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**The limitations related to the implementation of the triage policy and the identification of factors which can be used towards addressing them, in selected public, tertiary hospital.**

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A mini-dissertation submitted to the Faculty of Health Sciences, University of Cape Town, in partial fulfillment of the requirements for the degree of Master of Public Health (General)

Cape Town, 2011

# DECLARATION

## MPH (GEN) Mini-Dissertation

I \_\_\_\_\_ Student No. \_\_\_\_\_ declare that the work that I have submitted is my own and where the work of others has been used (whether quoted verbatim, paraphrased or referred to) it has been attributed and acknowledged.

Signature: \_\_\_\_\_

Date: \_\_\_\_\_

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## **1. Background**

The policy for the implementation of the triage system for patients in emergency units of the Western Cape was circulated in 2006, initially named the Cape Triage Score (CTS). This system was derived by the Cape Triage Group and later adopted for use to triage patients throughout South African emergency areas (EA). There are three versions of this policy in place specifically created for use by adults, children and infants. The tool used in this region is referred to as the Cape triage scale, later renamed the South African Triage Score (SATS). The policy is named, The implementation of the South African Triage scale, by the Department of Health, supports the implementation of the triage system in the pre-hospital setting, for use in all emergency areas. (Wallis et al, 2006 and Western Cape, 2006). Triage is a strategy aimed at improving flow and risk management of use especially in those settings where the demand for emergency care exceeds capacity by ensuring that the right types of patients receive the appropriate level of care and resources. (Retezar et al, 2011). This is often the scenario in many emergency areas in South Africa.

### a. The Triage system (Western Cape, 2006 and Wallis et al, 2006)

Triage is a process of sorting patients according to the urgency of the illness or the injury at the point of entry into the emergency unit, allowing for the sickest patients to be identified and managed accordingly. All patients are to be triaged as soon as possible on arrival at the institution by a dedicated nurse, in a dedicated triage area. Patients are classified in color codes as follows:

Red category patients are those patients who require immediate treatment, followed by those patients in the orange color category which are to be treated within 10 minutes, Yellow category patients are those whose treatment is to be provided within 60 minutes. Patients in the green category are to be treated within 240 minutes and those patients categorized as blue are those dead on arrival.

*The objectives of the triage system are the following* (Cooper, 2004 and Woolwich 2000):

To reduce the overall length of stay and to decrease waiting times for Red and orange patients. The triage system improves patient and health provider satisfaction, improves patient flow and decreases overcrowding within the emergency areas. It encourages the delivery of time-critical treatment for life threatening conditions and lastly ensures accurate categorization of patients.

## Instrument

The Cape triage score is a four level triage tool similar to the Italian 4 level triage score for which reliability and validity has been assessed in an observational study.

The study setting where the reliability and validity of the Italian 4 level score was assessed, was a large urban medical Centre, which sees 65 000 patients in its EC annually and with an admission rate of 14%. This study measured reliability by comparing the ratings given by the triage nurses at the time of the study with that given after 6 months. The inter rater reliability was done through comparing the mode of urgency given by the nurses with that given by an expert panel. These were compared using kappa scores. Good inter-rater reliability was observed in the 4 level triage tool assessed in this study( $k=0.73$ ) as well as the intra rater reliability score of a kappa score of  $k=0.82$  and this tool was recommended as being reasonably accurate in rating the triage acuity and for accuracy in triage coding.(Parenti et al, 2010)

The SATS tool is a two tiered approach triaging patients as follows (Wallis et al, 2006)

Firstly, a physiological scoring system, called the MEWS (Medical Early Warning Score) where the vital signs as well as the patient's level of consciousness are assessed. MEWS has been used to identify the level of physiological deterioration and where scores of five or more were given, is associated with an increased risk of death, ICU and high dependency admission. In addition to MEWS a mobility parameter as well as a trauma factor been added in order to increase its triage capabilities resulting in a system that has been renamed the Triage Early Warning Score (TEWS).



Secondly, a series of discriminators are applied to triage patients. (Wallis et al, 2006) which are as follows:

- a. The mechanism of injury: If the patient has been injured and a mechanism of injury score is given.
- b. Presentation: Any relevant symptoms or those symptoms seen with the naked eye are then documented.
- c. Pain: The amount of pain experienced by the patient is noted as being mild, moderate or severe and is often a useful indicator of patient priority.
- d. Discretion of senior health care professional: Using the above information the senior health care professional allocated a color code which they think best fits the overall condition of the patient taking into consideration the above mentioned factors. The senior official may alter the triage coding.

The score is calculated by measuring the physiological parameters followed by the assessment of discriminators which then lead to the allocation of a color category. (Wallis et al, 2006)

## **2. Problem statement**

The problem of overcrowding in emergency areas is a worldwide challenge with disastrous consequences, such as the increased rate of mortality of the patients in emergency departments (Sprivulus, 2006). This challenge is often associated with long waiting times of patients and has been proven to be associated with a longer patient stay (Richardson, 2002). This often results in an increased demand of resources and unpleasant experiences by those making use of the emergency areas, both staff and patients.

However there seem to be variations in how the triage system is implemented in terms of the uniformity of categorizing patients being assessed (Diley and Standen, 1998) in many emergency centers around the world. Observed in this study was how 52% of the nurses may alter their triage practices in response to the amount of activity within that particular department, This highlights the differences in practices between institutions and that the use of the triage score might vary from one institution to another. This is an evident limitation in the process of validating the triage scales used in different parts of the world. The Delphi method is suggested as being an appropriate validation tool for triage scales, more appropriate for use in developing countries. This method is a form of construct validity which allows a 'gold standard' to be set by a specialist panel consensus. This method is favorable due to its elimination of potential bias and its financial feasibility. (Twomey et al, 2007)

The triage system is a strategy aimed at improving flow and risk management in a setting where needs exceed clinical capacity. Its effective implementation would have the benefit of increasing service quality and providing a less stressful experience for the patients as well as the staff allocated to the areas.

This institution faces the challenge of overcrowding with high bed occupancy levels as well as overcrowded emergency areas and long waiting times. It would be an ideal setting for the implementation of the triage system. Instead this policy is being implemented fragmentally, by a few and without much consistency.

It then raises questions around the factors which would make this system one that is not deemed as necessary to use in these emergency settings even though there is known evidence of its effectiveness. ( Retezar et al, 2011)What factors could be present in this institution which would be preventing the implementation of such a policy?

In a study done immediately after the implementation of the triage system, in a 200 bedded acute hospital of Cape Town, the waiting times of patients were measured before and after the implementation of the nursing based triage system. This study concluded a significant reduction in waiting times of all but one category of patients, the green category. In this category of patients a reduction was evident but this did not reach statistically significant measures. This was said to be attributed to the use of the same amount of human and infrastructural resources after the implementation of the triage system in this setting. Factors such as these were said to be reducing the potential effectiveness of the triage system in this hospital. There was a trend of a reduction in waiting times evident in the higher priority color codes. This suggested improvements in the efficiency of services in the emergency department in these categories of patients. (Bruijins et al, 2008)

The problem identified in this study was the inconsistency in the implementation of the triage system in this institution. We therefore wish to develop an understanding towards issues contributing to the irregular use of the triage system and wish to better understand the reasons behind this inconsistency. Through the knowledge of barriers, we could then work towards the optimal use of this system. This would be beneficial towards the reduction of overcrowding as well as the reduction of waiting times for patients accessing the EA. The absence of an effective triage system is associated with poor management of clinical risk, increased morbidity and increased mortality. (Wallis et al, 2006). In addition this absence is also associated with a longer patient stay at the EA, which often contributes to overcrowding resulting in high resource utilization by patients within the EA's. (Retezar et al, 2011)

The researcher works as a bed manager in this study setting and on a daily basis attempts to assist with organizing the institution's EA without the consistent use of a triage system. She therefore has some understanding of the setting and insight into challenges the institution is facing regarding the implementation of a triage system. The understanding of these factors should make the triage system more usable and practical for use in this setting, ultimately improving quality of services in the emergency areas.

### **3. Justification of the study**

The triage system is a system and process that has been shown to yield beneficial results in many settings and has been very effective towards achieving a reduction in waiting times in certain categories of patients. It allows a platform for the efficient detection and appropriate response to those patients that cannot afford to wait due to the severity of their illnesses or injury. (Cheung et al, 2002) Time to triage and response rates can be used as indicators of triage quality and ED performance.

Compliance to this policy would be a potential alleviation of challenges related to overcrowding and ultimately could form a needed contribution to increasing the quality of services rendered at the emergency areas. It is then of great interest that we attempt to understand the underlying factors towards inconsistent use of this policy in this setting

It is known that the triage system is an effective method in reducing waiting times for patients in the emergency areas, therefore contributing to a reduction in the length of stay of patients in health institutions. (Cheung et al, 2002). The amount of literature about the implementation challenges encountered are however minimal, and that many resource constrained institutions are facing such challenges, with even fewer alternative strategies which could reduce overcrowding and increase the quality of services rendered in emergency areas.

### **4. Research Aim**

To investigate the underlying factors behind limitations towards the implementation of the triage policy in this institution. Through the identification of these limitations, identify effective methods to overcome them, with the purpose of supporting the implementation of the triage policy in this setting.

