

# IMPLEMENTING A TRIAGE SYSTEM IN AN EMERGENCY UNIT: A LITERATURE REVIEW

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## ABSTRACT

**Background:** Wars have laid the foundation on which today's triage is based. Triage is used during disasters, at accident scenes and in the trauma and emergency units of hospitals to sort patients according to the acuity of their injuries/conditions and the type of care they require. Nurses are usually the people who receive the patient first and who assess the priority of the patient's immediate needs. In addition, the nurse also intervenes by taking immediate action to prevent the deterioration of the patient's condition and/or to implement life-saving interventions. Qualified, professional nurses are therefore required. The locations and equipment of the health care facility must suit patients' needs. Triage classification systems provide nurses with the guidelines they need to judge the triaging of patients. The triage system is designed to enable professional emergency personnel to take informed decisions and to reduce mortality and morbidity rates among trauma cases.

**Keywords:** accident and emergency units; Cape Triage Score; casualty incidents; history of triage; the Patients' Rights Charter

## INTRODUCTION

Before the concept of medical triage, triage was used as a means of grading the quality of commodities such as coffee beans and wool (Woolwich 2000:476). The founder of the medical triage concept was Baron Dominique Jean Larrey (1766–1842) (Howell 1988:9). Nestor (2003:3–4) describes how, during the French Revolution and the Napoleonic wars of the 18th and 19th centuries, the plight of soldiers was generally ignored. However, Baron Larrey, a dynamic and well-respected French military surgeon, revolutionised the care of soldiers on the battlefields, showing care and compassion in a period where surgeons were generally perceived as butchers. Not only was Larrey

recognised as being a brilliant surgeon, but he also helped to ensure that the injured were more efficiently care for (Howell 1988:9).

At the age of thirteen, Larrey left his home in the Pyrenean Mountains to commence his medical studies. He completed his studies in Toulouse and Paris and commenced service in the French navy. During his time of service in the 1872 French Revolution, war rules required Larrey to remain three miles behind the frontline to receive the injured (Nestor 2003:3). Soldiers who were not carried off the battlefield by their comrades were left to die. Class differences also dictated that officers received assistance before soldiers; as a result, soldiers were forced to wait several days before being treated or, if many officers were wounded, to go without medical treatment altogether.

At the time, the injured soldiers who were not helped off the battlefield by their exhausted comrades had to wait for the bulky and impractical wagons called “fourgons” to come for them. In some instances these wagons took up to three days to reach the injured, and many died prior to receiving any sort of medical assistance. As a means of transport, the “fourgons” caused the injured further trauma simply because they lacked any form of suspension.

According to Howell (1988:9) and Nestor (2003:3), Larrey broke the rules and rode onto the battlefield, together with fellow surgeons and his medical orderlies (“infirmiers”) during battles, operating on the wounded in the field or at a nearby secluded site. Realising that this was not practical, Larrey evacuated the injured in a light transport vehicle, known as the “flying ambulance” (“*les ambulances volantes*”). This reduced response time and increased survival rates. This “flying ambulance” was a horse-drawn carriage, which was light, but tough; it had padding and suspension which improved the journey’s comfort. During the medical evacuations in the flying ambulances Larrey and the “infirmiers” were often attacked having to defend themselves with whatever weapons available – the Red Cross and Geneva Convention were not yet in operation. Larrey realised that the order of treating the injured according to class – upper class treated first, followed by the lower classes and prisoners last – was not conducive to survival rates (Nestor 2003:3). He then introduced the first form of triage, namely, treating the most seriously wounded first, without considering rank or class.

Larrey also realised that operating on the injured within the first hour of trauma increased the victim’s chances of survival – possibly the birth of the “golden hour” concept (ATLS 1997:9). Those with minor injuries were forced to wait and the more seriously injured persons assisted first, whilst the fatally wounded were laid aside and given alcohol to ease their last moments. According to Howell (1988:10) it was here that the concept of triage (“trier” – “to sort”) was borne.

Woolwich (2000:476) maintains that nurse triage was conceptualised during the 1960s in the Vietnam War. It was only in the 1980s that nurse triage was formally recognised in the United Kingdom (UK).

