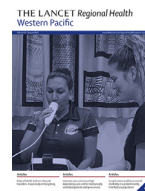


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## What is the ideal triage process and the resources it requires?

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Healthcare can be limited by infrastructure, consumable supplies, and human resources. Money can provide infrastructure and secure supplies but cannot as readily improve human resources. Human resources do not just depend on the education and training of the healthcare workers available, but also on their innate and tacit skills honed by their experience as well as their attitudes and behaviours that ensure they learn from their experience. It is fashionable to attempt to improve staff performance by educational courses, guidelines, protocols, and decision-support tools. Many of these are based on expert opinion or evidence generated from well-resourced clinical settings, and they usually have supply and infrastructural requirements. They are, therefore, of no value in settings where these are not available, and their unrealistic promotion may cause healthcare workers' resentment and undermine their morale [1].

Triage is particularly important when demand for care exceeds the available resources, and it has been identified as a priority area for global emergency care research [2]. The World Health Organization, International Committee of the Red Cross and Médecins Sans Frontières have developed the Integrated Interagency Triage Tool (IITT) for use in resource-limited emergency departments. In *The Lancet Regional Health - Western Pacific* Rob Mitchell and colleagues validated it in what they describe as a resource-limited urban emergency department in Papua New Guinea [3]. Triage using the tool took an average time of three and a half minutes, and it was claimed to perform well in the detection of time-critical diagnoses, and the identification of patients who were likely to die or require admission to hospital.

Validation of a triage system for use in a low-resource setting should include some comparison with alternative systems already in use. IITT's obvious competitor is the South African Triage Scale (SATS) that has been widely implemented and evaluated in South Africa, in several low-or middle-income countries, and in a wide

range of settings [4]. The SATS criteria that identify an emergency (RED) patient are cardiac arrest, obstructed airways, convulsions, facial burns or inhalation, and hypoglycaemia. All of these, except hypoglycaemia, are likely to be determined instantly using System 1 thinking. In contrast, IITT, has 20 RED criteria, with 8 additional ones if the patient is pregnant. Such an assessment demands System 2 thinking [5], which takes time and effort. Moreover, some of the criteria, such as capillary refill time, heart rate, hypothermia, blood pressure, ECG changes and the assessment of mental status are all likely to take time, equipment, and expertise. It is, therefore, difficult to see how this triage system can be used in truly low-resource settings where all three of these requirements may be in short supply.

The challenge for any triage system is identifying patients with time-critical illness who do not seem that sick. Any patient who is a victim of severe trauma, in severe pain, respiratory distress, unable to walk and talk, or bleeding torrentially should be easily identified. Yet in this study there was a delay in identifying 30% of patients with a time-critical diagnoses, and others have found that a substantial proportion of emergency department patients who subsequently die or become critically ill are not designated as high acuity at triage [6]. All physicians have had the privilege of working with nurses who "at a glance" can trump any triage system, and most people can intuitively recognise of life-threatening illness. Simply "eyeballing" the patient has been reported to triage more efficiently than the formal procedures of the Danish triage system that uses a complex algorithm based on the primary complaint and a full set of vital signs [7]. However, intuition is a feeling and not a thought than can be analysed and understood. It may, therefore, not always trigger the appropriate action. In acute situations, when other patients and many other variables must be considered, simple scores or rules may potentially perform better than even expert intuition as they consistently apply the same rules and ignore irrelevant detail [5].

In a low resource setting that lacks experienced emergency healthcare providers the principal purpose of triage should be to

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prioritize patient evaluation and not to make disposition or management decisions. Efficient triage should not only identify those patients that require urgent care, but also as many patients as possible who do not require it and who can be safely managed later or electively. The ideal triage process should be so simple it can be performed by anyone without the need for training, and require either no equipment, or equipment that is cheap, available, easy to use, reliable and robust. In short, in any disaster it should be possible to teach within seconds any passer-by to safely triage patients. The IITT comes nowhere close to these requirements. Better processes and tools, based on research in the appropriate setting rather than expert opinion, are needed.

#### Declaration of competing interest

John Kellett a major shareholder, director and chief medical officer of Tapa Healthcare DAC, a start-up medical software company.

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