## **5. Research objectives**

- To describe the factors associated with the non implementation of the triage policy in this institution
- To allow the recognition of challenges related to the implementation of the triage policy.
- To identify the necessary changes necessary to put in place so as to encourage the implementation of the triage system.

## **6. Research questions**

### a. Primary question

What are the limitations related to the implementation of the triage policy in this tertiary institution and what factors can be identified and assist in addressing them?

### b. Secondary questions

1. What is the knowledge of the staff working in the emergency areas about the triage policy?
2. What is the perception of its benefits?
3. What is the perception of its disadvantages?
4. What are the factors inhibiting the implementation of the triage system in this institution?
5. What changes are necessary to encourage implementation of the triage policy in this setting?

## 7 .Methodology of research

7.1.) *Study design:* This study will be in the form of a qualitative, descriptive study. A qualitative approach better fits the study due to the unknown reasons for irregular implementation of the triage system in this setting, necessitating engaging with those who are meant to implement it. A descriptive approach would be utilized as there is some evidence on the implementation of the SATS, this existing evidence however did not address many of the challenges related to inconsistencies in its implementation due to the effective implementation of the system in the setting, whereas in this setting this was not the case. (Augustyn et al, 2009). Knowledge about its implementation challenges is minimal in the local setting. We therefore wish to build on the existing knowledge regarding the usability of the Cape triage scale (the tool) as well as the triage system in emergency areas (the process)

7.2.) *Setting:* This study will be carried out in the emergency areas of a public academic hospital, in the Western Cape. This institution has a total of 1310 beds with six emergency areas, providing tertiary and secondary level services to areas around the Cape Metropolitan as well as surrounding rural areas of the Western Cape. The areas included in the study will be namely the trauma EA, two x surgical EA's, a pre-ICU EA, an internal medicine EA as well as a neurology EA. This setting was chosen as it was the only tertiary hospital in the Western Cape where the triage system was not fully being implemented despite struggling with challenges of overcrowding in its EA's.

7.3.) *Study population:* The participants of this study will be nurses and medical doctors working in the emergency areas of this hospital which is a public institution.

A total of 20 participants will form the sample, which comprises of nursing and medical staff that is designated to the emergency areas. This is in order to have a sample that is large enough to include various professionals in from all six EA's and yet allow for in-depth analysis of the qualitative data even though representation is not the objective as this is a qualitative study. This was important due to the various EA operating differently and seeing different types of patients. The study participants will be recruited as follows, two x nursing staff from each of the following areas i.e. Trauma, the two surgical EA's, the internal medicine EA, the pre-ICU EA and the neurology EA. Five members of the medical staff as well as three nursing managers and two medical seniors. The pediatric emergency area will be excluded from the study. The study population will be purposefully sampled from these different emergency areas. This is in order to receive experiences from each area as they operate in different ways. Different types of patients are seen in these various areas (E A's) and therefore experiences regarding the triage policy are likely to differ.

7.3.1. Inclusion criteria: Nurses and doctors who are placed in the emergency areas of this hospital working with adult patients. Those who have given consent in a written form and those nursing managers and senior medical doctors who have given written consent.

7.3.2. Exclusion criteria: Those staff working in the pediatric emergency areas, as only the adult emergency areas will be part of this study. The pediatric EA uses a different version of the SATS and these differences could have influenced the feedback from the participants. Varying experiences with the pediatric version of the SATS might have been encountered within the pediatric EA as opposed to experiences from staff in the adult EA's. The pediatric EA and the adult EA are also under different management within this setting. Personnel who did not provide consent as well as those who verbally express their wish for non inclusion were excluded from this study.

#### *7.4) Data collection*

The following processes are to be followed leading up to data collection:

Ethical approval is to be obtained from the University of Cape Town's Ethical Committee. This process is to be followed by an application requesting permission to initiate study in this specific study setting, from hospital management involved in the hospital's research committee. Once this permission is obtained, permission for inclusion from the participants in the EA's which are to be studied will also be required prior commencing with the study.

Multiple methods which consist of two data collection methods will be utilized. I.e. semi structured interviews and a focus group discussion. This is for purposes of understanding personal, individual experiences as well as those by groups of staff working in the EA's.

- 1) A focus group discussion: The nursing staff working in the emergency areas will be invited to participate in a focus group discussion in order to reflect on their knowledge, experiences and suggestions towards the triage system in the emergency areas of this institution. This would be helpful towards understanding the variations in the experiences of nursing staff in the EA's as well as those experiences that could be similar or shared. (Refer to appendices 1, of Part D)
- 2) Five key informant interviews: The nursing managers and senior medical doctors of the emergency areas will be interviewed in order to receive their insight into the challenges related to the implementation of the triage policy in this institution. One manager or senior will be interviewed per area from either the nursing or the medical department. This would be for purposes of understanding the role

hospital management has in terms of the implementation of the triage system as well as the challenges which they could be facing.(Refer to appendices 2, of Part D)

- 3) Five interviews of the medical staff: The medical staff from the different areas will be invited to participate in semi-structured interviews arranged to suit their availability as the medical doctors do not always work according to conventional working hours.(Refer to appendices 2, of Part D)
- These interviews and focus group discussions will be of a semi structured nature allowing the participants some amount of flexibility in how they respond and also allowing for answers which might not have been predicted. This would also allow a variation in content based on what the participants felt was important for them to communicate about the implementation of the triage policy.

Questions asked in the questionnaires will cover the following areas:

- Analysis of current situation in emergency areas
- Knowledge of the triage policy
- Factors inhibiting implementation of the triage policy
- Potential changes which could encourage increased adoption of triage policy



## 8. Data Analysis

The data will be analysed through constant comparative analysis with the utilization of thematic analysis. (Bradley et al, 2007) Patterns and themes identified and found to be common or different in the perceptions, practices, and thoughts from the transcripts obtained during the interviews and focus group will be noted and explained. The themes which emanate from the data collected will be organized and presented, forming the results of the study. (Boyatzis, 1998) "A theme is a pattern found in the information found that at minimum describes and organizes the possible observations and that at maximum interprets aspects of the phenomenon. This could be directly observable or at the latent level underlying the phenomenon, can be used as a way of seeing or making sense of information" (Boyatzis, 1998).

Semi-structured interviews will be recorded and transcribed by the researcher, prior analysis. The emerging themes will be identified and notes will be made on the transcripts. These emerging themes will be grouped together in subheadings arranged to add insight to the research question. The relevant knowledge obtained will be organized and interpreted in the results section of the study.

The data from the focus group as well as from the interviews to be transcribed verbatim, as the interviews were done in English. Information obtained from these, which will be included in the article, would have minor grammatical corrections made.

### Academic Rigor

The reliability of this data will be ensured through the use of data triangulation: using the following methods, individual interviews and a focus group discussion. This is to strengthen the quality of the data obtained from the participants by allowing the participants to share their experiences as a collective and in addition to allow other professionals working in the same EA's an opportunity to provide their input on the same events recalled in the focus group discussion on an individual basis, with their identity protected. Data triangulation was to minimize bias in this study and adding credibility to the qualitative data collected. (Golafshani, 2003)

## **9. Data safety and monitoring**

The data (transcripts and tapes) will be stored by the researcher away from the research site in a locked box. This data will not contain any names of participants and will only make reference in codes. The transcripts from the interviews will be stored in the offices of Metro emergency services and will be used for further studies related to this topic. Only the researcher will know the identity of those who will be interviewed. This will not be documented in any of the research material used during the collection of data. The tapes will be destroyed after they have been transcribed to protect the identity of the participants.

University of Cape Town

## **10. Ethics**

The purpose of this study is to investigate the factors which contribute to the inconsistent implementation of the triage policy. It aims to understand which factors enable better use of the policy as well as those which inhibit its optimal use. Formal ethical approval will be obtained from the UCT Human Ethics Committee. Permission for entry into the institution will be obtained from the Provincial offices of the Department of Health in the Western Cape.

The participants are employees of the institution and are based at the research sites. There will be different ways of inviting the participants namely,

- a) Those that will form part of the focus group discussion will be invited by the researcher and approached individually through the information on availability obtained from the nursing manager of the emergency centre, those available will be invited to attend
- b) Three nursing managers and two senior medical doctors working in these areas will be verbally invited; interviews will be arranged based on the availability of each manager/ senior medical doctor, after the institution provides permission to conduct study.
- c) Five medical doctors will be approached individually by the researcher, and invited to participate in the study.

All participants will be required to fill in a consent form should they agree to participate in both the focus group as well as the individual interviews (Copies of the information sheet, consent forms are attached in the appendices of this proposal). Due to the fact that the participants are employed to work in these emergency areas, sensitivity will be utilized and the health workers will be treated with the outmost respect, their feedback will be treated with the highest degree of confidentiality and no reference will be made to the participants. No individuals will be referenced during and after the study.

Anonymity of the participants: Participants to the individual interviews will be known only by the researcher so as not to attract any negative consequences as a result of inclusion in this study, they are however free to withdraw from the study at any time during the research process.

Focus group participants will be approached and invited based on their availability due to shift work, and the information of those available will be received from the nursing manager of the emergency department. They will be approached and invited by the researcher based on their availability, a date and time pre arranged between the manager and the researcher, ideally during the staff lunch times. The emergency department nursing manager will however not be informed of which staff members have agreed to participate in the study and a venue away from the emergency areas will be booked for the conduction of the focus group as well as the interviews.

