

TRIAGE — A SOUTH AFRICAN PERSPECTIVE

The burden of acute medical and trauma presentations requiring emergency treatment by ambulance personnel and emergency units in South Africa is overwhelming.



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While an estimated 60 000 South Africans are murdered and die in road traffic accidents each year,¹ at least 2.5 million cases of non-fatal injury require emergency care during the same period.² This translates to about 66 trauma presentations per 1 000 population per annum. In South Africa the burden of non-trauma emergencies seeking medical care has not been formally estimated. However, since non-natural deaths account for only 15% of all deaths in this country,¹ it is safe to assume that the annual medical emergency case load is at least as great as, or greater than, the estimated annual trauma case load. In addition, limited health care budgets place additional constraints on the number of emergency care personnel employed to deal with this overwhelming case load. Triage, the process of prioritising patients according to medical need, is a necessity in any system, but particularly in one facing these challenges.

HISTORICAL BACKGROUND

The word triage means to sort or choose. The French surgeon, Baron Jean Larrey, prioritised medical care on Napoleon's battlefields. He sorted patients according to medical priority rather than rank (a revolutionary concept at the time). Those with the highest probability of survival (and therefore ability to return to battle) were preferentially treated. Larrey also developed a system of horse-drawn mobile ambulances or 'ambulance volantes' — the precursor of the modern ambulance (Fig. 1).³



Fig. 1. Larrey's 'ambulance volantes' (adapted from ref. 3).

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THE TRIAGE PROCESS

Triage applies to situations where the number and severity of casualties exceed the medical capacity in that environment. Patients are sorted according to medical priority; in a hospital setting those who are most ill are given the highest priority. This article focuses on triage in emergency units (both medical and trauma presentations). Triage is ideally done by an experienced sister, although an experienced doctor is required in a mass-casualty or disaster scenario. Ideally, patients presenting to emergency units, especially units with long waiting times, need to be seen within minutes and assessed by the triage nurse. The assessment should be brief (maximum 5 minutes), evaluating the nature of the problem and the patient's condition. In a well set-up system, basic tests may be commenced (e.g. ECG in chest pain, urine Dipstix in renal colic or urinary infection), even basic blood tests. This facilitates the clinical consultation with the doctor. Similar principles apply to road-side medicine. Patients are prioritised according to need and ambulances are also delegated to medical points according to the severity of the problem (the process of 'prioritised dispatch').

Ideal triage system

The following are characteristics of an ideal triage system:

- primarily identifies patients with life-threatening conditions
- requires minimal training
- easy to use
- able to process many patients quickly
- provides information regarding services and waiting times

- determines appropriate treatment area in the emergency department
- decreases waiting area congestion
- provides continuity between the roadside (ambulance) and emergency units
- encompasses trauma and medical cases.

EMERGENCY UNIT DESIGN AND TRIAGE

Emergency units should ideally be designed and/or set up with the triage process in mind. Ambulances should have direct access to the resuscitation area, delivering high priority ('red' or 'P1') patients directly to this area without going through a waiting room of stable patients. The triage area should be adjacent to the waiting area, with a means to direct patients swiftly to either the 'majors' or the 'minors' section of the unit. Additional facilities, such as a separate paediatric section, procedure room and counselling area, are all useful. A sister's/doctor's desk with direct view of the majority of stretcher cases is valuable in monitoring patient status within the unit. Similarly, an 'eyeball' approach to the waiting room often identifies acutely ill patients; this applies to patients not yet assessed by triage personnel as well as those previously triaged who may be deteriorating and need re-assessment or urgent treatment.

GLOBAL TRIAGE

Emergency units throughout the world have triage systems in place. The UK has been using the Manchester triage protocol for many years. This system was developed by the Manchester Triage Group in 1997. The basic rationale was to design a system ensuring that patients are seen in

order of clinical need rather than in order of attendance. The triage nurse codes every new arrival on a 1 - 5 number system; doctors then see those patients in order of their numerical coding.⁴ Unfortunately, it is based on 52 algorithms and is a large, unwieldy instrument requiring extensive training and practice. Many accident and emergency units in the UK are now moving away from this system, or are adapting it to ensure better patient throughput in their units. Adaptation has become essential owing to the unwieldy nature of the system, as well as the long waiting times of stable patients (categories 4 and 5). This has resulted in units using a 'streaming' system whereby patients are 'streamed' from triage into the 'majors' (stretcher) area or 'minors' (GP cubicle) area, and there are at least two medical teams at work simultaneously. These units also employ the services of emergency nurse practitioners (ENPs) together with doctors in the 'minors' area to treat stable patients. In Australia, the Australian Triage Score (ATS) is the main tool; it is also a '1 - 5' system based on a long list of patient conditions.⁵ Although easier to implement than the Manchester protocol, it is also bulky, requiring training and lengthy assessment time. Similarly, the Canadian Triage Assessment Score (CTAS) is a 1 - 5-based priority system also using a lengthy list of conditions requiring differential scoring.⁶ These systems appear to be large and impractical in a South African setting owing to the training required for implementation, and the time taken to assess patients.

