

**A REVIEW OF WHETHER PERI-OPERATIVE NURSING RECORDS USED IN THE
WESTERN CAPE METROPOLITAN HEALTH REGION ARE IN LINE WITH
INTERNATIONAL STANDARDS AND RECOMMENDATIONS FOR STANDARD
CONTENT AND DESIGN CHARACTERISTICS FOR THE WESTERN CAPE.**

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**by
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ABSTRACT

Peri-operative nursing is faced with increasing pressure to improve productivity while coping with diminishing resources. Nurses have to work harder and faster while still maintaining a high standard of patient care. This emphasises the need for comprehensive, yet easy-to-use peri-operative nursing records.

A descriptive, non experimental research design was used to survey peri-operative nursing records used in the Western Cape Metropolitan Health Region and content and design characteristics were identified. A comparison was made between these records and the standard set by the Association of Operating Room Nurses (AORN) in the United States of America. The criteria stipulated by the AORN standard were found to be relevant to South African peri-operative nursing practice with a few exceptions. In spite of this, the peri-operative nursing records reviewed did not compare well with the AORN standard and were particularly deficient in risk management areas such as potential injury related to positioning the patient, and electrical and physical hazards. Content criteria not mentioned by the standard, but appearing in the local records were identified and certain aspects of design recognised in the literature were also discussed. Recommendations for a South African standard for peri-operative nursing records were made, as well as recommendations for further research into the use and design of peri-operative nursing records.

SUMMARY

The objectives of this research were:

- To review the peri-operative nursing records currently in use in the Western Cape Metropolitan Health Region and identify their design and content characteristics.
- To compare the content characteristics of the records in use, with established international criteria.
- To make recommendations on the content and design of future peri-operative records in the Western Cape Metropolitan Health Region.

The review of the peri-operative records is limited to the pre-operative assessment, preparation for surgery, intra-operative care and immediate post-operative evaluation. The post-operative care given in the recovery room is not included in the review, and is recommended for a future study.

LITERATURE REVIEW

Nursing documentation plays a role in risk management, quality management, legal protection of the nurse and control of budgets, as well as its primary function of communicating the needs of, and care given to the patient.

Sources of research into peri-operative documentation were gained from literature from the USA, UK, Canada and Australia, as there was a limited amount of local literature. The recommended standards for peri-operative documents in these countries were examined in order to find a suitable conceptual framework for the study. The "Recommended Standards and Practice for Peri-operative Documentation", published by the Association of Operating Room Nurses (AORN) in the USA proved to be the most comprehensive. This standard recommended content for a peri-operative record, and as such was useful for the development of the measuring instrument.

METHOD

A descriptive, quantitative research design was chosen to evaluate the peri-operative records used by hospitals in the Western Cape Metropolitan Health Region. The measuring instrument was developed using the AORN model for the required content criteria. The design characteristics identified in the literature and possible differences in South African peri-operative practice were also included in the measuring instrument.

The content criteria were grouped according to peri-operative nursing diagnoses identified by the AORN. The criteria groups selected were:

- A: Pre-operative assessment.
- B: Potential for injury related to patient positioning.
- C: Potential for injury related to electrical hazards.
- D: Potential for injury related to physical hazards.
- E: Potential for fluid and electrolyte imbalance.
- F: Potential for infection.
- G: Potential for injury related to foreign objects.
- H: General documentation.

The population consisted of peri-operative documents used in hospitals with surgical facilities in the Western Cape Metropolitan Health Region. Taking into consideration the fact that some hospital groups use a standard peri-operative record, the number of independent records was seventeen. The number of hospitals participating in the research was fourteen, representing 82% of the population.

Each peri-operative nursing record in the sample group was evaluated in three dimensions. The data pertaining to comparison with the AORN criteria, design characteristics and local criteria were identified. These three categories were then collated separately to facilitate analysis of the data. The average scores for each criteria group, as well as for each hospital were calculated. The frequency of criteria not found in the AORN standard were tabulated and so were the design characteristics. The data was stratified into private and public hospitals as well as in-patient and out-patient hospitals, and the statistical differences analysed.

DISCUSSION OF THE RESULTS

Average compliance with the AORN criteria is 52%, and adjustment of the criteria to be appropriate to South African peri-operative practice, increases the average to 61%. These scores are low, and indicate the low priority given in the records to areas of potential risk to the surgical patient. In particular, the areas of potential for patient injury related to positioning, electrical and physical hazards and potential fluid and electrolyte imbalance were found to be deficient.

General documentation criteria such as the names of persons providing care, time of discharge and type of anaesthesia were well represented in the records assessed. The only criterion not achieving 100% compliance in the general documentation group was critical incidents occurring intra-operatively. This is of concern, as critical incidents need to be communicated in the patient's nursing record to ensure continuity of care and accountability. Pre-operative assessment criteria score 67%, second highest, but the emphasis in this group is on assessment of physical status. The emotional and psychosocial status of the patient, as well as the formulation of intra-operative care plans, do not score well. Pre-operative visits by the peri-operative staff were also identified as an area of deficiency.

The emphasis on potential for infection was lower than may be expected, with these criteria scoring 63% after adjustment of the criteria to suit South African conditions. Infection control risk management issues such as wound classification and skin preparation were the lowest scoring criteria in this group. Potential for injury related to foreign objects scored 61%, but exclusion of radio-active implants from the calculation raised the score to 81%.

Figure 1 shows the average criteria group results for all the hospitals before and after adjustment of the AORN criteria to suit South African conditions.

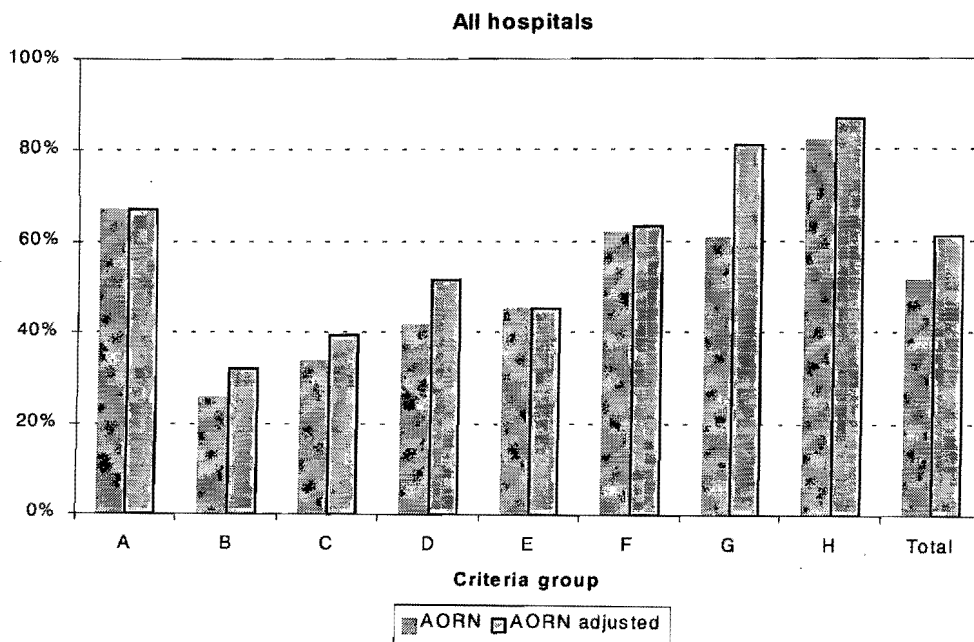


Figure 1. Criteria group scores for all the hospitals

There is no significant increase in the scores of hospitals after adjustment of the criteria, as only four of the AORN criteria were identified as inappropriate. These were method of transfer, radio-active implants, temperature of the patient and electro-surgical unit (ESU)

settings. Criteria found in the local records that were added to the final calculations were; condition of the limb after removal of the tourniquet, skin sutures used, deep vein thrombosis prevention, type of operation and time spent in operating room.

No statistical difference was found between criteria group scores of public and private hospitals. This was not unexpected, as there have been close educational and practice links between these two types of hospitals in the Western Cape. At a 95% certainty level, out-patient hospitals score significantly lower than in-patient hospitals for potential for injury related to patient positioning (all out-patient hospitals scored 0%). At a 90% level of certainty there was also a statistical difference in the total scores between in-patient and out-patient hospitals. Possible reasons for these hospitals recording a minimum of information are; the shortage of time for the peri-operative nurse to record between patients, shortage of staff, and the fact that the documents of out-patient facilities are often locally designed, without the benefit of access to the educational resources available to the larger hospital groups. Of interest is the fact that two of the in-patient hospitals also scored 0% for the criterion, potential for injury related to patient positioning. These are smaller clinics that do not belong to any of the large national groups, have locally developed records and cater for a large number of quick turn-over surgical cases. Statistically they behave in a similar fashion to the out-patient hospitals, possibly for the same reasons.

Figure 2 shows the average result of each hospital across all the criteria groups before and after the adjustment of the criteria. The hospitals were randomly allocated an identity number by the database program, in order to ensure anonymity.

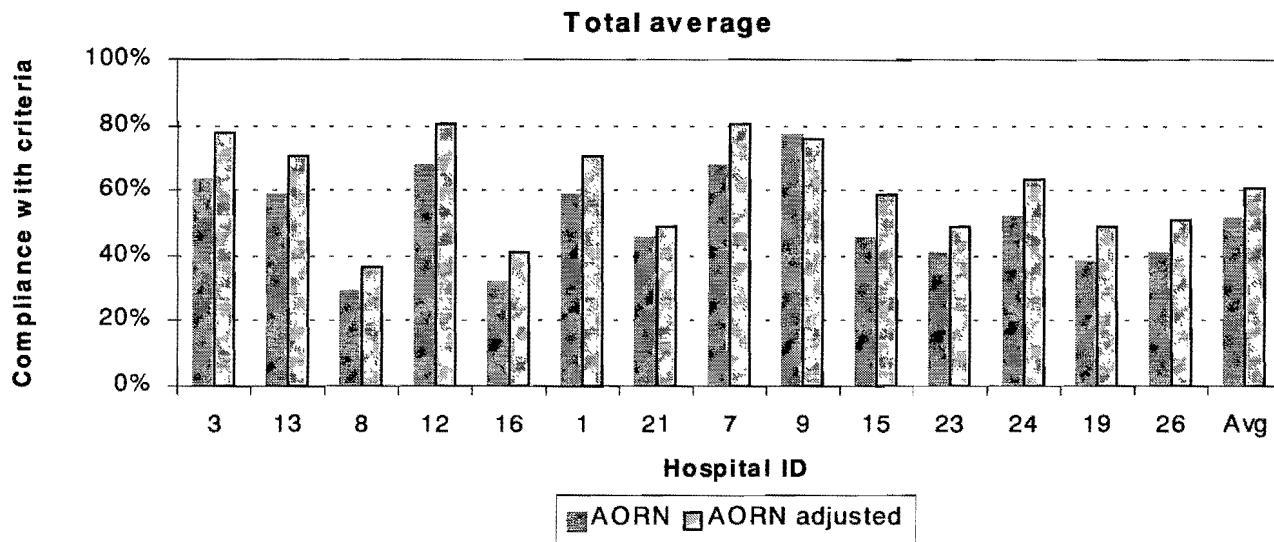


Figure 2. Total average of all the hospitals before and after adjustment of the AORN criteria

It was discovered that the design features of the Western Cape records do not promote accuracy and efficiency, and lack scientific principles in the intra-operative phase. Only half the records assessed use a "tick-the-box" format in their documents and failure to do so may result in wasted time and inconsistent entries. None of the documents assessed use intra-operative care plans, with interventions grouped according to potential problems and expected patient outcomes. This indicates an incomplete use of the 'Nursing Process' and lack of a scientific approach to intra-operative care.

RECOMMENDATIONS

Although the focus of this research was the Western Cape Metropolitan Health Region, six of the hospitals surveyed belong to large hospital groups that use a national document. In addition to this the issues relating to peri-operative nursing practice are common to all hospitals in South Africa. The recommendations arising from this research can therefore be generalised to a wider population of all hospitals in South Africa.

The following recommendations are made towards the formulation of a Western Cape Metropolitan standard for a peri-operative nursing record:

1. The peri-operative record should include care plans for all peri-operative phases; pre-; intra-; and post-operative. These should include; identification of potential or actual problems, expected outcomes, planning and implementation of nursing care, and evaluation.
2. The following data should be included in the peri-operative record:
 - Evidence of preoperative assessment including, physical, emotional and socio-cultural data.
 - Evidence of the pre-operative visit, and intra-operative planning by operating theatre staff.
 - Presence of sensory aids and prosthetic devices.
 - Skin condition prior to surgery including septic foci, existing lesions and potential for breakdown of skin integrity and general skin condition post surgery.
 - Position of the patient during surgery and positioning devices used.
 - Type of electro-surgical unit used (bipolar/monopolar), position of indifferent electrode and skin condition before application and after removal of the indifferent electrode.
 - The type of temperature control device used and position of the temperature probe.
 - The type of lasers used and other special equipment.
 - Position of the tourniquet cuff, times of application and removal of the tourniquet, condition of limb after removal, and the pressure settings used.
 - Intra-operative X-rays and fluoroscopy.
 - Position of monitoring devices, which can be recorded on a body diagram.
 - Administration of blood and blood products as well as medications used should be recorded in the peri-operative record only if the anaesthetic record does not have this information, or is not available to the post-operative caregivers.
 - The type of irrigation solutions.
 - The type of skin preparation solution.
 - The site, type and number of drains and catheters.
 - The number and type of plugs or wound packing and type of dressings.
 - The skin suture material used and the type of sutures inserted.
 - Classification of the surgical wound.
 - Implants used in surgery including radio-active implants.
 - Swab, instrument and needle count including throat pack.

- Data relating to specimen collection.
 - Type of anaesthesia and type of operation.
 - Time spent in operating room.
 - Names, signatures and qualifications of the persons providing care at each stage of the peri-operative period, including hand over at each stage.
 - Critical incidents occurring intra-operatively.
 - Data related to assessment, planning, implementation and evaluation of care given in the recovery room.
3. The design of the peri-operative record should be such that the least amount of time is needed to complete the documentation of comprehensive care. The following design characteristics are recommended, as they will facilitate speed and accuracy.
- A 'tick-the-box' format should be used for as much of the document as is possible. Where this is not possible only short notes should be required.
 - The peri-operative record should be an integrated document including pre-operative assessment, pre-operative preparation, intra-operative nursing care and post-operative evaluation and nursing care, to facilitate communication between the various caregivers.
 - The 'Nursing Process' should provide the foundation for the design of the peri-operative record with nursing interventions grouped according to potential/actual problems and identified patient outcomes in a standardised care plan.
4. There should be a written internal policy regarding peri-operative documentation. The policy should address how, where and what to document. This should be part of a formal orientation programme for all new staff entering the area as well as part of the continuous education of existing staff.

CONCLUSION

The nature of peri-operative nursing and the high-risk environment in which the nurses work make the records that they keep particularly important. Peri-operative nursing documentation contains important communication about the needs of the patient, and the nursing care given to meet these needs. It plays a vital role in risk management and assuring quality care in the operating theatre. More emphasis should be placed on documentation of the intra-operative nursing interventions needed to prevent patient injury in the records used in the Western Cape Metropolitan Health Region.

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DEFINITION OF TERMS

Accreditation: "Accreditation is a standardised program for evaluating health care organisations to ensure a specified level of quality, as defined by a set of industry standards. Organisations that meet accreditation criteria receive an official authorisation of approval of their products and services" (Huntington 1997:1). Accreditation enables the hospitals to become "preferred providers" for some of the managed health care organisations. This means that the patients belonging to these organisations are required to use certain health care facilities and service providers. Failure to use the recommended hospitals or service providers puts payment by the medical aid at risk.

Anaesthetic Record: In South Africa the responsibility for recording the vital signs and medications and intravenous fluids used intra-operatively, rests with the anaesthesiologist and is therefore also responsible for the anaesthetic record. This is not a nursing document but has important information for post-anaesthesia caregivers. Some hospitals supply an anaesthetic record that is carbon copied for the anaesthesiologist's own records.

Continuous Quality Improvement (CQI): A key component of total quality management (TQM), CQI uses rigorous, systematic, organisation-wide processes to achieve ongoing improvement in the quality of products, services and operations, and the elimination of waste. CQI programs focus on both outcome and process of care (Huntington 1997:1).

Electro-surgical unit and electro-surgery: Technical advancements in safety and performance have made the electro-surgical unit the most commonly used electrical equipment in surgery (Hutchisson, Baird and Wagner 1998: 830). The electro-surgical unit consists of a high frequency electrical generator with variable power controls, an active electrode that delivers the current to the surgical site, and a dispersive electrode that returns the current from the patient to the generator. The electrodes are usually disposable. Most modern units also incorporate a smoke extraction facility (Hutchisson et al 1998: 833). Two major types of active electrodes are used; monopolar, requiring a dispersive electrode, and bipolar, where the active electrode directs the current towards and away from the surgical site. Different electrical frequencies and intensities result in either cutting of the tissue, coagulation, or a combination of both called blend (Hutchisson et al 1998: 834).

The electro-surgical unit presents a potential danger to the operators and to the patient. These dangers are; burns, electrical shocks, explosions and fires. Burns to the patient

usually occur at the site of the dispersive electrode when there is an increased resistance to the current at this site. This may be caused by insufficient contact between the patient and the electrode as a result of fluid pooling, defective adhesive or application, excessive hair, or creams applied to the skin. Burns may also occur when the older ground-referenced units are used, at the site of any area where the patient is connected to the earth (Hutchisson et al 1998: 836). This usually occurs at the ECG electrodes but is rare, as most new units are isolated generators. The smoke plume which results from the use of the active electrode on the tissue also presents a danger as 5% of its constituents are composed of solid particles and live viruses have also been isolated (Ulmel 1998: 1244).

Fluoroscopy: Imaging of body structures using a fluoroscope and image intensifier. A fluorescent light reproduces optical images identified by x-rays on to a luminescent screen. These images can be magnified using an image intensifier and are projected onto a television monitor (Atkinson and Fortunato 1996:145). Fluoroscopy is most commonly used in orthopaedic surgery during reduction of fractures.

Joint Commission for Accreditation of Health care Organisations (JCAHO): "JCAHO is a private, non-profit organisation in the USA which functions as the main accrediting body for hospitals and other provider facilities, who pay JCAHO for its services. JCAHO publishes national standards, surveys facilities on request, and awards accreditation to those that demonstrate compliance with the standards. JCAHO accreditation is voluntary, but is required for participation in Medicare. JCAHO now has accreditation standards specific to health care networks and is now accrediting them" (Huntington 1997:2).

Managed care: "Health care systems that integrate the financing and delivery of appropriate health care services to covered individuals by; arrangements with selected providers to furnish a comprehensive set of health care services, explicit standards for selection of the care providers, formal programs for ongoing quality assurance and utilisation review, and significant financial incentives for members to use providers and procedures associated with the plan" (Huntington 1997:2).

Managed health care is a means of controlling the cost to the medical aid organisation. A managed health care organisation usually administers these controls on behalf of several medical aids or medical insurance companies. Managed health care in SA, as in the USA, has been instituted in an attempt to control spiralling costs of private health care and an increase in medical aid/insurance fraud by members and service providers (Tregear 1999:17).

Operating Theatre/Operating Room: The operating theatre refers to the suite of individual operating rooms including, the receiving room, recovery, processing areas and storage. The operating room refers to the individual unit of one surgical area. It may include a scrub room, setting up room and anaesthetic room or these may be shared with adjoining operating rooms.

Peri-operative nursing: Peri-operative nursing is the continuous process of pre-operative preparation and assessment, intra-operative planning and implementation and immediate post-operative evaluation. By recognising the process rather than the surgical event, the patient is treated holistically and nursing care is planned for and implemented scientifically. By calling it peri-operative, the emphasis is shifted from just 'setting up' and 'scrubbing' for cases, to the total care of the surgical patient. It is truly nursing care and not a role that could be performed by a surgical technician without nursing training (Gruendemann and Meeker 1983: 3-8).

"Peri-operative nursing describes a total package of hand and head skills performed by the operating room nurse. It provides a schema whereby operating room nursing is viewed in professional perspective and the nursing process is a pervasive thread" (Gruendemann and Meeker 1983: 3)

The overall objective of peri-operative nursing is to improve the care given to the surgical patient by the operating room team and to ensure a satisfactory outcome for the patient.

" Peri-operative nursing can be described as a specialised science and an art involving patient-nurse interaction through direct patient contact and care, it is not purely technical nor procedure-orientated" (Lombard 1993:31)

Peri-operative nursing record: The peri-operative nursing record consists of the documents used to record nursing care in the surgical patient. It includes:

- The pre-operative assessment and preparation checklist
- Intra-operative record of nursing care
- Immediate post-operative evaluation
- It may also include the recovery room care record.

The trend in the USA is to have an integrated nursing document with the preoperative assessment and checklist combined with the intra operative nursing record. As the post

anaesthesia care unit (called recovery room in South Africa) is considered a separate unit from the operating theatre, their documents are separate. In South Africa many of the private hospitals have followed this trend of an integrated document but also include the recovery room record. The use of an integrated document encourages a holistic approach to peri-operative care especially where the document is designed according to the 'Nursing Process'. This enables total patient care to be viewed simultaneously by the post anaesthesia caregivers in the recovery room and the wards or units.

For the purpose of this study the peri-operative document is confined to:

- The preoperative assessment.
- The preoperative checklist.
- The intra-operative nursing record and immediate post-operative evaluation.

Where these are not presented as an integrated document the admission record usually has the information about preoperative assessment and the preoperative checklist.

Other documents that may accompany the patient to the operating theatre from the ward are:

- Fluid balance charts.
- Observation charts.
- The admission record.
- Nursing progress report.
- Diagnostic investigation results.
- Anaesthetic record.

Peri-operative nursing team:

Scrub nurse:

The scrub nurse in South Africa is usually a registered nurse with training in Operating Theatre Nursing Science or experience in operating room nursing.

The duties of the scrub nurse are:

- Assess and plan for individual needs of each patient during the intra-operative period. This is achieved by identifying potential problems and planning care to accomplish the required outcome for the patient.
- Prepare the operating room for the patient.
- Set up and control the sterile surgical supplies.
- Supervise the care of the patient during surgery, e.g. positioning, application of tourniquet etc.
- Assist the surgeon during the surgical procedure.
- Control instruments, swabs and sharps during the surgical procedure and institute counts when appropriate.
- Record care given to the patient and control of hazards.
- Communicate the details of care of the patient to the recovery room staff.
- Supervision of the circulating nurse and the anaesthetic nurse.

Circulating nurse:

The circulating nurse is also referred to as the floor nurse. In some hospitals the circulating nurse may be a registered nurse but in most instances in South Africa this member of the surgical team is an enrolled nurse or enrolled nursing auxiliary. The duties of the circulating nurse are carried out under the supervision of a registered nurse and are:

- Prepare the environment for the patient, taking into account the individual needs of each patient.
- Assist the scrub nurse to set up the sterile supplies.
- Gown the sterile team.
- Assist with positioning the patient.

- Set up and operate any special equipment needed for the surgery, e.g. tourniquet or camera.
- Assist the sterile team by supplying sterile items for use in the sterile field.
- Count and control swabs, instruments and needles with the scrub nurse.
- Complete the peri-operative record.
- Assist with the transfer of the patient to the trolley or bed.
- Clear away used items at the end of the operation and clean the operating room in preparation for the next patient.

Anaesthetic nurse:

The duties of the anaesthetic nurse are:

- Prepare for the anaesthetic according to the needs of the patient and type of surgery.
- Check the anaesthetic equipment and supplies.
- Assist the anaesthesiologist during anaesthetic induction and emergence
- Fetch drugs, intravenous fluids and other supplies needed during maintenance of anaesthesia.
- Assist the sterile scrub team and circulating nurse when necessary.
- Assist with the transfer of the patient to the trolley or bed.
- Prepare for the next patient and make sure the patient is sent for at the correct time.

Peri-operative record-keeping: Peri-operative record-keeping is carried out by a number of nurses along the process of peri-operative care. The ward nurse admitting the patient records preoperative assessment. Since these nurses usually do not have operating theatre experience they rely on the documents to ask the appropriate questions. It is difficult for them to formulate individualised intra-operative care plans for the patient, as they usually do not have insight into the risks involved in intra-operative care. The operating theatre nurse may perform a further pre-operative assessment during a preoperative visit. This nurse can compile a care plan for intra-operative care by identifying potential intra-operative problems and the individual needs of the patient.

Intra-operative care is recorded by the circulating nurse, anaesthetic nurse and the scrub nurse. The circulating nurse records the bulk of the information on behalf of the scrub nurse, who checks, completes, and signs the document. The scrub nurse or registered nurse is ultimately responsible for the accuracy of the peri-operative document.

Preferred Provider Organisation: "An arrangement whereby a third-party payer contracts with a group of "preferred" medical care providers who furnish services at lower than usual fees in return for prompt payment and access to a certain volume of patients" (Huntington 1997:3).

Recovery room: The recovery room in South Africa is located within the operating theatre complex. In many hospitals it is staffed by registered nurses with either critical care training or experience, as it is recognised as a high-risk area. In all but the smaller clinics there are dedicated recovery room staff, but scrub personnel are required to attend to patients in recovery after hours. For this reason it is included as an area of rotation for the Diploma of Operating Theatre Nursing Science and 6 month Certificate of Operating Theatre Nursing Science. Also many hospitals require their scrub personnel to rotate through the recovery room during orientation. This assists the staff to understand the importance of continuous care and teaches them to give appropriate hand over to the recovery room staff.

The American Association of Peri-anaesthesia Nurses (ASPN) identifies three categories of patients in the post anaesthesia phase dependent on the complexity of care needed. In the USA, post anaesthesia unit (PACU) all three categories of patient are catered for. In South Africa however, the class one patient, requiring assisted ventilation highly technical monitoring and hourly blood gases, is nursed in the intensive care unit and is transferred directly after completion of the surgery (Smith 1992:8,9).

Risk management: A comprehensive program of activities to identify, evaluate, and take corrective action against risks that may lead to patient or employee injury, and property loss or damage with resulting financial loss or legal liability (Huntington 1997:3)

Turn around time: The time that elapses between the completion of one surgical case and the commencement of anaesthetic induction of the next patient.

Utilisation review: "A mechanism used by some medical aid companies and employers to evaluate health care on the basis of appropriateness, necessity, and quality. For hospital review, it can include pre-admission certification, concurrent review with discharge planning and retrospective review" (Huntington 1997: 3).

1 INTRODUCTION

The motivation for this research arises from an interest in the development of the peri-operative nursing records, as observed during practice in the field of operating theatre nursing over the past seventeen years. Peri-operative records have developed in response to risk management incidents and to adapt to changes in nursing practice and technology. The quality of peri-operative nursing records used in the Western Cape was questioned in relation to a recognised recommended standard and to each other.

1.1 BACKGROUND

In order to understand peri-operative record-keeping and the problems encountered by operating theatre nurses, it is necessary to describe the context of peri-operative nursing practice in South Africa.

1.1.1 Peri-operative nursing practice in South Africa

The situation in most South African operating theatres differs slightly from practice in the United States of America (USA) and the United Kingdom (UK). In South Africa, a nursing team consisting of scrub nurse, circulating nurse, and anaesthetic nurse, staff each operating room. In most instances, these three nursing staff members are responsible for completion of an entire operating list, and the scrub nurse would scrub for all the cases on the list. The registered nurse is almost always the scrub nurse, and the anaesthetic nurse and circulator are either enrolled nurses or enrolled nursing auxiliaries. In rare cases there may be more than one registered nurse, enabling them to alternate the scrub and circulating roles. The registered nurse in the scrub role may be qualified with a Diploma or Certificate in Operating Theatre Nursing Science, or may have received preceptor training for this position. In some hospitals there may be a registered nurse supervising the anaesthetic nurses and this person usually has training in Intensive Nursing Science.

The registered nurse is fully responsible for the planning and implementation of patient care, even though she is a member of the sterile team and does not have direct access to the patient for hands on care. For instance, this nurse is accountable for the positioning of the patient and the maintenance of skin integrity even though another member of the team usually positions the patient. The circulating nurse performs nursing interventions under supervision of the scrub nurse and documents patient care. The scrub nurse, on completion of the surgery, checks the entries in the peri-operative record and after immediate post-operative evaluation of the patient, completes the documentation and then signs the record.

As time is limited it is important that the documentation can be completed quickly without compromising accuracy or reducing the comprehensive nature of the record.

In the USA the circulating nurse is a registered nurse and the scrub personnel may either be a registered nurse or a surgical technologist, with specialised training in this field. The technologist does not have any nursing training and is responsible to the registered nurse (Atkinson and Fortunato 1996:84). The fact that the circulating nurse is registered, means that this nurse is able to take full responsibility for patient care and has direct access to the patient for nursing interventions such as positioning or application of a tourniquet, etc (Atkinson and Fortunato 1996:76). In the United Kingdom the situation is similar to South Africa in that the scrub nurse is a registered nurse. The circulating nurse is usually also a registered nurse and Operating Department Assistants (ODA) are employed to work as assistants to the anaesthetist. According to Power (1993:72) the numbers of ODAs have increased recently and they are moving into the scrub role in some hospitals.

The number of unregistered or unlicensed personnel working in the operating theatres in the USA, UK and South Africa has increased over the past few years. This has occurred as a result of the introduction of managed health care, reduced budgets and shortage of theatre trained personnel (Abott 1994:382, Ponder 1994:459, James 1996:11, Shaw 1997:44). In many nursing schools in the USA and the UK, experience in the operating theatre has been reduced or taken off the curriculum for basic nursing training (Gray 1997:771, Beitz and Houck 1997:119). As a result the numbers of nurses entering post basic training in operating theatre nursing has decreased (Power 1993:72).

The number of nurses entering the Operating Theatre as a post basic speciality in South Africa has been affected by several factors. Firstly, Nursing Colleges in the Western Cape suspended the training of nurses in the Diploma of Operating Theatre Nursing Science in 1998. At least two of the private hospital groups in the Western Cape now offer this course independently of the public sector but the number of nurses that they are able to train annually, does not make up for the loss of the public sector training. Of the 90 000 nurses registered in South Africa only 11 500 have specialist qualifications and only a small number of these are qualified in Operating Theatre Nursing Science (Krost 2000:2).

In addition to reduced recruitment to the operating theatre, the number of registered nurses working in the operating theatre has come under pressure from other influences. The private health care system in South Africa has adopted the USA style of managed health care, which has put pressure on the staffing budgets in private hospitals. Managed health care

organisations have also employed operating theatre trained nursing staff to work as utilisation reviewers, in order to assist in assessment of claims. This has taken specialised nurses away from the areas where they are most needed.

Rationalisation of the public health services has led to the freezing of nursing posts in the public sector. To make matters worse, an increasing number of registered nurses with post basic qualifications are leaving the country annually to work in foreign countries. In 1999, 3300 nurses left the country, a large number of them specialist trained, and many will not return. This represents 3.6% of the total population of registered nurses in South Africa. Training of registered nurses cannot keep up with this loss to other countries. According to the Deputy Director of Gauteng Nursing Education, her province would have to train 900 new nurses a year to meet the needs of the province and in 2000 there are only 320 registered nurses qualifying (Krost 2000:2). This means that the pool of registered nurses from which to draw and train staff for the operating theatre is diminishing.

The shortage of theatre trained nursing staff, and the changing skill mix in the operating theatre, makes it difficult for the remaining registered nurses to maintain standards with the limited resources available. One method of assessing that standards are maintained is by auditing the nursing care as documented by the peri-operative nurse.

1.1.2 Development of peri-operative nursing records in South Africa

Peri-operative nursing records have developed in response to changes in nursing practice, advances in technology, risk management strategies, and as a result of influences from managed health care and regulatory boards. As changes occurred and problems arose leading to legal intervention, new content criteria were added to the peri-operative nursing records (Hubbard 1988:32, Lombard 1993:31, Treager 1999:17). In the private hospital groups in the Western Cape, development of the design of peri-operative documents has occurred independently in each hospital group. The nursing records are either designed centrally at the head office of the organisation concerned, or locally by the individual hospitals. The latter is usually a collaborative effort between operating theatre nursing staff and the nursing management. The individual needs and philosophy of the organisation concerned, as well as the type of surgical facility, has an influence on the content and design of the peri-operative nursing record. This has led to a number of different designs and approaches with no efforts to standardise across all the hospitals. Some of the larger private hospital groups as well as the public sector and military hospitals have standardised their records nationally or regionally within their own organisations. Unfortunately, there is no

evidence of published literature about the development of peri-operative records in South Africa. This is therefore an area for possible future research.

1.2 STATEMENT OF THE PROBLEM

As previously discussed, peri-operative nurses face many difficulties in their daily nursing practice that have a direct influence on peri-operative record-keeping.

Shortage of nursing staff, for the reasons previously discussed, and increased workload, has put severe time constraints on the registered nurse in the operating theatre. The registered nurse in the operating theatre, faces the difficult situation of balancing limited time available with the need to comprehensively document the nursing care given, and the risk management practised during the intra-operative phase. The patient in the operating room is particularly vulnerable to injury, as general anaesthesia removes natural protective reflexes and interferes with homeostasis. The registered nurse assumes the role of advocate for the patient to protect and care for the patient's health, safety and dignity (Marshall 1994:11). It is therefore important that any care given is comprehensively recorded without delaying the progression of the operating lists.

Not only is a comprehensive record of nursing care important with regard to patient care, it is also vital as protection for the nurse, especially in cases where there is litigation (Castledine 1998:172). The number of patient complaints is increasing, as patients become more aware of their rights (Kelbrick 1991:16). Nurses in the operating theatre needs to ensure their own safety as well as that of the patient. Only nursing care that is documented is considered admissible as evidence in a legal investigation (Morrissey-Ross 1988:364, Barnard 1988:24, Groah and Reed 1983:1174).

As discussed previously, the reduction in staffing budgets as a result of rationalisation of services in the public health sector, and the introduction of managed health care in the private sector has put pressure on the number of registered nurses employed in the operating theatre. The existence of the registered nurse in the operating theatre may be under threat as it could be more economical to train and employ scrub technicians in the scrub role and use unregistered nurses in the circulating role (Nel 1997:49, Power 1993:72). Documentation is a means of demonstrating the important role the registered nurse plays in the operating theatre. Documentation combined with risk management concerns can prove that the registered nurse has an essential role in the operating theatre. If presented in

financial terms, such as prevention of costly litigation, or prevention of infection or injury to the patient it may have more weight with non-nursing management and hospital administrators (Heartfield 1996: 102).

As a direct result of the shortage of personnel, and reduced budgets, temporary nursing staff from nursing agencies are used more frequently in South African operating theatres. This allows more staffing flexibility, as a core number of nursing staff is employed permanently and agency nurses employed when the workload increases beyond the capability of these permanent nursing staff. The movement of nursing staff between hospitals, and use of different peri-operative documents could cause confusion and impair the accuracy of record-keeping. A standardised approach to peri-operative nursing records may alleviate this problem.

The previous discussion highlights the importance of ensuring that peri-operative nursing records are easy to understand, quick to use, promote accuracy of the entries and improve communication between all care givers in the peri-operative period. Recommended guidelines for the content and design of peri-operative nursing records, which can be applied in all types of surgical settings, are therefore needed. These recommendations should be the minimum standard to ensure patient safety.

1.3 PURPOSE OF THE STUDY

The purpose of this study is to review the peri-operative records currently in use in the Western Cape Metropolitan Health Region and compare the content criteria with an established international standard for peri-operative documentation. The object of this is to make recommendations for the future design and content of the South African documents. A recommended standard or guideline is needed, as those recommended by the South African Theatre Sisters Association do not cover all aspects of peri-operative nursing care (SATS 1999). Applicability of this research extends beyond the Western Cape Metropolitan Health Region. Five of the private hospitals in the sample group and one public hospital (Military) have national peri-operative records. These account for a large number of the hospitals in South Africa outside of those administered by the provincial administrations. The recommendations of this research are therefore applicable to South Africa.

1.4 OBJECTIVES

The objectives of this research are:

- To review the peri-operative nursing records currently in use in the Western Cape Metropolitan Health Region and identify their design and content characteristics.
- To compare the content characteristics of the documents in use, with established international criteria.
- To make recommendations on the content and design of future peri-operative records in the Western Cape.

1.5 LIMITATIONS

The following limitations are identified in this research:

- The research is confined to review of the design and content of peri-operative nursing records and does not explore the way in which the peri-operative nurses used the documents. The users of these documents could have been included, to determine if there is a discrepancy between apparent usage, as evident by the design of the document, and actual use. For example the nurses may be routinely recording information that is not requested by the peri-operative record. This is not taken into consideration in this research as only information elicited by the documents is considered.
- In order for a holistic approach to peri-operative nursing to be reflected in the documents it is important that the care of the patient in the recovery room is included in a standard for peri-operative documentation. The AORN standard includes pre-operative assessment, intra-operative nursing care, and immediate post-operative assessment prior to hand-over to the post-anaesthesia caregivers. The documentation of care given in the recovery room is therefore excluded from their standard. A model for the content criteria needed in the recovery room section would have to be sought elsewhere. Possible models are the recommendations by SATS and the standards for documentation recommended by the American Society of Post Anaesthesia Nurses. The recovery room section was not included in this research, as a consequence of the deficiency in the AORN standard as well as the fact that it would have made the research too extensive. In addition to this, in most of the hospitals surveyed the nursing staff working in the recovery room and those working in the operating theatre do not overlap their functions. This may

not be true in all hospitals beyond the sample group as in the smaller outlying clinics and district hospitals, the scrub nurses usually perform a dual role and also recover the patient. However, in order to make comprehensive recommendations for a South African standard for peri-operative nursing documentation, the recovery room care must also be included.

- A limitation in the method is the narrow range of assessment of the content criteria, with only a yes/no measurement used in the measuring instrument. This is identified as a potential problem in the method, which is overcome by discussing each criterion in detail in the discussion of the findings. The small size of the sample group allows descriptive breakdown of the results of each criterion, which may not have been possible with a larger sample. An alternative measurement for each criterion could have been a Likert scale, or summated rating scale, giving a range of scores for each criterion (Polit, Hungler 1993:209).
- The fact that the peri-operative records reviewed are only those used in the Western Cape Metropolitan Health Region may be perceived as a limitation. This is however of no great concern as the results of 42% of the hospitals surveyed are applicable nationally. These hospitals have a common peri-operative record used by all their hospitals. This includes private hospital groups as well as the military hospital. The results of one of the public hospitals is also applicable to all hospitals administered by the Provincial Administration of the Western Cape but the limitation comes in applicability to public hospitals outside this province. The applicability of the results therefore extends beyond the Western Cape Metropolitan Health Region.

1.6 RESEARCH PLAN

Figure 1.1 shows the research plan that was developed in order to achieve the stated purpose and objectives of this research. Key aspects of the plan are an extensive review of the available literature on peri-operative documentation and identification of a model to be used as a basis for the measuring instrument.

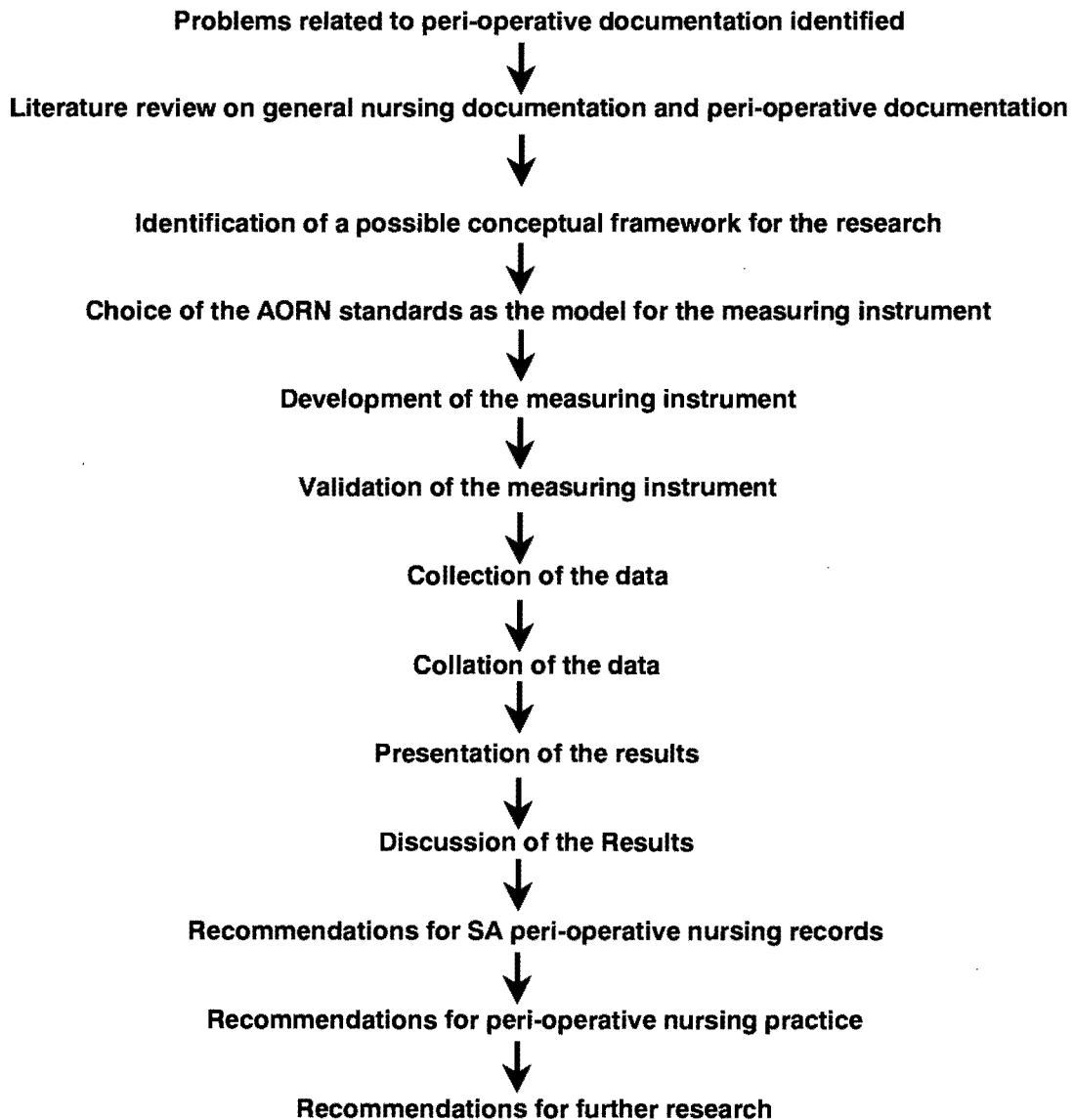


Figure 1.1. Overall research plan

2 REVIEW OF THE LITERATURE

2.1 INTRODUCTION

A review of the literature related to general nursing documentation and peri-operative documentation was carried out, with consultation of various databases, libraries and experts in South Africa and abroad. The databases used were; Medline, CINAHL, the Cochrane library and the World Wide Web. In order that peri-operative documentation practices could be understood holistically, the broad context within which current documentation practices occur was reviewed. The review therefore includes a broad history of the development of general nursing documentation and the various purposes of nursing documentation before focussing on peri-operative documentation. A review was carried out of the research and development of peri-operative documentation from literature in the USA, United Kingdom (UK), Canada and Australia, as there was no evidence of South African literature on the development of peri-operative records. The recommended standards for peri-operative documents in various countries were also examined to find a conceptual framework for the study. The setting of standards was only briefly discussed, as this is a large topic in itself.

2.2 HISTORY OF NURSING DOCUMENTATION

The history of nursing documentation reflects the history of the development of nursing from the practice, political and technological points of view. As nursing theories were developed, new technology implemented, and the role of the nurse changed, the nursing record or documentation has been adapted to reflect these changes.

Initially documentation was only used to communicate the doctors' orders and not to communicate the nurse's observations of patient status. These observations made by the nursing staff were communicated verbally to the medical staff. In the 1930s in America, the nursing theorist Virginia Henderson, encouraged the writing of care plans to communicate nursing care (Iyer, Hand and Camp 1991:1).

2.2.1 The 'Nursing Process'

The concept of nursing as a process, rather than a set of separate tasks started to emerge in the United States of America in the 1950s. Lydia Hall first referred to the process of nursing in a lecture entitled, "The quality of nursing care", given before a meeting of the Baccalaureate and Higher Degree Programs of the New Jersey League for Nursing (de la Cuesta 1983:366). Orlando later described an approach to the 'Nursing Process' in detail.

"Orlando's theory discusses the uniqueness of nursing from a process rather than a function orientation. Thus, the nurse ascertains the patient's needs, determines appropriate actions to meet them and sees that these actions are implemented" (Disbrow and Orlando 1980:124).

2.2.1.1 Origin of the 'Nursing Process'

The 'Nursing Process' has its roots in General Systems Theory initially introduced by Ludwig Von Bertalanffy in the 1930s. General Systems Theory became the basis for scientific enquiry in the 1950's and 1960's (Mason and Attree 1997:1045). Nursing theorists adopted the scientific principles described in Systems Theory and applied them to nursing. The holistic, scientific, patient centred approach of the 'Nursing Process' appealed to nurses who were at the time dissatisfied with a task-oriented approach to nursing and were seeking recognition of their professional status (Allen 1998:1224, de la Cuesta 1983:367)

"The nursing process presupposes patient rather than task-assignment and some written plan of care that informs all health providers who collaborate with each other, the client and the family in implementing the care" (Henderson 1982:105).

2.2.1.2 Steps of the 'Nursing Process'

The Nursing Theories Conference Group (1980:13) describes the five steps of the 'Nursing Process' as; assessment, nursing diagnosis, planning, implementation and evaluation. They also advocate a further step in the process, reassessment, which should take place at every stage of the process. Assessment enables the nurse to identify the individual needs of the patient and to compile a care plan. Evaluation of the implementation of the plan is essential to establish whether the outcomes and goals have been met. All stages of the 'Nursing Process' should be recorded in the nursing documentation.

2.2.1.3 From teaching tool to method of documentation

Initially, the 'Nursing Process' was viewed as a teaching tool as the majority of nurses developing the 'Nursing Process' were from the educational sector. It was a useful problem-solving approach to nursing education. In the early 1970s it was introduced in the USA to clinical practice and by 1977 it was implemented at hospital level in the United Kingdom and included in the training syllabus. (De la Cuesta 1983:367, Allen 1998:1224). Rather than just a theory of nursing, or a problem-solving educational tool, it was now also seen as a method of documenting nursing care. In fact, nurses often regard the 'Nursing Process' as the document itself and not a scientific approach to clinical decision-making. Henderson

(1982:103) questions the usage of the title and criticises the over-emphasis of the scientific aspect of nursing at the expense of nursing as an intuitive art.