The reference of the participants in terms of codes will enable the opportunity to provide clarity on any unclear responses during the interviews and will increase the usability of the information, as well as maximize the number of responses for research questions.

The interviews of key informants will be anonymous to those either than the interviewer and no mention of their names will be made in the transcripts. All data and information will remain strictly confidential and the names of the participants will not be documented in the results section as well as the transcripts, they will solemnly be referred to in terms of codes.

Benefits to participants: No monetary benefits will be promised to the participants in this study so as not to manipulate or influence the findings in any way. Participants will not be coerced into participating Participants will not require re-imburement for travelling as they will be interviewed in their working environment on the days they are on duty. The negotiation of their availability will be done individually for the interviews and as a group for the focus group discussions (lunch time).

Refreshments will however be provided to the participants during the focus group discussion, especially since it will be during their lunch time.

The long term benefit to participation will be the opportunity of sharing their experiences regarding this policy in order to contribute to making it much easier for them through the understanding of the factors under investigation. The knowledge obtained from the study will also be available to the managers of these areas so as to allow for decisions which could contribute to the improvement of the services rendered in these areas.

Harm to participants: No issues are known to have potential harm to the participants as this study does not involve physical involvement with patients, and is not requiring responses that are expected to be emotionally disturbing. Should such instances arise; the concerned participant will be referred and assisted through information and guidance to access appropriate staff support services.

### **11. Dissemination of the findings**

The results of the findings will be of interest to the hospital management, the EMS (Emergency Medical Services) management, the staff working at the emergency areas as well as to students and professionals seeking to add to their knowledge about the triage policy which supports implementation of the triage system.

The research findings will be distributed in several ways to different stake holders:

- A presentation will be held where the findings will be made known as well as recommendations for further research and health service provision. The following stake holders will be invited to this presentation, the EMS personnel, the nurses working in emergency areas as well as the management of both the EMS as well as Tygerberg Hospital
- A summary of the research as well as the findings will be given to the nursing managers, medical manager as well as EMS management during the presentation, and through the post to those who are unable to attend the presentation.
- A hard copy of the research will be made available to the provincial offices of the department of health.
- The research will be published in a peer review journal for the access of all interested healthcare professionals, academics and students.

## 12. LOGISTICS

### RESEARCH SCHEDULE

YEAR 2011										
ACTIVITY / MONTH	JAN	FEB	MARCH	APRIL	MAY WK 1	MAY WK2-4	JUNE	JULY	AUG	SEPT
Protocol development										
Ethical Approval										
Application for study permission										
Piloting										
Data Collection + Analysis										
Write up										
Dissemination and Feedback										

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## **i.)Introduction**

Triage is a system which is utilised in emergency areas with high volumes of patients. This system aims to provide order in situations overcrowding is experienced and provides a system of organising patients waiting to be seen based on their severity. The sickest patients receive priority over those which are less severe, and can wait for a specified amount of time depending on the physical and physiological status of the patients' condition. Literature is available of the effectiveness of various triage systems with very little information available on challenges related to its implementation in various settings. ( Molyneux et al,2006 and Goransson et al, 2005)) This study aims to investigate logistical challenges behind the limitations of the implementation of this system, supported by the Policy on the implementation of the triage Scale.(Department of Health, 2006)

### **ii) The literature reviewed in this section has the following objectives:**

- To describe the triage system.
- To support its effectiveness and benefits.
- To explore available knowledge on issues limiting its implementation.

### **iii)SEARCH STRATEGY**

Strategy: The following terms were utilised to search for appropriate literature on the study topic. All studies which had the following terms were explored. The references used in those studies were further explored to reach those studies relevant to the literature review objectives.

The following terms were used to search for studies which met the objectives of the literature

Review:

- Triage system, the Cape Triage Score, the South African Triage Score, Triage Scales
- Triage implementation, Emergency policies.
- Triage system barriers, limitations, challenges, benefits, advantages, and effectiveness.
- Triage system types, various, Canadian Triage and Acuity Scale, Manchester Triage Scale, Emergency Severity Index.
- Search engines: Google scholar, Medline, Science direct, Pubmed, the UCT library's e electronic journal resource and the CINAHL database.

### **A. Aim of triage in emergency areas (EA)**

The primary aim of triage is to identify all those patients whose condition is expected to worsen should immediate care not be received. The secondary aim is to identify all those patients who do not require time critical care, can be safely triaged into a non-urgent category. These patients would have to wait for a few hours or be referred to another health care provider. (Hardern, 1999).

Triaging of patients has the following goals: 1.)to identify patients with urgent life threatening conditions,2) to determine the most suitable treatment areas for those patients arriving in the EC,3) To reduce congestion and overcrowding in emergency areas (Hardern, 1999& Kuruvilla and Mac Donald, 2005).

### **B. Various triage systems**

'Triage is the sorting of patients for treatment in situations of least modest resource Scarcity, according to an assessment of the patient's medical condition and the application of an established sorting system or plan' (Iserson and Moskop, 2007).

There are various settings and instances where this can be done, defining the types of triage as being, ED triage, ICU triage, military triage(often referred to as battlefield triage) and disaster(mass casualty) triage(Iserson and Moskop, 2007).

In the emergency department (ED) triage there are various forms of triage systems practiced in various parts of the world. Five level systems are utilized in the ED triage setting in countries such as Spain, Canada and the United Kingdom. The United States uses a three level triage system, the Emergency Severity Index, which classified the most severely ill patient in their highest level, i.e. level I category.(Gilboy et al, 2003) The Canadian triage and Acuity Scales makes use of clinical descriptors reduce congestion in the EA. (Canadian association of emergency Physicians, 1998).

The Manchester triage scale is in the form of 52 algorithms from the basis of the chief complaint to establish the appropriate triage level, this scale is used widely in Great Britain (Manchester triage group, 1997).

The above mentioned triage systems have proven to be challenging for implementation in South Africa due to variations in the emergency and hospital settings between South Africa and other countries. The challenges faced in terms of the acquisition of the training of personnel in the country as well as location specific and resource limited demands. Pre hospital triage if delivered accurately is of great value to communication with the receiving hospitals, encourages accurate allocation of appropriate resources, quality management as well as creates a platform for the conduction of quality and ambulance audits (Iserson and Moskop, 2007).

### ***C.1. The South African Triage Score (SATS), inception of the tool***

The South African Triage Group (SATS), consisting of paramedics, medical doctors and nurses, was assigned in 2004 with the task of designing a triage system that is suitable for South Africa for emergency and hospital pre-setting. It set goals of defining vital sign parameters and designed a system with the objective of ensuring usability, effective and efficient sorting of emergency patients (Wallis et al, 2006).

The SATG designed an effective triage tool for use in pre- hospital and EA settings. This is in a form of a color based system, where the patient is classified according to the severity of the injury/illness and coded to belong to one of the color codes. These are Blue, Red, Orange, Yellow or Green, which is physically demonstrated through use of colored stickers. These stickers represent the different triage categories i.e. seriousness of the patient's injury/illness, the targeted time to treat varies for each colour code.

### ***C.2. SATS tool: Description of the South African Triage Score, the process of categorizing patients***

The physiological scoring systems as well as a series of discriminators are used to establish ratings by classifying patients into each category. The physiological scoring system comprises of the Triage Early Warning Score (TEWS), which is a combination of the medical Early Warning Score (MEWS) (systolic blood pressure, heart rate, respiratory rate, AVPU measuring the level of consciousness). Due to its medical bias, a mobility parameter would increase the severity score for trauma patients; improving its triage capabilities and resulting in a TEWS score (Wallis et al, 2006).

The discriminators used in the second phase of the SATS are the mechanism of injury, presentation, pain level and lastly concluded with the senior health care professional's discretion in order to improve the process with the addition of an opinion into the parameters, either upgrading or down grading the triage status (Wallis et al, 2006).

The ideal acuity rating system should allow for quick sorting of patients identification of those patients that require urgent medical attention in the EC's. The level of acuity should represent the seriousness of injury or illness and this should not be influenced by the EC volume. The ideal scale should have characteristics of reliability, utility and relevance. (Eitel et al, 2003)

### **C.3. Reliability and validity of the SATS**

Reliability refers to the degree to which repeated assessments of the same patient with the triage instrument will deliver the same acuity level. *Consistency* in simple terms (Twomey et al, 2007) & (Fernandes et al,2005 )This is measured as either Inter-rater reliability detecting differences in rating by different officers of the same patient or Intra-rater reliability detecting variations of the same officer's ratings of the same patient.(Twomey, 2007 & Fernandes et al, 2005).

Validity refers to the degree, the acuity level reflects the true acuity at the time of triage, referring to a form of external reference and surrogate markers have been utilized to assess triage tools. Due to different parts of the world utilizing different tools, very little is available on the SATS's specific validity and reliability.

One study was found assessing the reliability of SATS, unique to the South African context. A cross sectional reliability study was undertaken. The reliability of acuity ratings amongst vignettes to assess reliability of acuity ratings amongst five emergency physicians five physicians and ten ENA' s (Enrolled nursing assistants) through the categorization of 100 vignettes. The kappa score measuring reliability between the nurses alone was, 0.66 and 0.76 among the group of emergency physicians, with the intra class coefficient for the group of emergency physicians being 0.76 and 0.66 for the group of nurses and a combined being 0.98 (Twomey, 2011). The results showed that the SATS has good inter- and intra-rater reliability when used by emergency physicians and ENA's.