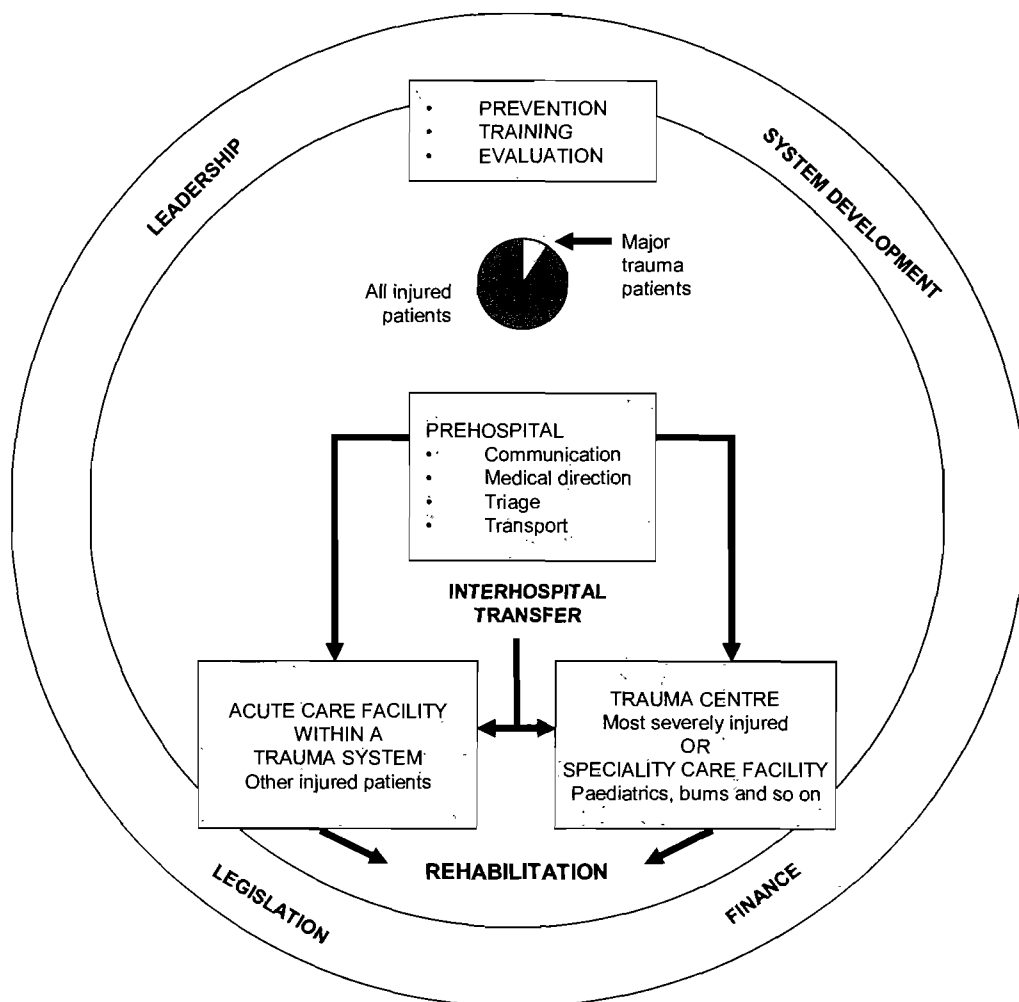
## DEFINITIONS OF TRIAGE

There are different definitions of triage. The core of "triage" is related to its French translation, namely, "to sort" ("trier"). A common definition noted throughout the literature is that of a process which "places the patient in the right place at the right time to receive the right level of care" (Qureshi & Veenema 2003:153). Ross, Morgan and Schwab (1988:375) state that patients have to be sorted according to the seriousness of their injuries. The same principles were adopted by Caroline (1995:438), who states that triage is the degree of urgency for care required and "the type of care required in the multiple victim situation".

A second aspect of triage is described by Ross et al (1988:375) whereby triage methods are used to determine to which trauma centre a specific patient should be transferred. These guidelines – described by different organisations such as the Committee on Trauma of the American College of Surgeons in the ATLS® manual (1997:329) – are given to medical personnel to improve the quality of their decision-making in the transfer of severely injured persons to major trauma centres. This application is used in the USA where trauma care systems are formalised. The ATLS® course is widely taught in South Africa and these guidelines are followed in a less organised manner – of interhospital transfers by road, fixed wing or rotor wing aircraft.

## AN INCLUSIVE TRAUMA SYSTEM

Figure 1 shows Klein's (1996:1337) illustration taken from the Advanced Trauma Life Support (ATLS®) manual, whereby all care providers are integrated into the system. The author describes how each patient's medical needs should be coordinated to make the best use of a health care facility's resources. For example, if a severely injured patient is triaged as the highest priority patient (described as "emergent", or "red" or "priority I"), he/she should be taken to a major trauma centre.



**Figure 1: An inclusive trauma system**

(Source: Klein 1996:1337)

The “inclusive trauma system” illustrated in Figure 1 should work within a framework of integrated trauma care, based on leadership, legislation, finance and continual system development. Core components on which all aspects of the emergency unit system should focus include prevention of trauma, training and evaluation of staff and systems. The first aspect of further trauma care, prehospital trauma care, comprises communications, medical direction, triage and transport, both from the primary scene as well as interfacility transportation. Two trauma care institutions are illustrated, namely, the acute care facility that can manage trauma in general, and the specialised centres that provide specialist services, such as paediatric hospitals, burns centres and major trauma

centres. The final aspect of a comprehensive trauma care is that of patient rehabilitation (Klein 1996:1336).

## **THE SCOPE OF TRIAGE**

Triage is used in a variety of incidents. These include during disasters, on the battlefield, in hospitals (by nurses), in multiple casualty incidents and in certain communication situations.

### **Triage during disasters**

Caroline (1995:438) states that, at an accident scene, triage should be done in several rounds. The initial triage round should be where patients are situated on the scene and the triage officer should then move from one person to the next, deciding which victims require immediate assistance. During this triage phase, priorities for treatment are based on the “airway, breathing, circulation” (ABC) model. Patients who are “hopelessly injured” (Caroline 1995:438), such as those who have been decapitated, should be bypassed. These patients are regarded as those where continued treatment is deemed “futile”, a word, according to Hall, Schmidt and Wood (1999:931) which defies clear definition in modern intensive care and emergency science. Other patients who can initially be bypassed are those with non-life threatening injuries (Qureshi & Veenema 2003:154).