2.2.1.4 Regulation of nursing documentation introduced

In 1951 the American Joint Commission for accreditation of health care organisations (JCAHO), the body in the USA that legally certifies hospital services, established standards for nursing documentation. Other similar organisations followed their example around the world (Iyer, Hand and Camp 1991:1).

In the 1970s JCAHO made the preparation of care plans a prerequisite for accreditation of nursing services. This ensured the complete implementation of documentation of the 'Nursing Process' into nursing practice in the USA (De la Cuesta 1983:367).

2.2.1.5 The 'Nursing Process' in South African operating theatre literature

South Africa adopted the 'Nursing Process' into clinical practice in the late seventies. In 1981 the South African Nursing Council refers to the "scientific approach to nursing" and states it to be synonymous with the 'Nursing Process' (SANC 1981:33). Some areas of nursing were slower to implement the 'Nursing Process' and the operating theatre was one of these areas.

The 'Nursing Process' was first mentioned in South African operating theatre literature in June 1983 by Paverd (1983:47-51) and Auchterlonie (1983:38-42). Both stressed the importance of assessment of the patient in order to plan for individualised intra-operative care. Hubbard (1988:31) expressed concerns that operating room nurses have very little prior knowledge of their patients unless they visit and assess the patient pre-operatively. Without a pre-operative visit to the patient in the ward it is impossible for the peri-operative nurse to plan correctly and there is a risk that the nurse is doing no more than assisting the doctors to fulfil their roles. It is questionable whether this is nursing. A purely technical, task oriented role can easily be carried out by non-nursing personnel. It is essential that the nurse in the operating room systematically plans for, and provides care to ensure a safe environment for the patient.

2.2.1.6 Concerns about the use of the 'Nursing Process'

Since the 70's the importance of nursing records has increased and nursing documentation now has a more scientific foundation. Nurse educators, nursing theorists and nurses in

clinical practice have however expressed concern about the use and usefulness of the 'Nursing Process' in practice. Recent research has given further credence to these concerns. Allen (1998:1223-1230) found that the nurses held conflicting attitudes towards the 'Nursing Process' as the foundation for documentation. On the one hand it was valued as a symbol of professionalism while on the other, the nurses found it difficult to implement the written 'Nursing Process' with reduced staff and increased patient turn-over. Mason (1999:380-387) showed that care plans had no apparent positive influence on nursing practice. She suggests that new and imaginative plans of action for patient care should be encouraged and that these should be clinically led, and not confined by the use of a nursing model or by management requirements.

Fonteyn and Cooper (1994: 315) suggest that the problem-solving processes used by nurses in the clinical areas are still poorly understood and have been inadequately researched. Nurses at all levels use a variety of different problem-solving styles and may be inhibited by the need to work within the constraints of one model. Benner and Tanner (1987:23) found that expert nurses are less likely to use a purely analytical process in problem-solving and rather rely on an intuitive grasp of the whole situation. This is re-emphasised in research on clinical decision making by peri-operative nurses conducted by Parker, Minick and Kee (1999:45) They concluded that expert peri-operative nurses make decisions based on their assessment of the "big picture" from a foundation of caring and experience. Decisions in crisis situations especially, are often instinctive, based on the experience of the nurse and do not follow a set problem-solving approach. Documentation according to a rigid problem solving approach is therefore not compatible with the expert nurse's decision making process.

In the USA, from 1986 to 1988, JCAHO noticed a rise in non-compliance with their requirement for written nursing care plans. This was accompanied by a rise in the use of standardised care plans and protocols. In 1991 JCAHO no longer required a written care plan as one of their standards for documentation. This has led to speculation that the written, individualised, nursing care plan will disappear from nursing records (Bridger 1991:35). Some nurses in the USA feel that nursing educators will now find it increasingly difficult to justify the writing of long elaborate plans of care to their students (Fonteyn and Cooper 1994:317). Interestingly, the Council for Health Service Accreditation in South Africa, the local equivalent of JCAHO founded in 1995, does not require the writing of care plans (Whitaker 1997:44, COHSASA 1996:13.14–13.24). Peri-operative documents published in USA nursing literature after 1991 still include nursing care plans, but are much less detailed than those in documents published before 1991. The care plans are standardised with the option of adding

individual needs (Lunow and Jung 1993:1173, Palmerini 1996:240). This is an indication that the peri-operative nurses in the USA still value care planning as part of their practice. The use of care plans in the peri-operative setting will be discussed in more detail later in this chapter.

2.2.2 New trends in nursing documentation

New methods of recording nursing care are emerging that may well replace the written 'Nursing Process' and care plans as the dominant modality. Critical, clinical or care pathways are one new method that is finding favour in both the UK and the USA. Critical pathways are a day-by-day chronological summary of the multidisciplinary care needed for any given diagnosis or treatment. The goal is to consolidate all the separate pieces of paper currently used into one pathway. The nurse then uses progress notes to document deviations from the pathway described (Bridger 1991:37, Currie and Harvey 1998: 35,36). Ibarra, Iaffoon, Snyder, Gambrell and Olson (1997:97) described the use of clinical pathways as a tool for case managers in acute care settings like the operating theatre. "By creating tangible definitions of quality in the peri-operative setting, clinical pathways improve patient care and assure clinical consistency of care" (Snyder et al 1997:97).

Multidisciplinary care plans, like clinical pathways, case management models, practice guidelines and critical pathways, have become widespread in the UK. They enhance communication between all members of the health care team (Castledine 1998:172, Haigh and O'Connell 1996:32).

Another method of documentation gaining popularity is the system of "charting by exception" developed by a group of nurses at Milwaukee's St Luke's Hospital. A flow sheet of "normals" or expected assessment and intervention outcomes is designed so that the nurse only has to tick these as they occur and only the exceptions are written in long-hand (Rider 1991:37).

Computers have prompted a shift towards standard care plans and care pathways. The reduced number of qualified nurses in the clinical areas has assisted in accelerating this development. Software packages are in use in many USA hospitals that eliminate the need for hand written nursing notes entirely (Bridger 1991:38). Standardised nursing care plans are now available at several sites on the Internet. One such site is the USA, National Institute of Health, Clinical Centre site (<http://www.cc.nih.gov/nursing/standards.html>: 23/5/99).

Unfortunately, computer hardware and specialised nursing related software is expensive and probably out of the reach of many South African hospitals at the moment. We can however anticipate a trend towards increased use of computers for nursing documentation in the future.

Experience has shown that the operating theatre has usually adopted new methods of documentation after they have been implemented in other units. However irrespective of the new systems adopted in the future, it is vitally important that the system is compatible with the working environment of the operating theatre, taking into account the special needs of the patient and the nurse.

2.3 THE PURPOSE OF NURSING DOCUMENTATION

Documentation of patient care is a routine part of the daily work of nurses. It is seen by some nurses as written evidence of nursing interventions and by others as a misrepresentation of actual nursing care and a waste of valuable time that could be spent with the patient (Heartfield 1996:98, Iyer, Hand and Camp 1991:1). Nursing documentation has several different functions as discussed in the following sections.

2.3.1 A record of care given

The primary function of nursing documentation is to record the care given by the nurse to the patient in response to the individual's needs. Nursing documentation is a way of communicating information about a patient to all the members of the health care team (Iyer, Hand and Camp 1991:1). Nurses are however, among the only health professionals who are required to document every step of their decision-making process as they currently do, using the steps of the 'Nursing Process' (Castledine 1998:172)

In order for the nursing documents to fulfil all their functions they need to be designed correctly with the outcome or purpose of the document taken into account. Iyer, Hand and Camp (1991:2) list the following desired documentation outcomes:

- The chart is legally sound.
- The chart reflects the 'Nursing Process'.
- The chart reflects the patient's ongoing status from shift to shift.
- Forms are designed to avoid duplication of information.
- The plan of care and chart complement each other.

- The documentation system is designed to facilitate retrieval of information for quality assurance monitoring and research.

As well as recording the process of nursing care, nursing documents also play an important role in:

- Legal protection of the nurse and patient.
- Risk Management.
- Qualitative management.
- Control of budgets.

2.3.2 Legal protection of the nurse and the patient

We live in an increasingly litigious society. Patients have become more aware of their rights with regard to medical treatment and nursing care and are more likely to take legal action in the event of problems arising (Kelbrick 1991:16). Unfortunately, nurses have largely viewed keeping records of nursing care as a necessary evil taking up precious time that could be spent with patients (Heartfield 1996:98).

It is vital that nurses acknowledge the importance of documenting all care given as well as the patient's response to that care. In cases of litigation, the nursing notes are used in the courts as evidence of the quality and type of care given. A well kept, accurate nursing record can protect the nurse in assertions of malpractice or negligence (Castledine 1998:172). Care that is not recorded, is not considered to have been performed (Morrissey-Ross 1988:364). Insufficient or inaccurate documentation leaves the nurse vulnerable to the charge that he or she was either not aware of the incident, or did not take the appropriate steps to correct or report the situation. A gap in the record is more likely to cause legal difficulties than a straightforward, honest account of events (Barnard 1988: 24, Groah and Reed 1983:1174).

2.3.3 Risk Management

Nursing documentation plays an important role in identification and management of risk or danger to the patient. By reviewing incident reports and nursing notes, it is possible to establish patterns, identify high-risk areas and determine what steps might be taken to improve patient safety.

"Risk management actions generally include: a revision of policies, procedures and clinical standards; assessment of systems effectiveness and efficiency; and creation of training or education programs" (Ryan 1993: 2).

The operating theatre is a high-risk area for the patient who is at his most vulnerable. It is vitally important that the hazards that the patient encounters are recorded, as well as the patient's physical reaction to these, and the steps taken to prevent patient injury (Atkinson, Fortunato 1996:157).

2.3.4 Continuous Quality management and maintenance of nursing care standards

Nursing records are also used in continuous quality management as an internal measure of standards. Internal audits of nursing documents, on a regular basis, ensure that nursing standards and the standards for documentation are maintained. The nursing audit is also an important part of ensuring that patient care outcome standards are met. The nursing audit is defined as *"examining what we are doing with the aim of making improvements in the quality of care of patients"* (Meurier 1998:140).

Nursing documentation is becoming increasingly important as the main source of information for the measurement and improvement of quality nursing care. In order to be useful in this role, the documents must be based on scientific principles, fulfil their purpose in nursing and comply with criteria that would make them legally admissible as evidence in court (Barnard 1988:35).

Many hospitals in South Africa have instituted continuous quality management programs in all departments, including the operating theatre. Unfortunately, there does not seem to be any research published about the process of quality management in South African operating theatres. Hopefully, this will be remedied in the near future. Examples of using the peri-operative documents for quality management were found in the UK and USA literature. Cormack (1996:10) describes an audit of the pre-operative patient checklist and hand over by the ward to the receiving nurse in the operating theatre. Spinks (1996:32) stresses the fact that the operating theatre will always be an area of high risk for the patient. An audit of the nursing records can help to identify the risk areas in the operating theatre department. As an example, audits of the peri-operative records used in the operating theatre at Norwalk Hospital Connecticut were conducted on surgical counts, aseptic technique, and whether or not patients received post-operative instructions (Larkin 1990:462).

2.3.5 Control of budgets and patient costs

Nursing documentation can be useful in the control of health care costs to the patient. With the advent of managed health care in South Africa in 1996, many health care facilities have employed nursing staff as utilisation review officers.

The function of the utilisation review nurse (UR nurse) is to examine the nursing records of patients belonging to the managed health care organisations and to compare these with the costs billed to the patient. The UR nurse also advises nursing and medical staff on cost containment, especially with regard to investigative procedures. The patients' notes, especially the nursing records are audited in order to obtain proof of the need for expensive interventions and investigations. Accurate documentation of admission diagnoses and operative procedures are vital as these determine payment by the medical aid or insurance. All diagnoses and treatments are coded and only a pre-determined amount for the recorded diagnosis will be paid by the medical aid or insurance company involved. An inaccurate diagnosis or record of treatment could result in considerable cost to the patient or loss to the hospital (Huntington 1997:3, Tregear 1999:17). This has serious implications for the operating theatre, as in South Africa it is usually the peri-operative nurse who records the type of surgical procedure performed.

2.4 SETTING STANDARDS

The purpose of this research is to make recommendations for a local standard for peri-operative nursing records. In order to do this, the process of developing standards needs to be examined and current standards and published research on the development of peri-operative records evaluated.

2.4.1 Definition of a standard

A standard is defined by the Oxford English Dictionary (1989:1250) as an; *"expected or accepted level of quality, specified level of proficiency, thing used as a test or measure for weights, lengths, quality, purity etc"*.

The Royal College of Nursing in their 1986 document, "Checklist on how to write standards of nursing care", define a standard as, *"a professionally agreed level of performance appropriate to the population addressed, which is observable, achievable, measurable and desirable"* (cited by Kemp, Richardson 1993:31).

2.4.2 Types of standards

Standards of nursing care may either be minimum requirements to ensure patient safety, such as those laid down by regulatory bodies, or may be the goal or a level of excellence in nursing practice (Mitchell 1994:292, Dean-Barr 1994:316). Standards can be classified as regulatory; as mandated by a regulatory body, voluntary; as developed by health care practitioners, or involuntary; such as those defined by managed health organisations or insurance companies (Beyea, Nicholl 1999:1)

The American Nurses Association (ANA) has reclassified standards into two major groups. These are standards of care and standards of professional performance. Standards of care are described as "*a competent level of care as demonstrated by the 'Nursing Process' involving assessment, diagnosis, outcome identification, planning, implementation and evaluation*" (Dean-Barr 1994:317). Standards of professional performance describe "*a competent level of behaviour in the professional role including, activities relating to quality of care, performance appraisal, collegiality, ethics, collaboration, research and resource utilisation*" (Dean-Barr 1994:317).

2.4.3 The process of developing standards

The development of standards is an important first step towards assuring quality nursing care. This is followed by application of the standard to nursing practice providing a means of determining the quality of care and ensuring accountability of the nurse (Dean-Barr 1994:316). Clinical practice standards define what the reasonable nurse would do in similar or the same situation and should be developed after a process of investigation of current practices and recent research (Beyea and Nicholl:1).

In developing standards, there may be a conflict between what is desirable and what is realistic given the available resources. As a result of this, certain factors need to be taken into consideration when setting standards. The standard should be; measurable, achievable and appropriate to the population to which it will be applied. The meaning should be unambiguous, leaving no room for doubt and should not conflict with professional ethics, policy and procedure or offend in any way (Kemp, Richardson 1993:33). Standards should be set only after the following:

- An interdisciplinary review of current needs, practices, guidelines and principles of care.
- An extensive review of the literature and published research.

- Examination of the proposed standard by nursing experts, clinicians and all affected parties (Beyea and Nicholl 1998:1).

There are many different models for writing standards of practice. One model based on the ANA's approach to quality management divides the standard into structure, process and outcome. Structure refers to factors in the organisation that enable the nurse to function, such as equipment, staffing, management and educational facilities. Process standards are the nursing care given to the patient, and outcome standards are the end result of the care and the effect on the patient and the community. All three domains may be used in the setting of standards, or it is also possible to devise a quality-measuring instrument using only one domain (Kemp, Richardson 1993:36, Hodges, Icenhour and Tate 1994:299).

The ANA, in a new framework for nursing standards of practice and practice guidelines, has suggested that standards be considered distinct from guidelines (Dean-Barr 1994:318). Clinical practice guidelines have been systematically developed to help health care professionals and patients make informed decisions about the management of health conditions (Beyea and Nicholl 1998:2). Guidelines may be designed to guide rather than regulate, but the difference between them becomes blurred in a lawsuit, where even guidelines may be used to define a standard of care (Beyea and Nicholl:2).

Standards and guidelines can be used in conjunction with 'Nursing Minimum Data Set', such as those developed by Kleinbeck (1996:928) for peri-operative nursing, to develop database systems that can provide valuable information on the quality of nursing care (Dean-Barr 1994:319).

Institutional policies and procedure guidelines set standards for nursing practice within the institution. It is important that orientation of new staff and continuous education of existing staff include information and regular updates of the hospital policies. Policies should be updated regularly to ensure they reflect the latest knowledge and research (Beyea and Nicholl 1999:3).

Setting standards does not guarantee the delivery of quality patient care. Internal audits of nursing care, as part of a total quality management program ensure that standards are met and policies and procedures followed (Meurier 1998:140). The use of nursing records in the audit process has already been discussed.

Standards of nursing practice, whether mandated regulations, guidelines for clinical practice or local policies, if correctly developed and monitored, can ensure research-based nursing practice.

2.5 STANDARDS FOR NURSING DOCUMENTATION

Several different organisations set standards for nursing documentation.

Some of these are:

- The South African Nursing Council.
- Accreditation Boards.
- Professional Associations.

2.5.1 South African Nursing Council Regulations

The objects and powers of the South African Nursing Council (SANC) are laid down in accordance with chapter one, sections three and four, of the Nursing Act 50 of 1978 as amended by Act 21 of 1992 and Act 145 of 1993. In accordance with the Act, the South African Nursing Council exercises authority over the practice of all categories of nurses.

SANC regulation R387 of 1985 as amended by R866 of 1987 and R2490 of 1990, "Rules setting out the acts and omissions in respect of which the Council may take disciplinary steps", mentions record-keeping. In paragraph three the nurse is instructed to give, "*patient care through correct diagnosis, treatment care, prescribing, collaborating, referral, co-ordinating and patient advocacy as the scope of practice permits.*" In paragraph five with regard to record-keeping, the nurse is instructed, "*to keep clear and accurate records of all actions performed in connection with the patient*" (SANC 1990:2).

Regulation R2598 of 1984 as amended by R1469 of 1987, R2676 of 1990 and 260 of 1991, "Regulations relating to the scope of practice of persons registered or enrolled under the nursing act", refers to documentation indirectly. The nurse is responsible for, "*the diagnosing of a health need and the prescribing, provision and execution of a nursing regimen, to meet the need of a patient or group of patients or, where necessary referral to a registered person*" (SANC 1991:2). Although documentation is not directly mentioned, the communication of a nursing regimen is only effective by accurate documentation.

Both the above regulations give an indication of the importance that the South African Nursing Council places on planning and communicating patient care through accurate record-keeping.

2.5.2 Accreditation of Health Care Organisations

Regulatory boards like the USA Joint Council for Accreditation of Health care Organisations (JCAHO) and the local equivalent, the Council for Health Service Accreditation of South Africa (COHSASA), have also set standards for record-keeping. COHSASA has accredited a large number of private and public hospitals and clinics in South Africa (Whitaker, Muller 1997:44).

COHSASA has standards for health records, but does not mention the peri-operative record specifically. Some of the criteria mentioned are applicable to the operating room, but they focus more on medical, rather than nursing records. For example, the names of the surgeon, assistant, and the anaesthetist are required, but no mention is made of the nurses involved: not even with regard to the control of swabs, instruments, and sharps. The requirements are limited to recording care given by the anaesthetist and the surgeon. Patient status such as positioning, or use of electro-surgery devices is not mentioned. As previously indicated no mention is made of nursing care plans, or any form of planning for patient care. Nursing care is under emphasised and risk management carried out by the nursing staff is not mentioned at all (COHSASA 1996:13.14 -13.24).

The COHSASA standard for the health record service states, *"The health record contains data which facilitates patient care, evaluation of care provided, administrative activities, management activities and research activities"* (COHSASA 1996:13.14). However, the criteria related to this standard emphasise care given by the doctors and not the nursing staff.

2.5.3 Professional Associations

The professional associations of nursing specialities, often provide guidelines or standards for nursing practice within these specialities. These standards or guidelines may include recommendations for documentation. The standards for peri-operative nursing records, as recommended by associations in South Africa, USA, UK and Australia, are discussed in the following section.

2.6 RECOMMENDED STANDARDS FOR PERI-OPERATIVE DOCUMENTS

In selecting recommended standards for peri-operative documents for review, certain criteria were taken into account. These were availability, the type of organisation setting the standards, and the country of origin. The country had to be English speaking, with educational and/or professional links to South Africa. The organisation selected in each country was the major or only operating room nursing organisation, with influence over a large number of nurses working in this field. The countries chosen were the United States of America, United Kingdom, Australia and South Africa. All the standards selected were available either directly from the organisation, or were published in journals, or on the Internet.

2.6.1 South Africa

In South Africa the operating room nurses' organisation is The National Association of South African Theatre Sisters (SATS). In the SATS "Guidelines for basic theatre procedure" (1994), record-keeping of certain peri-operative nursing functions is mentioned. Recommendations for peri-operative record-keeping are mentioned during discussion of the different aspects of intra-operative care. Examples of this are the application of a tourniquet, or the swab, instrument, and needle count. However, no specific recommendations are made for the content, or design of a peri-operative document. The guidelines discussed for documentation do not cover all aspects of peri-operative care. Also there is no local standard or uniformity in peri-operative nursing records currently in use. The SATS record-keeping guidelines are summarised as follows:

- Type of anaesthetic.
- Consent signed.
- Pre-operative checklist for preparation of the patient.
- Premedication given and signed.
- Swab instrument and needle count.
- Position of the diathermy plate (indifferent electrode).
- Evaluation of the patient's skin for lesions.
- Evaluation of the patient's skin for injuries.
- Condition of the skin post-operatively.
- Position of the patient on the table.
- The time the patient left the theatre.
- A record of specimens.

- Medications given (SATS 1994:16,23,27,48,59,69).

2.6.2 United States of America

The Association of Operating Room Nurses (AORN) is the organisation responsible for setting standards of practice for operating room nurses in the USA.

In June 1996, AORN published their revised recommended practices for documentation of peri-operative nursing care. The recommendations published in 1990 had four recommended practice statements (AORN 1990:4.1- 4.3). The 1996 recommended practices have been consolidated into the following two statements:

- *"The patient's record should reflect the peri-operative patient's plan of care, including assessment, diagnosis, outcome identification, planning, implementation and evaluation.*
- *Policies and procedure regarding documentation should be written, reviewed annually, revised as necessary, and readily available within the practice setting"(AORN 1996: 1145).*

In the 1996 publication, the AORN recommends that documentation, using the 'Nursing Process' be completed for each procedure, as it is vital for the continuity of patient care. Effective documentation also helps to ensure that patient outcomes are set, and that these are met, thus ensuring the maintenance of quality patient care (AORN, 1996: 1145).

The AORN also identify certain critical data that should be included in peri-operative nursing documentation. These are minimum requirements and are summarised as the following:

- Identification of persons providing peri-operative care.
- Evidence of pre-operative assessment.
- Skin condition pre-; and post-surgery.
- Presence of prosthetic and sensory devices.
- Positioning of the patient in surgery.
- Use of the electro-surgical unit (ESU), including position of the indifferent electrode and ESU settings.
- Use of temperature control devices and temperature of the patient intra-operatively.
- Placement of electrocardiogram electrodes, blood pressure cuff and other monitoring devices.

- Administration of blood and blood products.
- Specimen collection.
- Skin preparation.
- Drains, catheters, plugs, and dressings used.
- Use of a tourniquet including positioning of the cuff.
- Implants used in surgery and left in the patient.
- Use of radio-active implants.
- Swab, instrument and needle count.
- Intra-operative X-rays and fluoroscopy.
- Use of lasers.
- Wound classification.
- Type of anaesthesia used.
- Critical incidents occurring intra operatively.
- Time and status of patient at discharge.
- Any significant or unusual occurrences pertinent to peri-operative patient outcomes (AORN 1996:1148).

In 1998, the AORN published a revised version of these standards on their Internet web site (<http://www.aorn.org/journal.htm>). The intention of this was to allow international feedback from operating room nurses before publishing the 1999 standards. Although there were structural changes in the lay out of the standards, the content remained the same as the 1996 version.

The AORN standard is comprehensive, and includes details of content criteria recommended for inclusion in a peri-operative document. It strongly emphasises the use of the 'Nursing Process' as a problem-solving tool, and advocates the use of care plans for all stages of the peri-operative period. It is easy to understand, and covers all aspects of peri-operative nursing care, apart from the care given in the recovery room.

2.6.3 Australia

The Australian Confederation of Operating Room Nurses (ACORN) is the peri-operative organisation for all operating theatre nurses, anaesthetic nurses and post anaesthesia care unit (PACU) nurses within Australia. It is represented in all the states and sets standards for operating room nursing as well as disseminating information to members through conferences, journals and publications. (ACORN internet homepage; <http://www.acorn-limited.com.au>: 1).

ACORN have set standards and guidelines for operating theatre practice in a publication entitled " Standards, guidelines and policy statements" (1989). Standard number two, has information pertinent to record-keeping and states:

"The registered nurse assesses the health status of the patient and gathers data which is retrievable and communicated to the appropriate persons" (ACORN 1989: A3)

The ACORN list the data that should be collected, and these should presumably be documented as this is the most effective method of communicating the information to other nursing staff and health care professionals. The data needed is divided into information that should be collected by each member of the operating room team; scrub nurse, anaesthetic nurse and circulating nurse. Some of the data, which should receive special attention in the pre-operative assessment, are listed as follows:

- The age of the patient.
- Surgical procedure to be performed.
- The type and duration of anaesthesia administered.
- Previous anaesthetic history and/or reactions.
- Anaesthetic and surgical history of siblings and families.
- Pain management regime.
- Allergic, and other sensitive reactions.
- Complications encountered during surgery and/or anaesthetic and the treatment initiated.
- Location of patient's family and/or significant others within the facility.
- Cultural and religious information.
- Weight and height (ACORN 1989:A5).

ACORN recommends that all patient care be documented completely, accurately, and legibly, in a manner that allows for easy retrieval, communication and evaluation (ACORN 1989:A7).

Of interest is the fact that the USA, AORN standards are cited as a resource in the ACORN, "Standards, Guidelines and Policy Statements" (ACORN 1989:E1). The ACORN recommendations are comprehensive and cover all aspects of peri-operative nursing care.

2.6.4 United Kingdom

The National Association of Theatre Nurses (NATN) in the United Kingdom, have published "Principles for safe peri-operative practice in the peri-operative environment" (1998). Although they do not specify the content required in a peri-operative record, they do give guidelines for the construction of care plans. The NATN follow a scientific, 'Nursing Process' approach, with the identification of potential problems or nursing diagnoses in the pre-; intra-; and post-operative phases. The problems identified are as follows:

Pre-operative phase:

- "Fear related to potential outcome of surgery.
- Anticipatory grieving due to loss of part of the body.
- Alteration in nutrition.
- Potential fluid volume deficit.
- Sleep pattern disturbance.
- Anticipatory anxiety due to unfamiliar environment and impending surgery."

Intra-operative phase:

- "Potential alteration in respiratory function due to anaesthesia.
- Potential fluid volume deficit due to blood loss during surgery.
- Potential injury due to decreased level of consciousness.
- Potential decrease in cardiac output due to anaesthesia, decreased mobility and venous pooling.
- Potential for infection".

Post-operative phase:

- "Pain related to the surgical procedure.
- Potential injury due to returning level of consciousness.
- Sensory-perceptual alterations due to returning level of consciousness.
- Ineffective airway clearance due to retained secretions"(NATN 1996:38, 39).

The NATN recommendations emphasise the importance of identifying actual and potential problems, in order to plan for appropriate nursing care, at all stages of the peri-operative experience.

2.6.5 External influences on nursing documentation

Regulations and criteria for standards, set by regulatory bodies and managed health care organisations, have had an effect on the design of nursing documentation. There is a danger that there may be too much external influence on the content and design of peri-operative documentation from non-nursing management, and not enough input from the users of the documents. Documentation must be appropriate for the clinical area in which it is used and not merely a management tool or means of control. Allen (1998:1229) expresses concern that influences such as quality management and litigation have had a negative effect on the way nurses view documentation. He says, that although the importance of accurate documentation cannot be under emphasised, there is a danger that the documents, that are highly visible, will be given priority to the less visible aspects of patient care. Fear of accountability can also influence a nurse to omit important entries from the nursing record (de la Cuesta 1983:369)

Heartfield (1996:98-103) also expressed concern about power relationships making the caring aspect of nursing invisible.

“Through documentation nursing actions are costable, linked to the cure focus of medicine and the social and political institutions of health care provision. These power/knowledge relations illuminate a particular view of nursing that conceals certain aspects such as the invisibility of intuitive/nurturing women’s work” (Heartfield 1996: 102).

Peri-operative nursing records have not escaped the influences of regulation, litigation and management principles imposed by non-nursing personnel. There is a danger that the cost control and regulatory priorities of organisations like managed health care organisations, or accreditation bodies, may have more influence on the future design of peri-operative records than peri-operative nurses may. Safety of the patient and the quality of patient care should be the primary motivations for peri-operative record design.

2.7 PERI-OPERATIVE NURSING RECORDS

2.7.1 Research and development of peri-operative nursing records in the literature

The USA, AORN Journal, proved to have the most literature available on the topic of peri-operative documentation. Outside the USA the references to peri-operative documents and record-keeping in the operating room were scarce. The SATS Journal published articles about operating theatre documentation in the 80s and since then there have been no further

references to the subject. The references in the 80s occurred at a time when the 'Nursing Process' had recently been introduced to South African nursing practice (Paverd 1983:47-51, Auchterlonie 1983:38-42).

The American Journal of Nursing published an article in 1982 entitled "A unified approach to assessment of the surgical patient". In this article Keithly and Weirauch-Tasic (1982:612-614) describe the development of an assessment form that allows pre-operative assessment and reassessment during the intra and post-operative stages. Although this is not a complete peri-operative nursing record, it was interesting in its design in that it allowed a complete progression of the changing status of the patient through the surgical area, visible at a single glance. Assessment is made of; vital signs, neurological status, physiological status, and psychosocial status. The criteria in each area changed to be appropriate for the different needs of each area.

Speelman (1985:644-647), explains the development of a graphic record to monitor patients having surgery under local anaesthesia. This closely resembles the anaesthetic record completed by anaesthesiologists in South Africa. It was designed to be used in conjunction with a written care plan and nursing record. In a similar vein Kendall (1993:718) combined the peri-operative record and the intra-operative monitoring to produce an intra-operative record for local anaesthesia.

The Southwest Texas Methodist Out-patient Surgery Centre have designed a document to include; all new technology used, enough space for patient education and discharge planning, and a separate nursing care plan. This hospital has emphasised that the same level of care is necessary for out-patients as for in-patients and therefore the nursing records should be equally comprehensive. They also caution that there is a tendency to treat out-patients as an inferior class of patients that do not require the same care documented as in-patients (Poss 1991: 81 -84).

In 1987 three articles were published in AORN journals about peri-operative documentation. Aimino (1987:73), describes the development of a peri-operative record using care plans as a new innovation. She sites the limited time spent with the patient, as the reason that although care plans are used in other areas of nursing, they were still relatively new to peri-operative nursing. The use of care plans in peri-operative records is discussed later.

Virginia Stanfield (1987:699), describes the design of a new peri-operative record for their hospital in Wisconsin. This record was designed using actual and potential nursing

diagnoses, and the nursing interventions in the pre-; and intra-operative phases were grouped under their relevant diagnoses or potential problems. This is a standardised plan for care, and focuses the nurse's attention on potential situations of high risk. The nurse for instance, on seeing potential impairment of skin integrity, should know to implement measures such as extra padding, to prevent the potential problem. Space was left for actual problems, nursing interventions, and outcomes required. Mention was also made of documentation by exception. For instance the condition of the skin after removal of the electro-surgical unit dispersive electrode (diathermy plate) was not recorded unless there was a skin reaction (Stanfield 1987:704). As the condition of the skin prior to application of the electrode was also not recorded it was felt that this could lead to problems. Some nurses may just fail to check the site altogether if not required to do so in the documentation.

In the same year, Leuze and McKenzie (1987: 1122) published experimental research conducted on a pre-operative assessment tool using the Roy Adaptation model. *"By developing a pre-operative assessment tool using the Roy Adaptation Nursing Model, the peri-operative nurse can evaluate the patient from both a psychological and a physiological point of view"* (Leuze and McKenzie 1987: 1123).

The results showed that the experimental group, who had assessed their patients using the adaptation model, had more knowledge of their physiological and psychosocial needs. This had a strong theoretical basis but was extremely long considering it was only the pre-operative assessment. No mention was made of using the Roy Adaptation Model in the intra- and post-operative phases.

Departmental need to improve their peri-operative documentation has motivated some nurses to investigate the literature, change their own documents, and to publish this process. In the USA this change has often been prompted by the document's failure to pass accreditation by JCAHO. Wilhelm-Hass, Rowley and Robinson (1991:754-760) designed a document using the "AORN Standards and Recommended Practices for Peri-operative Documentation" published in 1990. Their objective was to design an intra-operative document that incorporated the 'Nursing Process', medico-legal parameters and professional standards. This had to be achieved on a two-page document that was easy to read and quick to use. The result was comprehensive but cluttered. Very little writing was necessary but the data was crowded and difficult to read in the journal. The actual document may be easier to read as it would be larger.

Spry and Jenkins (1991:741) published an article about the creation of a new intra-operative nursing record. The design of this intra-operative record was comprehensive and easy to use but as it covered only one page the information was crowded together. It also failed to address the pre-; and post-operative phases and therefore encouraged fragmentation of care and documentation. Nursing diagnoses were printed, and outcome goals set that may not be applicable for each patient. A diagram was used for indicating the skin condition of the patient. This is a good concept as it allows the nurse to record the exact location of skin lesions without the need for description that may be inaccurate. Speed and accuracy of use were the motivating factors for the design of this document.

In 1993 two articles were published on peri-operative documentation both with interesting innovations. Shirley (1993:1427) describes the design of a double page intra-operative record that is carbon copied in triplicate. One copy is kept in the patient notes, one is filed in the operating theatre department and the third is sent to the infection control department for data collection. According to Shirley, the importance of the peri-operative record for the infection control nurse is often underestimated. It has useful information pertaining to skin preparation, wound classification and the type of surgery performed (Shirley 1993:1431).

Lunow and Jung (1993:1174), describe a pre-operative assessment work sheet that is colour coded, in triplicate and is given to each area of the operating room department before the patient arrives. This enables the nurses to plan correctly for each patient. The two previously mentioned peri-operative records emphasise communication of patient care to all caregivers in the peri-operative process.

From the literature it is apparent that the 'Nursing Process' is used as the foundation for the design of all the peri-operative records published. The importance of pre-operative assessment and planning, as well as identification of potential problems that may occur intra-operatively, and the setting of patient outcome goals are strongly emphasised.

Table 2.1 summarises the development of peri-operative documentation as recorded by the AORN Journal. The major focus of the design of each document and the motivating factors behind that design are tabulated. The macro design and content characteristics are also tabulated. Not all the documents mentioned have been discussed previously, as some will be included in discussion at a later stage.

Table 2.1. Summary of the chronological development of peri-operative documentation

Year	Authors	Major focus and motivation for the design	Peri-operative document characteristics
1982	Keithley Tasic	A surgical patient assessment form with pre, intra- and post-operative phases on one form. To ensure continuity of care and to document the changing status of the patient.	2 pages. Assessment only.
1984	Mackie Peddie Pendleton	Implementation of the 'Nursing Process'. Need for a comprehensive document that is short and meets the AORN and JCAHO standards. National Group for Classification of Nursing Diagnosis used.	36 Nursing Care plan guides under headings; nursing diagnosis, defining characteristics, goals, actions. Peri-operative Record: 2 pages. 'tick-the-box' system. Graphic for skin condition and location of monitoring devices.
1985	Speelman	A local anaesthesia graphic report for monitoring patients	2 pages. Only observations recorded. To be used in conjunction with the peri-operative record.
1987	Aimino	Care Plans using outcome standards or peri-operative nursing from AORN. Potential nursing diagnoses named with goals set. Old record was outdated. Need for a comprehensive document that took less time, fulfilled legal requirements and included the 'Nursing Process'.	2 Pages 'tick-the-box' format: yes, no, N/A. Pre, intra and post op phases split Appropriate standardised care plan number named in the record.
1987	Stanfield	Nursing diagnoses using AORN Outcome standards. Need to overcome the difficulties of using care plans in the operating room.	2 pages. 'tick-the-box' format; yes, no N/A. Nursing intervention arranged under the headings of five potential nursing diagnoses. Documentation by exception.

Year	Authors	Major focus and motivation for the design	Peri-operative document characteristics
1987	Leuze & McKenzie	Pre-operative assessment only using the Roy adaptation model.	2 pages. Divided under the headings of; Physiological. Self-concept. Role function. Interdependence.
1988	MacKenzie, Beresford & Laurel	A peri-operative record to meet the needs of an out-patient department. Priorities are, continuity of care and time. Nursing diagnoses from North American Nursing diagnosis Association incorporated.	3 pages including pre-operative and post-operative care plans. Divided into: Nursing diagnosis. Nursing plan/ Interventions. Evaluation. All writing, no checklist.
1989	Slone, Burkholder & Campion	A comprehensive peri-operative record needed. Need to comply with the AORN recommended practices.	2 pages. Divided into pre, intra and post-operative phases. Tick and short comment format
1989	Edel, Johnson & Tiller	Need to reduce time spent in documentation and increase accuracy.	2 pages. Combination of 'tick-the-box' and short comments. Interventions divided according to three nursing diagnoses.
1991	Wihelm-Hass, Rowley and Robinson.	Accurately recorded statistics, nursing care planning and medico-legal events needed. Current document out-of-date and did not comply with the recommended standards.	2 pages Body diagrams for marking skin lesions and positions of monitoring devices. Five potential nursing diagnoses given codes and nursing interventions listed under these codes. Tick-the-appropriate-item, with long lists of alternatives.

Year	Authors	Major focus and motivation for the design	Peri-operative document characteristics
1991	Spry and Jenkins	Intra operative record only. Need to reflect all care given. AORN outcome standards used.	1 page. Pre operative and post-operative nursing diagnoses. Interventions grouped according to standard nursing diagnoses. Expected outcome reached; yes/no. Space for individualised diagnosis. 'tick-the-box' design.
1991	Poss	New document designed to incorporate care plans. AORN patient outcome standards used.	5 pages including; pre-operative nursing notes, intra-operative nursing notes, patient care plan, recovery room and post-operative nursing notes. For use in out-patient surgery only. 'tick-the-box' design.
1993	Lunow and Jung	Use of the 'Nursing Process' and individualised care plans to bridge the gaps between care environments. AORN Standards and recommended practices and Standards for Post Anaesthesia Nursing.	3 pages not including post-operative phase. Tick the box system. Individualised care plan in duplicate. One copy on pre op. visit section and peel off label for intra operative section
1993	Shirley	New record designed prior to review by JCAHO. Focus on outcomes. Uses outcome standards of peri-operative care as recommended by AORN.	3 pages. Formatted under headings ; Nursing diagnosis, nursing actions and patient outcomes. Nine potential nursing diagnoses as Injury divided into five sections. Diagrams for indicating positions of monitors. Tick-the -box system.

Year	Authors	Major focus and motivation for the design	Peri-operative document characteristics
1996	Palmerini	<p>Need for a comprehensive, easy to use form that demonstrates continuity of care and is easy to up date.</p> <p>Previous document had narrative notes and was lengthy.</p> <p>Based on AORN, JCAHO and American Society of Post Anaesthesia Nurses standards.</p>	<p>Checklist and tick the box system.</p> <p>Generic care plan with nursing interventions listed under appropriate diagnosis and goal.</p>
1995	Null Richter-Abt Kovac	<p>Peri-operative nursing diagnosis flow sheet.</p> <p>Need to comply with JCAHO standards.</p>	<p>6 pages.</p> <p>11 nursing diagnoses, desired outcomes and interventions listed.</p> <p>Care identified in pre admission, pre-op, Intra-op, PACU and discharge phases.</p> <p>Codes used to identify level of care.</p>

(Keithley et al 1982:612-613, Mackie et al 1984:195-196, Speelman 1985:646, Stanfield 1987:700-701, Aimino 1987:84-85, Leuze 1987:1128-1129, Slone et al 1989:810-813, Edel et al 1989:598-599, MacKenzie et al 1988:532-535, Spry and Jenkins 1991:741, Poss 1991:83-84, Wilhelm-Hass et al 1991:754, Lunow and Jung 1993:1173-1176, Kendall 1993:718, Shirley 1993:1434-1435, Null et al 1995:549-550, Palmerini 1996:239).

2.7.2 Use of Nursing Diagnoses in the design of peri-operative documents

Several authors have used nursing diagnoses and care plans in the design of peri-operative records. This has been largely initiated by the need to comply with regulatory criteria requirements and a desire to individualise operative nursing care (Null et al 1995:549, Palmerini 1996:239).

From the literature, there seems to have been three main approaches to the incorporation of nursing diagnoses into the peri-operative record. The predominant method is to divide the peri-operative record according to potential problems, and list the interventions necessary to prevent these problems under these headings. This creates a standardised care plan. The

peri-operative record described by Stanfield (1987:700-701) was divided into the following sections:

- Data collection and assessment.
- Potential for knowledge deficit.
- Preparation for surgery.
- Potential for infection.
- Potential for impairment of skin integrity.
- Potential for injury.
- Potential for fluid and electrolyte imbalance.

Four other peri-operative documents use a similar system, but include goals or patient outcomes. The nursing interventions, or actions, are comprehensively listed and the nurse just puts a tick in the appropriate box. Three of these documents allowed scope for individualised care plans, by documentation of actual patient problems and expected outcomes (Edel et al 1989:598-599, Wilhelm-Hass 1991:758-759, Shirley 1993:1434-1435, Palmerini 1996:240-246).

The second method of incorporating care plans and nursing diagnoses was only seen in one document. At St Luke's Medical centre Milwaukee the peri-operative record has been designed to include a separate individualised care plan. During pre-operative assessment, which is done in this hospital by the operating room staff, an individualised care plan is devised. This is duplicated (carbon copied) onto a peel off sticker, which is placed on the intra-operative record. At the same time as the pre-operative assessment, the patient receives education about the surgery and post-operative expectations. This system works well to assist the operating room nurse to plan, and provide individualised care, and at the same time to reduce patient anxiety (Lunow and Jung 1993:1167).

The third method involves lengthy standardised or individualised care plans for each nursing diagnosis, or for each category of surgical patient. These documents are used in addition to the peri-operative record (Mackie et al 1984:195-199, Aimino 1987:76-85, Null et al 1995:549-550). Some have numbered care plans and the number is entered on the peri-operative record. The care plans act as guides to practice, and appear to serve the same purpose as a procedure manual. This method is time consuming and not appropriate for the South African situation.

West (1989:304) stresses the importance of patient safety, in planning patient care in the operation theatre. She is concerned however, that the introduction of theatre care plans to hospitals in the United Kingdom has focused attention on the recording process and not on the actual planning of care. The care plans adopted by the American nurses were viewed by British nurses as impractical and time consuming. West is concerned that the alternative adopted in the UK has reduced the peri-operative record using the 'Nursing Process' to; *"an administrative checklist for entry into the Operating Department"*. She stresses the need for some kind of compromise in working with the 'Nursing Process' and continuous teaching of staff in correct use of documentation.

In South Africa nurses are still not comfortable with the use of nursing diagnoses. Most are happy with the concepts of assessment, planning, implementation and evaluation in the 'Nursing Process' but fall short in documenting the planning phase or expected patient outcomes. Standard care plans are the most common care plans used and are not yet used in operating theatres. Most operating theatres do have procedure manuals however and if these are written according to a process approach of, input, (or assessment standards,) through-put, (or process standards) and out-put, (or goals,) they detail expected patient outcomes for each nursing action. These may in many instances be considered standard care plans or guidelines. This method of writing policy and procedure manuals is based on the major concepts of General Systems Theory. The operating theatre can be considered an open system where there is constant interchange between the environment and its' component parts (Abbot, Biala and Pollock 1983:46).

2.8 CONTENT OF A PERI-OPERATIVE RECORD

In order to design an effective peri-operative nursing record, it is necessary to identify what it is that a peri-operative nurse actually does, the potential risks to the patient, and problems that may arise.

2.8.1 The nature of peri-operative nursing

Peri-operative nursing includes all actions undertaken by a nurse during the pre-; intra-; and post-operative periods. The pre-operative period is from admission of the patient until admission to the operating theatre suite. The intra-operative phase includes reception to the operating room suite, care during surgery, immediate post-operative evaluation of the patient by the scrub nurse and ends with admission to the recovery room. The post-operative period begins with evaluation and care of the patient in the recovery room, high care unit or

intensive care unit and extends until the surgeon discontinues his follow up. Clearly the peri-operative nurse is not directly involved in all these phases but the planning and care she gives in the pre-; and intra-operative phases have a direct effect on the patient's recovery in the post-operative phase (Atkinson et al 1996:24). The peri-operative nurse is directly responsible for pre-operative assessment and planning, intra-operative care and immediate post-operative evaluation. The duties of the peri-operative nurse can therefore be divided according to the steps of the 'Nursing Process'.

2.8.1.1 Assessment and Planning:

The patient is usually assessed and prepared for surgery by the ward nurse. The peri-operative nurse involved with the surgical procedure on the patient should however perform a further assessment. Pre-operative visits have the advantage of establishing contact between the patient and the operating theatre staff in order to allay fears and educate the patient. The peri-operative nurse can identify potential and actual problems that the patient may have during the intra-operative phase, and can plan better to avoid these risks. The ward staff may not have the same insight into potential risks in the operating theatre as the trained or experienced peri-operative nurse (Auchterlonie 1983:27).

Shortage of qualified nursing staff, lack of time and insufficient support from management often stand in the way of pre operative visits in spite of their value to both the patient and the nursing staff (Wicker 1995:16). A study in the UK, indicated that only approximately 10% of patients receive pre-operative visits from the operating room nurses. Often the operating theatre nurses are kept busy with non-nursing tasks, such as cleaning, and this limits their time available for the patients (Wicker 1995:16). Auchterlonie (1993:32) suggests that a pre-operative visiting nurse, with operating theatre training, should be employed to perform this task and that she should liaise with the operating theatre and recovery room staff. This has the advantage of ensuring that pre-operative visits occur, but procedures must be in place to encourage accurate communication of the findings of the visit. Capstick (1991:43-49) in an article entitled " Is your journey really necessary?" describes her experience as a pre operative visit nurse in the UK. She also stresses the importance of staff education in the skills needed for pre operative visits and the support needed by the management.

2.8.1.2 Implementation and Evaluation

During the intra-operative phase the nurse is responsible for ensuring the following;

- Absence of infection by practising aseptic technique.
- Maintenance of skin integrity by correctly positioning the patient and providing padding and positioning supports when appropriate.
- Absence of injury by proper application of safety measures related to chemical, physical, laser, radiation and electrical hazards.
- Absence of injury related to extraneous objects by ensuring that swab, instrument and sharps counts are carried out according to the hospital policy.
- Maintenance of the dignity of the patient (Atkinson et al 1996:28).

All the above need to be evaluated in the immediate post-operative period and the outcome recorded in the peri-operative record. The peri-operative nurse in her role as patient advocate, ensures that the above outcomes are met by making educated decisions for patient care, on behalf of the unconscious patient (Hunter 1994:7). *"In safeguarding the patient, the nurse supports and thereby advocates the patient's interests in the restoration of the patient's health and well-being"* (Marshall 1994:11).

