

## PREHOSPITAL CARE

# Evolution of triage systems

Iain Robertson-Steel



*Emerg Med J* 2006;23:154–155. doi: 10.1136/emj.2005.030270

The French word “trier”, the origin of the word “triage”, was originally applied to a process of sorting, probably around 1792, by Baron Dominique Jean Larrey, Surgeon in Chief to Napoleon’s Imperial Guard. Larrey was credited with designing a flying ambulance: the Ambulance Volante. Baron Francois Percy also contributed to the organisation of a care system for the ongoing management of casualties. Out of the French Service de Santé, not only emerged the concept of triage, but the organisational structure necessary to handle the growing number of casualties in modern warfare.

The original concepts of triage were primarily focused on mass casualty situations. Many of the original concepts of triage, the sorting into immediate, urgent, and non-urgent with the use of the holding category in the warfare situation, remain valid today in mass casualty and warfare situations. The triage sieve<sup>1</sup> remains in place and is widely used throughout the UK, Netherlands, Sweden, India, Australia, and NATO military organisations.

The Cape Triage Group, in this edition of *EMJ*, describes the development of a new triage system for the Cape Town area.<sup>2</sup> This triage system is specifically designed for the needs of the health services in South Africa. It raises many interesting issues, which are applicable to the development of triage systems worldwide. The original triage systems were based on sorting surgical patients in battlefield settings, and the concepts of prioritising patients and providing care at scene were developed in France in the early 1800s. The system then developed, mainly in the military situation, throughout the conflicts of the 19<sup>th</sup> and 20<sup>th</sup> centuries.

With the development of organised medical systems in the western world, the early 1900s saw triage emerging in the emergency departments in the US, UK, and Europe. Triage at this time consisted usually of a brief clinical assessment that determined the time and sequence in which the patient should then be seen by the limited resources, or, if applied in the field, the speed of transport and choice of hospital destination for initial treatment.

Three phases of triage have emerged in modern healthcare systems. First, prehospital triage in order to dispatch ambulance and prehospital care resources. Second, triage at scene by the first clinician attending the patient. Third, triage on arrival at emergency department or receiving hospital.

Triage, by definition, is a dynamic process, as the patient’s status can change rapidly.

Patients may enter the triage stream at any point—for example, patients with critical illness and injury not infrequently walk in to accident and emergency departments.

Multiple portals of entry to health care have resulted in the evolution of different systems of triage for telephone contact, ambulance contact, and direct patient entry to hospital or primary care facilities. This diversity of healthcare triage systems is creating difficulties in developing integrated care services.

Early triage systems were primarily trauma based, originating as they did from the battlefield situation. The challenge for triage systems is to develop systems that can manage the full spectrum of clinical presentations from critical illness and injury through to minor illness and minor injury, with advice, from the very young to the very old. Systems that generate a response to every call, simply sorting into advanced or basic life support, are no longer acceptable.

At each stage of the triage process, certainty can be added by measurement of physiological parameters and the introduction of structured clinical examination.

The health burden on emergency services throughout the world is increasing, patient expectations are rising, and all organised care systems are having to cope with the problems of increasing demand, increasing financial pressures, limitations on staff, and an ability to apply ever more complex medical processes to save the lives of patients who previously would have been non-survivors.

Prehospital triage systems are widely applied in different countries. However, they lack sensitivity and specificity, and are not applicable for emergency hospital use where clinical parameters are measured, and the patient has a history and examination made by a clinician. Many systems are validated only for trauma triage. The European Emergency Data (EED) project<sup>3</sup> identified the enormous diversity of emergency care systems in the European countries studied.

However, some common parameters did emerge in identifying those who are at immediate risk of loss of life, those who were urgent, and those who could be pointed to more routine care.

The challenge for the future is to develop effective triage systems, which, as their primary function, rapidly identify those who require the best available emergency response for trauma or medical problems, and focus the response using a sensitive and specific system, in order to use limited resources most effectively, and to focus the delivery of the critically ill and injured to centres where definitive care may be given in one move. Pre-hospital care systems must be able to support patients en route, as journey times to a limited number of specialist centres increase.