The second round of triage should be done at the triage area (Caroline 1995:438), namely an area designated for treatment. Once life-threatening injuries are managed, secondary injuries can be managed. Subsequent triage rounds should occur where the less seriously injured are initially assessed on the scene, whilst the critically injured should receive a detailed secondary survey en route to hospital.

### **Tactical-military/battlefield triage**

Qureshi and Veenema (2003:155) describe the tactical-military battlefield triage as being similar to disaster triage, with the greater emphasis being triage and transport strategies. Thelan, Urden, Lough and Stacy (1998:1052) mention that the care of soldiers and victims during wartime enhanced the principles of triage and rapid transport of the injured to appropriate facilities. Throughout history, military experience has demonstrated that more lives can be saved by decreasing the time from injury to the receiving of definitive care.

## Hospital/nurse triage

The United Kingdom (UK) has recognised the importance of immediate assessment of patients on their arrival in the emergency unit and has therefore included the (registered) nurse triage concept into its national *Patient's Charter* developed by the Department of Health in 1991. The UK identifies two types of nurse triage:

- Indirect triage is done by the nurse via a telephone (see “Telephone triage”).
- Direct triage occurs when each patient entering the emergency unit department is assessed face-to-face. Direct triage can be further categorised into three types of triage: non-professional triage, basic triage and advanced triage (Woolwich 2000:477).
  - *Non-professional triage*: On the patient's arrival, he/she registers with the receptionist and waits for the doctor. Only if the receptionist has a specific concern about the patient's condition will he/she call a nurse to assist or evaluate the patient.
  - *Basic triage*: The patient is briefly assessed by the nurse on his/her arrival. The nurse assigns a priority rating and the patient is then allocated to the treatment area. This usually occurs only when there is a nurse available.
  - *Advanced triage*: In this instance the most comprehensive care is rendered by the trained and highly experienced nurse. The patient is assessed and then suitable investigations are initiated, such as X-rays, phlebotomy and a limited physical examination. The patient may then be referred to an external service provider.
  - *Intermediate triage*: In addition, Woolwich describes this much used triage system in the UK, which is between basic and advanced triage. Here the nurse not only assesses and prioritises the patient on his or her arrival, but he/she also initiates some nursing interventions such vital signs, electrocardiograph (ECG), urinalysis and pregnancy testing. Some emergency departments also have written protocols where patients may receive early analgesia or have initial X-rays for certain injuries. This type of triage requires stringent written standards and policies as well as thorough training by nurses, supported by regular in-service education sessions.

Walsh (1990:43) mentions the extended role of triage where, if triage were more formalised, the nurse would be able to send a patient with a minor injury for X-rays without seeing the emergency unit doctor first, thereby reducing the time spent in the emergency unit.

## Multiple casualty incidents

Multiple casualty incidents occur in the emergency unit when the department is under stress as a result of the arrival of a large number of patients but still remains functional.

On-call staff may be called in, but the disaster plan is not activated. Delays may occur in seeing patients, but patients do eventually receive attention (Qureshi & Veenema 2003:155).

## Telephone triage

“Telephonic triage is a systematic process that screens a caller’s symptoms for urgency and advises the caller when to seek medical attention based on the severity of the problem described” (Briggs 2002:1). This process has evolved recently: health-care providers have become increasingly aware of the financial implications of health care and so have been forced to carefully evaluate whether care is needed at a particular moment (Swansberg & Swansberg 2002:234). When a doctor is unavailable, it is the nurse who is more accessible owing to his/her 24 hours per day availability. Thelan et al (1998:1052) are of the opinion that the nursing management of the patient requiring emergency treatment and attention begins the moment a call for help is received and continues until the patient is seen; it is a continuum that includes six phases, namely, pre-hospital care, hospital resuscitation, definitive care and operative phase, critical care, intermediate care and rehabilitation.

## THE PURPOSE OF TRIAGE

Historically, the purpose of triage was to return as many soldiers as possible to full capacity on the battlefield, and to save as many lives as possible (Caroline 1995:438). Where mass casualties occur, “the purpose of triage is to accomplish the greatest good for the greatest number” (Caroline 1995:439). This is also the view of Nicol and Steyn (2004:224–225) who believe that, during a crisis, there is little opportunity for “lateral thought or prolonged considerations of alternatives”.

Woolwich differentiates between military triage and nurse triage functions. Whereas military triage identifies “salvageable cases for evacuation” (2000:476), nurse triage prioritises emergency patients into a system of care as part of an integral process. Nurse triage is not done primarily to reduce waiting times for patients (Woolwich 2000:476). On the contrary, it has been found in several studies that, although waiting times for the seriously ill were shorter, overall waiting times have increased.

Woolwich (2000:476) therefore describes the main purpose of triage as “to make the best possible use of the available medical and nursing personnel and facilities” and to determine “which patients need immediate care ... and which patients can wait”. This view is also expressed by Hall et al (1999:8), who add that the system of triaging contributes to the success of randomisation. Patients are thus not only seen by the right people at the right time, but also within the appropriate clinical area.

