

Paediatric triage in South Africa: Where are we?

It is vital that early signs of cardiovascular compromise are recognised.

H Buys, MB ChB (Zim), LRCP LRCS (Edinburgh and Glasgow), MRCP (UK), FCPaed (SA)

Senior Specialist, Department of Ambulatory and Emergency Paediatrics, Red Cross War Memorial Children's Hospital and Department of Paediatrics, University of Cape Town

Dr Buys enjoys ambulatory and emergency paediatrics and is an advocate for child health.

Correspondence to: H Buys (Heloise.Buys@uct.ac.za)

The outcome for paediatric cardiac arrest remains dismal, hence the critical need for healthcare staff to recognise the early signs of cardiovascular compromise and use timely interventions to halt further deterioration in children presenting at emergency units. This forms the basis of triage.

At state hospitals in South Africa 30 - 50% of deaths in hospitalised children occur within 24 hours of admission – lack of training and equipment, delays in recognising the severity of a condition, and other delays are thought to be responsible. Triage helps to identify and give preference to critically ill children for time-dependent emergency care.

What triage does

Triage is not about diagnosing, but about how to identify the child that needs immediate attention and treatment; how to further prioritise the one in need of urgent care; and, of equal importance, how to recognise and attend to the one with non-urgent, non-life-threatening complaints in a timely fashion. This remains the challenge of any emergency department. Triage tools are designed to prioritise the urgency of medical conditions, but may also help to maintain efficient flow within centres. It should be remembered that triage is not a comprehensive assessment tool.

Triage should help to identify:

- children with life-threatening airway and breathing problems, circulatory inadequacy and severe dehydration
- severity of illness and urgency of required intervention
- outcome measures – death, admission, paediatric intensive care unit (PICU) and high-care admissions
- resource needs
- triage categories – should correlate with the clinical acuity.

For many years informal triage was the norm locally and nationally; the unofficial triage nurse would draw on her years of clinical experience in dealing with children to distinguish the critically ill. However, this subjectiveness is difficult to develop and only identified emergency patients tend to benefit. The others would have to wait their turn in crowded waiting areas. These skills should rather be honed and combined with validated triage tools for maximum benefit. Discrepancies in triage competency will always exist, as there are few dedicated paediatric emergency units. Even where these units exist, there are different levels of nursing competence. This will inevitably influence the final triage score and needs to be considered when choosing the triage tool.

The uncontrolled mixing of non-urgent and urgent category patients leads to adverse patient outcomes, inefficiency and client dissatisfaction. The needs of non-urgent patients should be recognised and resource allocation should be apportioned accordingly. A common misconception is that non-urgent patients have only minor medical complaints. Candice Bonaconsa (unpublished data, 2012) eloquently demonstrates that the complexity of certain medical conditions may involve considerable time and effort and yet not demand urgent care.

Which triage tool is best?

Over the years a number of paediatric triage tools have been developed and extrapolated from adult tools. There is no gold standard paediatric triage tool and the following represent some of the many that are available:

International paediatric triage tools

- Emergency Severity Index (ESI: 2000)
- Canadian Paediatric Triage and Acuity Scale (PaedCTAS: 2001, revised 2008)

- Australasian Triage Scale (ATS: 2000)
- Manchester Triage Scale (MTS: 1996, revised 2006).

Most of the triage tools from developed countries are sophisticated computer-based systems, are time consuming and require skilled staff. For example, the MTS has 52 flowcharts with seven that are paediatric specific, which has considerable training implications and resource requirements. However, they are all excellent triage tools with inbuilt safety nets. Their further refinements have been made possible by increasing the number of acuity tiers from 3 to 4 to 5 levels to allow for better specific acuity differentiation. While this is desirable and cannot be argued with, it needs to be balanced by the capacity and commitment to deliver the required resources – a challenging task for the public health system in South Africa.