Care of the patient during the post-operative period in the recovery room and the ward, is the responsibility of nursing staff other than the operating room staff. However, the documentation of intra-operative care and post-operative requirements by the peri-operative nurse, has a direct effect on the care given in both these areas (Atkinson et al 1996:31).

2.8.1.3 Decision making by Peri-operative Nurses

Research has shown that peri-operative nursing is outcomes driven and that peri-operative nurses think in terms of actions required to achieve an outcome (Kleinbeck 1999:21). Peri-operative nurses in their clinical decision making, remain focused on patient safety and prevention of harm (Killen, Kleinbeck, Golar, Takahashi, Uebele 1997:106). This research has implications for the content of a peri-operative record. Outcome standards for the prevention of identified potential risks are an ideal format for the layout of a peri-operative record.

2.8.1.4 Requirements of a Peri-operative Nurse

The South African Nursing Council, in their directive for the Diploma in Operating Theatre Nursing Science, stipulates the knowledge and skills required of a registered nurse with the diploma. With regard to documentation the nurse specialised in Operating Theatre Nursing Science must be able to:

- "Identify the physiological and psycho-social needs of the individual patient experiencing surgical intervention.
- Develop and implement an individualised plan of nursing that meets the identified needs of the patient.
- Co-ordinate the individualised plan with other members of the health team, in order to promote continuity of care for each patient undergoing surgery.
- Provide patient guidance for surgical patients in day care situations pre-, intra- and post-operatively" (SANC 1993:3-4).

The above indicates that the South African Nursing Council places importance on individualised care planning in the operating theatre. The importance of communication between members of the team in the operating theatre is also highlighted and this could be facilitated by multidisciplinary peri-operative documentation. In addition to this the importance of patient education is stressed. The operating theatre nurses best accomplish patient education during pre-operative and post-operative visits. All these factors were also identified as important in the peri-operative documents reviewed in the literature.

2.8.2 Essential components of a peri-operative record

Groah and Reed (1983:1180) identify essential components for peri-operative documentation. These are:

- A record of baseline patient data, problems and goals.
- Nursing interventions.
- Actual patient outcomes.
- Information about post-operative care.

These can be identified in the major sections of the peri-operative record; the pre-operative assessment, preparation checklist, intra-operative nursing record and the recovery room record (Groah, Reed 1983:1181). These are the broad components of the peri-operative

record. The content criteria of the record are linked to the tasks carried out by the peri-operative nurse.

2.8.2.1 Data Elements of Peri-operative Nursing

Kleinbeck (1996:928) used the AORN surgical patient outcomes to produce a list of peri-operative nursing minimum data. The object was to identify the individual tasks carried out by the peri-operative nurse. She did this by using patient outcome standards recommended by AORN, and describing nursing actions needed to meet patient needs and to help them meet the outcomes identified (AORN 1993:89-90).

The patient outcome standards are:

- "The patient demonstrates knowledge of the physiological and psychological responses to surgical intervention.
- The patient is free of infection.
- The patient is free from injury related to positioning; extraneous objects; or chemical, physical and electrical hazards.
- The patient's skin integrity is maintained.
- The patient's fluid balance is maintained.
- The patient participates in the rehabilitation process" (AORN 1993:89-90).

For each outcome, Kleinbeck lists nursing actions necessary for their achievement. For example for patient outcome: 'The patient's skin integrity is maintained', the nursing interventions are as follows:

- "Assesses patient's skin integrity.
- Assesses patient's potential for skin injury.
- Implements protective measures to maintain the patient's skin integrity.
- Evaluates the patient's response to positioning" (Kleinbeck 1996:929).

These nursing actions should in most instances be recorded in the peri-operative document. For details of Kleinbeck's complete minimum data list see Appendix B.

The AORN republished their patient outcome standards in 1997. There are now twenty-nine standards as the previous outcome standards have been broken down into smaller categories. For instance injury to the patient, is now covered by eight different criteria related

to; the procedure, extraneous objects, chemicals, electricity, positioning, laser, radiation and transfer or transport. Psychosocial outcomes have also been added such as, respect for the dignity, ethnicity and culture of the patient (AORN 1997:408-414). This last criterion is particularly important in the multicultural society in which we live in South Africa.

2.9 DESIGN CHARACTERISTICS

During examination of the peri-operative documents published in the literature, certain common design characteristics were noticed. These design characteristics were introduced to new documents in order to increase efficiency and improve the accuracy of the information recorded. In order to examine these design characteristics in context, it is first necessary to examine the factors that are barriers to accurate record-keeping, and the role that design plays in omissions in nursing records.

2.9.1 Barriers to accurate documentation

A number of extrinsic and intrinsic factors affecting the accuracy of record-keeping are found in the nursing literature, not all of them directly related to the design of the documents in use.

2.9.1.1 Extrinsic factors

Extrinsic factors affecting the accuracy of record-keeping include, lack of time to chart, work overload, stressful atmosphere or environmental disruptions and fragmentation of the charting system (House and Bailey 1992:374, Meurier, Vincent, Parmar 1998:1012). Nurses have a tendency to attribute the causes of documentation errors, to external, uncontrollable factors, thereby attempting to remove themselves from accountability (Meurier et al 1998:1018).

Lack of time to complete the documentation accurately, is a commonly identified barrier to accurate record-keeping by nurses and medical staff (Stanfield 1987:699, Howse and Bailey 1992:374, du Toit and Dewar 1990:26, Meurier, Vincent and Parmar 1998:1012). In two separate research studies Meurier et al (1997:111) and Parmar, (1998:1016) identify work overload as a common cause of nursing documentation errors. This can be linked to time constraints and is a common problem facing the peri-operative nurse. The length of the document, and the amount of information needed, may also be linked to the time factor. According to Killen et al, (1997:106-107) time is the greatest obstacle to using the 'Nursing Process' in peri-operative settings. Limited nurse-patient interaction due to time constraints and work overload leads to difficulty in identifying important nursing diagnoses.

The length of time spent on record-keeping can be affected by the design of the document. Stanfield (1987:699) suggests that a "tick-the-box" system of record-keeping in a peri-operative document, increases the speed of use and accuracy of entries. Standardised care plans, with nursing interventions grouped according to routine intra-operative nursing diagnoses and patient outcomes, also improves the speed of record-keeping while maintaining a logical and scientific approach (Edel et al 1989:596, Wilhelm-Hass et al 1991:754). Standardised peri-operative care plans do not necessarily exclude the possibility of individualised care planning. Without taking up too much time it is possible to identify the individual needs of the patient and intra-operative requirements for prevention of potential problems. This can be recorded on the peri-operative record by the peri-operative nurse during a pre-operative visit. Individualised care plans work together, with the standardised care plan, to give a comprehensive record of patient care (Edel et al 1989:596).

Fragmentation of the charting systems used by different members of the nursing, medical and paramedical team is also cited as a barrier to effective communication in the records (Howse et al 1992:374). Uys (1985:29), in research undertaken to examine the implementation of problem oriented nursing records, identifies fragmentation as a problem. Fragmentation results in repetition of entries and frequent interviews of the patient. Integration of the peri-operative document to include all pre-; intra-; and post-operative care as well as multidisciplinary entries by the nurses, anaesthesiologist, and surgeon could reduce fragmentation. This also ensures that the information needed by the post anaesthesia caregivers is centralised, and accessible (Palmerini 1996:239).

Assessment by too many different nurses, and by nurses with little insight into the requirements of the assessment process, is also cited as a reason for documentation errors (Meurier et al 1998:1018). In the peri-operative setting the assessment is carried out by the ward staff, even though planning and implementation of the intra-operative care is carried out by the peri-operative nurse. It is important therefore that pre-operative assessment and care planning is carried out by nursing staff with insight into the risks to the patient during the intra-operative phase. Pre-operative assessment by the operating theatre staff is therefore essential.

2.9.1.2 Intrinsic factors

Intrinsic factors affecting record-keeping are identified as those arising from the nurses themselves. Lack of knowledge or information, and emotional barriers of dissatisfaction with the system of documentation are the major factors identified (Meurier et al 1997:111, Howse et al 1992:374)

Du Toit and Dewar (1990:10), stress the importance of clinical knowledge as the basis for intelligent decision making. This reinforces the previously mentioned motivation for pre-operative assessment and care planning by the operating theatre staff.

Lack of knowledge of the requirements of pre-operative assessment and intra-operative care can cause deficiencies in the entries. Meurier et al (1998:1018), suggest the use of prompts and clinical nursing guidelines in the design of the documentation, to improve the accuracy of record-keeping. A study conducted in an accident and emergency setting showed that the use of proformas in medical practice, for specific conditions, resulted in more accurate and complete medical records (Wallace, Gullan, Bennet, Avila, 1994:74). The use of standard pre-operative assessment, and intra-operative care plans as well as prompting the required entries by using a 'tick-the-box' entry system would assist novice nurses to the operating theatre and ensure accurate, consistent, and relevant documentation.

Emotional barriers to accurate documentation include, dissatisfaction with the design of the document, too much emphasis on content by fear of legal action, and unpopular compulsory requirements by regulatory bodies. Fear of accountability is a barrier to record-keeping where the nurse is unsure of the implications of the entry. Nurses are also reluctant to record information that they feel is undervalued by the doctors (Howse et al 1992:376). Involvement of the users of the documents in their design could alleviate the problem of dissatisfaction with the design of the documents.

2.9.2 Design characteristics of the peri-operative documents reviewed

The predominant design characteristics of the peri-operative documents reviewed are as follows:

- The 'Nursing Process' was used as the foundation for the overall design of the documents.

- The pre-; and intra-operative nursing care plans were standardised, with nursing interventions listed according to potential problems.
- Reducing the length of the document was a major motivating factor in designing new documents. An attempt was made in all cases to keep the documents as short as possible. A maximum of two pages for the intra operative section seemed to be a common goal
- "tick-the-box" or short note formats were used in the design of the majority of the documents.
- Integration of the peri-operative record to include all aspects of care in one document was recommended to encourage continuity of care (Keithley et al 1982: 612-613, Mackie et al 1984: 195-196, Speelman 1985:646, Stanfield 1987: 700-701, Aimino 1987: 84-85, Leuze 1987: 1128-1129, Kendall 1993: 718).

Introduction of the 'Nursing Process' with care plans was a common reason for changing the previously used peri-operative document. This was done in order to comply with the JCAHO requirements (Edel et al 1989:596, Seifert and Grandusky 1990:1008, Shirley 1993:1427). The steps or principles of the 'Nursing Process' were followed in almost all cases. This gives a logical sequence to the document of assessment, planning, implementation and evaluation. Where Nursing diagnoses were used and goals set, the nursing actions required for these were grouped according to their related diagnoses to form standardised care plans. Nursing diagnoses were written in a "potential for/actual risk" format (Shirley 1993:1434 and 1435, Palmerini 1996:239).

A 'tick-the-box' system was used in most cases for as much of the document as possible. This reduces the amount of writing and increases the ease and speed of use. It also ensures that the required information is documented as it is all prompted. This ensures consistency in the type of information recorded and reduces the problems associated with failure to record certain items. Where a 'tick-the-box' system was not possible the nurse was required to fill in a blank space or make short notes but these are kept to a minimum (MacKenzie et al 1988:530, Palmerini 1996:240-242, Shirley 1993:1431).

Palmerini (1996:240) recommends an integrated record in a flow sheet format as it encourages continuity of care from phase to phase. The three-sheet fold out document described in the article includes patient preparation information, and pre-; intra-; and post-operative care. Continuity of care was also cited as the reason for the integrated record designed for the Southwest Texas Methodist Out-patient centre. The record consists of a pre-operative, intra-operative and recovery room record and a patient care plan (Poss

1991:81). This was one of only two records in the literature that included the recovery room section (Palmerini 1996:245, Poss 1991:81).

2.9.3 Design characteristics

In conclusion the design characteristics that have been identified to have an affect on the accurate use of the peri-operative records are the following:

- The length of the peri-operative record, especially the intra-operative section.
- The layout of the document e.g. 'tick-the-box'.
- Standardised nursing care plans used for pre-operative assessment and preparation of the patient for surgery and intra-operative nursing care.
- Integration of the record to include the pre-operative assessment, preparation for surgery, intra-operative care and post-operative evaluation.
- Multidisciplinary entries including the surgeon and anaesthesiologist as well as the nurses' entries.

2.10 CONCLUSIONS

Nursing documentation is the visible, tangible proof of nursing care and it is therefore important that it is used, and completed correctly. Nursing documentation plays an important role in not only providing an accurate record of care given to the patient, but is also an important source of information for quality management, risk management, and financial control.

"Accurate documentation is testimony to the plan and implementation of nursing care for each patient. Patient assessment, nursing diagnosis, patient goals, nursing interventions, and patient evaluation should be included in this documentation" (Spry and Jenkins 1991:740).

Peri-operative nursing documentation is an important communication of the needs of the patient and the nursing care given to meets these needs, or to prevent potential problems. The review of the literature, has shown the importance of pre-operative visits to the surgical patient by the operating theatre nursing staff in order to establish the special needs of the patient during the intra-operative phase. Pre-operative assessment, care planning, documentation of intra-operative care and evaluation of the patient all form vital components of the peri-operative record.

The history of nursing documentation mirrors the development of the professional growth of the nursing profession and its response to the changing environment in which nurses work. Peri-operative nursing records have responded to these changes more slowly than other areas of nursing. Although there have been recent changes in the design of nursing documentation in other parts of the world, the 'Nursing Process' as a problem-solving tool remains the dominant modality used in the peri-operative documentation identified in the literature and is recommended by the South African Nursing Council.

Nursing documents, and especially those used in the operating theatre, need to be dynamic. Changes in technology, nursing theory, politico-economic approaches to health care delivery, and regulatory requirements all affect nursing documentation. It is therefore essential that the documents used to record nursing care in the operating theatre are adapted regularly to correspond with these changes. It is vital however that external influences do not become an overriding factor in the design and content of the peri-operative record to the exclusion of patient and nursing needs.

Peri-operative documentation in the USA has a strong theoretical and standard based foundation that is not evident in South Africa. The emphasis on the use of care plans in the peri-operative setting in the USA and UK is also not evident in South African peri-operative literature. There is a paucity of South African literature on research into peri-operative nursing records and there is scope in this area for future research.

The guidelines for documentation from SATS are not comprehensive and do not cover all nursing interventions in the operating room. There are no stipulated minimum standards for peri-operative records in South Africa and this means that there could be a great discrepancy in the content of these documents from hospital to hospital. A comprehensive standard is needed taking into account differences in practice between South Africa and other countries. Of the standards and recommended practices examined in the literature review, the AORN standard provides the most comprehensive recommendations for the content and design of a peri-operative record. Also there is a strong link between the USA and South Africa in the way peri-operative nurses are trained as the prescribed textbooks in the Western Cape and many other provinces are published in the USA. These are reasons for the suitability of the AORN standard to be used as the conceptual framework for the development of a measuring instrument for this research. This is discussed further in the next chapter.

The variety of peri-operative nursing records reviewed in the literature give research based evidence for making recommendations towards a South African standard. The motivations

found in the literature for redesigning the peri-operative records also apply to practice in South Africa. These are the need to:

- Complete the documentation accurately, in as little time as possible.
- Comply with regulatory criteria.
- Ensure that the documentation is comprehensive and includes all care given in the peri-operative period.
- Incorporate the steps of the 'Nursing Process' to show scientific planning of patient care and evaluation of outcomes.

As identified in the literature, research into peri-operative documentation is largely confined to review of existing documents, and development of new documents. There does not appear to be any published literature on the quality of record-keeping that takes place in peri-operative records, the problems that peri-operative nurses have with the records or the effect of documentation in the operating theatre on patient outcomes. These areas have been researched in nursing areas outside the operating theatre and there is scope for further research in these topics.

Selection of a standard for peri-operative documentation, and the development of the measuring instrument based on the findings of the literature review, are discussed in the discussion of method that follows.

3 METHOD

3.1 OUTLINE OF THE METHOD

Figure 3.1 shows the various components of the method used to research peri-operative records in the Western Cape Metropolitan Health Region.

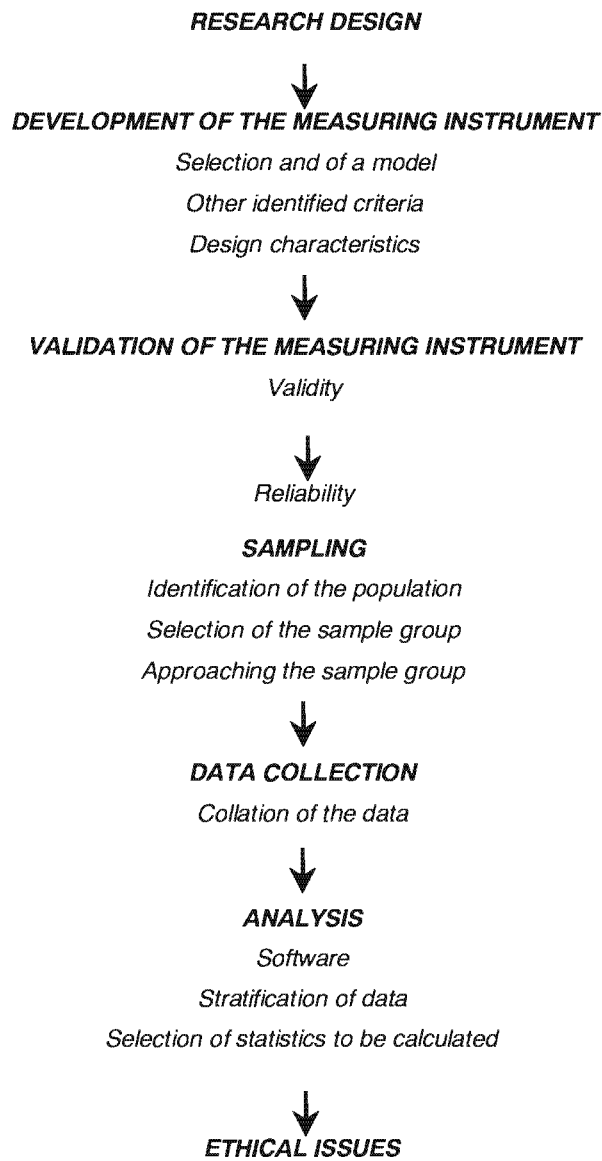


Figure 3.1. Components of the Method.

3.2 RESEARCH DESIGN

A descriptive research design was chosen for the study. Descriptive research is defined by Polit and Hungler (1993:435) as; *"studies that have as their main objective, the accurate portrayal of the characteristics of individuals, situations and groups and the frequency with which these characteristics occur."* This study describes the content and design characteristics of the peri-operative documents used in the Western Cape Metropolitan Health Region. A non-experimental, quantitative design was used as the characteristics are represented numerically and are not changed, or influenced by manipulation of an independent variable.

3.3 DEVELOPMENT OF THE MEASURING INSTRUMENT

The data collection method chosen, was a document survey of peri-operative documents. Document surveys in nursing research usually collect data about patients, or patient care, from the entries made by nurses in the patient records. In this research the design and content characteristics of the record itself were under investigation, not the quality of the care reflected by the entries. Although the design and content characteristics of a document may have an influence on the accuracy of entries made by nurses, accuracy of use was not part of this study. Therefore, problems encountered with the accuracy of information entered into patient records did not have a negative impact on this research. The design and content characteristics may have an influence on the quality of care given as failure to identify potential risks to the patient in the documents could mean that the excluded aspect of care is not carried out. This is discussed further with examination of each of the content criteria in chapter five.

3.3.1 Process plan for development of the measuring instrument:

The following steps were taken in the process of developing a measuring instrument, and are discussed in the following sections:

- Selection of a model for the measuring instrument.
- Selection of content criteria.
- Refinement of content criteria.
- Identification of the design characteristics of the documents.
- Pilot evaluation of a peri-operative record not included in the sample.
- Validation of the measuring instrument.

3.3.2 Examination of peri-operative nursing record content criteria models

In selecting a model for content criteria to evaluate the peri-operative documents used in the Western Cape Metropolitan region, standards set for documentation in South Africa, the UK, Australia and the USA were evaluated. Examination of these recommended standards was discussed in full in the literature review. The merits of each standard are discussed in the following sections.

3.3.2.1 South Africa

In South Africa standards and guidelines for practice in the Operating Theatre are set by SATS. It is not a regulatory body and as such only makes recommendations.

The SATS recommendations have already been discussed in the literature review. (See Appendix A for full details of SATS recommendations.) The recommendations discuss documentation of nursing interventions in the operating theatre as part of the general discussion for each nursing intervention. For instance, in the discussion of the use of electro-surgery (diathermy) the recommendation is made to:

- "Record condition of the skin post-operatively.
- Record the position of the diathermy plate on the patient's record and in the register."

(SATS 1998:48)

This recommendation is however deficient as no mention is made of recording a baseline observation of the condition of the skin before application of the diathermy plate (indifferent electrode).

Not all the nursing interventions performed by the registered nurse in the operating theatre are covered by the SATS recommendations, so another model was sought. The SATS recommendations did however mention the recovery room care, a section that was deficient in all the other standards. Although, it did not give recommendations for documentation in the recovery room, it did outline the observations and nursing care necessary during this phase of care. For the purpose of this research the evaluation is limited to the pre-operative assessment, intra-operative nursing care and immediate post-operative evaluation of the patient and does not include the recovery room stage. The peri-operative nurse, usually the scrub nurse in South Africa, is directly involved in record-keeping in all the previously mentioned stages.

3.3.2.2 United Kingdom

Although the NATN in the UK gives recommendations for care planning strategies and examples of nursing diagnoses, it does not give specific recommendations for the content of a peri-operative record. It was therefore not considered as a suitable model for this study.

3.3.2.3 Australia

The Australian standard, as discussed in the literature review, was more detailed than the two previously mentioned. Although recommendations are not given directly for the content of a peri-operative document, recommendations were made for data that needs to be collected. *"The nurse collects data which has direct implications for the safety of the patient throughout the peri-operative experience"* (ACORN 1989:A3). Emphasis was however on the preoperative assessment phase and the intra-operative section was not as comprehensive.

Of interest is the previously mentioned fact that the USA, AORN standards are cited as a resource in the ACORN, "Standards, guidelines and policy statements" (ACORN 1989:E1). Unfortunately, the manual is not fully referenced and only provides a bibliography so it is not possible to establish the extent of AORN inclusion in Australian recommendations.

3.3.2.4 United States of America

The AORN model provides concise recommendations for content of a peri-operative record, which are not found in any of the other models reviewed. Details of this model have already been discussed in the literature review. A full copy of the standard can be seen in Appendix C. It was the only standard that gave specific details of the minimum content recommended in a peri-operative document.

Motivation for using this standard as the model for the measuring instrument is given credence by the fact that operating theatre nurse training in the Western Cape has close links to the USA system. USA textbooks are used as the foundation for the teaching of operating theatre technique, surgery and patient safety. The recommended books are the latest editions of:

- Gruendemann B, Meeker M. Alexander's care of the patient in surgery, published by Mosby Company.
- Atkinson L J. Fortunato N H. Berry and Kohn's operating room technique published by Mosby Year Book Inc.

Although the Australian recommendations are detailed, the American model was selected as the model for the measuring instrument. As well as the comprehensive nature of the standard, it gives detailed recommendations for content. The operating theatre nurses in the Western Cape are familiar with American standards, techniques and approaches to risk management in the operating theatre. One deficiency of this model is the absence of data related to the care given in the recovery room. Standards for recovery room care in the USA are set by the American Society of Post Anaesthesia Nurses.

3.3.3 Refinement of content criteria

Once the model had been selected it was necessary to refine it into a format that could be used as a measuring instrument. The AORN recommended practices consist of two standards and a list of criteria that are recommended for inclusion in the peri-operative document.

The two standards are as follows:

- "The patient's record should reflect the peri-operative patient's plan of care, including assessment, diagnosis, outcome identification, planning, implementation and evaluation.
- Policies and procedure regarding documentation should be written, reviewed annually, revised as necessary, and readily available within the practice setting" (AORN 1996:1145).

The list of content criteria has already been given in the Literature review and can also be seen in Appendix C.

The second standard was not included in the design of the measuring instrument as the researcher felt that it was not directly related to the design or content of the peri-operative record. It is however, important for any documentation to have an accompanying policy document to explain the use of the document, and this is included in the recommendations discussed in chapter seven.

A list of criteria was compiled from the AORN standard in the order in which they appear. The criteria were listed so that each was a single measure. This involved sub-dividing criteria that were grouped in the standard so as to facilitate meaningful and accurate measurement.

The list was double-checked by the researcher against the standard and errors corrected. A second list was compiled and evaluated by a registered nurse with similar training and experience to the researcher. This was done to ensure that bias had not been introduced as a result of the clinical experience of the researcher.

The criteria were put into a table format, with a Yes/ No option and space for comments. Provision was also made in the measuring instrument for recording content criteria occurring in the peri-operative nursing records reviewed, which were not mentioned by the AORN model.

3.3.4 Identification of the design characteristics of the documents

A quantitative evaluation of the design characteristics of the documents was carried out using the data obtained from the literature review as criteria for evaluation. Review of published peri-operative documents and design barriers to accurate and efficient record-keeping revealed the following design criteria:

- Length of the document.
- Length of the intra operative section of the document.
- Is the document an integrated peri-operative document including pre-; intra-; and post-operative phases of care?
- Is a 'tick-the-box' system used, or is it necessary to write large amounts in long-hand?
- Are the nursing interventions grouped according to nursing diagnosis?
- Can the record be described as multidisciplinary?
- Are different records used for day-surgery patients?

These were added to the list of AORN generated criteria on the measuring instrument.

3.3.5 Pilot evaluation

A peri-operative record no longer in use was chosen to pilot the measurement tool. Problems identified as a result of the pilot evaluation were that the list of criteria was long and not in any particular arrangement. This made the presentation of the results in graphic format and analysis very difficult. In order to facilitate presentation of the results the criteria were grouped according to nursing diagnoses adapted from the AORN outcome standards (Kleinbeck 1996:929-931).

The group labels selected were:

- Pre-operative assessment.
- Potential for injury related to patient positioning.
- Potential for injury related to electrical hazards.
- Potential for injury related to physical hazards.
- Potential for fluid and electrolyte imbalance.
- Potential for infection.
- Potential for injury related to foreign objects.
- General documentation.

Grouping of the criteria was also recommended by one of the experts involved in the validation process. The pilot evaluation allowed the researcher to make minor adjustments to the measuring instrument by re organising the criteria according to the appropriate groups.

3.3.6 Finalisation of the measuring instrument

The measuring instrument was finalised after validation by experts as discussed in section 3.4. (See Appendix D for the finalised measuring instrument.) The final measuring instrument used on the peri-operative documents consisted of a list of grouped content criteria obtained from the AORN model, provision for the inclusion of other identified criteria, and a list of design characteristics criteria as identified by a review of the literature.

3.4 VALIDATION OF THE MEASURING INSTRUMENT

"Validity is a judgement of the extent to which a component of research reflects the theory, concept or variable that the researcher intends" (Seaman 1991:318).

3.4.1 Validity of the measuring instrument.

"Validity refers to whether a measurement instrument actually measures what it is supposed to measure" (LoBiondo-Wood, Haber 1990:251). In order to assess the validity of the measuring instrument, face validity and content validity was measured.

3.4.1.1 Face Validity

Face validity was tested by ten registered nurses working in the operating theatre. Seven were trained in operating theatre nursing science and three had more than two years

experience in operating theatre work. They were working as scrub nurses and in the recovery room at the time of the evaluation. All were working at the same hospital, which is one of those in the study.

All ten were independently shown the list of criteria without any headings or labels. When asked what they thought the list was measuring they replied as follows:

- Peri-operative nursing care/ tasks: 6 respondents.
- Content of a peri-operative nursing record: 4 respondents

This confirmed the face validity of the measuring instrument.

3.4.1.2 Content Validity

Two operating theatre experts assessed the measuring instrument for content validity. Both experts were in senior positions in operating theatres. One was a unit manager and the other the national manager for operating theatres of a large private hospital group. Both were given a copy of the AORN, "Recommended practices for peri-operative documentation" and a copy of the final draft of the measurement tool. The purpose was to ensure that the content in the measurement tool was valid, according to the model selected. Both confirmed the content validity.

3.4.2 External validity of the study

External validity refers to the extent to which the results of the study can be generalised to populations and situations other than those included in the study (Polit and Hungler 1993:436). Standardised, national documents are used by the four largest groups of private hospitals in South Africa as well as the Military Hospitals. These hospital groups are represented in the study and therefore there are a large number of hospitals all over the country to which the results of the study would be applicable.

In the Western Cape, the hospitals controlled by the Provincial Administration of the Western Cape all use the same peri-operative documents. This represents a much larger number of hospitals than those in the Western Cape Metropolitan Health Region.

The results of this study can therefore be generalised beyond the Western Cape Metropolitan Health Region.

3.4.3 Validity of the model/conceptual framework

The process through which the AORN standard is formulated increases the validity of the model chosen. A multidisciplinary committee of peri-operative nurses and representatives from other medical and paramedical organisations develop the AORN Recommended Practices. These organisations are;

- The American College of surgeons.
- The American Society of Anaesthesiologists.
- The Association for Professionals in Infection Control and Epidemiology.
- The American Society of Hospital Central Service Personnel.
- The International Association of Hospital Central Service and Material Management.

The nurse members of the committee are appointed by the AORN President-elect and serve a two-year term. Nurses wishing to serve on the committee make an application to the Executive Department at AORN headquarters and are assessed before appointment.

Each recommended practice to be written or revised is assigned to a peri-operative nurse member of the committee. This nurse studies the existing document and recommendations available, finds new information in the literature, and seeks opinions from experts when new research material is not available. Using all this information the nurse drafts a proposed recommended practice which is critiqued by all members of the committee including the liaisons from the participating organisations. The critique involves a comprehensive evaluation of the proposed recommendation for accuracy, completeness, ease of understanding and flow of information.

After the proposed recommended practice has been critiqued it is placed on the AORN Internet web site, www.aorn.org, for review and public comment. A copy is also sent to every AORN Chapter president and is reviewed by these bodies. AORN has Chapters all over the world.

In conclusion, the final revised recommended practice is published in the AORN Journal and incorporated into the following year's "Standards, recommended practices and guidelines". These are published annually (Fogg 1998:1-5).

3.4.4 Reliability

Inter rater reliability of the measuring instrument was tested by a registered nurse with a Diploma in Operating Theatre Nursing Science. Her qualifications and experience are similar to that of the researcher. She is currently unemployed, so does not owe loyalty to any of the hospitals in the study and therefore the risk of bias is greatly reduced. She assessed three peri-operative documents using the measuring instrument, and the results were compared with those obtained by the researcher.

The peri-operative documents were randomly selected by offering the assessor the range of hospital identity numbers from which to choose. The hospital at which she had worked for the past eleven years was excluded to avoid bias. As she had not worked with any of the other hospital documents, and is unfamiliar with them there was consistency in the evaluation.

Pearson's r correlation coefficient was calculated for each hospital. Pearson's r coefficient calculation measures the significance of the difference between two scores and is appropriate for interval and ratio data. This test is commonly used in the testing of test-retest, and inter rater reliability (Polgar and Thomas 1991:286). There was a significant correlation between the test score, and retest score indicating a high degree of reliability in the measuring instrument. The full calculation and results can be seen in Chapter 4 - Results.

3.5 SAMPLING

3.5.1 Identification of the population

The population chosen was peri-operative nursing records from all hospitals in the Western Cape Metropolitan Health Region. Both public and private hospitals are represented in the study. The extent of the Western Cape Metropolitan Health Region is detailed in the map in Figure 3.2.

Figure 3.2. Map indicating the limits of the Western Cape Metropolitan Health Region.

3.5.2 Inclusion criteria for the population

The eligibility criteria for inclusion in the population were:

- The hospital was located in the Western Cape Metropolitan Health Region.
- The hospital had operating theatre facilities.

A large number of hospitals in the Western Cape Metropolitan Health Region cater for non surgical patients and therefore, were not considered when quantifying the population or selecting the sample.

3.5.3 Size of the Population

According to the "Hospital and nursing yearbook of Southern Africa", (Rotelli 1998:86-97) there are 33 hospitals and clinics with operating theatre facilities in the Western Cape Metropolitan Health Region. This excludes the government day clinics that perform limited out-patient surgery. The population consisted of the peri-operative nursing records used by these hospitals, and not the hospitals themselves. In order to determine the size of the population group it was necessary to determine how many different documents were in use. The 8 Public hospitals use a standardised peri-operative document. These hospitals were therefore counted as 1 in the final available total.

Some of the private hospitals belong to large national groups that use a standardised document. It was therefore necessary to determine to which group they belonged and whether a standardised document was in use. The process of large groups taking over smaller hospitals or groups is ongoing, and negotiations and changes are not always made public. Group loyalties were determined telephonically, and by sending letters of request to all hospitals where the affiliations were uncertain. Twenty-six letters were finally sent and group loyalty ascertained on reply (See appendix E for a copy of the letter). Any changes in affiliation after February 1999 were not taken into account and the research is therefore applicable to the status of the hospitals before this time.

The final available total of independent documents was 17. Therefore the population was 17 at the time of the survey.

Figure 3.3 illustrates the distribution of the hospitals and the number of individual peri-operative records available.

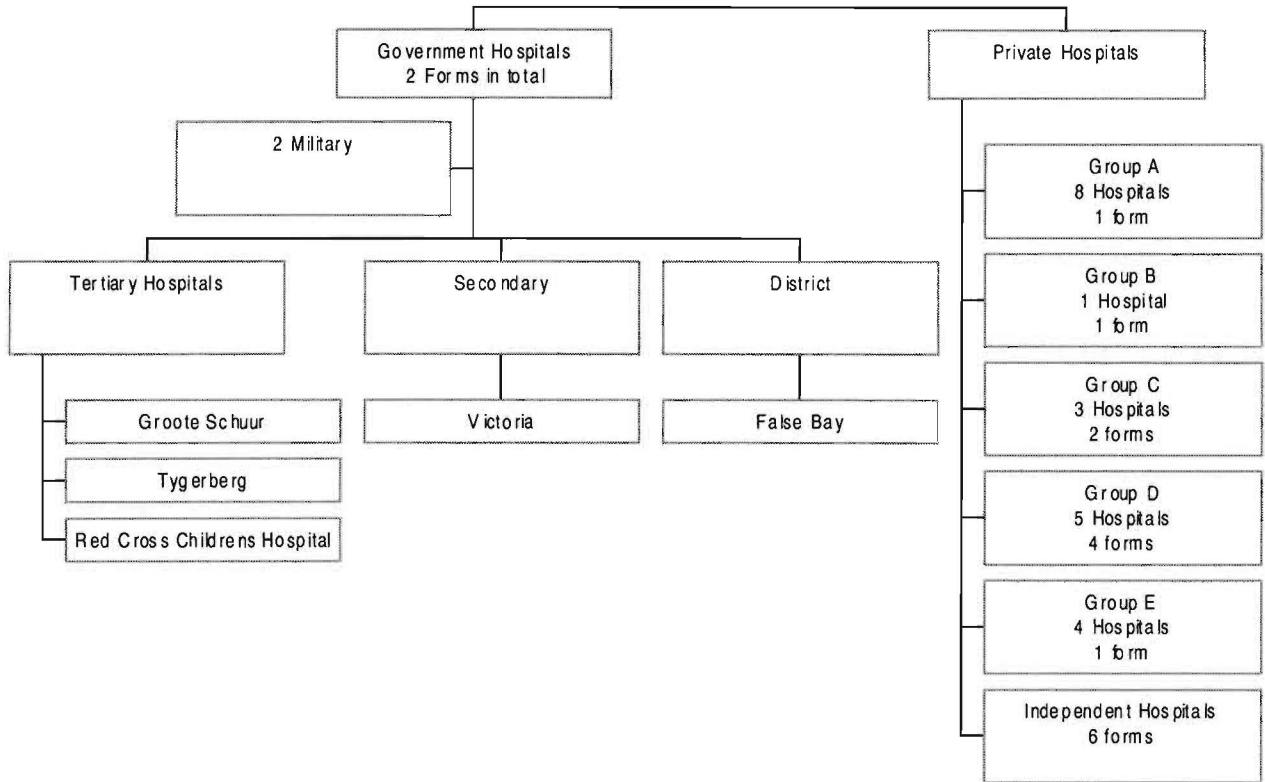


Figure 3.3. Hospital distribution

3.5.4 Method of sampling

A purposive method of sampling was used. This is a non-probability method and these methods are usually not considered as scientifically accurate as probability methods such as random selection, or cluster sampling (Polit et al 1990:176). However, as the population was small the entire population was considered to be the sample group. Bias was therefore not introduced in the sampling process.

3.5.4.1 Sample Size

As the population and the sample group are the same, $n = 17$.

3.5.4.2 Criteria for inclusion in the sample

The criteria for inclusion in the sample group are the same as those for inclusion in the population. An additional criterion is that where there were several hospitals in one group using the same peri-operative records, the closest geographically, and a hospital using English as the predominant language, was chosen. This was for convenience.

3.5.5 Stratification of the sample

The sample was stratified into private (15) and public (2) hospitals, and the private hospitals can be further stratified into those that deal with day cases, or out-patient (4) surgery only, and those that handle in-patient as well as out-patient surgery. Both the public hospitals are in-patient facilities so the total number of in-patient hospitals was 13. The sample was stratified in this manner in order to facilitate data analysis. Comparisons between the different strata are made in the analysis of the findings.

Figure 3.4 illustrates the stratification of the sample.

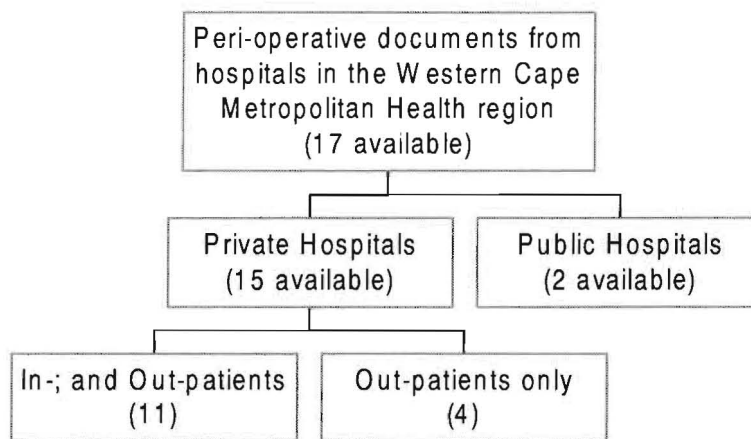


Figure 3.4. Stratification of the sample

3.5.6 Obtaining the sample

A letter requesting permission to use the hospital documentation was sent to the different hospitals (See Appendix E). A database of surgical facilities in the Western Cape Metropolitan Health Region was set up, and a mail-merge program facilitated the addressing of each letter to the hospital concerned, and to the appropriate person within the facility.

The letters were addressed to the nursing service manager and the operating theatre unit manager. The nursing management was targeted initially, and if requested, a further letter was sent to the Hospital Administration. Despite the fact that all the Provincial Administration hospitals use the same form design, a letter was sent to the three tertiary hospitals, and to a secondary and a district hospital. This was done to ensure that there was no variation in the structure of the document between the district, secondary and tertiary hospitals. It was discovered that all the Provincial Administration hospitals in the Western Cape use a common pre-operative assessment and intra-operative record.

Follow up telephone calls were made to those hospitals that had not replied a month after the letters had been posted. It was necessary in many cases to reiterate the fact that the documents requested be blank copies, and that patient details would not be needed. Requests for copies of the proposal for the study and a letter from the University showing approval for the study were requested by some of the hospitals. These were supplied on request.

The Provincial Administration hospitals gave permission after the Medical Superintendents at two hospitals had viewed the proposal. Permission from the Medical Services of the South African National Defence Force came from the Director of Nursing in the South African Military Health Service, Pretoria. The request was forwarded to Defence Intelligence, who refused permission to use patient details from documents. As this was not part of the study it was not applicable.

Permission was refused by three of the private hospitals. Concerns about confidentiality were given as the reason for refusal. In spite of assurances of confidentiality, they continued to withhold permission. These hospitals are independently owned and do not belong to any of the large private hospital groups, although two are linked to each other and all three have a close working relationship.

In all, 14 of the 17 hospitals approached responded positively to requests for peri-operative documentation. The process of gaining access to the sample participants took longer than anticipated; a total of four months.

3.6 DATA COLLECTION

Each of the received peri-operative nursing documents was evaluated against the measuring instrument. Physical data such as medical history, surgical history and nursing assessment according to body systems was recorded in most cases in the admission assessment record. The pre-operative assessment and checklist in the peri-operative record is usually limited to data that is directly relevant to the surgical experience and preparation of the patient for surgery. For this reason the admission assessment record was included in the review of the peri-operative record. Medical records such as the surgeon's report, and anaesthetic records were not considered in the evaluation. The evaluation was confined to nursing records and multidisciplinary documents that are used to record nursing care in the pre-operative and intra-operative phases. The process was repeated four times by the researcher with a time space of at least two days between each evaluation. This was done to ensure that no omissions had occurred. When the scores of two consecutive evaluations correlated then the results were finalised.

3.6.1 Collation of the data

The data was separated into the following categories:

- AORN criteria.
- Criteria not covered by the AORN standard.
- Design characteristics of the peri-operative records.

Each group of data was analysed separately. The AORN criteria were grouped according to the previously mentioned nursing diagnoses and the frequency of occurrence across the fourteen hospitals noted. See appendix F for raw data and appendix G for collated raw data.

3.7 ANALYSIS

3.7.1 Software

3.7.1.1 Database

A database of the hospitals was set up in Microsoft Access and the following criteria used as fields:

- Name of the hospital.
- Address.
- Telephone number.
- Fax Number.
- Contact person.
- In-patient or out-patient
- Private or public.

The database facilitated the use of a mail-merge program to address each letter of request personally to the hospital and individual concerned. An identity number was randomly assigned to each hospital automatically by the program. This was important for control of the data and it ensured confidentiality when presenting the results.

3.7.1.2 Data collection software

A form was set up in Microsoft Access to facilitate the collection of the data. The AORN criteria from the measuring instrument were used in the creation of this form. This was linked to a spreadsheet in Microsoft Excel in order to create graphs and to perform calculations. The frequency of occurrence of the criteria was indicated for each hospital as a binary scale (1 or 0). Separate spreadsheets were set up for the criteria not covered by the AORN criteria and the design characteristics of the peri-operative records.

3.7.2 Stratification of data

The data was stratified according to the divisions described in the stratification of the sample:

- Public/Private
- In-patient/Out-patient

Indication of the stratification was given in the database program and this facilitated analysis of the different strata.

3.7.3 Explanation of the content and design characteristics criteria

In order to evaluate each of the peri-operative records against the measuring instrument it was necessary to define the criteria. A yes/no response was used necessitating the indication of requirements for compliance with each criterion. Comments were made on the measuring instrument about each criterion, as the yes/no answer did not always give enough information about individual differences. As the sample group was small, each criterion was examined in further detail in the discussion of the findings. This would not have been possible with a large sample and the use of a graded scale of measurement for each criterion would have been more appropriate.

3.7.3.1 Evidence of pre-operative assessment

Any evidence of preoperative assessment and preparation for surgery was taken as presence of this criterion. Evidence of pre-operative assessment was sought in the admission record, as well as the peri-operative record, as the assessment performed by the ward staff with relevance to surgery is often not repeated.

3.7.3.2 Physical data

Pre-operative assessment of physical data includes the medical history, surgical history, anaesthetic history, vital signs and checklist for preparation for surgery.

3.7.3.3 Emotional data

Data relating to the emotional status of the patient and anxieties expressed. Any record of attempts to alleviate anxiety by education of the patient or other means was also taken as evidence of this criterion.

3.7.3.4 Psychosocial data

Examples of psychosocial needs of a patient are:

- Security: Patients need to feel safe, in the care of people whom they can trust. They need to feel protected, reassured, comforted and cared about.
- Acceptance by others: People need empathetic understanding of their feelings, both negative and positive.
- Recognition of the individual worth of the patient: Respect needs to be paid to the cultural values, religious beliefs, race and socio-economic status of each patient.
- Self-actualisation: People need to be productive, make their own choices and decisions, and have control over their behaviour and environment (Atkinson et al 1996:99).

Psychosocial data was therefore taken as any data relating to the above.

3.7.3.5 Nursing Diagnosis

Any evidence of the use of standard nursing diagnoses in the design of the record, or a request for individualised diagnoses was proof of this criterion.

3.7.3.6 Care Plan devised

Care plans in the pre-, intra-, and post-operative phases were all taken into consideration. In the analysis these were separated out and the importance of intra-operative care plans discussed.

3.7.3.7 Presence of sensory devices

Presence, or removal of sensory aids was considered. Sensory aids were taken to include hearing aids, contact lenses and spectacles.

3.7.3.8 Presence of prosthetic devices

Prosthetic devices included dentures, caps and crowns as well as artificial limbs, eyes and orthotic devices. Internal prostheses such as orthopaedic devices and heart valves were also considered. Mention of any of these prostheses ensured compliance with the criterion.

3.7.3.9 Skin condition pre-surgery

A base line assessment of the skin condition prior to surgery was required. Assessment of the general skin condition, presence of bruises, breaks in the skin, septic foci and the condition of the pressure areas is important. If the patient's skin condition has not been examined pre-operatively then any lesion discovered post-operatively must be presumed to have occurred during the surgery. Any mention of skin condition pre-operatively ensured compliance.

3.7.3.10 Position of the patient

Evidence of a record of the position or positions that the patient was placed in during surgery fulfilled this criterion. The common positions used are; supine, Trendelenburg's, reverse Trendelenburg's, Fowler's, sitting, lithotomy, prone, jack-knife, knee-chest, lateral kidney, lateral chest positions and Sim's recumbent (Atkinson et al 1996:443).

3.7.3.11 Positioning devices used

Equipment used in the positioning of the patient is designed to stabilise the patient in the desired position, protect the patient from harm and provide exposure to the surgical site (Atkinson et al 1996:439). Any mention of straps, padding, supports or other positioning devices fulfilled this criterion.

3.7.3.12 Method of transfer

The patient may be transferred to and from the operating theatre on a trolley, a bed, or even a wheelchair, as may occur in an out-patient facility. In out-patient units the patient may also walk to the operating room.

3.7.3.13 Position of indifferent electrode

In South Africa the indifferent electrode is referred to as the diathermy plate. It is the grounding electrode for a monopolar electro-surgical unit. It may also be called the inactive or dispersive-electrode (Atkinson 1996:266). The position of the indifferent electrode is relevant, as it should be placed as close to the surgical site as possible to facilitate grounding. It should not be placed over a joint, broken or wet skin or over a metal prosthesis and must make contact with the skin over the entire area of the electrode (Atkinson 1996:269). Mention of the position of the indifferent electrode was required.