Whereas many different triage systems occur, Jones (1993:13) and Woolwich (2000:476) both state that the main purposes of triage include patient assessment, priority rating,

first aid, and the control of infection. First aid can be provided the moment the patient arrives at the hospital, and infection controlled as soon as an initial assessment has been made – thus reducing exposure risk to other patients. Hall et al (1999:8) make the point that scoring systems applied during triage cannot measure quality of life, functional status or patient satisfaction, and nor do they predict long-term outcomes beyond hospital survival. Although these issues are obviously important, the patient's physical wellbeing is the primary factor, and it is this that needs to be considered in triage.

Jones (1993:14) describes two advantages of formal triage systems:

- Practical advantage: consistent management of patients occurs with decreased disparity in the quality of prioritisation decisions.
- Moral advantage: decisions based on an official triage system are fairer, and so there is less subjectivity in decision-making. Accountability is assured in that there is always some way of determining the quality of management.

Through constant triage and the assessment of the waiting patients, the waiting area becomes a known entity and patient flow can be controlled and organised (Woolwich 2000:476).

Once the patient and family have noted that their relative has received some initial attention, they will have an easily identifiable source of information for enquiries. This ultimately will reduce anxiety and lessen the aggression associated with longer waiting times. This, in turn, will increase patient satisfaction with the service provided (Woolwich 2000:476).

## FACTORS INFLUENCING TRIAGE DECISIONS

According to Caroline (1995:438), the first two principles of triage, and therefore factors influencing triage decisions, are that saving a life takes precedence over saving a limb, and that the immediate threats to life are asphyxia and haemorrhage.

According to the American College of Surgeons Committee on Trauma (1997:25), there are two categories of triage, based on the magnitude of the casualty situation. These categories essentially differ in the principles of triage and thus the description of their category is accurate:

- Multiple casualties: The number of patients and the seriousness of their injuries do not exceed the facility's capacity to provide appropriate care. Here, triage is aimed at treating those with the most life-threatening injuries first.
- Mass casualties: The number of patients and the seriousness of their injuries *do exceed* the facility's capacity to provide appropriate care. In this situation, the patients with the greatest probability of survival are treated first.



Ross et al (1988:375) maintain that the third factor that influences the triage decision is the magnitude of the situation, and thus the professional's ability to manage the situation, together with the victims' chances of survival of the trauma. This view is still supported by various authors such as Thelan et al (1998:1052) and Hall et al (1999:8).

## **THE RIGHTS OF THE INJURED AND THE ROLE OF TRIAGE**

In a draft document by the World Health Organization's (WHO's) Injuries and Violence Prevention Department and International Association for the Surgery of Trauma and Surgical Intensive Care (WHO 2003:16), three broad sets of (injured) patients' rights have been identified. These rights can be applied to any patient in a medical emergency. These rights are quoted below (WHO 2003:16):

- Life-threatening injuries are appropriately treated according to appropriate priorities and in a timely fashion to maximise the likelihood of survival.
- Potentially disabling injuries are treated appropriately so as to minimise functional impairment and to maximise return to independence and participation in community life.
- Pain and psychological suffering are minimised.

In terms of the Patients' Rights Charter of the Republic of South Africa (RSA), every citizen in the Republic has the right to receive "timely emergency care at any health care facility ... regardless of one's ability to pay" (The Patients' Rights Charter 2006). This statement implies that a system of triage must be in place at every medical emergency facility in order to sort patients and determine patient treatment priority.

## **REQUIREMENTS FOR EMERGENCY UNIT TRIAGE**

- The Cape Triage Group (2005) recommends certain elements for triage within the emergency unit, namely, a location, equipment and additional optional equipment:
- Location: A safe and private area should be identified that is accessible to patients and staff at all times. Ideally, a flow should be possible from the reception area through the triage room to the general area where patients are seen.
- Equipment: Universal precautions such as gloves, facemasks and protective clothing are imperative. A wall clock should be available for good time-keeping, as should basic equipment for measuring patients' vital signs, such as a thermometer (mercury or digital) and baumanometer (manual or electronic). Basic dry dressings should be available to give patients first aid when required.

- Additional (optional) equipment that may be useful include: a pulse oximeter, an ECG machine, haemogluco- and haemoglobin finger-prick tests, urinalysis strips and urine pregnancy tests.

