApp group and for example if you've got a hectic P1 on its way, heads up guys, this is what's going on, this is what I'm bringing, and it gives everybody time to prepare themselves. So, when the patient arrives, no one's running around trying to say where's the airway trolley, where are we going to put this patient all in the midst of China, handover the patient as well."
Not all personnel who work in the emergency centre would be interested in working in the prehospital environment	<ul style="list-style-type: none"> • "I think it would depend on who you went to. So, a lot of the sort of chronic MO type people that are not interested in emergency medicine as a speciality, they are doing it because it's a job and they can do it. I don't think they'd care, they'd be very irritated because with these guys, let's face it, these guys who as we or who speaking about, these guys are the problem in the beginning already and they're not keen to learn, they're not keen to change behaviour. I think the emergency medicine guys as a speciality would be very keen, would be very interested and formulating an approach that helps you guys and it helps us, and yes ultimately helps the patients in the ER."
Interprofessional education had the potential to create	<ul style="list-style-type: none"> • "I think on those okay in us [emergency centre] right? The sisters, nurses and us because in triage, everyone does triage even an ENA, EN, RN so you can find that an ENA

Category	Respondent quotes
a shared expectation	didn't know what information to get there from paramedics so I think from nurses, we have to give like training on this case of handover from the paramedics and the nurses and the doctors because I think this is a good start to do. So I think they have to get the training even us, get the training of what's more relevant to get from your paramedics."

4.5.2.2.2 Emergency centre personnel indicated that it was time for the development of a handover that was specifically developed for the emergency centre

ECP indicated that it was time for the development of a handover that was specifically developed for the emergency centre; this had the potential to improve interprofessional handover. ECP perceived existing handover formats as failing to cater for the unique environment of the emergency centre, but this may not be the final solution and may be a challenge to implement. The categories and quotes are depicted in Table 4-95.

Table 4-95: Emergency centre personnel indicated that it was time for the development of a handover that was specifically developed for the emergency centre

Category	Respondent quotes
An emergency centre-specific format had the potential to improve interprofessional handover	<ul style="list-style-type: none"> • "Yes, because you know with an ED, it's quite different transporting a patient from scene to ED, from home to ED, from a hospital to the emergency department, it's different things that are happening there, like it's different case picking a patient up from scene and getting a patient who's already stabilised from another hospital. At least if you can try and come up with a new way of handing over of patients to ED's." • "Exactly, and everybody would know what's cooking and what's going on. Even for the intern who's just started working or the MO who has just started rotating in the ED, there is something that they can base it on and make sure that the patient doesn't suffer because let me put it like this, our first few weeks we forget, it took me quite a while to

Category	Respondent quotes
	<p>learn the ropes of what I need to be asking, what I need to be looking out for, and it could have been done better.”</p> <ul style="list-style-type: none"> • “Only for the emergency department. Yes, because it would save time, it would save time and relay all the information necessary. And I don’t know if you’ve noticed that blue... there are different colours for different teams but the carbon copy that sometimes get left with the patient is illegible that’s absolutely illegible half of the time. So, even though somehow the information has been recorded, you still can’t you make heads and tails of it.” • “It may, I suppose if you facilitate a more smoother handover process, then definitely it will actually decrease the amount of time. So, I mean if a guy comes in and it’s five to seven, and he knows if he gives a proper handover and it goes smoothly, he can probably be out of there in five minutes anyway.” • “Yes I think or maybe we can start it as a pilot study to see if it would help but I think it can help a lot, we can try it.” • “I think so, that could help, that could help just to clear the differences because really often... but we do have like smooth days hey, it’s not all bad. It’s just a reinforcement. I think reinforcement yes, and just make sure like we’ve got a standard protocol of handover. It will help, it will help.” • “Personally, I hate mnemonics, that’s just personal thing, I hate... I don’t learn like that, it’s to me either you sort of you know it or you don’t, I think it’s a good place to start especially for a lot of the junior guys, but you know what, there’s things that aren’t covered in that and there are things that are given more priority, and it’s done just because it say so I must do it on here... it also does have a role especially on a training perspective, in the early... when the guys are still learning, and they don’t have a lot of experience. I think so, because a lot of stuff in the ward and it... that you need to something for the emergency department. Yes, so it’s that social negotiation type thing.”

Category	Respondent quotes
Existing handover formats fail to cater for the unique emergency centre environment	<ul style="list-style-type: none"> • “Well as I said it’s quite different when presenting to different specialities and everything, yes these mnemonics may not be a hundred percent and all that but so far they are working, it’s what we have, it’s what we’re using but to get a standardized one for EMS personnel to ED doctors... So if we can get probably a standardized EMS to ED doctor type of approach to it, I think that could help and that could work. Yes, it’s something worth considering.”
An emergency centre-specific handover may not be the final solution	<ul style="list-style-type: none"> • “We should, yes but then on the other hand it might not be one-glove-fits-all. So for instance here in the paediatric casualty we see all medical trauma and everything whereas in, there’s adult trauma there’s also adult medical, it might not be one-glove-fits-all. So there might be allowance for any other changes.”
Implementation of a new handover format may be a challenge	<ul style="list-style-type: none"> • “Well with the academic, for the hospital staff well it would be easy because we often have academic meetings. So if there can be presentations and things like that and then for the pre-hospital staff I’m not sure how they’re doing their continued professional development and things so I think it should be incorporated in something like that.”

4.5.2.2.3 Emergency centre personnel indicated that non-specific standardisation was a potential strategy for emergency centre handover improvement

ECP indicated that non-specific standardisation was a potential strategy for emergency centre handover improvement. ECP perceived standardised handovers as creating a shared handover expectation. The categories and quotes are depicted in Table 4-96.

Table 4-96: Emergency centre personnel indicated that it was time for the development of a handover that was specifically developed for the emergency centre

Category	Respondent quotes
Standardisation would assist newly qualified personnel	<ul style="list-style-type: none"> • “Yes, they can work if they’re introduced across the board because it’s no use the paramedics standardising and then the medics not knowing what the standard is or not knowing

Category	Respondent quotes
as well as ensuring comprehensive handovers	<p>that hey this is how the paramedic is going to present ... basically come up with something to make the handover process simpler, better, that everybody knows because if the doctor knows what to expect and let's say a junior paramedic or somebody whose been on the job for week forgets to mention something, that doctor will be privy to say, oh hey by the way you forgot to mention this, what's going on there, versus the doctor not having any standard to work on, paramedic leaving, doctor feeling like oh my gosh, there's no information for me to work with."</p> <ul style="list-style-type: none"> <li>• "Definitely as I've said, in a way I'd know what I'm supposed to be expecting in my mind because sometimes even when I'm receiving, things will come up a bit later on like 'I forgot to ask about what was actually given to the patient, what drugs are you giving t the patient, where was the ET tube?', you know what I mean? So if it was a standardized thing in my mind I'd I'll also be able to just record it."
Standardised handovers would create a shared expectation	<ul style="list-style-type: none"> <li>• "I think it would help because in that way if it's standardized everybody would know what is happening and what is expected from the paramedics and what the paramedics think that the doctor is expecting this from me so yes, if it's standardized I think it will help." <li>• "Let me just think about it actually, just to maybe try and incorporate it in, but whether or not you have a standardised approach, what I would rather say, it maybe have an integrated approach I think, you come with your approach to giving me handover regarding the patient, the I take most of what I get from you and then I would incorporate it with how I would receive my handover. So, that when I have a report to write on, it would be much, much, much easier."

4.6 Conclusion

The data collected from Study One and Study Two were presented in this chapter. The questionnaire data were reported on as both quantitative and qualitative data for each of the study populations, namely the PECP and ECP. Interview transcriptions were read, coded, categorised and themes were identified. Themes were reported on using categories and their related quotes were used as substantiation. The following chapter presents a discussion of the results presented in this chapter and links the various themes to published literature.

CHAPTER 5: DISCUSSION

5.1 Introduction

This study set out to investigate, explore and describe the perceptions of the practice of patient handover between PECP and the emergency centre. This was achieved by using an sequential explanatory mixed-methods research design to collect data. Study One utilised a quantitative design and collected data related to emergency centre handover using a purpose-designed, paper-based questionnaire. Patient information variables were ranked in order of importance by both PECP and ECP. PECP's and ECP's knowledge and opinions related to certain aspects of emergency centre patient handover were collected and described with some of these responses forming the foundation for the face-to-face, semi-structured interviews. Study Two utilised a qualitative design and face-to-face, semi-structured interviews to gather data. The data gathered from the quantitative and qualitative phases were used to gain a better understanding of patient handover between the PECP and the emergency centre. The study sought to describe the information that PECP and ECP considered most valuable for inclusion in handover to the emergency centre, their opinions related to current handover practice, as well as their knowledge and opinions related to handover adjuncts and general quality of handover. The study also aimed to analyse and interpret the data collected for these objectives to generate appropriate themes to construct a model that would potentially address three specific areas within handover, namely content, process and communication.

5.2 Discussion of the Results

The detailed findings of this study were presented in the Results section (Chapter Four) and were arranged in sections that related to the aim and objectives of the study and how the data were gathered. The purpose of this chapter is to synthesise the main results of the study and to relate these to the aim and objectives of the study. The phrasing of problems as a question that was applied to format Chapter Four was employed for the discussion. Each of the headings below is therefore phrased as a question with a clarifying discussion that follows.

5.2.1 What was the effect of qualification, experience and training on handover quality?

Qualification and experience levels between PECP and ECP were presented in Table 4-1, Table 4-2, Table 4-48 and Table 4-49. The basic prehospital emergency care qualification was a four-week-long course and at the time of the study, remained the mainstay of service delivery

within the South African prehospital emergency care environment.³⁸ The highest prehospital emergency care qualification was a four-year tertiary qualification, meaning there was a significant disparity in knowledge, training and skills within the prehospital domain. Most PECP were qualified at the basic level; in the South African context, a four-week course. This is similar to many other African systems where inadequate expertise and knowledge limit the capacity of prehospital emergency care systems to respond to the relevant needs of the communities they serve. The majority of prehospital participants had less than 10 years of experience, whereas most ECP had more than 10 years of experience. Both PECP (Table 4-10) and ECP (Table 4-57) indicated that qualification had a potentially positive effect on how handover was received or delivered. This means that there would be an expectation that handovers may be brief or of a generally low quality from PECP due to the lower qualified personnel being a significant majority. PECP indicated that a higher qualification of ECP was associated with a perception of better attentiveness and better contextualisation of the information handed over, although this was not always the case (Table 4-11). PECP also indicated that there was a preference for handing over to a doctor as opposed to other personnel (Table 4-11). This was linked to the perception that a doctor had a better understanding of the information handed over as well as the ability to make final decisions and management choices (Table 4-31).

Handing over directly to a doctor has been observed in other studies as well, where participants have indicated that this led to more robust and comprehensive handoffs and mitigated the risk of information loss due to repeated handovers and the information losing accuracy and becoming fragmented.¹¹⁰ Within the resource-constrained environment, doctors are not commonplace, and data suggest that South Africa has a critical shortage of medical practitioners.²⁷ This means that handing over directly to a doctor may often simply not be possible, and handing over to an emergency medicine physician is even less likely. This is not only true for doctors; there are also critical staff shortages in the nursing domain.^{32,33} These staff shortages affect the availability of highly qualified staff to receive prehospital emergency centre handover. PECP highlighted the fact that their initial handover was often to less qualified ECP. This was sometimes one of the reasons for repeated handover when the more qualified personnel became available and the information needed to be repeated.

ECP indicated that a higher prehospital emergency care qualification was linked to a perceived better quality of handover, improved levels of understanding and insight, but that this could also be linked to the experience of the person handing over (Table 4-58, Table 4-87 and Table 4-88). This suggests that both qualification and experience have the potential to positively affect handover quality. It is important to consider that in the case of a basic qualification,

where the attendee would have been exposed to limited content, experience may only facilitate a better packaging of information as opposed to a better understanding of medical knowledge and patient pathologies. Jamshidi *et al* identified a lack of knowledge and experience as barriers to interprofessional collaboration between prehospital and in-hospital personnel. In addition, the lack of knowledge and experience was perceived to negatively affect health outcomes post-delivery of patients to the emergency centre as well, resulting in a loss of patient information and inadequate patient care.¹¹⁴ Kalyani *et al* reported similar findings in that education was an important factor linked to handover quality.¹⁰⁷ Both Jamshidi and Kalvani *et al*'s studies were performed in resource-constrained environments where educating and training healthcare personnel remain a challenge.

Sujan, Spurgeon and Cooke postulate that the practitioner with more experience is better able to determine the appropriate amount of information required, whereas a person with minimal experience may be prone to recording everything, an approach described as “naïve” and “sub-optimal”.¹³⁶ The challenge with experience is that the qualification is the determinant of the knowledge of the deliverer or receiver of handover. In the South African context, where most of the deliverers of handover likely have a basic, four-week qualification, experience may not necessarily serve to improve handover content but may well have a positive effect on technique. This may also relate to the process of encoding error, as discussed previously, where the experience was perceived to result in a better coding process. In the content component of handover, a more experienced handover deliverer would better contextualise the patient, their condition and the most appropriate information to include in handover. This had the potential to make the handover more focussed and more relevant to the patient being handed over but would also be linked to the levels of education and training to which the deliverer of handover had been exposed. Less qualified personnel has been associated with an adverse impact on handover efficacy.¹¹⁴ As mentioned, in the South African context where adequate staff education and training remain a challenge, most PECP involved in handover have a four-week basic qualification.³⁸ This lack of qualified personnel has the potential to negatively affect the content and general quality of handovers.

Formal handover training exposure was presented in Table 4-9 for PECP and Table 4-56 for ECP. Less than half of PECP respondents and ECP respondents indicated that they had any formal training in handover. A general lack of handover training within the emergency centre environment for both PECP and ECP has similarly been highlighted by Farhan *et al*.⁹⁶ Evidence related to formal handover education is somewhat sparse, and there is a general lack of information related to how many students receive training and evaluation on patient handover.^{9,51,92,255,256}

Challenges related to training in the resource-constrained healthcare setting include the fact that there may not be sufficient funding to send staff on training. In addition, the inherent overcrowding and understaffing prevalent in the resource-constrained emergency centre may mean that management would be unwilling to give staff time off to attend training. In 2005, it was estimated that only 8% of medical schools in the United States were formally teaching handover.²⁵⁷ Most junior doctors admitted to having no formal handover training and acknowledged feeling unprepared for patient handover.⁶⁷ In addition to the lack of handover training in general, existing training has been perceived as lacking appropriate focus, being disjointed, and there is a paucity of data related to the effects of educational and training interventions.^{258–261} A lack of formal training may result in haphazard and unstructured information transfer with a resulting decrease in the quality of handover and increased risk of sentinel event. This would be exacerbated in the resource-constrained setting where low levels of training and mentoring are the norm and where there is limited focus on upskilling or updating practitioners.

Formal training related to patient handover is an essential component of the education and training of any healthcare provider who will be required to transfer patient information.^{67,98} One of the challenges associated with teaching handover within an academic curriculum is that it is essentially a skill embedded in the clinical domain.²⁶² The implication is that it is not necessarily a skill that can be learnt in the classroom. The inherent staff shortages and high patient loads mean that handover training within the clinical domain would potentially require redeploying personnel to training from their normal operational roles. This redeployment may further exacerbate understaffing and, as a result, overcrowding and patient backlog. Interestingly, the BAA qualification did not include a clinical practice component during training either. This means that most South African PECP would not have had any handover training embedded in clinical domains.³⁸ In addition, and of particular relevance in the emergency centre, interprofessional handover education has been identified as an area that is less frequently focussed upon in handover education.²⁶³

A lack of experience has been linked to what Mohorek and Webb term “encoding error”.¹³⁷ Encoding refers to the process of the handover deliverer putting their thoughts into words and encoding error refers to mistake or omission during the encoding process. Some suggested reasons for encoding error have been that the deliverer lacks the knowledge or experience to correctly encode the message.¹³⁷ The participants in this study attributed both the qualification level and experience of the deliverer of emergency centre handover as important components of their handover quality (Table 4-10, Table 4-11 and Table 4-57). This would suggest that emergency centre handover quality is linked to both formalised training as well as practical

experience related to that training. Within the resource-constrained healthcare system, formalised training is not commonplace and practical handover experience is often not gained under the tutelage of a higher qualified or more experienced practitioner. Instead, the understaffing and work pressures often dictate that training and mentorship are assigned a low priority and personnel are responsible for their own upskilling.

The research base related to patient handover and the effects of educational intervention is steadily growing, but areas remain where sufficient information is not yet available. These areas include the determination of the transfer of skills from the educational to the workplace environments, a lack of long-term retention studies, and evidence related to the direct link between patient handover and patient outcomes.²⁶² Further research is required to understand the effects of formalised classroom training, as well as on-the-job training, on quality of handover and the resultant effects on patient care and the incidence of sentient events. The paucity of research related to education and training, and its effects on patient handover in the resource-constrained environment, is a cause for concern and should be a focus point in future. The development of a model that contextualises limitations related to qualification and experience of personnel and existing training related to the effect that each has on the efficacy of emergency centre handover within the resource-constrained environment may provide potential solutions to some of the problems highlighted in this thesis.

This section partially achieved Objective Three described under [1.6 Objectives](#).

5.2.2 What are the levels of importance of patient variables handed over?

There is limited literature related to what standard information should be delivered during a handover, and this has led to some PECP improvising or developing their own working guidelines.¹¹⁰ Participants in this study were asked to classify handover variables by levels of importance in an effort to rank patient information for handover. The results are depicted in Table 4-3 for PECP and Table 4-50 for ECP. Within the ten variables considered most important by PECP and ECP, eight were identified by both groups. These were pulse rate, blood pressure, vital signs, patient priority, type of major injuries, respiration rate, Glasgow Coma Score, and anatomical location of major injuries. It was interesting to note that certain physiological variables did not enjoy a high priority. Examples were SpO₂ and ECG, and it is postulated that one of the reasons for this could be that complex and expensive devices are required to measure these variables and, in the resource-constrained environment, these may not be readily available.

Physiological variables linked to high-level interventions, such as intubation and EtCO₂, were probably not assigned a high priority due to the limited number of patients where these would be relevant. By extrapolation, these variables would become irrelevant in an environment such as that in this study where interventions such as intubation or even intravenous access may simply not be available on the scope of most PECP. Low- and middle-income countries would fall into this category, with the low-income countries having such significant resource constraints that they may not have any formalised prehospital systems in place.²⁶⁴ This would have a significant effect on what expertise and interventions are available and, as a result, what information would be considered relevant for inclusion into the prehospital to emergency centre handover.

Patient history variables were assigned similar levels of importance by both ECP and PECP. Past medical history was ranked 21st by PECP and 22nd by ECP. Past surgical history was ranked 26th by PECP and 24th by ECP. General patient history differed in that it was considered more important by PECP (7th) than ECP (27th).

The acute nature of prehospital patient management and the resultant emergency centre handover is often reflected in the fact that, unless pertinent to the patient, a detailed patient history may be deemed as something that can be elicited from the patient in the emergency centre after handover. It is important to bear in mind that there is a generally low qualification level among most PECP within the South African and other resource-constrained environments.²⁶⁴ This may translate into a lack of appreciation of the importance of the patient's history and may also result in a lack of contextualisation of the importance of certain information in specific patient populations. In addition, where intervention level is limited due to scope, such as in the South African context, aspects of patient history not directly related to interventions may simply be omitted. This may explain the difference in ranking of the general patient history.

Demographical variables were ranked with low levels of importance by both PECP and ECP. General demographics were ranked 29th by PECP and 33rd by ECP. Age was ranked 31st by PECP and 28th by ECP, and gender was ranked 33rd by PECP and 32nd by ECP. This information often features in the initial information from handover mnemonics such as DeMIST,¹⁴⁸ SBAR¹⁸⁴ and ASHICE¹⁷³. Perhaps the acute nature of the patient who usually presents to the emergency centre means that their demographic information may become secondary to arriving at a provisional diagnosis and appropriate initial triage plan. The incongruence between mnemonics used in the prehospital and emergency centre environments may also be a contributor to the differing priorities assigned to handover

information variables. This incongruence is discussed further under [5.2.5. Are mnemonics an option for standardisation of emergency centre handover?](#)

Ranking patient variables implies that there is a minimum dataset that should be presented for all patients. Participants in Meisel, *et al's* study discussed whether handovers should have a format where only the minimum necessary information should be relayed or whether it should be more extensive.¹¹⁰ Prehospital participants in Meisel *et al's* study suggested that a patient whose clinical status had changed (improved or declined) during prehospital care would require a more detailed handover.¹¹⁰ This links to the study by Wohlhauer *et al* and highlights the contextual nature of the emergency centre handover. It suggests that the patient may ultimately be the determinant of what information is more or less important.²⁶⁵

Independent of the ranking of importance, both PECP (Table 4-16) and ECP (Table 4-62) participants indicated in open-ended questions that vital signs, mechanism of injury, chief complaint, signs and symptoms, treatment and interventions, medical history and demographics were important contributors to an effective handover. This was despite some of these variables having scored low on the ranking scale, which highlights the contextual nature of handover data. The implication is that despite standardisation of handover being suggested quite often in the literature, the rigid and non-contextual nature of many mnemonics or handover tools means that important, patient-specific information may inadvertently be omitted, or conversely that unimportant information may be unnecessarily included. These factors may be linked to education and experience, where a broad heading such as 'patient history' would be more meaningful to a person with a basic qualification than a heading such as 'surgical history'. In an environment where doctors are a rarity, the opportunity for elective surgery, and potentially even emergency surgery, would be limited, meaning that this variable may not have significance to PECP. This would be true of vital signs where a person who does not have access to a blood glucose test would not consider this a significant variable, even in the diabetic patient where such information is contextually critical.

Emergency centre participants mentioned the lack of equipment, and specifically the glucometer as a contributor to poor handover (Table 4-60). This demonstrates the different factors that affect the importance assigned to patient variables for inclusion into handover within the resource-constrained environment. It is unlikely that a resource-rich system would experience similar problems, highlighting the contextual nature of an emergency centre handover. The development of an emergency centre model within the resource-constrained environment may provide some guidance on the importance of specific variables within the uniqueness that is the resource-constrained emergency centre handover.

This section achieved Objective One and Objective Two described under [1.6 Objectives](#).

5.2.3 What was the general opinion of the quality of handovers within the emergency centre?

Participant opinions on the general quality of emergency centre handover were depicted in Table 4-4 for PECP, and in Table 4-51 for ECP. The majority of both groups indicated that emergency centre handovers were average or below average. PECP were more positive about the accuracy and relevance of their own handovers (Table 4-5) than ECP were about the handovers they received (Table 4-52). The fact that the majority of PECP were qualified at a relatively low level may tie into what Kruger and Dunning term “unskilled and unaware of it”.²⁶⁶ Kruger and Dunning postulate that a person’s lack of competence in a specific domain robs them of the metacognitive ability to realise this lack of competence.²⁶⁶ The fact that lower qualification levels are prevalent within resource-constrained environments, that initial handover training is neglected, and that there is little, if any, training aimed at improving handovers, means that most PECP would be oblivious to what an effective handover actually entails. By extrapolation, they would be of the opinion that their handovers were ‘good’ regardless of the actual standard of their handovers. Several studies confirm that handovers are inefficient or that the general quality of handovers is poor.^{50,51,81,267}

There have been several suggestions that the quality of patient handover requires improvement.²⁶⁸ Many of the identified improvement strategies suggested in this thesis would have the ultimate result of potentially improving the general quality of emergency centre handover. Improving emergency centre handover is a complex problem that requires a multifaceted approach to not only problem identification, but also to a search for practical and implementable solutions.