3.7.3.14 Electro-surgical unit identity and settings used

As part of the risk management in the operating theatre the electro-surgical units should all be identified. This facilitates control of the regular servicing of the units and enables the repairs and problems encountered to be recorded and followed up. Any mention of the identity of the unit and the settings used were considered.

3.7.3.15 Skin condition before and after

These two criteria refer to the condition of the skin prior to application of the indifferent electrode and after removal. As a part of risk management this is necessary, as there is a danger of burns occurring at the site of the indifferent electrode.

3.7.3.16 Use of Temperature control devices

Temperature control devices may be used to maintain body temperature by warming or may be used to induce hypothermia where this is necessary for the type of surgery. The devices may be external such as electric under-blankets, water blankets or hot air blowers or they may be systemic where an extracorporeal circulation is either cooled or warmed (Atkinson 1996:338, Wehmer, Baldwin 1986:789). All these devices were taken into consideration in evaluation of this criterion.

3.7.3.17 Temperature of the patient

Any record of the patient's temperature during the intra-operative phase was proof of this criterion. The baseline temperature taken preoperatively was not considered as this criterion is linked to the use of temperature control devices during the intra and post-operative periods. Only the peri-operative nursing record was considered and recording of temperature on other documents was not taken into account.

3.7.3.18 Use of lasers

Several different types of lasers are used for different modalities of surgery depending on the wavelength of the light. The most common lasers used in surgery today are, Argon, Holmium YAG, Neodymium YAG, Excimer, Carbon Dioxide, Ruby and Tuneable dye lasers (Atkinson 1996:274) Any mention of laser use was taken into consideration when evaluating this criterion.

3.7.3.19 Placement of ECG electrodes

Any description or graphic representation of the placement of the ECG electrodes during the intra-operative period was taken into consideration.

3.7.3.20 Placement of the tourniquet

The limb, position of the limb and side was necessary to comply with this criterion.

3.7.3.21 Time on and off recorded and pressure settings

The time of application and removal of the tourniquet as well as the pressure settings of the tourniquet were considered in the evaluation of these two criteria. Correct pressure is the amount needed to produce a bloodless field and is usually 30 to 70 mm of mercury higher than the systolic blood pressure in an adult. The time is important as necrotic effects and neuro-vascular damage may occur after continuous inflation times of more than an hour and a half (Atkinson et al 1996:275).

3.7.3.22 Intra-operative X-rays and/or Fluoroscopy

X-rays and fluoroscopy present a radiation danger to the patient and the staff in the operating theatre. Any evidence of recording these two criteria was considered.

3.7.3.23 Position of the blood pressure cuff and oximeter probe

Diagrammatic representation or description of the position of the blood pressure cuff and oximeter probe was taken into consideration for compliance with these two criteria. An automatic non-invasive blood pressure cuff is usually used, and is set to take a reading at least every five minutes.

3.7.3.24 Administration of blood and blood products, medications used, and irrigation solutions

Mention of the use of blood, blood products, medications and irrigation solutions was assessed in the peri-operative nursing record only. The anaesthetic record and any other documents were not taken into consideration.

3.7.3.25 Skin preparation

In assessing this criterion the type of preparation solution used was considered. Only skin preparation during the intra-operative phase was considered, as pre-operative skin preparation was part of the pre-operative assessment and preparation.

3.7.3.26 Drains and catheters used

Any mention of the type and site of drains and catheters used intra-operatively was used in evaluation of these two criteria.

3.7.3.27 Plugs/wound packing and dressings used

These two criteria are also self-explanatory. Any mention of the type and site of plugs and the type of dressings applied during surgery were taken into account in evaluation of these criteria.

3.7.3.28 Wound classification

Any classification of the surgical wound was considered in assessment of this criterion. Surgical wounds are classified according to the degree of microbial contamination. The classification recommended by the AORN and published in several books on operating theatre technique is clean, clean contaminated, contaminated and infected. The explanation of each of these descriptions is as follows:

- **Clean:** A clean wound is a surgical wound that is primarily sutured and does not involve cavities with microbial flora. The expected infection rate is 1% to 5%.
- **Clean contaminated:** A surgical wound that has involved the opening of a cavity with normal microbial flora such as the gastro-intestinal, respiratory and genito-urinary tracts. For example, an abdominal hysterectomy would be classified as clean contaminated as the vagina is opened. If the bowel has been opened but is well prepared and spillage of bowel contents does not occur the wound is considered to be clean contaminated. The expected infection rate, is 8% to 11%
- **Contaminated:** All trauma wounds are considered contaminated. If there is spillage of bowel contents or a break in the aseptic technique the wound is classified as contaminated. The expected infection rate is 15% to 20%

- **Septic/Infected:** There is evidence of inflammation and/or pus present. Organisms are present before the commencement of surgery. The expected infection rate is 27% to 40% (Atkinson et al 1996:526).

Classification of the wound indicates the infection control nurse an idea of which patients to monitor more closely for signs of post-operative infection.

3.7.3.29 Implants and radio-active implants used in surgery

Implants used in surgery include but are not limited to the following:

- Joint replacements.
- Plates, screws, and pins for fixation of bones.
- Heart valves.
- Dental and maxillo-facial implants.
- Intra ocular lenses
- Silicone implants such as breasts, finger and toe joints and cosmetic facial implants.
- Vascular patches and replacements for arteries.
- Cochlea implants for hearing.

Radio-active implants emit alpha and beta particles and/or gamma rays and are implanted for therapeutic purposes in the treatment of malignancy (Atkinson et al 1996:145). They require special handling by the operating theatre staff and specialised post-operative care of the patient (Atkinson et al 1998:925).

Any evidence of implant type and radio-active implants was taken as evidence of these criteria.

3.7.3.30 Swab, instrument and needle/sharps count

If there was evidence of a swab count this criterion was acknowledged. Since it is not standard in practice in South Africa to record the instrument and needle count these were not requirements. Instruments are counted and recorded as correct on the instrument tray control slips supplied by the Central sterilising supply department. Needles are counted by the scrub nurses alone and are recorded by some of the hospitals. The mention of swab, instruments, and needle counts are individually discussed in detail in the discussion of the findings.

3.7.3.31 Specimen collection

Any record of collection of specimens including type of specimen, site of removal and test required was considered in evaluation of this criterion.

3.7.3.32 General documentation

The criteria in this group could not be placed with any of the nursing diagnoses and were thus grouped together as general documentation. The criteria are self explanatory and are:

- Type of anaesthetic.
- Time of discharge from the operating room.
- Names of persons providing care.
- Critical incidents occurring intra operatively.

In total there were 44 content criteria in the measuring instrument. The following is an explanation of the requirements for compliance of the design characteristics.

3.7.3.33 Length of the document and length of the intra-operative section

The length of the document was measured as sides of pages. Where the document was integrated with other relevant documents such as the consent form, these were also counted into the total. The length of the document has a bearing on the time spent completing the record-keeping process and has an influence on efficiency in the operating theatre.

3.7.3.34 'Tick-the-box' format

Compliance with this criterion was ensured if more than two thirds (66%) of the document was formatted as a checklist, "tick-the-box" or short 'fill-in-the-blank'. Long narrative notes did not meet this criterion.

3.7.3.35 Integrated record

If all components of the peri-operative record were together in either a foldout sheet or booklet format, then the document complied with this criterion. Components necessary to meet the criteria were, pre-operative assessment, pre-operative preparation for surgery, intra-operative nursing care, and post-operative evaluation. The inclusion of the admission

record or repetition of admission assessment information in the peri-operative record was noticed as an incidental finding and was noted for discussion.

3.7.3.36 Multidisciplinary record

If other members of the surgical team, such as the anaesthesiologist and/or surgeon used the peri-operative record, then it was considered to be multidisciplinary. This only applied to the records that were integrated as all the hospitals supplied anaesthetic records and some have separate surgeon's reports.

3.7.3.37 Nursing interventions in the pre-operative phase grouped according to nursing diagnosis

In order to comply with this criterion the pre-operative assessment and preparation for surgery had to be designed as a care plan with nursing diagnoses or potential problems listed, and interventions listed according to these diagnoses.

3.7.3.38 Nursing interventions in the intra-operative phase grouped according to nursing diagnosis

The above applies equally to the intra-operative phase.

3.7.3.39 Separate documents for out-patients

In an initial review of the documents it was noticed that some hospitals had separate records for day-surgery cases. If a different type or style of document was used for day-surgery patients in the pre and intra-operative phases then this criterion was indicated as present.

3.7.4 Selection of statistics to be calculated

The frequency of compliance with each criterion was calculated and presented in table and graph format. The criteria were grouped and for each group the average, median, standard deviation and variance were calculated across all the hospitals. Standard deviation gives an indication of the distribution of scores around the average. This gives an indication of the spread of scores. Variance was necessary for the calculation of the *t*-test. The *t*-test was used to calculate the significance between the different strata of the sample.

For each hospital the average, median and standard deviation were calculated over all the groups of criteria. Since the number of criteria in each criteria group varies, the weighted

average was also calculated by weighting each criteria group average score by the number of criteria in each group. Since the number of criteria in each group only varied from 3 to 8, the difference between the arithmetic average and the weighted average was not great. The arithmetic average takes the total result of the groups added together and divides by the number of groups, whereas the weighted average is the sum of all the criteria results divided by the number of criteria. Since the weighted average is the most accurate calculation it was used to formulate the graphs comparing the average score of each hospital with the average score across all the hospitals.

The difference between the different strata of the sample group was also calculated. The *t*-test was used to calculate whether there was a significant difference between the public and private hospitals as well as between the hospitals with in-patients and those that cater for out-patients only.

Criteria scoring four or less out of the possible total of fourteen were identified for discussion as critical areas. This score represents a result of less than 30%.

3.8 ETHICAL ISSUES

This study does not deal with human subjects and as such does not have as many ethical considerations as one that does. However, this does not exclude the need to examine the ethical considerations involved.

The Belmont Report identifies three primary ethical principles on which to base the standards of ethical conduct: beneficence, respect for human dignity and justice (Polit and Hungler 1993:355). Since the study involves a sample group of documents and not people, the principles of beneficence and respect for human dignity do not initially appear to apply. However there is a human component involved in the study as the designers of the peri-operative documents have invested time and effort into the documents and the users of these documents have a loyalty to the organisation that employs them. The applicable ethical considerations identified were as follows:

3.8.1 Principle of Beneficence:

The principle of beneficence encompasses the maxim: "Above all do no harm" (Polit et al 1993:356).

3.8.1.1 Risk/benefit ratio

In consideration of the risk/benefit ratio it was recognised that there are risks of, loss of privacy, and exposure of inadequate record-keeping practices in the hospitals involved in the study. This can be weighed against the benefits that the study will have for all the hospitals involved. It will help the hospitals to identify areas in their peri-operative documents that are inadequate and are potential medico-legal risks. The recommendation of a set of standards for peri-operative documents will aid the hospitals in the design of their own documents and improved documents will have a positive effect on patient care. The perceived risks were not considered to outweigh the benefits. The participant hospitals were made aware of the risks and benefits before participation in the study.

3.8.2 Principle of respect for human dignity

The principle of respect for human dignity includes the right to full disclosure and consent (Polit et al 1993:259)

3.8.2.1 Right to full disclosure

Full details of the nature of the research and the implications for the research were given to the hospitals. Some hospitals requested a copy of the protocol and this was supplied. A report of the findings of the study was promised to each hospital that agreed to participate.

3.8.2.2 Consent for the use of hospital documentation

As full disclosure was given with regard to the nature, implications and risk/benefit ratio of the research, the hospitals approached were able to make an informed decision about whether to participate in the research or not. Verbal and written consent was obtained from the relevant nursing and administrative management of the hospitals participating in the research. Consent was given voluntarily and without coercion.

3.8.3 Principle of justice

The principle of justice includes the subject's right to privacy and to fair treatment (Polit et al 1993:363).

3.8.3.1 Confidentiality of the hospitals taking part in the study

The hospitals were promised the right to confidentiality. Confidentiality was ensured by randomly assigning the hospitals an identity number using a database program. The names of the participating private hospitals were not mentioned in the report, either in the selection of the sample or the results. However it was necessary for the researcher to know the identity of the hospitals in order to give feedback to them on their individual results.

3.8.3.2 Security of the documents

The largest portion of the sample group is taken from private hospitals. Since these are operated as businesses and are in competition with each other it was important to ensure that the documents were kept secure. The hospitals have invested time and money in the design of their documentation and do not allow these documents to be viewed without permission from their head offices. Only the researcher and the person testing inter rater reliability had access to the peri-operative documents. The registered nurse trained in operating theatre nursing science who tested for inter rater reliability is unemployed at the moment so does not have loyalties to any of the hospital groups. Some of the hospitals requested that a promise of security, or an indemnity be signed before the documents could be released.

4 RESULTS

The purpose of this chapter is to present the results of the initial analysis of the peri-operative documents received. Interpretation and discussion of results is carried out in the following chapter.

4.1 RESPONSE RATE

Of a population of 17 independent records, a sample of 14 was obtained i.e. 82% of the population participated in the survey. The sample group, although small, represents a much larger number of hospitals, as there were a number of institutions using the same peri-operative records. Table 4.1 shows the characteristics of the sample in order of records received.

Table 4.1. Sample characteristics

Hospital ID	Public/Private	In-patient/Out-patient
3	Private	In-patient
13	Public	In-patient
8	Private	In-patient
12	Private	In-patient
16	Private	Out-patient
1	Private	In-patient
21	Public	In-patient
7	Private	In-patient
9	Private	In-patient
15	Private	Out-patient
23	Private	Out-patient
24	Private	In-patient
19	Private	In-patient
26	Private	Out-patient

4.2 INTER RATER RELIABILITY TEST RESULTS

Pearson's correlation coefficient was calculated to evaluate inter rater reliability of the measurement instrument. The calculation method was based on that described by Polgar and Thomas (1991:286) and the significance level and rejection region were taken from correlation tables. Table 4.2 shows the scores achieved in the reliability test.

Table 4.2. Total scores of the reliability tests

HOSPITAL IDENTITY	8	1	9
TEST SCORE	12	26	31
RETEST SCORE	10	25	34

4.2.1 Calculation of Pearson's Correlation coefficient

Null Hypothesis:

There is an insignificant correlation between the test and retest scores.

Alternative Hypothesis:

There is a significant correlation between the test and retest scores.

Significance level:

Selected to be 5%, which is a significance level generally accepted by statisticians. The significance level is an indication that the conclusions drawn from the calculation are 95% correct.

Calculation of rejection region:

There are 3 pairs of observations; the degree of freedom is therefore equivalent to $3 - 2 = 1$
(Degree of freedom = Number of observations - Number of independent variables)

The critical value from the correlation tables = 0.9969 (correct for 5% significance level).

Therefore the rejection region = 0.9877 to 1.0000

Calculation of correlation coefficient: The correlation coefficient is calculated to be 0.9923

Conclusion: The correlation coefficient falls in the rejection region. The null hypothesis is therefore rejected. The correlation between the test and retest is therefore significant. Therefore, the instrument is reliable when used by a second evaluator.

4.3 RAW DATA

See Appendix F for raw data.

The raw data was separated into three categories:

1. Data related to AORN criteria.
2. Other content criteria discovered in the records, not identified by the AORN model.
3. Design characteristics of the records according to prescribed criteria.

The data related to the AORN criteria was grouped according to the following criteria groups:

- A:** Pre-operative Assessment
- B:** Potential for injury related to patient positioning.
- C:** Potential for injury related to electrical hazards.
- D:** Potential for injury related to physical hazards.
- E:** Potential for fluid and electrolyte imbalance.
- F:** Potential for infection.
- G:** Potential for injury related to foreign objects.
- H:** General documentation.

For each criteria group the average, median, standard deviation and variance was calculated as a score and as a percentage. See appendices G and H for results of the calculations according to grouping of the data.

4.4 RESULTS BY CRITERIA GROUPING

4.4.1 Overview

Figure 4.1 shows the average group criteria score for the entire sample. The total average score for all criteria groups is 52%. A large variation in scores is evident, and these will be discussed later.

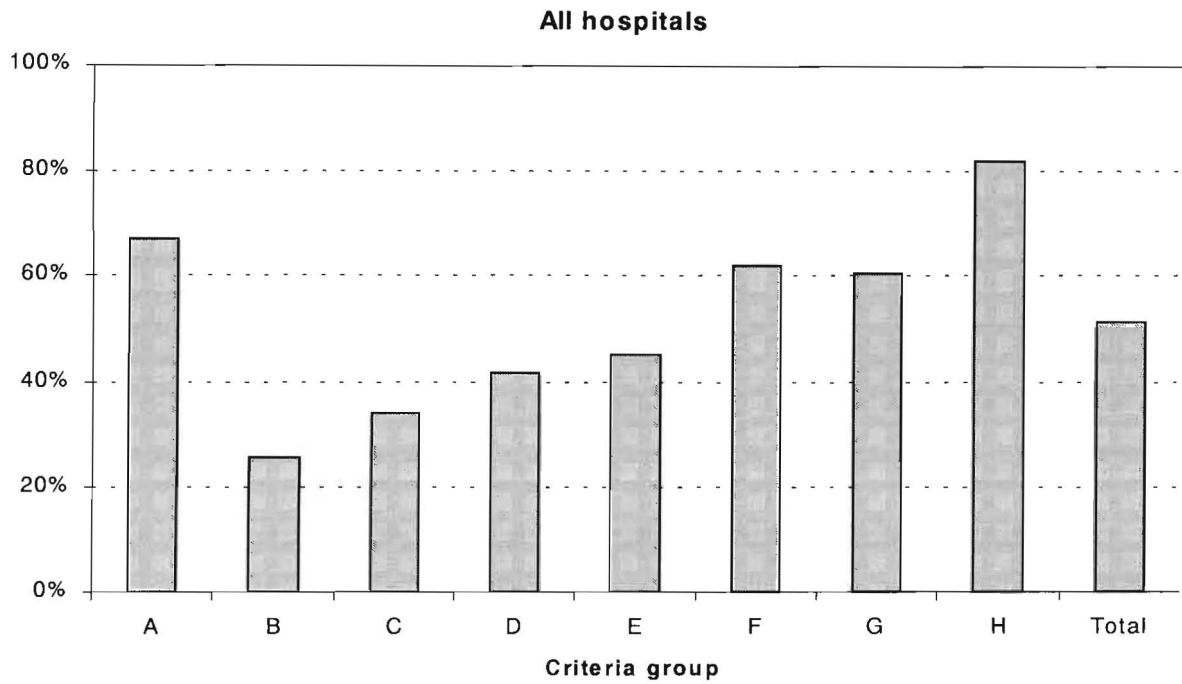


Figure 4.1. Average criteria group scores (see previous page for key to the criteria groups)

The number of hospitals compliant with each criterion within criteria groups and the scores of each hospital for each criteria group are shown in the following sections. The underlying raw data is shown in appendix F and the criteria group average scores and standard deviations can be seen in Appendices G and H.

4.4.2 Pre-operative assessment

Figure 4.2 shows the number of hospitals compliant for each of the pre-operative assessment criteria. A wide range of scores is evident for each criterion, with all hospitals complying with three of the criteria and only two hospitals complying with one of the criteria. Data related to planning for intra-operative care, such as nursing diagnosis and care plans score relatively low in contrast to collection of assessment data.

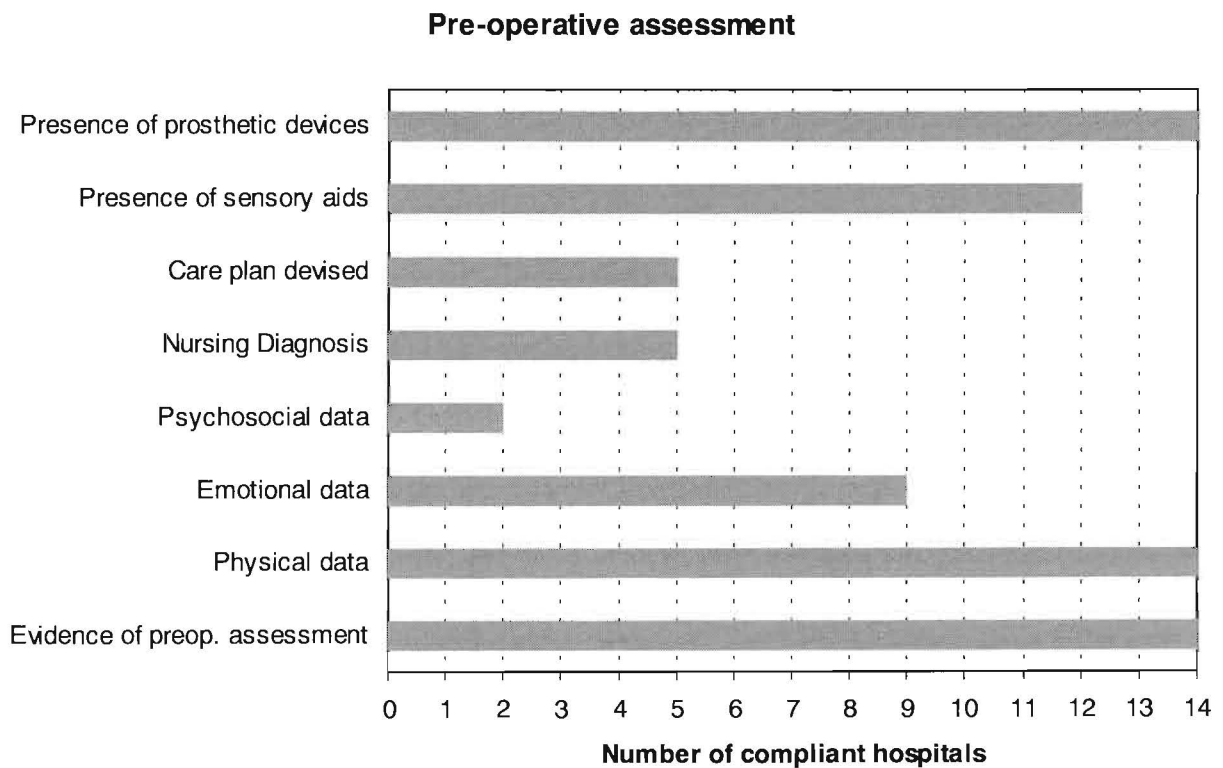


Figure 4.2. Pre-operative assessment criteria compliance

Figure 4.3 shows hospital scores for pre-operative assessment across all the hospitals. For criteria group A, pre-operative assessment, the average score for a hospital is 67% compliance with the criteria, and is the second highest scoring group. The standard deviation for this group of criteria is 14%, which is low compared to standard deviations for the other criteria groups. The range of scores is from 50% to 100%.

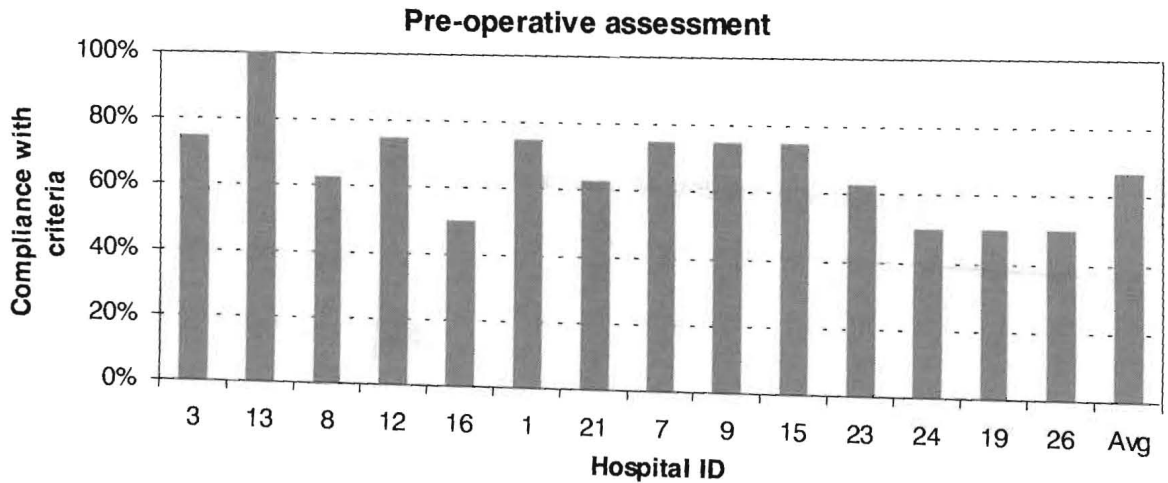


Figure 4.3. Preoperative assessment group compliance by hospital

Figure 4.5 shows the scores for injury related to patient positioning for all the hospitals. The overall compliance with the criteria in this group, at 26%, is very low. This is disturbing, as positioning is an area of potential risk to every surgical patient. Six hospitals did not record any information related to positioning. Only one hospital scores above 60%.

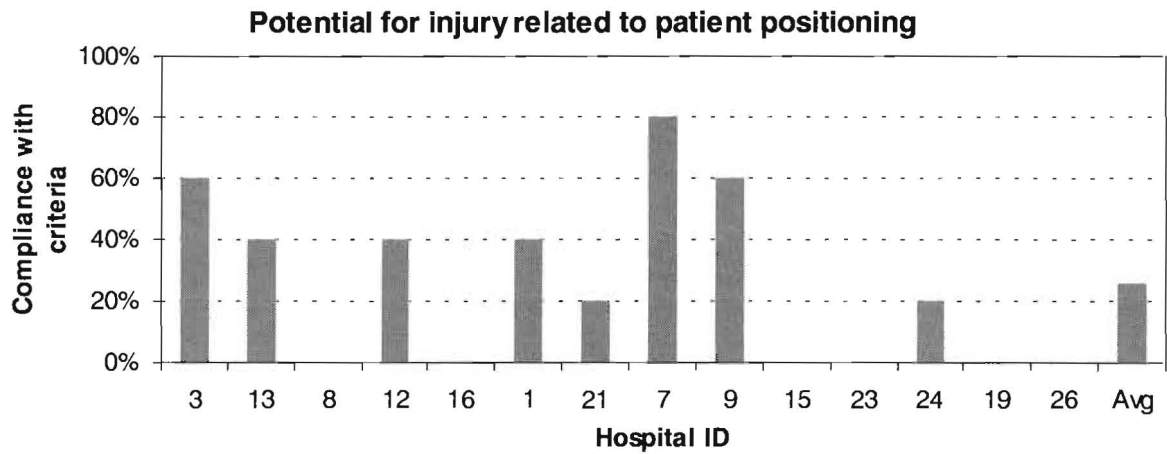


Figure 4.5. Potential for injury related to patient positioning group compliance by hospital

4.4.4 Potential for injury related to electrical hazards

Figure 4.6 shows hospital scores for potential for injury related to electrical hazards. Eighty six percent, or 12 of the 14 hospitals record the position of the indifferent electrode although there is not a corresponding compliance with other aspects of the electro-surgical unit use.

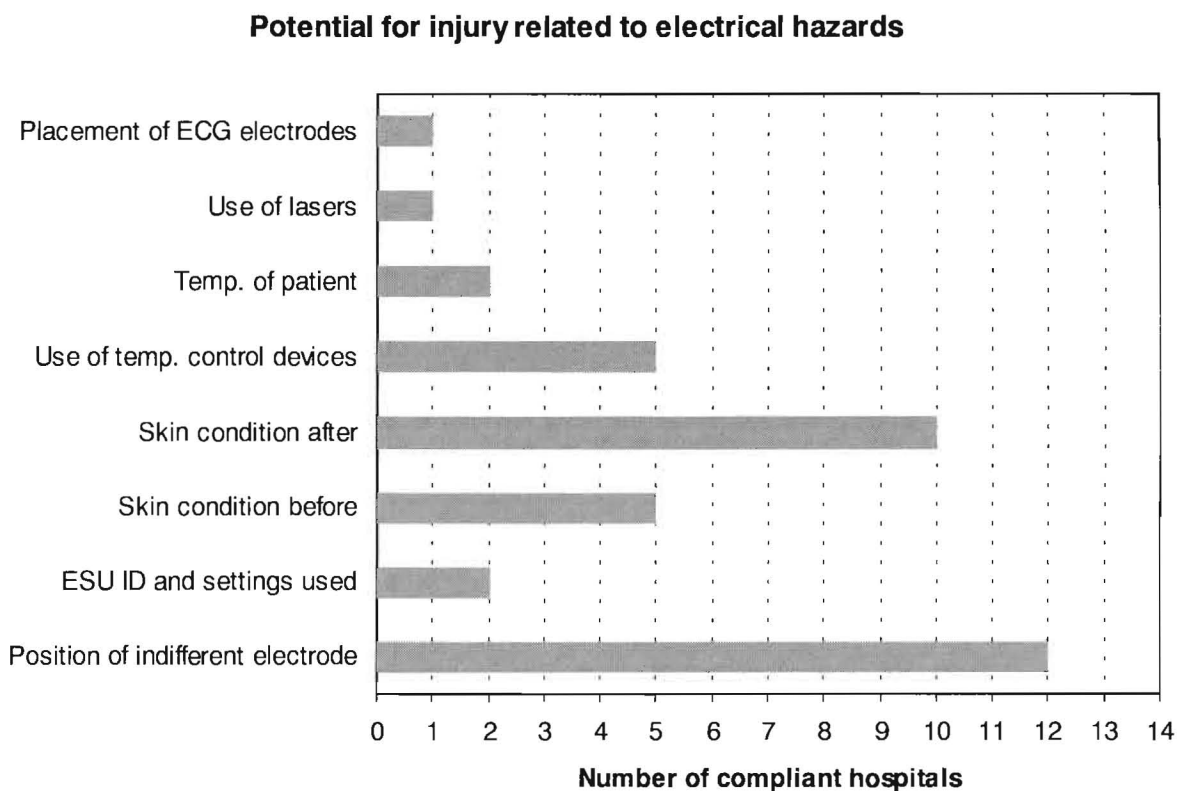


Figure 4.6. Potential for injury related to electrical hazards criteria compliance

Figure 4.7 shows the scores for potential for injury related to electrical hazards across all the hospitals. The mean score for criteria in this group is 2.7 out of 8, representing 34%. This is very low when one considers the common usage of electrical devices in modern surgery and the inherent dangers that these devices present to the patient. The standard deviation is 22%, which is high as the range of scores is from 0% to 88%. The hospital scoring 0% is an out-patient clinic, which caters for mostly ophthalmic surgery. They have different peri-operative records for the ophthalmic and other surgery but as both these forms were taken into consideration the fact that ophthalmic surgery does not use an electro-surgical unit could not be a mitigating factor.

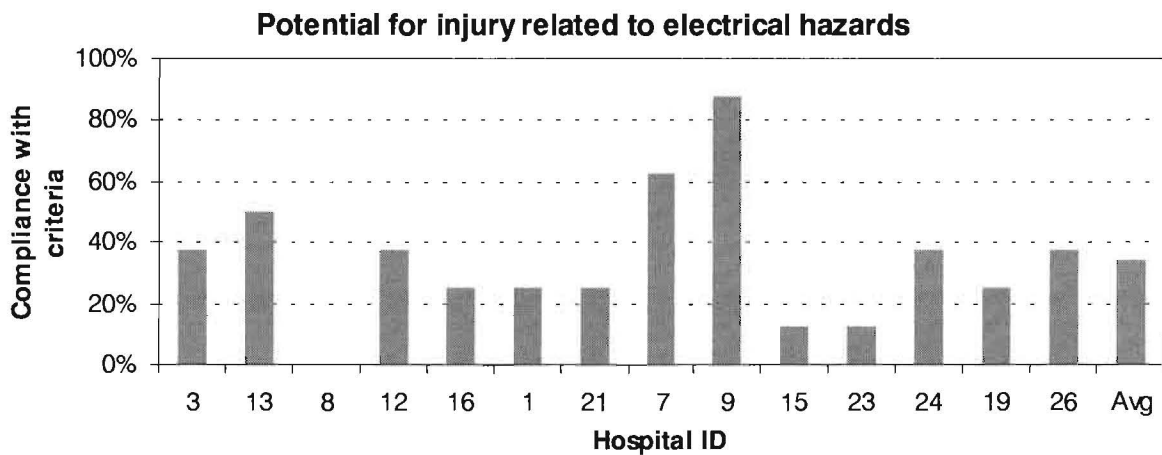


Figure 4.7. Potential for injury related to electrical hazards group compliance by hospital

4.4.5 Potential for injury related to physical hazards

Figure 4.8 shows hospital scores for potential for injury related to physical hazards. There is a wide range of scores in this group with the position and time of the tourniquet scoring the highest. Positioning of monitoring devices was recorded by only one hospital.

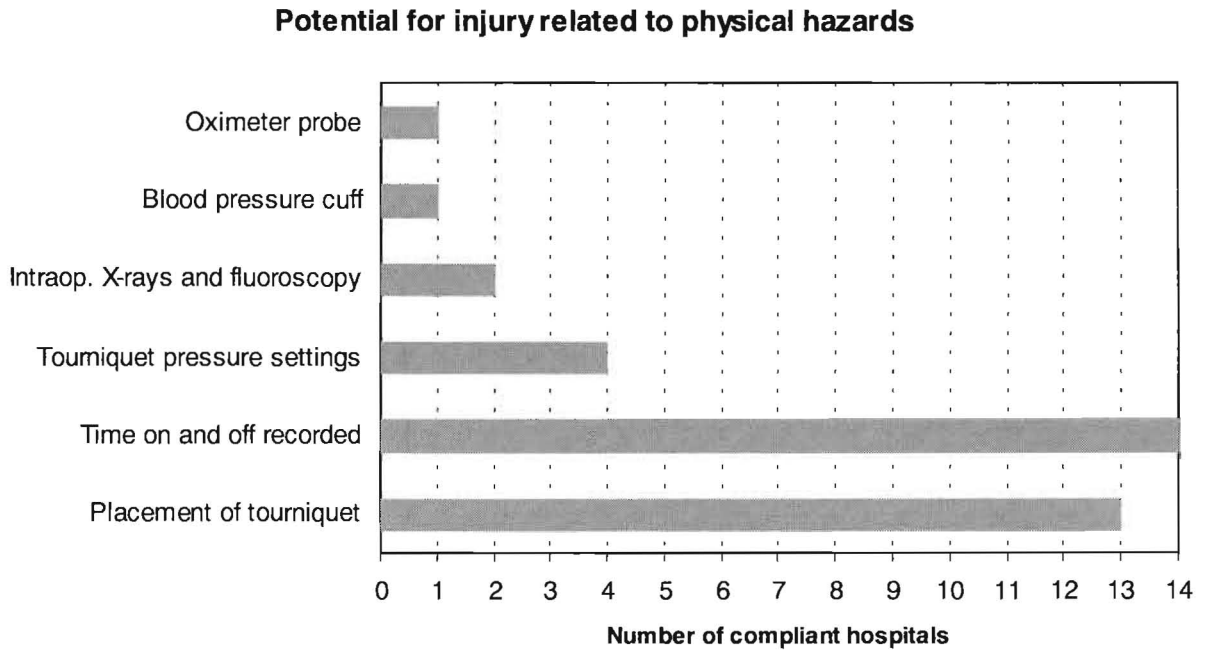


Figure 4.8. Potential for injury related to physical hazard criteria compliance

Figure 4.9 shows the scores for this group across all the hospitals. In this group the mean score was 2.5 out of 6, or 42%. Five hospitals scored above the average and one scored 82%. The monitoring device positions brought the scores down, as this group would have scored much higher if the tourniquet was evaluated separately. The standard deviation was 17%.

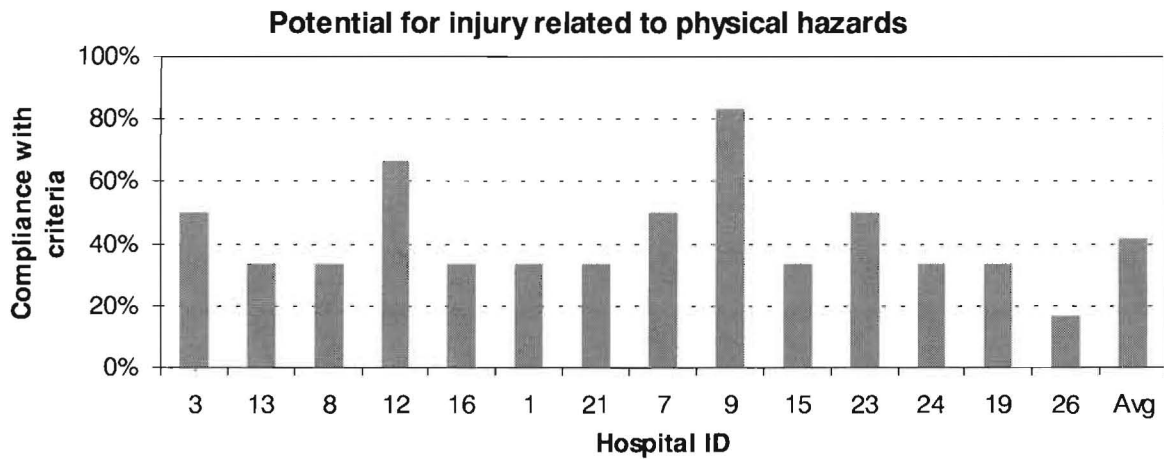


Figure 4.9. Potential for injury related to physical hazards group compliance by hospital

4.4.6 Potential fluid and electrolyte imbalance

Figure 4.10 shows hospital scores for potential fluid and electrolyte imbalance. This group includes two criteria that are not directly related to nursing care in the peri-operative period. Although the scrub nurse is responsible for controlling the amount of irrigation solution used, the medications and intra-venous solutions are controlled and recorded by the anaesthesiologist. Irrigation solutions are not recorded by any of the hospitals where as more than 50% of the hospitals record medications and blood products used intra-operatively.

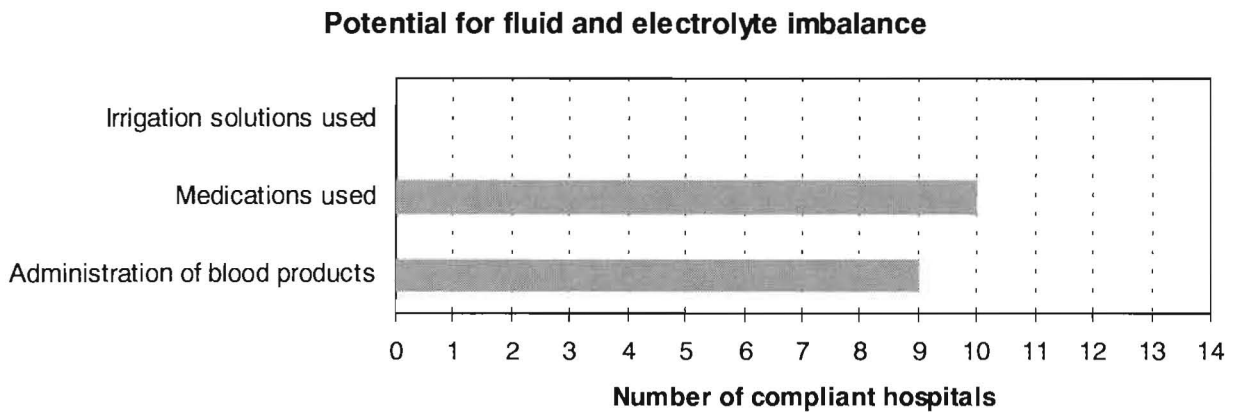


Figure 4.10. Potential for fluid and electrolyte imbalance criteria compliance

Figure 4.11 shows the scores in this group across all the hospitals. The mean score for this group is 1.35 out of a possible 3, representing a 45% compliance with the criteria. The standard deviation is 21%. Six of the hospitals scored 67% which represents the highest score in this group. One hospital failed to score in this group. This will be discussed later.

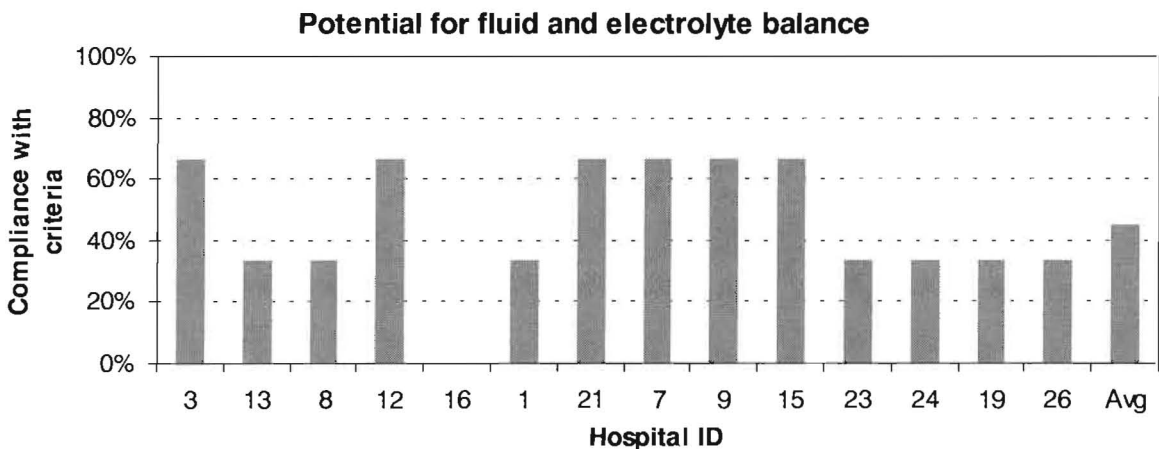


Figure 4.11. Potential for fluid and electrolyte imbalance group compliance by hospital

4.4.7 Potential for infection

Figure 4.12 shows hospital scores for potential for infection. The compliance with the criteria in this group is good in comparison with other groups. There is 100% compliance with the recording of drains used.

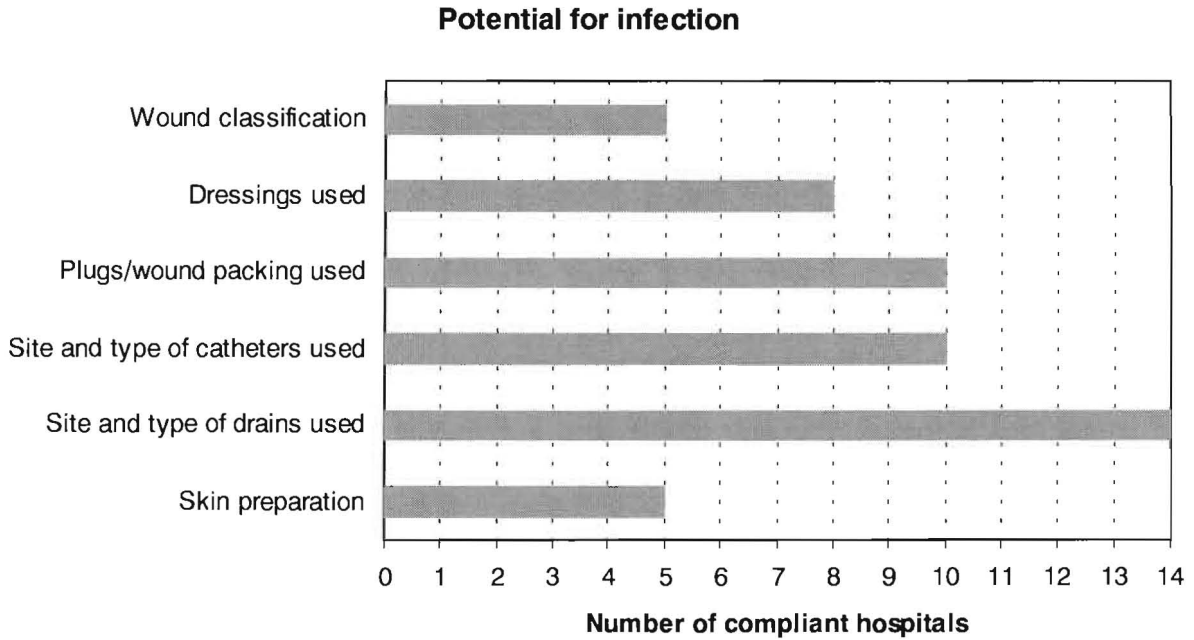


Figure 4.12. Potential for infection criteria compliance

Figure 4.13 shows the scores for this group across all hospitals. On average the compliance with criteria in this group is 62% or 3.7 out of a possible 6. Two hospitals score 100%. The standard deviation is 25% and the spread of scores is from 17-100%.

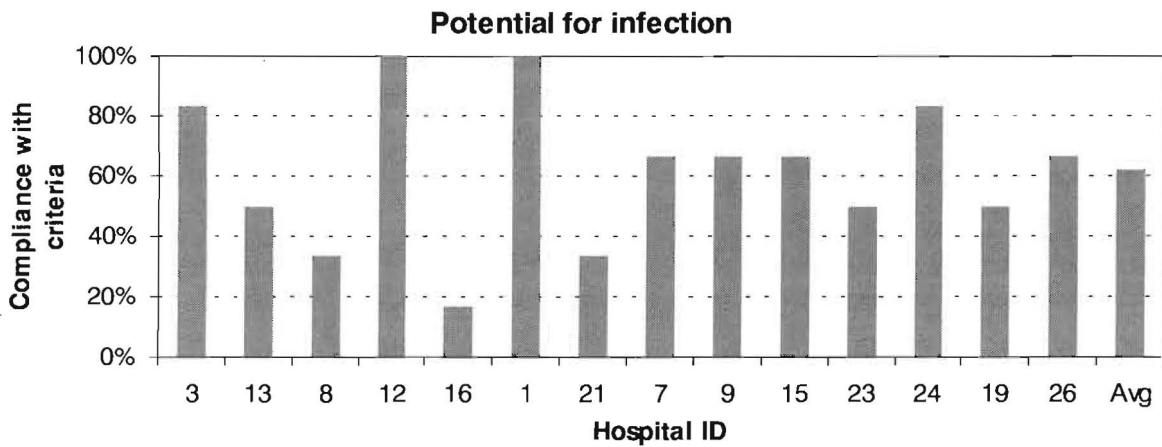


Figure 4.13. Potential for infection group compliance by hospital

4.4.8 Potential for injury related to foreign objects

Figure 4.14 shows scores for potential for injury related to foreign objects. Compliance in this group is high apart from radio-active implants that are not recorded at all.