Staffing for triage is discussed in the literature and there are different opinions about this:

- The situation where triage is to be done will determine who should be responsible for the role of triage. Caroline (1995:438) states that the most senior person, that is, the person with the highest level of training and the most experience, should be responsible for such a function.
- The Cape Triage Group (De Vries, Gottschalk, Wallis & Wood 2005:40), on the other hand, believe that the most junior level of nurse should be able to triage patients in the emergency unit, thus making the highly trained nurse available to provide more comprehensive care. If the Cape Triage Score is taken into consideration, this may be the option to take where limited triage aids may be initiated (eg urinalysis, ECGs and pregnancy tests).
- When intermediate and advanced triage (Woolwich 2000:477) is considered, though, a registered nurse may be required to initiate advanced investigations (eg X-rays and phlebotomies). This is, however, a UK-based emergency nurse scope of practice and not as yet a South African practice. In defence of this situation, Heyns (2002:4) states that, in the South African context, the comprehensive role of the nurse and the scope of practice is still a controversial one and there is no decisive answer about what the registered nurse's core competencies are during life-threatening situations. According to Heyns (2003:4), in cases where immediate action is needed for life-saving interventions, this may lead to nurses experiencing powerlessness and questions often arise concerning the ethical and medico-legal aspects of this situation.
- Some traits that the triage nurse should possess are suggested by Qureshi and Veenema (2003:154). These include: having clinical experience, good judgment and leadership, the ability to remain calm under stress, being decisive, knowledgeable about available resources, having a sense of humour, being a creative problem-solver, being available, and having experience and knowledge of anticipated emergency activities. When these traits are analysed, it is obvious that a senior nurse with experience and specialised training in emergency nursing is more suitable to triage than a junior nurse with less experience.

Woolwich (2000:478) states that investing in a triage system is a costly exercise and up to 15% of the nursing budget may be required to staff a medium-sized emergency unit's triage system. The system must be a 24-hour service and the nurse should be free to do triage only, and have no other obligations. The triage nurse's role should be clear, thus ensuring rapid assessment, identification of the primary complaint, prioritising

and documentation. The nurse should, however, have some flexibility in the triage decision process, and not blindly take vital signs when this is inappropriate (eg in life-threatening situations such as in cases of profuse bleeding and cardiac arrest). In such cases, immediate "first aid" should be implemented and the patient referred to a primary care giver so that the triage nurse can resume her clinical duties.

## **TRIAGE AND THE ROLE OF THE EMERGENCY UNIT NURSE**

A typical emergency unit is a busy one and, to avoid confusion, care should be logically organised from the patient's entry until discharge. Walsh (1990:34) suggests that each patient has a primary nurse who will care for him or her from admission until discharge. This is in contrast with task-based nursing, which Walsh suggests should have no place in the emergency unit. Primary care nursing has numerous advantages, namely, enhanced communication between administrative staff, nurse, patient and doctor, holistic care ensuring all care is rendered, increased patient security, knowing who he/she is dealing with and, finally, improved monitoring of the patient's condition. The emergency nurse can thus be seen as the most important person in the emergency unit in that it is the emergency nurse who co-coordinates all the interventions that are to take place once the patient enters the emergency unit.

Walsh (1990:43) describes triage as consisting of extended roles for the triage nurse, where a suitably trained and experienced nurse should initially assess all patients on their arrival at the emergency unit, prioritise, and then refer them to a primary nurse. This is probably the only task-based nursing approach in the emergency unit.

The triage nurse should be at the frontline of the unit, together with the reception/administrative staff to alleviate non-medical staff's decision-making of who should be seen first and who is stable enough to have his or her hospital file opened instead of being attended to immediately by medical staff (Alarcon, Fernandez & Kluertz 1998:432).

In 1986, Nuttal (1986:66) made the point that the triage nurse helps to manage the unknown factor in patients' illnesses and injuries in the waiting room, especially during busy periods, thus reducing the frustration and tension experienced by administrative staff, nurses and patients themselves. Selvig (1985:30B) said that, while the nurse knows what is happening in the waiting room, the patients also feel reassured that at least someone with knowledge is monitoring their condition. This view is strongly supported in the literature by Almes, Davis, Elder and Littlepage (2004:263), Mallet and Woolwich (1990:1445) and Thelan et al (1998:1052). According to Heyns (2003:77), this arrangement also increases patient satisfaction, in that it emphasises the caring role of the nurse.

Managing patient flow is also important in a busy emergency unit and this can be managed by the triage nurse (Parish 2000:6). This holds definite advantages for all staff in the emergency unit, namely the administrative staff, doctors, other nurses and

ancillary staff (eg porters). The patient may receive all the treatment and/or investigations required from the triage nurse, or he/she may be handed over to a primary nurse who will facilitate further treatment and monitoring. Once the correct decision has been made, all staff will know where the patient is at that particular moment. The triage nurse's role of controlling patient flow should help the doctor, in that he/she will know, at any given time, which patient requires assistance in which order, and initial side room tests may be initiated (eg urinalysis, vital sign monitoring and ECG) (Gottshalk 2004:326). Patient flow management also helps to prevent overcrowding in the waiting room because more ill/injured patients will be moved to the general area of the emergency unit (Fraser-Moodie, George, Pritty, Read, Westlake & Williams 1993:220; Edwards 1999:20). Workloads will be more evenly distributed between nurses if the triage nurse allocates patients accordingly (Dolan 1998:1; Edwards 1999:20).

Triage makes it possible to manage infection control in the emergency unit more efficiently (Edwards 1999:20). If a patient is assessed, by the triage nurse, as potentially having an infectious disease, he/she can be isolated immediately. In the same way, a patient entering the unit with an actively bleeding wound can be assisted to the appropriate area so that the blood spillage can be contained immediately.