Currently there are three types of paediatric-specific triage tools in use in South Africa: two are mentioned in the 2012 International Standards of Care for Children – ETAT and the South African Triage Scale (paediatric version); IMCI was adopted by South Africa in 1997.

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Paediatric triage tools for resource-poor settings

- Integrated Management of Childhood Illness (IMCI: 1996, revised 2011 SA)
- Emergency Triage Assessment and Treatment (ETAT, 2005)

- Paediatric South African Triage Scale (PSATS: 2006, revised 2011).

Good training and user-friendliness do much to enhance acceptance by nursing staff as well as the ultimate goal. In one study, skilled anaesthetists demonstrated significantly superior triage precision compared with paramedics whose triage precision was deemed unacceptable. This particular triage tool employed anatomy, physiology and mechanism of injury criteria. Clearly, it is impractical and inappropriate to have skilled anaesthetists performing triage in our setting. Nursing personnel can be adequately trained to use an established validated tool that allows for safety, reassurance and patient satisfaction.

Integrated Management of Childhood Illness (IMCI)

Introduced by the World Health Organization (WHO) to reduce the high morbidity and mortality associated with the main childhood illnesses in developing countries, these are integrated guidelines for comprehensive assessment and management of sick children at primary care level. Although not explicitly

publicised as a triage tool, the manual calls for the rapid appraisal of children in the waiting area to detect danger signs: unable to feed/drink, vomits everything, convulsions, lethargy/abnormal conscious level. After this triage process the child can then be assessed and the illness acuity classified and managed along set algorithms.

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Emergency Triage Assessment and Treatment (ETAT)

This is a five clinical module course developed in Malawi and adopted by the WHO in 2005 to address the high risk of mortality in children presenting at health centres without triage in developing countries. It is intended for and well-suited to low-resource centres, especially those with high caseloads of children, and where child mortality rates are high and fall far off the 2015 Millennium Development Goal with regard to death caused by pneumonia, diarrhoeal disease, sepsis and malnutrition. Supported by the WHO, independent USA and European aid agencies, and African government health departments, it has been incorporated into the Royal College of Paediatrics and Child Health's Child Health in Developing Countries courses. ETAT's Advanced Paediatric Life Support (APLS)-based A-B-C-D triage approach emphasises the rapid identification of:

- airway obstruction
- poor quality breathing pattern
- circulatory shock
- coma
- convulsions or
- severe dehydration.

This 3-point triage and treatment tool is fast being put into effect throughout Africa and other developing countries in Asia, Latin America and the Western Pacific. It is a natural progression from and provides a link that bridges IMCI with hospital level care. Its strength lies in its simplicity; its founders claim that it takes <60 seconds to perform and is particularly suitable to high caseload

Example

An infant that arrives with fast breathing and is judged by the triage nurse to have a dusky tongue would be immediately taken to the resuscitation room and treated per problem, e.g.:

- head tilt, chin lift to open the airway, any secretions are gently suctioned away
- oxygen is given by face mask.

The nurse notes that the infant's hands are cold to touch, the pulses are weak and the capillary refill time is prolonged to 4 seconds; the infant appears sleepy. While observing this the nurse also notes that the infant does not appear to be severely malnourished. The mother says that the infant has had watery stools for 1 day.

- An intravenous cannula is placed.
- A 20 ml/kg bolus infusion of normal saline is given rapidly.
- A drop of blood is set aside to check for blood glucose.
- While doing this the infant must be kept warm.
- Other treatments are given, e.g. antibiotics, and laboratory investigations are done.

The infant begins to look much better and more alert, the pulses improve, and the blood glucose is normal. The nurse or the doctor can now begin the process of taking a full history and making a detailed assessment. The final diagnosis is one of acute gastroenteritis. Definitive care can now proceed.

settings. It has been used successfully at a busy central children's hospital since 2007 and may be well suited as a national triage model. It has been adopted and adapted in several African health systems.