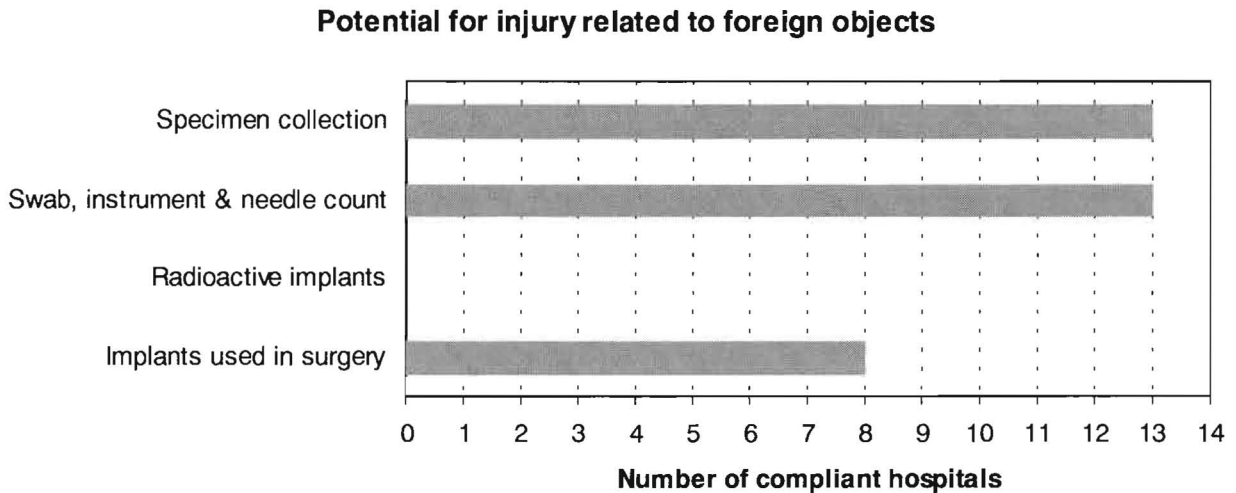


Figure 4.14. Potential for injury related to foreign objects criteria compliance

Figure 4.15 shows the scores for this group across all the hospitals. The overall compliance with these criteria is relatively high, 2.42 of a possible 4, or 61%. The standard deviation is also high at 21% as the range of scores is 0% to 75%. Eight of the hospitals score 75%, five score 50% and one did not comply with any of the criteria.

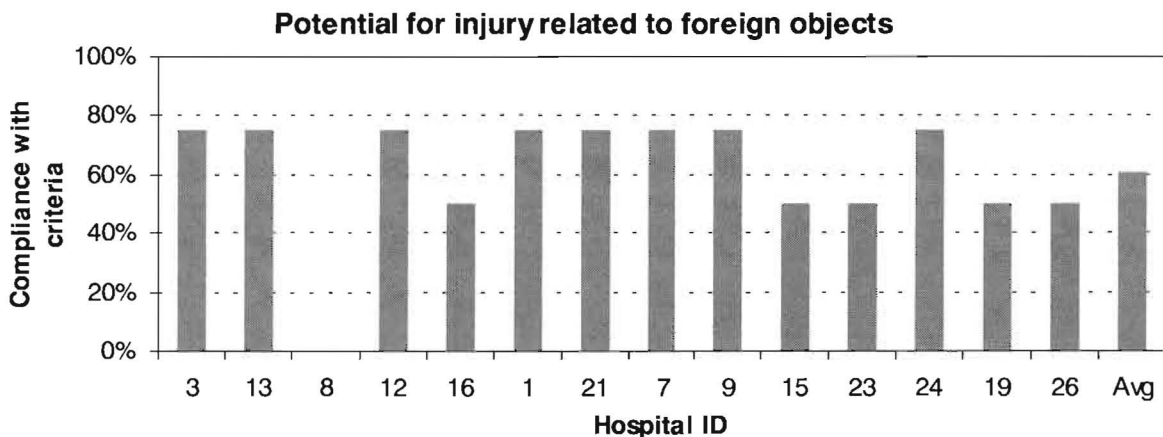
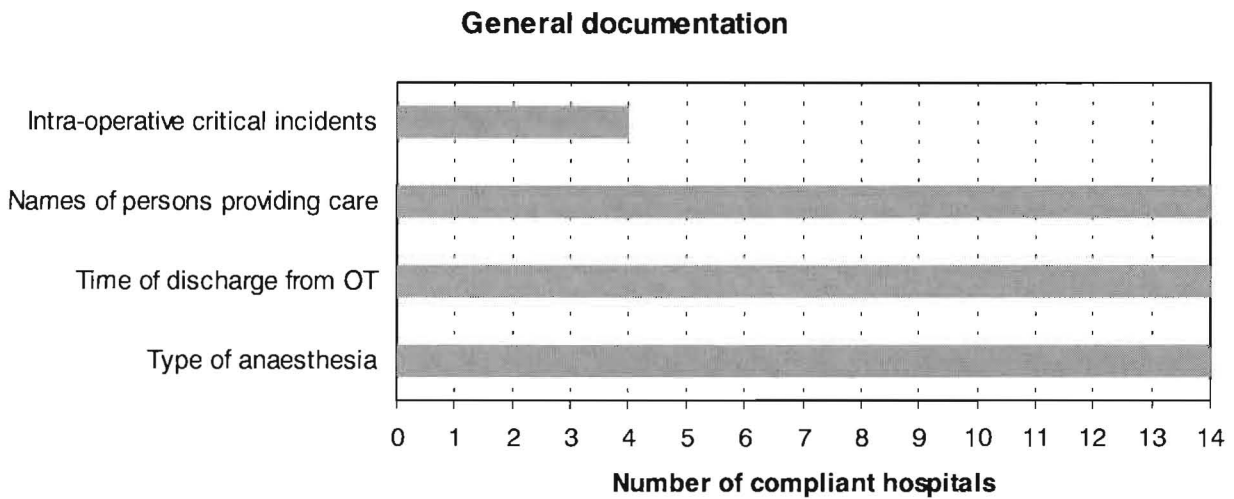


Figure 4.15. Potential for injury related to foreign objects group compliance by hospital

4.4.9 General Documentation

Figure 4.16 shows hospital scores for general documentation. There is a high level of



compliance in this group with three of the criteria scoring 100%.

Figure 4.16. General documentation criteria compliance

Figure 4.17 shows the scores in this group across all hospitals. The average compliance with criteria in this group is 3.3 out of a possible 4. This represents a compliance average of 82%. The standard deviation is low, 12% with a range of scores from 75% to 100%. The high scores are to be expected, as these are basic requirements for peri-operative records and also apply to many other types of records.

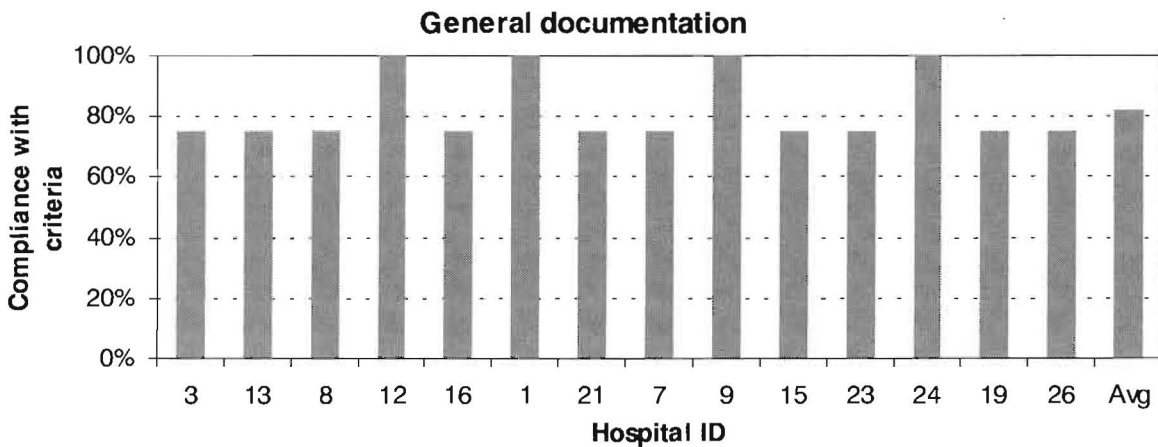


Figure 4.17. General documentation group compliance by hospital

4.4.10 High scoring criteria

Table 4.3 shows those criteria for which twelve or more hospitals were compliant. This represents a score of 86% or higher.

Table 4.3. Criteria with 12 or more compliant hospitals

Criterion Group	Criteria	Score
A	Presence of prosthetic devices	14
A	Presence of sensory aids	12
A	Physical data	14
A	Evidence of pre-operative assessment	14
C	Position of indifferent electrode	12
D	Time on and off recorded	14
D	Placement of tourniquet	13
F	Site and type of drains used	14
G	Specimen collection	13
G	Swab, instrument and needle count	13
H	Names of persons providing care	14
H	Time of discharge from OT	14
H	Type of anaesthesia	14

4.4.11 Low scoring criteria

Table 4.4 shows those criteria for which three or less hospitals were compliant. This represents a score of 21% or lower.

Table 4.4. Criteria with three or less compliant hospitals

Criterion Group	Criteria	Score
A	Psychosocial data	2
B	Positioning devices used	1
B	Method of transfer	0
C	ESU settings	2
C	Temperature of patient	2
C	Use of Lasers	1
C	Placement of ECG	1
D	Intra operative X-rays, fluoroscopy	2
D	Placement of BP Cuff	1
D	Placement of Oximeter probe	1
E	Irrigation solutions used	0
G	Radio-active implants	0

The implications of the above low scoring criteria are discussed in the next chapter.

4.5 RESULTS BY HOSPITAL

4.5.1 Overview

Figure 4.18 shows the average score of each hospital across all criteria (presented in the order in which responses were received). The total average score for all hospitals is 52%. Hospitals 9, 7 and 12 have the highest total scores (77%, 68% and 68% respectively), while hospitals 16 and 8 have the lowest total scores (32% and 30% respectively). The standard deviation of average scores for hospitals is 15% i.e. an indication of the spread of average hospitals scores about the average.

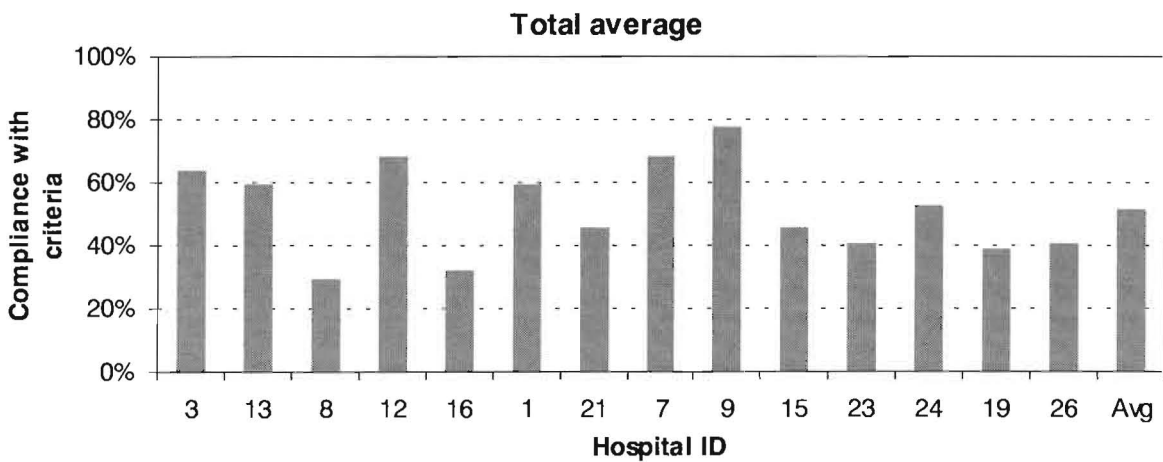


Figure 4.18. Average scores for each hospital.

4.5.2 Criteria group scores

The following graphs show criteria group scores for each hospital compared with the average score across all hospitals for that criteria group. The graphs are presented in the order of descending average hospital score. The key results identified are:

- One hospital, number 9, scored higher than the average for all the criteria groups.
- Hospitals 16 and 8, with the lowest total scores, score zero for three of the criteria groups and consistently score below the average for all other criteria groups.

Figure 4.19 shows the results for hospital 9, a private, in-patient facility. The group criteria scores fall within a narrow range of between 60% and 77%. All criteria groups score above the average. The hospital average score of 77% is well above the total average for all hospitals. This hospital has the highest total score.

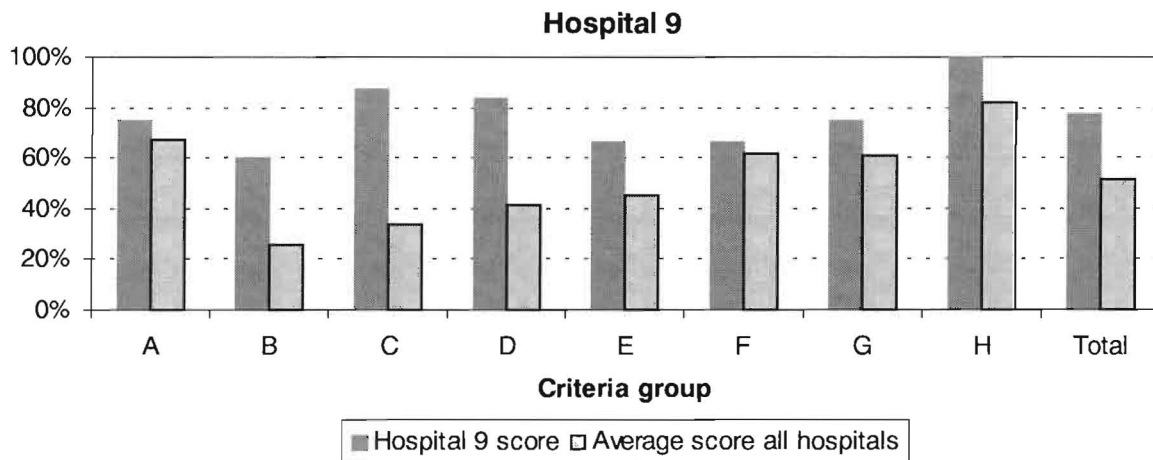


Figure 4.19. Average scores for hospital 9

Figure 4.20 shows the results for hospital 12, a private, in-patient facility. This hospital scores consistently above the average in all criteria groups. The hospital average score is 68%.

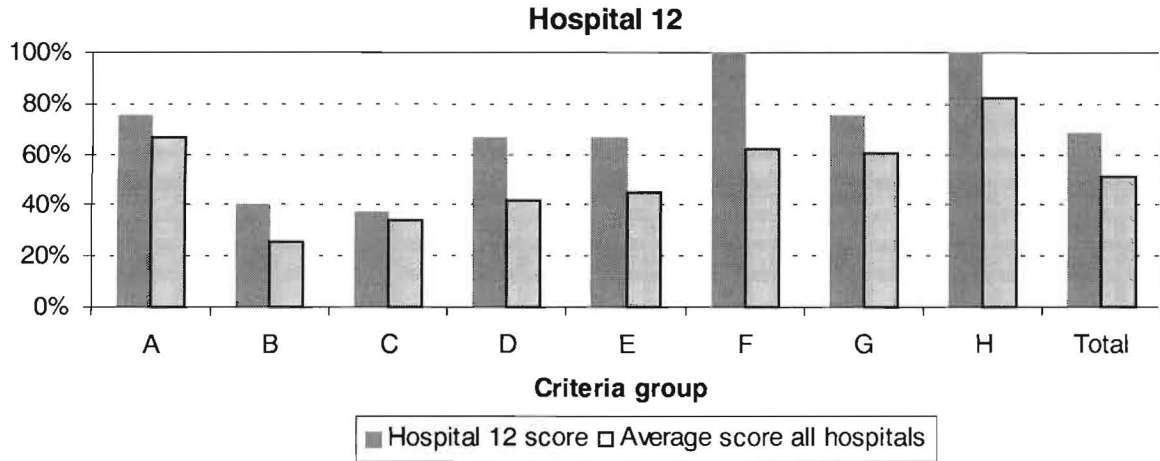


Figure 4.20. Average scores for hospital 12

Figure 4.21 shows the results for hospital 7, a private, in-patient facility. Criteria group scores do not follow the general trend and are almost consistently above average. The hospital average score is 68%.

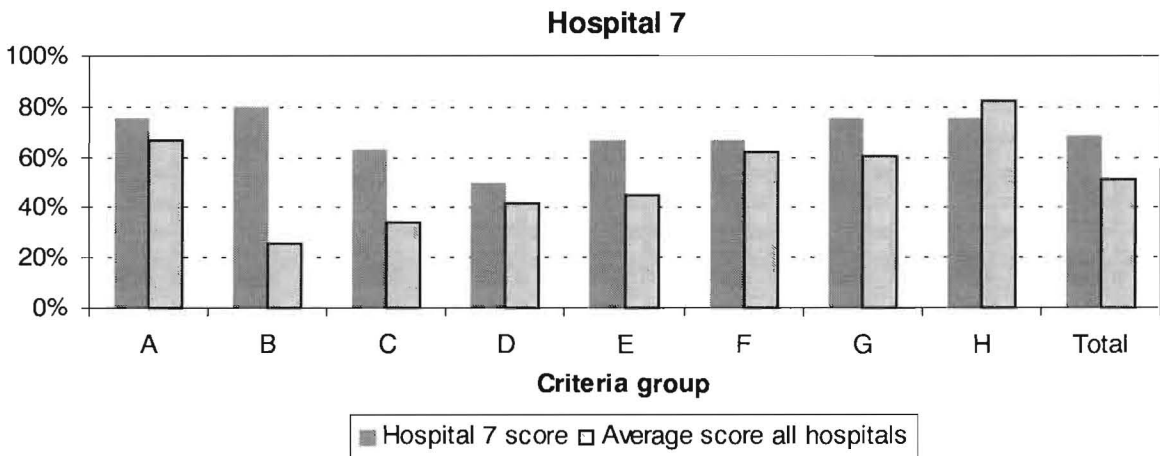


Figure 4.21. Average scores for hospital 7

Figure 4.22 shows the results for hospital 3, a private in-patient facility. This hospital scores consistently above average in all but one of the criteria groups. The hospital average score is 64%.

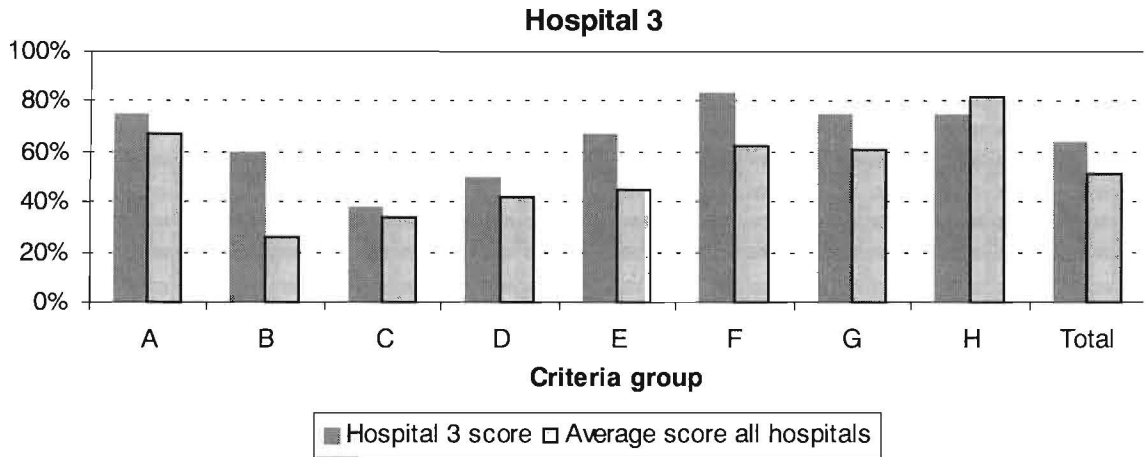


Figure 4.22. Average scores for hospital 3

Figure 4.23 shows the results for hospital 13, a public in-patient facility. The hospital average score of 59% is higher than average. Criteria group A scores 100%.

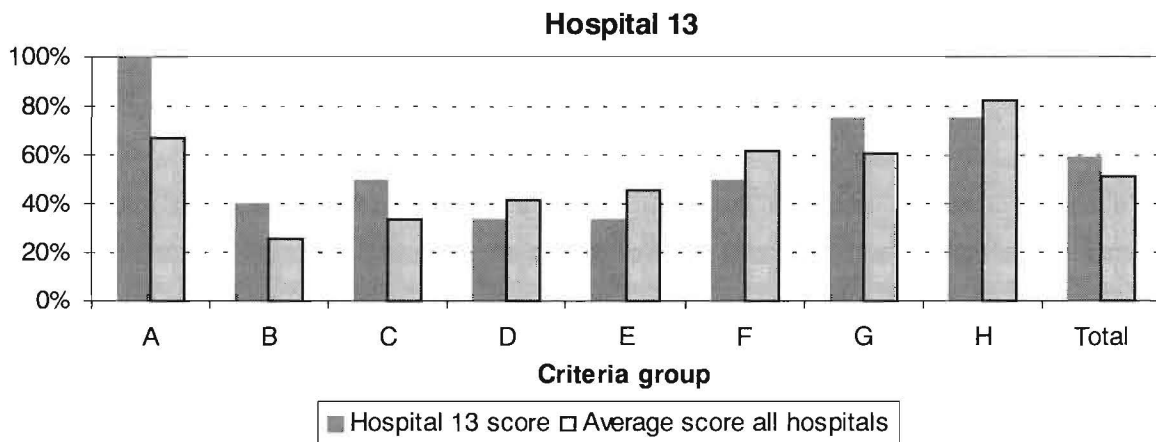


Figure 4.23. Average scores for hospital 13

Figure 4.24 shows the scores for hospital 1, a private, in-patient facility. The hospital average score of 59% is higher than average. Criteria groups F and H score 100%.

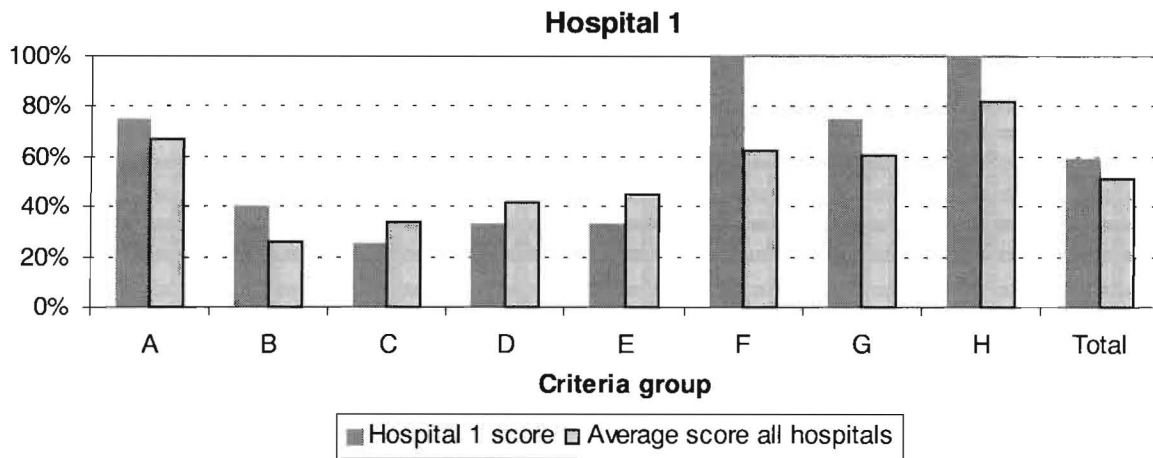


Figure 4.24. Average scores for hospital 1

Figure 4.25 shows the results for hospital 24, a private in-patient facility. Scores for this hospital closely follow the average, including the hospital average score of 52%.

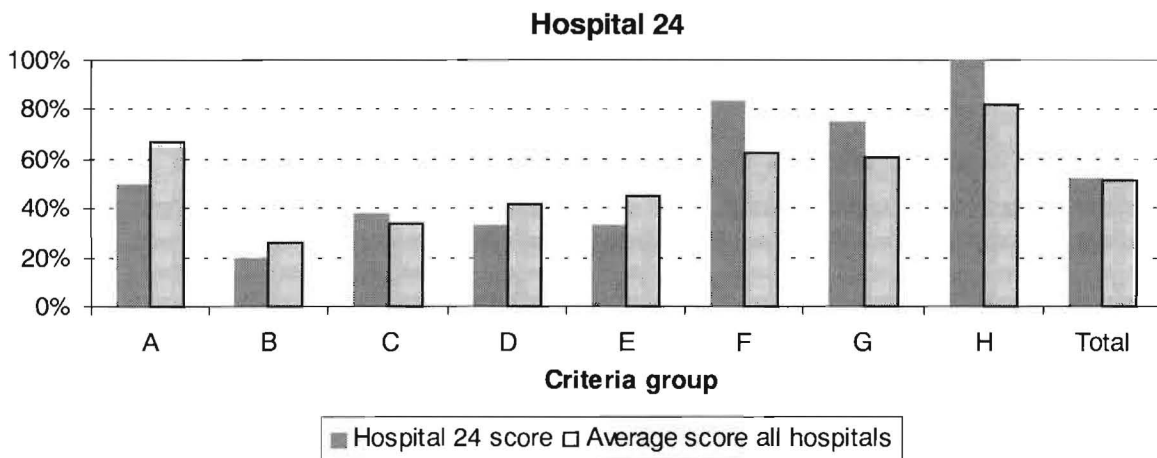


Figure 4.25. Average scores for hospital 24

Figure 4.26 shows the results for hospital 21, a public sector, in-patient facility. The criteria group scores follow the average trend, although the hospital average score of 45% is slightly below the average.

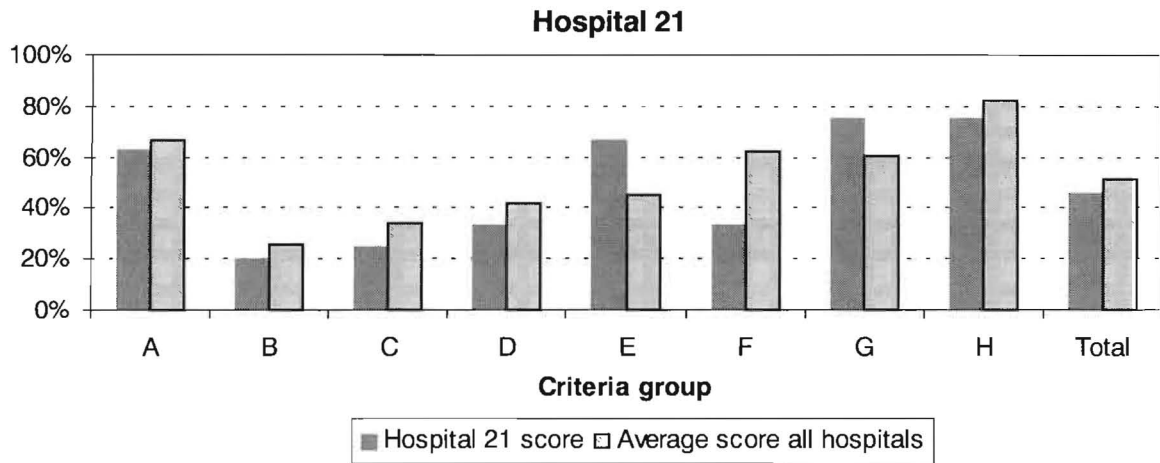


Figure 4.26. Average scores for hospital 21

Figure 4.27 shows the scores for hospital 15, a private out-patient facility. Criteria group scores follow the average trend, although the hospital average score of 45% is slightly below the average. Hospitals 15 and 21 score very similarly, despite being different types of hospitals.

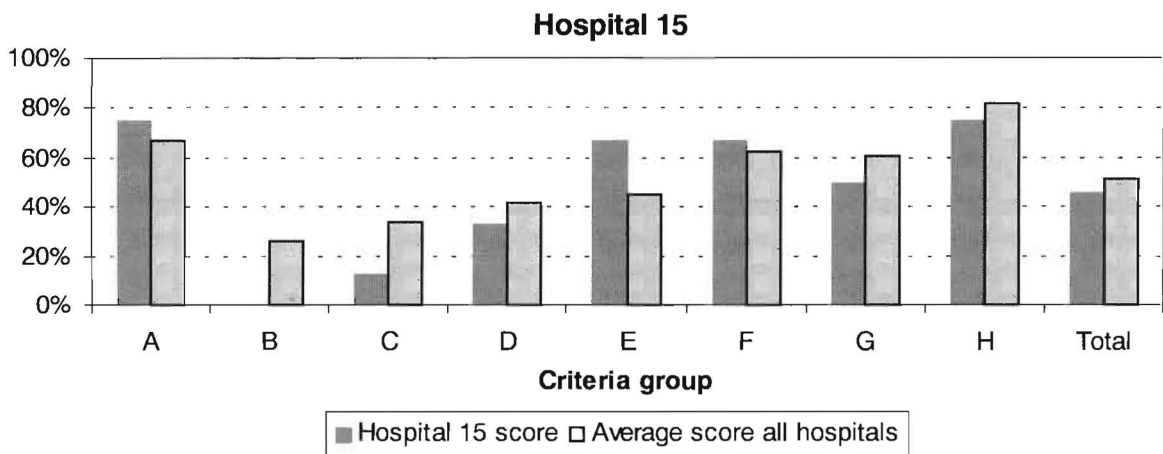


Figure 4.27. Average scores for hospital 15

Figure 4.28 shows the results for hospital 23, a private out-patient facility. The hospital average score of 41% is below the total average for all hospitals. Criteria group B scores 0%.

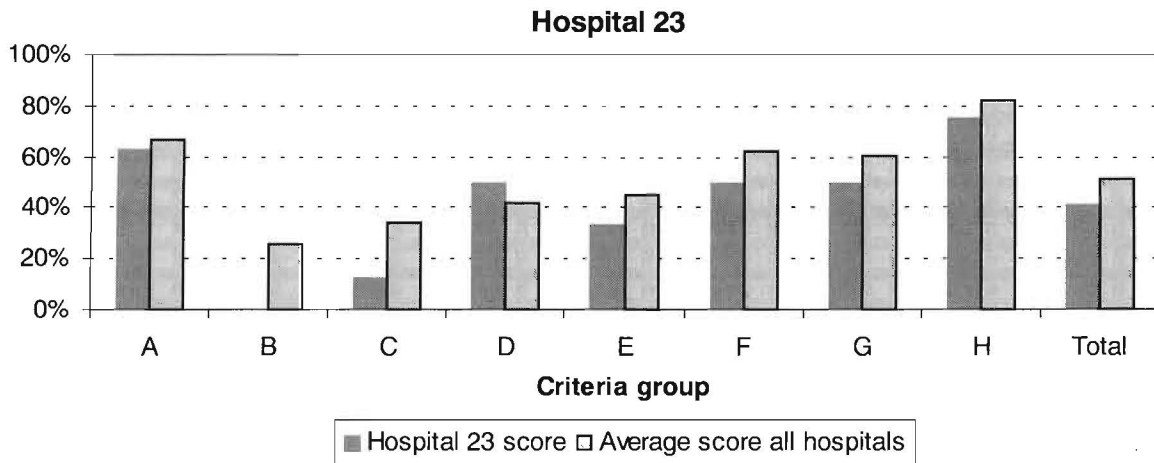


Figure 4.28. Average scores for hospital 23

Figure 4.29 shows the results of hospital 26, a private out-patient facility. At 41%, the average hospital score is well below the total average for all hospitals. Criteria group B scores 0%.

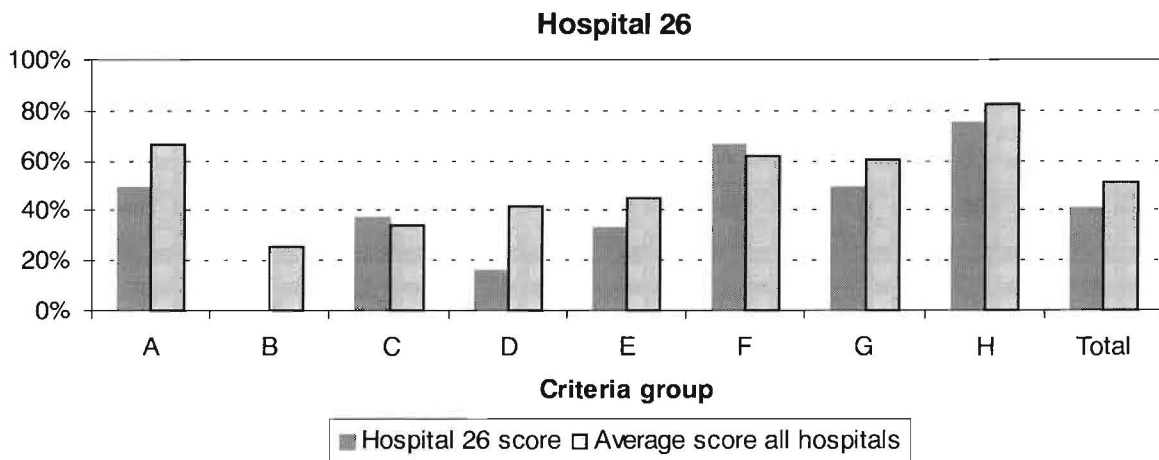


Figure 4.29. Average scores for hospital 26

Figure 4.30 shows the results for hospital 19, a private in-patient facility. Criteria group scores follow the average trend, but are consistently below average. . The hospital average score of 39% is well below the total average for all hospitals. Criteria group B scores 0%.

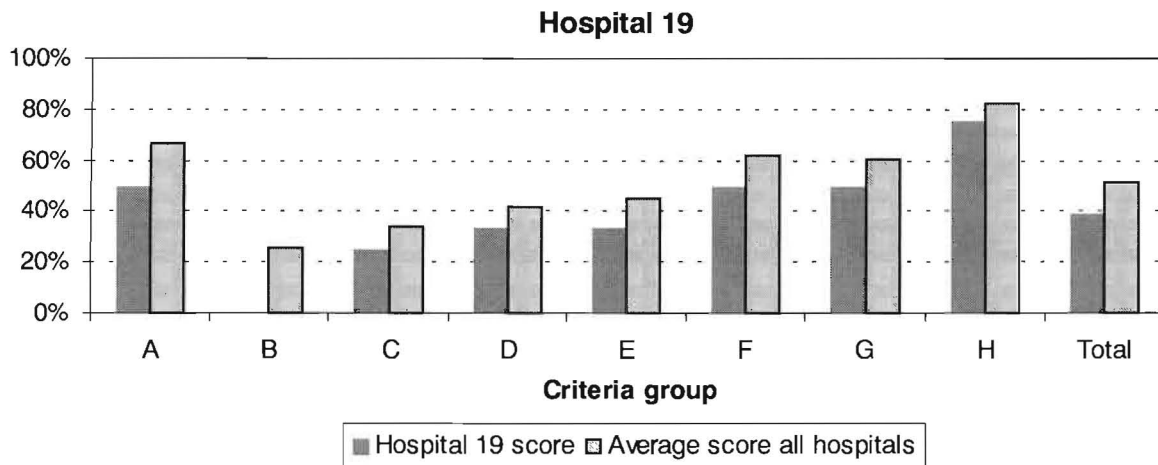


Figure 4.30. Average scores for hospital 19

Figure 4.31 shows the results for hospital 16, a private out-patient facility. This hospital scores consistently below the average in all criteria groups, and has a hospital average score of 32%. Criteria groups B, C and E score 0%.

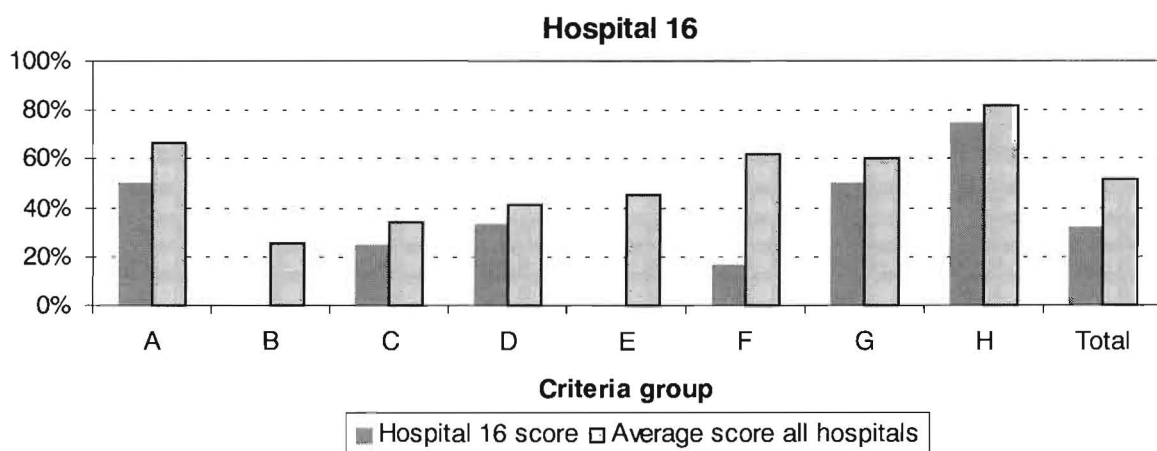


Figure 4.31. Average scores for hospital 16

Figure 4.32 shows the results for hospital 8, a private in-patient hospital that caters for a large number of quick turn-over cases and out-patients. This hospital scored the lowest, viz. 30% and scored consistently below the average in all groups. Criteria groups B, C and G all score 0%.

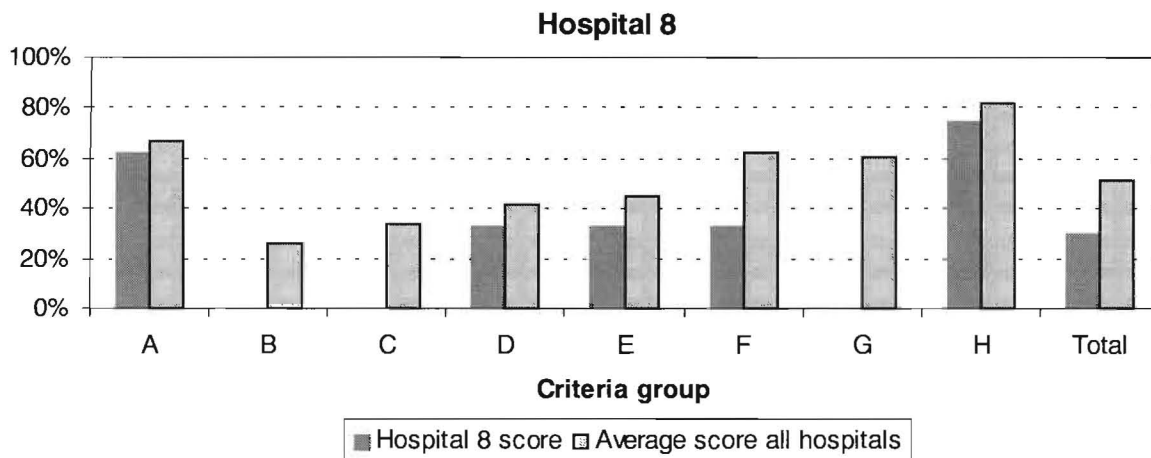


Figure 4.32. Average scores for hospital 8

4.5.3 Stratification of data

When sample or population sizes are small, it is appropriate to use the *t*-distribution to test for the difference between means. The *t*-distribution assumes that:

- The underlying populations are normally distributed.
- The population variances of the two samples are equal

The *t*-test statistic was calculated for each group of criteria for private/public and in-patient/out-patient groupings. This is to test whether there is a significant difference between the mean score of each criteria group for public and private hospitals or in-patient and out-patient hospitals. The method for calculation of the *t*-test is taken from Underhill and Bradfield (1996:207-223).

It was necessary to calculate the variance for the public hospitals, private hospitals, in-patient hospitals and out-patient hospitals, and then from these calculate an average variance for each pair of samples.

The following illustrates the use of the t-distribution to test for the difference between average scores of the public/private and in-patient/out-patient stratification. The actual results follow the illustration of the calculation.

Null hypothesis:

The difference between the average scores is insignificant.

Alternate hypothesis:

The difference between the average scores is significant.

Significance level:

Selected to be 5%.

Determination of the rejection region:

The null hypothesis is rejected if $t_{\text{calculated}} > 2.18$ or $t_{\text{calculated}} < -2.18$

(Taken from tables for significance level and 12 degrees of freedom. Underhill and Bradfield 1996:333)

Calculation of the t-test statistic:

$$t_{\text{calculated}} = \frac{\text{mean public} - \text{mean private}}{(\text{variance}/n_1 + \text{variance}/n_2)^{0.5}}$$

$$\text{where variance} = \frac{(n_1-1)*\text{variance public} + (n_2-1)*\text{variance private}}{n_1 + n_2 - 2}$$

4.5.3.1 Private/Public

Table 4.5 shows group criteria variances, average scores and t-test statistics for private and public hospitals.

Table 4.5. Results of t-test for comparison of private and public hospitals.

Criterion Group	Variance Private	Variance Public	Aggregate Variance	Average Private score	Average Public score	t-test statistic
A	0.88	4.50	1.18	5.17	6.50	1.61
B	2.20	0.50	2.06	1.25	1.50	0.23
C	3.52	2.00	3.39	2.67	3.00	0.24
D	1.17	0.00	1.08	2.58	2.00	-0.74
E	0.42	0.50	0.43	1.33	1.50	0.33
F	2.27	0.50	2.12	3.92	2.50	-1.27
G	0.79	0.00	0.72	2.33	3.00	1.03
H	0.24	0.00	0.22	3.33	3.00	-0.93
TOTAL	47.90	18.00	45.41	22.58	23.00	0.08

There is no significant difference between the average scores of the private and public hospitals in any of the criteria groups i.e. the t-test statistic is always less than 2.18 and greater than -2.18. Even at a 10% significance level (90% certainty) there is no significant difference between average scores, i.e. the t-test statistic is always less than 1.78 and greater than -1.78. This is not unexpected as the private hospitals, until recently, have drawn their nursing staff from those trained by the public hospitals, and the expertise they gained in the public sector has had an influence on the service provided in the private sector.

4.5.3.2 In-patient/Out-patient

Table 4.6 shows group criteria variances, mean scores and *t*-test statistics for in-patient and out-patient hospitals.

Table 4.6. Results of t-test for comparison of in-patient and out-patient hospitals.

Criterion Group	Out-patient Variance	In-patient Variance	Aggregate Variance	Mean In-patient score	Mean Out-patient score	t-test statistic
A	0.92	1.38	1.26	4.75	5.60	1.28
B	0.00	1.73	1.30	0.00	1.80	2.67
C	0.92	3.66	2.97	1.75	3.10	1.32
D	0.67	1.12	1.01	2.00	2.70	1.18
E	0.67	0.28	0.38	1.00	1.50	1.38
F	2.00	2.22	2.17	3.00	4.00	1.15
G	0.00	0.93	0.70	2.00	2.60	1.21
H	0.00	0.27	0.20	3.00	3.40	1.51
TOTAL	6.33	42.01	33.09	17.50	24.70	2.12

Table 4.6 shows that comparison of the in-patient hospital with the out-patient hospital average scores indicates a significant difference in criteria group B - potential for injury related to patient positioning as shown in the shaded portion. All the out-patient hospitals failed to score in this group. No significant difference was found for the other average criteria group scores. Interestingly, at a 10% significance level (90% certainty), the total score of out-patient hospitals is significantly lower than the total score of in-patient hospitals i.e. the total score *t*-test statistic of 2.12, falls in the new rejection region for 10% significance, of greater than 1.78 or less than -1.78. Change of the significance level does not affect the group scores as only group B remains the only group to fall within the rejection region.

4.6 CRITERIA NOT COVERED BY THE AORN STANDARD

The AORN standard did not cover all the content criteria evident in the peri-operative records used in the Western Cape Metropolitan Health Region. Table 4.7 shows the content criteria noted and frequency of these additional criteria not included in the AORN standard.

Table 4.7. Criteria not included in the AORN standard.

Criteria	Frequency	Percentage
Duration of anaesthetic	6	43%
Duration of surgery	6	43%
Time spent in operating room	14	100%
Condition of limbs after removal of tourniquet	3	21%
Type of skin sutures used	10	71%
Type of operation performed	13	93%
Throat pack recorded	6	43%
Instrument trays used	3	21%
Cross-clamp time	2	14%
All packs sterile	3	21%
Abnormal blood loss	2	14%
Bypass time	1	7%
DVT prevention	2	14%
Names of recovery personnel receiving patient	6	43%
Names of ward staff receiving patient	8	57%
Name of receiving nurse in OT	5	36%

The type of operation and the sutures used occur in a high percentage of the documents. Only one peri-operative nursing record did not record the type of operation and this was recorded on the surgeon's report. Low scoring criteria such as the cross-clamp time and bypass time were noticed in hospitals with cardiac and vascular facilities. Not all the hospitals in the sample have either vascular surgery or cardiac surgery facilities, which accounts for the low frequency of these criteria.

4.7 DESIGN CHARACTERISTICS OF PERI-OPERATIVE DOCUMENTS USED IN THE WESTERN CAPE METROPOLITAN HEALTH REGION.

Table 4.8 shows the number of hospitals compliant with the design characteristics identified in the literature review. None of the hospitals used a design with the nursing interventions grouped according to nursing diagnosis in the intra-operative phase. Nursing diagnoses were however used by three hospitals in the pre-operative phase. Only half the hospitals used a tick-the-box format for the design of the peri-operative record. The implications of the results of each criterion will be discussed later.

Table 4.8. Design characteristics of the documents used in the Western Cape Metropolitan Health Region

Design Characteristics		Frequency	Percentage
45	Integrated record	9	64%
46	'tick-the-box' system predominant	7	50%
47	Grouping according to nursing diagnosis (pre)	3	21%
48	Grouping according to nursing diagnosis (Intra)	0	0%
49	Different records for day-surgery cases	2	14%
50	Multidisciplinary records	2	22% of integrated records
		Average	Standard Deviation
51	Number of pages in the full record	4.6	1.9
52	Number of pages in the intra-operative section	1	0.3

5 DISCUSSION OF THE RESULTS

5.1 INTRODUCTION

Discussion of the results of the research is divided into the following areas:

- Comparison with the AORN standard.
- Comparison between private and public hospitals.
- Comparison between in-patient and out-patient facilities.
- Trends in hospital results.
- Extra criteria discovered in the peri-operative records sampled.
- Design characteristics.

Conclusions about the relevance of the criteria to South African peri-operative nursing practice are discussed throughout this chapter as well as in the next chapter.

5.2. COMPARISON WITH THE AORN STANDARD

The peri-operative nursing documents used in the Western Cape Metropolitan Health Region were compared with the AORN standard using the measuring instrument. The following is an analysis and discussion of each criterion within the criteria groups.