The features of the ideal scale should be applicable to all patient populations and age groups and the information on the acuity level of patients should be incorporated into funding formulations, allowing for comparisons to be made between institutions of similar size and function (Twomey et al, 2007).

### **D. SATS policy**

The existence of the triage system has led to the conceptualizing of the Triage Policy which served as guidance on how the triage process is to be implemented, from 2006 onwards. This policy states the following occurrences as being part of the basic triaging process according to the Triage policy. (Dept of Health Western Cape, 2006) The basic requirements for the implementation of this policy are met in most CHC facilities around the Western Cape (WC) with a few still experiencing implementation challenges. The implementation of the Triage Policy requires the support of managers as well as those health workers who will be transforming the policy into action. Institutions often face challenges of restructuring their resources to meet the needs of policy implementation due to the development of new tasks, a shift of responsibilities, in accordance to the resource demands of the policy to be implemented. These shifts might are often a challenge in unilateral implementation.(Crosby, 1996)

The nature of the policy process is not always a coherent, continuous process, instead can often be fragmented and interrupted, as with the implementation of this policy in some settings within the WC

i) Resource requirements:

- All patients are to be triaged as soon as possible after arrival at a facility
- A dedicated triage nurse is required at all times
- A dedicated area is preferred, but in the absence of such patients can be seen at a bed space in the EA
- This area should be well signed, secure, large enough to accommodate the triage nurse, wheelchair and a relative or carer
- A desk or chair in the location, with all the necessary paper work, colored stickers, wall clock, gloves, dry dressings, thermometers, sphygmomanometer and access to a blood glucose monitor
- Measuring tape, area which to mark the height of children, CTS prominent posters, instruction manual, CTS patient information leaflet displayed in the waiting room in English, Afrikaans and Xhosa.

ii) Target times to treat

- RED: Immediate
- ORANGE: Within 10 minutes
- YELLOW: Within 60 minutes
- GREEN: Within 240 minutes
- BLUE: Dead

iii) Responsibilities of emergency areas (EA):

- Each EA is expected to assign a task team responsible for the implementation and functioning of triage. This team should consist of a doctor and a professional nurse.
- A task team within each institution is to review the implementation challenges identified with support from the provincial implementation manager.

The above characteristics mentioned in i, ii and iii form part of the requirements for the triage process documented through the use of the triage tool.

### ***E. Advantages of using SATS***

Waiting times:

In a study done by Bruijins et al, in 2007, a reduction in waiting times of red (82%) orange(44%), yellow (40%) category patients was observed. in the prospective arm after the implementation of a triage system. This reduction reached statistically significant proportions, except in the green category of patients where reduction of 19% was evident, but did not reach statistical significant measures. A combined reduction of 38% was evident in all 4 categories and was attributed to the implementation of the triage system in this prospective, cross sectional study. In this study the reduction of waiting times was achieved even after other possible effects were adjusted for, such as staffing numbers, available facilities, patient load, and level of nursing and medical skill. The studies support reductions waiting times of acceptable levels due to the implementation of the triage proving its effectiveness.

Advantage of using triage systems: A comparison was made amongst different states in Columbia amongst those which had implemented state trauma systems through the comparison of mortality rates amongst those states which had the systems and those which lacked a formal system of trauma care. The presence of trauma systems was associated with a 9% reduction in the global injury mortality rates, even after adjusting for other known covariates which are known to affect MVA related deaths, with the highest reduction being amongst those patients which are young and those which are elderly, usually being the most vulnerable to adverse outcomes.(Nathens et al 1999) .In another study, 18% reduction in waiting times for those patients who received triage compared to those who did not receive a partial or full triage standing order was achieved after implementation of triage (Retezar et al, 2011).

## ***F. The impact of an absence of a triage system***

### **i) Overcrowding:**

Definition of EA overcrowding: When the supply of health services is mismatched with the demand and supply for the emergency services (Sprivulus et al, 2006).

The challenge of overcrowding causes increases in volumes and causes a reduction in the systems capacity, in America from 1992 to 2003 EA visits increased from 90 million to 114 million, and contrastingly the number of EA's were reduced by 8.1% from 1994 to 1999. This negatively affects the ability of the emergency teams to deliver effective, good quality care. Overcrowding can affect what is termed as service quality (defined as: The patients perspective of the quality of their experience, determined by the waiting time, staff interactions, symptom control, the perception of the patient on the quality of the medical services and communication) (Sprivulus et al, 2006).

In a study done in Perth, a part of Western Australia between 2000 and 2003, overcrowding in the hospital and in the EA's was associated with a 30% relative increase in mortality for patients requiring admission to the EA, this increase was independent of age, season, diagnosis or urgency. In this study a bed occupancy of above 90%, was proven to be closely associated with an EA access block as well as increases in the duration of EC length of stay (Sprivulus et al, 2006).

A longer period of stay in the EA was established for those patients who experienced overcrowding and eventually died, confirming a relationship between mortality in the EC and overcrowding. (Sprivulus et al, 2006). The impact of overcrowding in causing delays in the delivery of time critical care may be a contributor to this established relationship. Human error theory predicts that errors occur more frequently when systems are stressed by constraining resources, such as when a hospital is overcrowded (Sprivulus et al, 2006). This is often associated with the placing of some patients in incorrect wards where staff might not be most capable of attending to the patients' specialty specific medical needs or the ability to interpret clinical cues which might communicate the occurrence of potential adverse events (Sprivulus et al, 2006).

The time patients spend waiting to be evaluated seems to have an influence on whether patients are seen, or leave the EA without being seen. This poses a serious public health challenge as patients would leave the institutions without a diagnosis or treatment, returning only when symptoms worsen (Eitel et al, 2010). Factors such as the increased complexity of EA diagnosis, complexity of the treatment required for the EA patients, the time that is spent waiting for evaluations in the EA, the lack of appropriate funding for EA's, increases in numbers of uninsured patients presenting to EA departments, workforce shortages and the deficiencies in preventative care are all potential contributors to the challenge of overcrowding in EA (Eitel et al, 2010).

Process re-engineering methods can be used to understand factors which contribute to crowding and provide tools to help alleviate it by improving service quality and patient flow. Methods which could be used to address this challenge could include the implementation of the triage policy among other alternatives (Eitel et al, 2007).

Longer waiting times: in the South African study, assessing the effect of implementing a triage policy on waiting times, a reduction in waiting times in the prospective arm was established with the implementation of SATS in the hospitals' EA. This demonstrated longer waiting times associated with the absence of a triage system. The amount of time spent waiting for medical attention for severely unstable and sick patients could potentially allow a life to be saved or contribute towards one that is lost. (Bruijns et al, 2008).



## **G. Barriers to implementation**

### ***Barriers to successful implementation of the triage policy***

A multitude of potential barriers face the implementation of public health programs and policies in the emergency centers i.e. end use attitudes, resources, system structure, limited knowledge base and the lack of a responsible champion. A need for the identification of such barriers is necessary within the contextual setting to note and accommodate cultural influences. (Mc Kay et al, 2009) A few studies have investigated the limitations and barriers to the implementation of state trauma systems in the pre-hospital setting as being the following: A study done by Standen and Dilley, 1997 mentions the following barriers as contributing to the implementation of the triage policy within emergency departments (Standen and Dilley, 1997).

- Geographical layout of the department where triage functions are being performed
- The availability and the experience level of the medical practitioners and registered nurses.
- The number of patients being seen through the specific department
- The acuity of the patients seen
- The challenges regarding the uniformity of the performance of triage orders were studied and it was found that a vast majority of the registered nurses which participated in this study categorized 17 of the 20 cases assessed in 2 adjacent categories, implying that a patient could wait half an hour in one hospital for treatment and only 10 minutes in another. (Standen and Dilley, 1997).
- The nurses which are responsible for the triaging of patients were also found to alter their triage practice depending on the activity level of the emergency areas. In the Australian setting where conforming to triage practice is results in the institutions facing penalties, they do so to avoid the penalties upon the institution, and would triage the patients up when it is quiet in order for the institutions to achieve targets. (Standen and Dilley, 1997). There were also inconsistencies regarding the prior qualifications of the staff required to fulfill triage functions, with some hospitals requiring a triage nurse to have at least 3 months prior to commencing the triage role, with other requiring more than 12 months, and with some only recognizing a certificate in emergency and or critical care nursing .