Triage systems in the future, having identified those who are at immediate risk, then have to move to management of the urgent patients and, at this point, prioritise patients who are clinically stable but seriously ill into the most appropriate order for treatment or evacuation, identifying the most appropriate receiving unit.

For those patients who are identified as only requiring routine care, the challenge for future triage systems is to put them into the right care stream, directing them either for immediate management of minor illness or minor injury where appropriate, or phasing it within an appropriate time banding.

As we approach the challenges of the 21<sup>st</sup> century, triage systems need to be developed where a common system is in place, which is accessible and usable by the Ambulance Service, pre-hospital care providers, general practice and

**Abbreviations:** EED, European Emergency Data; TEWS, Triage Early Warning Score

advice centres. The Norwegian Medical Index<sup>4</sup> evolved with the purpose of being a common triage system, for the Norwegian healthcare system, and has spread throughout Finland and Sweden. This system attempts to address the problems of integrating triage, prioritisation, and streaming.

In the UK, Reforming Emergency Care<sup>5</sup> and Transforming NHS Ambulance Services<sup>6</sup> identified the need to have a common triage system.

An integrated triage, prioritisation, and streaming system or concept, which firstly identifies patient need, separating it from simple demand, then identifies the most appropriate resource for the patient and the most appropriate end point, be it Stroke Unit, Trauma Centre, Catheter Lab, or General Practice, needs to be developed, as in "peace time", services are now taking on much more of a gatekeeper role.

With limited resources available, and in the face of increasing demand, it is vital to ensure that we focus on the early principles espoused by Baron Larrey and his colleagues.<sup>7</sup> First, treating the sickest first, second evacuating them to the most appropriate care facility in priority order, third maximising the use of our available resources for maximum patient benefit, and aiming for minimum time to definitive treatment.

In order to be able to deliver effective emergency care, triage systems must evolve from sending an ambulance to every call, to sending the most appropriate responder and directing the patient to the most appropriate care provider, or providing advice.

In order to use triage effectively, the underpinning logistics of an emergency care system must be in place in order to rapidly evacuate patients to the most appropriate response, neither under nor over triaging them.

When a patient arrives at an emergency unit, the opportunity to carry out more extensive triage presents itself. Manchester Triage,<sup>8</sup> the Canadian Triage Assessment Scale,<sup>9</sup> and the Australian Triage Score<sup>10</sup> are triage tools that are currently in wide use. The Cape Triage Group is trying to produce a triage system for local use in Cape Town that demonstrates the need to develop a simple system for use in a specific environment. They correctly identified the differences between the management of severe injury and those with complex medical problems. Modification of the MEWS score<sup>11</sup> and the re-naming of the score as the Triage Early Warning Score (TEWS) requires further study and research into sensitivity, specificity, and outcome.

Scoring on mechanism of injury is sensitive at identifying casualties with severe trauma and may produce over triage.

The Cape Triage Group correctly identified the need to have a common triage system in place throughout the Western Cape area in order to ensure that resources function effectively together, providing a medical or surgical/trauma care response.

The Cape Triage Group also recognised the need to identify the future requirement for specific triage tools for adults and children. It may also be necessary to consider the development of triage scores for managing the complex elderly patient.

The concepts of triage, sorting into priority, remain sound and unchanged since the early 1800s. In the 1800s the available options for further care were very limited.

The challenge for triage system evolution in the future is to separate demand from need, to focus the correct initial pre-hospital response to patients most in need by having a sensitive and specific triage system, to increasingly focus on rapid evacuation of the critically ill and injured to an emergency unit where a more detailed triage and prioritisation process can be carried out.

As the complexity of healthcare systems increases, and as patient expectations rise, triage will be a vital tool in the first steps of patient management. Prioritisation and streaming underpinning triage systems must be developed using a common system across whole health economies.