Safety of the patient can also be assured through quick triage (Edwards 1999:20). The triage nurse would be able to determine, for example, that the patient is in need of a safe environment, if the patient is a threat to himself/herself. Privacy can also be provided if the patient is noted as being in severe distress; this emphasises the professional-ethical responsibility of the registered nurse, which he/she must fulfil with competence, integrity and compassion (Searle & Pera 1997:273).

Potential admission to the hospital may also be gauged through triage and further resource consumption can be assessed (Alarcon et al 1998:432). Some of the triage nurse's core responsibilities therefore include:

- Initial assessment: history taking
- Focused physical examination and taking of vital signs
- Initial diagnostic studies such as x-rays
- Documentation
- Crisis intervention
- Public relations
- Triage rounds (quick evaluations and re-evaluations)

Bucknall and Gerdtz (2000:28) list some specific secondary triage roles, also performed by nurses, which include:

- Urinalysis

- Blood glucose measurement
- Administration of paracetamol to a febrile child
- Performing a Plaster of Paris check
- Administering oxygen therapy
- Initiating oral rehydration in a child
- Administering nebulised medication
- Initiating an ECG
- Collecting venous blood for laboratory studies
- Initiating intravenous cannulation

In determining the roles and functions of triage nursing, however, the scope of the nurse's practice in a specific country must obviously be taken into account.

## TRIAGE CLASSIFICATION AND SYSTEMS

Several different triage classifications occur internationally, ranging from a three-tier to a five-tier system. The three main categories are known as “emergent, urgent and non-urgent”; where a four- or five-tier classification system is used, subcategories are added to the end of the spectrum (Qureshi & Veenema 2003:157). In the following table, Qureshi and Veenema compare these triage categories:

**Table 1: Hospital triage categories for a 3-, 4-, or 5-tier system**

<b>Three-tier system</b>	Emergent/Class 1	Urgent/Class 2	Non-urgent/Class 3		
<b>Four-tier system</b>	Emergent/Class 1A	Emergent/Class 1	Urgent/Class 2	Non-urgent/Class 3	
<b>Five-tier system</b>	Emergent/Class 1A	Emergent/Class 1	Urgent/Class 2	Non-urgent ED care/Class 3	Non-urgent ambulatory care/Class 4

Source: Qureshi & Veenema (2003:157)

Qureshi and Veenema (2003:157) describe three differently tiered triage systems (see Table 1):

- In the three-tier system, *emergent* represents any condition that requires immediate treatment, such as airway obstruction, cardiac arrest, seizures and asthma. *Urgent* denotes any serious injury or illness, which must be attended to, but which can also afford to wait up to two hours without a significant increase in mortality or morbidity. Examples include long bone fractures, bleeding controlled by direct pressure, and pyrexia. *Non-urgent* describes any condition that can wait for more than two hours, without any possibility of the patient's condition deteriorating. This includes minor lacerations, rashes and simple fractures.
- The *emergent* category is subclassified into two categories in the four-tier system, namely, conditions which require treatment immediately (1A) versus rapid treatment (within a few minutes or 1B). 1A problems would include cardiac arrest, airway obstruction or haemorrhagic shock, whereas 1B problems would include asthma and a cardiac dysrhythmia with stable blood pressure. *Urgent* and *non-urgent* problems are the same as the three-tier system.
- In the five-tier system, the *emergent* as well as the *non-urgent* categories are sub-categorised. The *emergent* category is categorised as in the four-tier system and the *urgent* case as in the three-tier system. The *non-urgent ED* case is described as a condition that is not acute, but still requires the technology of the Emergency Department (ED), such as minor lacerations requiring suturing, or minor joint injury that requires X-rays for diagnoses. Cases that could be managed in the ambulatory setting (eg a clinic) are classified as *non-urgent ambulatory care* (eg places where patients collect chronic medication refills).

Qureshi and Veenema (2003:157) state that emergency units that are traditionally busy and experience overcrowding, usually use the five-tier system, whilst those that seldom experience delays would use the three-tier system. It is recommended, however, that the units using the three-tier system be able to change to a more complex system in cases of disasters (ie where large numbers of patients would require attention simultaneously).

According to Caroline (1995:441) a five-tier classification can also be used to prioritise patients for evacuation in a multi-casualty situation. This classification compares favourably with the hospital triage classification and the standard triage scale (with specific colour codes and target times). Table 2 shows a similar trend to triage category definitions. This table is shown to demonstrate the similarity of South African classifications to classifications used by the international community.

**Table 2: Triage classification in priorities for evacuation**

Priority classification	Definition	Examples
Priority I	Patients in persistent danger of asphyxiation or exsanguination	Thoracic injuries (massive haemothorax, cardiac tamponade, thoraco-abdominal injuries) Any injuries threatening the airway Shock
Priority II	Stabilised patients in danger of shock Patients with closed head injury and deteriorating level of consciousness	Blunt abdominal trauma Widespread burns
Priority III		Spinal cord injuries Eye injuries Hand injuries Major compound fractures or injuries to large areas of muscles
Priority IV	Patients with lesser fractures and soft tissue injuries	Wrist fractures Joint injuries
Priority V	“Walking wounded”	Minor lacerations and abrasions

Source: Caroline (1995:441)

From Table 2, it is evident that Caroline’s (1995:441) categories are very similar to the five-tier classification (five levels of prioritisation). Differences are noted in the identification of the categories. The *Priority I* patient would be equivalent to the *Emergent 1A* patient, *Priority II* equivalent to *Emergent 1*, *Priority III* equivalent to *Urgent*, *Priority IV* similar to *Non-urgent ED* care, and *Priority V* similar to *Non-urgent ambulatory* care.