The identification of limitations in the implementation process of policy, provide a baseline for as well as ensure that the appropriate support is given to the institutions on a continuous according to the needs of the institution, these limitations might vary depending on the stage of implementation as well as the setting where implementation is to take place. (Nathens et al, 1999)

#### H.i) Policy implementation: The process

The implementation of public health policies in the emergency settings has its own challenges, which are similar in many other emergency centers around the world. The methods which could be used to reach solutions on how to address these are most likely to be found in the local settings through the conduction of qualitative and quantitative research methods. EA have their own unique organizational culture, procedures, records systems and constraints, even though the goals of all EA are likely to be the same (Mc Kay et al, 2009)

Each hospital has its own unique organizational culture, which often clashes with the nature of polices and with what policies require people to do. Policy is always the outcome of a process of conflict between differing interests and a process of bargaining to resolve disputes (CREHS, 2009& McKay et al, 2009).The resource levels of the Models of implementation and specific hospital

Policy implementation is not always a coherent, continuous process instead it can be fragmented and interrupted. Changes in policy often require the support of stakeholders, allowing for the inclusion of day to day processes and procedures as well Rules that institutions are familiar with and also affected by change, forcing new patterns of interaction to occur, which cause the process of implementation to be have to adjust to these challenges often prolonged over a certain number of years, and leading to constraints in accessing a number of resources. (Crosby, 1996)

### *Hii).Implementation Theories*

The implementation of a policy such as the SATS policy could be evaluated as an indicator of the quality of health services rendered within an institution. Issues such as overcrowding of EA's, long waiting times in the EA and accurate matching of resources to match the acuity of the patient are aspects which the triage system aims to address (Stephen et al, 1995)

The Baldrige Award Criteria is a tool which can be used to assess the issues related to the implementation of quality improvement projects within the hospital context (Goldstein and Scweikhard 2002). Achieved through the use of employee judgments influenced by the size of the hospital, the culture, whether the implementation approach is adopted and whether or not the hospital is involved in Quality Improvement initiatives. Whether or not a hospital uses Comprehensive Quality Improvement (CQI)/Total quality management (TQM) is expected to be directly impacting the perceived impact and clinical efficiency measures (Shortell et al, 1995).

The following are available hypothesis which attempt to explain the processes of policy implementation and the factors which could affect the outcome of policy implementation.

The CQI/TQM hypothesis: Hospitals who reported incorporation and involvement of all five CQI/TQM principles which are the following

- Focusing on the underlying organizational processes and systems as causes of failure rather than blaming individuals
- the use of structured problem solving approaches based on statistical analysis
- the use of cross functional employee teams
- Employee empowerment to identify problems and opportunities for improvement and to take necessary action 5)a focus on internal and external customers(Shortell et al, 1995)

The culture hypothesis: Culture is defined as 'the values, beliefs and norms of an organization that shape its behavior 'It is believed that successful implementation necessitates a culture which emphasizes empowerment, autonomy, and risk taking. (Shortell et al, 1995).

The implementation approach hypothesis: Based on the Miles and snow typology which classifies organizations as defenders: Involves fine-tuning the organization's quality improvement approaches, focusing mostly on external accreditation requirements, analyzers: following an ordered sequence of employee training from top management to lower employee training taking a few QI projects at a time , prospectors. Seizing opportunities as they arise within a planned framework of implementation and reactor/opportunistic approach may be used to address problems that are not part of an overall plan (Shortell et al, 1995).

Policy change often requires difficult changes in the supporting stakeholder coalitions, changes in structures and the rules institutions are familiar with, as well as requires new ways of interaction amongst those affected by the policy in order to bring about the required change. The difficulties may arise in the implementation process which may cause the process to be prolonged over years disrupted by flow of critical resources. (Crosby, 1996).

#### **i.v) Gaps in literature**

The information on the implementation of triage policies is minimal and made even more so by the variations in the systems used in the various parts of the world. Data on the SATS policy is extensively of a quantitative nature with hardly any studies done on the implementation challenges experienced by the different types of institutions. It was of great importance to attempt to understand the issues related to its implementation in a tertiary hospital from the perspective of those who are meant to implement it. This was to evaluate how interactions with complex structures and systems could contribute towards limitations related to its implementation in similar settings. The local literature available is on a few institutions where it is being implemented fully and there is a gap in the availability of literature from those institutions which are falling behind with the implementation process, for purposes of understanding the reasons why they are experiencing such limitations. This study aims to add to the body of qualitative knowledge through understanding how people who are to implement the triage policy interact with the different aspects of its realization, in order to create a successful process or in contrast contribute towards its limitations.

#### **v) Need for further research**

Further research is necessary to ascertain the differences in factors affecting implementation of triage and how these differences affect its outcomes. This would be greatly demonstrated through a comparative study between this and another one of a similar size and with similar services where the triage system is being effectively implemented using the SATS as a tool to establish how these differences in culture and processes involving decision making affect how policies are accepted by those who are to implement them. A comparative study would highlight what the differences are and how those differences translate into action to support policy changes effectively.

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PART C: ARTICLE

ABSTRACT

**Study aim:** This study aims to investigate the factors limiting the implementation of the triage system in a setting which faces challenges with implementation through identifying and describing those factors which could effectively address these limitation.

**Results:** Segregation of processes related to staff availability, high number of minor injuries accessing tertiary level care, perception of impractical time to treat targets of non-urgent categories of patients, lack of institutional support for the implementation of the policy, lack of understanding of the triage system by nursing staff and high activity levels in the hospital's EA were identified as limitation to the implementation of the triage system in this setting.

Recommended solutions by participants were: Management support, availability of champion to lead and guide implementation process. The alignment of resources towards supporting effective implementation of the policy as well as adequate preparation through education and training.

**Conclusion:** Active participation, clear role identification of stakeholders within a process of monitoring and evaluation are essential for sustainable, consistent and effective implementation of the triage system. An in-depth understanding of the dynamics existing in settings or those similar to where policy implementation is to take place increase the likelihood of achieving successful implementation of policy.

Keywords: triage system limitations, triage system barriers, South African Triage scale (SATS), emergency areas/departments (ED/EA)



## INTRODUCTION

The South African Triage Scale (SATS) was introduced in 2006 (Department of health, 2006). Derived by the South African Triage Group, it was designed for use in emergency areas (EA) throughout South Africa. The tool has three versions: adult, child and infant version of the scale. The SATS tool is designed to be completed by Enrolled Nursing Assistants in EA, and aims to sort patients according to the urgency of illness or injury, allowing the sickest patients to be identified and managed accordingly. The category chosen will determine how long a patient can afford to wait for medical attention. This should be done in a dedicated triage area. The triage system is aimed at improving flow and risk management in a setting where needs exceed clinical capacity. Its effective implementation would have the benefit of increasing service quality and providing a less stressful experience for the patients and staff allocated to the areas. (Harden, 1999)

In common with many facilities across the world, this hospital faces the challenge of overcrowding with high bed occupancy levels, long waiting times and overcrowded EA, making it an ideal setting for the implementation of a triage system. However, our experience has been that the triage tool has been implemented fragmentally with little consistency. There is no known reason, as to why this may be the case, even though its effectiveness is known (Retezar et al, 2011), or what may be the best solution to address the problem.

We therefore undertook a study to determine the factors preventing the effective implementation of the SATS in this hospital, and to make recommendations to improve uptake of the policy.

## METHODS

We undertook a qualitative, descriptive study, in the Emergency Areas of a public academic hospital in Cape Town, South Africa. This institution has a total of 1310 beds with six emergency areas, providing tertiary and secondary level services to areas around the Cape Metropolitan as well as surrounding rural areas of the Western Cape. The EA included in the study were the Trauma Unit, the two surgical EA, an internal medicine EA and the resuscitation (pre-ICU) area.

A total of 20 nurses and doctors working in the EA formed the study population; two nursing staff from each of the five EA, five members of the medical staff and five senior managers. The participants were purposefully sampled.

### Data Collection

We used multiple methods to reduce the impact of bias and improve data quality

- 1) Semi-structured interviews.
- 2) Focus group discussion: Nursing staff working in the EA were invited to participate in focus group discussions reflecting on their knowledge, experiences and suggestions on the triage system.
- 3) Key informant interviews: five nursing managers and senior doctors were interviewed to receive their insight on challenges related to the implementation of the triage policy.
- 4) Medical staff interviews: medical staff from the different areas was invited to participate in semi-structured interviews.

## RESULTS

### Demographics

80% of the participants invited attended the focus group discussion and 80% of the targeted staff agreed to participate in this study.

Focus group: Eight nurses (three registered nurses, two staff nurses and three auxiliary nurses) took part; all these participants were female.

Interviews: Two registered nurses and two senior medical personnel participated in the study as key informants. Four medical interns were also interviewed as the first medical doctors to assess incoming patients in the emergency areas. The interviewees were four males and four females.

### Themes

Several themes were identified, describing how participants interacted with the triage policy, and how they understood and perceived limitations towards its implementation. The themes were identified through the data analysis process and were not pre-determined by the researcher. They aimed to provide answers to the research questions. Themes emerged from the data collected and were organized, as follows:

1. The organizational culture at this setting and how it affects the triage policy outcomes.
2. The existing baseline knowledge about the policy
3. Current perceptions about the implementation of the triage policy in this setting
4. The identification of limitations to the implementation of the system/policy and proposed solutions.

## 1. The impact of organizational culture on policy outcomes

Decision making: The institution was perceived by all participants as one which had an autocratic culture; management made decisions affecting daily processes without including the views of those affected. *'The forms were just brought to the department and we were told. The guidelines were put on the wall. We just have to triage the patients from now on.'*

Stressful working conditions: The participants expressed the experience of working in this institution as highly stressful, due to high volumes of patients, having to assume responsibility for complaints, and a perception of a deterioration of services. Resistance to change was evident - *"we don't like change and you create an anxiety and you tend to resist it"*. Five of the seven doctors felt that the current system is definitely not working but that change was very hard to effect: *"...we changed the setup here and it lasted for about a month...they didn't like the system, they didn't like changing what they were used to."*

Communication was identified to be one of the factors affected by current culture by many of the participants. Communication was identified to have contributed to several challenges with implementation of the system in this setting. Common sub- themes are indicated in **table 1**.