Kruger and Dunning postulated that providing appropriate training to individuals who lacked competence would provide these “incompetent” individuals with the relevant metacognitive skills to realise that their performance was poor and, in doing so, would help them realise the limitations of their abilities.²⁶⁶ The need for training was one of the themes that emerged with strong traction throughout this study. Emergency centre-specific handover tools should be developed specifically for the resource-constrained environment and should take cognisance of the limitations related to levels of knowledge, training, skills and experience. Training should be focussed on addressing issues that are specifically poorly performed as opposed to a simple generic approach as may be followed in a highly resourced environment where existing levels of knowledge and training tend to be quite high. This information has the potential to

contribute to the development of a model that addresses some of the issues related to emergency centre handover within the resource-constrained environment.

This section partially achieved Objective Two and Objective Three described under [1.6 Objectives](#).

5.2.4 What was the general opinion on handover length within the emergency centre?

The duration of emergency centre handover is linked to how concise and comprehensive the information is that is handed over. There is a paucity of literature related to the actual time that a handover within the emergency centre should take.⁹³ Most PECP (Table 4-6) felt that their own handovers were of appropriate length (58%) or too short (22%), whereas ECP (Table 4-53) felt that they were either of appropriate length (48%) or too short (46%). This apparent incongruence may be linked to some of the factors identified previously. Inadequate (basic) training would limit the handover deliverer's ability to adequately determine what patient information and physiological variables are important. The missing information may give the receiver the impression that the handover was too short, not so much from a time as from a content perspective. Many studies have identified conciseness as a desirable attribute for a handover, but there is little information that defines guidelines for conciseness.¹⁰⁷

Conciseness of handover was an attribute identified as contributing to a good handover by both PECP (Table 4-14) and ECP (Table 4-60). The challenge in evaluating length and conciseness relates to the contextual nature of the information deemed important. In the high-acuity patient, the deliverer would probably be inclined to include more information than in the case of a low-acuity or 'stable' patient. In other words, there needs to be a balance between conciseness and comprehensiveness.²⁶⁹ Johnson *et al* point out that although concise, emergency centre handovers tend to focus on vital signs and become obsolete within a short period of time.²⁷⁰ Wolhauer *et al* specify that it is the patient who determines the information balance. Concise and efficient handovers were more appropriate for stable, straightforward patients whereas high-risk (high-acuity) patients would require more time and dialogue to complete the handover.²⁶⁵ Thompson *et al* postulated that an increase in the amount of total information does not necessarily result in an improvement in patient care.²⁵⁵ Redley *et al* found that too much information (content considered irrelevant to ongoing patient care) was perceived to increase the duration of handover, detract emphasis from information considered important, and compromise completeness and quality of verbal communication.¹⁰⁶

Overly brief handovers have the potential to cause confusion, reduce opportunities to ask clarifying questions and have a negative effect on patient safety.⁹³ A handover that is perceived as too short may reflect information being missing. The lack of appropriate levels of education and training in the local, resource-constrained setting due to the brevity of prehospital emergency care training potentiates limited knowledge; as a result, the tendency is to omit appropriate amounts of information about the patient. ECP indicated that there was information considered important from the scene, but this was often not handed over (Table 4-90). The actual information that was considered important was not explored in detail but would, in all likelihood, be contextual and patient-dependent. This would imply that a longer handover with more relevant information may be preferable, but that it was the contextual relevance of the information that was of paramount importance.¹⁰⁶ Further research is required to better understand the link between amount of information and perception of whether or not a handover is too short or too long.

South Africa is considered one of the most unequal countries in the world.²⁷¹ The consequence for emergency centre handover is that on-scene information becomes all the more important to contextualise the patient's background, socioeconomic status and potential disease profile. In addition, the uncontrolled immigration facing the South African healthcare system means that often the patient may speak a language not understood by the emergency centre staff. This creates additional challenges if the patient cannot speak a local dialect, or is not accompanied by someone who is able to translate.

This section partially achieved Objective Two and Objective Three described under [1.6 Objectives](#).

5.2.5 What about mnemonics as an option for standardisation of emergency centre handover?

There was general agreement between PECP (Table 4-7) and ECP (Table 4-54) that using a mnemonic was considered an appropriate way to ensure the comprehensiveness of handover. There was generally poor knowledge related to commonly used mnemonics. PECP were most familiar with the MIST mnemonic (Table 4-8), and ECP were most familiar with the SOAP mnemonic (Table 4-55). More than half of PECP (55%) had never heard of the SOAP mnemonic and more than half of ECP (56%) had never heard of the MIST mnemonic. Apart from the two mnemonics identified by the participants in each domain, other commonly used mnemonics had low levels of familiarity. The incongruence between mnemonics used in the

prehospital and emergency centre environments may also be a contributor to the differing priorities assigned to handover information variables.

The lack of appropriate education programmes may be one of the reasons that mnemonic knowledge was poor, but in the resource-constrained environment, mnemonics may have an important role to play. Determining a minimum data set has been a strategy suggested by several authors, however, in the resource-constrained environment, many of these may not be relevant or simply unavailable due to equipment limitations. Existing mnemonics have been linked to unnatural information flows when compared to emergency centre processes, and this has the potential to decrease the efficiency of handover and make implementation impractical.⁹² Within the resource-constrained emergency centre, with its busyness, overcrowding and task-orientated environment, there may be no specific process flow and handover is seen as independent of the hospital, thereby negating the argument of incongruence and impracticality between handover and emergency centre process.

The implication of the incongruence between PECP and ECP mnemonic familiarity was that MIST was the format most commonly used to deliver PECP handover. Conversely, SOAP was the most likely format for the emergency centre to receive handover. This incongruence may negatively affect the shared understanding of the patient. The deliverer would be following their preferred, and in their opinion, well-known mnemonic's structure, while the receiver may consider the same handover as haphazard and lacking structure related to the mnemonic that they are familiar with and on which their information expectation would be based.

An incongruence in handover familiarity may translate into a barrier related to the aim of creating a shared understanding, or "active co-construction of understanding" of the patient due to the deliverer and receiver of emergency centre handover having what Cohen, Hilligoss and Amaral term "potentially dissimilar mental models" of the patient and their condition.¹⁷⁰ This dissimilar mental model may also have its roots in the different levels of knowledge and training between the deliverer and receiver of handover. A person with poor training and knowledge levels would potentially be unable to realise the true acuity of the patient, whereas the emergency centre handover receiver may immediately recognise the high acuity of the patient. The deliverer of handover may therefore omit important information or, conversely, the receiver may fail to recognise the significance of some of the information handed over. This dissimilar mental model would be the source of conflict, and the use of a mnemonic may prove beneficial in these resource-constrained environments.

The Linear Model of Communication suggests that structured handover protocols, such as mnemonics, could conceivably improve the content of patient handover.¹³⁷ Several mnemonics are used to facilitate better handover.⁹³ However, mnemonics have been identified in the literature as failing to recognise the contextual nature of the information that they include and often include data elements that may not be relevant to emergency centre practice.⁹² This is highlighted in the results (Table 4-3 and Table 4-50), where demographic data were ranked as being of low importance by participants, and yet often form part of the initial information presented. Some of the disadvantages identified by PECP of using a standardised approach was that it did not contextualise information and could be overly prescriptive, potentially making the deliverer 'narrow-minded' (Table 4-32).

The limitations of currently used mnemonics and their context within the resource-constrained environment should be considered when searching for a potential solution aimed at handover content standardisation. The point previously made related to the knowledge and training limitations within the resource-constrained environment may, in fact, mean that a prescriptive standardised format could actually be the most practical solution.

The use of handover mnemonics has been shown to improve the quality of handover, however, the reasons for the improvement after implementation have not been directly attributed to the mnemonic alone.²⁶⁸ There was no evidence found for a mnemonic that had been developed specifically for the uniqueness of the emergency centre. It is possible that the current practice of using non-emergency centre mnemonics adapted for use in the emergency centre may be the reason for their lack of efficacy. A mnemonic that is developed specifically for the emergency centre may provide a more comprehensive solution to improving emergency centre handover than merely trying to implement a mnemonic that has its roots in another domain of healthcare. This mnemonic should take the limitations of the resource-constrained environment into account and should recognise the differing levels of education, training and available resources when determining the minimum dataset.

This section partially achieved Objective Two and Objective Three described under [1.6 Objectives](#).

5.2.6 What content factors were identified that affect the efficacy of emergency centre handover?

Handover content refers to the actual patient information variables that are included in the handover. Each variable has a perceived importance value but there are several factors that

may affect the relative importance of each within the context of the patient. The identified content factors included the perceived importance of handover variables for inclusion in handover, additional information often not included in handover, the contextual nature of patient information and information that was omitted from handover.

This section partially achieved Objective One, Objective Two and Objective Three described under [1.6 Objectives](#).

5.2.6.1 What was the relative importance of handover variables for inclusion in emergency centre handover?

Participants in this study were asked to classify handover variables by levels of importance in an effort to rank patient information for handover. The results are depicted in Table 4-3 for PECP and Table 4 for ECP. The relative importance of handover variables for inclusion in emergency centre handover was discussed in detail under the heading [5.2.2 What are the levels of importance of patient variables handed over?](#) The following sections present handover content over and above those that related to the ranking of importance levels.

5.2.6.2 What additional patient information was identified as important for inclusion into handover?

An unintended consequence of the question related to what participants thought contributed to a good handover, was that many participants stipulated patient information variables whose inclusion they considered contributed to a good handover (Table 4-13, Table 4-16, Table 4- and Table 4-60). Most of the patient information variables included in the questionnaire were mentioned in the responses from both PECP and ECP. Importantly, treatment interventions and responses to treatment were highlighted by PECP (Table 4-16) and ECP (Table 4-62) as contributing to good handover. These specific patient information variables were only prominent in the MIST and DeMIST mnemonics, but these two mnemonics only specified treatment and not responses to treatment.^{171,172} This is an important variable that should be considered for inclusion in future handover standardisations.

The scope of the BAA is limited and it is thus not uncommon for them to have performed invasive interventions during transport. It is, however, important to acknowledge that despite this, a minimum dataset should not necessarily be based on the scope of the lowest common denominator; instead, the importance of information for inclusion should be a key

consideration. Within the resource-constrained environment, it may be necessary to consider locally relevant information to avoid confusion. An example would be the exclusion of SpO₂ in an area where there are no pulse oximeters or other advanced equipment. Any proposed handover tool should be malleable enough to cater for omissions or additions to content.

Emergency centre participants highlighted the importance of the PECP gathering detailed on-scene information that was not available to personnel who were not at the location where the patient was found (Table 4- and Table 4-). This information was considered important to emergency centre staff for better contextualising the patient, to facilitate a more holistic picture of the patient, and would improve certain administrative processes related to patient admission. One suggestion from the emergency centre participants in this study was to ensure that a family member, or collateral, accompanied the patient (Table 4-). It is often the case that in the resource-constrained setting a facility may not have adequate bedding and may, in fact, be unable to adequately feed the patients. The patient having a collateral allows them to explore other solutions to these real-world problems.

Anecdotal evidence suggests that patients often bring their own blankets in anticipation of there being bedding shortages. This is a potential motivator that PECP could use to ensure that the patient is accompanied by a collateral. This may assist the receiving facility in having access to a greater amount of information that may not have been gathered or handed over by the PECP. The involvement of the patient or a family member in the handover is a strategy suggested for clarification of questions related to information that the deliverer of the handover does not have at their disposal.^{45,210} While this may be a potential solution, the responsibility would still rest with the PECP to ensure that there is adequate information available, specifically medical information, to which the collateral may not have been privy.

Much of the information available to the PECP on the scene and from bystanders is unavailable to the ECP who do not have the opportunity to examine the scene or interview bystanders or family members. This means that the sole source of this important contextual information is often the PECP who attend to the patient. Within the South African context, the number of official languages and influx of immigrants who often do not speak any of these recognised languages may mean that the only time a translator may be present would be on scene. This would make gathering appropriate information all the more important at this time, as the person able to translate is often not necessarily the person accompanying the patient. Paradoxically, participants in Meisel *et al's* study indicated that important on-scene information was often dismissed by the hospital staff.¹¹⁰ Perhaps a reason for this information not routinely

being gathered or handed over may be that it is frequently not considered contextually important by the receiver of the handover.

Meissel *et al* found that prehospital participants indicated a perception that they were privy to specific information that had the potential to influence the timelines and type of attention that would be given to their patients. These participants described how they practiced “frontline medicine” and observed relevant characteristics, evidence or circumstances of the trauma scene or patient’s home.¹¹⁰ The importance of situational information has also been highlighted by Harmsen *et al* who studied prehospital communication between trauma helicopter, ambulance services, and dispatch centres.¹¹² The results indicated that more patient and situational information needed to be handed over than was physically handed over using the two most common mnemonics included in their study (SBAR and MIST). The authors further suggested that standardisation of prehospital handovers was a possible solution.¹¹²

The incorporation of a minimum on-scene dataset into a mnemonic may be a solution to a portion of the missing information challenge, but further research is required to determine exactly what information would be considered appropriate. The presence of a collateral may help in mitigating some of the challenges related to missing information. Anecdotally, one of the challenges with having a collateral accompany the patient relates to the practical issues that are pervasive in a resource-constrained setting. Transport, nutritional and employment consequences related to accompanying a patient are often barriers to a person being willing, or able, to accompany a patient to the hospital. This may mean that the responsibility to gather more on-scene information than normal would fall to the PECP to ensure that the receiving facility has sufficient information at their disposal.

5.2.6.3 What about the contextual nature of patient information?

The dynamic nature of patient illness and presentation means that each patient variable has a contextual value assigned to it. An example of the contextual nature of handover variables would be that of temperature. In the hypo- or hyperthermic patient, temperature becomes a physiological variable of critical importance; however, in the patient without any temperature concerns, the variable may become insignificant. The same argument could be made for variables related to trauma and non-trauma patients where variables such as the mechanism of injury or past medical history would have a corresponding contextual and patient-specific relevance. The understanding of the significance of a specific variable within a particular patient’s context may be linked to qualification and understanding of that specific pathology.

ECP participants in this study linked higher prehospital qualification to a better quality of handover (Table 4- and Table 4-). The South African PECP's education and training are characterised by a range in training duration from four weeks for the BAA, to four years for the graduate professional.³⁸ This may translate into an inconsistent understanding and contextualisation of patient data and resultant diagnostic interpretation. The result is that although the patient information encoding process is unique to each individual, individuals within the same qualification band would likely share a similar understanding of the patient and what information would be relevant to that patient's specific condition.

The wide range of knowledge and training levels dictated by the qualification mix may indicate significant incongruences between the understanding levels of not only PECP and ECP, but also between PECP and their prehospital colleagues. Similarly, persons within different qualification bands may differ significantly in their perceptions of what information is relevant to the particular patient currently in their care. A possible reason may be that higher qualified PECP's education and training would improve their ability to contextualise important and less important bits of information. Standardised handover strategies tend to be rigid and generally ignore the contextual nature of information. The development of an emergency centre-specific handover that is malleable may mitigate some of the challenges associated with appropriate contextualisation of handover information. However, as discussed previously, prescriptive standardisation may actually be an appropriate strategy within the resource-constrained environment.

5.2.6.4 What about missing information?

ECP identified specific patient information variables when asked what contributed to a bad (ineffective) handover (Table 4-63 and Table 4-66) as well as PECP delivering incomplete handovers that were missing information as an additional barrier. There was confirmation of this in the interviews where ECP highlighted inadequate assessment and history taking as contributors to poor emergency centre handover (Table 4-75). Missing information made it difficult for ECP to adequately prioritise the patient (Table 4-92). Mnemonics such as SBAR include a section related to the environment and situation in which the patient was found and may provide a good base from which to work when gathering on-scene information.^{143,165,180} Perhaps the most concerning issue related to missing information was that ECP indicated PECP sometimes left without handing over at all; they simply 'dumped' their patients (Table 4-8).

There are some within the South African prehospital healthcare system who lay the blame of callous practitioners at the door of the private training colleges whose primary focus seemed aimed at quantity as opposed to quality training. This meant that the prehospital environment became somewhat of a job-seeker's domain where the focus was on simply getting a job as opposed to serving the community. The numbers of gainfully employed BAAs would seem to confirm this assumption that numbers (and money) are the drivers as opposed to actual need.³⁸

Both PECP (Table 4-22) and ECP agreed that it was time for an emergency centre-specific handover mnemonic (Table 4-69). PECP indicated that it was important for ECP to be included in the process of determining a minimum dataset (Table 4-47). This recognition is testament to the importance of the shared picture approach. Any proposed mnemonics should take cognisance of the importance of on-scene information as well as the contextual nature of patients' physiological variables. Further research is required to explore what information is considered as contributing to a comprehensive handover, and then to package this in an easily understandable, emergency centre-relevant and malleable format.

5.2.7 What process factors were identified that affect the efficacy of emergency centre handover?

The handover process refers to how the handover actually occurs. This includes things such as the personnel involved in handover, the environment in which it takes place, and how the handover actually took place. Process factors identified by participants included a lack of personnel to receive the handover, interruptions during handover, the need to perform multiple handovers, a lack of patient privacy, rushed handovers, and a lack of pre-notification prior to arrival at the emergency centre.

This section partially achieved Objective One, Objective Two and Objective Three described under [1.6 Objectives](#).

5.2.7.1 What about the lack of ECP available to receive handover?

A shortage of physical manpower was a challenge identified in Jamshidi *et al's* study related to cooperation challenges between prehospital and in-hospital emergency services in handover.¹¹⁴ Participants highlighted the high patient to nurse ratios, the resultant higher workloads ("three times as much as other wards") and that there was often no free staff to

take delivery of new patients. This Iranian perspective is a situation not dissimilar to the one described by participants in this study.

PECP identified a lack of emergency centre staff available to receive patient handover as a relatively frequent occurrence and a barrier to effective patient handover (Table 4-17, Table 4-27 and Table 4-28). PECP attributed the general busyness of the emergency centre as the primary reason for ECP not being available to receive handovers. Lack of appropriately qualified staff and staff shortages in general, overworked staff who were often 'snowed under', and a general attitude of disinterest by receiving staff were the main factors identified by PECP as contributing to a lack of ECP available to receive emergency centre handovers.

There are critical shortages in the South African healthcare system, and the emergency centre is no exception. The staff shortages from both a medical practitioner and nursing perspective in South Africa are well documented.^{27,32,33} Not only this, but there is also a critical shortage of highly qualified PECP within the South African healthcare system.³⁸ Understaffing of emergency centres is often linked to busyness and is a seemingly common phenomenon.²⁷²⁻²⁷⁵ Both PECP (Table 4-19 and Table 4-35) and ECP (Table 4-78) recognised the understaffing problem within emergency centres.

PECP in this study indicated that delays in the handover process were frustrating and resulted in having to deliver handovers to inappropriately qualified ECP (Table 4-19, Table 4-28 and Table 4-29). This sentiment has been echoed by participants in Meisel *et al's* study who consciously raced to obtain prompt care for their patients but felt defeated when that race was stalled due to delays in the emergency centre.¹¹⁰ Meisel *et al* conducted their study using participants sourced from three national and regional meetings attended by EMS providers in the United States.²⁷⁶ This means that these were persons from and working in a resource-rich environment. Within the resource-constrained environment, these delays are far more common, far more pronounced, and may also include factors such as advanced life support practitioners waiting for extended periods with the patient for an ambulance to transport the patient. The challenge is that, without adequate staff, there will be a constant delay in handover processes.

The appointment of a triage nurse or officer has been suggested by participants elsewhere in this thesis as a possible solution (Table 4-23). This would then facilitate more rapid triage of critical patients but could also result in further delays if that person is subject to large patient volumes. The problem with this solution is that in a system that is already understaffed and overworked, it would be unlikely for such a role or person to be available to allocate to a purely

triage function. In addition, there would need to be a structured triage process familiar to all involved in the transfer of the patient from the prehospital to the emergency centre environments. There are several triage score systems in use in the South African environment, such as the Triage Early Warning Score (TEWS).¹⁷² The challenge is that within the resource-constrained setting, dissemination and training related to these scores is often not possible, limiting their efficacy. A further challenge is that where education and training are lacking, and where triage scores and handover strategies are incongruent, a complete re-evaluation of the patient may be required to ensure appropriate triage. This re-evaluation was identified by PECP participants as a source of frustration and may actually have its roots in this very scenario.

5.2.7.2 What about interruptions during emergency centre handover?

An interruption can be defined as any event that disrupts the handover process.²⁷⁷ Interruptions during handover were a common source of frustration for PECP in this study (Table 4-19 and Table 4-29). Participants perceived interruptions as occurring commonly and these were attributed to inattentive listening and receiving staff being distracted by the tasks they were performing, resulting in information having to be repeated and the handover deliverer having to repeat the handover. De Lange *et al* observed similar interruptive behaviour in a private hospital setting in South Africa, an environment not overly dissimilar to that in which some of the participants of this study would have been involved in handover.²⁷⁸ The fact that De Lange *et al* studied a private facility may have meant that some of the identified problems could have the potential to be more pronounced in the more resource-constrained public healthcare system.

Interruptions have the potential to increase handover discontinuity and the likelihood for errors in communication, and consequently, errors in patient care.^{72,184,194,277} Reasons for interruptions during patient handover include; opportunistic activities such as multitasking, the completion of non-urgent tasks, and interruptions by other healthcare professionals.²⁷⁹ Prehospital participants echoed these reasons for interruptions (Table 4-19 and Table 4-29). Some of the consequences of interruptions identified by prehospital participants included the need to hand over the same information multiple times, or even to repeat the entire handover multiple times (Table 4-19, Table 4-29 and Table 4-30).

Literature suggests that interruptions during handover are commonplace.^{136,147,194,279} Venkatesh *et al* found that verbal interruptions occurred in 49% of handovers and that 6% of handovers were interrupted for patient care issues.¹⁹⁴ Spooner *et al* found that handovers in

the ICU were interrupted an average of twice per handover. Interruptions were most commonly from fellow medical personnel and alarming equipment.²⁰⁹ Habicht *et al* reported that interruptions to intern handover were pervasive, occurring more than 40% of the time.²⁷⁷ This data would suggest that not only are interruptions commonplace, but they have almost become accepted practice. However, it has been proposed that there is a greater risk for human error when interruptions to handover become accepted practice within healthcare.²⁰⁹

The use of a designated area for handover may be a solution to some of the issues linked to interruptions but will by no means solve all of the potential causes. The receiving personnel may still be required to perform other tasks and there may still be interruptions, but these would, in all likelihood, be decreased. Von Dossow and Zwissler suggest that a “sterile cockpit” approach be followed where only patient-related communication and no private communication is permitted. They further suggest that only one person be allowed to speak during the handover and that the only permitted interruptions would be for emergencies. There was also a recommendation that sufficient time should be allowed for questions from any member of the team after the handover had been completed.¹⁸⁴ Many of these recommendations have been suggested by other authors as well.^{51,158} However, although these suggestions seem logical, further investigation is required to determine whether or not these are practically implementable and result in measurable benefit.