Actual examples of injuries are given in Table 2, with the most serious injuries falling into the *Priority I* category where problems are noted with the airway, breathing and/or circulation. *Priority II* is the more stable patient who is nevertheless in danger of developing problems in the *Priority I* category. Serious head injuries also fall into this category. *Priority III* patients can also be described as serious when the examples are noted. However, these patients are more stable than *Priority II* patients. *Priority IV* patients are again more stable than *Priority III* patients and can wait a longer period of time to be treated; *Priority V* patients are regarded as the least seriously injured of all patients and the people who, in a multiple casualty situation, can wait the longest to be treated.

**Table 3: The standard triage scale with colour codes and target times**

Classification name	Description	Time interval
<i>Immediate resuscitation (red)</i>	Patients in need of immediate treatment for the preservation of life	To be seen on arrival (ideally seen by a medical team awaiting the patient's arrival after prior notification by the ambulance service)
<i>Very urgent (orange)</i>	Serious ill or injured patients whose lives are not in immediate danger	All these patients should be seen within 10 minutes of arrival
<i>Urgent (yellow)</i>	Patients with serious problems but apparently in a stable condition	All these patients should be seen within 60 minutes of arrival
<i>Standard (green)</i>	Standard emergency unit cases without immediate danger or distress	The aim should be for these patients to be seen within 120 minutes
<i>Non-urgent (blue)</i>	Patients whose conditions are not true accidents or emergencies	If the patient has to wait, it should not be more than 240 minutes – patients can also be redirected to more appropriate facilities

Adopted from Woolwich (2000:482)

The most serious patient, the *red* patient, is in need of assistance on his/her immediate arrival at the emergency unit. The *orange* patient, who is also serious but not in immediate danger, should be seen within 10 minutes of his/her arrival. The *yellow* patient, who is stable, should be seen within 60 minutes of his/her arrival at the emergency unit and the *green* patient can wait up to 120 minutes. The *blue* patient is classified as a patient who can be seen elsewhere, such as at an outpatient clinic (which is in line with the UK state health system), but if he/she is to wait, it should not be for more than four hours.

### Cape Triage Score (CTS)

Following research done by De Vries et al (2005:38–41) in 2004 and 2005, the Cape Triage Group designed the Cape Triage Score, a triage assessment tool (algorithm) that could be used in pre-hospital and the emergency unit situations. The tool was designed for, and used successfully by, the least-qualified category of nurses, namely enrolled nurse auxiliaries, and has proven successful within a secondary (provincial) hospital where mortality rates and waiting times improved after its implementation.



It was decided to remain with the colour classifications, because colours were more easily identifiable and practical (such as used for hospital folder identification and labelling). It was decided to identify these classifications with the colour codes currently used in South Africa, except that an additional colour was included, namely, orange; this was to help distinguish between the “stable red” and “unstable yellow” patient.

**Table 4: The Cape Triage Score colour codes**

Colour	Description
Red	resuscitation / physiologically unstable patients
Orange	serious cases with potentially unstable physiology or potentially life-/limb threatening pathology
Yellow	physiologically stable cases with reasonably serious medical or trauma problems
Green	minor injuries/illness
Blue	those who are clearly dead

Source: De Vries et al (2005:39)

Two tables were designed to assist in using the CTS algorithm: the physiological scoring system (the Triage Early Warning System, the TEWS) and the Symptom List. The triage nurse uses these two instruments are used in conjunction with each other, to help him/her come to a final classification of the patient’s injury/illness severity.

The symptom list (Cape Triage Group 2005:15) generates the actual triage colour – which ultimately indicates the patient’s seriousness and who should be attended to in which order. The symptom list acts as the “safety net” where a patient’s vital signs are normal, but his/her pathology requires urgent attention. The calculation of the triage colour is thus two-tiered. The TEWS is calculated (Cape Triage Group 2005:13, 14) first by matching the vital signs to scores as specified in the TEWS table. The scores are then added to obtain a total TEWS. Once the total TEWS score is obtained, it is carried over to the symptom list (Cape Triage Group 2005:15) and placed in a colour code. The health care provider then covers that specific colour code with his/her right hand and examines the column(s) to the left of the hand to determine whether any of the obtained history falls into the higher triage colour code. If a symptom is noted in the higher colour, the triage code is then changed into the matching code of the column in which that symptom was found. Triage is only done upwards (eg from yellow to orange, and never downwards).

A final aspect of the CTS is the use of triage aids and further management. Triage aids are suggested interventions that should be undertaken to improve triage sensitivity. These interventions should be done only if waiting times will not be prolonged. The interventions described should also be undertaken within the scope of the health

care provider and at the discretion of the institution. Interventions are classified into compulsory and optional: compulsory interventions should be performed if time permits and optional interventions performed to enhance the triage process.