Table 1

<b>Areas of communication</b>	<b>Quote</b>	<b>Comment</b>
<b>With management</b>	<i>"Many times we invite them to see how we work, but they don't come. Every day we ask them and they still say they are very busy, they say they can't come. "from one nurse "Whatever they are doing at the time. They are always willing to come."</i>	Nursing staff agreed that they felt management was unapproachable and that their attempts to speak to management were unsuccessful.
<b>Between medical doctors and nursing staff</b>	<i>"the registrar does not tell the nurse which patients are coming, then they are unprepared"</i>	The nursing staff felt that the communication they had with medical staff was very good. Amongst registrars and nurses this was poor resulting in nurses not always being prepared for admissions EA's.
<b>Between staff and patients</b>	<i>"As soon as they walk in, there's no contact with them while they wait. That would improve the patient doctor relationship overall creating a great atmosphere to work in where patients are much more catered for than currently." statement by one doctor.</i>	Three participants in the interviews felt that the communication between the doctors and the patients was contributing to the creation of an unpleasant working environment. That the implementation of the triage policy, if including patient education could change this.

1. b. Impact of organizational culture on policy processes followed: The participants reflected feeling excluded in decision making processes. Previous attempts by nurses to get management's attention resulted in resentment and negative feedback from their colleagues. The institution is perceived as being reactive to policy changes implemented in other tertiary hospitals. *"They go to \*\*\* hospital and to other hospitals, found out that triage is working there perfectly but our hospital is not like \*\*\*hospital. You've got different departments where patients go to...but they think the same thing will work here in this hospital."*

2. The existing baseline knowledge about the triage policy

2.a. Knowledge about the triage policy

All participants displayed knowledge of the different triage categories and target times for treatment. Most staff made reference to the importance of assessing those patients in the Red category immediately; most also felt that they needed to discourage Green coded patients from coming to this facility for their emergency care. Three doctors stated their wish to demonstrate this intention by leaving Green patients to wait for long periods. Most participants did not agree with the targeted timeframes for Orange, Yellow and Green category patients, due to other clinical commitments (attending to theatre, ward patients, and resuscitations outside EA ).

Source of triage knowledge: one doctor received knowledge from exposure to primary care, two from private healthcare, and one from another tertiary hospital. Two stated that the triage system had being briefly mentioned during the course of their undergraduate studies, with one of them



recalling it covered during orientation. Two senior doctors obtained knowledge “through experience”. Junior medical staff learned about it during undergraduate studies but admitted that it was not emphasised sufficiently. As one senior doctor stated, *“It’s a policy that one becomes aware of once you are in an institution and you must actually implement it...It’s not really common knowledge ...”*.

Some nurses attended triage training, others gained knowledge through experience. Other nurses obtained their knowledge from managers and previous attempts to implement the policy in the trauma unit by senior medical personnel. A majority expressed not being aware of the objectives of the triage policy. *‘The purpose of why you triage wasn’t explained to us.* This was reinforced by three doctors, who stated that nurses were unable to interpret the findings after completing triage, resulting in urgency level not being established.

All participants had knowledge about the different roles in the triage process; they admitted that the system was not in place in the EA in this study setting. Some nursing staff perceived filling in the SATS form to be the only task expected of them in triage, and could not connect this to the amount of time that the medical doctors took to see patients: they felt they did not have control of how long doctors took to assess patients.

#### 2.B.Platforms where this knowledge was received by participants

The participants’ main source of exposure to the triage system and policy was through working in other healthcare institutions, where often the SATS form is completed without patients being sorted in terms of priority. Doctors expressed numerous challenges with operations in the EA, and

expressed dissatisfaction with the qualifications of nurses, as well as the geographic isolation of the EA. *“Our main problem is triage. ...a patient will come in and they call you immediately when*

*you get there it’s a surgical case.’ I’ve got a problem with triage. I’ve been informed of patients sitting there for hours, we get constantly called...”*

Current practice in the emergency areas: All doctors admitted not implementing the triage system. *“We don’t have a triage system first and foremost..”* They admitted seeing patients based on a first come first served basis. All, however communicated seeing the most severe patients first, and understanding the need to do so.

Method of determining priority: Participants reported use of various methods to determine medical priority, often by observing physical signs and using the Glasgow Coma Scale. They trusted the existing referral system, where the sickest patients are assumed to have been telephonically referred first. However, many of them highlighted the weaknesses of this process, such as referring doctors “lying” to get patients admitted in the institution. Nursing staff working in Trauma said they filled in SATS forms but these did not determine the order patients were seen in. Most expressed that they are not strongly against the implementation of the triage policy, and recognised its benefits, but felt that support from management was necessary to create conditions suitable for policy implementation. *“The patients come first...”*

3.Perceptions about the triage policy and how these affect its implementation in this setting.

3.a. Perception of benefits associated with the implementation of the triage policy

Completion of the SATS form: The nursing managers perceived the SATS form to be simple and easy to fill in - when incorporated into the admission procedure it should not require additional

time to complete; nurses found the form to be simple. Medical staff perceived the form to be effective in assisting them determine which patients to prioritise.

They wished to receive objective information from nursing staff on how much time patients could spend waiting, in order to assist them prioritize between various areas they had to cover when on call: *"...they'd be able to say It's*

*a sick patient and once you get an opportunity to come see the patient and leave it at that. As opposed to saying I've got a patient who is very ill. I've assessed her to be a Red patient. I think she needs to be seen now. It gives us a different view: okay I've got time to buy while I'm still busy with patients here .."*

A senior medical staff saw the implementation of the triage policy as potentially being of great benefit towards encouraging early access to health care. *"In fact we could potentially benefit from it because very often there's a possibility of catching patients who are too late in their care and once we start treating later on we end up utilizing critical care resources".*

Most of the doctors used the triage system to stall and prolong waiting times for Green patients *"...essentially the triage gives us the ability to stall them. To get the message across that there's a million other people who are waiting their turn. They want to circumvent.. and get seen quicker. .. they just have to wait."* All participants study agreed on the need to see Red patients immediately, but not the non-urgent categories: all viewed this as a benefit of implementing the triage policy in the EA.

### 3.b). Perceived disadvantages of implementing the policy and using the triage system

Four doctors based their perceptions of implementing the triage policy on the current situation in the triage area (where the policy is only being implemented in terms of filling in the form).

*'Amongst the interns our main problem is the triage area...a patient will come in and they call you immediately when you get there it's actually a surgical case'*

Most doctors complained that the nursing staff currently working in the triage area was not knowledgeable about the triage process to the extent required to implement the policy correctly. '

*I think they are just junior, so I think they need somebody else to gauge the urgency.'* All made reference to the incorrect information provided by referring institutions on the state of patients; they associated this with high numbers of patients with minor injuries or illnesses referred to the institution. Five of the doctors referred to this as a limitation. *"Obviously the referring doctor knows what they need to say for the patient to get accepted. So they'll just modify things, the patient has a heart rate of this and the patient has a blood pressure ... just excite the results in order for our doctor to accept the patient. The patient arrives here and is not what was said".*

In the surgical EA, nursing staff felt that implementing the triage policy would not affect the order patients are seen, due to the unpredictability of doctor availability from different surgical disciplines: patients were seen in the order that specialist teams were available, not by urgency:

*"Now the vascular doctor is there before another surgical doctor... you must explain to the other patients that their department is another department. You don't fall under that doctor, your doctor must still come see you."*

Nurses held accountable for delays in waiting times: During the focus groups, nurses expressed concern in being expected to explain waiting time delays to patients even though patients were waiting for the doctor. *"We can triage patients quickly but it's the doctors our patients are waiting for. In trauma you can have your Orange patients, your Green patients; all the doctors are busy in the ICU, still the patients have to wait, it can be more than three hours sometimes". The doctor says the patient can wait up to three hours, but if the patient starts to complain two weeks later, we have to fill in the reports that it was said that the patients can wait up to three hours... nursing staff ask what the purpose of the form is?"*

Categorisation of patients: A nurse working in the resuscitation area complained of variations in the urgency of patients referred there, even though they would all be classified as Red according to the triage system *"Most of them are Red patients, but even in Red patients you can also say this one needs intubation, this one just oxygen. We can still sort them...some are more important than others."*

The SATS form: There was a lot of negative feedback from nurses about having to fill in the SATS form, especially as they had never received training on it, and had to do it most when the workload is high *"...and some people don't know how to do it or when its busy they just ignore the form and when we come in the morning we see the patients taken last night were not triaged"*

The nurses felt that the admission form contained similar information about patients, viewing this as unnecessary duplication. *"It doesn't help because you write it on that paper and on that other paper you are going to do the same thing."*

Low levels of trust in the triage system: Medical doctors did not trust the SATS' ability to effectively determine illness/injury severity. *"I think those things factor for me, inside as a whole....so I look at vitals at the examination and what I know initially about the condition...in a way you can weigh out that even if they score the same, this one is scoring a little bit better. My insight into the condition is what I use to highlight how I would group this guy for more urgent care. Sometimes there are factors inside that weigh more."*

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4. The identification of limitations to the implementation of the triage system in this setting as well as avenues which could be effective towards addressing these:

Several factors were mentioned as limiting implementation presented in **table 2**.