5.2.7.3 What about having to hand over multiple times?

Multiple handovers refer to when a handover needs to be delivered more than once for the same patient. Prehospital participants identified having to repeat their handovers as a source of frustration, and cited having been asked the same question to having to repeat the entire handover to multiple persons as the primary reasons (Table 4-19 and Table 4-30). Reasons postulated for having to provide multiple handovers included triage and escalation of care, lack of attentive listening, interruptions, and individual emergency personnel not taking responsibility for a single patient. These reasons are reflective of the typically understaffed and overcrowded resource-constrained healthcare system.

Multiple and repeated handovers have been linked to loss of information.^{3,16,18,20,45,54,168,210} This information loss was one of the negative effects of needing to perform multiple handovers identified by PECP (Table 4-19). This was attributed to their either inadvertently omitting facts, or deliberately omitting facts as a result of the frustration associated with the repetition. Fragmentation and divided communication have been identified as risks to effective handover. The result is a loss of vital information due to the multiple handovers being required during the

triage or care escalation process.³ This information dilution is not dissimilar to the phenomenon described by Owen *et al* where information is lost each time a new person becomes involved in the information transfer process.³

Multiple handovers negatively affect the efficacy of patient handover. There is a reduction in the amount and relevance of information handed over, and the frustration felt within the handover process has the potential to negatively affect communication. Some solutions suggested elsewhere in this thesis may assist in reducing the incidence of multiple handovers. Within the resource-rich emergency centre, dedicated handover time as well as ensuring that the appropriate handover person is available are reasonably easy strategies to put in place. The same is not true for the overcrowded and overworked resource-constrained emergency centre. This does not mean that improvement strategies are not possible, but environment-specific solutions need to be sought within the confines of what is available. Simply teaching personnel how to actively listen would go a long way to reducing the need to repeat information without the need for additional staff. Structured handover protocols that link into triage processes may also reduce the need for multiple handovers.

5.2.7.4 What about patient privacy during emergency centre handover?

The layout of the emergency centre often results in handovers taking place in high-traffic areas that tend to be noisy.²⁸⁰ The busyness of the emergency centre habitually means that there are insufficient cubicles or other private places for patient handovers to occur. This lack of privacy was identified as a source of frustration to ECP participants (Table 4-64) in this study. This frustration has been echoed in other studies where patients have been placed “in the hall”, “in the corner”, or “next to the broom closet”.¹¹⁰ It is postulated that issues related to patient privacy are more pronounced in the resource-constrained environment where facilities and staff are more limited. Kalyani *et al* explored the perspectives of Iranian paramedics and emergency centre members on handover.¹⁰⁷ The fact that their study was conducted in Iran means that participants may share some of the resource constraints experienced by the participants in this study. Kalyani *et al*'s participants shared a sentiment that patient privacy was compromised in the emergency centre and that there were up to ten people near the patient during handover.¹⁰⁷ It is unlikely that this scenario would exist in a resource-rich environment, but is one that participants in this study would most likely be quite familiar with.

A suggestion for maintaining patient privacy has been to create a designated area away from the clinical environment.²⁷⁷ Unfortunately, especially within the resource-constrained environment, many emergency centres have been converted from pre-existing hospital areas.

This often means that the structural changes that would be required to create an environment for effective handover are not practical or financially possible. Despite this, a simple area in the emergency centre that is conveniently located and surrounded by a curtain could go a long way to addressing this issue.

5.2.7.5 What about the perception that PECP handovers were rushed?

ECP identified rushed handovers as a barrier to effective handover (Table 4-63, Table 4-64 and Table 4-67). There were several reasons postulated for the rushing of handovers, which included the fact that PECP had outstanding cases to attend to; that they did not have sufficient knowledge about the patient; or that they merely wanted to conclude the handover as quickly as possible. Perhaps more concerning than rushed handovers were handovers that were simply not done and where ECP indicated that the patient was 'abandoned' by PECP without a handover (Table 4-81). Rushed handovers tend to be incomplete and have the potential to result in adverse events that may include medication errors, inappropriate treatments regimes, or delays in initiating treatment.¹⁰² The rushing of handovers was more common among less qualified personnel and occurred most often at prehospital shift handover (Table 4-76).

The backbone of the South African prehospital emergency care services is the BAA who makes up the majority of persons registered with the HPCSA and those working in the services. In the under-resourced and overworked environment, as often found in South Africa and other resource-constrained environments, there are high call volumes that cannot be timeously serviced by the available vehicles and staff. This results in a call backlog and pressure put on the PECP to hurry their handover so that they can attend to the next call within a timeframe acceptable to the system in which they work. Some of the perceived effects of rushed handovers identified by participants were that it was negative for the team, resulted in inadequate patient information, and was a source of frustration.

In the same way that prehospital personnel often have time constraints and are under pressure to quickly hand over patients, so too the staff in the emergency centre are often under time pressure due to the inherent busyness of the emergency centre.⁵⁰ This inherent busyness may also be a contributor to PECP feeling pressured to complete their handovers as quickly as possible (Table 4-19 and Table 4-35). The ECP's perception related to rushed handovers may also stem from the PECP's demand for preference when they bring a patient into the emergency centre (Table 4-79). Many of the solutions to rushed handovers relate to setting dedicated time aside for the handover. This is difficult to implement in the prehospital to

emergency centre handover due to the ad hoc nature of these handovers. Perhaps a solution is for both the deliverer and receiver of handover to allocate a specified period of time dedicated only to information handover and questioning. This period of time would need to be malleable to cater to patient acuity and the contextual nature of the patient handover. Despite arguments related to resource constraints, it could be argued that even in the resource-poor emergency centre, the handover is going to take place regardless. Allocating a dedicated time to the handover would assist both the deliverer and receiver in realising a similar expectation and reducing the pressure to rush the handover.

5.2.7.6 What about pre-notification?

Pre-notification involves the PECP contacting the emergency centre and informing them of the patient before their arrival. Pre-notification is commonly expected and deemed critical when a high-acuity patient is en-route to the emergency centre, such as stroke patients where time-sensitivity is a consideration.^{281–283} Pre-notification is usually conducted via telephone and is used by the emergency centre to plan for the patient's arrival by allocating staff roles, anticipating the needs of the patient and maintaining flow within the emergency centre.^{45,136,210} ECP identified a lack of pre-notification as a source of frustration (Table 4-63, Table 4-64, Table 4-74 and Table 4-78). They felt 'ambushed' when a high-acuity patient was brought in without any pre-notification. The challenge associated with this was that there was no time for preparation, either by way of staff, equipment or mental preparation. Within the resource-constrained environment, there may be only one set of specific equipment that may be stored for safety. This would mean that preparation would need to include sourcing and setting up the equipment. A simple, anecdotal example would be that of a laryngoscope in an under-resourced emergency centre. There may only be one laryngoscope in the emergency centre and not all the blades may be functional. This would mean that additional planning would need to be implemented to ensure adequate equipment preparation, and it may also be possible that bailout devices would be unavailable. Additionally, the person best qualified to perform a high-risk procedure is unlikely to be waiting in the emergency centre and may need to be summoned from elsewhere in the facility.

There may be several reasons for PECP not employing pre-notification strategies. As suggested in Table 4, ECP indicated that PECP may not adequately understand triage and referral processes, which may be a contributing factor. Not only this, but PECP may need to use their own airtime to make the call to the emergency centre, may not have the correct number, or may be sent from pillar to post by the switchboard who do not understand their request. This, in turn, may result in PECP becoming frustrated and, after repeated

experiences, simply ceasing to attempt to pre-notify. In the resource-constrained environment, such as South Africa, prehospital advanced life support tends to work alone; should they be busy with a high-acuity patient, their focus may not be on pre-notification but rather on performing life-saving interventions.

PECP should be made aware of the importance of pre-notification as well as when pre-notification is appropriate. It is also important for systems within which PECP work to have adequate communication channels to perform pre-notification in the event that the operational practitioner is unable to contact the receiving facility.

5.2.7.7 What about the perceived lack of knowledge about each other's qualifications, scopes of practice and working environments?

Handover within the emergency centre between PECP and ECP is an interdependent and collaborative process. This interdependence requires high levels of shared understanding related to roles, tasks and objectives related to the handover process as well as to patient management. The prehospital and emergency centre environments are not the same and there is a momentary coming together of these two environments during handover. These environmental differences often result in a lack of awareness related to each other's problems, duties and responsibilities within the continuum of patient care. There is evidence to suggest that the more team members know about each other and their roles, the more effective the team becomes.^{10,16,177} Healthcare professionals interact numerous times a day, however, there are often differing perceptions related to their roles and responsibilities within the domain of patient needs and patient care.¹¹⁹

This section partially achieved Objective One, Objective Two and Objective Three described under [1.6 Objectives](#).

There are several factors that have the potential to affect interprofessional handover. These factors include contextual factors such as interprofessional differences, a lack of established relationships, hierarchical relationships, infrequent face-to-face communication, and a lack of awareness of each other's working environments.⁷³ A lack of knowledge about each other's qualification structures and working environments were identified by both PECP and ECP as potential barriers to effective emergency centre handover.

5.2.7.7.1 Lack of knowledge about qualification structures and scopes of practice

PECP indicated that ECP did not understand the qualification structures and scopes of practice of prehospital emergency care (Table 4-17, Table 4-18, Table 4-41 and Table 4-44). This was identified as one of the potential sources of PECP being generically labelled as merely “ambulance drivers” (Table 4-36). PECP participants identified a lack of knowledge of scope as a source of conflict when they were asked why they had done something that fell outside of their scope (Table 4-44). Data from ECP, however, indicated that there was some understanding of the qualification structures and scopes (Table 4-58, Table 4-75, Table 4-76 and Table 4-80). ECP mentioned a general lack of sufficient knowledge related to prehospital personnel qualifications and scopes of practice, and a need for them to learn about these qualifications and scope (Table 4-86).

The recent changes to PECP’s scopes of practice may be a driver of the incongruent expectations.²⁸⁴ Kalyani *et al* reported similar challenges in expectation in their study, where Iranian PECP had also recently undergone an increase in scope.¹⁰⁷ It is important for ECP to understand prehospital qualification structures and scopes of practice to ensure their expectations are realistic and to avoid conflict related to inappropriate patient management requests. The same is true for PECP having an adequate understanding of emergency centre staff qualifications and scopes.

5.2.7.7.2 Lack of understanding of each other’s working environments

PECP participants (Table 4-40) indicated that they did not think ECP were aware of the challenges associated with working in the prehospital environment. ECP (Table 4-78 and Table 4-79) stated they did not think PECP were aware of the challenges associated with working in the emergency centre. Despite this perception of a lack of interprofessional working environment knowledge, both PECP and ECP indicated that they were actually aware of the challenges faced by the other profession in their working environment. PECP indicated that they usually worked in the emergency centre as part of their training, but that emergency centre staff did not work in the prehospital environment (Table 4-43). This was perceived to potentially give PECP a better understanding of the emergency centre than the ECP had of the prehospital environment. ECP participants indicated a similar perception of the training disparities (Table 4-94).

Both PECP (Table 4-43, Table 4-44, Table 4-45 and Table 4-46) and ECP (Table 4-63, Table 4-68 and Table 4-94) participants agreed that interprofessional education and

interprofessional collaboration (IPC) were probably the most appropriate solution. IPC has been defined as “multiple health workers from different professional backgrounds working together with patients, families, caregivers and communities to deliver the highest quality of care”.²⁸⁵ IPC was identified by both PECP and ECP as a strategy to improving emergency centre handover. One of the strategies suggested in the literature for improved IPC is for “different groups to just get together”.¹¹⁹ Van den Bulcke *et al* recommend that opportunities should be created for both formal and informal dialogue between healthcare workers.²⁸⁶ Creating such opportunities, whether formally or informally, is a highly effective strategy for enhancing communication and collaboration.¹¹⁹

Both PECP (Table 4-21, Table 4-43 and Table 4-45) and ECP (Table 4-67, Table 4-68 and Table 4-94) agreed that IPC and education were important strategies to improve relationships and efficacy in emergency centre handover. One of the prehospital participants alluded to the fact that the relationship was better when there was more interprofessional socialisation (Table 4-46). IPC, training and work have been suggested by several authors as a strategy for improving interdisciplinary gaps and misunderstandings.¹¹⁰ Both sets of participants agreed that working in each other’s environments would lead to a better contextualisation of the challenges faced and improved IPC; a strategy that may assist in bridging the gap between the prehospital and emergency centre environments. Many of these strategies have been discussed elsewhere in this thesis and should be seen as cogs in the greater machine of emergency centre handover, which is, in itself an IPC.

The primary challenge within the South African and other resource-constrained environments is that within a system that is inherently understaffed, overcrowded and under-resourced, there is limited opportunity, and indeed appetite, to redeploy personnel from a functional role for education or training. From a resource management perspective, the value add to the system gained by facilitating programmes aimed at better IPC are offset by the consequences of not having enough staff to service the daily patient load.

5.2.7.8 What about the structure of emergency centre handover?

The structure of emergency centre handover, as a contributor to improved handover, was identified by participants in both the prehospital (Table 4-14) and emergency centre (Table 4-60) participant groups. PECP identified structure as a contributor to their own good handover practice. ECP also identified structure as important using words such as “organised” and “structured”. Despite both groups agreeing that structure was important, evidence suggests that personnel within the emergency centre use different structures.¹⁶² The majority of

currently used handover tools include generic structures that may be problem-based, content-based, system-based or process-based. The content delivered in a handover is frequently highly contextual and is usually driven by organisational culture or unit practices; this results in differences in content overlap.¹⁶² These differences in structure and resultant content overlap may be perceived as the handover lacking in structure. A lack of structure during the patient handover was identified by ECP as a barrier to effective handover (Table 4-66), and has been perceived in other studies to negatively affect the quality of the handover as well.²⁰⁰ The challenge remains to identify what is actually meant when healthcare practitioners use the term “structure”.

One suggested solution to improving structure has been to standardise interprofessional handover tools.¹⁶² Both PECP (Table 4-13 and Table 4-14) and ECP (Table 4-59 and Table 4-60) agreed that structure was a desirable attribute to emergency centre handover and linked a lack of structure with poor handover (Table 4-66). The use of a standardised structure has been linked to a shared mental model which is related to improved understanding and awareness.²⁶⁸ There is currently a lack of evidence in terms of the existence of standardised handover structure tools for prehospital to emergency centre patient handover. This opens up the door to the development of an emergency centre-specific handover tool that can be based on sound evidence of what the emergency centre handover should include.

This section partially achieved Objective One, Objective Two and Objective Three described under [1.6 Objectives](#).

5.2.7.9 What about the environment in which emergency centre handover takes place?

The emergency centre is not an environment that is conducive to effective communication.^{102,106} It is an inherently busy and chaotic place.^{3,20,103,104} Almost all of the participants in Kalyani *et al's* Iranian study mentioned that a lack of a good emergency centre environment for transferring patients was a barrier to effective handover. A similar phenomenon was observed by participants in this study, which was conducted in a similarly resource-constrained environment as Iran.¹⁰⁷ A shortage of physical working space was a challenge identified in Jamshidi, *et al's* study, which related to cooperation challenges between prehospital and in-hospital emergency services in handover.¹¹⁴ Specific challenges identified in the low-resource setting were overcrowding and resultant equipment shortages in the emergency centre, as well as a lack of an appropriate space to perform handovers.

PECP (Table 4-17, Table 4-19 and Table 4-28) and ECP (Table 4-74, Table 4-77, Table 4-78, Table 4-80, Table 4-85 and Table 4-90) in this study identified the general busyness in the emergency centre as a barrier to effective handover. This busyness was linked by PECP to ECP's availability to not only receive handover, but also their ability to focus attentively on the handover being delivered. Emergency centre staff elsewhere have linked the busyness of the emergency centre with an environment that discouraged conversations, explanations, and other meaning-making interactions.²⁷⁵ The busyness in the emergency centre is often compounded by understaffing. South African healthcare facilities are chronically understaffed and this is only compounded by the busyness that is characteristic of the emergency centre.^{32,33} In other words, a busy emergency centre that is understaffed is made busier when there is inadequate staff to deal with the regular patient flow. Overcrowding of the emergency centre has been observed in several studies.²⁸⁷ Although understaffing was the primary observed problem, overcrowding is a real issue in the resource-constrained setting, but this would usually manifest as understaffing. The busyness was highlighted by ECP who indicated that PECP assisting them with the patient after handover would be of great assistance (Table 4-77).

The emergency centre is often described as noisy.^{77,107,184,194,288} Smith *et al* reported that more than 50% of emergency centre doctors classified noise as the largest distractor to handover.²⁸⁹ Both PECP (Table 4-19) and ECP (Table 4-90) acknowledged that the emergency centre was a noisy environment. Kalyani *et al*'s Iranian study reflects the challenges of handing over in the resource-constrained environment where one participant described being able to: "hear a lot of noises such as screaming, shouting, using obscene language...".¹⁰⁷ Loud and disruptive environments have been linked to increased difficulty in communicating a clear message. This concept is borrowed from the field of electrical engineering where it is referred to as signal-to-noise ratio.²⁹⁰

Nursing staff have linked the high-traffic, noisy environment of the emergency centre to difficulty in concentrating on the information being communicated during handover.¹⁰⁷ This noisiness may be a contributing factor to the perception that ECP were inattentive receivers of prehospital emergency centre handover. The suggestion of a designated handover area may contribute to solving this issue. Unless the problems of overcrowding, overworked staff, inadequate resources and insufficient education and training are resolved, it is unlikely that the emergency centre environment is going to become any more conducive to effective handover. In saying this, it must be borne in mind that a willingness to improve is the key to unconventional thinking and finding novel, low-cost solutions that are appropriate for implementation in the resource-constrained setting. To quote a colleague who functions in a

resource-constrained emergency centre: “The solutions are there, you just need to be willing and passionate enough to find them”.²⁹¹

This section partially achieved Objective One, Objective Two and Objective Three described under [1.6 Objectives](#).

5.2.8 What communication factors were identified that affect the efficacy of emergency centre handover?

Communication between two healthcare providers is a complex process and is often practitioner-dependent.¹²¹ Communication as a component of patient handover is of such importance that it has been claimed that for the quality of healthcare to improve, communication between interdisciplinary healthcare providers must improve.²⁹² Communication between two persons is usually made up of verbal, non-verbal and paraverbal components. Each of these has the potential to facilitate or obstruct effective communication. It has been estimated that only 7% of communication is actually verbal, and the remaining 93% is comprised of non-verbal and paraverbal components.²⁹³ Existing literature suggests that handover efficacy is affected by both verbal and non-verbal communication, face-to-face communication, and the use of standardised processes and content.^{294,295} Face-to-face handovers have been identified as a critical element for ensuring reliable handovers, and these are preferable to handovers where there is no face-to-face communication or conversation.^{121,296}

In the face-to-face scenario, non-verbal and paralinguistic communication is directly observable, and therefore, of great importance to an effective patient handover. The emergency centre handover is a communication interaction between two professions and the nature of this interprofessional interaction means that it is a bidirectional interaction. The importance of handover’s bidirectional nature is highlighted by Wohlauer’s definition: “a bidirectional conversation whatever the setting or context, and includes the active involvement of the sender and the receiver”.¹³⁵ Handovers have been described as a dialogue between health professionals that have the potential to foster equity, empathy and common ground.²⁹⁷ In fact, Abraham *et al* refer to a “symmetry in dialogue” during handover communication, which they relate to a balance between the sender and receiver, instrumental in achieving bidirectional coordination of communication.¹⁶³

Both PECP and ECP participants in this study identified poor communication skills as barriers to effective emergency centre handover. The three primary communication components

(verbal, non-verbal and paraverbal), each of which has the potential to affect the efficacy of emergency centre handover, are discussed below.

This section partially achieved Objective One, Objective Two and Objective Three described under [1.6 Objectives](#).

5.2.8.1 Verbal handover communication

Verbal communication refers to the actual words that are used during an interaction. Verbal communication is an important aspect of patient handover between the PECP and the emergency centre. Verbal communication is the most common method of information transfer used when handing over in the emergency centre. The verbal handover allows the deliverer to convey subtleties related to the patient's condition and to emphasise aspects related to the patient's condition that may not be immediately apparent.¹³⁶ The verbal handover also allows for questioning and feedback related to the patient and the information conveyed, as well as an opportunity to use the experience as a learning occasion. Verbal, face-to-face handover communication has been identified as the safest and most efficient method of handing over.²⁹⁸ Verbal communication has also been associated with fostering collaboration between colleagues as well as contributing to better personal familiarity with colleagues.¹³⁶

Some barriers to effective verbal handover include that it may be unstructured, rushed or non-specific.¹³⁶ These barriers are discussed in different areas of this thesis ([4.4.3.2.3 Content factors identified by ECP as contributors to bad deliverer handover](#), [5.2.7.5 PECP handovers were rushed](#)). In addition, the communication medium, environment and interpersonal relationships may hamper the verbal handover process. More than half of all cases that caused or contributed to severe patient safety incidents have been attributed to errors in verbal communication between staff.¹²⁶ Evidence suggests that the emergency centre recall of verbal information provided during the prehospital handover is worse for patients with higher acuity than those with a lower acuity.²⁹⁹

PECP identified the use of medical terminology as a contributor to their own handovers being good (Table 4-13 and Table 4-15). ECP in this study identified the use of non-medical terminology (as well as the use of vernacular languages) as barriers to effective handover (Table 4-87 and Table 4-90). This was congruent with two of the negative confounders to handover identified by Von Dossow and Zwissler, namely language barriers and lack of medical language.¹⁸⁴ The use of effective and explicable communication has been linked to patient care and improved patient outcomes.³⁰⁰ The emergency centre is a true cultural

melting pot, not only from the perspective of the patient demographics, but also from that of the medical professionals who interact within its walls on a daily basis. A commonly understood language is important during patient handover⁷⁷ and, conversely, languages that are not understood by all involved in the patient handover process negatively affect the efficacy of the information transfer, and as a result, patient outcomes.^{3,65,77,92,115,300} Some of the issues previously discussed have relevance under this heading as levels of training, proficiency in the language of handover and the ability to communicate effectively are all factors that contribute to the efficacy of the handover.