5.2.1. Group A: Pre-operative assessment

5.2.1.1 Evidence of pre-operative assessment

Figures 4.2 and 4.3 indicate that all fourteen of the hospital documents show some evidence of pre-operative assessment. The high scores recorded for this criteria group are an indication of the importance placed on pre-operative assessment in the Western Cape Metropolitan Health Region. Although the importance of pre-operative assessment is recognised, there is a deficiency in pre-operative visiting by the peri-operative nurses as only 3 hospitals indicate in the peri-operative record whether this has occurred. The ward nurses, who admit the patient, perform the pre-operative assessment and in most cases these nurses do not have insight into all the possible risks in the operating theatre. Only basic assessment data is collected with no intra-operative care plans compiled in all but two cases. Therefore, the 'Nursing Process' is not correctly utilised during the peri-operative period in twelve of the fourteen hospitals surveyed.

Data relating to pre-operative assessment of the surgical patient was found in; the admission assessment record, as well as in the peri-operative record as part of the pre-operative assessment and preparation checklists. The pre-operative preparation checklist is a record of preparation required for the patient going for surgery and was present in all the hospitals surveyed. It forms part of the pre-operative assessment of the patient and is carried out by the ward nurses admitting the patient. Table 5.1 shows the type and frequency of data that is collected by the hospitals in their pre-operative preparation checklists.

Table 5.1. Pre-operative preparation and assessment data required by the peri-operative records reviewed.

	Frequency out of 14
Consent signed.	12
Identification of the patient.	12
Removal of make-up.	12
Removal of jewellery.	12
Removal of false teeth.	13
Removal of contact lenses.	13
Skin preparation/shave.	13
Passed urine prior to transfer to operating theatre.	10
Bowel preparation.	10
Advised not to smoke.	3
Advised to stay in bed.	3
Patient dressed in theatre attire.	7
Nil per mouth.	12
X-rays.	13
ECG.	3
Blood results.	1
Blood to theatre/Blood ordered.	10
Eye drops to theatre.	1
Premedication given.	11
DVT prevention stockings.	3

Vital signs: Blood Pressure, pulse, respiration, temperature.	14
Urinalysis results.	11
Haemoglobin results.	6
Interpreter needed.	1
Haemoglucotest.	6
Seen by the anaesthesiologist.	5
Cot-sides up.	2
Need for support after discharge.	1
Anxiety addressed by reassurance and/or education.	9
Signature of the nurse preparing the patient for surgery.	12

Some of the hospitals, especially those catering for out-patients, integrate their admission assessment record with the peri-operative record allowing the admission assessment to form part of the pre-operative assessment and preparation. This is a good idea for out-patient hospitals that only cater for surgical patients, as the information required from each patient is fairly standard and integrating records keeps all the information together encouraging continuity. In an in-patient hospital there may be medical patients admitted and there is usually only one type of admission assessment record. It is therefore necessary to have a separate peri-operative record to collect information specific to pre-operative preparation.

An alternative arrangement could be to have separate forms for medical, and surgical patients, and include the admission assessment for the surgical patient in the peri-operative record. There would be some repetition if a medical patient was taken to surgery later but this should not be a problem as a second assessment with information specific to surgery would be of benefit, especially if the patient is taken to surgery some time after admission. The health status of the patient may have changed from the time of admission.

One of the hospitals repeats the medical and surgical history obtained in the admission record, in the peri-operative nursing record. This should be avoided, as it is unnecessary repetition. Nursing records should compliment each other and work together to provide a complete picture of the status of the patient and the care given.

5.2.1.2 Physical data

Figure 4.2 indicates that all hospitals record physical data as part of their pre-operative assessment. As previously mentioned this is collected in the admission assessment record and the pre-operative preparation assessment. Physical data includes vital signs, range of movements that may affect positioning intra-operatively, current illnesses, allergies and general condition of the skin. All of these are well represented in the peri-operative records assessed.

5.2.1.3 Psychosocial data:

Figure 4.2 indicates that only two hospitals record psychosocial data during the pre-operative assessment. One of the compliant hospitals records the present living situation of the patient, community support available and the need for assistance on discharge. If assistance is needed at home after discharge, then specific health care instructions are recorded in the patient education section of the peri-operative record. The other hospital recording psychosocial data records the need for an interpreter.

Atkinson et al (1996:99) identify psychosocial data as that relating to security, self identity and actualisation, culture and acceptance by others. Psychosocial data or socio-cultural data such as home language, the need for an interpreter and whether the patient's home situation is conducive to rehabilitation and recovery, are all of particular relevance to the South African situation. Whether these criteria are included in the peri-operative record or the admission assessment record does not really matter but they should be recorded somewhere in the patient's records.

5.2.1.4. Emotional data

Figure 4.2 indicates that nine of the fourteen hospitals record the presence of pre-operative anxiety in the assessment of the patient. At 64% of the total, this is low when one considers that pre-operative anxiety was present in most surgical patients. Anxiety related to the surgery, alteration of body image, and possible pain is exacerbated by loss of a familiar environment, loss of control over the environment and helplessness (Burrige 1993:12). Interventions related to reducing anxiety, such as education, orientation, and premedication should also be recorded.

5.2.1.5 Nursing diagnoses used and care plan devised

Figure 4.2 indicates that five hospitals use nursing diagnoses and devise care plans in one or more sections of their peri-operative records. Only two hospitals, however, include care planning for the intra-operative phase. Both these hospitals have open care plans for documentation of individualised problems and care needed. In one of these hospitals, a pre-operative diagnosis is made and special requirements for the patient intra-operatively recorded. The time of the pre-operative visit and the signature of the visiting nurse are also required. The same record also requires the documentation by the scrub nurse of a post-operative diagnosis. However according to a representative of the hospital, this is hardly ever completed.

The second peri-operative record with evidence of an intra-operative care plan, asks for identified risk factors or potential problems. A care plan of nursing actions required to solve the problem or meet the needs of the patient is then devised. The space allowed is very small in both these documents which could discourage nurses from documenting pre-operative visits and planning.

A third hospital records whether the operating room nurses conducted a pre-operative visit. There is however, no evidence of identifying potential or actual problems, and no evidence of care planning in this peri-operative record.

After speaking to a representative from each of the three hospitals previously mentioned, it was established that none of the hospitals have a formal pre-operative visiting program and that informal visits are carried out infrequently. The major reasons for this are staff shortages and heavy caseloads for the nursing staff available. Wicker (1995:18) describes informal pre-operative visiting as 'ad hoc', according to time allowed with little or no documentation or feedback to the rest of the theatre team. This type of pre-operative visiting is infrequent and does not encourage continuity of care. It appears that only the students undertaking the Diploma in Operating Theatre Nursing Science perform pre-operative visits on a regular basis and that apart from in these instances, the care plan sections of the documents are usually left blank. Research has indicated that only about 10% of patients in the UK receive peri-operative visits (Wicker 1995:16). It appears from the peri-operative records reviewed in this research, that a similar situation or worse, could be true for South African patients. Further investigation of the frequency of pre-operative visits is required.

The other three hospitals with evidence of care plans have standardised care plans for the pre-operative period and two of these also include the post-operative period. These hospitals have formatted the pre-operative checklist into a standardised care plan. All identify potential problems and give nursing interventions to prevent these problems arising. Scope is not however provided for individualised problems or care plans. The potential problems in the pre-operative assessment are identified as:

- Potential anxiety
- Potential vomiting
- Potential adverse anaesthetic reaction
- Potential wound infection
- Potential safety risk
- Potential chest infection

The pre-operative nursing interventions required to prevent these potential problems are listed in checklist format under the above headings. This is one of the three approaches to the use of nursing diagnoses in peri-operative documents found in the literature review (Stanfield 1987:700-701). The nursing diagnoses or problems identified are not however carried through to the intra-operative phase.

Two of the hospitals use the same format as mentioned above for the immediate post-operative period and recovery room, as well as in the ward. The problems identified in this period by these hospitals are:

- Potential asphyxia
- Potential shock
- Potential altered level of consciousness
- Potential impaired circulation
- Potential pain

5.2.1.6 Presence of sensory aids and prosthetic devices

Figure 4.2 indicates that twelve hospitals document the presence of sensory aids and all the hospitals record the presence of prosthetic devices. Prosthetic devices included dentures, caps and crowns as well as artificial limbs, eyes and orthotic devices. Sensory aids included hearing aids, contact lenses and spectacles. It is not apparent from the AORN standard why these two aspects of assessment of the patient are singled out over others such as allergies

or vital signs. They do however have important implications for the nursing care of the patient intra-operatively.

The disabled patient with special needs requires special treatment and removal of supportive devices such as a hearing aid will increase the anxiety of the patient. All fourteen hospitals record removal of the prosthetic and sensory aids from the patient. A more patient centred approach is to allow the patient to go to surgery with sensory and physical aids that will allow them to interact with their environment in as normal a way as possible and to prevent embarrassment. Hearing aids and spectacles should be sent to the recovery room if they are removed while the patient is under anaesthesia. This ensures that they are available when the patient wakes up and is once again in need of them (Atkinson 1996:108). The problem with this ideal situation is the possibility of loss or damage of expensive prostheses or sensory aids is increased. Motivation to protect the devices and therefore the hospital from liability unfortunately usually overrides the individual needs of the patient.

5.2.1.7 Conclusions of discussion of pre-operative assessment

All the AORN pre-operative assessment criteria are important aspects of the pre-operative phase, supported by the literature review and personal experience of the author (Wicker 1995:16, Capstick 1991:43). Although all fourteen hospitals record some form of pre-operative assessment, the focus is largely on physical data and preparation for surgery. Little attention is paid to psychosocial and emotional data, and planning for intra-operative care, such as nursing diagnosis and care plans score relatively low in contrast to collection of assessment data. This indicates an incomplete implementation of the 'Nursing Process'. In all but two hospitals, there is no evidence of intra-operative care planning at all. Planning for patient care is particularly important in the Western Cape context where large social diversity exists. Planning of patient care is an essential part of the scope of practice of the registered nurse. If operating theatre nurses do not plan comprehensive and holistic peri-operative nursing care they run the risk of performing a purely technical role which could easily be carried out by non-nursing personnel (Hubbard 1988:31, Geoghegan 2000:17).

5.2.2 Group B: Potential for injury related to patient positioning

The surgical patient is positioned for surgery to provide access for the surgeon in order to facilitate maximum exposure of the surgical site. In order to do this safely certain criteria need to be fulfilled. The position should not limit respiration, impede circulation or put undue pressure on nerves or the skin over a bony prominence. In addition, the position should take

Table 5.2 shows an example of the Norton pressure sore risk assessment scale (Harkness et al 1996:401).

Table 5.2. Norton pressure sore risk assessment scale

NORTON PRESSURE SORE RISK ASSESSMENT				
PHYSICAL	MENTAL	ACTIVITY	MOBILITY	INCONTINENT
Good 4	Alert 4	Ambulant 4	Full 4	No 4
Fair 3	Apathetic 3	Walk with help 3	Limited 3	Seldom 3
Poor 2	Confused 2	Chair 2	Very limited 2	Urine 2
Very bad 1	Stuporous 1	Bedfast 1	Immobile 1	Both 1

Four of the hospitals check the skin condition after surgery, two of which did not check prior to positioning the patient. In effect therefore, only two of the fourteen hospitals check the skin condition before and after surgery. If a baseline check of the skin condition is not made and recorded, then lesions that were present pre-operatively could be taken as injuries occurring intra-operatively. This has serious risk management and legal implications.

5.2.2.2 Position of the patient

Figure 4.4 shows that the position of the patient during surgery is only recorded by eight of the hospitals. Three of the hospitals list the possible patient positions and a 'tick-the-box' system is used to indicate which position is utilised. The other five hospitals require the position to be written in long-hand.

One hospital that does not record the position deals with mainly one type of surgery so the position would be fairly standard. They do however perform a limited number of other types of surgery where the patient position would vary, so failure to record the position of the patient cannot be justified. All the other hospitals deal with a variety of types of surgery requiring various positions and no justification could be found for not recording the patient position.

The anaesthetic records of all the hospitals were also examined and there was no evidence that the anaesthetist recorded the patient position in those hospitals that do not record it in the peri-operative record. If another member of the surgical team recorded the position, then

failure to record in the peri-operative record could be justified. This was not however found to be the case.

5.2.2.3 Positioning devices used

Figure 4.4 shows that only one hospital records the use of positioning devices, supports or restraints. A variety of devices are used to support the patient in the position required for surgery. The purpose of these devices is to, stabilise the patient in the position, provide maximum access for the surgeon, and at the same time protect the patient from potential injury. The operating tables have attachments for specific purposes and some are particular to certain types of surgery (Atkinson et al 1996:440). Whether positioning devices are used to stabilise the position or to protect the patient from injury they all have inherent dangers to the patient associated with their use. For example, these could be injury to skin, nerves, or muscles as a result of pressure or traction (Gruendemann and Huth Meeker 1987: 103). It should therefore either be standard policy to use certain positioning devices, in which case it is not necessary to record their use or, devices should be recorded as used. One of the peri-operative records examined in the literature review lists the most commonly used positioning devices and the nurse only has to record those used with a tick in the appropriate box (Shirley 1993:1431).

5.2.2.4 Method of transfer

Figure 4.4 shows that the method of transfer of the patient is not recorded by any of the hospitals. The majority of the hospitals transfer patients to the theatre on their beds, but some also use trolleys. In out-patient clinics the patient may walk into the theatre if a local anaesthetic is to be used. The relevance of the method of transfer to patient safety is questionable and the lack of score by any hospital in the survey indicates that it is not considered of importance in the Western Cape. Of more importance from a risk management perspective is the use of cot-sides and/or restraining belts on the bed or trolley, especially after a patient has received sedative or analgesic medication as a premedication. This was identified as a criterion in the pre-operative checklist/assessment but is recorded by only two of the hospitals.

5.2.2.5 Conclusions of discussion of potential for injury related to patient position

All patients are positioned for surgery in some manner and every position presents its own potential risks of injury to the patient. The low scores in this criteria group are therefore disturbing and show a failure to record a fundamental hazard to the patient. The average

score for this group is 26%, which is very low and justification for not recording the position in the peri-operative record could not be found, as no other member of the surgical team records the position of the patient. Six hospitals fail to score at all in this criteria group and interestingly these hospitals perform predominantly day-surgery or quick turn-over surgery with a short stay in hospital. All four of the out-patient hospitals fail to score in this group. It is possible that with the shortage of time available for record-keeping in these hospitals that this aspect was not considered necessary to include in the peri-operative record. Only one hospital scores substantially above the average in this group by fulfilling all the criteria apart from the method of transfer. This phenomenon will be explored in more detail with the discussion of the sample stratification results. One of the divisions in the stratification of the data deals with the comparison between in-patient and out-patient hospitals.

The method of transfer was considered irrelevant to the South African situation and the 0% compliance of this criterion indicated that the hospitals surveyed did not consider it important. Removing this criterion from the calculation changes the average compliance in this group to 32%. It therefore does not change the result substantially and is still very low for an important risk area to the surgical patient. The use of cot-sides or restraining belts on patients during transfer to the operating theatre was identified as a criterion in the Western Cape documents and will be discussed further in the recommendations.

The following criteria from this group are recommended for inclusion in a South African standard:

- Skin condition pre-surgery
- Skin condition post-surgery
- Position of the patient
- Positioning devices used

5.2.3 Group C: Potential for injury related to electrical hazards

Figure 4.1 indicates that the average score for this criteria group is 34%, which is second lowest of all the criteria group results. Figures 4.6 and 4.7 show the results related to potential for injury related to electrical hazards. Figure 4.7 indicates that one hospital does not score in this criteria group and two hospitals score 13%, which is compliance with only one criterion. Apart from hospitals 7 and 9, both private, in-patient hospitals that both score well in this criteria group, all the hospitals score below 50%.

5.2.3.1 Criteria related to the electro-surgical unit

Figure 4.6 shows that the position of the indifferent electrode or diathermy plate, as it is called in South Africa, is recorded by twelve of the fourteen hospitals. One of the remaining hospitals indicates whether electro-surgery was used or not but does not mention the position of the electrode. This is a problem if a burn or lesion is noted on the patient's skin later, as the peri-operative nurse cannot prove that the injury was not related to use of the electro-surgical unit. One hospital surveyed does not record any data related to electro-surgery at all. This is hospital 8, an in-patient facility that deals with a large number of out-patients and quick turn-over cases. No justification could be found for not recording information related to electro-surgery, as the types of surgery performed in hospital 8 require the use of all forms of electro-surgery.

The settings used on the electro-surgical unit are recorded by two hospitals. One other hospital records these in a separate book that is kept with the electro-surgical unit. The significance of the settings is questionable as the units vary considerably even within the same makes. The manufacturers do however recommend optimum settings for cutting, coagulation and fulguration. Optimum settings should be part of a policy document for use of the electro-surgical unit. Regular servicing of the electro-surgical units should be recorded and any repairs catalogued for risk management purposes. This gives documented proof that adequate care is taken of the units in the case of investigation into accidents involving staff and/or patients.

Figure 4.6 indicates that ten of the hospitals, or 71%, record the skin condition after removal of the indifferent electrode. This may indicate that the majority of the hospitals are aware of the dangers associated with the use of electro-surgery. One of the primary sites of possible burn injury, related to the use of the electro-surgical unit, is at the site of the indifferent electrode. This may be as a result of an insufficient contact area, which increases the resistance to the electrical current and causes heating and a burn (Hutchisson et al 1998:835).

Five hospitals, or only 36%, record the skin condition before application of the dispersive electrode. It has been argued in the literature review that if recording by exception, the skin condition before application need not be recorded unless there is something wrong (Rider 1991:37). By implication there should be nothing wrong with the skin before application or else the electrode should not have been applied in that location. Recording by exception assumes that the checks have been performed and only deviations from the normal are recorded. However if the nurse is required to record pre-; and post-operative skin checks

then there is proof that these checks were performed. The same is not true when recording by exception, and there may be legal implications as the burden of proof is on the nurse. The low score for skin condition before application cannot however be justified by the possible use of documentation by exception. The reason for this is that the number of hospitals recording the skin condition before application and after removal of the indifferent electrode does not correspond. No reason could be found for this discrepancy. The fact that four hospitals did not record any information about skin condition related to the dispersive electrode could possibly be explained by the use of documentation by exception but this is not borne out by the design of these hospitals documents.

5.2.3.3 Use of Temperature control devices

Inadvertent hypothermia is a commonly occurring complication of general anaesthesia (Fox 1993:76). General anaesthesia predisposes to hypothermia as it causes loss of protective mechanisms like shivering. It also increases vasodilatation, decreases basal metabolic rate and depresses the thermo-regulating centre in the hypothalamus. Hypothermia delays reversal of anaesthetic agents, increases the risk of post-operative infection, increases oxygen requirements in the immediate post-operative period and causes changes in fluid, electrolyte and acid-base homeostasis. Dysrhythmias, cardiac arrest, hypoxia, metabolic acidosis and hyperglycaemia may occur as a result of inadvertent intra-operative hypothermia (Atkinson et al 1996:370,382, Fox 1993:76).

Figure 4.6 shows that five hospitals record the use of temperature control devices such as warming blankets, over-head infra-red lamps, or forced-air skin surface warmers (e.g. Trade name of one variety in South Africa: Bair Hugger). Heating devices such as these, are now almost routinely used for surgery of any duration, as the patient's recovery period is dramatically improved (Atkinson et al 1996:370). All of these devices have inherent dangers associated with their use, such as the risk of burns or electric shock. In order to monitor problems that occur for risk management purposes it is important to record the type of warming device used for each patient.

The temperature of the patient intra-operatively is only recorded in two hospitals but this is not seen as a problem. The intra-operative temperature is part of the monitoring carried out by the anaesthesiologist and is recorded on the anaesthetic record in South African hospitals. It is not considered part of the peri-operative nurse's duty and is therefore not considered relevant to the South African situation.

5.2.3.4 Use of Lasers

Lasers are used in certain types of surgery and their use is expanding rapidly. Figure 4.6 indicates that only one hospital records the use of lasers and this has more to do with billing the patient than safety as it is accompanied by a charging code. The hospital involved is an out-patient surgical unit that uses a variety of lasers and the type of laser used is not indicated.

As different types of lasers are being increasingly used in modern surgery they are a danger that could be encountered by many surgical patients (Atkinson 1996:274, AORN(2) 1998:67). Each type of laser has special precautions that must be taken with regard to eye protection and operational safety. All the hospitals assessed in this research use lasers of one variety or another so no justification could be found for not recording this aspect of care.

5.2.3.5 Placement of electrocardiogram electrodes

Figure 4.6 shows that only one hospital records the placement of ECG electrodes and does so by using a body outline diagram. Since there is a standard position for a three lead ECG, the value of recording the position of the electrodes could be questioned. However, there are times when the standard position cannot be used. For instance, during breast surgery, or thoracotomy when the standard position would interfere with the surgical site.

The major danger associated with the ECG electrodes is the risk of burns due to capacitation (also called capacitative coupling). Capacitation is the induction of a current in an insulated lead as a result of a current flowing in an adjacent insulated lead. This occurs as a result of magnetic fields created around the insulated lead when the electricity is flowing. For example if the electro-surgical electrode is activated close to an ECG electrode the magnetic field created may induce a current in the ECG electrode and cause a burn (Hutchinson et al 1998:833).

Recording the position of the ECG electrodes is considered relevant notwithstanding the low score of only one hospital compliant with this criterion. The reason for this is that there are risks to the patient as described above. The low compliance however, indicates that it is not considered important by the hospitals, and this may be because it is a difficult criterion to record quickly. The easiest way to do this would be with a body diagram where the nurse just has to indicate the position with a cross or dot. Figure 5.1 shows an example of how this may be achieved.

commonly used equipment appearing in the peri-operative record. This is discussed further in chapter 7 in the recommendations.

The following criteria from this group are recommended for inclusion in a South African standard:

- Position of the indifferent electrode.
- Skin condition before application of the indifferent electrode.
- Skin condition after removal of the indifferent electrode.
- Use of temperature control devices.
- Use of lasers.
- Use of any electrical equipment that could be a danger to the patient.

The following criteria were considered not relevant to the peri-operative nursing record in South African practice for the reasons already discussed:

- Electro-surgical unit settings.
- Temperature of the patient as monitored intra-operatively.

5.2.4 Group D: Potential for injury related to physical hazards.

Figure 4.1 shows that the average score for this criteria group is 42%. Figures 4.8 and 4.9 show the results of this criteria group.

5.2.4.1 Criteria related to the use of a tourniquet

The compliance with recording data related to the use of a tourniquet is fairly high. Figure 4.8 shows that all the hospitals record the times of inflation and release. One hospital does not record the limb where the tourniquet was applied even though the times of inflation and release are recorded. It is possible that some nurses may record the limb site even though it is not asked for but this is not possible to prove without further research and may be inconsistent. It cannot be relied on.

There should be 100% compliance with these two criteria related to the use of a tourniquet, as the tourniquet is a potential area of injury. Injury may occur to the skin, nervous system or vasculature. The tourniquet cuff has a risk of causing damage to the integrity of the skin if the skin is pinched during inflation. In addition to this the inflation times should be monitored as

after an hour of ischaemia, the muscles in the affected limb begin to suffer damage. If the time is prolonged the metabolic changes occurring in the muscles may be irreversible. Pressure injury can also occur to vasculature and nervous tissue leading to gangrene, delayed healing or even paralysis (Atkinson et al 1996:474, Meeker, Rothrock 1995:304). For these reasons it is important to record the position of the tourniquet cuff and the times of inflation and release. The AORN in the USA has recommended practices for the use of pneumatic tourniquets. They recommend that in addition to adequate maintenance and correct use of the tourniquets, it is essential that all staff are educated about the potential complications and prevention strategies when using a tourniquet (AORN (1) 1998:1057).

The pressure settings are recorded by only five hospitals. Since fairly standard settings are used in adult patients according to the gender, limb size and systolic blood pressure, the settings may not be important. The settings may however be useful in the case of investigation into an injury, and the fact that the setting is recorded would mean that notice is taken of the setting on the machine. The settings on the machine may however be unreliable if regular calibration does not occur. One of the tasks of the scrub nurse therefore, is to check the calibration before use (AORN(1) 1998:1057). This could prevent injuries by helping to eliminate the dangers of over inflation.

5.2.4.2 X-rays and Fluoroscopy

Figure 4.8 shows that the use of intra operative x-rays or fluoroscopy is recorded on the peri-operative record by only two hospitals. It is a requirement of the International Commission on Radiological Protection (ICRP) that the owner of the X-ray equipment keep records of use of the equipment (ICRP 1990:26). In many instances the equipment is owned by the X-ray department and not the operating department so these records would not appear in the patients' notes and should be recorded in the peri-operative record. X-rays and fluoroscopy are required during certain orthopaedic, vascular and investigative procedures. The risk to the patient during short-term exposure to X-rays is minimal, although any exposure to radiation has some effect on the tissues of the body (Shymko 1998:599). The use of X-rays and fluoroscopy should be recorded in some form in case this information is needed for risk management purposes at a later stage.

5.2.4.3 Oximeter and Blood pressure cuff

The same hospital that recorded the position of the ECG electrodes also recorded the position of the blood pressure cuff and other monitors on a body outline diagram. This was

the only hospital that complies with these criteria as can be seen in figure 4.8. The need to record the position of monitoring devices like the pulse oximeter and blood pressure cuff relates to the danger of injury that these devices pose. For instance the blood pressure cuff may cause pressure injuries to the skin, blood vessels and nerves if the device is incorrectly applied and used. These injuries should be recorded as part of the general condition of the skin post-operatively and the position of the devices gives an indication that these specific areas have been checked before application and after removal of the devices.

5.2.4.4 Conclusions of potential for injury related to physical hazards

All the AORN criteria in this group are considered relevant to the South African situation in spite of the low compliance with the monitoring devices. The average compliance with this group of criteria is low, 42% as indicated in figure 4.1. This is the result of low compliance with the position of the monitoring devices and the use of X-rays and fluoroscopy. If these criteria were to be removed from the calculation then the average result is 59%. Although they score poorly and are obviously not considered important by 13 of the 14 hospitals surveyed, monitoring devices do pose a risk of injury to the patient. Indicating their position could be useful for identifying the cause of an injury identified during immediate post-operative examination or later in the post-operative period of the patient.

The easiest way to record the position of monitoring devices is on a body outline diagram with each device indicated by a different symbol. Figure 5.1 is an example of how this can be done. The potential for injury indicates that they should be recorded, even though it appears as if it is not done in the majority of Western Cape hospitals.

5.2.5 Group E: Potential for fluid and electrolyte imbalance

Figure 4.1 shows that the average score for this criteria group is 45%. Figures 4.10 and 4.11 show the results in this criteria group. Figure 4.11 indicates that one hospital, an out-patient facility, does not score in this group. There are only three criteria in this group and as two of them are not directly nursing tasks the low scores are not of concern.

Figure 4.10 shows that administration of blood and blood products is recorded by nine of the fourteen hospitals; medications used, recorded by ten hospitals, and irrigation solutions are not recorded at all.

In South Africa, recording of fluid balance in the intra-operative period is either done by the anaesthesiologist on the anaesthetic record, or by the peri-operative nurses on a separate 24 hour fluid balance chart that is continued later by the ward nurses. A 24-hour fluid balance chart is better than recording the fluids used on the peri-operative record as it gives continuity for the post anaesthesia caregivers.

Irrigation solutions used intra-operatively would appear to be more in the domain of the scrub nurse, but figure 4.10 shows that they were not recorded by any of the hospitals. The type of solution used may have a bearing on later allergic reactions and the amount used needs to be monitored so that the estimate of blood loss can be calculated by the anaesthesiologist.

5.2.5.1 Conclusions of potential for fluid and electrolyte imbalance

Irrigation solutions used, medications used, and the administration of blood and blood products in many instances are recorded on documents other than the peri-operative nursing record. This accounts for the low average compliance of 45%. All the information in these criteria is needed by the post-anaesthesia caregivers and should be easily accessible to them. These criteria are not the direct responsibility of the peri-operative nurse but if there is a chance that the anaesthesiologist does not record the information then it may be necessary to include the information on the peri-operative record. A satisfactory compromise is to have a multidisciplinary form where the anaesthesiologist records his information along with the surgeon and peri-operative nurse.

All the AORN criteria in this group have been kept in the calculations even though they are not considered entirely relevant to peri-operative records in South Africa. The reason for this is that the information is important for the post-anaesthesia caregivers in order for them to plan patient care. Whether the information appears on a 24-hour fluid balance chart, the anaesthetic record or the perioperative record, it should all be readily available.

5.2.6 Group F: Potential for infection

Figure 4.1 shows that the average score for this criteria group is 62%, and is the second highest score across the criteria groups. Figure 4.13 shows that 11 of the fourteen hospitals score above 50% in this criteria group. Figure 4.12 shows the number of hospitals compliant with each criterion.

One of the primary functions of a peri-operative nurse is to take steps to prevent surgical infection in the patients. This is achieved by:

- Adhering to aseptic technique.
- Maintaining a clean environment.
- Controlling the environment, e.g. reducing traffic in the surgical area, adequate air-conditioning, and monitoring staff health and hygiene (Atkinson et al 1996: 31).

5.2.6.1 Skin Preparation:

Figure 4.12 shows that five hospitals record information about skin preparation. All of these hospitals record the agent used and one of the hospitals recorded the name of the person performing the skin preparation. The scrub nurse usually performs skin preparation, but in certain cases the surgeon or assistant may prepare the skin. In the case of wound infection the Infection Control Nurse may want to investigate the technique of the person who performed the skin preparation (Shirley 1993:1431). The name of the person performing the skin preparation is therefore useful. The site of the skin preparation is also required by the AORN standard, but the type of operation performed indicates this. It is not recorded by any of the hospitals in the survey and is not considered necessary.

The type of solution used for skin preparation should also be recorded as the patient may display an allergic reaction on the skin preparation site. The Infection Control Nurse may also in the case of an infection, investigate the type of skin preparation solution used in relation to the type of surgery. For instance, it would be considered inappropriate to use Aqueous Chlorhexidene as a skin preparation solution for a joint replacement procedure as it is not sufficiently effective against gram negative micro organisms.

5.2.6.2 Drains and Catheters

Figure 4.12 shows that all fourteen hospitals record the type of drains used. This information is important for the ward nurses caring for the patient post-operatively and 100% compliance is to be expected. Other important information about drains needed by the ward nurses are the site and type of drain, number of drains and whether the drain is stitched or pinned in position. Eight of the hospitals just have the word 'drains' and a blank space. This is relying on the nurse to fill in all the correct details, which may not happen consistently, especially with agency nursing staff, who may not be familiar with correct use of the peri-operative record as recommended by the hospital policy. Three of the hospitals record the type of

drain. In addition to this, two hospitals record the number, and one hospital, the site of the drain. If the type, site and number of drains are to be consistently recorded by all nurses using a peri-operative record then it is necessary to prompt it in the document as well as have the requirements for recording specified in a policy.

Figure 4.12 shows that catheters used are recorded by ten hospitals. The type of catheter is recorded by three hospitals and in addition to this two hospitals record the number of catheters used. The type, number and site of the catheter are recorded by only one hospital. The remaining hospitals just have the word catheter and a blank space. As with the drains the site, type and number should be requested in the peri-operative record.

5.2.6.2 Plugs/wound packing and dressings used

Figure 4.12 shows that plugs and wound packing are recorded by ten hospitals in the sample group and dressings used by only eight hospitals. These indicate low compliance in areas where the information is vital for the post anaesthesia caregivers. The ward nurses need to know about the presence of plugs and wound packing, as it is possible for a plug such as a vaginal plug, to be forgotten and left in position for an excessive length of time. This will cause discomfort for the patient and will increase the risk of infection.

The type of dressing should be recorded for the benefit of the staff caring for the patient post-operatively. Dressings may be considered to include bandages, casts and splints, all of which may be constrictive in the presence of swelling. The ward nurses need to know the type of dressing so that it may be monitored and changed as required or according to the prescription of the doctor.

5.2.6.3 Wound Classification

Of the five hospitals that record wound classification, four use the classification recommended by the AORN. This classification divides the surgical wound into, Clean, Clean contaminated, Contaminated and Septic (Atkinson et al 1996:526). The explanation of each of these wound descriptions is given in explanation of each criterion, in the method.

The fifth hospital uses a classification of, Clean, Contaminated and Septic. Wound classification is an indication of the risk of post-operative infection. It is therefore important for infection control risk management. The type of classification used is not important as long

as there is an explanation of the classification in the policy manual and this is known by all the hospital staff.

All the hospitals compliant in this criterion are in-patient facilities with designated infection control nurses. The smaller clinics and out-patient hospitals do not have infection control programmes and this could account for their failure to comply with this criterion.

5.2.6.4 Conclusions of potential for infection

Compliance in this group is lower than expected with an average of 62%. This is disturbing, as prevention of infection is one of the fundamental responsibilities of the peri-operative nurse. The standard deviation in this group is high, 25%, as the range of scores for the hospitals is from 17% to 100%. Hospital 16, one of the out-patient hospitals scoring consistently low in other groups, also fails to score in all but one of the criteria in this group.

All the criteria in this group provide important information for post-operative care and for risk management purposes. They are all relevant to South African practice so justification for the low score cannot be justified by irrelevant criteria.

The following criteria related to potential for infection should be included in a South African peri-operative record:

- Type of skin preparation.
- Person performing the skin preparation.
- Type, site and number of drains.
- Site and type of catheters used.
- Site and number of plugs/wound packing used and solution used on the plug.
- Dressings used, including bandages, casts and splints.
- Wound classification

5.2.7 Group G: Potential for injury related to foreign objects.

Figure 4.1 shows that the average score for this criteria group is 61%. Figures 4.14 and 4.15 show the results of the criteria in this group. Figure 4.15 shows that one hospital does not score in this criteria group. This is hospital 8, a private in-patient facility that caters for a large number of quick turnover cases and has scored consistently low across all the criteria groups.

5.2.7.1 Implants used in surgery

Implants are used in various types of surgery, more commonly in orthopaedic, vascular, facio-maxilla, cosmetic and re-constructive surgery. Implants may be a prosthesis, a temporary or permanent replacement for a missing or malfunctioning structure such as a heart valve or blood vessel. Implants may assist the functioning of a vital organ, such as a cardiac pacemaker or they may provide permanent or temporary support to the skin and bones (Atkinson et al 1996:512).

Implants are constructed of inert materials such as titanium, carbon fibre, ceramics or silicone, in order to reduce tissue reaction. The ideal implant does not cause an inflammatory or immune response in the patient, and in the case of vascular implants the surface should have as little thrombogenic effect as possible (Atkinson et al 1996:513).

Figure 4.14 shows that only eight of the hospitals surveyed record the use of implants during surgery. This is in spite of the fact that all the hospitals involved use implants of some variety or another. Manufacturers of implants supply stickers with details of the type of implant, date of manufacture and batch codes as part of their quality management program. These stickers can be used in the patient's peri-operative record and the doctor's notes. Some manufacturers also provide cards for the patient with details of the implant. If there is a problem with the implant or that batch of implants, then there is a record of implants used and patient's can be notified. These stickers facilitate accurate and quick recording of implant details so compliance with this criterion should be 100%.

Radio-active implants are not recorded as a separate criterion by those hospitals that use them. Only three of the hospitals in the sample group routinely use radio-active implants and these are recorded under the general heading, 'implants'. The 0% compliance with this criterion is therefore explained.

5.2.7.2 Swab instrument and needle count

The process of surgery involves the introduction of foreign articles such as swabs, instruments and sharps into body cavities. It is vitally important that these are controlled and monitored throughout the duration of the surgery. Swabs, instruments and needles are counted and controlled by the scrub nurse and the circulating nurse. This ensures that swabs, instruments or needles are not left in the surgical wound. Retained foreign objects cause pain, infection, adhesions and substantially delay healing, as further surgery is

required to remove the retained objects. Maintaining strict adherence to aseptic principles must also ensure sterility of all articles introduced into the patient.

In assessing the documents, any mention of a swab count was taken as compliance with this criterion. The division of swab, instrument and needle count individually, is broken down and discussed here. Table 5.3 shows the breakdown of hospitals recording just swab count, swabs and instruments and swabs, instruments and needles. Two hospitals only record a swab count, but indicate the instruments are correct on the Sterilising supply department checklist found in each sterile tray. One hospital records a swab and instrument count. No justification could be found for three hospitals not indicating that the needles were correct. In these three hospitals the scrub nurse performs an informal needle count which does not include the circulating nurse, and is not recorded. The danger is that the needles may not be counted at all. Ten hospitals record all three counts on the peri-operative record.

Table 5.3. Breakdown of swab, instrument and needle count results.

	Number of hospitals
Swab count only recorded	2
Swabs and instrument count recorded	1
Swab, instrument and needle count recorded	10

Figure 4.14 shows that only one of the hospitals in the survey group does not record the swab count at all. It is disturbing that any hospital should exclude this criterion, as it is one of the major risks facing almost every patient in surgery. The compliance should be 100%. This hospital, number 8 has scored consistently low over various criteria. All types of surgery are performed in this hospital with the exception of cardiac surgery so there is no excuse for not recording the swab, instrument and needle counts.

5.2.7.3 Specimen collection

Figure 4.14 shows that thirteen hospitals record the collection of specimens. Tissue removed during surgery is, with very few exceptions, sent for pathology, cytology or for culture. Tissue or foreign body specimens may be an important part of the diagnosis and treatment of the patient or may be important for forensic purposes. For these reasons specimens are vitally important and the loss of a specimen may cause the patient physical harm and mental anguish. It is important that specimens are handled correctly and a record of the type of

specimen collected should be recorded on the peri-operative record. The registered nurse in the operating theatre is responsible for the correct handling of specimens. Collection of specimens should therefore be recorded in the peri-operative record. If the specimens are recorded in the surgeon's report, which forms part of a multidisciplinary peri-operative record, then it may not be necessary for the nursing staff to record this information.

5.2.7.4 Conclusions of potential for infection

The average compliance with criteria in this group is fairly low, at 61%. This can be explained by the 0% compliance in recording the use of radio-active implants. If the radio-active implant criterion is removed from the calculation then the percentage compliance is 81%. As most of the hospitals do not use radio-active implants, it is not necessary to include this criterion. Those using radio-active implants record them under the general heading of implants or have separate records for these special implants.

The following criteria from this group are recommended for inclusion in a South African standard:

- Type of implants used in surgery.
- Swab, Instrument and needle count.
- Specimen collection.

5.2.8 Group H: General documentation

These criteria did not fit into any of the other groups as requirements for a nursing diagnosis, so were grouped together as general documentation. Figures 4.16 and 4.17 show the results of this criteria group.

The compliance in this group is high as might be expected. Figure 4.16 shows that all the hospitals record the time of discharge from the operating room, the names of the persons providing care and the type of anaesthesia used.

Of great concern is the lack of recording of intra-operative critical incidents. Figure 4.16 indicates that only four hospitals record critical incidents on the peri-operative record.

Critical incidents could include but should not be limited to the following:

- Loss of a swab, instrument or needle/sharp.
- Cardiac arrest.
- Injury to the patient such as may occur as a result of a fall off the operating table or trolley.
- Burns, either electrical, chemical or as a result of hot fluids.
- Breakdown of skin integrity.
- Incorrect dosage of medications.
- Reactions to medications, irrigation solutions and/or skin preparation solutions.
- Excessive blood loss.
- Break in aseptic technique.
- Loss or damage to a specimen.
- Surgical accident e.g. transection of the ureter during abdominal hysterectomy

All the above 'critical incidents' need to be communicated to the ward nurses. In the hospitals in the Western Cape these are usually recorded in an incident report, used for risk management purposes, but the ward nurses do not usually see these as they do not become part of the patient's notes. A brief note of critical incidents as well as mention of problems such as pressure areas showing signs of redness, would be useful for the post-anaesthesia caregivers, as well as serving the function of protecting the peri-operative nurse.

5.2.8.1 Conclusions of general documentation

The average compliance in this group is 82%, which is relatively high as expected. All the criteria in this group are considered important for inclusion in a peri-operative nursing record and are relevant to South African practice. The low compliance with recording critical incidents occurring during surgery can be explained by the fact that all the hospitals use incident reports to record these events. This however does not solve the problem of communication to the staff caring for the patient after the critical incident has occurred, whether ward or recovery room staff. In the experience of the researcher these incidents are usually communicated verbally, but this is unreliable and lacks accountability. It is necessary therefore to record critical incidents occurring intra-operatively and this criterion is recommended for inclusion in the peri-operative record.

5.2.9 Overall conclusions of discussion of the criteria groups

The preceding discussion examines each of the AORN criteria for relevance to South African peri-operative nursing practice and risk management. The following criteria were considered to be not relevant for the reasons already discussed and are not recommended for inclusion in a South African standard:

- Method of transfer.
- Radio-active implants.
- Temperature of the patient.
- ESU settings.

The position of the monitoring devices were identified as not considered important by the hospitals in the sample group as only one records these. The importance of recording the position of monitoring devices may be questioned, as it is difficult to accomplish. However the potential risk of injury that these devices pose to the patient is real. The difficulty with recording the position of monitoring devices quickly and accurately can be overcome by use of a body diagram as described and illustrated in figure 5.1.

The three criteria in group E, potential fluid and electrolyte imbalance, were considered to be not entirely relevant to the peri-operative record as they should be recorded by the anaesthesiologist or recorded on a 24-hour fluid balance chart. Since information relating to use of blood products, irrigation solutions and medications is vital for the post-anaesthesia caregivers, the criteria were included in the recommendations for a South African standard. The presentation of information related to fluid balance should be in the form of a 24-hour fluid balance chart, which can be continued in the post-operative period by the caregivers. This will be discussed further in chapter 7.

Table 4.3 and 4.4 show the low and high scoring criteria. Two of the three criteria scoring 0% are included in those that have been identified as not relevant to the South African situation. The low scoring criteria of particular importance are;

- Psychosocial data.
- Use of positioning devices.
- Use of lasers.
- Intra-operative X-rays and fluoroscopy.

All the above are either compliant in only 1 or 2 hospitals. Recording data relating to the cultural, emotional and spiritual needs of the patient are of particular importance in a multi-cultural society such as South Africa. Positioning devices, lasers, X-rays and fluoroscopy pose risk of injury to the patient and are therefore important for risk management purposes.

Of interest is the fact that there are no high scoring criteria in groups B, potential for injury related to patient positioning and E, potential for fluid and electrolyte imbalance. Group B is an area of risk management that needs greater attention by all the hospitals in the Western Cape as already discussed. The low results of the criteria in group E can be justified by the fact that the information may appear on other documents such as the anaesthetic record or a 24-hour fluid balance chart.

5.3 CONTENT CRITERIA NOT CONTAINED IN THE AORN STANDARD DISCOVERED IN THE WESTERN CAPE RECORDS

After assessment of the peri-operative documents used in the Western Cape, content criteria were discovered that were not described in the AORN recommended standards for peri-operative documentation. All the documents were examined, new criteria were recorded on the measuring instrument and the frequency of each criterion was noted. Table 4.7 shows the list of additional content criteria noted. The following is a discussion of each criterion and its importance for inclusion into a South African standard for peri-operative nursing documentation.

5.3.1 Duration of Anaesthetic/Surgery

All the hospitals record the duration of time the patient spends in the operating room. (Operating room is distinct from the operating theatre or theatre suite. See Definition of terms for an explanation.) Six hospitals record the duration of the anaesthetic and the duration of the surgery separately. The anaesthesia may have a substantially longer duration than the actual surgery. This occurs when a regional nerve block, such as a spinal or an epidural anaesthetic is used, or an epidural catheter is inserted for post-operative pain control. These procedures extend the time the patient spends in the operating room. The duration of the anaesthetic usually corresponds with the duration spent in the operating room. The duration of the anaesthesia has implications for the post-anaesthesia caregivers as prolonged time spent under anaesthesia increases the risk of hypothermia and injury related to positioning, as well as increasing exposure of the patient to anaesthetic drugs (Atkinson et al

1996:370,382, Fox 1993:76). The time spent in the operating room should be added to the recommendations for a South African standard.

5.3.2 Condition of the limb after removal of the tourniquet

The placement of the tourniquet, an AORN criterion, is recorded by 12 of the hospitals and in addition to that, 3 hospitals record the condition of the limb after removal. The condition of the limb after removal of the tourniquet could be considered part of the overall condition of the skin post-operatively, which could possibly account for the low number of hospitals recording this aspect of post-operative evaluation. Post-operative skin condition is however only recorded by 3 of the hospitals, representing 21% so this was also not particularly well represented by the hospitals surveyed. If examination of the condition of the limb after removal of the tourniquet is to be considered part of the overall skin condition this must be specified in the hospital policy for peri-operative documentation.

Skin condition at the tourniquet site does not however cover all the checks needed after removal of the tourniquet. The limb should be checked for colour, perfusion, pulses, temperature and the affected limb should be compared with the unaffected limb. It should therefore be included as an additional criterion to the general skin condition post surgery, even though the majority of the hospitals do not record it. This criterion should be added to the recommendations for a South African standard.

5.3.3 Skin Sutures used

The type of skin sutures used is recorded by 10 of the 14 hospitals, an indication that it is considered important by the hospitals in the study. One of the hospitals that does not record this criterion, Hospital 8 scores very low in virtually all the criteria groups with an average score of 30%. Another hospital records the skin sutures used in the surgical report completed by the surgeon. The information is therefore available to the ward staff in this instance although the nursing staff does not record it. The other two hospitals fail to record the type of skin sutures used at all. This criterion is recommended to be included in a standard for peri-operative documentation, as it is information needed by the ward staff for post-operative wound care.

5.3.4 Type of operation performed

The type of operation performed is recorded on the peri-operative nursing record by 13 of the 14 hospitals. In the outstanding hospital, the information is recorded in the surgical report by the surgeon so is available to the post-anaesthesia caregivers.

It is not clear from the literature why the type of operation is not included in the AORN recommendations for a peri-operative record. It appears however that in most hospitals in the USA the surgeon completes a surgeon's report and this information is recorded in that document. As a surgeon's report kept in the patient's file is not completed in many of the Western Cape hospitals it is important that the information is recorded in the peri-operative nursing record. A signature of verification by the surgeon would increase the legal validity of the entry. Another way to increase the validity is for the surgeon to enter the details of the operation on a multidisciplinary peri-operative record. This is required by one of the private hospitals assessed.

Details of the type of surgery are necessary for the ward staff. The type of surgery has implications for post-operative care such as positioning, observations and diet. The type of operation as recorded in the peri-operative record often gives details of implants, the number of incisions and special equipment used. For example, 'Laparoscopically assisted vaginal hysterectomy' gives an indication of the type of surgery, the surgical approach and the equipment used. The type of surgery also defines the extent of the skin preparation site and the site of the wound/s.

This criterion is important and needs to be included in a standard for peri-operative documentation.

5.3.5 Throat pack

The use of a throat pack is recorded by 6 of the hospitals either as part of the swab count or as a separate item. Where it was part of the swab count, the throat pack was listed under type of swab. It is not necessary to have this as a separate criterion if the throat pack is routinely recorded in the swab count and may be recorded under 'Other' in the 'Type of swab used'. The use of a throat pack should also be recorded by the anaesthesiologist on the anaesthetic record.