<b>Limitation</b>	<b>Quote</b>	<b>Analysis</b>
<b>Segregation of processes related to Doctor Availability</b>	<i>"Filling in the form does not matter.. its the doctors patients are waiting for"</i> (nurse)	Nurses perceived a lack of centrality interns of availability of surgical doctors to hinder effectiveness of triage system, in the surgical EA's.
<b>Minor injuries/illness accessing tertiary level services</b>	<i>"at the end of the day the green patients are occupying all the beds because the doctor can't send the patient away."</i> (nurse) <i>There's a yellow case or a red case then you don't know what to do with the patient, because they're no beds to lie on!"</i> (doctor)	Inability to send patients away perceived to have resulted in a loss of control on EA access for minor injuries. This was understood to hinder ability to achieve time targets.
<b>Perception of impracticality of the triage policy's time to treat targets:</b>	<i>'it all depends on how busy it is. Patients can be here at say 14:00 in the afternoon and they are only seen at night. '</i> (doctor).	Four of five doctors interviewed did not agree with time to treat targets for categories other than the critically ill/injured, which they agreed required immediate medical attention.
<b>Lack of support by: management</b>	<i>"We've changed the system and it lasted about a month and it was back to old system, those in power don't like changing what they are used to"</i>	Senior doctors communicated this to create an environment of sustaining the status quo even though implementing the triage policy would create efficient services in the EA. This support was seen as necessary for availing the necessary resources to ensure sustainable implementation of the triage policy and towards ensuring compliance.
<b>Medical doctors</b>	<i>"I even ask occasionally why</i>	Other doctors were perceived to display lack of interest in

	<i>we don't have triage and why aren't we implementing it. No one really answers. It is there and people have heard about it...haven't seemed bothered they're just busy with their daily work."</i>	implementing the policy / system in the EA.
<b>The perceived lack of understanding and inability to communicate information necessary for Doctors to prioritize patients</b>	<i>. "We don't get the history. We don't get the main complaint of why they're sent in or what they know; it's a very difficult situation to prioritize."</i>	Drs felt that nurse's inability to communicate findings of filling SATS form was causing their inability to priorities according to acuity levels.
<b>The activity levels within the EA</b>	<i>"Some people ignore the form when it's busy. morning you realize that patients admitted last night were not triaged"</i>	Busyness was understood to encourage non-compliance to SATS processes, even though it is to organize EA when busy.
<b>Patients lack of understanding of the policy</b>	<i>"People see on Television trauma units how quick they are, all professionals are in the same place; they expect the same here" (nurse)</i>	Patients were perceived to insist on being seen on first come first served basis, hindering implementation of SATS.
<b>Attitude of staff about triage</b>	<i>"Our main problem is the triage area...patients come and demand you see them there and there..."</i>	Most of the participants displayed a general negative attitude due to limited understanding of triage.
<b>Variations of hospital's EA</b>	<i>"our hospital is not like other hospitals...here we have different EA."</i>	All the hospitals EA operate differently from each other and implementing triage uniformly has been a challenge for this hospital.



Participants suggested the following changes to help effective implementation of the triage system:

**table 3.**

<b>Recommendation</b>	
Staff availability	Restructuring of the activities staff are currently responsible for to encourage consistency in the triaging of patients.
Infrastructural changes	Adequate space allowing for patients to be assessed while waiting, in a manner which treats them with dignity and respect
Screening of referrals	The authority to refer green patients to lower level institutions by medical doctors
Patient education	The availability of educational material, highlighting use of the system and its objectives for patients in the emergency areas. The doctors preferred nurses to take responsibility of educating patients.
Staff training on triage system	Training on objectives of the system, aim of the SATS form with the involvement of middle managers to support attendance amongst the nursing staff. It was suggested that the training be incorporated as part of the nursing duties. Attending of courses during the time that the individuals are at work seen as a tool to use to encourage attendance.
Availability of necessary resources	The availability of the appropriate stock in the emergency areas, preventing disruptions which could cause potential delays in seeing critically ill patients immediately.
Management support	The support of all levels of management, top and middle towards ensuring that the staff are motivated to comply and adhere to the policy as well as address the issues which could require the availability of resources within the institution.
Allocation of champion	The allocation of a champion to steer the implementation of the policy and to provide the necessary physical support in terms of supervision during the initial stages of the implementation process encouraging staff co-operation and support towards policy goals.

## DISCUSSION

We found staff to have multiple barriers to effective implementation of the triage policy in this hospital. These were mainly in the areas of:

- lack of policy support (lack of resources to ensure effective and efficient implementation)
- lack of knowledge about the policy and its goals (by staff and patients)
- lack of integration of institutional processes (to allow effective implementation)

Some of these were those identified through studies done outside of South Africa (Standen et al, 1997; Molyneux, 2006). However, we also found organisational culture to have a great influence on the irregular implementation of the triage policy in this setting. Hospitals tend to have their own organizational culture (things they value, their assumptions about the world, and their ways of working) (CRES, 2009). These cultures can fit or clash with the nature of policies and the actions required from those who are to implement them. The management culture at this hospital appears to be autocratic, most staff tend to not welcome change, and resources to facilitate the implementation of the triage policy do not seem to have supported its implementation. The triage policy was implemented without prior preparation of most of those who were to implement it and with minimal communication. This contributed to the negative perceptions about the policy as the nursing staff felt there were numerous issues which needed to be addressed prior to its implementation. These issues were identified to be the number of staff, the type of patients referred to the hospital by other hospitals, the availability of doctors to see patients as well as issues around who will be accountable to patients for waiting time delays should the triage policy

be implemented. These concerns were not addressed or even communicated formally by nursing staff to management despite attempts to do so, contributing to a culture of managers dictating and front line implementers resisting, this has made it challenging to sustain the implementation of the triage system as front line implementers do not own the process. Many of the participants did not seem to fully understand the benefits associated with an effective triage system and its contribution towards creating an EA setting which is much more efficient and organized. Policy change necessitates changes in the familiar structures and rules with which the institution is familiar, creating new patterns of interaction (Crosby, 1996). The stakeholders involved in policy change need to work together to support the policy's goals, as implementation might require changes in how resources are allocated and utilized (Crosby,1996). This study indicates that significant changes in organisational culture are necessary for effective implementation of this policy.

Participants also reflected the institutional approach of excluding front line staff from the processes of planning; they perceived managers to be unapproachable and inaccessible when they wished to communicate challenges of this policy to them. If a top down approach is to be utilised, good communication, a clear understanding of the desired outcome, the presence of a single implementing authority, a small well defined chain of command, and sufficient time and resources allocated towards ensuring implementation are necessary, which did not seem evident in this study(Hudson et al, 2004). Exclusion may well have contributed to the inconsistencies with implementation, as views and experiences of those who are to implement it were not incorporated. The exclusion and perceived inapproachability of management contributed to a negative relationship between implementers of policy and management.

Management has a difficult task of balancing the need to achieve policy goals and forging a trusting relationship between themselves and the implementers of this policy. Establishing a balance is beneficial for policy implementation (CREHS, 2009).

Many of the limitations identified such as segregated processes, the appropriateness of patients which access the EA, knowledge about the tool and its use, appropriate resources to encourage effective implementation could have been addressed within this platform. Addressing these limitations affords the ability to integrate such changes into current practice. This would benefit those who implement policy, as well as making the most of the available resources within this setting. The integration of evidence which takes into account variations in operations, culture, constraints and experiences by different EA could create a platform for effective implementation of the triage policy in this setting.

Challenges with compliance are to be expected with such policies and without a supportive legal framework lack the recourse for ensuring compliance, there were no evident consequences and incentives even though audits were being conducted routinely. Incentives and penalties are options which should be considered to encourage effective implementation achieved through the involvement of administering organizations. (Nathens, 1999)

It is recommended that quality assurance measures are part of the monitoring and evaluation process of pre-hospital triage to ensure that limitations to compliance are addressed and continued support is given to complying institutions. This platform can contribute to a triage policy which is appropriate and relevant to many differing emergency settings. (Nathens, 1999)

## LIMITATIONS

Study design: Due to the qualitative study design a sample size sufficient for quality analysis was important as we had to have a study sample that was manageable and appropriate for the time available to conduct the study. However, we believe that the insight provided will allow significant improvements in policy implementation.

A multi-site comparative study would have demonstrated the effects of different influences on policy implementation; such differences could provide insight on necessary changes required for improved policy compliance. However, a single study setting had the advantage of providing opportunity for more in-depth investigation. In addition, the aim of the study was to investigate challenges in the Cape Town hospital widely acknowledged to struggle the most with the triage policy.

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## CONCLUSION

Organisational culture in this setting has a significant influence on the acceptability and implementation of the triage policy. There are multiple challenges which will need to be overcome to achieve better uptake of triage and many of them can be overcome through stronger monitoring and evaluating mechanism which include various facets of implementation. These platforms should aim to be representative of the various clinical disciplines involved with the triaging of patients as the experiences of various professionals are likely to differ due to differing roles in the implementation of the triage system. Active participation of implementers is necessary to achieve policy success. Implementers and hospital managers need to have common goals through understanding the benefits of an effective triage system and its impact on flow and resource management. This setting is a wonderful example of a setting that would benefit from an effective triage system with many of the identified limitations similar to those in many other settings struggling with the effective implementation of the triage system.

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## PART D: ADDENDUM

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My husband, Mr Tando Mandla thank you for your love and support. You have consistently supported my ambitions for education and motivated me to do my best and to keep on going. Your patience and encouragement have tremendously contributed to my professional growth.