The lack of a shared language has been identified as a barrier to creating a shared picture of the patient by both prehospital and ECP.³ Jamshidi *et al* identified the use of a non-common language within a resource-constrained environment as a barrier to effective emergency centre handover.¹¹⁴ In Africa, and specifically South Africa, there is a multitude of dialects, making a common language of patient handover communication all the more important. De Lange, van Eeden and Heyns, in a study conducted in a similar setting to this one, identified the use of “indigenous language” as being considered disrespectful.²⁷⁸ The authors suggested that a potential solution is the adoption of a language understood by all, in their case, English.¹¹⁷ The use of a ‘common language’ is a strategy that has also been suggested in other studies.³ The standardised format of handover is a tool that has been explored elsewhere in this thesis, but perhaps it is time to consider a standardised language of emergency centre handover. This standardised language should refer to both the language of handover as well as a set of standardised medical terminology. In the South African context, the language may be English, but in other areas of the continent, this may need to be adapted for local conditions, for example, in the Francophone regions.

Within the resource-constrained environment, there is often simply no money, time or willingness to participate in language workshops. These may be seen as demeaning, and there is a prevailing anti-colonialism narrative that may create animosity towards the use of a specific language as the preferred language in handover communication. When trying to decide on a common language, there should be a careful balance between practicality and cultural sensitivity. Appropriate measures aimed at marketing or promoting a specific language policy may simply be too expensive and, as a result, proposed changes may meet with limited success.

5.2.8.2 Non-verbal handover communication

Non-verbal handover communication cues are an adjunct to what is being said verbally. Non-verbal communication includes cues such as posture, gestures made during communication, bodily orientation, eye contact, physical distance and facial expressions.^{121,184} There is very little in the literature that describes the role and effect(s) of non-verbal communication on the efficacy of handover.¹²¹ PECP identified ECP's non-verbal communication as generally poor and projecting a lack of interest (Table 4-17 and Table 4-18). Some specific factors mentioned by participants included a general disinterest, a lack of appropriate eye contact, and overall poor communication.

The fact that PECP commented on communication from ECP implies that there is a bidirectional nature to the communication interactions that occur between professions during emergency centre handover. ECP participants identified poor communication skills as a barrier to effective handover (Table 4-63 and Table 4-65) and also specified factors such as poor eye contact (Table 4-70) and poor body language in general (Table 4-65). Negative body language on the part of the receiver (ECP) implies that the prehospital handover deliverer is acutely aware of communication signals from the receiver, and vice versa. Thus, emergency centre handover communication is a bidirectional interaction where both deliverer and receiver have interchangeable roles and, in fact, are simultaneously deliverers and receivers of communication information.

The perception that eye contact was an important component of effective handover has been highlighted in previous studies. Interestingly, Carroll *et al* found that there were differences in the experiences of eye contact in handover between incoming and outgoing nurses in the same department. Incoming nurses (receivers) preferred more eye contact, whereas outgoing nurses (deliverers) preferred less eye contact.³⁰¹ PECP participants in this study indicated that body language, specifically eye contact, was one of the aspects that made their own handovers good (Table 4-15). The ideal amount of appropriate eye contact is difficult to quantify and can be summed up by a participant who stated: "ensure casually good eye contact". There was an indication from ECP that negative body language from their own ECP was a contributor to ineffective handover (Table 4-70). This highlights the importance of appropriate body language on the part of the receiver of the handover and, in doing so, emphasises that interprofessional communication within emergency centre handover is bidirectional.

There were several other areas of non-verbal communication seen to be contributors to better handover. A friendly attitude was deemed a contributor to good handover by both PECP (Table 4-14) and ECP (Table 4-61). The non-verbal cues that related to a friendly attitude were not specified but a combination of positive non-verbal cues would certainly improve the impression and assist in the creation of a friendly attitude. Some factors mentioned by PECP as contributing to a good handover included smiling, introducing themselves and ensuring that the receiver was attentive (Table 4-14 and Table 4-15). A smile was also identified as desirable from the receiver of the handover (Table 4-24).

ECP indicated that a friendly attitude was a contributor to not only better handover, but also to improved interpersonal relationships and collaboration (Table 4-59, Table 4-60, Table 4-71 and Table 4-84). A smile was also identified by ECP as important to effective handover (Table 4-70). There was a paucity of exploration of friendly attitudes during handover in the literature that was reviewed. Some of the determinants of what a friendly attitude entails may also exist within the paraverbal domain and are discussed under that heading.

As much as friendliness was perceived as a contributor to good handover, there were several behaviours on the part of the receiver that were considered unfriendly and contributing to bad handover by PECP, namely body language, listening and communication skills, rudeness and lack of eye contact (Table 4-18). ECP cited similar behaviours that negatively affected handover efficacy. Rudeness on the part of PECP delivering handover was a barrier (Table 4-65 and Table 4-85) but ECP were also aware that they could be reciprocally rude (Table 4-65 and Table 4-85). Many behaviours that were deemed to be barriers to effective handover were identified by both PECP and ECP. The implication is that communication needs urgent improvement on the part of both deliverer and receiver of emergency centre handover.

South Africa is a culturally diverse country, and the emergency centre is no different. Barriers to effective emergency centre handover interactions may be exacerbated by cultural difference, and it is essential to acknowledge that cultural differences may also be perceived as barriers to effective non-verbal communication.¹¹⁹ Although there was a perception by PECP and ECP that eye contact was a contributor to good handover, it is possible that culturally, the receiver may have perceived this as a negative aspect of the handover delivery. Similarly, some cultures discourage assertiveness or openly challenging opinions, especially from females. This would make it difficult for female receivers of handover to speak up despite them seeing something that may be wrong or require intervention.¹¹⁹ The receiver may attempt to communicate this in a different way, or indirectly in a manner that could be misinterpreted by the deliverer of the handover. It is possible that a nurse or doctor may desist from

commenting on the PECP's handover or patient management, and simply adopt a passive role, leading to the perception of disinterest. Perhaps the first step in improving communication during patient handover would be to create an awareness of the effects of non-verbal communication on handover efficacy, and to focus on emergency centre handover as a bidirectional and ongoing communication event.

5.2.8.3 Paraverbal handover communication

Paraverbal cues are an adjunct to verbal communication and are sometimes referred to as the 'how' of what is being said. Paraverbal cues include features such as the pace and pitch of communication, as well as intonations and hesitations during communication.¹²¹ Prehospital emergency care participants in this study indicated that clear speech with adequate volume were characteristics contributing to their own good handover (Table 4-15). Clarity of speech was also identified by ECP as important for effective handover (Table 4-61). Different dialects and accents have the potential to affect how clearly the receiver is able to understand what is being said and potentiates handover information being misunderstood or misinterpreted.^{149,178} Accents affect the way in which a word is pronounced and may result in the receiver having difficulty in understanding what was said.³⁰⁰ Interestingly, it is not only in persons who do not speak English as a first language where accents affect communication; language and accents among native English-speaking nurses have also been identified as barriers to effective communication.³⁰²

With 11 official languages in South Africa and a significant influx of immigrants, it is unlikely that accent neutralisation³⁰⁰ is a practical solution within the South African healthcare system. A further complication to language and accent may be that healthcare professions tend to have their own "slang" and jargon,³⁰³ as per geographical areas, and these may not share commonality between professions handing patients over. Establishing a common language and a list of appropriate medical terminology and phrases may be a solution, but, within the resource-constrained environment, the limitations related to staff availability, funding and expertise remain potential barriers to these types of solutions.

5.2.8.4 What about perceived disinterest in handover and inattentive listening?

PECP from this study indicated that ECP displayed inattentiveness and lack of engagement in the handover process (Table 4-34 and Table 4-35). The most prominent reason postulated for inattentive receivers was the busyness of the emergency centre and the fact that

emergency centre staff were “very, very overworked” (Table 4-35). A further reason postulated for the disinterest included the presence of a triage nurse who was not interested in prehospital vital signs as they measured their own, especially if the two were different; that inattentiveness was a facility-dependent phenomenon. In the resource-constrained emergency centres within which this study was conducted, overcrowding, understaffing and a task-orientated approach have all been identified as barriers to effective handover. The emergency centre receiver of handover, who is trying to function within such a challenging environment, may simply be overworked and under-resourced as opposed to disinterested. Attentiveness to handover was also linked to qualification. This disparity went both ways, where more qualified PECP delivered handover to less qualified ECP (Table 4-18, Table 4-29 and Table 4-35). In addition, PECP acknowledged that inattentiveness might have been due to the emergency centre’s continued exposure to poor quality handover delivered by less qualified PECP (Table 4-35).

The perception that handovers were generally poor quality is interesting because PECP participants were commonly positive about their own handovers. The implication was that prehospital emergency care handovers were primarily performed by personnel with a basic qualification and the quality of these would be poor. This would result in ECP having a general predisposition to disinterest based on a low expectation of what was going to be delivered. The point made by Kruger and Dunning²⁶³ is relevant because, among personnel who are unable to recognise their own shortcomings, the blame for a poor handover experience would be shifted to the receiver of handover, or vice versa.

This practice of “inattentive listening” has been observed in several emergency centre studies.^{16,20,117,151,304} One of the reasons postulated for the lack of receiver engagement in patient handover has been that the emergency centre staff prioritise patient management over listening to the patient handover. This prioritisation has been linked to a conflict between active listening and performing simultaneous practical tasks, attributed to feelings of frustration in the deliverer of the patient handover.³ It was interesting to note that ECP participants also identified poor listening on the part of the PECP as a contributor to bad handover (Table 4-64). In the resource-constrained emergency centre, overcrowding, understaffing and a generally high workload means that receivers of handover are often simultaneously involved in a much greater number of tasks than their peers who work in high-resource settings. This serves to compound the problem of task-orientation and multitasking in the resource-constrained environment.

Inattentive listening has been linked to a loss of information related to the patient, and PECP having to repeat themselves.⁶⁵ This was a sentiment echoed by PECP participants in this

study who indicated that they were required to repeat information that had already been handed over to the receiver (Table 4-19). Active listening by the receiver has been linked to perceptions by the handover deliverer as being respected as a person as well as being recognised for their contribution to the management of the patient.⁷⁸ Deprioritising verbal handover by the receiver may be viewed by the deliverer as distracted or dismissive behaviour and has the potential to negatively affect handover communication.²⁹⁴ Attentive listening is an important component of effective patient handover and should be prioritised by all personnel involved in emergency centre handover. The fact that PECP and ECP are cognisant of how well the other appears to be listening highlights the bidirectional communication cues that are being observed and analysed by both communicating parties during the handover.

PECP participants in this study identified an underlying perception that ECP had a low expectation of the potential quality of handover from the PECP and often viewed them as “merely ambulance drivers” (Table 4-36). This pre-existing perception may be one reason for the perceived disinterest in prehospital emergency care handover. PECP acknowledged that this low expectation on the part of the ECP might be attributed to the ongoing poor handover quality from PECP (Table 4-36). Many healthcare personnel who have become accustomed to poor communication and teamwork are prone to a culture of low expectation. This permeates an expectation that information is likely to be faulty or incomplete; in turn, there is a tendency to ignore important pieces of information and clinical discrepancies.¹¹⁹ This low expectation may be one of the reasons that ECP are perceived to be disinterested in prehospital emergency care handover. However, it is also possible that the passive role adopted by some emergency receivers of handover may be construed as disinterest. This passive behaviour by receivers of handover has similarly been observed by Foster and Manser.¹³⁹ Yet there remains uncertainty related to the levels and type of activity on the part of the receiver that would be considered beneficial to the handover process.¹³⁹

Inattentive listening on the part of the receiver may negatively affect the perception of the deliverer, which may result in an ineffective handover. Handover recipients in Owen *et al*'s study acknowledged that they did not always listen attentively to handover.³ ECP participants in this study also admitted to not always listening attentively (Table 4-64). The most common reason for this appeared to be the need to perform patient treatment activities while multitasking during handover reception. A suggested strategy for overcoming the challenges has been that handovers for critically ill patients should be delivered in two phases. The first phase would include essential information being given immediately, and the second phase would include any supplemental information. The second phase would occur after the initial treatment was provided.¹⁶

It has been suggested that apart from life-threatening situations, no one should speak to or touch the patient while a verbal handover is being delivered.¹⁶ Perhaps a more logical and easily implementable solution would be to simply allocate dedicated time to the handover during which all personnel directly involved in the handover focus exclusively on the handover being delivered. One potential problem with this approach is that it would require cessation of any peripheral tasks to focus on the handover. In the overcrowded and busy resource-constrained emergency centre, this may create conflict since personnel would potentially feel that there are a multitude of tasks that take preference over dedicating time to the handover. Perhaps a simple solution is to educate all personnel on the importance of effective emergency centre handover and the effect of inadequate handover on the increased risk of an adverse event.

5.2.8.5 What about written handover?

Written aids are one of the strategies that have been suggested as a means of improving patient handover. Talbot and Bleetman suggest that verbal handovers should be accompanied by a written report to avoid information inadequacies.¹⁴⁸ One of the barriers identified by PECP in this study was that ECP seemed more interested in the written document they completed than their verbal handover (Table 4-19). Conversely, ECP perceived PECP as being more interested in obtaining a signature on their document than performing an appropriate handover (Table 4-75).

In this study, it appeared that the written document was a distraction during the verbal handover process and did not seem to be viewed as a valuable adjunct to the handover, but rather as an administrative 'tick-box'. However, this does not mean that the written document does not have value in the handover process. ECP indicated that the written record was an important way to augment verbal handover (Table 4-61 and Table 4-70). The discrepancies between delivered and received information were highlighted by Murray *et al* who found that more than 25% of in-hospital notes showed misinterpretations, wrong statements or omissions when these notes were compared with those of the PECP.¹⁵⁰ The written document serves as a more comprehensive record of the complete prehospital patient-practitioner interaction and often contains information not included in the verbal handover. Despite not being one of the primary focuses of this study, written handover is an important strategy to improving handover and should be studied further.

5.2.9 What effects do interprofessional relationships and interactions have on emergency centre handover?

Emergency centre handover is an important component of the patient care continuum. It is critical that all healthcare personnel involved in the care of a patient see themselves as members of a bigger team.¹¹⁹ Literature characterises effective teams as having common purpose and intent, respect, trust and collaboration. In addition, team members have been shown to value familiarity over formality.¹¹⁹ Hilligoss and Cohen identified interprofessional differences, a lack of established relationships and a lack of awareness of each other's working environment as contributors to unsafe handover.⁷³ There has been a drive to begin viewing patient handover as more of a team activity as opposed to a simple "deliverer" and "receiver" concept. Improved interprofessional relationships, communication and respect have the potential to positively affect patient handover within the emergency centre and beyond and to break down many of the barriers that currently exist.

This section partially achieved Objective One, Objective Two and Objective Three described under [1.6 Objectives](#).

5.2.9.1 Interprofessional communication

The importance of bidirectional interprofessional communication was highlighted by both PECP (Table 4-24) and ECP (Table 4-83). Wohlaer *et al* stress that effective handovers require bidirectional communication and active involvement from both the deliverer and receiver of the handover.²⁶⁵ Wohlaer *et al* goes on to describe an effective handover as being a bidirectional conversation regardless of the setting or context in which that handover occurs.¹³⁵ In addition, an effective handover includes active involvement on the part of both the deliverer and the receiver of handover.¹³⁵ Abraham *et al* talk about "symmetry of dialogue" which is described as a balance between the sender and receiver, instrumental for achieving a highly interactive, bidirectional and seamless coordination of communication during handover.¹⁶³

The data from this study indicate that interprofessional communication is a bidirectional process. Not only is this based on the verbal, non-verbal and paraverbal aspects of communication, but also the need for feedback and further questioning. The implication is that a unidirectional communication model, such as that postulated by Shannon and Weaver³⁰⁵ and advocated by Mohorek *et al*,¹³⁷ may not be appropriate nor comprehensive enough for emergency centre handover communication, which is, by its very nature, interprofessional and bidirectional.

5.2.9.2 What is the effect of interprofessional relationships?

Participants in this study indicated that pre-existing relationships, where they knew the deliverer or receiver of handover, improved handover efficacy. Conversely, previous negative experiences had the potential to act as a barrier to interprofessional communication. PECP participants attributed familiarity with repeated interactions, and these interactions improved relationships (Table 4-38). ECP shared similar sentiments (Table 4-76, Table 4-82 and Table 4-83). Pre-existing relationships were linked to improved trust between healthcare providers. Relationships and communication between PECP and ECP have been linked to a direct influence on the quality of not only current but also future transitions.²⁸⁰

Participants in this study indicated that relationships were developed over time and with multiple interactions. Similar findings were described by Bost *et al* who found that relationships were developed over time and dependent on past experiences.²⁰ In cases where relationships were good, there was a perception by PECP that the nurses trusted their assessments and believed them.²⁰ Both sets of participants in this study indicated similar sentiments related to good relationships having been built up over time and the levels of trust that were associated with them.

A lack of familiarity was linked to a lack of trust by ECP related to what findings or treatment had been administered by the PECP (Table 4-19). This lack of trust was viewed by some to indicate a lack of respect. Where there is a lack of respect and trust, and resultant collaboration, there is an increased risk of error and adverse event.¹¹⁹ Interprofessional mistrust and misunderstandings between PECP and ECP have been described in the literature as negatively affecting communication and information transfer.⁴⁴ In the resource-constrained environment, there is little time available for forging relationships, and the task-orientated nature of both the prehospital and emergency centre environments means that personnel are potentially not focussed on developing relationships as much as they are at completing tasks that would decrease the patient backlog.

5.2.9.3 What about interprofessional respect?

Both PECP and ECP identified a lack of mutual respect as a significant barrier to effective handover. PECP indicated that ECP did not respect them and looked down on their qualifications (Table 4-11, Table 4-12, Table 4-17, Table 4-18, Table 4-34 and Table 4-36). Reasons for this lack of respect included the poor perception and general treatment of PECP by ECP, that ECP were more often than not exposed to poor attitudes and quality of handover

from PECP, and there was simply a pre-existing lack of interprofessional respect. PECP acknowledged that respect was a two-way street and that they too were guilty of not affording other professions the relevant respect (Table 4-37). They acknowledged that respect should be bidirectional (Table 4-24 and Table 4-37). Having an established relationship along with giving and receiving respect was linked to the nature of interprofessional relationships (Table 4-38). ECP also indicated that respect and a good attitude from PECP was a contributor to good handover (Table 4-59, Table 4-61, Table 4-73, Table 4-78 and Table 4-84), and a bad attitude negatively affected handover (Table 4-64). Some of the causes for the perceived bad attitude included obstructive attitudes, derogatory comments, impatience and unspecified attitude in general.

ECP linked qualification and attitude, where more senior practitioners were perceived to have better attitudes, but there was also an indication that attitude was more personality-dependent than qualification dependent, with some emergency centre participants linking the two (Table 4-83 and Table 4-85). ECP also linked confidence to a more positive attitude and acknowledged that negative attitudes sometimes originated from the emergency centre staff themselves, linking this to the busyness of the emergency centre (Table 4-84). Mutual respect has been associated with improved communication during handover and a decrease in errors within the emergency centre.^{211,306} The critical effect of mutual respect on emergency centre handover efficacy means that this is an aspect of handover that should urgently be addressed.

5.2.9.4 What about the perception of hierarchy within the emergency centre?

Hierarchies have been identified as a common barrier to effective collaboration and communication.^{119,184} Within the emergency centre, there are several hierarchies; there are the intraprofessional vertical hierarchies among the medical and nursing personnel, as well as the interprofessional hierarchies among the medical and nursing professions. These hierarchical relationships are compounded by the PECP who, in themselves, have a hierarchical structure based on factors such as qualification or rank. There is also a hierarchical relationship between the PECP deliverer of handover and the ECP receiver of handover. This hierarchical relationship sometimes differs in nature between the PECP delivering the handover and the medical or nursing personnel receiving the handover.

Many PECP participants in this study were of the opinion that the ECP looked down on them and saw them as “just ambulance drivers” (Table 4-12, Table 4-18, Table 4-35 and Table 4-36); a sentiment confirmed by some of the ECP participants (Table 4-75). This perception would result in a vertical hierarchical relationship where the PECP handover deliverer would

potentially feel intimidated or uncomfortable with a resultant desire to prove themselves and not appear incompetent.¹¹⁹ These types of hierarchical relationships could threaten the feelings of psychological safety in the deliverer or receiver of handover.¹³⁹ In the event that there is a feeling of an unsafe psychological environment, individuals may fear embarrassment, rejection or punishment, which, in turn, may affect their willingness to interact.¹³⁹ Hierarchical relationships in the emergency centre are potential barriers to interprofessional relationships and, as a result, also to effective handovers.

The fact that PECP were under the impression that they were seen as mere ambulance drivers had the potential to exacerbate initial feelings of being lower on the hierarchical scale, decreasing handover efficacy. The generally lower qualification levels of most PECP, when compared to the ECP, may create a predisposition in the minds of PECP that their qualifications and scopes are being looked down upon. This seems to be the case and given the current and proposed qualification structures and available opportunities for training in South Africa, this is unlikely to change in the short to medium term for the less qualified PECP, if at all.³⁸

Hierarchical structures have been described as a type of psychological noise and is associated with encoding error.¹³⁷ There have been drives towards more cooperative rather than more competitive agendas aimed at improving handover and thereby benefitting patient care.¹¹⁹ Improving interprofessional relationships and respect may assist in breaking down hierarchical barriers, thereby improving handover efficacy. Improved interprofessional relationships and better interpersonal familiarity might decrease the degree to which vertical hierarchical relationships negatively affect handover.

5.2.10 What are the effects of practitioners being questioned about patient management?

One frustration expressed by PECP was being questioned about their management of the patient (Table 4-19 and Table 4-33). This can be viewed from two lenses. On the one hand, it may simply be that the receiving personnel are merely trying to gather additional information to better contextualise the patient and, in doing so, create a more comprehensive shared picture. On the other hand, the PECP delivering the handover may see this as criticism of their patient management skills, as was commonly the case in this study (Table 4-33 and Table 4-33). PECP indicated that much of the questioning was critical rather than constructive. In addition, there were multiple references to anchoring, where one specific thing would become the focus of the handover interaction. Jamshidi *et al* found that one potential cause of

questioning patient management was an incongruence in the currency of knowledge.¹¹⁴ This relates to the education and training of personnel and, in the resource-constrained environment, it is often the case that updating training and ensuring currency are not prioritised. The Iranian environment of Jamshidi *et al*'s participants are not dissimilar in that both are resource-constrained. A concerning observation by Jamshidi *et al* was that prehospital deliverers of handover indicated they altered their management of the patient to satisfy the expectation of the receiving facility's personnel in order to experience fewer challenges at the time of handover.¹¹⁴ This was not a theme explored in this research project, however, prehospital participants in this study admitted to altering their handovers for the same reason.

ECP indicated that many PECP did not adequately assess or manage their patients (Table 4-75). Reasons suggested for this were inadequate assessment, poor history taking and management. Prehospital qualification level was seen as a major contributor to inadequate contextualisation and management of the patient. The fact that most prehospital emergency care handovers would be performed by the most basic personnel potentiates the emergency centre's perception that the PECP are, in fact, "just ambulance drivers". Jamshidi *et al*'s observation related to updated scope is also relevant here in that there may be an expectation of a certain level of care that cannot be provided by the deliverer of the handover.²⁵¹

The use of a standardised structure has been linked to a shared mental model which has the potential to improve understanding and awareness.²⁶⁸ The benefits and shortfalls of using standardised approaches have been discussed elsewhere in this thesis. Participants in this study generally indicated that some form of standardisation was necessary to create a shared understanding, but that this would need to be tailored to the emergency centre environment.