5.3.6 Instrument trays used and 'All packs sterile'

Three of the hospitals record the type of instrument trays used and /or the fact that the packs used were sterile. Since all items used in the sterile field should be sterile this seems superfluous. The quality control measures used in the Sterilising Supply Department should be adequate records for risk management purposes. A break in the aseptic technique should however be recorded as a critical incident, and will be indicated by the wound classification. These two criteria are not considered vital for inclusion in a standard, as the Sterilising Supply Department should have their own controls.

5.3.7 Cross-clamp and bypass times

These two criteria are included in the peri-operative records of some of the hospitals that perform cardiac and vascular surgery. Two hospitals record the cross-clamp time, and one the by-pass time. As these are not nursing functions it is felt that it would be better for the anaesthesiologist or cardiac technician to record these two criteria. It is not considered necessary to include this in a peri-operative nursing record.

5.3.8 Abnormal blood loss

Two hospitals record abnormal blood loss on the peri-operative nursing record. This represents 14% of the total. If a record were made of critical incidents occurring intra-operatively then it is not necessary to separately record abnormal blood loss as this would be included. Abnormal blood loss is also recorded by the anaesthesiologist on the anaesthetic record and this information is available to the post-anaesthesia caregivers. In hospitals where a 24-hour fluid balance record is continued intra-operatively, all blood loss would be recorded. It is therefore not considered necessary to include abnormal blood loss as content criterion for a peri-operative nursing record.

5.3.9 Deep vein thrombosis (DVT) prevention

Intra-operative DVT prevention such as anti embolism stockings or the use of a sequential pneumatic compression device is recorded by only one hospital. The risk of DVT depends on the type, location, and extent of the surgery as well as the condition of the patient pre-operatively. Age, obesity, immobility, certain medications and a history of thrombosis or cardiovascular disease are predisposing factors (Atkinson et al 1996:488). DVT prevention usually commences pre-operatively and is prescribed by the surgeon or anaesthesiologist. Physical steps are taken by the nursing staff during positioning of the patient to prevent

pooling of venous blood and thereby preventing DVT formation. Physical measures implemented intra-operatively are; compression stockings, sequential inflation devices applied to the lower limbs, and careful positioning to prevent venous pooling (Atkinson et al 1996:488). Measures taken during positioning of the patient are routine, but any additional measures such as mentioned above should be recorded. It may be entered as part of the individualised intra-operative care plan or may be part of the peri-operative record. Even though it is only recorded by one of the hospitals assessed, it is felt that it should be considered as part of a South African standard for peri-operative nursing records.

5.3.10 Names of staff receiving the patient in different areas of the operating theatre

Although the AORN standard stipulates the names and signatures of the persons providing care during the intra-operative phase, it was noted that some hospitals did not record the hand over of the patient at various points.

Although all the hospitals recorded the names of the surgeon, anaesthesiologist, assistant, scrub nurse, anaesthetic nurse and circulating nurse, the names of the staff at other stages of the peri-operative process were not always recorded. The names of the theatre staff receiving the patient in the operating suite was recorded by 5 of the hospitals, the names of the recovery room staff receiving the patient by 6, and the ward staff collecting the patient from theatre, by 8. Each time the care of the patient is transferred from one staff member to another, this process should be recorded. This ensures accountability at every stage. In the event of litigation or problems at a later stage it may be necessary to trace the caregivers responsible for the patient.

5.3.11 Recommendations for local criteria to be added to the AORN criteria

The following criteria should be added to the AORN recommendations in the formulation of a SA standard:

- Condition of the limb after removal of the tourniquet.
- Skin sutures used.
- DVT prevention.
- Type of operation performed.
- Time spent in operating room.
- Names of the staff receiving the patient in each area of the operating theatre.

In addition to the above criteria the use of specialised equipment and the care of the patient in the recovery room should also be added to recommendations for a South African standard.

5.3.11.1 Use of specialised equipment

More and more specialised equipment is being used in surgery today and every piece of equipment has its own inherent dangers to the patient or the user. If the use of lasers and electro surgery is to be routinely recorded, then it could be argued that any equipment used should also be recorded. For example, endoscopy equipment, insufflation devices, cell savers, argon beam coagulators and others may be recorded by either by ticking the appropriate box on a pre-recorded list of equipment or listing the special equipment used. See table 7.5 in the chapter on recommendations for an example of how this may be achieved.

5.3.11.2 Recovery Room data

Data relating to care in the recovery room should also be added, in order to complete a South African recommended standard for peri-operative documentation.

5.4 STRATIFICATION OF THE SAMPLE

The participating hospitals in the sample group were stratified in two dimensions, private (12) and public (2) hospitals as well as, in-patient (10) and out-patient (4) hospitals. Trends in hospital results were also analysed to try and identify any other type of possible stratification.

5.4.1 Private/Public

Table 4.5 shows that there was no significant difference between the results of the public and private hospitals. The reasons for this are as follows:

- Until at least 1997, Nursing Colleges allied to public sector hospitals have been responsible for training all nurses completing the Diploma in Operating Theatre Nursing Science in the Western Cape. This means that the theatre trained nursing staff working in private hospitals have the same basic attitude towards maintaining standards in the operating theatre as those in the public sector. This may change in the future as training has been suspended in the public sector, and at least two of the private hospital groups

now offer Peri-operative Nursing Science Diploma training in association with two different universities.

- The private sector has become as highly self regulated as the public sector, with the introduction of accreditation and managed health care. As a result the private hospitals have developed their own standards.
- There has been a close association between Operating Theatre managers in the public and private sectors through the Western Cape Theatre Standards Committee and through SATS. Co-operation has included standardisation of certain aspects of operating theatre practice and discussion of common problems.
- Although there are fundamental differences in the financial aspect of operating theatre management between the public and private sectors, the nursing care needed for the patient and the potential risks that the patient encounters are the same. Staff, budget and time constraints are also no longer confined to the private sector as rationalisation of the public hospitals has led to a leaner staff compliment and fewer resources.

5.4.2 In-patient /Out-patient hospitals

For the purpose of this stratification out-patient hospitals are defined as those that do not offer an overnight stay facility. In-patient hospitals offer an over night stay facility and usually offer a wider range of surgical specialities.

Of the fourteen hospitals in the sample group, only four hospitals cater for out-patients exclusively. Table 4.6 shows that at a 95% certainty, there is no significant difference between the average criteria group scores for seven of the eight criteria groups. However a significant difference was found in criteria group B: Potential for injury related to patient positioning. In this group all the out-patient hospitals scored 0%.

As previously discussed in the results section, by changing the degree of certainty from 95% to 90% the *t*-test results show that there is a significant difference between the in-patient and out-patient total average scores. It can be said with 90% certainty that the total score of out-patient hospitals is significantly lower than that for in-patient hospitals.

It is not apparent why the out-patient hospitals should have neglected the risk of injury related to positioning of the patient. One possible explanation could be that one or more of

the hospitals use a standard position for all patients. This is however not the case as all the hospitals perform a variety of types of surgery requiring different positions so a standard position could not be used as justification for not recording the position.

Another possible explanation could be the relatively short period of time spent by the patient in the operating theatre, which would reduce the risk of breakdown of skin integrity. This does not however explain the possible injury that could occur during positioning and during transfer of the patient. Also the length of time the patient spends in the operating theatre may be irrelevant if the patient has a pre-existing condition that increases his risk of breakdown in skin integrity.

A significant difference is not expected between the performance of out-patient and in-patient hospitals as the care needed for a patient intra-operatively, and the potential risks are the same for in-patients and out-patients. The literature has shown, however, that day-surgery facilities catering for out-patients spend much less time with each patient and as a result have more of a problem providing and documenting quality comprehensive care. Assessment of the patient is therefore inadequate as a result of the reduced time the nurse spends with the patient, and there is a risk that important observations may be missed. Also, the patient receiving a local anaesthetic is at risk of being treated as a second-class patient, not requiring as much care as a patient undergoing a general anaesthetic (MacKenzie et al 1988:526). Lack of time to spend with each patient, and to spend on documentation could therefore account for the statistical difference between the in-patient and out-patient hospitals at a 90% significance level. All the out-patient hospitals score low in criteria groups B, C, D and E. These are all criteria relating to possible injury to the patient and have risk management implications. It appears therefore that the emphasis of the criteria in the out-patient hospitals is more on assessment and general documentation than on recording interventions taken to prevent potential injury. This would reduce the time needed for documentation, but has serious implications for risk management as it leaves the nurse in a difficult position of not being able to prove what steps were taken to prevent injury (Morrissey-Ross 1988:364, Castledine 1998:172).

Killen (1997:21) identifies that the focus of peri-operative nurses' clinical judgements in the USA is on patient safety and prevention of harm. The results of this research suggest that this may not be true in the out-patient clinics in South Africa, as the emphasis on patient safety is less than that of the in-patient hospitals. This is assuming that the peri-operative documents accurately reflect the actual care given in the operating theatre. This may however not be the case, and further research is necessary to determine exactly what care is

given and why it is not documented. Most of the out-patient facilities have designed their own peri-operative records without input from a central head office or a large group. The documents are therefore designed for their particular needs and the exclusion of many aspects of risk management suggest that this is a low priority for these hospitals.

Another possible reason for the difference between in-patient and out-patient hospitals is that many of the out-patient facilities are smaller and have less resources than the larger in-patient facilities. This means that they may have a lower staff-patient ratio that increases the effect of the shortage of time spent with the patient. They may not have access to the same management and educational resources as hospitals in the larger groups and as such may not have nursing staff devoted to risk management and the up dating of documentation. These speculations need further research to confirm. The out-patient hospitals may also be less likely to have been through an accreditation program with COHSASA. Of interest however is that one of the in-patient hospitals that score very low across all criteria groups has been accredited by COHSASA. This reinforces the conclusion reached in the literature review that the criteria for documentation required by COHSASA do not focus adequately on nursing care and risk management, but are designed for a doctor led service (COHSASA 1996:13.14 -13.24).

5.4.3 Trends in the hospital results

When observing the criteria group scores for each hospital (Figures 4.19 to 4.32) it was observed that the hospitals fall into three distinct groups. Each group is discussed below.

5.4.3.1 Group One

These hospitals show the following trend with regard to criteria group scores:

- They consistently score lower than average. The average score in this group of hospitals is 38%; below the overall average of 52%.
- They score zero for Group B - potential for injury related to patient positioning.
- They also score particularly low for the following criteria groups:
 - Group C - potential for injury related to electrical hazards.
 - Group D - potential for injury related to physical hazards.
 - Group E - potential fluid and electrolyte imbalance.

Hospitals 8, 15,16, 19, 23, and 26 fall into this group. All four out-patient facilities are found in this group, as well as two in-patient facilities, but these two cater for a large number of out-

This is information considered relevant to surgery such as;

- Allergies
- Adverse anaesthetic reaction
- Bleeding tendency
- Smoking
- Physical limitations
- Porphyria
- Infectious diseases
- Medications taken, especially anticoagulants and cortisone

If at all possible, repetition should be avoided as it wastes time and may be a barrier to accurate record-keeping. The out-patient facilities all integrate the admission assessment with the peri-operative record. This saves time and increases continuity.

Three of the hospitals incorporate the anaesthetic record into the peri-operative record making it a multidisciplinary document. Two are in-patient hospitals and all three include records of observations, medications used, type of anaesthesia, monitoring and airway management. Integrating the anaesthetic record with the peri-operative record has advantages and disadvantages. If all the information is in one place it makes it easier for the post-anaesthesia caregivers to access it. However, access to the document for recording information may be a problem as the anaesthesiologist and the nurse may need to use it at the same time.

5.5.2 'tick-the-box' system

More than half the hospitals, 57%, use a predominantly 'tick-the-box' system of entering information in favour of long-hand entries. For example a list of the commonly used positions is displayed, and the nurse just has to tick or circle the appropriate position instead of writing it out. If the 'tick-the-box' system were not used then the document would read;

Patient position: _____

The nurse would be required to fill in the position and may not use a position name that is known to other nurses.

The 'tick-the-box' format has the following advantages identified in the literature review:

- Saves time by reducing long-hand entries.
- Prompts the nurse to enter the exact information required.
- It prompts the nurse to perform certain essential tasks which is especially useful for novice nurses in the operating theatre.
- It promotes consistency of language used.
- It is easier to read as it is not necessary to decipher handwriting.
- More information can be recorded in less space.
- Data can more easily be retrieved for research and quality management (Stanfield 1987:704).

One disadvantage of this method is that there may be little scope for individualisation. To overcome this problem a choice of 'Other' should be given where appropriate as well as an option for 'not applicable'. If the document is poorly designed with little space between the printing there may be a problem with inaccurate ticking. This could be a problem when the nurse is in a hurry or has a large writing style.

5.5.3 Grouping of pre-operative and intra-operative care according to nursing diagnosis

Although nursing diagnoses were used in the pre-operative and post-operative phases none of the hospitals used them in the intra-operative phase. This indicates that the 'Nursing Process' is not used in documenting care in the intra-operative phase.

Several of the peri-operative records examined in the literature review used nursing diagnoses or potential problems in the design of the intra-operative section of the peri-operative nursing record (Null et al 1995:549, Palmerini 1996:240). Shirley (1993:1434) describes the intra-operative nursing care plan used at the Texoma Medical Centre in Denison, Texas. In this document the nursing interventions are grouped according to potential or actual problems. There is very little writing involved as the record largely uses a 'tick-the-box' system. Patient outcomes are set for each nursing diagnosis and these form the immediate post-operative evaluation phase, with interventions for evaluation recorded under the outcome headings. This three column design of, nursing diagnosis, nursing intervention and patient outcome is easy to use and comprehensive (See recommendations in chapter 6 for examples of a peri-operative record using this format).

Only two of the peri-operative documents used in the Western Cape Metropolitan Health Region listed the nursing interventions according to the nursing diagnosis and this was only in the pre-; and post-operative phases.

5.5.4 Different records for day-surgery cases

Only two in-patient hospitals use different peri-operative records for out-patients. The intra-operative sections were the same in the out-patient record and the in-patient record. The major differences were found in the pre-operative assessment and preparation. In both cases the admission assessment of medical, surgical and anaesthetic history was incorporated into the pre-operative assessment and preparation. It was encouraging to see that the intra-operative sections of the in-patient and out-patient records were essentially the same as the patient faces the same potential problems in the operating theatre whether an in-patient or not.

5.5.5 Length of the document

The average number of pages in the peri-operative records reviewed is 4,6 with a range from 2 to 9 pages. The average number of pages in the intra-operative section was 1 page with a range from 0.5 to 2 pages. This is consistent with the documents reviewed in the literature review. The average length of the intra-operative section of the peri-operative records in the literature review was 2 pages and an attempt was made in most cases not to exceed this number of pages (Slone et al 1989:810, Edel et al 1989:598, Wilhelm-Hass et al 1991:745).

5.5.5.1 Arrangement of the pages

The hospitals that have an integrated peri-operative document arrange the pages in various ways. The most common methods are an A5 sized sheet, folded in two, creating 4 pages or a tri-fold sheet consisting of 6 pages. A small number of the hospitals have the peri-operative document in a booklet format together with the consent form, ward observations, progress report, and discharge details. Booklet formats keep all the relevant documentation together but are less flexible as they may include documentation that is not needed for every patient.

One of the out-patient hospitals has the peri-operative record and discharge details printed on card rather than paper, and this creates the patient folder. This is an interesting way of saving space and keeping all records together. Any additional documentation such as the anaesthetic record and consent form is filed inside the peri-operative folder.

The hospitals that did not have an integrated peri-operative record have separate sheets for pre-operative assessment, intra-operative care, and recovery room care.

5.5.6 Other design features

5.5.6.1 Graphics

Only one hospital uses graphics in their peri-operative nursing record. This hospital uses body outlines in the anatomical position, both anterior and posterior aspects. An anterior and posterior head and neck is also shown, as the head on the body diagram is small. These diagrams were repeated pre-; and intra-operatively.

The diagrams were used to indicate the position of:

- ECG electrodes
- The electro-surgical plate
- Peripheral intravenous lines
- Arterial line
- Central venous pressure line
- Incision/s
- Bruises and other skin lesions.

See Figure 5.1 for an example of how a body diagram can be used to record skin condition, monitoring devices and the position of the indifferent electrode.

Several of the peri-operative records examined in the literature review used body diagrams to indicate the condition of the patient's skin, the position of monitoring devices, tourniquet and electro-surgical plate positions and the extent of the skin preparation. As in the peri-operative record mentioned above, either letters, or symbols were used to indicate the exact position on the body (Mackie et al 1984:196, Wilhelm-Hass et al 1991:759, Spry et al 1991:741). This system has distinct advantages over describing positions as it is immediately apparent to the observer and removes the possibility of confusion caused by an inaccurate description.

5.5.7 Conclusions of design features

Although the major focus of this research has been on the content criteria of peri-operative nursing records the design features of a document have been shown to have implications for accuracy of documentation (Stanfield 1987:699, Howse and Bailey 1992:374, du Toit and

Dewar 1990:26, Meurier, Vincent and Parmar 1998:1012). The results show that there is room for improvement in the design of the peri-operative documents in the sample group. Changes are needed that will enable more content while at the same time reducing the time spent by the nurse documenting peri-operative care. Recommendations for the design of peri-operative documents are discussed later.

6 CONCLUSIONS

Conclusions have been discussed in each section of the preceding chapter. The following is a summary of these previously discussed points as well as a discussion of the results adjusted to suit the South African situation.

6.1 ADJUSTMENT OF THE RESULTS TO SUIT SOUTH AFRICAN PERI-OPERATIVE PRACTICE

Overall, the average compliance with the AORN criteria by the hospitals assessed is low at only 52%. The research question, "how do the local documents perform against an international standard?" is therefore answered as "poorly". However, this result includes some criteria that are not considered relevant to South African peri-operative nursing practice. The following criteria were identified as not relevant and can be excluded for reasons already explained in discussion in the previous chapter:

- Method of transfer.
- Radio-active implants.
- Temperature of the patient.
- ESU settings.

By excluding these criteria from the calculations a new compliance of 60% is achieved. See appendices J and K, for the full results adjusted for the new list of criteria. Additional criteria to those in the AORN standard were identified as important to the South African situation, see Table 4.7. When these criteria were evaluated and the appropriate criteria added to the adjusted list of AORN criteria mentioned above, the new average result across all the hospitals was 61%. This is only an increase of 9% on the original calculation so the low result cannot be justified by inappropriate criteria.

Figure 6.1 shows the average results for each hospital before and after the adjustment of the criteria.

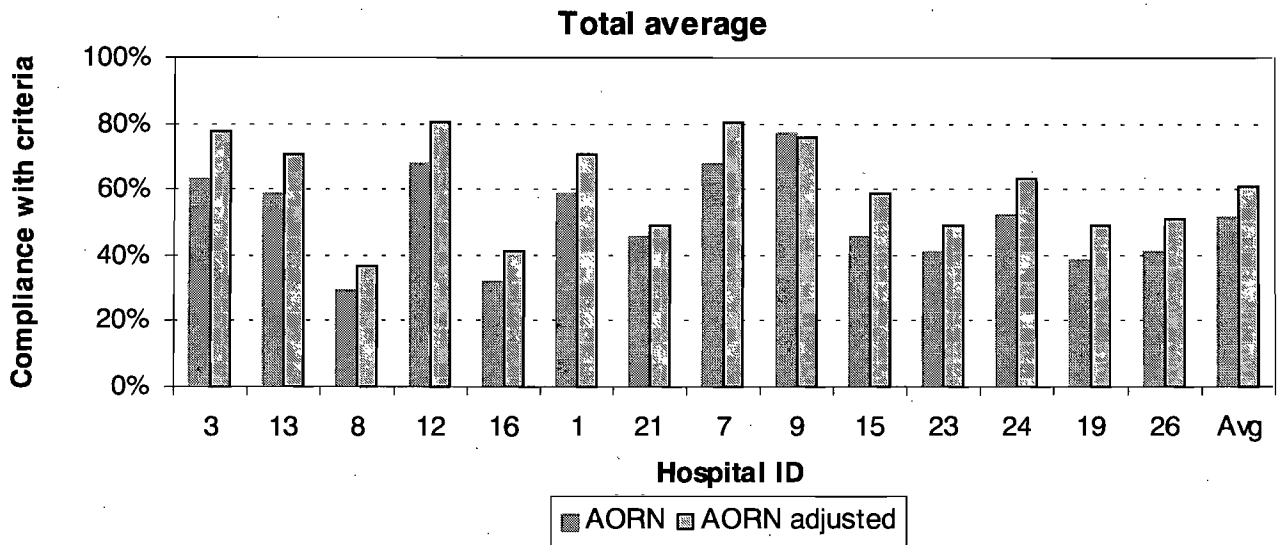


Figure 6.1. Results of all the hospitals before and after adjustment of the AORN criteria to suit SA peri-operative nursing practice

All the average scores improved by a margin of between 8% and 12%, but the total average compliance of 61% is still low.

Figure 6.2 shows the comparison between the criteria group results before and after adjustment of the criteria to suit SA peri-operative practice. The adjustment did not improve the results substantially in any of the groups except group G: Potential for injury related to foreign objects. Exclusion of radio-active implants as a separate criterion from implants used, increased the score from 61% to 81%.

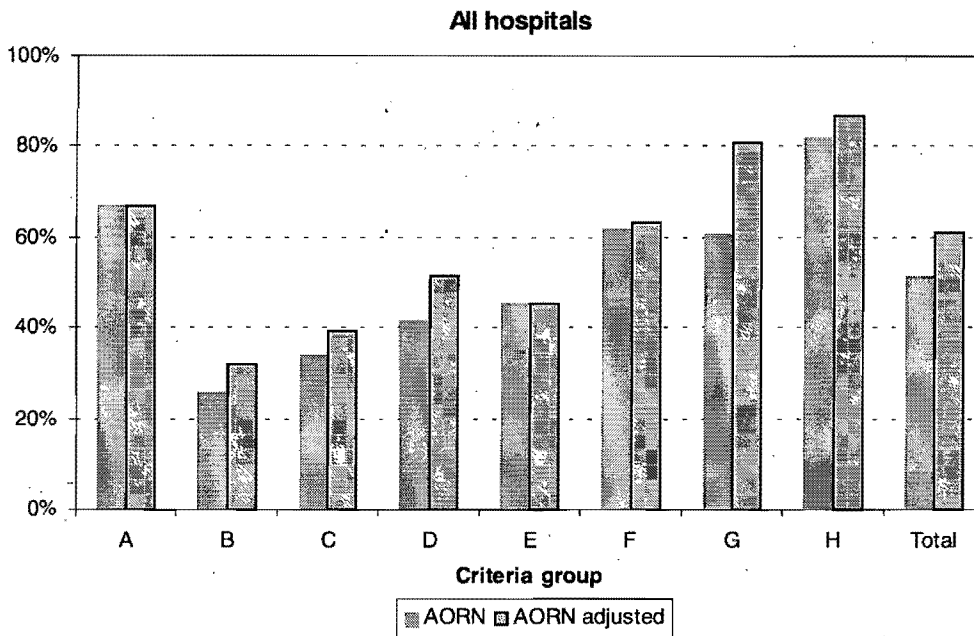


Figure 6.2. Results of each criteria group before and after adjustment of the AORN criteria to suit SA peri-operative nursing practice

6.2 CRITERIA GROUP RESULTS

The criteria group results show deficiencies in the areas of potential for patient injury related to positioning, electrical and physical hazards and potential fluid and electrolyte imbalance. In particular, criteria groups B, C and D are the criteria groups that score the lowest. Six of the hospitals scored 0% for group B: Potential for injury related to positioning, and these are either out-patient hospitals or in-patient facilities that cater for a large number of quick turn-over surgical cases. Possible reasons for these hospitals recording a minimum of information is the shortage of time for the peri-operative nurse to record between patients, lack of resources, and the fact that the documents are locally designed. Of interest is the fact that two of the six hospitals scoring 0% in criteria group B have been accredited by COHSASA. This reinforces the point made in the literature review that the criteria for documentation stipulated by COHSASA do not emphasise the importance of risk management in peri-

operative nursing practice. The focus of the COHSASA standard is on a doctor-led service and does not give specific criteria for nursing documentation (COHSASA 1996:13.14 -13.24).

6.3 HOSPITAL RESULTS

Hospitals were initially stratified into private/public hospitals and in-patient/out-patient hospitals. It was shown that there is no statistical difference between criteria group scores of public and private hospitals. Out-patient hospitals score significantly lower than in-patient hospitals for criteria group B: Potential for injury related to patient positioning. No valid justification for this phenomenon could be found.

Depending on the level of certainty chosen, there may be a statistical difference in overall scores between in-patient and out-patient hospitals. The nursing records of the out-patient hospitals in the sample group are deficient in the areas of risk management. Possible reasons for this have been discussed in some detail in the previous chapter and include; shortage of time for the peri-operative nurse to record between patients, lack of resources and the fact that the documents of out-patient facilities are often locally designed without the benefit of access to educational resources. The smaller clinics and hospitals often do not have infection control nurses or formal infection control programs which accounts for the low priority given to data related to infection control risk management.

6.4 DESIGN OF THE PERI-OPERATIVE RECORDS REVIEWED

An accurate value judgement on the merits of the design characteristics cannot be made without further research. The needs and opinions of the users of the documents need to be assessed as well as their perceived barriers to accurate record-keeping.

Research has shown that lack of time due to work overload and shortage of nursing staff has a direct influence on the accuracy of record-keeping (Stanfield 1987:699, Howse and Bailey 1992:374, du Toit and Dewar 1990:26, Meurier, Vincent and Parmar 1998:1012). Design features such as the length of the document, the content requirements and the format of entry of information will have an influence on the time spent on record-keeping. Only 50% of the hospitals surveyed use a predominantly 'tick-the-box' format of recording in the intra-operative phase in spite of the advantages of speed and increased accuracy (Stanfield 1987:699). This is one aspect of the design of the documents that could be changed in the future.

The length of the documents reviewed, although variable, on average comply with the length of those reviewed in the literature. The length of the document has an influence on the time spent on record-keeping and may also be an emotional barrier to accurate record-keeping. Nurses may perceive the documentation as a waste of time away from the important task of caring for the patient (Heartfield 1996:98, Iyer et al 1991:1).

Fragmentation of patient records has been shown to have a negative effect on accurate communication and several researchers propose that multidisciplinary documents will eliminate this problem (Howse and Bailey 1992:374, Uys 1985:29). Nine of the hospitals have an integrated record with pre-operative assessment and preparation, intra-operative care, and post-operative evaluation all recorded on the same document. Of these, only two use a multidisciplinary approach with the anaesthetic record integrated into the peri-operative document. Further investigation is needed to determine the attitudes of the nurses and doctors to a multidisciplinary approach to peri-operative records.

7 RECOMMENDATIONS

Arising from the research and the literature review several recommendations can be made with regard to the design and content of peri-operative records used in the Western Cape Metropolitan Health Region.

In each section of the recommendations for content criteria, an example is given of how the criteria could be included in a peri-operative record. A standardised care plan approach, based on the 'Nursing Process', is used with possible problems identified in a nursing diagnosis, nursing interventions listed, and patient outcomes identified. The patient outcomes incorporate the immediate post-operative evaluation carried out by the scrub nurse prior to hand over in the recovery room. This approach was the foundation of the design of several peri-operative records reviewed in the literature (Palmerini 1996:240-246, Shirley 1993:1427-1435). In particular, the layout of the peri-operative record designed at the Texoma Medical Centre had a strong influence on the recommendations made for the structure (Shirley 1993:1434-1435).

7.1 RECOMMENDATIONS FOR THE DESIGN OF PERI-OPERATIVE RECORDS

As the recommended content criteria are presented visually in a peri-operative record, the design recommendations are discussed first. These design characteristics were taken into consideration when designing the example of a peri-operative record.

Design characteristics should enhance the accuracy of the document and speed up its completion. Characteristics recommended are:

- A 'tick-the-box' format is recommended, as there are demonstrable advantages in time saving and accuracy to this method of recording (Stanfield 1987:699). Where a yes/no type answer requiring a tick is not appropriate, only a short note should be required. As much information as possible is on the peri-operative record, and the nurse is only required to select the appropriate information.
- The length of the document may also affect the time spent on record-keeping and should be kept to a minimum (Stanfield 1987:699)
- A 'Nursing Process' approach should be used with nursing interventions grouped according to potential/actual problems or nursing diagnoses. Standard and individualised care plans should be included for the pre-operative, intra-operative and post-operative phases. Standardised care plans, with nursing interventions grouped according to routine

intra-operative nursing diagnoses, improve the speed of record-keeping as well as providing a logical and scientific approach (Edel et al 1989:596, Wilhelm-Hass et al 1991:754).

- An integrated record with all phases of the peri-operative period recorded on one document is needed to encourage continuity and to increase the accuracy of communication. The possibility of multidisciplinary documents should also be further investigated (Howse and Bailey 1992:374, Uys 1985:29, Palmerini 1996:239).
- It is not necessary to have separate records for day-surgery cases and in-patients as the potential problems in the operating theatre are the same for all patients.

When designing the peri-operative record to incorporate the recommendations it became apparent that there was a conflict between keeping the document as short as possible while including all the necessary information. It is therefore understandable that some hospitals may have prioritised the content required and only included the data that they consider most important. However the risk management implications of excluding certain important data are serious, as it may leave the nurse in a position of not being able to prove that care was given.

7.2 RECOMMENDATIONS FOR CONTENT CRITERIA OF A PERI-OPERATIVE RECORD

From this research it is apparent that there are areas of weakness in the peri-operative nursing records used in the Western Cape Metropolitan Health Region. Low scoring criteria were identified in the results chapter and analysed for validity in the Western Cape context in the discussion chapter. Not all the low scores have reason for concern, as there are local reasons that may justify these scores. There are however several areas that require closer examination and improvement.

7.2.1 Group A: Pre-operative assessment

Although this group scored relatively high, 67%, there are some areas that could be improved upon. Psychosocial data is lacking in the collection of pre-operative assessment data, and this should be included to make the assessment holistic. In South Africa we have a multicultural society with many languages and customs. These should be considered when the patient is assessed for surgery. The patient's home situation and ability to cope post-operatively should also be taken into consideration.

Simply recording the emotional status of the patient is not enough. Measures taken to reduce anxiety such as orientation to the ward, and educating the patient about what to expect intra-; and post-operatively have been shown to reduce anxiety (Jost 1995:47). These should be recorded and the patient's individual reaction noted in the progress report.

Pre-operative assessment during pre-operative visits by the operating room nursing staff is essential if care planning is to be carried out. Provision for this needs to be made on the peri-operative record so that care plans are individualised and kept as part of the patient's permanent record. To facilitate pre-operative visits by operating theatre nurses, support is needed from nursing management in both the operating theatre and the hospital (Capstick 1991:43-49, Wicker 1995:16).

Figure 7.1 is an example of an individualised intra-operative care plan to be completed by the peri-operative nurse during a pre-operative visit.

Seen by operating theatre staff in the ward: Yes <input type="checkbox"/> No <input type="checkbox"/>			Signature: _____
Individualised Intra-operative care plan			
Potential/Actual problems	Nursing Interventions Planned	Goals/ Outcomes	

Figure 7.1. Example of an individualised intra-operative care plan

The admitting nurses in the ward or out-patient area should carry out a full pre-operative assessment. Part or all of this may be recorded as part of the admission assessment. An attempt should be made to reduce repetition of information, as most of the standard admission assessment is applicable to surgical as well as medical patients. The assessment should include the following:

- Medical history according to body systems.
- Surgical history.
- Anaesthetic history, in particular any adverse reactions to general or local anaesthetic.
- Family medical history, particularly of diseases such as porphyria and malignant hyperthermia.

- Physical status, including;
 - Base line vital signs, blood pressure, pulse, temperature and respiration.
 - Haemoglobin, where applicable.
 - Urinalysis.
 - Physical limitations and deformities.
- Emotional status.
- Data relating to socio-cultural status, e.g. what is the home situation and will the patient need assistance after discharge?
- Identification of potential problems and formulation of a care plan for the entire peri-operative period.

Pre-operative preparation of the patient for surgery is a process of physical and mental preparation of the patient. A pre-operative nursing care plan can be standardised for the majority of the nursing interventions required pre-operatively. Standard nursing diagnoses identified for the pre-operative period are:

- Potential Anxiety.
- Potential knowledge deficit.
- Potential vomiting.
- Potential wound infection.
- Potential safety risk.

West (1998:304) however warns against reducing the preoperative care plan to a simple administrative checklist of requirements for entry into the operating theatre.

Figure 7.2 is an example of a pre-operative care plan that includes all the preparation for surgery. A simple list is avoided and the nursing interventions are grouped according to the potential problems.

PRE-OPERATIVE CARE PLAN	
Nursing diagnosis	Nursing Interventions
POTENTIAL FOR/ACTUAL ANXIETY RELATED TO SURGERY AND KNOWLEDGE DEFICIT	Pre-; and post-operative procedures explained: Yes <input type="checkbox"/> No <input type="checkbox"/> Interpreter needed: <input type="checkbox"/> N/A <input type="checkbox"/> Language: _____ Education given (see progress report for details) Yes <input type="checkbox"/> No <input type="checkbox"/> Seen by Anaesthetist: Yes <input type="checkbox"/> No <input type="checkbox"/> Premedication given: Yes <input type="checkbox"/> No <input type="checkbox"/> Informed consent signed: <input type="checkbox"/> Patient needs assistance after discharge: Yes <input type="checkbox"/> No <input type="checkbox"/>
POTENTIAL VOMITING	Kept nil per mouth from _____ Advised not to smoke: Yes <input type="checkbox"/> N/A <input type="checkbox"/>
POTENTIAL/ACTUAL BREAKDOWN OF SKIN INTEGRITY	Condition of skin checked Yes <input type="checkbox"/> No <input type="checkbox"/> Comments: _____
POTENTIAL/ACTUAL INFECTION	Septic foci present: Yes <input type="checkbox"/> No <input type="checkbox"/> Details: _____ Skin Prep done: Yes <input type="checkbox"/> No <input type="checkbox"/> Area shaved : Yes <input type="checkbox"/> No <input type="checkbox"/> Bowel preparation: Yes <input type="checkbox"/> No <input type="checkbox"/> N/A <input type="checkbox"/> Dressed in theatre attire: Yes <input type="checkbox"/> No <input type="checkbox"/>
POTENTIAL FOR INJURY	BP: _____ Pulse: _____ Temp: _____ Resp: _____ Hb: _____ HGT: _____ Urinalysis normal: Yes <input type="checkbox"/> No <input type="checkbox"/> _____ Remove: Nail polish <input type="checkbox"/> Makeup <input type="checkbox"/> Jewellery <input type="checkbox"/> Contact lenses <input type="checkbox"/> Dentures: Yes <input type="checkbox"/> No <input type="checkbox"/> Removed <input type="checkbox"/> Caps/crowns Yes <input type="checkbox"/> No <input type="checkbox"/> Prosthesis: _____ Removed: Yes <input type="checkbox"/> No <input type="checkbox"/> Identification band applied: <input type="checkbox"/> Medic Alert insitu <input type="checkbox"/> Passed urine: Yes <input type="checkbox"/> No <input type="checkbox"/> Catheterised Yes <input type="checkbox"/> No <input type="checkbox"/> Investigations with the file: ECG <input type="checkbox"/> X-rays <input type="checkbox"/> Blood results <input type="checkbox"/> Advised to stay in bed <input type="checkbox"/> Cotsides up/safety strap on <input type="checkbox"/>
POTENTIAL/ACTUAL FLUID AND ELECTROLYTE IMBALANCE	Blood ordered: Yes <input type="checkbox"/> No <input type="checkbox"/> IV Infusion started: Yes <input type="checkbox"/> No <input type="checkbox"/>
Ward nurse responsible for pre-operative check: _____	
Transferred to theatre by: _____ Trolley <input type="checkbox"/> Bed <input type="checkbox"/>	
Theatre nurse receiving the patient: _____	

Figure 7.2. Example of a standardised pre-operative care plan.

The steps of the 'Nursing Process' should be used during the intra-operative period as well as the pre-operative phase, and standard nursing diagnoses pertinent to all surgical patients can be used to group together the relevant nursing interventions needed to achieve the required outcome standards. The nursing diagnoses used in this research are recommended for use in the intra-operative phase.

7.2.2 Group B: Potential for injury related to patient positioning

Since injury related to positioning is a risk facing every patient in the operating theatre it is recommended that all hospitals include this aspect of intra-operative nursing care and risk management in their peri-operative records.

Recommended criteria related to potential for injury due to positioning are:

- Position of the patient.
- Positioning devices used.
- Skin condition pre-surgery and post-surgery.

Figure 7.3 shows an example of the portion of a peri-operative record with details related to patient positioning. All the most commonly used positions and positioning devices are listed and the nurse only has to indicate those used with a tick in the appropriate box.

Nursing Diagnosis	Nursing Actions	Patient Outcomes
Potential for/Actual injury related to patient position.	POSITION: Supine <input type="checkbox"/> Prone <input type="checkbox"/> Lithotomy <input type="checkbox"/> Jack-knife <input type="checkbox"/> Lt. lateral <input type="checkbox"/> Rt. lateral <input type="checkbox"/> Other _____ Skin Integrity checked before positioning <input type="checkbox"/> * Positioning devices used for correct body alignment <input type="checkbox"/> Pillows/sponges <input type="checkbox"/> Sandbags <input type="checkbox"/> Bolster <input type="checkbox"/> Restraints <input type="checkbox"/> Fracture table <input type="checkbox"/> Mayfield headrest <input type="checkbox"/> Kidney support <input type="checkbox"/> Lithotomy supports <input type="checkbox"/> Stirrups <input type="checkbox"/> Spinal Frame <input type="checkbox"/> Other: _____	<input type="checkbox"/> No evidence of impaired skin integrity. <input type="checkbox"/> No evidence of neuromuscular damage. <input type="checkbox"/> Venous pooling prevented. * See critical incidents for details of deficiencies in skin integrity etc.

Figure 7.3. Example of a portion of a peri-operative record with details related to patient

7.2.3 Group C: Potential for injury related to electrical hazards

Criteria related to the use of the electro-surgical unit need some attention in the records currently in use. In particular, the condition of the site of the indifferent electrode before and after application. Differentiation should also be made of the type of electro-surgery used; whether monopolar, or bipolar, as there is a difference in the degree of risk, and an indifferent electrode is not needed for bipolar (Hutchisson et al 1998: 834).

Figure 7.4 shows an example of the portion of a peri-operative record related to potential for injury related to electrical hazards.

Nursing Diagnosis	Nursing Action	Patient Outcome
Potential for/ Actual injury related to electrical hazards	Electro-surgery used: Monopolar <input type="checkbox"/> Bipolar <input type="checkbox"/> Not used <input type="checkbox"/> Position of dispersive plate: _____ Skin condition checked before application <input type="checkbox"/> Warming device used : Electric Blanket <input type="checkbox"/> Forced hot Air <input type="checkbox"/> Systemic warming <input type="checkbox"/> Warm solutions used <input type="checkbox"/> Temperature probe site: Oesophagus <input type="checkbox"/> Rectum <input type="checkbox"/> Laser used: Yes <input type="checkbox"/> No <input type="checkbox"/> Type: Nd Yag <input type="checkbox"/> CO ₂ <input type="checkbox"/> Argon <input type="checkbox"/> Tuneable dye <input type="checkbox"/> Other _____	<input type="checkbox"/> Skin integrity under dispersive electrode maintained <input type="checkbox"/> No signs/symptoms of shocks or burns. <input type="checkbox"/> No apparent skin lesions that did not exist pre-operatively

Figure 7.4. Example of portion of a peri-operative record with data related to potential for injury related to electrical hazards

7.2.4 Potential for injury related to physical hazards

The criteria related to the use of a tourniquet were well represented by the hospitals in the Western Cape. All hospitals using tourniquets should record the position of the tourniquet, times of inflation and release and the condition of the limb after removal.

The necessity to record the position of monitoring devices is related to the dangers they pose to the patient. It is suggested that the anaesthesiologist should record the position of the monitoring devices and a body diagram is the easiest way in which to do this. An example of a body diagram is given in Figure 5.1.

Recommended criteria in this group are:

- Position of the tourniquet.
- Time of inflation of the tourniquet.
- Time of removal of the tourniquet.
- Condition of the limb after removal of the tourniquet.
- Use of intra-operative X-rays or fluoroscopy.
- DVT prevention used.

The use of other potentially dangerous equipment should also be noted on the peri-operative record. A list of commonly used equipment could be given and the appropriate devices circled or ticked. Different hospitals would vary this list to suit local requirements.

Figure 7.5. shows an example of the portion of a peri-operative record with data related to physical hazards.

Nursing diagnosis	Nursing Action	Patient Outcomes
Potential for injury related to physical hazards	Tourniquet used: Yes <input type="checkbox"/> No <input type="checkbox"/> 1. Left <input type="checkbox"/> Leg <input type="checkbox"/> Arm <input type="checkbox"/> Time on: _____ Time off: _____ 2. Right <input type="checkbox"/> Leg <input type="checkbox"/> Arm <input type="checkbox"/> Time on: _____ Time off: _____ Skin condition checked before application <input type="checkbox"/> Inflation setting: 1. _____ mmHg 2. _____ mmHg X-rays <input type="checkbox"/> Fluoroscopy <input type="checkbox"/> Contrast used: _____ Special equipment used: Argon beam coagulator <input type="checkbox"/> _____scope <input type="checkbox"/> Camera/video unit <input type="checkbox"/> Microscope <input type="checkbox"/> Insufflator <input type="checkbox"/> Phaco emulsifier <input type="checkbox"/> Cryo machine <input type="checkbox"/> Other _____ _____	<input type="checkbox"/> The tourniquet site is free from injury <input type="checkbox"/> The affected limb is free from injury <input type="checkbox"/> The patient is free from injury related to equipment used

Figure 7.5. Example of portion of a peri-operative record with data related to physical hazards

7.2.5 Potential for fluid and electrolyte imbalance

It is recommended that a 24-hour fluid balance chart accompany the peri-operative record when intra-venous solutions are commenced. In addition to this, the medications used should be recorded on the peri-operative record only if the anaesthetic record is not available to the post-anaesthesia staff. Essentially however, the anaesthesiologist is responsible for recording medications and intra-venous fluids used intra-operatively. An alternative would be to combine the anaesthetic record with the peri-operative document, but formation of a multidisciplinary document such as this would need further investigation.

7.2.6 Potential for Infection

The areas in this group needing attention are skin preparation and wound classification which should be included for infection control quality management purposes (Wicker 1995:16, Capstick 1991:43-49).

Criteria recommended in this group are:

- Skin preparation solution used.
- Skin preparation carried out by whom.
- Site, type and number of drains used.
- Site and type of catheters used.
- Plugs or wound packing left in-situ.
- Skin sutures used.
- Dressings used.
- Wound classification.

Figure 7.6 illustrates an example of a section of the peri-operative record with information related to the potential for infection.

Nursing Diagnosis	Nursing Actions	Patient Outcomes																
Potential for/Actual wound infection	Skin Prep: Povidone solution <input type="checkbox"/> Iodine in alcohol <input type="checkbox"/> Chlorhexidene in alcohol <input type="checkbox"/> Chlorhexidene aqueous <input type="checkbox"/> Other: _____ Skin prep by _____ Wound site: _____ Skin sutures _____	<input type="checkbox"/> The patient is free from the hazards contributing to wound infection.																
	<table border="1"> <thead> <tr> <th></th> <th>Number</th> <th>Site</th> <th>Type</th> </tr> </thead> <tbody> <tr> <td>Drains</td> <td></td> <td></td> <td></td> </tr> <tr> <td>Catheters</td> <td></td> <td></td> <td></td> </tr> <tr> <td>Plugs/Packing</td> <td></td> <td></td> <td></td> </tr> </tbody> </table>			Number	Site	Type	Drains				Catheters				Plugs/Packing			
			Number	Site	Type													
	Drains																	
	Catheters																	
	Plugs/Packing																	
	Wound Classification: Clean <input type="checkbox"/> Clean contaminated <input type="checkbox"/> Contaminated <input type="checkbox"/> Infected <input type="checkbox"/>																	
Dressing : _____																		
Aseptic technique maintained: Yes <input type="checkbox"/> No <input type="checkbox"/> (If No, see critical incidents for details)																		

Figure 7.6. Example of portion of a peri-operative record with data related to risk of infection

7.2.7 Potential for injury related to foreign objects

In this group it is recommended that radio-active implants be excluded as they may be entered as part of implants in general.

Recommended criteria in this group are:

- Implants used in surgery.
- Swab, instrument and needle count.
- Specimens collected.

Figure 7.7 is an example of a portion of the peri-operative record with data related to potential for injury related to foreign objects.

Nursing Diagnosis	Nursing Actions		Patient Outcomes
Potential for injury related to retained foreign objects Potential for misdiagnosis or wrong treatment related to loss of specimen	Instruments counted <input type="checkbox"/> Needles counted <input type="checkbox"/>		<input type="checkbox"/> The wound is closed with all swabs, instruments, sharps and other extraneous objects accounted for.
	Type of swab	Number of swabs used	
	Dissecting	(e.g. 5+5)	If swabs incorrect <input type="checkbox"/> :
	Small dissecting		
	Abdominal		<input type="checkbox"/> Surgeon notified
	Patties		<input type="checkbox"/> X-rays taken
	Other		<input type="checkbox"/> Incident report written, see details in critical incidents
	Implant used : _____ Stickers or details of implants: _____		
Specimen type: _____ Number: _____ Test: Histology <input type="checkbox"/> Cytology <input type="checkbox"/> MC&S <input type="checkbox"/> Other _____			

Figure 7.7. Example of portion of a peri-operative record with data related to foreign objects

7.2.8 General documentation

In this group the only AORN criterion in need of attention was the recording of critical incidents occurring in the operating theatre. This should not replace the need to write an incident report, but mention of untoward incidents should be made in writing in the patient's notes and not merely handed over verbally to the next caregiver.

Criteria recommended for inclusion in this group are:

- Type of anaesthesia.
- Type of surgery.
- Duration of surgery and duration of anaesthesia.
- Names of all staff providing care at each stage of the peri-operative process including the hand over of care.
- Critical incidents occurring during the intra-operative period. Figure 7.8. gives an example of how the critical incidents could be recorded

Critical incidents occurring intra-operatively:	Incident report completed: Yes [] No []	
Details of critical incident and action taken	Signature of Nurse	Signature of Doctor

Figure 7.8. Example of how critical incidents could be recorded

7.3 POLICY FOR PERI-OPERATIVE RECORD

The AORN standard recommends that, *"Policies and procedures regarding the documentation of peri-operative nursing care should be written, reviewed periodically, and readily available in the practice setting"* (AORN 1996:1150).