## **Part D: Appendices**

### **Appendices 1: Semi-structured interview guide for focus group discussion ( the health workers based at emergency areas)and the interview guide for the medical Dr's.**

Introduction of the research question

Researcher introduces herself and the topic to be studied.

Explanation of rules of engagement: The data obtained from you, the participant will be treated with confidence and your identity as the participant will not be revealed during the process of transcribing or in reporting the results of this study.

You can withdraw from this process at any stage during the interview and are required to sign a letter of consent prior resuming this interview.

The information obtained from this study is for purposes of improving the implementation of the triage system through understanding barriers related to its implementation.

#### Knowledge about the triage policy

How did you get to know about the triage policy or the triage system? What about the system or policy have you informed of? Could you explain to me what you understand about the triage policy and the triage system?

How was the knowledge gained? Did you receive any training on the triage system, if so from where?

#### Knowledge about the use of the triage instrument

Could you briefly describe in your own words the triage instrument used to assess patients? Have you seen this form/tool? Where have you seen it, is it being used in the emergency are you have been allocated to?

Confidence levels

Do you think this tool is effective, how do you feel about this tool, could you tell me what your perceptions are about it.

Focus Group: Independent use: are you able to use this tool independently. Would you say you need assistance in using this tool? Are those in the emergency area you have been allocated to able to use this tool? What have your experiences been in the emergency are you have allocated to . Are there any challenges you have experienced regarding the use of this tool

Doctors: Do you refer to the SATS to decide the order that you are to see patients? Do you use the information from the tool to help you organize patients in a certain way. Is this tool effective in assisting you determine which patients are critical and which can wait, could you describe your experiences regarding the use of the tool in the emergency area you have been allocated to.

Perceptions about the benefits of using the triage policy?

What do you think the benefits of using the triage system or implementing the policy are?

Could you describe these benefits to me?

Perceptions about the disadvantages ; What do you perceive the benefits of using the triage policy or the triage system to be? Could you describe these to me?

Do you think there are any consequences to not implementing the triage policy in this institution? What do you think these are and why?

Implementation of triage policy; How would you view the implementation of the triage policy and system to be in this hospital? Could you describe the current status of implementation in the emergency area you have been allocated to? What do you think are the factors that contribute to the current state of implementation? In this institution at large?

Factors according to experience and understanding that could be acting as barriers to its implementation, if so? Any other views about the Implementation of the triage policy which are understood to affect implementation

What changes would you suggest could be necessary to encourage regular use of the triage system in this hospital.

Suggested changes in practice to encourage regular use

Any other form of changes to benefit regular use of policy

Would the participants use the policy regularly should these suggested changes be put in place?

Closing

Thank you for participating in this study, your input is of great value to this process. Do you have any issues you require clarity on regarding the questions asked the policy or this study? Your time, knowledge and experiences are appreciated. This concludes the interview.

## **2: Semi structured Interview guide for the managers and senior medical doctors of the emergency areas**

These interviews will include the following questions:

Introduction key components:

Introduction of the research question

Researcher introduces herself and the topic to be studied.

Explanation of rules of engagement: The data obtained from you, the participant will be treated with confidence and your identity as the participant will not be revealed during the process of transcribing or in reporting the results of this study.

You can withdraw from this process at any stage during the interview and are required to sign a letter of consent prior resuming this interview.

The information obtained from this study is for purposes of improving the implementation of the triage system through understanding barriers related to its implementation.

Questions

- What are your experiences with the triage policy, would you regard yourself as using the triage system, is it used in the EA where you are based. What is the current status regarding the use of the policy in the EA. Why do you think it is used/Not used in the EA?  
Would you see yourself as a supporter of this policy? Why? If not what are your views and perceptions regarding its implementation in this hospitals EA's. Do you think it has a place in this setting? Would you regard the staff in the EA to be supporting the triage system? Are there any people within the EA that you would think are opposed to its implementation?

What are your experiences/or those of the staff within your departments regarding the triage tool?

Do they find it Usable/ practical? Do they understand it? Do they use it, if so would you regard this as consistent?

- Does the implementation of the triage policy have any effect on your objectives for the emergency area for which you are responsible for, if so how so?
- In your opinion is this policy implemented in the emergency area for which you are responsible for.  
If not, what factors do you think contribute to your answer for the above question?
- What factors would encourage more people to implement this policy, in your opinion.  
If these factors could be addressed somehow, would this make you encourage the use of this policy by staff within the emergency area under your responsibility?  
  
Are there any contributions which you could make to enhance the use of this policy? How would you encourage fellow staff to use it more effectively? What would your contributions be if you could modify the policy or the triage system, should you ever be given the opportunity to do so?

#### Closing

Thank you for participating in this study, your input is of value. Do you have any issues you require clarity on regarding the questions asked, the policy or this study? Your time, knowledge and experiences are appreciated. This concludes the interview.

### **Appendices 3: Requests for permission to conduct study**

To: Hospital management and Western Cape provincial office

#### **Re: Permission to conduct research in the emergency areas of \*\*\*\*\* Hospital**

I, Nomtha Bell would like to request for permission to conduct research in your facility, \*\*\*\*\* hospital through the university of Cape Town as part of a mini dissertation for the Public Health Program.

***The study title is: the limitations related to the implementation of the triage policy and the identification of factors which can be used towards addressing them, in a selected public, tertiary hospital.***

This research will be in the form of a descriptive study, with the inclusion of a total of 20 participants all staff of \*\*\*\*\* hospital, which comprise of the following

- This will involve the interviewing of 5 medical staff as well as 5 managers (nursing and medical) for duration of 30 minutes per interview; these will be conducted based on their availability so as to allow for least interference with their commitments and responsibilities, at a time suitable for them.
- Inclusion of 10 nursing staff from all the 5 emergency areas in a focus group discussion, for duration of an hour during their lunch time.

Research goals: This study will be done with an aim of utilizing this information for

- The modification of policy as well as practice in order to achieve the policy objectives
- As well as to allow for potential future modifications of the policy in response to institutional specific objectives and challenges.

The policy objectives are the following:

- To improve patient flow
- Reduction in waiting times of patients in emergency areas

- and to encourage the delivery of time critical care for appropriate patients in the emergency areas

This study aims to explore and provide opportunities for the addressing of the institutional challenges of this institution in relation to overcrowding in the emergency areas.

The participants will be required to fill in consent forms which will be issued and explained to them before commencement of all the interviews as well as the focus group discussion

The information obtained from this study will be available to the managers of these areas for use to encourage usability of the triage system. It is aimed at finding ways to make it maximally effective in the reduction of waiting times as well as the management of overcrowding in these areas.

This study has received ethics approval from the UCT ethics committee and the reference number is: **HREC Ref: 103/2011 for the duration of 1 year ending March 2012.**

Your assistance in this regard would be greatly appreciated and would be of great benefit to services of the institution.

Yours in service

Mrs NF Mandla (Miss NF Bell)

**Appendices 4: Letter of consent for the focus group discussions and interviews of medical practitioners.**

You are invited to participate in this study which aims to investigate the triage policy and the factors which are associated with its implementation in this institution, \*\*\*\*\* hospital. You have been invited to participate in this study because as a health worker in the emergency areas of \*\*\*\*\* hospital your experiences regarding this policy would be beneficial to understanding the issues and challenges to its implementation.

You are required to provide consent prior to answering the questionnaire and are also allowed to withdraw from this study at any time after the information has been collected, preferably through writing.

Your name and details will not be recorded in the transcripts as well as throughout the data analysis process, or in the final written document. Your anonymity will be protected as far as possible during the research process. Your identity will however be known to the researcher.

It would then be of great importance that you read the questions carefully and answer them as clearly as possible so that the information received from you is understood. You might however be contacted by the researcher after the interview/discussion for clarity in the responses after conduction of the discussion/interview.

Thank you for taking the time to express interest in this study. The information received through this process will be used to add to knowledge for the benefit of the institution as well as the health system at large.

I give consent / do not give consent to inclusion in this study and I give permission/ do not give permission for the researcher to use the information given to me through this questionnaire for purposes of understanding the factors affecting implementation of the triage policy.

Date: .....Time:.....

Signed:\_\_\_\_\_Contact no:\_\_\_\_\_



**Appendices 5: Letter of consent for participating in informant interviews**

You are invited to participate in this study which aims to investigate the triage policy and the factors which are associated to its implementation in this institution \*\*\*\*\* hospital. You have been invited to participate in this study because as a health worker in the emergency areas of \*\*\*\* hospital your experiences regarding this policy would be beneficial to understanding the issues and challenges to its implementation.

Your are required to provide consent prior participation and are also allowed to withdraw form this study at any time after the information has been collected, preferably through writing.

You will receive partial anonymity through this research process meaning that the researcher will be aware of your identity for practical purposes of conducting the interview but your details will not be recorded in the transcribing of the interview as well as in the data analysis and results section of the study. Your transcripts and data will be recorded as medical/nursing manager A, B, and C.

Thank you for taking the time to express interest in this study. The information received through this process will be used to add to knowledge for the benefit of the institution as well as the health system at large.

I.....provide permission for the researcher to use the information given to me through this questionnaire for purposes of understanding the factors affecting implementation of the triage policy.

Agree to be included in this study    I do not agree to participate in this study

Date:.....Signed:\_\_\_\_\_

**Guide for Authors**

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