This section partially achieved Objective One, Objective Two and Objective Three described under [1.6 Objectives](#).

5.2.11 What about the development of an emergency centre-specific handover?

Both PECP (Table 4-47) and ECP (Table 4-95) participants identified the development of a standardised emergency centre handover protocol as a potential strategy to improve emergency centre handover. Standardisation, as a means of improving handover, has also been mentioned by many authors.^{70,110-112,176,280} The focus of a standardised handover should be on reducing variability as opposed to enforcing consistency. Handover strategies should be focussed around telling the patient's story and should encapsulate both quantitative

outcomes data as well as qualitative contextual data.¹⁹⁸ This combination of the data has the potential to provide a “better story” and in doing so, improve the quality and quantity of information handed over. The focus should also be on creating a contextually adaptable format that is malleable enough to cater for most emergency centre scenarios.

One possible challenge to the development of standardised handover tools is that they have the potential to undermine the face-to-face nature of handover interaction.¹¹⁰ Traditionally, standardised handover strategies have often failed to acknowledge the specificity of the environments in which they take place. This has meant that it is often the case that one format, developed for and in a specific domain, is implemented in another domain without recognising this incongruence between the two. The development of an emergency centre environment-specific handover guideline that provides a fresh outlook on a standardised handover format could drastically improve emergency centre-specific handover.

Most, if not all, commonly used handover mnemonics or standardised processes described in the literature appear to have their origins within research-rich settings. This means that these strategies may not be relevant to the resource-constrained environment. Many of the challenges described in this thesis are either not present or highly diluted within the resource-rich environment. As such, they may not be perceived as significant enough challenges to warrant comment in resource-rich environments.

This section partially achieved Objective One, Objective Two and Objective Three described under [1.6 Objectives](#).

5.3 Conclusion

This study was able to explore emergency centre handover from the perspectives of both PECP and ECP within the resource-constrained South African emergency centre. This chapter sought to make sense of the results from Chapter Four and to suggest improvement and mitigation strategies related to emergency centre handover. There are several factors that contribute to the efficacy of the prehospital to emergency centre handover. Some of these factors relate to improved handover efficacy, and others decrease the efficacy of prehospital to emergency centre handover. This chapter has identified several areas of emergency centre handover that can be addressed by developing a model related to the findings and conclusions of this thesis. The following chapter will describe the development of the model to address the aims and objectives of the thesis within the context of the resource-constrained environment in which the study took place.

CHAPTER 6: DESCRIPTION AND DEVELOPMENT OF A HANDOVER MODEL FOR USE IN RESOURCE-CONSTRAINED SETTINGS

6.1 Introduction

Chapter Four provided the results of the study. These results were reported on using the two studies as separate entities and then integrating the quantitative and qualitative strands to produce the final results. Chapter Five discussed the results and related them to the aims and objectives of the study. This chapter will interpret the results and create a contextualised view of the emergency centre handover from both the deliverer and receiver of the handover. This view will be used to develop a model aimed at improving emergency centre handover. The chapter starts by providing a background on how the model was developed before presenting a description of the model. The model was arrived at using theoretically driven concepts and followed an iterative process of consultation with the supervision team where developing concepts were discussed and assumptions clarified. After each consultation, changes were either made or concepts cemented into the model.

Chapter Four contained information related to the data that were collected during Study One and Study Two, using the design and methodologies described in Chapter Three. The perception of the quality of a patient handover is often linked to several variables. Within this thesis, possible variables that may affect the perceived quality of the handover can be grouped into each of the main aims of this study and relate primarily to content, process and communication. In addition, there is an interprofessional category of variables that includes variables not directly linked to the three primary headings, but rather to variables that exist between the deliverer and receiver of the patient handover. This section achieved Objective Four, described under [1.6 Objectives](#).

6.2 Identification of the main concept

The central theme and main concepts that flow from emergency centre handover should be viewed in context as a process of patient information transfer and retention. Within this central theme, three aspects of handover related to the aims of the study, namely content, process and communication aspects of emergency centre handover. When viewing emergency centre handover as a process, information generally travels from an information source to its final destination. Although the flow of information is not dissimilar to the linear model suggested by Shannon and Weaver, there are several aspects related to emergency centre handover that

differ substantially from the somewhat simplistic model they postulated.³⁰⁵ Although this chapter is structured according to the main aims of the thesis, there is constant recognition that the quality of information flow is the primary driver of a good handover. Strategies aimed at improving handover would, therefore, need to be cognisant of the fact that information flow is chronological, and the aims of this thesis may be prevalent in several different areas of the handover process.

6.3 The flow of information

Shannon and Weaver postulated that communication was a linear process. In an effort to explain this process, they developed their Linear Model of Communication,³⁰⁵ which made several assumptions that are not supported by the bidirectional nature of human communication. In saying this, emergency centre handover communication follows five basic stages that are not overly dissimilar to those included by Shannon and Weaver,¹³⁷ and yet there are gross structural and process differences at and between stages not catered for in the original model.

The five basic stages follow the progression of information through the handover. It begins with an information source which, in the case of emergency centre handover, is the patient information possessed by the handover deliverer. This information source is encoded by the deliverer of the handover, the PECP, into a format that they believe will best encapsulate the most pertinent patient information for transfer. Once the information has been encoded, the handover deliverer presents this information as a signal that needs to be conveyed via a channel or medium. The channel or medium of communication is represented by the format in which the handover is delivered, and in the case of emergency centre handover, is either verbal or written, or both. The receiver of the handover is represented by the receiving ECP who may be a member of either the nursing or medical personnel. Once the message has been received, there is a process of decoding whereby the receiver makes sense of the message transmitted by the handover deliverer.

Shannon and Weaver's model recognises that certain factors have the potential to negatively affect the information transfer process. These factors are termed "noise" and act in ways that corrupt the message.³⁰⁵ There are different types of noise broadly classified into internal and external noise. Internal noise relates to psychological, physiological and semantic noise and acts in the domain of encoding and/or decoding the signals. External noise, on the other hand, is generated by the environment in which the communication is taking place and affects the

quality of the communication.¹³⁷ Figure 6-1 depicts an adapted flow diagram of the Linear Model of Communication.³⁰⁵

The unidirectional nature of information flow in Shannon and Weaver’s model fails to take several aspects related to the contextual nature of communication into account; it is, therefore, not appropriate to adequately describe emergency centre handover. The primary difference in the emergency centre handover process is that, at each stage of the message’s movement, there are bidirectional aspects of emergency centre handover that have the potential to affect the efficacy of information transfer. This means that a model for emergency centre handover requires some form of acknowledgement that communication is bidirectional. Figure 6-1 depicts an introductory view addressing the limitation of Shannon and Weaver’s model related to the bidirectional nature of communication during emergency centre handover. The model postulated in this thesis aims to mitigate and potentially solve some of the aspects related to content, process and communication aspects of emergency centre handover.

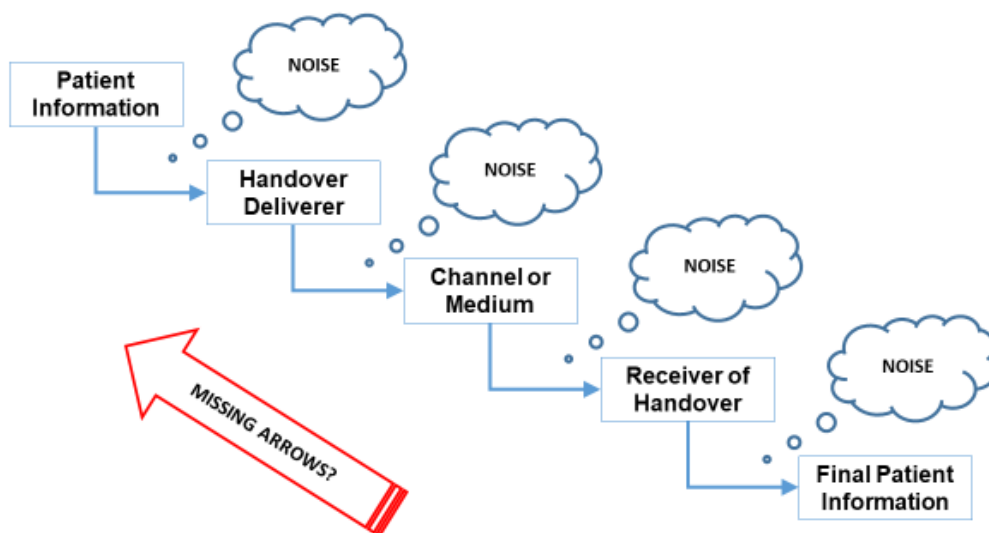


Figure 6-1: Information flow in emergency centre handover (adapted from Shannon and Weaver³⁰⁵)

6.4 An overview of the model

Theories form the basis of professional practice and are developed from the principles of evidence-based practice. These theories are developed through the generation of empiric knowledge, which is based on a systematic, scientific approach to discovering a real-life phenomenon. Empiric knowledge is a form of knowing that is grounded in perceptual experience.³⁰⁷ It is crucial for the researcher to approach the phenomena in question with a

creative and open mind to ensure the possibility of seeing new things. At the same time, it is important to remain grounded in the scientific and structured process of the development of empiric knowledge.³⁰⁷ Chinn and Kruger describe the process of empiric knowledge development as the process by which phenomena are conceptualised and structured into models and theories.³⁰⁸ Empiric knowledge is expressed formally through the media of models and theories. Chinn and Kramer argue that the researcher should maintain a critical reflection on the methods that they employ when developing and using knowledge, an “inward praxis”.³⁰⁸

There are several definitions for the term ‘model’. Businessdictionary.com defines a ‘model’ as a “graphical, mathematical (symbolic), physical, or verbal representation or simplified version of a concept, phenomenon, relationship, structure, system, or an aspect of the real world”.³⁰⁹ This definition is too generic, and in the context of this thesis, with reference to the definition suggested by Chinn and Kramer, a model represents a type of knowledge within an empirical pattern that details a broad theoretical conceptualisation describing the relationships between concepts. The model presents these concepts using words, symbols and graphic diagrams.³⁰⁸ Empiric theory is viewed in the context of what Chinn and Kramer refer to as “a creative and rigorous structuring of ideas that projects a tentative and systematic view of phenomena”.³⁰⁸ The theory adopted for this model was a situation-specific theory. Situation-specific theories have narrow scopes and focus on specific populations, phenomena and fields of practice.³⁰⁷ Emergency centre handover is appropriate for studies using a situation-specific theory in that it focuses on a specific population (those involved in emergency centre handover), a specific phenomenon (handover within the emergency centre), and a specific field of practice (emergency medicine).

In developing this model there was constant engagement with the supervision team. There was also an ongoing engagement with and referencing back to the Results and related literature. After each engagement and discussion with the supervisory team, concepts included in the model were refined, revised or, in some cases, discarded. There was a constant consideration for the act of handover within the resource constrained emergency centre and the unique environment that the model sought to clarify.

6.5 The structure of the model

The structure refers to what Chinn and Kramer call “the overall morphological arrangement of specific elements, especially concepts”.³⁰⁸ The structure of this model is loosely based on the flow of information described in Shannon and Weaver’s Linear Communication Model.³⁰⁵ However, this model acknowledges the bidirectional characteristics of information and

feedback, and the effects they have on handover efficacy. The model follows a structure based on a conceptual framework which, according to Chinn and Kramer, is “the logical grouping of related concepts or theories that is usually created to draw together several different aspects that are relevant to a complex situation, such as a practice setting”.³⁰⁸

6.5.1 Purpose of the model

The purpose of the model was linked to the question asked by Chinn and Kramer; “Why was the theory formulated?”³⁰⁸ The purpose of the model was to serve as a conceptual framework for an improved understanding of the emergency centre handover between PECP and the emergency centre. The model seeks to consider handover within the context of the definition suggested in Chapter Two. Further to this, the model seeks to unpack the different phases and role-players within emergency centre handover and to provide a structured approach to the identification of improvement strategies to handover practice within the emergency centre. This purpose closely links with the principles of Batho Pele (putting people first) and to the statement within the White Paper by then Minister for Public Service and Administration, Zola Skweyiya: “I am asking them (Departments) to identify the small but important improvements in their service delivery processes which can be immediately attended to and implemented”.³¹⁰

6.5.2 Assumptions of the model

The model considers the fact that handover is both a complex noun and a phrasal verb. These two principles underpin the model and are reflected in the following statements that have their origins in the Results and Discussion:

- The emergency centre handover takes place between PECP and personnel in the emergency centre.
- There are several phases through which information travels, from the time it is collected by the deliverer to the time when it is interpreted by the receiver.
- There is a decrease in the quality and quantity of information during the phases of emergency centre handover.
- There are different components in each phase that have the potential to facilitate or impede the transfer of information.
- Communication in the emergency centre handover can be verbal, non-verbal or paraverbal.
- Communication is bidirectional and messages transmitted between the two persons involved in the handover have the potential to facilitate or inhibit handover efficacy.

6.5.3 Definition of the central concept

The definition suggested in this thesis for handover forms the central theme of the conceptual model. This definition considers the fact that handover is simultaneously a complex noun and a phrasal verb. The definition of emergency centre handover is therefore: “Handover is a patient-centred process that presents adequate and contextually relevant patient-specific information from one medical professional to another. Handover information is presented in a structured format that facilitates optimal information transfer and recall, as well as establishing a shared understanding of the patient’s condition, to ensure ongoing continuity of care. Handover serves to transfer responsibility and accountability for continuity of care from one medical professional to another. The handover process is complete once the receiving medical professional indicates (verbally or in writing) that they have taken over responsibility for the patient.”⁸⁷

6.5.4 Structure description

The structure of the model is described with reference to the separate components displayed in Figure 6-2.

The parts that make up the model are:

- The process of information transfer within emergency centre handover – represented by a yellow spiral.
- Factors influencing the efficacy of each phase of the handover – represented by a circle divided into three equal pie slices. Each pie slice represents one of the factors that has the potential to affect handover efficacy, namely content, process and communication.
- Factors influencing the inter-phase efficacy of handover – represented by bidirectional, two-tone arrows. The bidirectional nature of the arrows represents the ongoing feedback from both phases that have the potential to affect the handover efficacy both positively and negatively. The red relates to factors that impede handover efficacy, sometimes referred as ‘noise’.

6.5.4.1 The sequential nature of handover

The handover process and sequential flow of information is represented by a spiral. The spiral signifies both the quality and quantity of information being transferred during the process of handover. Initially, there is a large amount of information available to the PECP, who then

decide what information is important to include and the amount of available information is reduced; information perceived as irrelevant is excluded from the dataset. Each of the five loops of the spiral represents a phase in the handover process where information loss can occur.

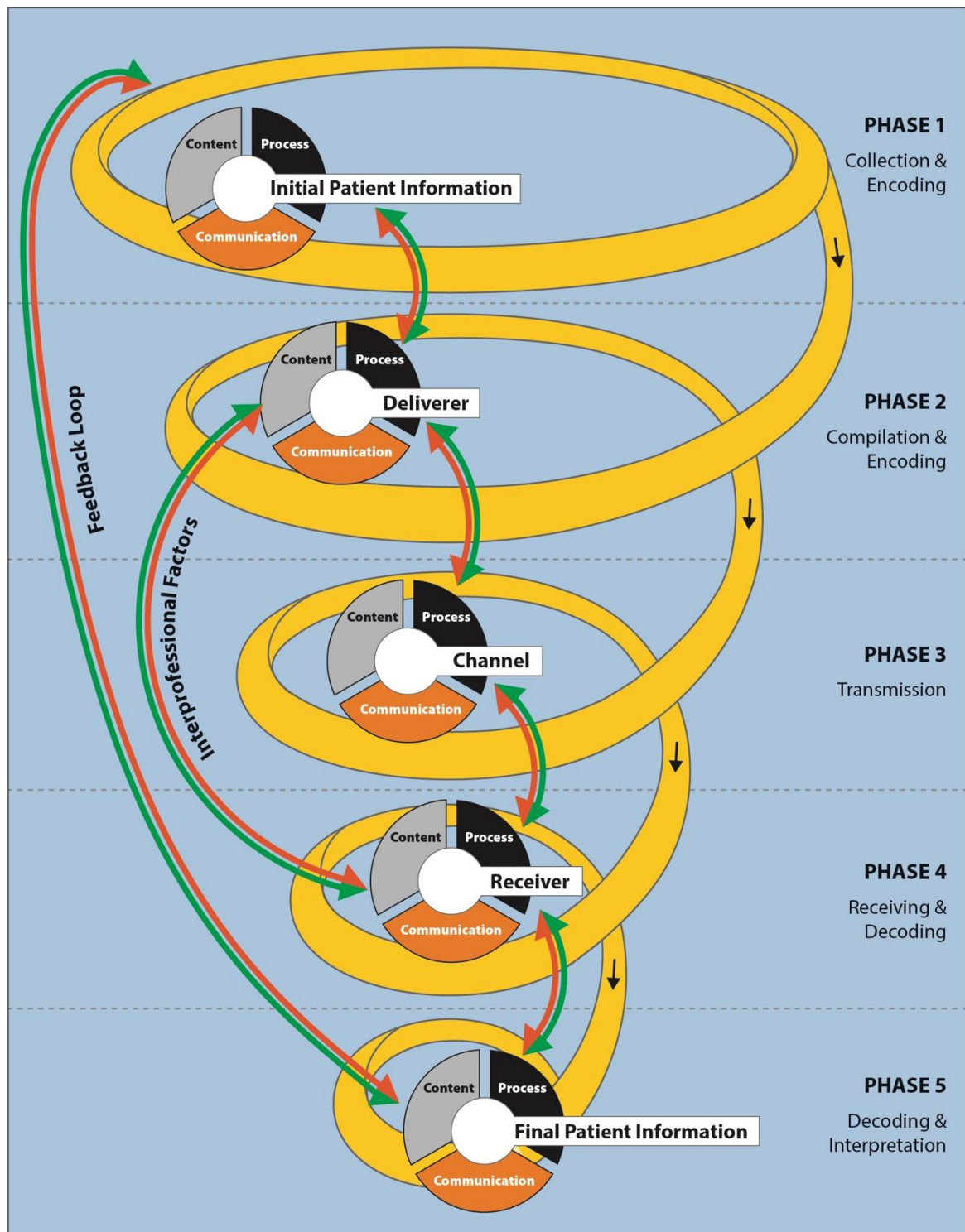


Figure 6-2: Emergency centre handover model

The colour yellow was selected to represent the spiral. Yellow denotes the mind and intellect, and it is the mind that is the primary driver of the handover process and interactions at each stage.³¹¹ Yellow has been associated with a tendency of making people more mentally analytical and critical, both of self and others. In the context of handover, being more mentally analytical and critical has the potential to identify areas requiring improvement in both one's own and other's practice. The potential also exists for criticism of others' practice which could result in conflict. Yellow also represents the colour of new ideas, finding new ways of doing things and is the practical thinker, not the dreamer.³¹¹ One of the primary findings in this thesis was that emergency centre handover required improvement. Improving current practice will require new ideas and exploring new ways of doing things that are practical and implementable.

The colour blue was chosen for the background as it represents many of the ideals that underpin effective handover. Blue is associated with trust, honesty and reliability.³¹² These are some of the principles enshrined in an effective emergency centre handover: There should be mutual trust, information transferred should be honest, and the handover should be reliable.

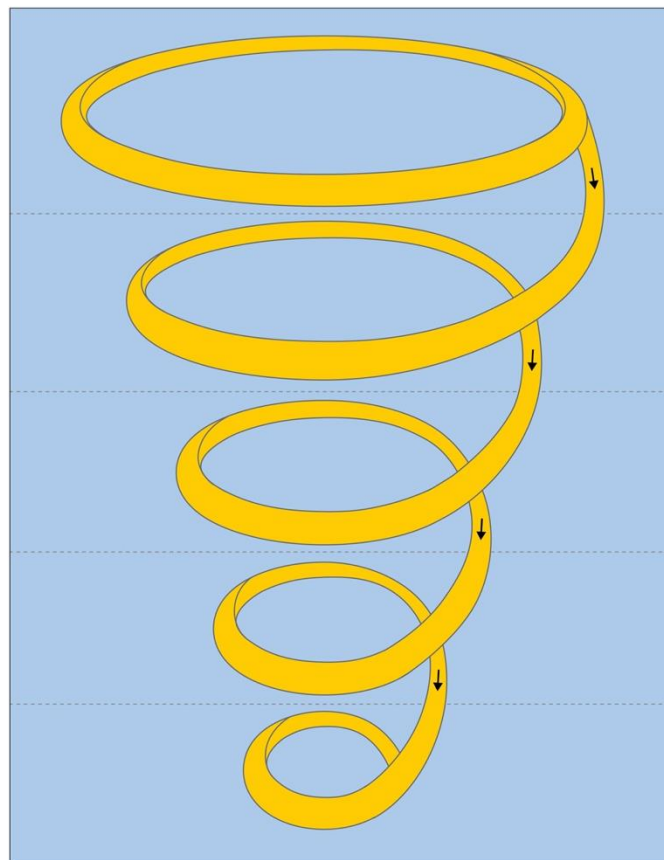


Figure 6-3: The flow of information in emergency centre handover

Blue relates to one-on-one communication as opposed to mass communication, as does emergency centre handover. Blue is considered conservative and predictable, and is a colour that calms, reducing tension and fear.³¹² Emergency centre handover tends to be conservative and reasonably predictable, and given the drive towards standardisation, these are desirable traits. Effective handover should be undertaken by calm persons in an environment that does not induce tension nor instil fear. Too much blue is associated with boredom and rigidity, which is why a light blue was chosen for the background.³¹²

6.5.4.2 Role-players in the transfer of information

There are two primary role-players in the emergency centre handover – the deliverer and the receiver of the handover. This model identifies five phases in the handover continuum that track the flow of information. Interactions occur between each of these phases and there are five interactions; two that involve the deliverer of handover, two that involve the receiver of handover, and one interaction that simultaneously involves both the deliverer and receiver of the handover. Each phase is represented by a circle that is divided into three sections, each signifying the three aims of this study; content, process and communication. Between each phase is a bidirectional arrow that is coloured red and green.

6.5.4.3 Bidirectional arrows

The bidirectional arrows represent the factors that have the potential to promote or impede handover efficacy. These factors occur simultaneously, which is why the bidirectional arrows are two-tone, green and red. Green represents the factors that have the potential to promote handover efficacy. Green is the colour of growth and balance, and is considered an emotionally positive colour.³¹¹ Green has also been described as a natural peacemaker. Within the context of handover, green represents what goes well and contributes to a more effective handover. Green is associated with a sense of right and wrong and invites good judgement. In the emergency centre handover, good judgement related to content, communication and process factors is an important contributor to handover efficacy.