Table I. **Ambulance triage coding**

Colour coding	Urgency	Mobility	Physiology	Priority coding
Red	Immediate	Stretcher	Unstable	P1
Yellow	Urgent	Stretcher	Stable	P2
Green	Stable	Walking	Stable	P3
Blue	Dead	n/a	n/a	P4

TRIAGE SYSTEMS IN SOUTH AFRICA

There is considerable variation in ambulance triage nomenclature within South Africa: 'red/yellow /green/ blue' versus 'priority 1/priority 2/priority 3/priority 4' (Table I). 'Blue' may mean completely stable or dead. These terms are interpreted differently, resulting in wide variation and disagreement in priority coding.

The Western Cape ambulance service uses a basic 'red/yellow/green/blue' triage system of ordering patients in medical priority at the roadside and when referring to hospital. This system is loosely based on physiological parameters (red = stretcher case and 'physiologically unstable'; yellow = stretcher case and 'physiologically stable'; green = walking wounded or ill). Despite these triage principles having been documented as far back as 1986⁷ there has been no attempt to formalise the physiological definition of 'stable' versus 'unstable'. The result is that ambulance personnel use their intuition, rather than a clear system, when coding patients. It is common to have stable 'red' patients and unstable 'yellow' and 'green' patients being brought to emergency units.

Patients triaged and sent back to the waiting area need to be seen according to priority. Maximum waiting times (to see the emergency doctor) vary according to the priority given and system objectives. The Manchester system uses the following targets: triage 1 — immediate; triage 2 — 10 minutes; triage 3 — 60 minutes; triage 4 — 120 minutes; triage 5 — 240 minutes. CTAS time scales are as follows: level 1 — immediate; level II — 15 minutes; level III — 30 minutes; level IV — < 1 hour; level V — < 2 hours. Busy units in South Africa would struggle to meet such criteria. However, the principle of having variable time objectives for different priority patients is sound; patient education (at emergency unit 'check-in' and triage) is clearly important to prevent misunderstandings regarding treatment priority and waiting times.

Currently emergency units in the Western Cape, both public and private, have no formal triage system. The medical staff tend to divide patients into stretcher versus non-stretcher cases. Stretcher cases are seen first, beginning with those who appear to be more ill or in greater pain. There is therefore minimal consistency between the ambulance coding method and the emergency unit triaging mechanisms.

NUMERICAL SCORING SYSTEMS

A different approach to triage is based on physiologically based scoring systems. These are straightforward to use and require only brief training. They are similar in concept to the Glasgow Coma Score (GCS), a composite score ranging from 3 to 15, assessing level of consciousness, which is now well established and in use globally. They provide a definite 'score' which referral and receiving parties both understand. Some of these systems, e.g. the Simplified Acute Physiology Score (SAPS), used for assessing deterioration of ICU patients, are too complex to use as a triage instrument (SAPS uses 14 variables per assessment).⁸ An example of a more basic system is the Triage Revised Trauma Score (TRTS) — comprised of the GCS, systolic blood pressure, and respiratory rate — which has been found useful as a triage tool for mass trauma.⁹ Another example is the Modified Early Warning Score (MEWS), a scoring system based on physiological parameters (pulse, blood pressure, heart rate, level of consciousness and temperature), which has been successfully used to assess medical inpatients at risk of clinical deterioration.¹⁰ Benefits of such systems include: numerical severity scores assigned to patients, avoidance of misunderstanding between referring and receiving parties, additional assessment parameters (e.g. temperature, respiratory rate), and a continuum of physiological assessment from the roadside through the emergency unit to the ward.

TRIAGE IN SOUTH AFRICA: THE FUTURE

The need for a standardised system of triaging emergency medical and trauma presentations in South Africa is apparent. The complex nature of triage tools currently used in the developed world makes them unsuitable for South African purposes. Many of the physiologically based systems are too complex for triage use (essentially designed for research purposes or ICU settings) or focus on one particular area of emergency (e.g. trauma). Perhaps the answer lies in the incorporation of a simplified numerical scoring system into a standard (e.g. colour-coded) triage system; the basic ambulance coding would still be in place while definite physiological parameters would be incorporated to avoid misunderstanding and ensure continuity.

References available on request.

IN A NUTSHELL

Triage is the process of ordering patients according to medical priority.

The overall objective is to do the most good for the most people.

Hospital triage involves identifying and preferentially treating life-threatening conditions.

Ambulance triage systems include colour-coded and 'priority-based' systems.

There is lack of uniformity and continuity in triage processes in South Africa.

No definitive triage physiological or algorithmic scoring system is currently in use.

A uniform national ambulance and hospital-based system would facilitate triage and treatment.