Examples of integrated care systems can be found throughout Europe—the French SAMU system being an

example where medical direction is involved in the triage prioritisation and streaming process.

Triage is only part of the key to improving care in the future and a great deal of further work needs to be carried out on access to care, telephone advice, the appropriate use of triage systems in ambulance services, and the integration of all components of the healthcare system through a logistics network that is simple to use and supported by all partners, ambulance services, hospitals, and primary care.

Meeting the challenges of demand management and gate keeping, and focusing limited resources on those most at need, remains the objective of an effective triage system in the 21<sup>st</sup> century.

The Cape Triage Group proposes a model adapted to the needs of the Western Cape area. Many of the lessons and principles are applicable to other healthcare systems and valuable lessons for the future can be learned from their work and the future outcomes that the Group intends to publish.

As healthcare systems become more complex, and demand and costs rise, integrated triage,<sup>12</sup> prioritisation and streaming systems, and using a common language and system remain the key to improving patient outcome and survival. The complexity of modern care, in terms of investigations, treatment, and supporting facilities, points to having a combined care pathway where the critically ill and injured are managed in combined centres where there is a focus on early examination, early investigation, and rapid access to definitive treatment. It is unlikely in the future that most healthcare systems will be able to afford the luxury of trauma centres and centres for the critically ill. The organisation into care systems, down stream of triage, is a lesson that dates back to Larrey and Percy who recognised that triage was the entry point to an organised system of care to maximise outcome.<sup>7</sup>

A great deal of further research needs to be carried out in the area of triage and logistics. The Cape Triage Group has made a positive proposal from which we can all learn and to which we can all contribute.

Competing interests: none declared

Correspondence to: Dr Iain R S Robertson-Steel, West Midlands Ambulance Service NHS Trust, Millennium Point, Waterfront Business Park, Waterfront Way, Brierley Hill, West Midlands DY5 1LX; iain.robertson-steel@wmas.nhs.uk

Accepted for publication 14 October 2005

## REFERENCES

- 1 **Advanced Life Support Group.** *Major incident management and medical support: the practical approach.* London: BMJ Publishing Group, 2002.
- 2 **Gottschalk SB,** Wood D, DeVries S, *et al.* The Cape Triage Score: a new triage system South Africa. Proposal from the Cape Triage Group. *Emerg Med J* 2006;**23**:000.
- 3 **European Emergency Data Project.** *EMS Data-based Health Surveillance System,* European Commission, 2004. <http://www.eed-project.de> (accessed 9 December 2005).
- 4 **The Norwegian Medical Association.** *The Norwegian index to emergency medical help.* Stavanger: The Laerdal Foundation for Acute Medicine, 1999.
- 5 *Reforming Emergency Care.* London: DoH, October, 2001.
- 6 *Taking healthcare to the patient—transforming NHS ambulance services.* London: DoH, June, 2005.
- 7 **Crumplin MKH.** *JR Coll. Edinb.* 47, June 2002, p 566–78.
- 8 **Manchester Triage Group.** *Emergency triage.* Manchester: BMJ Publishing Group, 1997.
- 9 **Canadian Association of Emergency Physicians.** *Implementation guidelines for the Canadian Emergency Department Triage and Acuity Scale (CTAS), 1998,* Canadian Association of Emergency Physicians. <http://www.caep.ca/002.policies/002-02.ctas.htm> November 2004 (accessed 9 December 2005).
- 10 **Australian College of Emergency Medicine.** *Guidelines for the implementation of the Australian Triage Score 98,* <http://www.acem.org.au/open/documents/triaguide.htm> November 2004 (accessed 9 December 2005).
- 11 **Goldhill DR.** The critically ill: following your MEWS. *QJM* 2001;**94**:507–10.
- 12 **Robertson-Steel I,** Edwards SN. Integrated triage: the time has come. *Pre-hospital Immediate Care* 2000;**4**:173–5.