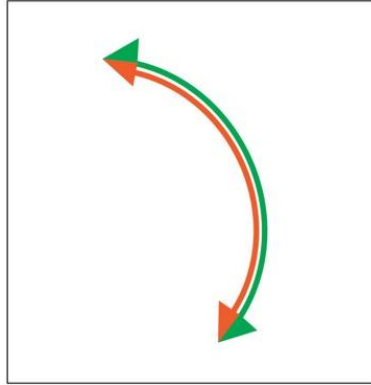


Figure 6-4: Bidirectional arrow

Red is described as the universal colour for danger and warning. Red is often associated with a passionate response. Being exposed to too much red has been linked to feelings of irritation, agitation and ultimately anger.³¹¹ Within the context of handover, factors that have the potential to impede handover efficacy are likely to elicit negative emotions, such as frustration, irritation and anger. Red is a colour that draws attention to itself and requires action to be taken.³¹³ This colour was used in this particular section because factors that are identified as impeding handover efficacy lie in the red section of the bidirectional arrow and require action to be taken.

There is a bidirectional arrow between the deliverer and receiver of the handover. This arrow represents the inter-practitioner factors that have the potential to affect the efficacy of handover and is independent of the channel. These factors are linked to the interpersonal content, process and communication factors not directly linked to the channel.

The final bidirectional arrow extends from the final patient information back to the initial phase of collection and encoding. This arrow represents the feedback loop that closes the model. It is imperative that there are processes that monitor the quality of handover and the effects on patient safety and outcome. Areas of improvement should be identified and acted upon with feedback given to both prehospital and hospital personnel in an effort to continually improve handover within the emergency centre and beyond.

6.5.4.4 Factors affecting the efficacy of handover

There were three factors identified within this thesis that had the potential to affect the efficacy of emergency centre handover. These factors could be mutually dependant but also mutually exclusive. In an effort to acknowledge this, the factors were represented by a circle divided

into three equal pie slices. Each pie slice represents one of the factors that has the potential to affect handover efficacy, namely content, process and communication.

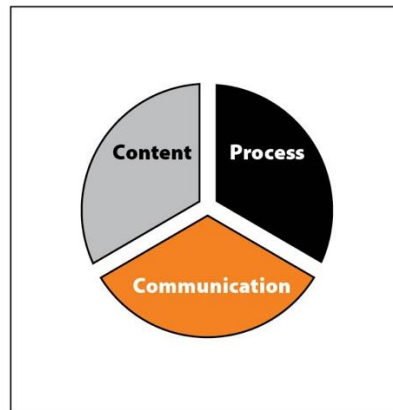


Figure 6-5: Factors affecting the efficacy of emergency centre handover

The content aspect of handover has been depicted in grey, which is a colour that is unemotional; it is detached, impartial and neutral.³¹⁴ Grey is a colour of compromise and is solid and stable.³¹⁴ Grey also lacks energy and is perceived to be neither stimulating nor exciting, neither reassuring nor soothing.³¹⁵ The actual content items of the handover are simply values that are handed over. The content items are neutral in that an item such as blood pressure could be seen to be simply a priority value that needs to be included in the handover.⁸⁷ As a term, 'blood pressure' is detached, impartial and neutral; however, it is the actual value that changes the perception. In the same way, grey is a colour that can move towards other colours, depending on its shade. In other words, the greyness of an included value can be seen to have context – this is true of the contextual nature of patient-specific physiological variables.

The process aspect of handover has been depicted in black. Black represents authority, power and control, and has been described as intimidating, unfriendly and unapproachable.³¹⁶ It is often the case that handover processes have been established by those in authority, are ingrained in the functioning of a unit, and are rigid to the point where they are unfriendly and unapproachable. Black has the potential to instil confidence in some people.³¹⁶ Standardised practices, such as those often found in handover, can promote confidence in that the need for the person to use their own initiative and open themselves up for criticism is decreased.

The communication aspect of handover has been depicted in orange. Orange relates to social communication and is associated with stimulating two-way conversations.³¹⁷ The emergency centre handover is essentially a two-way conversation with verbal, non-verbal and paraverbal

communication signals constantly being exchanged and interpreted. Orange encourages self-respect as well as respect from others.³¹⁷ In the context of emergency centre handover, respect is a critical component of an effective handover.

6.5.4.5 Phase descriptors

At the centre of each circle was the descriptor for the specific phase, depicted in white. White represents a new beginning and a clean slate; a canvas waiting to be written on. White implies impartiality and fairness, independence and neutrality.³¹⁸ White is appropriate as each phase is a clean slate until such time as the handover process commences and reaches it. It is the content, process and communication factors that are transferred that have the potential to change the colour.

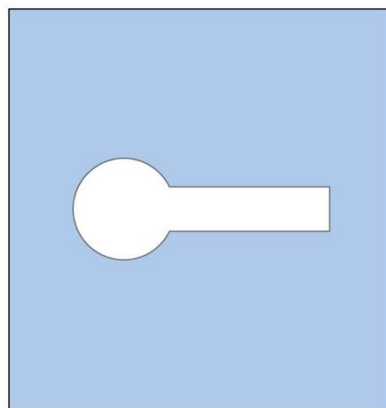


Figure 6-6: Phase descriptor

6.5.5 Phases of the emergency centre handover model

6.5.5.1 Phase One: Initial patient information (Data collection and encoding)

The aim of Phase One is for the deliverer of handover to gather the relevant patient information. This information is used to formulate a diagnosis and treatment plan, and will ultimately form the cornerstone of the handover. This is the phase where the most information is available.

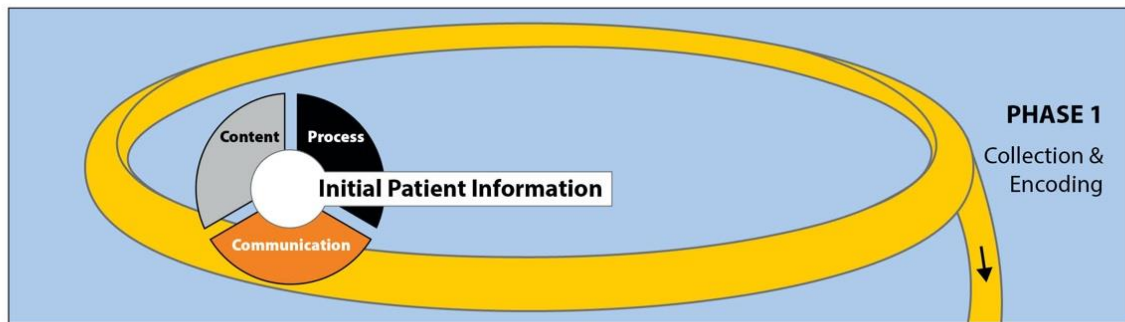


Figure 6-7: Phase One: Collection and encoding

The handover deliverer initially collects a large amount of information that pertains to the patient. This may be in the way of on-scene information, vital signs, patient history and information related to the chief complaint. The deliverer of the handover encodes and processes this information, deciding what information should be included or excluded (the content). Factors that may affect the information that is obtained in this phase include the education, training and clinical experience of the deliverer as well as their ability to process the information within the context of the specific patient. The decision of what information to encode further at this phase may be affected by the deliverer’s medical knowledge, ability to converse in the language required of the handover, and the communication cues that they consider appropriate.

Factors that have the potential to affect the efficacy of handover during Phase One include the lack or extent of training and experience related to handover – a process factor; lack of medical knowledge – a content factor; and language – a communication factor. Each of these factors presents specific challenges to effective handover, particularly within the resource-constrained environment.

6.5.5.1.1 Process: Lack of handover training and handover experience

A lack of training has the potential to decrease efficacy prior to the handover commencing. This study identified a lack of training among both PECP and ECP. Literature has similarly identified a general lack of handover training which is more pronounced in resource-constrained environments.³¹⁹ Lack of experience has been linked to what Mohorek *et al*/ refer to as “encoding error” where the deliverer of handover lacks the experience or knowledge to properly encode the message.¹³⁷ In addition, a lack of handover experience may be linked to unstructured and poorly formulated handover delivery, and educational interventions have

been shown to improve handover.¹³⁷ Handover training should thus be incorporated into the relevant curricula. For instance, simulation-based handover training has been shown to improve handover competency and should be incorporated into the curricula.³²⁰ Strategies aimed at addressing training and experience can be combined in simulation-type activities with appropriate feedback. However, within the resource-constrained environment, adequate simulation facilities are usually in short supply.

Appropriate feedback mechanisms need to be developed and implemented to identify areas requiring improvement, and training should focus on these. One of the challenges is that when there is a general lack of highly trained personnel, feedback mechanisms may be of poor quality. The addition of a handover mentorship programme should be considered for all newly qualified personnel where the resources exist.

6.5.5.1.2 Content: Lack of medical knowledge

Levels of education have been identified as a factor that affects the efficacy of handover.^{65,107} A deliverer who has limited medical knowledge would potentially be unable to identify abnormal physiological variables. They would likely be unable to contextualise and prioritise information related to the patient's specific presentation. The fact that most South African PECP have only a four-week qualification means that there is a general lack of in-depth medical knowledge.³⁸ This would result in incomplete information being included in the handover, as well as a lack of contextualisation of not only information handed over, but also that of information omitted. The results from this study show that there are some differences between the deliverer and receiver related to what variables are considered important. The perceptions of the handover deliverer would determine what information is collected at this stage; this may result in conflict at the delivery stage when information considered important by the receiver was not collected. Young *et al.* postulate that higher learner knowledge should decrease cognitive load and increase handover accuracy.³²¹ In the resource-constrained setting, such as the one in which this study took place, most PECP have only basic training. This implies that the personnel would have relatively high cognitive loads that would negatively affect the quality of information gathered, as well as the ultimate quality of the handover.

Phase One is a critical phase during which information related to the patient is gathered. This is where the deliverer of the handover decides what information to collect and why. The fact that the majority of South African PECP have only a four-week qualification potentially means that there may be limited capacity to collect adequate and patient-relevant information. Prehospital education and training programmes should thus focus on addressing the identified

issues with the aim of improving the quality and relevance of the information being gathered. Within the South African context, where the majority of handovers are performed by BAAs, the challenge remains to improve levels of basic medical knowledge. Appropriate education, training and upskilling strategies need to be developed and implemented to address the knowledge levels of the handover deliverers. These strategies have the potential to improve knowledge and, in doing so, decrease cognitive load and thereby improve the quality of handover as hypothesised by Young *et al.*³²¹

6.5.5.1.3 Communication: Language and terminology

Medical terminology is an important factor related to handover efficacy. Use of medical language was identified in this study as a contributor to good handover by deliverers of handover, and a lack of medical terminology was a barrier to effective emergency centre handover by receivers. This is congruent with literature.^{184,300,322} A lack of appropriate training would potentiate the use of more non-medical terminology, decreasing handover efficacy. The lack of knowledge of appropriate medical terminology during the information encoding process could decrease the efficacy of information collection in this phase. It is important for a minimum dataset of commonly used medical terminology to be communicated to all role-players.³²² Within the South African and other resource-constrained environments, a possible solution may be to develop a set of commonly used terms and incorporate these into education and training programmes. The use of a commonly understood language during handover is therefore also vital.⁷⁷ Conversely, handover that includes the use of languages, such as vernacular languages not understood by all involved, has been identified as a barrier to effective information transfer. The adoption of English as the language of handover will assist in that the deliverer would be able to start their encoding process in English. The ability to consult a source of commonly used words would further allow the deliverer to clarify or translate words that they may not know into English.

6.5.5.2 Phase Two: The deliverer of handover (Encoding and Compilation)

Once the initial patient information has been encoded, the handover deliverer will begin the process of information transfer. Phase Two involves the deliverer of the handover encoding the information from Phase One and compiling the handover they intend to deliver.

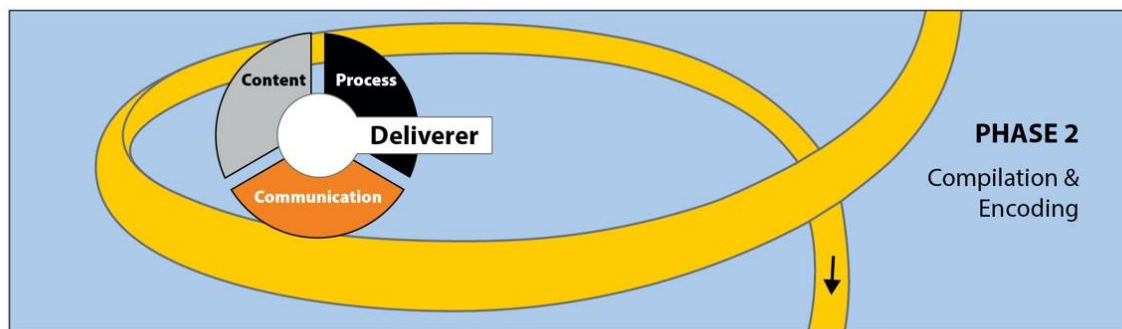


Figure 6-8: Phase Two: Encoding and compilation

6.5.5.2.1 Process: Hierarchical nature of the prehospital/emergency centre relationship

PECP identified several barriers to emergency centre handover processes. The perception that they were looked down upon by ECP potentially created a hierarchical relationship between the deliverer and receiver of emergency centre handover. A hierarchical handover relationship has been associated with the handover deliverer feeling threatened or fearful in several psychological areas.¹³⁹ The implication is that the handover deliverer may be less willing to interact comprehensively with the emergency centre staff. Hierarchical handover environments have also been associated with encoding error.^{114,137} It is possible that the deliverer of the handover may alter their handover content to satisfy the emergency centre as opposed to structuring their handover as best presents the patient. Improving interprofessional relationships and focussing on a more cooperative and equal emergency centre handover agenda may limit the establishment and effects of hierarchical emergency centre environments. The data from this study suggest that the hierarchical nature of the South African emergency centre may be more pronounced than that in resource-rich systems. This has the potential to negatively affect the quality of handover within these environments.

6.5.5.2.2 Process: Inattentive listening and multiple handovers

Interruptions to handover are commonplace with several adverse consequences.^{209,277} Inattentive listening, interruptions and the need to repeat or perform multiple handovers were identified by PECP as common barriers to effective handover. This is a phenomenon often identified in literature.^{18,278,280,323} PECP participants associated inattentive listening and having to repeat handovers as sources of frustration. Although these usually occur during the actual handover, they have the potential to affect the way in which the deliverer structures and delivers their handover. In an effort to mitigate the effects of interruptions and having to repeat

handovers, some participants indicated that they adapted their initial handover to cater for the eventuality that the handover would need to be repeated. There was also a perception that multiple handovers resulted in information loss or restructuring of initial information, a phenomenon alluded to in existing literature.³ Dedicated personnel and a dedicated venue for emergency centre handover reception are possible solutions that should be explored.¹⁸⁴ The “sterile cockpit” approach suggested by Segall *et al* is another potential solution that can be considered to limit interruptions and the need to repeat handovers.²²⁷

6.5.5.2.3 Content: Mnemonic use

The use of mnemonics has been suggested as a standardised handover technique.⁹³ PECP participants in this study agreed that mnemonics were appropriate but indicated that they had a poor familiarity of commonly used mnemonics. Mnemonics were perceived by some participants to be overly prescriptive. The results of this study imply that commonly used mnemonics fail to prioritise information deemed as important within the context of the patient. This may result in the process of encoding and compilation of the handover being negatively affected by rigidly following a mnemonic and the deliverer of handover including data elements that may not be relevant to the patient.⁹² The implication is also that important information may be omitted in the interests of adhering to the mnemonic. An emergency centre-specific mnemonic may be appropriate in addressing this issue as included information would be contextual to the nature of the general patient presenting to the emergency centre. Fitzpatrick *et al* suggest that mnemonics used in emergency centre handover should explicitly contain the perceived essential clinical variables required for prehospital handover.³²⁴

The results from this study should serve as a baseline for an emergency centre-specific handover that includes and prioritises information within the context of what is deemed important within both the prehospital and emergency centre environments.

6.5.5.2.4 Communication: Interprofessional relationships and interactions

Participants in this study highlighted the importance of interprofessional relationships on emergency centre handover efficacy. Familiarity, repeated interactions and pre-existing relationships were identified as contributors to effective handover. Where a deliverer of handover was familiar with the receiving facility and its personnel, the implication is that they would be more comfortable delivering the handover and that the hierarchical nature of the relationship would be decreased. A lack of familiarity, on the other hand, was associated with a lack of trust which, in turn, was perceived by PECP as a lack of respect. Interprofessional

mistrust has been linked to poorer communication and information transfer.⁴⁴ In the event that the deliverer of emergency centre handover does not have a good interprofessional relationship with the emergency centre, handover will be negatively affected in that he/she may pre-empt a negative interaction.

One of the challenges identified within the African context has also been that there is rarely a dedicated acute intake area that is staffed with nonrotating personnel.³²⁵ Moreover, the problem of a lack of staffing consistency was highlighted by participants in this study, who expressed frustration at having little continuity of staff within the emergency centre. This makes it potentially difficult to form relationships and could negatively affect handover efficacy.

There was a perception that persons on both sides of the handover were “ready to fight”. This highlights the possible effect that poor interprofessional relationships can have on handover efficacy. Strategies aimed at improving interprofessional relationships should be explored to decrease the chasm between the prehospital and emergency centre environments. The reason for the perceived lack of patience was not explored, but this could be logically traced back to the understaffed and overworked nature of personnel identified as a theme throughout this thesis.

6.5.4.6 Phase Three: Channel (Transmission)

Phase Three is comprised of the actual method of handover transmission. Handovers in the South African emergency centre are generally performed verbally with a corresponding written patient care record as an adjunct. This study focussed on the physical interaction between practitioners and did not focus on the written aspect of emergency centre handover. Several communication cues have also been identified in this thesis – those that impede and those that promote the effective transfer of information. Some of these cues are discussed under this heading and the remainder pertains to interpersonal communication and are discussed under the relevant heading.

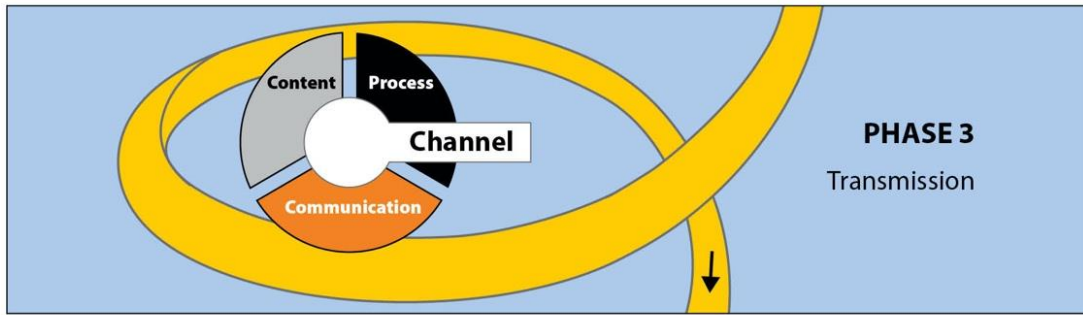


Figure 6-9: Phase Three: Transmission

6.5.4.6.1 Process and communication: External noise

Participants identified the emergency centre as an inherently busy and noisy place. The processes within the emergency centre have the potential to create a communication environment that hampers effective information transfer; for this reason, the two are grouped together. The fluid nature of the activities in the emergency centre means that there is a constant stream of noise. Alarms, conversations and patients all contribute to the amount of external noise potentially degrading the quality of verbal communication.¹³⁷ It is impractical to try and silence the emergency centre. A possible solution is to provide a quiet and secluded environment specifically devoted to handover.³²⁶ Within the resource-constrained environment, where many emergency centres have been converted from existing structures, a dedicated venue may not be possible. A simple solution may be an area in the emergency centre surrounded by a curtain that has been allocated as a dedicated handover area. In addition, the implementation of a “sterile cockpit” strategy has been proposed as a potential improvement strategy.¹³⁷ This strategy could improve attentiveness, decrease distractions and prevent unnecessary interruptions. The challenge within the resource-constrained environment remains personnel allocation within an environment that remains task-orientated due to its inherent business.

6.5.4.6.2 Content: Language

The use of vernacular language and non-medical terminology were identified by participants as barriers to effective verbal handover. In the event that there is a disparity between the fluency in the language of handover there is the potential to create conflict. Addressing the issue of language, or the words that are used, may require the adoption of a common language, but this would not be without challenges. As discussed in this thesis, the disparities

in education and training, medical knowledge, use of medical terminology and English proficiency negatively affect the content of emergency centre handover. Participants in this thesis overwhelmingly identified education and training as a solution to improved handover practice. Generic education and training will have limited benefit, so it is critical to ensure training focuses on the most pertinent areas that are most practical to implement. A list of common medical terminology for inclusion in handover should be compiled and distributed for reference by both ECP and PECP. In the environment where interprofessional relationships are amicable and built on trust, personnel can guide each other when either the deliverer or receiver of the handover is unfamiliar with a word or phrase.

Language disparities, such as pronunciation, enunciation and lack of medical terminology may result in incompleteness or incorrectness of information which, in turn, may be a source of stress and frustration.⁸⁶ The migration of people to South Africa, which itself has 11 official languages, compounds the problem of language disparity. This is further exacerbated by the influx of foreign doctors seeking experience. While accent neutralisation is unlikely to be a feasible option, the standardisation of some terminology may go a long way to improving the accuracy of information transferred during the verbal handover.

6.5.4.7 Phase Four: Receiver (Reception and decoding)

The aim in Phase Four is for the receiver to receive or gather information from the deliverer of the handover. The handover information is transmitted by the deliverer to the receiver. The receiver then begins the process of encoding the information they have received. The factors discussed in this section relate directly to the receiver. Factors that involve interprofessional communication and relationship are discussed under the relevant heading ([6.3.4.9 Interprofessional factors that have the potential to promote or impede handover efficacy](#)).

