New NHS Prehospital Major Incident Triage Tool: from MIMMS to MITT

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ABSTRACT

Triage is a key principle in the effective management of major incidents and is the process by which patients are prioritised on the basis of their clinical acuity. However, work published over the last decade has demonstrated that existing methods of triage perform poorly when trying to identify patients in need of life-saving interventions. As a result, a review of major incident triage was initiated by NHS England with the remit to determine the optimum way in which to triage patients of all ages in a major incident for the UK. This article describes the output from this review, the changes being undertaken to UK major incident triage and the introduction of the new NHS Major Incident Triage Tool (MITT) from the Spring of 2023.

Triage is a key principle in the effective management of major incidents and is the process by which patients are prioritised on the basis of their clinical acuity. It is the first clinical priority to be undertaken at a major incident, ahead of any patient treatment, and is typically performed with a rapid physiological assessment.

In countries using the Major Incident Medical Management Support principles (eg, the UK, Australia and South Africa), a two-staged approach to triage is undertaken.1 Primary triage is performed using the Triage Sieve, which provides an initial rapid assessment of physiology at the scene. Since 2013, the modified National Ambulance Service Medical Directors (NASMed) Sieve has been used in the UK.2 The NASMed Sieve is then followed by a more detailed assessment, using the Triage Sort, in a more permissive environment usually removed from the immediate incident scene (eg, in a casualty clearing station) (online supplemental figure 1).

The rationale for this two-stage approach is to allow assessment of a large number of patients rapidly using the more simplified tool, the Sieve, which requires neither clinical expertise nor additional medical equipment (eg for the measurement of Blood Pressure). Following this, the triage decision can be refined using the more detailed assessment with the Triage Sort (including Blood Pressure measurement and the Glasgow Coma Scale) and incorporating senior clinician decision-making. For the assessment of children under 12 years, an age-specific adaptation of the Triage Sieve (the Paediatric Triage Tape) is advocated as the primary triage method of choice.3

Additional triage methods are used elsewhere in the world, including the Amburg-Schwandorf Algorithm (ASAV) in Germany, the Careflight tool in some parts of Australia, and in the USA, both the Simple Triage and Rapid Treatment (START) and Sort Assess Life-Saving Intervention and Treatment (SALT) triage tools are used.4 While both START and Careflight are purely objective physiological triage tools, the ASAV and SALT differ in that they include a subjective triage assessment.

Work published over the last decade has demonstrated that existing triage tools perform poorly when identifying patients in need of life-saving intervention and may also be associated with increased mortality.4 5 Based on emerging evidence, a review of major incident triage (including an appraisal of all existing methods) was initiated by the National Strategic Incident Director for NHS England Emergency Preparedness, Resilience and Response. A Task and Finish (T&F) group was created, including stakeholders and representation from NHS England, the National Ambulance Resilience Unit, Defence Medical Services and the Advanced Life Support Group. This was a comparable process to that undertaken in the USA by Lerner et al which led to the development and introduction of the SALT triage method.6 The remit of the group was to determine the optimum way to triage patients of all ages in a major incident in the UK.

This review has resulted in the development of the NHS MITT (Figure 1), which having been announced in October 2022, will be introduced into UK practice from April 2023. In this article we discuss the changes made to the process of triage and the rationale behind these changes.

FORMAT

The layout and format of the MITT was developed in consultation with the Behavioural Science and Insights Unit from the UK Health Security Agency with several options field-tested in August 2021 during two simulated major incidents (one a rail
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PHYSIOLOGICAL THRESHOLDS

The physiological parameters within the MITT differ to those
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used in both the Triage Sieve and NASMeD Sieve and incorpo-
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rate the pulse and respiratory rate thresholds from the Modi-
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ified Physiological Triage Tool, MPTT-24.4 The rationale for
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changing these thresholds came from a large body of evidence
demonstrating that the thresholds within both former tools did
not reliably identify patients in need of life-saving intervention
and were theoretically associated with both increased mortality
and unacceptably high levels of undertriage (incorrectly classi-
yzing a patient as not needing a life-saving intervention).