Final management of the patient according to the CTS is suggested according to the colour code specified in Table 4.

**Table 5: Further management of the patient after triage**

Colour	Management
Red	Patient must be taken to resuscitation room for emergency management
Orange	Patient must be referred to the front room of the emergency unit for urgent management
Yellow	Patient must be referred to the front room of the emergency unit
Green	Patient for potential streaming where a specific person cares for these patients
Blue	Patient to be certified dead

Source: Cape Triage Group (2005:18)

According to Table 5, therefore, the patient's colour code should guide the nurse about where the patient should be managed after triage. The red, that is, the most seriously ill or injured patient, should be taken directly to the resuscitation room/area, whereas the orange patient must be placed in an area where he/she will be under observation (owing to the seriousness of his/her injury). The yellow-coded patient should be taken to the front room (general area) of the emergency unit and the green coded patient can be streamlined to be managed elsewhere or he/she can wait in the waiting room.

## DISADVANTAGES OF TRIAGE

Edwards (1999) discusses three weaknesses of triage. Referring to "category dominance", Edwards (1999:20) describes how allocating a colour or urgency category to a patient and cessation of further management can be a hindrance to triage. It is argued that triage fragments the patient's visit to the emergency unit where, for example, a patient triaged green is required to wait for the secondary medical appraisal when he/she may have been referred to the more appropriate agency by the nurse immediately after triage. In other words, triage's "gate-keeping function" can also waste time. Triage may cause a bottleneck, thus retarding patients' processing in the emergency unit. Bottlenecks may occur if all patients are required to see the triage nurse, whereas seeing the doctor immediately on arrival might have expedited a patient's removal to the emergency unit. Edwards (1999:21) criticises the use of triage algorithms whereby a proper history is not

taken but, instead, a specific sign or symptom is categorised and the patient's treatment course is then managed accordingly. Edwards (1999:21) refers to this as "patients being in danger of being reduced to a repository of signs and symptoms, passive recipients of others' decision making, having no part in the construction of the encounter". The final argument (Edwards 1999:21) states that triage is a medically delegated role, implying that its effectiveness can be determined only by medical judgment. Furthermore, patients are categorised in terms of the threat to physiological function, "a decision completely divorced from the context of the problem or its impact on the person" (Edwards 1999:21). Ultimately, nurses care holistically for their patients and the triage model might be designed more to suit the needs of the organisation than the needs of individual patients.

## SUMMARY OF LITERATURE FINDINGS

The triage nurse has several key roles in the smooth running of the emergency unit. Most importantly, he/she should initially assess all patients on their arrival at the emergency unit, prioritise them, and then appropriately refer them.

The triage nurse also helps frontline reception staff by deciding who should be seen first and who is stable enough to have his/her hospital file opened before being attended to. The triage nurse also helps to manage the unknown factor in patients' illnesses and injuries in the waiting room, especially during busy periods, thus reducing the anxiety of clerks, nurses and patients themselves. Patients feel more reassured, knowing that someone with medical knowledge is monitoring their condition.

Managing patient flow has definite advantages for all staff in the emergency unit, namely the administrative staff, doctors, other nurses and ancillary staff (eg porters). The patient may receive all the treatment and/or investigations required from the triage nurse, or he/she may be sent to a primary nurse who will facilitate further treatment and monitoring. Once the correct decision has been made, all staff will know where the patient is at any particular moment. The triage nurse's role of controlling flow should help the doctor to know which patient requires assistance in which order, and initial side room tests may be initiated (such as urinalysis, vital sign monitoring and ECG) (Gottschalk 2004:326). Patient flow management also helps to alleviate overcrowding in the waiting room, because seriously ill/injured patients will be moved to the nurses' general area of the emergency unit (Fraser-Moodie et al 1993:220; Edwards 1999:20). Workloads will be more evenly distributed between nurses if the triage nurse allocates patients systematically (Dolan 1998:1; Edwards 1999:20).

Triage also helps to manage infection control in the emergency unit more efficiently (Edwards 1999:20). If a patient is assessed, by the triage nurse, as potentially having an infectious disease, this patient can be isolated immediately until further clarification is obtained (at a later stage). In the same way, a patient entering the unit with an actively

bleeding wound can be assisted to the appropriate area so that the blood spillage can be contained immediately.

Triage can also improve patient safety (Edwards 1999:20). If the patient is judged to be a threat to him-/herself, the triage nurse can determine whether he/she needs a safe environment. Potential admissions to the hospital may also be gauged through triage and further resource consumption can thus be assessed (Alarcon et al 1998:432).

Core competencies that the triage nurse should possess include initial assessment through history taking, focused examination through the taking of appropriate vital signs, the initiation of diagnostic tests such as X-rays and/or the collection of venous blood, documentation, crisis intervention, public relations and triage rounds. Specific investigations that the triage nurse should perform include: urinalysis, blood glucose measurement, administration of paracetamol to a febrile child, performing a Plaster of Paris check, administration of oxygen therapy, initiation of oral rehydration in a child, administering nebulised medication, performing an ECG and intravenous cannulation.

These competencies are summarised from international literature sources and therefore do not take into account nurses' scopes of practice in different countries.

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