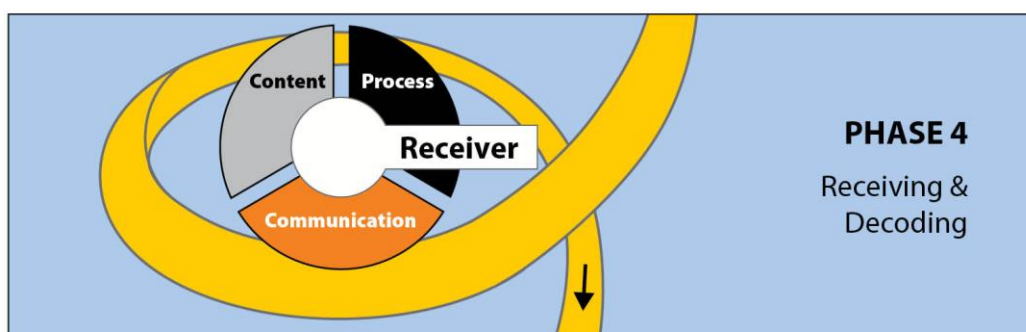


Figure 6-10: Phase Four: Receiving and Encoding

6.5.4.7.1 Process: Physiological factors

Physiological factors classified as negatively affecting handover include fatigue, hunger, thirst and irritation.¹³⁷ In the resource-constrained environment, such as the one in which this study was conducted, the overworked, understaffed emergency centre has several unique challenges often not as pronounced within the resource-rich setting. Fatigue has been identified as one of the most common handover distractions.⁶⁹ Fatigue complicates the already challenging emergency centre handover and has been shown to negatively affect performance and safety.^{132,327} Fatigue is a bidirectional issue within the resource-constrained emergency centre where both the deliverer and receiver of handover may be tired, hungry and irritable. The nature of shift work means that some of these variables cannot be changed, but there are factors that can be considered within the resource-constrained context. Ensuring that staff have adequate breaks and are afforded an opportunity to eat and drink may help decrease the physiological stressors and, in doing so, facilitate decreased irritation, fatigue and improved attentiveness. The challenge in the resource-constrained emergency centre is that there may simply be too much going on, or too little staff for adequate breaks to be taken. Novel human resource and time management strategies need to be conceptualised and evaluated to try and mitigate the causes and effects of negative physiological factors.

6.5.4.7.2 Process and communication: Inattentive listening

Some of the processes entrenched in the emergency centre have the potential to directly affect communication. PECP and ECP highlighted that there was a task-orientated approach within the emergency centre that negatively affected handover efficacy. The task-orientated nature of the emergency centre tends to result in receivers being more focussed on patients and patient assessment than on the handover.¹¹⁷ In addition, the constant noise from alarms, patients and other healthcare professionals within the emergency centre further complicates the receiver's ability to listen attentively to the handover.^{327,328} The noisy environment has been identified as a distractor to effective handover.¹⁸⁴ It is important that steps be taken to create an emergency centre that represents an environment conducive to effective handover. Limiting distractions is a strategy that may enable the receiver to focus more attentively on the handover being delivered. The busyness and understaffing of the resource-constrained emergency centre contribute to the task-orientated approach from personnel. This means that personnel are more focussed on the tasks at hand and clearing the backlog than they are on listening to a handover. In the same way that PECP should be taught to deliver handover, so too ECP staff should be taught to listen to and receive handovers.²⁷⁶

6.5.4.7.3 Content: Structure of handover

Structure was a factor identified by both ECP and PECP as important to effective handover. The fact that there was an incongruence related to participants' familiarity of commonly used mnemonics means it is time to re-evaluate the relevance of mnemonics. Commonly used mnemonics seem to be divided into prehospital and in-hospital developed structures with limited evidence found relating to any emergency centre-specific handover mnemonics. ECP were of the opinion that PECP handovers were either of appropriate length or were too short. This may be related to content and its perceived comprehensiveness or lack thereof. Further research is required to determine whether or not content relevance can be linked to the perception of handover length. Another potential reason for prehospital handovers being considered too short may be the general poor levels of education and training of PECP in the setting in which this study was conducted. A person with limited medical knowledge would not only be likely to only provide the most basic information, but would also be limited in their scope. This would leave little to be reported on.

6.5.4.8 Phase Five: Final patient information (Decoding and understanding)

The receiver decodes the information that they have received from the deliverer. The receiver classifies information's level of importance within the context of the patient and, using this information, formulates a diagnosis and treatment plan. This is the final phase in the emergency centre handover process itself.

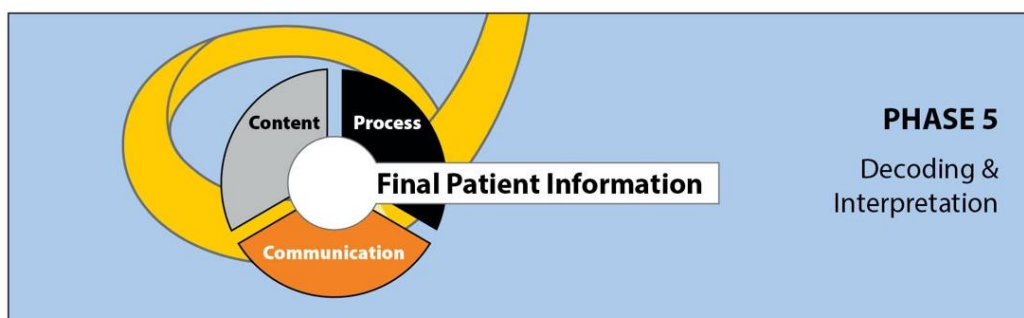


Figure 6-11: Phase Five: Decoding and Interpretation

6.5.4.8.1 Content and communication: Lack of medical knowledge

PECP identified handing over to a less qualified person as a barrier to effective handover. This was linked to a lack of appropriately qualified staff being available and a lack of understanding about the information being handed over. In the overworked, under-resourced emergency department, such as those in this study, it appears that the initial handover occurs between

the PECP and whoever is available to receive the handover. This may be acceptable for the low-acuity patient, where little by way of medical intervention is required. However, in the high-acuity patient where time may be of essence, this causes unnecessary delays in appropriate transfer of care and initiation of appropriate treatment.

Lacking proper knowledge to adequately decode the information received has been linked to an additional barrier to effective handover; that of semantic noise. Semantic noise relates to when an expression or word used by the deliverer is not decoded to the same message by the receiver.¹³⁷ Mohorek *et al* postulate that semantic noise only manifests for the receiver; however, this is based on the assumption that handover communication is a unidirectional process.¹³⁷ The model postulated in this thesis recognises that communication and the resultant flow of information is a bidirectional process, meaning that semantic noise has the potential to occur throughout the handover process. It is important that areas most affected by semantic noise are identified and strategies evaluated to decrease the effects of this semantic noise. The prevailing lack of medical knowledge by PECP results in semantic noise further up the information transfer spiral. This means that by the time the receiver decodes the information, the effects of poor encoding would have been exacerbated. The efficacy of the handover as a whole would then be negatively affected, with a corresponding increased potential for adverse events.

6.5.4.8.2 Process: *Busyness of the emergency centre*

In the overworked and under-resourced emergency centre, there is a constant flow of patients and a corresponding pressure on personnel to maintain the flow of patients to the relevant areas of the emergency centre or out into the hospital. Therefore, a receiver of handover may not have sufficient time to adequately decode, interpret and understand the information that has been handed over before they themselves hand the patient over to the next person in the chain of the patient's care. Not only is this relevant to the receiver of handover, but its effects on the prehospital handover deliverer have negative effects further up the handover spiral. The busyness of the emergency centre within the resource-constrained environment has negative effects on patient handover and has the potential to increase the risk of adverse events. The solutions to an overworked and understaffed emergency centre are not simple and will require well-considered solutions that focus on more effective resource utilisation because it is unlikely that there will be increased funding or staffing.

6.5.4.9 Interprofessional factors that have the potential to promote or impede handover efficacy

Various factors exist between the deliverer and receiver of handover that have the potential to affect the emergency centre handover's efficacy.

6.5.4.9.1 Process and communication: Interprofessional relationships

Interprofessional relationships have the potential to affect emergency centre handover both positively and negatively. Good interprofessional relationships have been shown to positively affect both the delivery and reception of handover.⁶⁹ Poor interprofessional relationships could have the opposite effect and negatively affect the efficacy of handover.^{116,279} Mohorek *et al* demonstrated that the quality of handover delivery and reception were positively impacted by a good relationship between the deliverer and receiver.¹³⁷ From a process perspective, it is important to create an environment where good interprofessional relationships are cultivated and encouraged. This could include IPC as well as opportunities for social interaction outside of the emergency centre.

One of the challenges identified within the African context has been that there is rarely a dedicated acute intake area that is staffed with nonrotating personnel.³²⁵ The lack of staffing consistency was highlighted by participants in this study who expressed frustration at having little continuity of staff with whom to interact. This made it potentially difficult to form relationships and could negatively affect handover efficacy.

6.5.4.9.2 Communication and process: Interprofessional courtesies

Sometimes there is a tendency for both PECP and ECP to be overly "task orientated". This has the potential for personnel involved in handover to omit affording each other common courtesies, such as greeting each other.¹¹⁷ Not greeting each other has been perceived as disrespectful.¹¹⁷ In the task-orientated environment, starting any standardised handover format with an allocation for greeting would help begin the handover in an appropriate manner. Cultural differences related to communication need to be taken into account during interprofessional communication. Eye contact is one such cultural difference that can positively or negatively affect handover efficacy. It is important that common courtesies are heeded during initial interprofessional interactions and that cultural sensitivity is employed to acknowledge the difference in communication strategies. In the busy and understaffed

emergency centre where task-orientation is prevalent, professional courtesies may often be omitted simply because the focus is on getting the job done.

6.5.4.9.3 Process and communication: The use of a common language

Information handed over verbally by the PECP is often either incorrectly or incompletely recorded.¹⁵⁰ This has negative implications for the ongoing care of the patient when they move out of the emergency centre and the only link to ensure continuity of care is often the written record transcribed by the receiver of the handover, which has significant limitations. The use of medical terminology between deliverer and receiver should be encouraged as this has the potential to improve understanding of the content and decrease confusion.

The lack of a common language has been identified as a communication barrier to effective handover. A common language should be adopted for all emergency centre handovers. In the South African context, the recommendation is for English with appropriate medical terminology to be adopted as the standardised language of handover communication.²⁷⁸ One potential strategy to improve the quality and quantity of information retained after handover is to augment the verbal handover with a written report, commonly referred to as a patient care record. This was identified by participants as a desirable practice, but was associated with challenges such as comprehensiveness of information and a focus on administrative processes associated with documentation as opposed to the content. Administrative processes within the resource-constrained emergency centre could serve as distractions to effective handover. PECP identified having to open patient files as a source of frustration. It is therefore important that processes are structured to recognise the importance of the PECP's handover within the patient care continuum.

6.5.4.9.4 Content: Medical knowledge

The varying levels of medical knowledge were identified by both PECP and ECP participants as barriers to effective handover. These barriers manifest in almost all areas of the handover process; from encoding in Phase One through to decoding and understanding in Phase Five. Young *et al* have postulated that higher patient complexity should increase cognitive load and have a resultant decrease in handover accuracy.³²¹ In the high-acuity patient, this would be compounded by the prevailing poor levels of education among the resource-constrained PECP. The shortages of highly educated personnel are widespread, which implies that both education levels and patient acuity increase cognitive load and decrease the accuracy of handovers.³²¹ The range of prehospital qualifications and the vastly different levels of

knowledge associated with each qualification means that this will probably remain an issue in emergency centre handover.

6.5.4.10 The feedback loop

It is imperative that all aspects of emergency centre handover are continually evaluated for quality and relevant improvement strategies. The establishment of some form of standardised approach to emergency centre handover is essential.³²⁹ It is imperative that all participants in emergency centre handover are involved in determining the relevant emergency centre handover improvement strategies related to content, process and communication. The focus should be on providing relevant content, creating a shared working environment, and a common language understood by all.

Constant engagement and evaluation of current handover practice between deliverers and receivers of emergency centre handover is the cornerstone of improving handover. Engagement should be bidirectional, open and honest, and conducted in an environment of mutual trust. Improvement strategies would positively affect content, process and communication factors associated with emergency handover. In the resource-constrained environment, where education and training levels are inherently low, it is postulated that the quality of information moving up and down the feedback loop may be negatively affected. A consequence of generally poor education and training potentially translates into a poor capacity for research. This could have a negative effect on the ability of the system to not only identify problems, but also to generate solutions to the identified problems.

6.6 Conclusion

This study was able to explore emergency centre handover from the perspectives of both PECP and ECP within the resource-constrained South African emergency centre. This chapter sought to use the results from Chapter Four and the improvement and mitigation strategies related to emergency centre handover from Chapter Five to postulate a model related to emergency centre handover. The goal was to develop a model that addresses the handover that occurs in the emergency centre between the PECP (deliverer) and the ECP (receiver). The model was introduced, and each of its components and relevant motivations were explained within the context of the aims and objectives of the study. The following chapter will describe the recommendations, limitations and areas of future research.

CHAPTER 7: RECOMMENDATIONS, LIMITATIONS AND FUTURE RESEARCH

7.1 Introduction

Chapter Six described the model and the phases that were used to explain the process of emergency centre handover within a resource-constrained environment. This chapter provides an overview of the research project and discusses some of the limitations that have been identified. Recommendations are made for future research projects and future researchers within the domains related to this thesis. The chapter concludes with a section related to the significance of this research and the contribution it makes within the field of emergency centre handover and the broader healthcare environment.

7.2 Recommendations

The model developed in this thesis addresses content, process and communication aspects of emergency centre handover within a resource-constrained setting. The model identified several areas where emergency centre handover can potentially be improved. Such improvements do not need to be a cost- or resource-intensive undertaking. These potential improvements are briefly discussed below as recommendations.

7.2.1 Recommendation One: Content - Patient variables for inclusion into emergency centre handover

There were similarities between what PECP and ECP considered as important patient variables to include in handover. The recommendation is to produce a standardised set of patient information variables that are most relevant to emergency centre handover, specifically those in the resource-constrained environment. Given the contextual nature of patients, their underlying illness and relevant physiological variables, a generic list would be the first potential solution. The next step would be to package these variables into a standardised format that recognises the importance of each patient variable while still maintaining a logical flow. Once this has been compiled, research and validation would be required to determine its practicality and implementation potential.

ECP indicated that they would prefer more information related to the environment in which the patient was found. PECP should take more detailed observations that can be reported to the ECP during the handover. It may be necessary to determine the most important variables on which to report by conducting a study related to environmental information variables.

7.2.2 Recommendation Two: Content - Qualification and handover content

The range of prehospital qualifications and the effect that it had on handover quality was an area of concern. Some personnel from both prehospital and emergency centre environments highlighted limitations to rigidly structured standardised strategies such as mnemonics. However, standardised strategies were identified as being generally beneficial. The poor interprofessional congruence with commonly used mnemonics means that it is definitely time for a prehospital to emergency centre handover mnemonic to be developed, tested and implemented. This standardised mnemonic would include the minimum dataset required, packaged in a manner that best adheres to the definition of handover postulated in this thesis. This will limit the effect that qualification would have on the quality and quantity of information handed over. The problem of inadequate education and training is likely to remain a problem for the foreseeable future; however, even basic handover training has been shown to be beneficial.

7.2.3 Recommendation Three: Communication - Verbal communication

Interprofessional communication was identified as a significant barrier to communication. Verbal communication was affected by the actual language of communication, the relevance of the medical terminology used, and the length of the handover. It is recommended that English be adopted as the common language for handover within the South African emergency centre. Further to this, a list of basic medical terminology should be developed and circulated to ensure that there is a minimum set of commonly understood phrases or terms used within emergency centre handover. This would potentially help to counter the generally poor levels of education and training within the resource-constrained environment.

7.2.4 Recommendation Four: Communication - Interpersonal communication

Interpersonal communication during emergency centre handover should incorporate identified strategies that contribute to effective handover. These should include a greeting and an introduction, positive body language, such as smiling, and the demonstration of active listening techniques and appropriate, culturally sensitive eye contact. A friendly attitude should be projected, and rudeness should be avoided while maintaining an attitude of mutual respect for qualifications and the challenges associated with each other's working environments. Preconceptions related to the delivery or reception of handover should be minimised, and the expectation should always be positive. A common understanding should be fostered related to the challenges of working in a resource-constrained environment. Both the deliverer and

receiver of emergency centre handover should be cognisant of the fact that the other person may be negatively affected by physiological or psychological noise. A patient and understanding attitude should be adopted to decrease the incidence of conflict. In the same way PECP should be taught to deliver handover, ECP should be taught to listen to the handover.²⁷⁶ A team-based approach to education and training that recognises the challenges within a resource-constrained environment should be adopted. This will ensure that solutions are not monodimensionally aligned to either only the deliverer or the receiver of emergency centre handover.

7.2.5 Recommendation Five: Process - Emergency centre handover processes

Emergency centre handover needs to occur in an area that is conducive to effective communication. Strategies should be implemented to provide a common handover area where external distractions are limited and where patient confidentiality is ensured. It is unlikely that staff shortages and the busyness of the emergency centre will change within the resource-constrained environment any time in the foreseeable future. Novel strategies to improve human resource allocation and utilisation are needed to ensure appropriate staff are available to receive the prehospital handover into the emergency centre. Moreover, interruptions during handover remain a challenge. Teaching both deliverers and receivers of handover about active listening could decrease the incidence of interruptions. Additionally, allowing for the completion of the handover prior to the receiver asking questions is a simple, easily implementable strategy that can reduce the incidence of multiple handovers. A common understanding of the challenges faced by both PECP and ECP also has the potential to decrease frustration related to resource limitations.

7.2.6 Recommendation Six: Process - Pre-notification

PECP should pre-notify the receiving emergency centre of all high-acuity patients. This will allow the hospital to prepare appropriately for the patient's arrival and ensure that all relevant resources are available. Pre-notification information can be requested by the receiving doctor to ensure that the appropriate information is handed over. In the resource-constrained environment, pre-notification becomes critical to ensure that appropriate resources can be sourced in anticipation of the patient's arrival. It is further recommended that emergency centres develop a standard list of information that they require to determine the patient's acuity and possible resources required. It is recommended that PECP develop contact protocols to ensure techniques for personnel in the operational environment to be able to contact the emergency centre to pre-notify accordingly. Where resources are not available for direct and

effective communication between the PECP and ECP, it may be necessary to incorporate persons not directly involved in patient handover into the process. This may include handover training programmes for dispatchers.

7.2.7 Recommendation seven: Process - Cross-pollination

The perceived lack of understanding of each other's working environments was evident among both PECP and ECP. The appreciation of the effects of resource-constraint by both parties serves as a good foundation for future programmes. Personnel should be allowed to spend time in each other's environments, and this should be coupled with a short information session. This session should include information related to qualification structures, scopes of practice, and any additional information related to better understanding the specific working environment. This additional information could include information on systems, process flow and resource allocation, and how these are affected by resource-constraint or poor resource allocation. It is important to highlight the effect that the inappropriate allocation of resources will have within the resource-constrained environment.

7.2.8 Recommendation Eight: Interprofessional relationships

The degradation over time of interpersonal relationships has seemingly been one of the contributors to ineffective emergency centre handovers. Some of the strategies mentioned above may help to address the issues, but more needs to be done. There is a need to increase interaction between the PECP and ECP. Even though there is a prevailing environment of resource constraint and overwork, opportunities need to be created for social dialogue between the two environments. It is time to recognise, develop and improve the social interactions and interprofessional relationship and, in doing so, to foster the notion of a team-based approach to emergency centre handover. This, in turn, has the potential to improve interprofessional respect. The hierarchical environment in the emergency centre is a barrier to effective handover and needs to be addressed appropriately. Many of the recommendations suggested above would serve to improve relationships and create more cooperative as opposed to competitive agendas.

7.3 Limitations

The study was cross-sectional and collected data using a generic, staged recruitment procedure limited to one geographical area. As in similar studies, the convenient nature of data collection thus meant that the sample was potentially non-representative. The paucity of

literature related to emergency centre handover meant that the questionnaire was designed using data from studies that were conducted in environments that were resource-rich. This may have resulted in the questionnaire lacking some context within the environment in which it was employed. The wide range of qualifications and scope currently working in the prehospital emergency care environment and used to guide data collection may have resulted in skewing of the data towards basic and intermediate life support handover. Given the distribution of current operational prehospital emergency care personnel, this was unavoidable.

The use of paper-based questionnaires may have excluded potential participants who were not present at the workplace when questionnaires were distributed. This could have resulted in a smaller sample size. The prescriptive nature of the questionnaire may have meant that certain areas of emergency centre handover remained unexplored. This was mitigated by using open-ended questions to gather more data on specific areas of concern.

The questionnaire was distributed in one language, English, which may have affected certain participants' understanding of the questions. This may have led to varying interpretations and, as a result, unconscious responses that may have skewed certain results. There were instances where questions remained unanswered in the questionnaires. There was no way to explore why these specific questions had been omitted, but it is possible that this may be linked to the varying interpretations mentioned before. Despite the questionnaire being perceived as quite short, it is possible that certain respondents may have experienced questionnaire fatigue, which could have affected their responses, specifically to the open-ended questions.

The interview protocols used in Study Two were compiled using data from Study One, and the participants were not necessarily the same. This meant that certain aspects related to the aims of the study might have remained unexplored at the conclusion of the interview. Recruitment was based on convenience, and potential interviewees with valuable data may have been unintentionally omitted due to their being occupied with other tasks.

Some interviewees were known to the interviewer, and this may have affected their responses. This was mitigated by trying to create a casual and comfortable environment in which the interviewee was able to speak freely. It is possible that the way in which the questions were asked may have influenced the responses. This was mitigated by using an interview protocol and the researcher consciously being aware of the phrasing and structure of questions.

Despite the use of CAQDAS, the sheer volume of interview data may have resulted in coding fatigue, potentially harming the coding process and resultant themes. This was mitigated using the code-recode strategy. There were certain areas of some interviews where external noise had a negative effect on how well the interview could be heard. Generally, these were limited to words or short phrases and were unlikely to affect the holistic transcription and analysis. Where interview environments were noisy, this may have negatively affected both the interviewee and interviewer's focus on the questions and responses.

In hindsight, it may have added value to examine the context of emergency operations beyond the emergency centre handover. This may have had the potential to give the study improved context within the greater healthcare domain. Despite the fact that emergency centre handovers are somewhat unique to the emergency centre itself, it would be valuable to integrate future research with other areas where handover takes place. This may be a valuable source of information where common uncertainties and risks could be integrated into potential avenues of research.

7.4 Future research

Ongoing research that aims to improve current practice should be the mainstay of any patient-centred healthcare system. The uniqueness of the resource-constrained emergency centre and the processes that take place within its walls mean that many practices and procedures advocated in other areas of the hospital may not have adequate relevance for implementation. In the same way, some areas of this thesis may not directly relate to practices within the resource-rich emergency centre. There are many areas that have been highlighted in this thesis where further research opportunities exist.

There is a paucity of emergency centre handover research in general. The virtually non-existent research on resource-constrained (specifically African) emergency centre handover means that it is imperative that further research is undertaken related to emergency centre handover. The model proposed in this thesis identified five phases of emergency centre handover and acknowledged the bidirectional nature of handover communication. Several of the findings from this thesis require further research and investigation to further improve the content, process and communication aspects of emergency centre handover.

It is important to acknowledge that several of the findings of this thesis may be generalisable to the resource-rich setting. Some potential future studies could aim to test the model by attempting to answer the questions relevant to each phase in the model that have been

phrased below. Within the African context, several countries are setting up prehospital systems and the results of this thesis could be used to establish processes and procedures in such a way that emergency centre handover efficacy is improved from the outset. These future studies should be carried out in both resource-rich and resource-constrained settings.

7.4.1 Phase One

- What factors affect the collection and encoding processes during initial patient contact?
- How can the medical knowledge and terminology of existing PECP be improved to ensure that they collect and encode the appropriate information?
- What type of handover training should be provided to PECP to improve the quality of information gathered?