It is essential that every operating theatre department have an extensive policy and procedure manual. Included in this should be a policy for the use of the peri-operative document. Regular updates are necessary, and the peri-operative record itself should be reviewed regularly. The needs of a department may change and with changes in technique and technology the peri-operative record should be adapted to meet these. New staff should be given instructions on the use of the peri-operative record as part of their orientation. Standard use of the document is essential for risk management and medico-legal reasons (Beyea, Nicoll 1999:2).

7.4 SUMMARY OF RECOMMENDATIONS FOR A SOUTH AFRICAN STANDARD FOR PERI-OPERATIVE NURSING RECORDS

In order for complete recommendations to be made for a South African standard for peri-operative records, further research is necessary. It is necessary to obtain the opinions of the users of the peri-operative records with regard to the following:

- Which content criteria do the peri-operative nurses consider necessary? This research has identified content criteria that are included in the peri-operative documents used currently, as well as those recommended either by the AORN standard, or by their importance to peri-operative nursing practice. It does not identify the importance of these criteria to the users of the documents. In order for a South African standard to be completely inclusive, the opinions of the primary users of the documents should be sought.
- What information does the recovery room, ward and intensive care staff need? There may be information that the post-anaesthesia care givers would find useful but that has been over looked by the peri-operative nurses.
- What further information is needed for risk management and quality management? Not all the information entered into the peri-operative record is just for communication between the peri-operative nurses and the post-anaesthesia caregivers. Some of the information is used to monitor the control of risk in the operating theatre as well as information that may be needed in the case of legal action. This may vary from hospital to hospital depending on the needs of the particular organisation or facility
- What are the barriers to accurate and efficient record-keeping in the operating theatre? Does the layout of the document and the number of pages have any relevance to accurate completion of the peri-operative record? External factors such as time limitations, staff ratios, and the fact that the registered nurse is usually scrubbed have been identified in this research as possible reasons for inadequate record-keeping in the operating theatre. Further research is needed to confirm these as definite factors in the operating room.

In addition to the pre-operative and intra-operative data, the recovery room section of the peri-operative record needs to be examined in a similar fashion to the review carried out in this research. The SATS recommendations for recovery room care could possibly be used as the model for the research. SATS published standards for post-anaesthesia care in their December 1992 journal based on the standards of practice recommended by the American

Society of Post-Anaesthesia nurses which could be used as a model for further research (Smith 1992:6-14).

In spite of the previously mentioned limitations to this research the following recommendations can be made towards the construction of a recommended standard for peri-operative nursing records in South African:

1. The peri-operative record should include peri-operative care plans for all phases of the peri-operative period. These should include identification of potential or actual problems, expected outcomes, planning and implementation of nursing care and evaluation.

2. At least the following data should be included in the peri-operative record:
 - Evidence of pre-operative assessment including;
 - Physical data.
 - Emotional data.
 - Socio-cultural data.
 - Evidence of pre-operative visit and planning by the operating theatre nurses.
 - Presence of sensory aids.
 - Presence of prosthetic devices.
 - Skin condition prior to surgery including septic foci, existing lesions and potential for breakdown of skin integrity.
 - Skin condition post surgery .
 - Position of the patient during surgery.
 - Positioning devices used.
 - Type of electro-surgical unit used (Bipolar or Monopolar).
 - Position of indifferent electrode.
 - Skin condition before application of indifferent electrode.
 - Skin condition after removal of indifferent electrode.
 - The type of temperature control device used.
 - Position of the temperature probe.
 - The type of lasers used.
 - Use of special equipment (E.g. as insufflator, argon beam coagulator etc.).
 - Position of the tourniquet cuff.
 - Times of application and removal of the tourniquet.

- Condition of limb after removal of the tourniquet.
 - Pressure settings of the tourniquet.
 - Intra-operative X-rays and fluoroscopy used.
 - Position of monitoring devices such as blood pressure cuff, oximeter probe, and ECG electrodes.
 - Administration of blood and blood products as well as medications used should be recorded in the peri-operative record only if the anaesthetic record does not have this information, or is not available to the post-operative caregivers.
 - The type of irrigation solutions used.
 - The type of skin preparation solution used.
 - The site, type and number of drains used.
 - The site and type of catheters used.
 - The number and type of plugs or wound packing used.
 - Type of dressings used.
 - The skin suture material used and the type of sutures inserted.
 - Classification of the surgical wound.
 - Implants used in surgery including radio-active implants
 - Swab, instrument and needle count including throat pack.
 - Data relating to specimen collection.
 - Type of anaesthesia.
 - Type of operation.
 - Time spent in operating room, which may also be divided into length of surgery and length of anaesthesia.
 - Names, signatures and qualifications of the persons providing care at each stage of the peri-operative period, including hand over at each stage.
 - Critical incidents occurring intra-operatively.
3. The design of the peri-operative record should be such that the least amount of time is needed to complete the information without compromising the documentation of comprehensive care. The following design characteristics are recommended as they will facilitate speedy, accurate peri-operative record-keeping:
- A 'tick-the-box' format should be used for as much of the documents as is possible. Where this is not possible only short notes should be required.

PRE-OPERATIVE CARE PLAN		Name of Patient: _____ Hospital Number: _____
Nursing diagnosis	Nursing Interventions	
POTENTIAL FOR/ACTUAL ANXIETY RELATED TO SURGERY AND KNOWLEDGE DEFICIT	Pre-; and post-operative procedures explained Yes <input type="checkbox"/> No <input type="checkbox"/> Interpreter needed: <input type="checkbox"/> N/A <input type="checkbox"/> Language: _____ Education given (see progress report for details) Yes <input type="checkbox"/> No <input type="checkbox"/> Family/ Significant others involved in assessment and education: Yes <input type="checkbox"/> No <input type="checkbox"/> Informed consent signed: <input type="checkbox"/> Seen by Anaesthetist: Yes <input type="checkbox"/> No <input type="checkbox"/> Premedication given: Yes <input type="checkbox"/> No <input type="checkbox"/> Patient needs assistance after discharge: Yes <input type="checkbox"/> No <input type="checkbox"/>	
POTENTIAL VOMITING	Kept nil per mouth from _____ Advised not to smoke: Yes <input type="checkbox"/> N/A <input type="checkbox"/>	
POTENTIAL/ ACTUAL BREAKDOWN OF SKIN INTEGRITY	Condition of skin checked Yes <input type="checkbox"/> No <input type="checkbox"/> Comments: _____	
POTENTIAL/ACTUAL INFECTION	Septic foci present: Yes <input type="checkbox"/> No <input type="checkbox"/> Details: _____ Skin Prep done Yes <input type="checkbox"/> No <input type="checkbox"/> Area shaved Yes <input type="checkbox"/> No <input type="checkbox"/> Bowel preparation: Yes <input type="checkbox"/> No <input type="checkbox"/> N/A <input type="checkbox"/> Dressed in theatre attire: Yes <input type="checkbox"/> No <input type="checkbox"/>	
POTENTIAL FOR INJURY	BP: _____ Pulse: _____ Temp: _____ Resp: _____ Hb: _____ N/A HGT: _____ N/A Urinalysis normal: Yes <input type="checkbox"/> No <input type="checkbox"/> _____ Remove: Nail polish <input type="checkbox"/> Makeup <input type="checkbox"/> Jewellery <input type="checkbox"/> Contact lenses <input type="checkbox"/> Dentures: Yes <input type="checkbox"/> No <input type="checkbox"/> Removed <input type="checkbox"/> Caps/crowns Yes <input type="checkbox"/> No <input type="checkbox"/> Prosthesis: _____ Removed: Yes <input type="checkbox"/> No <input type="checkbox"/> Identification band applied: <input type="checkbox"/> Medic Alert insitu <input type="checkbox"/> Passed urine: Yes <input type="checkbox"/> No <input type="checkbox"/> Catheterised Yes <input type="checkbox"/> No <input type="checkbox"/> Investigations with the file: ECG <input type="checkbox"/> X-rays <input type="checkbox"/> Blood results <input type="checkbox"/> Advised to stay in bed <input type="checkbox"/> Cotsides/safety strap <input type="checkbox"/>	
POTENTIAL/ACTUAL FLUID AND ELECTROLYTE IMBALANCE	Blood ordered: Yes <input type="checkbox"/> No <input type="checkbox"/> IV Infusion started: Yes <input type="checkbox"/> No <input type="checkbox"/>	
Transferred to theatre by: _____ Trolley <input type="checkbox"/> Bed <input type="checkbox"/>		
Ward nurse responsible for pre-op. check: _____ OT staff receiving patient: _____		

INTRA-OPERATIVE CARE PLAN		
Seen by operating theatre staff in the ward: Yes <input type="checkbox"/> No <input type="checkbox"/> Signature: _____		
Individualised Intra-operative care plan	Nursing Interventions planned	Goals/ Outcomes
Date: _____ Type of Operation: _____		
Surgeon; _____ Assistant/s: _____ Anaesthesiologist/s: _____		
Scrub Nurse: _____ Circulating nurse: _____ Anaesthetic nurse: _____		
Time into theatre: _____ Time Out: _____ Length of surgery: _____		
Type of anaesthetic: Local <input type="checkbox"/> General <input type="checkbox"/> Regional <input type="checkbox"/> Specify site if regional: _____		
Nursing Diagnosis	Intra-operative Nursing Action	Patient Outcome
Potential for/ Actual injury related to electrical hazards	Electro-surgery used: Monopolar <input type="checkbox"/> Bipolar <input type="checkbox"/> Not used <input type="checkbox"/> Position of dispersive plate: _____ Skin condition checked before application <input type="checkbox"/> Warming device used : Electric Blanket <input type="checkbox"/> Forced hot air <input type="checkbox"/> Systemic warming <input type="checkbox"/> Warm solutions used <input type="checkbox"/> Temperature probe site: Oesophagus <input type="checkbox"/> Rectum <input type="checkbox"/> Laser used: Yes <input type="checkbox"/> No <input type="checkbox"/> Type: Nd Yag <input type="checkbox"/> CO ₂ <input type="checkbox"/> Argon <input type="checkbox"/> Tunable dye <input type="checkbox"/> Other _____	<input type="checkbox"/> Skin integrity under dispersive electrode maintained <input type="checkbox"/> No signs/symptoms of shocks or burns. <input type="checkbox"/> No apparent skin lesions that did not exist pre- operatively

<p>Potential for injury related to physical hazards</p>	<p>Tourniquet used: Yes <input type="checkbox"/> No <input type="checkbox"/></p> <p>1. Left <input type="checkbox"/> Leg <input type="checkbox"/> Arm <input type="checkbox"/> Time on: _____ Time off: _____</p> <p>2. Right <input type="checkbox"/> Leg <input type="checkbox"/> Arm <input type="checkbox"/> Time on: _____ Time off: _____</p> <p>Skin condition checked before application <input type="checkbox"/></p> <p>Inflation setting: 1. _____ mmHg 2. _____ mmHg</p> <p>X-rays <input type="checkbox"/> Fluoroscopy <input type="checkbox"/> Contrast used: _____</p> <p>Special equipment used: Argon beam coagulator <input type="checkbox"/></p> <p>_____scope <input type="checkbox"/> Camera/video unit <input type="checkbox"/> Microscope <input type="checkbox"/></p> <p>Insufflator <input type="checkbox"/> Phaco emulsifier <input type="checkbox"/> Cryo machine <input type="checkbox"/></p> <p>Other _____</p>	<p><input type="checkbox"/> The tourniquet site is free from injury</p> <p><input type="checkbox"/> The affected limb is free from injury</p> <p><input type="checkbox"/> The patient is free from injury related to equipment used</p>																
<p>Potential for/Actual wound infection</p>	<p>Skin Prep: Povidone solution <input type="checkbox"/> Iodine in alcohol <input type="checkbox"/></p> <p>Chlorhexidene in alcohol <input type="checkbox"/> Chlorhexidene aqueous <input type="checkbox"/></p> <p>Other: _____ Skin prep by _____</p> <p>Wound site: _____ Skin sutures _____</p> <table border="1" data-bbox="428 952 1110 1171"> <thead> <tr> <th></th> <th>Number</th> <th>Site</th> <th>Type</th> </tr> </thead> <tbody> <tr> <td>Drains</td> <td></td> <td></td> <td></td> </tr> <tr> <td>Catheters</td> <td></td> <td></td> <td></td> </tr> <tr> <td>Plugs/Packing</td> <td></td> <td></td> <td></td> </tr> </tbody> </table> <p>Wound Classification: Clean <input type="checkbox"/> Clean contaminated <input type="checkbox"/> Contaminated <input type="checkbox"/> Infected <input type="checkbox"/></p> <p>Dressing : _____</p> <p>Aseptic technique maintained: Yes <input type="checkbox"/> No <input type="checkbox"/> (If No, see critical incidents for details)</p>		Number	Site	Type	Drains				Catheters				Plugs/Packing				<p><input type="checkbox"/> The patient is free from the hazards contributing to wound infection.</p>
	Number	Site	Type															
Drains																		
Catheters																		
Plugs/Packing																		
<p>Potential for/Actual injury related to patient position.</p>	<p>POSITION: Supine <input type="checkbox"/> Prone <input type="checkbox"/> Lithotomy <input type="checkbox"/> Jack-knife <input type="checkbox"/></p> <p>Lt. lateral <input type="checkbox"/> Rt. lateral <input type="checkbox"/> Other _____</p> <p>Skin Integrity checked before positioning <input type="checkbox"/>*</p> <p>Positioning devices used for correct body alignment <input type="checkbox"/></p> <p>Pillows/sponges <input type="checkbox"/> Sandbags <input type="checkbox"/> Bolster <input type="checkbox"/> Restraints <input type="checkbox"/></p> <p>Fracture table <input type="checkbox"/> Mayfield headrest <input type="checkbox"/> Kidney support <input type="checkbox"/></p> <p>Lithotomy supports <input type="checkbox"/> Stirrups <input type="checkbox"/> Spinal Frame <input type="checkbox"/></p> <p>Other: _____</p> <p>DVT Prevention: Stockings <input type="checkbox"/> Massage <input type="checkbox"/> SPCD <input type="checkbox"/></p>	<p><input type="checkbox"/> No evidence of impaired skin integrity.</p> <p><input type="checkbox"/> No evidence of neuromuscular damage.</p> <p><input type="checkbox"/> Venous pooling prevented.</p> <p>* See critical incidents for details of deficiencies in skin integrity etc.</p>																

Potential for injury related to retained foreign objects Potential for misdiagnosis or wrong treatment related to loss of specimen	Instruments counted <input type="checkbox"/> needles counted <input type="checkbox"/>		<input type="checkbox"/> The wound is closed with all swabs, instruments, sharps and other extraneous objects accounted for If swabs are incorrect: <input type="checkbox"/> Surgeon notified <input type="checkbox"/> X-rays taken <input type="checkbox"/> Incident report written, see details in critical incidents
	Type of swab	Number of swabs used	
	Dissecting	(e.g. 5+5)	
	Small dissecting		
	Abdominal		
	Patties		
	Other		
Implant used : _____			
Stickers or details of implants: _____			
Specimen type: _____ Number: _____			
Test: Histology <input type="checkbox"/> Cytology <input type="checkbox"/> MC&S <input type="checkbox"/> Other _____			
Critical incidents occurring intra-operatively:		Incident report completed: Yes <input type="checkbox"/> No <input type="checkbox"/>	
Details of critical incident and action taken		Signature of Nurse	
		Signature of Doctor	
Received in recovery room by: _____ Report given by: _____			

Figure 7.9. Example of a peri-operative nursing record

Simply setting a standard or giving guidelines for the design and content of a peri-operative record in the Western Cape is not the end of the process. Review of the literature has shown that standards need certain characteristics to enhance their acceptability. They should be appropriate to the practice situation, measurable, realistic, acceptable by all involved and presented in an unambiguous manner (Kemp, Richardson 1990:33). Users of the peri-operative documents, nurses from all areas caring for surgical patients, need to be consulted as to the appropriateness of the recommended standard or guidelines. Their understanding of the criteria and whether the recommendations are realistic or not also needs to be ascertained. This research is therefore the first step in a process of developing a standard or guideline for peri-operative nursing records in South Africa. Even after the process of consultation, refining, testing and final setting of standards the standard should be reviewed

regularly to adapt to changes in technology and nursing practice (Kemp et al 1990:46, Dean-Barr 1994:317).

Once a standard has been set it needs to be maintained in nursing practice and continuous quality management may achieve this. Regular internal audits of the peri-operative nursing documents will identify areas of non compliance in the process of record-keeping, indicate possible areas that need to change and give a vehicle for educating the staff (Spinks 1996:32). Monitoring patient injury in the operating theatre in a formal risk management program will also identify areas of risk that should be added to the peri-operative record. The importance of nursing documentation in risk management was recognised and discussed in the literature review (Ryan 1993:2)

In conclusion, Spry and Jenkins, (1991:742) sum up the requirements of peri-operative documentation in the following concise manner:

"The intra-operative log must reflect all care provided during the patient's stay in the OR. It must be simple enough to be completed in a short time, reflect the institution's standards of care, and include mandated reporting data. It should also indicate that current nursing practices are in effect".

7.5 OTHER RECOMMENDATIONS RELATED TO PERI-OPERATIVE PRACTICE ARISING OUT OF THE RESEARCH

In review of the literature and during the process of the research it became apparent that there is a problem with pre-operative visits by peri-operative nurses and a lack of planning of intra-operative care. Pre-operative visiting needs to become a core task in the operating theatre as it is fundamental to care planning. In order for the peri-operative nurse to give individualised care for each patient it is necessary to have some knowledge of the individual needs of the patient. This is not possible if the first time the registered nurse sees the patient is during skin preparation, after the patient is anaesthetised.

The registered nurse in the operating theatre needs to move away from the scrub role and begin to nurse the patient in the theatre again. The registered nurse should work as the circulating nurse, to enable her to have access to the patient for nursing interventions such as positioning, and management of risk to the patient. If the role of the registered nurse in the operating theatre cannot be justified by improved patient care, improved efficiency and

reduced costs then a situation where the registered nurse is removed from the operating theatre entirely may arise (Geoghegan 2000:17).

Reduction in budgets has meant a change in the skill mix in the operating theatre and a reduction in the number of registered nurses. Twenty years ago the registered nurse was by far in the majority in the operating theatre and this is no longer true as their numbers have been replaced largely by Enrolled Nursing Auxiliaries. In many cases these nurses are entering the operating theatre without any training in the special requirements of the area aside from orientation and on the job training (Geoghegan 2000:17).

Removal of the registered nurse from the scrub role is not popular amongst existing peri-operative nurses in South Africa. They see it as a threat to their authority in the operating room. Research undertaken in 1997 at the University of the Free State showed that 75% of peri-operative nurses interviewed rejected the idea of training theatre technologists to take over the role of the scrub nurse. In contrast, 66% of matriculants interviewed were of the opinion that scrub technologists should be trained. They felt that specific training would save time and money and they could enter the work place sooner than if they had to complete nursing training first (Nel, Becker 1997:50).

Scrub Technicians need to be introduced as specially trained scrub personnel, supervised by registered nurses. Sub categories of nurses could also be used as scrub personnel and they would have the additional advantage of a nursing background as well as training in the scrub role. This proposed solution to the problems of patient care in the operating theatre is not confined to South Africa. Many countries have already replaced the scrub nurse with a technician while maintaining a professional nursing presence in the operating theatre as the circulating nurse. This allows the professional nurse to plan and implement nursing care as well as manage risk to the patient (Brett 1996:5-8). In an article entitled "Role over?" published in Nursing Times, Power (1993:72) comes to the following conclusion:

"The real solution to the problems outlined is self evident. Nurses in theatre must change their practice by relinquishing the scrub role to the operating department assistants and return to nursing the patient. Nurses can be allocated to patients on the list and charged with the responsibility of assessing needs, planning care and evaluating its effectiveness throughout the patient's stay in theatre and recovery."

7.6 RECOMMENDATIONS FOR FURTHER RESEARCH:

Arising out of this research the following further research is recommended:

- What are the opinions of the users of the peri-operative documents on their design and content?
- How do Nurses and Doctors view multidisciplinary peri-operative records?
- What is the quality of record-keeping by peri-operative nurses in South Africa?
- What are the barriers to accurate record-keeping in the operating theatre in South Africa?
- How are patient outcomes affected by peri-operative documentation?
- The quality of non-nursing peri-operative records such as the anaesthetic record and how their use affects post surgical nursing care.
- The historical development of peri-operative nursing records in South Africa.
- A qualitative review of continuous quality management programs in use in operating theatre departments in South Africa.
- The frequency and effect of pre-operative visits by peri-operative nurses in South Africa.

7.7 CONCLUDING REMARKS

This research may be viewed as the first step in the development of a national standard, for peri-operative nursing records in South Africa. Further research is needed to provide a holistic standard covering all phases of the peri-operative period. There appears to be significant room for improvement in the peri-operative records currently in use in the Western Cape Metropolitan Health Region, and the same is probably true of records used throughout the country. Further research is needed to confirm this. The recommendations have been sent to the hospitals involved in the study, and it is hoped that this research will assist in improving the general standard of peri-operative nursing documentation.

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APPENDICES

APPENDIX A: SATS GUIDELINES FOR RECORD-KEEPING

Anaesthetic record

- "Anaesthetic records to be kept of all vital signs as monitored and drugs given.
- Type of anaesthetic to be entered in the patient's theatre record and register (SATS 1998:16).

Pre-operative assessment

- "Consent form correctly completed" (SATS 1998: 23).
- "Pre operative checklist correctly completed and signed
- Premedication as prescribed, recorded and signed.
- Record all abnormalities as reported.
- Nursing process checklist completed and signed" (SATS 1998: 25).

Swab, instrument and needle count

- "On completion of case, swab, needle and instrument count to be recorded on the patient records and in the register" (SATS 1998: 32).

Diathermy

- "Record condition of the skin post-operatively
- "Record the position of the diathermy plate on the patient's record and in the register (SATS 1998:48).

Positioning the patient

- Record position of the patient on theatre table
- Record the evaluation of skin lesions or injuries
- Record time the patient left the operating theatre" (SATS 1998:59).

Specimens

- "Record of specimens kept in dept
- Record in the patients record and register" (SATS1998: 69).

APPENDIX B: NURSING INTERVENTIONS IDENTIFIED BY KLEINBECK (1996:929-930)

Patient outcome 1: The patient demonstrates knowledge of the physiological and psychological responses to surgical intervention.

Nursing interventions:

- Identifies barriers to communication.
- Verifies operative procedure.
- Determines level of knowledge.
- Identifies philosophical, cultural and spiritual practices.
- Assesses the patient's readiness to learn.
- Provides preoperative instruction based on the patient's identified need.
- Evaluates patient's response to instruction.
- Identifies patient's physiological status.
- Provides anticipatory guidance about the expected sequence of surgical events.
- Develops individualised plan of care.
- Assesses patient's coping mechanisms.
- Verifies patient identity.
- Include patient's family members and significant others in the preoperative teaching.

Patient outcome 2: The patient is free from infection.

Nursing interventions:

- Implements aseptic technique.
- Assesses the patient's susceptibility to infection.
- Classifies surgical wounds.
- Monitors sterile field.
- Prepares the skin for surgery.
- Corrects breaks in surgical technique.
- Monitors the patient for signs and symptoms of infection.
- Protects the patient from cross contamination.
- Minimises duration of invasive procedure by planning patient care.
- Maintains peri-operative environmental sanitation.

- Adheres to universal precautions.
- Verifies prophylactic interventions.

Patient Outcome 3: The patient's skin integrity is maintained.

Nursing interventions:

- Assesses patient's skin integrity.
- Assesses patient's potential for skin injury.
- Implements protective measures to maintain the patient's skin integrity.
- Evaluates the patient's response to positioning.

Patient Outcome 4; The patient is free from injury related to positioning; extraneous objects; or chemical, physical and electrical hazards.

Nursing Interventions:

- Performs required counts.
- Notes patient's sensory impairments.
- Applies safety devices.
- Determines mobility of patient's body parts.
- Notes abnormalities, injuries, and previous surgeries.
- Identifies presence of internal and external prostheses and implants.
- Assesses patient's musculoskeletal status.
- Verifies patient's allergies.
- Screens the patient for signs of physical and substance abuse.
- Monitors the surgical environment.
- Administers medications.
- Monitors the patient's physical changes.
- Transports the patient according to individual needs.
- Applies tourniquets.
- Evaluates patient's responses to interventions.
- Confirms patient's identity before surgery.
- Uses supplies and equipment safely.
- Monitors patient behavioural changes.
- Develops a plan that reflects the patient's individual choices.

- Manages specimen handling and disposition.
- Uses positioning aids.
- Reports devices implanted intra-operatively.
- Implements thermo-regulation methods.

Patient Outcome 5: The patient's fluid balance is maintained.

Nursing Interventions:

- Reports deviation of diagnostic study results.
- Monitors patient's physiological parameters.
- Administers volume replacement therapy.
- Notes patient's nutritional status.
- Monitors patient's intake and output.
- Evaluates patient's responses to fluid therapy.

Patient Outcome 6: The patient participates in the rehabilitation process.

Nursing Interventions:

- Identifies data relevant to planning for patient discharge.
- Participate in planning for patient's discharge.
- Reinforces instructions based on patient's age and identified need.
- Elicits patient's expectations of post-operative home care.
- Evaluates patient's coping mechanisms for home care.
- Evaluates patient's environment for home care.

APPENDIX C: AORN RECOMMENDED STANDARDS AND PRACTICES FOR PERI-OPERATIVE DOCUMENTATION

Purpose

The AORN recommended practices provide guidelines to assist peri-operative nurses in the documentation of nursing care in the peri-operative practice setting. Documentation, using the nursing process, should be completed for each surgical and other invasive procedure. The 'Nursing Process' is a formalised, systematic approach to providing and documenting patient care. Peri-operative documentation is essential for the continuity of goal-directed care and for the comparison of achieved patient outcomes to the expected patient outcomes.

RECOMMENDED PRACTICE I

The patient's record should reflect the peri-operative patient's plan of care, including assessment, diagnosis, outcome identification, planning, implementation, and evaluation.

Discussion

The 'Nursing Process' provides the governing framework for documenting peri-operative nursing care. When the 'Nursing Process' is used in peri-operative practice settings, it demonstrates the critical-thinking skills practised by the nurse in the care of the surgical patient. Documentation should include information about the status of the patient, nursing diagnoses and interventions, expected patient outcomes, and evaluation of the patient's response to peri-operative nursing care.

Interpretative statement 1

The patient's record should reflect an assessment (i.e., physical, psychosocial, cultural, spiritual) performed by the peri-operative nurse prior to surgery or other invasive procedures.

Rational

A documented assessment forms a baseline for the development of nursing diagnoses and planning patient care. This assessment should continue through each subsequent phase (i.e., intra-operative, post-operative) in order to provide continuity of care.

Discussion

During the assessment process, the peri-operative nurse collects data about the patient's status. The ongoing process of assessment should be performed in accordance with the AORN Standards of Peri-operative Clinical Practice.

Interpretative statement 2

The patient's record should reflect the care planned by peri-operative nurses.

Rationale

Documentation of the peri-operative plan of care should include nursing diagnoses, prescribed nursing interventions, expected patient outcomes, and an evaluation of the quality of care delivered.(2).

Discussion

The planning process begins when the peri-operative nurse identifies nursing interventions that will address the patient's actual or potential risk for health problems (i.e., nursing diagnoses). The goals of nursing interventions are to prevent potential patient injury or complications and to intervene/treat actual patient problems. Patient outcomes should be individualised, prioritised, measurable, realistic, and obtainable.

Interpretative statement 3

The patient's record should specify what nursing interventions were performed and when, where, and by whom during each phase of peri-operative care.

Rationale

Documentation of nursing interventions promotes continuity of patient care and improves communication between health care team members.

Discussion

The implementation process is a result of assessment and planning, utilising nursing judgement and critical thinking skills.

Interpretative statement 4

The patient's record should reflect a continuous evaluation of peri-operative nursing care and the patient's response to applied nursing interventions.

Rationale

Documentation provides a mechanism for comparing actual versus expected patient outcomes.

Interpretative statement 5

Peri-operative documentation should include but is not limited to;

- identification of persons providing peri-operative patient care (i.e., name, title, signature of person responsible for the care);
- evidence of peri-operative patient assessment including baseline physical, emotional, and psychosocial data;
- description of the patient's overall skin condition on arrival and discharge from the peri-operative suite;
- presence and/or disposition of sensory aids and prosthetic devices (e.g., eye wear, hearing aids, dentures, artificial limbs);
- placement of the electro-surgical unit (ESU) dispersive pad and identification of the ESU and settings used during the surgical procedure;
- use of temperature regulating devices including identification of the unit and documentation of the patient's body temperature before and after discharge from the peri-operative suite;
- placement of electrocardiogram electrodes, blood pressure cuff, oximetry and temperature probes, and other invasive and non-invasive monitoring devices;
- patient's positioning/repositioning, positioning devices and supports, and/or restraints used during the surgical procedure;

- placement of tourniquet cuffs including identification of the unit, pressure settings, and inflation and deflation times;
- location of skin prep including prep solution used;
- use of lasers including identification of the unit, name of surgeon and support staff members, type of laser used, surgical procedure, the lens used, length of time laser used, and wattage;
- use of intra-operative x-rays and fluoroscopy;
- patient specimens and cultures taken during the surgical procedure;
- location and type of drains, catheters, wound packing, casting material, and dressings used;
- placement and location of implants (e.g., medical devices, synthetic and biologic grafts, tissue, bone) including the name of the manufacturer or distributor, lot and serial numbers, type and size of implant, and expiration dates as appropriate, and other information requirements by the US Food and Drug Administration;
- placement of radio-active implants including the time, number, location, and type of radio-active material inserted in the patient;
- administration of blood or blood products, medications, irrigations, and solutions to the patient during the peri-operative period;
- wound and anaesthesia classifications;
- documentation of sponge, sharp, and instrument counts as appropriate;
- time of and patient status at discharge, disposition of the patient, method of transfer; and
- any significant or unusual occurrences pertinent to peri-operative patient outcomes.

Discussion

Documentation of all nursing activities performed is legally and professionally important for clear communication and collaboration between health care team members and continuity of patient care.

RECOMMENDED PRACTICE II

Policies and procedures regarding the documentation of peri-operative nursing care should be written, reviewed periodically, and readily available in the practice setting.

Discussion

These recommended practices should be used as guidelines for the development of policies and procedures for documentation within the peri-operative practice setting. Documentation policies and procedures should establish authority, responsibility, and accountability and serve as operational guidelines. An introduction and review of documentation policies and procedures should be included in the orientation and ongoing education of personnel to assist them in the development of knowledge, skills, and competencies that influence peri-operative patient outcomes.

Every peri-operative practice setting uses a formal system of documentation of patient care. Although, the method of documenting peri-operative nursing care varies among practice settings, documentation forms should include, but are not limited to:

- the operative record,
- peri-operative patient checklists,
- nursing notes,
- flow sheets,
- care plans,
- implant records,
- laser logs, and
- surgical count records. (8)

The methods selected for documenting peri-operative-nursing care must correspond to the institution's overall philosophy of documentation and record-keeping.

(AORN 1996:1145-1149)

APPENDIX D: MEASUREMENT TOOL

HOSPITAL IDENTITY NUMBER:				
A: PRE OPERATIVE ASSESSMENT				
		Yes	No	Comments
1	Evidence of preoperative assessment			
2	Physical data			
3	Emotional data			
4	Psychosocial data			
5	Nursing Diagnosis			
6	Care plan devised			
7	Presence of sensory aids			
8	Presence of prosthetic devices			
	Other criteria found:			
B: POTENTIAL FOR INJURY RELATED TO PATIENT POSITIONING				
9	Skin condition pre surgery			
10	Skin condition post surgery			
11	Position of the patient			
12	Positioning devices used			
13	Method of transfer			
	Other criteria found:			

C: POTENTIAL FOR INJURY RELATED TO ELECTRICAL HAZARDS

		Yes	No	Comments
14	Position of diathermy plate			
15	ESU Id and settings used			
16	Skin condition before			
17	Skin condition after			
18	Use of temperature control devices			
19	Temp of patient			
20	Use of lasers			
21	Placement of ECG electrodes			
	Other criteria found:			

D: POTENTIAL FOR INJURY RELATED TO PHYSICAL HAZARDS

22	Placement of tourniquet			
23	Time on and off recorded			
24	Pressure settings			
25	Intra-operative X-rays and fluoroscopy			
26	Placement of blood pressure cuff			
27	Placement of oximeter probe			
	Other criteria found:			

E: POTENTIAL FOR FLUID AND ELECTROLYTE IMBALANCE

28	Administration of blood and blood products			
29	Medications used			
30	Irrigation solutions used			

	Other criteria found:			
F: POTENTIAL FOR INFECTION				
31	Skin preparation			
32	Site and type of drains used			
33	Site and type of catheters used			
34	Plugs/wound packing used			
35	Dressings used			
36	Wound classification			
	Other criteria found:			
G: POTENTIAL FOR INJURY RELATED TO FOREIGN OBJECTS				
37	Implants used in surgery			
38	Radio-active implants			
39	Swab, instrument and needle count			
40	Specimen collection			
	Other criteria found:			
H: GENERAL DOCUMENTATION				
41	Type of anaesthesia			
42	Time of discharge from OT			
43	Names of persons providing care			
44	Critical incidents occurring intra operatively			
	Other criteria found:			

DESIGN CHARACTERISTICS OF PERI-OPERATIVE NURSING RECORDS:				
		Yes	No	Comments
45	Integrated record			
46	'tick-the-box' system predominant			
47	Grouping according to nursing diagnosis			
48	Different records for day-surgery			
49	Adequate space for writing			
		Number		
50	Pages in the full record			
51	Pages in the intra-operative section			

APPENDIX E: LETTER REQUESTING USE OF HOSPITAL DOCUMENTATION

Ms M D Geoghegan
29 Totnes Road
7800 Plumstead
Ph: 7612789
Email; nermal@iafrica.com

«Organisation Name»

«Address»

«City»

«Postal Code»

15/2/1999

Dear Sir/ Madam,

PERMISSION TO USE HOSPITAL DOCUMENTATION FOR RESEARCH

I am a registered nurse undertaking research for a master's degree at the University of Cape town and would like to have your permission please, to include your hospital in my research.

The research is an investigation into the peri-operative records used in the Western Cape Metropolitan region. I will review the content and design features of documents from a selection of public and private hospitals and clinics and compare them with recommended practices from the Association of Operating Room Nurses in America. The purpose of the research is to make recommendations for the future design and content characteristics of peri-operative nursing records. I would also like permission to interview a member of the operating theatre staff and would appreciate if you could let me know who would be suitable. This would be necessary to answer any questions that I may have about the use of your peri-operative records.

The name of your hospital will not be released in the findings of the research so that confidentiality can be ensured. On completion of the research I will send you a summary of the findings and recommendations. If possible could you post me a copy of all patient documentation used in the operating theatre by nursing staff or could you let me know where I could collect it. I hope that you will be able to assist me.

Thank you.

Yours faithfully,

DENISE GEOGHEGAN RN, RM, OT Nur Sc., AUDNE (UCT)

Copy to Operating Theatre Unit Manager

APPENDIX F: RAW DATA

Hospital ID	3	13	8	12	16	1	21	7	9	15	23	24	19	26	Total
Evidence of preoperative assessment	1	1	1	1	1	1	1	1	1	1	1	1	1	1	14
Physical data	1	1	1	1	1	1	1	1	1	1	1	1	1	1	14
Emotional data	0	1	1	1	0	1	1	1	1	1	1	0	0	0	9
Psychosocial data	0	1	0	1	0	0	0	0	0	0	0	0	0	0	2
Nursing Diagnosis	1	1	0	0	0	1	0	1	0	1	0	0	0	0	5
Care plan devised	1	1	0	0	0	0	0	1	1	1	0	0	0	0	5
Presence of sensory aids	1	1	1	1	1	1	1	0	1	0	1	1	1	1	12
Presence of prosthetic devices	1	1	1	1	1	1	1	1	1	1	1	1	1	1	14
Skin condition pre surgery	1	1	0	1	0	0	0	1	1	0	0	0	0	0	5
Skin condition post surgery	1	0	0	0	0	1	0	1	1	0	0	0	0	0	4
Position of the patient	1	1	0	1	0	1	1	1	1	0	0	1	0	0	8
Positioning devices used	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1
Method of transfer	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Position of indifferent electrode	1	1	0	1	1	1	0	1	1	1	1	1	1	1	12
ESU ID and settings used	0	0	0	0	0	0	0	1	1	0	0	0	0	0	2
Skin condition before	1	1	0	0	0	0	0	1	1	0	0	1	0	0	5

Skin condition after	1	1	0	1	1	1	0	1	1	0	0	1	1	1	10
Use of temperature control devices	0	1	0	1	0	0	1	1	1	0	0	0	0	0	5
Temp of patient	0	0	0	0	0	0	1	0	1	0	0	0	0	0	2
Use of lasers	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1
Placement of electrocardiogram electrodes	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1
Placement of tourniquet	1	1	1	1	1	1	1	1	1	1	1	1	1	0	13
Time on and off recorded	1	1	1	1	1	1	1	1	1	1	1	1	1	1	14
Pressure settings	0	0	0	1	0	0	0	1	1	0	1	0	0	0	4
Intra-operative X-rays and fluoroscopy	1	0	0	1	0	0	0	0	0	0	0	0	0	0	2
Blood pressure cuff	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1
Oximeter probe	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1
Administration of blood and blood products	1	1	0	1	0	0	1	1	1	1	1	1	0	0	9
Medications used	1	0	1	1	0	1	1	1	1	1	0	0	1	1	10
Irrigation solutions used	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Skin preparation	1	0	0	1	0	1	0	0	1	0	0	0	0	1	5
Site and type of drains used	1	1	1	1	1	1	1	1	1	1	1	1	1	1	14
Site and type of Catheters used	1	0	0	1	0	1	0	1	1	1	1	1	1	1	10

Plugs/wound packing used	1	1	0	1	0	1	0	1	1	1	1	1	1	0	10
Dressings used	0	1	1	1	0	1	0	1	0	1	0	1	0	1	8
Wound classification	1	0	0	1	0	1	1	0	0	0	0	1	0	0	5
Implants used in surgery	1	1	0	1	0	1	1	1	1	0	0	1	0	0	8
Radio-active implants	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Swab, instrument and needle count	1	1	0	1	1	1	1	1	1	1	1	1	1	1	13
Specimen collection	1	1	0	1	1	1	1	1	1	1	1	1	1	1	13
Type of anaesthesia	1	1	1	1	1	1	1	1	1	1	1	1	1	1	14
Time of discharge from OT	1	1	1	1	1	1	1	1	1	1	1	1	1	1	14
Names of persons providing care	1	1	1	1	1	1	1	1	1	1	1	1	1	1	14
Critical incidents occurring intra operatively	0	0	0	1	0	1	0	0	1	0	0	1	0	0	4

APPENDIX G: SCORES FOR EACH HOSPITAL ACCORDING TO GROUPING

	Hospital Identity Number	3	13	8	12	16	1	21	7	9	15	23	24	19	26	Avg	Med	SD	VAR
A	Pre-operative assessment	6	8	5	6	4	6	5	6	6	6	5	4	4	4	5.4	6	1.01	1.32
B	Potential for injury related to patient positioning	3	2	0	2	0	2	1	4	3	0	0	1	0	0	1.3	2	1.44	1.91
C	Potential for injury related to electrical hazards	3	4	0	3	2	2	2	5	7	1	1	3	2	3	2.7	2	2.00	3.14
D	Potential for injury related to physical hazards	3	2	2	4	2	2	2	3	5	2	3	2	2	1	2.5	2	1.01	1.04
E	Potential for fluid and electrolyte imbalance	2	1	1	2	0	1	2	2	2	2	1	1	1	1	1.4	2	0.69	0.40
F	Potential for infection	5	3	2	6	1	6	2	4	4	4	3	5	3	4	3.7	4	1.63	2.22
G	Potential for injury related to foreign objects	3	3	0	3	2	3	3	3	3	2	2	3	2	2	2.4	3	0.93	0.73
H	General documentation	3	3	3	4	3	4	3	3	4	3	3	4	3	3	3.3	3	0.47	0.22
	Total	28	26	13	30	14	26	20	30	34	20	18	23	17	18	22.6	26	6.95	41.94

APPENDIX H: PERCENTAGE SCORES FOR EACH HOSPITAL ACCORDING TO GROUPING

Hospital Identity Number	3	13	8	12	16	1	21	7	9	15	23	24	19	26	Avg	Med	SD	VAR
A Pre-operative assessment	75%	100%	63%	75%	50%	75%	63%	75%	75%	75%	63%	50%	50%	50%	67%	69%	14%	0.02
B Potential for injury related to patient positioning	60%	40%	0%	40%	0%	40%	20%	80%	60%	0%	0%	20%	0%	0%	26%	20%	28%	0.08
C Potential for injury related to electrical hazards	38%	50%	0%	38%	25%	25%	25%	63%	88%	13%	13%	38%	25%	38%	34%	31%	22%	0.05
D Potential for injury related to physical hazards	50%	33%	33%	67%	33%	33%	33%	50%	83%	33%	50%	33%	33%	17%	42%	33%	17%	0.03
E Potential for fluid and electrolyte imbalance	67%	33%	33%	67%	0%	33%	67%	67%	67%	67%	33%	33%	33%	33%	45%	33%	21%	0.04
F Potential for infection	83%	50%	33%	100%	17%	100%	33%	67%	67%	67%	50%	83%	50%	67%	62%	67%	25%	0.06
G Potential for injury related to foreign objects	75%	75%	0%	75%	50%	75%	75%	75%	75%	50%	50%	75%	50%	50%	61%	75%	21%	0.05
H General documentation	75%	75%	75%	100%	75%	100%	75%	75%	100%	75%	75%	100%	75%	75%	82%	75%	12%	0.01
Weighted average	64%	59%	30%	68%	32%	59%	45%	68%	77%	45%	41%	52%	39%	41%	51%	49%	15%	0.02
Arithmetic average	65%	57%	30%	70%	31%	60%	49%	69%	77%	47%	42%	54%	40%	41%	52%	51%	15%	0.02
Median	71%	50%	33%	71%	29%	58%	48%	71%	75%	58%	50%	44%	42%	44%	53%			
Standard deviation	15%	24%	29%	23%	26%	31%	23%	10%	13%	29%	25%	29%	22%	25%	23%			
Variance	0.02	0.06	0.08	0.05	0.07	0.10	0.05	0.01	0.02	0.08	0.06	0.08	0.05	0.06	0.04			

APPENDIX I: RAW DATA RELATED TO CRITERIA NOT COVERED BY THE MEASURING INSTRUMENT

	3	13	8	12	16	1	21	7	9	15	23	24	19	26	TOTAL	%
Duration of anaesthetic	1	1	0	0	0	1	0	1	0	0	0	1	1	0	6	43%
Condition of limbs after removal of tourniquet	1	0	0	0	0	0	0	1	0	1	0	0	0	0	3	21%
Sutures	1	1	0	1	1	1	0	1	1	1	1	1	1	1	12	86%
Type of operation performed	1	1	1	1	1	1	0	1	1	1	1	1	1	1	13	93%
Throat pack	0	1	0	0	0	0	0	0	1	1	1	1	1	0	6	43%
Instrument trays used	0	1	0	0	0	0	1	0	0	0	0	1	0	0	3	21%
Cross-clamp time	0	0	0	1	0	0	0	0	1	0	0	0	0	0	2	14%
All packs sterile	0	0	0	1	0	0	0	0	0	0	1	1	0	0	3	21%
Abnormal blood loss	0	0	0	1	0	0	0	0	0	0	0	0	0	1	2	14%
Bypass time	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	7%
DVT prevention	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1	7%
Names of recovery personnel receiving patient	1	1	0	0	0	0	0	1	1	0	1	0	1	0	6	43%
Names of ward staff receiving patient	0	1	1	0	0	1	0	1	1	0	1	1	1	0	8	57%
Name of receiving nurse in OT	1	1	0	1	0	0	0	0	1	0	0	1	0	0	5	36%

APPENDIX J: RESULTS OF ADJUSTED CRITERIA

	Hospital identity number	3	13	8	12	16	1	21	7	9	15	23	24	19	26	Avg
A	Pre-operative assessment	6	8	5	6	4	6	5	6	6	6	5	4	4	4	5.4
B	Potential for injury related to patient positioning	3	2	0	2	0	2	1	4	3	0	0	1	0	0	1.3
C	Potential for injury related to electrical hazards	3	4	0	3	2	2	2	5	6	1	1	3	2	3	2.6
D	Potential for injury related to physical hazards	3	2	2	4	2	2	2	3	3	2	3	2	2	1	2.4
E	Potential for fluid and electrolyte imbalance	1	1	0	1	0	0	1	1	1	1	1	1	0	0	0.6
F	Potential for infection	5	3	2	6	1	6	2	4	4	4	3	5	3	4	3.7
G	Potential for injury related to foreign objects	3	3	0	3	2	3	3	3	3	2	2	3	2	2	2.4
H	General documentation	3	3	3	4	3	4	3	3	4	3	3	4	3	3	3.3
	Total	27	26	12	29	14	25	19	29	30	19	18	23	16	17	21.7

APPENDIX K: RESULTS OF ADJUSTED CRITERIA AS PERCENTAGES

	Hospital Identity number	3	13	8	12	16	1	21	7	9	15	23	24	19	26	Avg
A	Pre-operative assessment	75%	100%	63%	75%	50%	75%	63%	75%	75%	75%	63%	50%	50%	50%	67%
B	Potential for injury related to patient positioning	75%	50%	0%	50%	0%	50%	25%	100%	75%	0%	0%	25%	0%	0%	32%
C	Potential for injury related to electrical hazards	43%	57%	0%	43%	29%	29%	29%	71%	86%	14%	14%	43%	29%	43%	38%
D	Potential for injury related to physical hazards	75%	50%	50%	100%	50%	50%	50%	75%	75%	50%	75%	50%	50%	25%	59%
E	Potential for fluid and electrolyte imbalance	50%	50%	0%	50%	0%	0%	50%	50%	50%	50%	50%	50%	0%	0%	32%
F	Potential for infection	83%	50%	33%	100%	17%	100%	33%	67%	67%	67%	50%	83%	50%	67%	62%
G	Potential for injury related to foreign objects	100%	100%	0%	100%	67%	100%	100%	100%	100%	67%	67%	100%	67%	67%	81%
H	General documentation	75%	75%	75%	100%	75%	100%	75%	75%	100%	75%	75%	100%	75%	75%	82%
	Weighted average	71%	68%	32%	76%	37%	66%	50%	76%	79%	50%	47%	61%	42%	45%	57%
	Arithmetic average	72%	67%	28%	77%	36%	63%	53%	77%	78%	50%	49%	63%	40%	41%	57%