In this model ETAT places children into one of three groups:

- Emergency-sign patients: require immediate treatment to prevent death. Include the IMCI 'danger signs' group. Recognition is guided by assessing:
 - airway and breathing problems
 - circulation inadequacy (shock)

- coma
- convulsions
- confusion
- dehydration (severe).
- Priority-sign patients: need to be given priority care, should not wait for hours, can be further grouped into higher and lower acuity groups, e.g. very urgent and urgent.
- Non-urgent cases: do not have emergency or priority signs, have a lower risk of mortality, can wait their turn, does not mean 'not ill', could have complex health problems, could have chronic underlying health conditions, could have minor health problems, form the bulk of children arriving at healthcare institutions.

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The other modules go on to offer problem-specific treatment guidelines for the A-B-C-D emergencies that should be instituted without delay in the emergency room while help is called for and blood is collected for urgent tests.

If the child has trauma or surgical problems the tool suggests directing the patient to the correct area within the emergency unit to obtain surgical help and to follow trauma guidelines. When Airway-Breathing-Circulation problems exist in injured or surgical patients, these must be addressed immediately. Any obvious bleeding must be stopped simultaneously.

South African Triage Scale (SATS), version 2011

A uniquely South African paediatric triage scale, this tool employs a clinical triage component modelled along the lines of ETAT with additional trauma pointers, coupled with a physiological assessment and scoring tool known as the Triage Early Warning Score (TEWS) where vital signs such as heart rate, respiratory rate, temperature, mobility and alertness are assessed and scored. This tool is a 4-tier scale and allows for some differentiation in children without emergency signs into

three further categories: very urgent, urgent, and not urgent. This acuity differentiation requires more time in the triage process and resource allocation to allow flow patterns into specific areas in the emergency unit. However, it is an excellent tool that takes ETAT to the next level and may do much to enhance the care of children with priority conditions by separating their acuity needs to avoid treatment delays.

Who should triage?

At most centres across the world, trained nurses carry out triage at clinic and hospital level. Experience goes a long way to improving accuracy – something that can be a very difficult task, particularly in very young infants. Measurement of respiratory rate, heart rate, pain and Glasgow Coma Scale (or AVPU scale) are challenging, even for experienced paediatric nurses who often resort to the use of monitors. Where equipment is scarce it becomes vitally important not to forego accuracy and mis-assess critical vital signs. Pain in children is particularly difficult to assess, as they often do not verbalise pain, even if they are old enough to complain.

Benefits of triage

Being able to attend to children in order of their illness acuity has been shown to reduce mortality. This has been well demonstrated with ETAT in Malawi for both early and total hospital mortality. It is important to refresh and consolidate triage skills to maintain precision, accuracy and safety. Efficiency flows from this point. Triage is a dynamic process and constant vigilance is key.

Conclusion

In sub-Saharan Africa, as in other developing areas, poverty generates high numbers of sick children ranging from critically ill to chronically unwell to those with non-urgent conditions. The resources are finite and need careful management. Appropriate triage contributes to child survival; the needs of the child come first. As there are nearly 16 million children below the age of 15 years in South Africa, an infant mortality rate of 41 per 1 000

live births and <5 year mortality rate of 57, we are obligated to address their needs – paediatric triage is an essential care package that needs urgent roll-out.

Recommendations

All healthcare facilities dealing with children should perform a rapid triage process that gathers sufficient information to assign the correct triage category to a sick child and offer adequate paediatric resuscitation care.

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- Triage sorts ill children into acuity categories.
- Children with emergency red signs need to go immediately to resuscitation.
- Children with non-urgent conditions need to be separated from acutely ill children and dealt with away from the acute care areas.
- Triage can be life saving.
- The triage waiting area should be under constant surveillance.
- Sick children may deteriorate rapidly and change from urgent category to red (immediate care category).
- Triage can be performed effectively by trained nurses.