7.4.2 Phase Two

- How can the perception of hierarchy within the emergency centre be changed to facilitate more cooperative as opposed to competitive communication?
- What is the most appropriate information that should be handed over, and how should this information be packaged to facilitate effective handover delivery?
- How can PECP act to improve interprofessional relationships?

7.4.3 Phase Three

- What strategies exist to decrease external noise and the influence it has on emergency centre handover, and how can these be implemented?
- Which language is the most appropriate to use as a common handover language and what challenges may be associated with its implementation?

7.4.4 Phase Four

- How can physiological factors affecting emergency centre staff be mitigated?
- Where is the best place for handovers to be received?
- What listening strategies are most appropriate to teach to ECP, and how can these be taught?
- What is the most appropriate information that should be handed over, and how should this information be packaged to facilitate effective handover delivery?

7.4.5 Phase Five

- What factors affect the decoding and interpretation processes after the handover has been received?
- How can the medical knowledge and terminology of existing ECP be improved to ensure that they decode and interpret the information received appropriately?
- What strategies can be implemented to decrease the workload on ECP?

7.4.6 Interprofessional factors

- What can be done to improve the interprofessional relationships between PECP and ECP?
- What common interprofessional courtesies are most appropriate to improve interprofessional communication?

7.4.7 Feedback loop

- How is information identified for inclusion into the feedback loop?
- What processes need to be put in place to facilitate appropriate and constructive information exchange within the feedback loop?

All of the above questions could be asked simultaneously when considering that each phase of emergency centre handover is inexorably linked to all the others. Future research could involve concurrent studies of all five phases while exploring the relevant links between the questions asked above. There can be no doubt that emergency centre handover requires extensive study for the safety of the patient, the healthcare professional and the effective operation of the healthcare system within which it occurs.

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Appendix 1: Ethical Approval



UNIVERSITY OF CAPE TOWN

Faculty of Health Sciences
Faculty of Health Sciences Human Research Ethics Committee
Room E52-24 Groote Schuur Hospital Old Main Building
Observatory 7925
Telephone [021] 406 6338 • Facsimile [021] 406 6411
e-mail: sumayah.ariefdien@uct.ac.za

03 December 2012

HREC REF: 624/2012

Mr A Makkink
Surgery
Division of Emergency Medicine
J-Floor
OMB

Dear Mr Makkink

PROJECT TITLE: A STUDY OF EMERGENCY CENTRE STAFF AND PREHOSPITAL PROVIDER OPINIONS ON CURRENT HANDOVER PRACTICES WITHIN THE GREATER JOHANNESBURG AREA

Thank you for your response to the issues raised by the committee.

It is a pleasure to inform you that the HREC has **formally approved** the above mentioned study.

Approval is granted for one year till the 28 December 2013.

Please submit a progress form, using the standardised Annual Report Form, if the study continues beyond the approval period. Please submit a Standard Closure form, if the study is completed within the approval period.

Please note that the ongoing ethical conduct of the study remains the responsibility of the principal investigator.

Please quote the HREC. REF in all your correspondence.

Yours sincerely

PROFESSOR M BLOCKMAN
CHAIRPERSON, HSF HUMAN ETHICS

Federal Wide Assurance Number: FWA00001637.
Institutional Review Board (IRB) number: IRB00001938

sAriefdien

Appendix 2: Approval for Upgrade: Master's to PhD



DOCTORAL DEGREES BOARD
UNIVERSITY OF CAPE TOWN
Masingene Building,
Private Bag X3, Rondebosch, 7701
Tel: +27 21 650 2202
E-mail: ddb@uct.ac.za

23 February 2017

STRICTLY CONFIDENTIAL

Mr AW Makkink MKKAND001
MKKAND001@myuct.ac.za

Dear Mr Makkink

APPLICATION FOR MASTERS UPGRADE TO PHD

I am pleased to inform you that the Doctoral Degrees Board has approved your request to upgrade from a Masters to PhD degree. The University requires candidates for this degree to be registered for a minimum of two years, provided you maintain unbroken registration and comply with the rules for the degree.

Please contact your Faculty Office to check whether there are particular procedures to follow or forms you need to complete for this purpose.

We wish you well with your research.

Yours sincerely



Janine Isaacs (Mrs)
Doctoral Degrees Board Office
cc: Dr S Bruijns, Surgery
Co-supervisor: Dr C Stein
FACULTY OF HEALTH SCIENCES
Ref: CC012017
Attachment

Appendix 3: Invitation and Information Sheet: Prehospital Emergency Care Personnel

Dear Potential Participant,

Invitation for Participation: MSc: Emergency Medicine Research Project

My name is Andrew Makkink and I am an Emergency Medical Care lecturer employed by the University of Johannesburg and am currently registered towards an MSc: Emergency Medicine at the University of Cape Town.

The course requires for an original research project to be completed within the field of emergency medicine. As an Emergency Care Practitioner (ECP) I gave the topic for my research a lot of thought and decided to make it relevant to an aspect of emergency medical care that I believe is not only under-researched, but, also one that I believe has the potential to improve patient care within both the prehospital environment and the Emergency Centre. This prompted my research topic: **A study of emergency centre staff and prehospital provider opinions on current handover practices within the greater Johannesburg area.**

Ethical approval for this study was granted by the UCT FHS Human Research Ethics Committee HREC/REF: 624/2012. The HREC may be contacted at:

Telephone [012] 406 6338

Fax [021] 406 6411

Email sumayah.ariefdien@uct.ac.za

Approval has also been granted by the relevant authorities in your domain to conduct this research within the facility.

Should you wish to participate in this study, please would you be so kind as to complete the consent form as well as the questionnaire attached to this letter and either return it to the researcher, or deposit it in the box that I have left in the unit?

Please complete the attached consent form and hand it back to the researcher, or deposit it in the box that I have left in the unit – it will not be attached to the questionnaire, ensuring your anonymity.

I thank you for the time taken in considering participating in this study and look forward to what I believe will be valuable feedback.

Yours faithfully,

Signed by candidate

Andrew Makkink

MSc: Emergency Medicine student (UCT)

PARTICIPANT CONSENT FORM

I, _____, hereby confirm that I have read and understood the following:

DESCRIPTION: You are invited to participate in a research study on Emergency Centre (EC) Handover. From the information collected and studied in this project we hope to learn more about handover within the EC, including factors that may affect the quality of handover practices.

PROCEDURES: You are required to complete a questionnaire pertaining to a number of aspects of handover. I would request that you are honest in your opinions so that we can gather real, reliable and valid data that may help us understand the handover process better.

RISKS AND BENEFITS: There are no anticipated risks associated with this study. You will not receive any direct benefit from participation. We cannot and do not guarantee or promise that you will receive any benefits from this study.

TIME INVOLVEMENT: Your participation in this study will require you to fill in the questionnaire after you have completed with the handover process. This process should take a maximum of a few minutes.

PAYMENTS: You will not be paid to participate in this study.

CONFIDENTIALITY: All data will be treated with the strictest confidentiality and will not be divulged to any external parties.

PARTICIPANT'S RIGHTS:

- Participation in this study is completely voluntary.
- You may withdraw from this study at any time.
- This project will comply with the strictest ethical conditions and has received ethical clearance from the appropriate committee.
- All data will be kept in the strictest confidentiality and will not be disclosed to any third parties.
- In the event of any data being published, your anonymity is guaranteed.

ETHICAL CONSIDERATIONS:

Ethical approval for this study was granted by the UCT FHS Human Research Ethics Committee HREC/REF: 624/2012.

The HREC may be contacted at:

- Telephone [012] 406 6338
- Fax [021] 406 6411
- Email sumayah.ariefdien@uct.ac.za

Signature (participant): _____ Date: _____

Signature (researcher): _____ Date: _____

Appendix 4: Prehospital Emergency Care Personnel Questionnaire

- The aim of this questionnaire is to determine what information you as the prehospital care provider feel is important to hand over to the staff in the Emergency Centre.
- Please rank the following items in order of what you believe their relevance or importance is within a handover by making a cross in the appropriate block.
- This should be based on what YOU believe is generally the most important information that you would like to transfer about a patient when handing over in the EC.
- Please feel free to add any aspects of patient information that do not appear on the list and rank them accordingly.
- Please fill in all the blocks.

What is your qualification?	BAA	AEA	ECT	CCA	How long have you been qualified at this level? (Years)		
	NDIP	BTECH	Other: (Specify)		How many years experience do you have within the EMS? (Years & Months)	Y	M
DESCRIPTION				Unimportant	Somewhat important	Important	Critically important
Mechanism of Injury/ Nature of Illness							
• Approximate impact speed							
• Restrained / Unrestrained							
• Airbag deployment							
• Damage to car / Intrusion							
• Time since incident							

• Death of an occupant in the same compartment				
Injuries sustained				
• Type of major injuries				
• Anatomical location of major injuries				
Patient priority				
Vital signs				
• Pulse rate				
• Blood Pressure				
• Respiration Rate				
• SpO ₂ (Oxygen saturation)				
• Temperature				
• Capillary Refill				
• Glasgow Coma Score				
• End tidal CO ₂				
• ECG analysis				
• Hypotensive episode prehospital				
• Patient Mobility				
• TEWS Score				
History				
• Allergies				
• Medications				
• Past Medical History				
• Past Surgical History				
Last meal/drink consumption				
Demographics				
• Age				

• Gender				
Add other:				

What do you think the general quality is of the handovers that you observe within the Emergency Centre environment?

Poor	Below Average	Average	Above Average	Excellent
------	---------------	---------	---------------	-----------

Handing over using a mnemonic (DeMIST, SBAR, SOAP) is the best way to ensure that all the important information is handed over?

Strongly Disagree	Disagree	Unsure	Agree	Strongly Agree
-------------------	----------	--------	-------	----------------

How often do you think that handovers that you perform are accurate and provide relevant information about the patient?

Never	Rarely	Sometimes	Often	Always
-------	--------	-----------	-------	--------

Do you think that your handovers are generally:

Too short	Of appropriate length	Too long
-----------	-----------------------	----------

Have you ever received formal training on how to hand over?

No	Yes
----	-----

Please indicate by making a cross which of the following handover mnemonics you are familiar with:

	Have never heard of it	Unfamiliar, but have heard of it	Familiar and use it myself when I hand over
DeMIST			
SOAP			
SBAR			
CUBAN			
ASHICE			
MIST			

To what extent do you think that qualification of the EC staff that you hand over to has a direct effect on how well they receive your handover ?

No effect	Small effect	Some effect	Significant effect
-----------	--------------	-------------	--------------------

Please explain your answer:

.....

.....

List five things that you do that you believe make **your** handovers 'good'.

.....

.....

.....

Please briefly discuss some aspects that can make the act of handing a patient over a 'bad' experience for you when you hand over in the Emergency Centre.

.....

.....

What do you think could be done to improve the standard of handover within the Emergency Centre?

.....

.....

.....

I thank you for your time taken in completing this questionnaire and hope that this brings us closer to an improved handover process.

Appendix 5: Research Study information Sheet- Interview

PhD: Emergency Medicine Handover Research Project

RESEARCH STUDY INFORMATION SHEET

Dear potential participant,

I WOULD LIKE TO INVITE YOU TO PARTICIPATE in a research study.

Before you decide whether or not you would like to participate, I would like you to understand why the research is being done and what it will involve for you. **I will go through the information sheet with you and answer any questions you have.** This should take no longer than a few minutes.

The study is part of a research project that I am conducting towards my Master's Degree in Emergency Medicine and focuses on Handover within the Emergency Centre.

PART 1

WHY I AM DOING THIS STUDY AND WHAT WILL HAPPEN TO YOU IF YOU DECIDE TO TAKE PART IN IT

THE PURPOSE OF THIS STUDY is to evaluate your opinions and experiences of a number of aspects related to handover. I am looking at handover within the Emergency Centre from both the prehospital and in-hospital perspectives. You have been invited to take part in this interview so that I can use your knowledge and experiences to gain valuable insights into handover to use in my study.

DO I HAVE TO TAKE PART? It is up to you to decide to join the study. I will describe the study and provide a brief summary of the information in this document. If you indicate that you are willing to take part, I will provide you with a consent form for you to sign. You are free to withdraw at any time, without giving a reason. If you are uncomfortable answering a question, please indicate this and we will move onto the next question – you are not obligated to answer all questions. Should you decide to end the interview please inform me. I will then ask if you would like your data completely withdrawn from the study or whether I can use this in my data analysis.

WHAT WILL HAPPEN TO ME IF I TAKE PART? If you elect to take part and sign the consent form, we will then begin the interview if you are comfortable in the environment that the interview is taking place. Due to the nature of the interview process the interview will be recorded on two devices to ensure that any minor technical issues are mitigated.

EXPENSES AND PAYMENT: You will not receive any remuneration for participating in this study and will also not be expected to incur any expenses.

RISKS INVOLVED IN PARTICIPATION: There are no perceived risks associated with your participation in this study.

BENEFITS INVOLVED IN PARTICIPATION: Apart from the potential that exists for self-reflection based on the questions that you may be asked, you are unlikely to benefit directly from the research. However, the potential exists that the information that you provide may result in more information related to what we know about handover. This in turn may result in improved handover practice.

WHAT IF THERE IS A PROBLEM? Any concerns or complaints that you may have related to any aspect of the study will be addressed appropriately. The detailed information on this is given in PART 2.

WILL MY TAKING PART IN THE STUDY BE KEPT CONFIDENTIAL? Yes. There are a number of processes in place to ensure your confidentiality. The details are included in PART 2.

END OF PART 1: If you are satisfied with the information in PART 1 and are considering participation, please read the additional information in PART 2 to aid you in making your final decision.

PART 2
MORE DETAILED INFORMATION ABOUT THE CONDUCT OF THE STUDY

WHAT WILL HAPPEN IF I WANT TO WITHDRAW FROM THE STUDY? You are free to withdraw at any time, without giving a reason. If you are uncomfortable answering a question, please indicate this and we will move onto the next question – you are not obligated to answer all questions. Should you decide to end the interview please inform me. I will then ask if you would like your data completely withdrawn from the study or whether I can use this in my data analysis.

WHAT IF THERE IS A PROBLEM? Should you have any questions or concerns, please ask me immediately and I will try to address these as best I can. Should you require any clarification post conclusion of the interview, please do not hesitate to contact me at the details listed below:

Andrew Makkink

083 230 1733

amakkink@uj.ac.za

You may also contact either of my research supervisors:

Dr Stevan Bruijns

stevan.bruijns@uct.ac.za

Dr Sean Gottschalk

seanchalk1@gmail.com

Dr Christopher Stein

011 559 6564

cstein@uj.ac.za

If you feel that any questions or complaints regarding your participation in this study have not been dealt with adequately, you may contact UCT FHS Human Research Ethics Committee (HREC/REF: 624/2012).

The HREC may be contacted at:

- Telephone [012] 406 6338
- Fax [021] 406 6411
- Email sumayah.ariefdien@uct.ac.za

WILL MY TAKING PART IN THIS STUDY BE ANONYMOUS? No. the nature of the interviews means that anonymity is not guaranteed, however, there are a number of steps that have been put in place to ensure your confidentiality. These include assigning codes to interviews that will ensure that you are not identifiable as the interviewee and transcribed data will also not have any identifiable data.

WHAT WILL HAPPEN TO THE RESULTS OF THE RESEARCH STUDY? The results will be written into a research report that will be assessed by relevantly qualified and appointed persons. The intention is to publish the results of the study and should this be the case, there will be no way for you to be identified as a participant. Should you wish to view the results, you can contact me directly for access to the final report.

WHO IS ORGANISING AND FUNDING THE STUDY? I am organising the study under the supervision of Dr Sean Gottschalk and Dr Christopher Stein. The study is overseen by the Department of Emergency Medicine at the University of Cape Town and is self-funded.

WHO HAS REVIEWED AND APPROVED THIS STUDY? Before this study was allowed to start, it was reviewed by a number of appropriate committees to ensure that your interests were protected at all stages of the study.

FURTHER INFORMATION AND CONTACT DETAILS: Should you require any further information or have any additional concerns not already clarified, please do not hesitate to contact me at the details provided earlier in this document.

Researcher:

Signed by candidate

Andrew Makkink

PhD Candidate: Emergency Medicine (UCT)

Appendix 6: Interview Consent Document

I, declare the following:

- I agree to take part in an interview that will explore my opinions and experiences related to handover within the Emergency Centre.
- I have read or had read to me the appropriate information document and consent form that are both written in a language in which I am fluent and comfortable.
- I have been given a chance to ask questions and these have been adequately answered.
- I have voluntarily consented to participate in this study and have not been pressurised to take part in this study.
- I am aware that I can withdraw from the study at any time without any penalty or prejudice.
- I consent to the researcher recording the interview in a method or methods deemed appropriate.

Signed at: (Place)

Signed on this (day) of (Month) 2015

Signature of participant

Signature of researcher

Appendix 7: Interview- Consent to be Recorded Document

I, declare the following:

- I have read the information brief and have consented to participation in the study.
- I consent to the interviewer recording the interview on an appropriate recording device(s) and transcribing this into a word processing program for coding and analysis.
- I understand that the researcher will take all appropriate steps to protect the confidentiality of the information and that both the interview and the transcripts will be destroyed after an appropriate period of time has elapsed.
- I am also aware and understand that excerpts from the interview may be included in the thesis as well as any potential or actual publications that may come from this research project, with the understanding that any quotations will be anonymous.
- I understand that I am not obligated to answer all questions and that I may end the interview at any point without any negative consequences. I may also request that the data recorded to date be destroyed and that this may not be used in any way towards the final research project or write-up.

Signed at: (Place)

Signed on this (day) of (Month) 2015

Signature of participant

Signature of researcher

Appendix 8: Declaration by Principal researcher

I, Andrew William Makkink declare that:

- I have explained the information in this document to the abovementioned participant.
- I have encouraged him/her to ask questions and have taken sufficient time to answer them to his/her satisfaction.
- I am satisfied that he/she has adequately understood all aspects of the research, as discussed above.
- I did not use an interpreter.

Signed at: (Place)

Signed on this (day) of (Month) 2015.

Signature of participant

Signature of researcher

Appendix 9: Prehospital emergency care personnel interview protocol

What is your qualification/HPCSA registration category?

How long have you been qualified at this level?

How long have you been in the EMS?

QUESTION 1:

From a handover process perspective, the most common theme was that often appropriate staff are not available.

- Have you experienced this? If so, how often have you experienced this and why do you think this happens?

Another emerging theme was handover interruptions and multiple handovers.

- How often do you experience either of these? What effect, if any, does this have on your handover?

“It seems that there is a link between qualification and how well handovers are received, in other words – higher qualified EC personnel are more attentive and seem to understand your handovers better.”

- Do you agree with this statement? What have been your experiences with different qualifications and their reception of your handovers?

“Some people say that it is better to hand directly over to a doctor.”

- Do you agree? Why do you say this?

QUESTION 2:

“Communication within the EC during handover has been identified as an area that contributes to ‘bad’ handover experience.”

One of the common themes was that EC staff seem to show a lack of interest in PECP handover.

- Have you experienced this? If so, what do you think the main reasons are for this?

Another theme that emerged was that some PECP felt that EC staff did not respect them.

- Do you think this is true? If so, why do you say this?
- Do you think it goes both ways and that some PECP do not respect the EC staff? If so, why do you say this?

QUESTION 3:

An interesting point made by some participants was EC staff questioning their management of the patient.

- Have you experienced this? If so, how often and why do you think that this happens?

QUESTION 4:

Education and training appear to be the most commonly suggested solutions to improving handover quality.

- Do you agree with statement? Why do you say this? If you agree, how do you think that this can best be achieved?
- Do you think that a standardised approach to handover will improve the process? If so, how do you think that this could best be achieved?

It seems as if the relationship between PECP and the EC is somewhat strained and could be improved.

- Why do you think that there is this perceived strained relationship between the PECP and EC?
- What do you think could be done to improve this relationship?

Thank you for your time.

Is there anything else that you would like to add?

Appendix 10: Emergency centre personnel interview questions

What is your qualification?

How long have you been qualified at this level?

How long have you been in the Emergency centre?

QUESTION 1:

There seems to be a direct link between the qualification level of the PECP and the quality of their handover. In other words, the higher qualified the PECP, the better their handover.

- Do you agree with this statement? Why do you say this?
- What do you think makes prehospital handovers better or worse? Please provide examples.

QUESTION 2:

“It seems as if PECP have a poor attitude when interacting with the EC.”

- Have you experienced this?
- Please provide some examples of behaviour that you consider contributing to poor attitude?
- What do you think the main reasons for this are?
- Do you think that there is any link between level of prehospital qualification and poor attitude? Why do you say this?

QUESTION 3:

Some of the reasons suggested for handovers being 'Bad' are poor patient assessment.

- Do you think that PECP do not assess their patients properly?
- Why do you say this?

Another phenomenon related to bad handover is that the PECP do not know sufficient information about their patient.

- Do you think that PECP do not know enough about the patient that they handover to you?
- What are the most common items that you feel are missing?
- How does this missing information affect you?

Another 'bad' practice is that of PECP rushing their handover so that they can leave.

- Have you experienced this? How often does this happen?
- If so, why do you think that this happens?
- How does this affect you?

QUESTION 4:

Education and training are possible solutions to improving handover quality.

- Do you agree with statement? Why do you say this? If you agree, how do you think that this can best be achieved?

QUESTION 5:

Using a standardised approach to handover, such a mnemonic is a suggested way to make handovers better.

- Do you think that a standardised approach to handover will improve the process? If so, how do you think that this could best be achieved?

PECP tend to use the DeMIST or MIST mnemonic and EC staff seem to be more familiar with the SOAP mnemonic.

- How easy do you think that it is easy to integrate the two?
- Do you find it easy to follow the DeMIST mnemonic when you are receiving a handover?

It seems as if the relationship between PECP and the EC could be improved.

There are suggestions that mutual respect, teamwork and understanding need to be encouraged and implemented.

- What do you think the best way is to achieve this?
- Some people suggest cross-discipline working. Do you think that this would make a difference?

Thank you for your time.

Is there anything else that you would like to add?

Appendix 11: Editing Certificate and Turnitin Report

Between lines editing

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To whom it may concern:

I hereby confirm that I have edited the thesis entitled: "DEVELOPMENT OF A MODEL TO ADDRESS THE CONTENT, PROCESS AND COMMUNICATION ASPECTS OF EMERGENCY CENTRE HANDOVER". Any amendments introduced by the author hereafter are not covered by this confirmation. The author ultimately decided whether to accept or decline any recommendations made by the editor, and it remains the author's responsibility at all times to confirm the accuracy and originality of the completed work.

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Leatitia Romero

Affiliations

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PROCESS AND COMMUNICATION ASPECTS OF EMERGENCY
CENTRE HANDOVER

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This study is in fulfillment of the requirements for the degree Doctor of Philosophy
Emergency Medicine in the Faculty of Health Sciences at the University of Cape Town

Supervisors: Associate Prof Susan Rayner Braine
Associate Prof Christopher Owen Alexander Sells

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