The new thresholds (Heart Rate >100 and Respiratory Rate
<12 or ≥24) were determined in a study using logistic regres-
sion methodology and were found to be the optimum param-
eters with which to identify adult trauma patients in need of
life-saving intervention.7 Furthermore, the inclusion of the new
physiological thresholds is consistent with the approach taken in
the NHS Clinical Guidelines for Major Incidents and the latest
iteration of the Defence Medical Services Battlefield Casualty
Drills Sieve.8

THE SURVIVOR RECEPTION CENTRE

The Survivor Reception Centre (SRC) has historically been used
as a term for an area where the uninjured would be taken during
a major incident. Both the SRC and an assessment of whether
the patient is injured have been removed from the MITT, as
concern was raised that occult injuries may declare themselves
within the SRC, where the medical resources are likely to be
limited. Furthermore, the MITT is designed as a rapid primary
triage assessment, ideally taking less than 30s, so it was felt it
was not appropriate to define whether an individual is injured
or not at this stage. As a result, all living individuals involved
in a major incident should be categorised as minimum Priority
Three, allowing for them to be reassessed and discharged from
medical care if and when appropriate.

SECONDARY TRIAGE

With evidence demonstrating that the secondary triage tool, the
Triage Sort, performs poorly when compared with the MPTT-24
at identifying patients in need of life-saving intervention,5 its
use has been deprioritised while further research is undertaken
to determine an improved method of secondary triage. In the
interim, the consensus is to repeat the triage process using the
MITT and when resources allow, follow the local major trauma
triage tool with decision support from senior clinicians.

WHAT ABOUT THE CHILDREN?

Where previously the Paediatric Triage Tape1 (online supple-
mental figure 2) was advocated as the primary triage method
for those aged under 12 years, following a review of existing
published evidence, the MITT uses the same physiological
thresholds in both adult and paediatric patients. This approach
is borne out of a recent comparative analysis of paediatric MITT s
demonstrating that both the existing Paediatric Triage Tape
and JumpSTART performed poorly when identifying paedi-
iatric patients in need of life-saving intervention. Within the
same comparative analysis, the adult MPTT-24 demonstrated
improved performance with reduced rates of undertriage.6 The
Sheffield Paediatric Triage Tool (online supplemental figure 3),
a specific paediatric adaptation of the MPTT-24, demonstrated
the best predictive performance, but owing to its complexity,
was deemed to be not feasible for use in the field as a primary
triage tool.9

Additionally, the MITT incorporates two specific paediatric
elements; the consideration of rescue breaths and the automatic
categorisation of those under 2 years as Priority One. The inclu-
sion of rescue breaths in paediatric life-support algorithms is
common and is an attempt to reverse hypoxia which may lead to
cardiac arrest. While the Paediatric Triage Tape did not include
rescue breaths, the JumpSTART method did. In a large paedi-
atriic Delphi study, consensus opinion was that rescue breaths
should be included within triage guidance, but only for mech-
isms which were likely to result in hypoxia, such as submer-
sion, immersion or smoke inhalation.10 Paediatric patients who
remain apnoeic following five rescue breaths are categorised as
dead.

Automatically categorising paediatric patients aged under 2
years as Priority One originates from a review of the Trauma
Audit and Research Network (TARN) database, which demon-
strated an increased mortality and need for life-saving inter-
vention in this age group (online supplemental figure 4).11 The
nature of the TARN database and its inclusion criteria have been
previously described elsewhere and are included within online
supplemental figure 5.5 While cases of non-accidental injury will
certainly influence these data, it was felt that this was a clinically
important and pragmatic step.
This age group will be at variable developmental milestones (mobility and verbal), thereby making accurate assessment difficult; furthermore, assessing young children is likely to be emotive, especially for those with limited paediatric experience. These factors are likely to be exaggerated in the context of a major incident. This automatic categorisation as Priority One was felt necessary to reduce cognitive burden of those involved in triage at the incident scene. While the introduction of this step may result in a theoretical increase in overtriage, the likelihood of significant numbers of paediatric patients under the age of 2 years being involved in a major incident is deemed to be low and therefore was felt by the T&F group to be a tolerable risk.

SUMMARY

The new NHS MITT will be introduced into UK practice as a unified replacement to the NASMeD Sieve and Triage Sort in the Spring of 2023. It differs from the previous NASMeD Triage Sieve in a number of ways, notably by having modified physiological parameters and by being designed for use across the entire age range, including both adults and children. Major incident triage should be rapid, reliable and reproducible, irrespective of the provider performing it. The introduction of the MITT into practice fulfils these principles, and provides not only an evidence-based approach to major incident triage, but also a more simplified approach by adopting a single approach across all ages.

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