The South African Triage Scale (SATS)

Training manual 2012
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INTRODUCTION

Learning Objectives:

- Understand the purpose of triage and the benefits of implementing the SATS
- Be familiar with the requirements for standardised triage implementation
- Understand the terminology and key concepts around triage

A nine-month old baby boy is carried into the children’s section of the outpatient department in his mother’s arms. He appears to be asleep. At the triage desk he is seen by a nurse and found to have lips and tongue that are grey/blue in colour, and he is taken straight into the resuscitation room as an emergency.

In the resuscitation room he is given oxygen at 15 l/min by face mask with a non-rebreather reservoir bag. He is noted to be grunting and breathing very fast. His hands are cold to touch and the capillary refill time is prolonged to four seconds. An intravenous cannula is placed. A blood sample is taken at the same time for blood glucose, full blood count and blood culture. An intravenous infusion of normal saline is commenced at 20ml/kg to run as fast as it can go.

Other treatments are given, depending on the result of the investigations and the response to the treatment he receives. It is now 18 minutes since the baby came through the outpatient department’s door, and his situation is stable. It is now time to take a full history and carry out a full examination to make a definitive diagnosis. He is diagnosed as having very severe pneumonia, and receives specific treatment for this. However, before coming to this diagnosis, no time was wasted; his status was stabilized, based on a few leading signs and symptoms, even when the medical staff did not know exactly what was wrong with him.

This was good triage and emergency management. Would it have happened like this in your hospital? In this training course, you are going to acquire the necessary knowledge for the correct triage of sick children and adults.

Many deaths in hospital occur within 24 hours of admission. Some of these deaths can be prevented if very sick patients (especially children) are quickly identified on their arrival and treatment is started without delay. In many hospitals around the world, children are not checked before a senior health worker examines them; as a result, some seriously ill patients have to wait a very long time before they are seen and treated. Children are known to have died of a treatable condition when waiting in the queue for their turn. The idea of triage is to prevent this from happening.

The purpose of triage is to prioritise patients based on medical urgency in contexts where there is a mismatch between demand and capacity (i.e. patient load overwhelms the available resources).

1.1 The benefits of implementing SATS
1. expedite the delivery of time-critical treatment for patients with life-threatening conditions.
2. ensure that all patients are appropriately prioritised according to their medical urgency.
3. improve patient flow.
4. improve patient satisfaction.
5. decrease the patient’s overall length of stay.
6. facilitate streaming of less urgent patients.
7. provide a user-friendly tool for all levels of health care professionals.

By introducing the SATS at a public urban hospital in Cape Town, mean waiting times were reduced significantly for all priority levels except the non-urgent green category. The most dramatic reduction in waiting times was seen in patients coded as red (R2).1

ACKNOWLEDGEMENTS

On behalf of the Paediatric Triage Working Group and the South African Triage Group

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1.2 Triage requirements

Triage is simple to do, but in order to standardise the process and comprehensively implement the SATS as a validated tool certain requirements need to be met. Table 1 shows the equipment needed for the process and Appendix A on page 4 includes a detailed checklist of requirements.

<table>
<thead>
<tr>
<th>Location</th>
<th>Equipment</th>
<th>Additional equipment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Privacy: Screen, partition or</td>
<td>Gloves, face masks &amp; other barrier protective devices</td>
<td>Pulse oximeter with paediatric probes</td>
</tr>
<tr>
<td>separate room.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Safety: Security/protected</td>
<td>Wall clock</td>
<td>ECG</td>
</tr>
</tbody>
</table>
| Size of area: pushchairs,        | Low reading electronic/mercury thermometer                                 | Finger prick machine, haemoglobin and gl</p>

1.3 Who should be the triage provider?

Nurse-based triage has been successfully implemented worldwide in the countries of North America, Europe, the Middle East and Australasia since the development of Emergency Medicine as a specialty about 30 years ago. Table 2 shows the number of medical practitioners and nurses per unit of population in South Africa, compared to some “developed” countries. Given the significantly lower doctor: nurse ratio in South Africa compared to countries where nurse triage is widely practiced, it is apparent that the development of nurse-based triage should be a priority in our setting.

<table>
<thead>
<tr>
<th>Country</th>
<th>Rate per 100,000 population/ year</th>
<th>Rate per 100,000 population/ year</th>
<th>Doctor: Nurse ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>South Africa</td>
<td>56.3</td>
<td>471.2</td>
<td>1: 8.0</td>
</tr>
<tr>
<td>Canada</td>
<td>229</td>
<td>897</td>
<td>1: 4.0</td>
</tr>
<tr>
<td>Australia</td>
<td>240</td>
<td>830</td>
<td>1: 3.4</td>
</tr>
<tr>
<td>Israel</td>
<td>385</td>
<td>613</td>
<td>1: 1.6</td>
</tr>
<tr>
<td>UK</td>
<td>164</td>
<td>479</td>
<td>1: 3.0</td>
</tr>
</tbody>
</table>

Table 2: Doctor and nurse rates per 100,000 population per annum for selected countries

Nurses are the first medical contact for the patients attending the Emergency Centre in most instances. In South African studies, adequately trained Enrolled Nursing Assistants (ENAs) have been shown to be accurate to a degree comparable with international standards of nursing triage. The South African Triage Scale should be known and applied by all health care professionals involved in the Emergency Centre. The triage provider can be the medical officer, the registered nurse, enrolled nurse or the ENE. The purpose of this training program is to empower the individual who participates with the knowledge to triage. It will only be through practice and repetition that a provider will become skilled with triage. Successful providers are therefore encouraged to participate in triaging as frequently as possible in order to stay in practice and up to date.

1.4 Terminology and key concepts

1. Triage, from the French word “trier”, literally means: “to sort”. The aim is to bring “the greatest good to the greatest number of people” – this is achieved through prioritising limited resources to achieve the greatest possible benefit. Patients are sorted with a scientific triage scale in order of urgency – the end result is that the patient with the greatest need is helped first.

2. Patient to triage: for the hospital or clinic context this refers to a patient that appears relatively stable and is able to mobilise him/herself to the designated triage area. This will be the type of triage used for most hospital and clinic cases.

3. Triage to patient: here the patient is usually unstable. The patient is unable to mobilise him/herself to the designated triage area and will need to be triaged where they are found. They may need to be referred directly to the resuscitation (resus) area if they are at a health facility. Triage may also be performed at the bedside and documented in retrospect. This type of triage will be used less often in the hospital context and predominantly in the pre-hospital context.

4. Physiology (i.e. vital signs): refers to the normal functioning of the different body systems. Some of the physiology can be readily measured (e.g. pulse, blood pressure, respiratory rate, temperature).

5. TEWS: Triage Early Warning Score. This is a composite score of the patient’s physiology. The score is derived by assigning a number between 0 and 2 for each of the patient’s vital signs. The higher the score the greater the urgency.

6. Streaming: the use of dedicated healthcare resources for each priority group of patients. For green patients, this may be a doctor or nurse practitioner: this person needs their own space to see these patients.

7. Pain: Severe pain is unbearable, the worst pain the patient has ever felt. It may be associated with sweating, paleness, and altered level of consciousness. Moderate pain is intense, but bearable. Mild pain is any other pain. Remember to do a pain assessment on every patient that you see.

8. Additional Investigation: You will find this exclamation icon in later chapters. It represents an additional investigation which may lead to a change in the patient’s triage priority level. Checking the blood glucose concentration or measuring the oxygen saturation level are examples of additional investigations. Section six outlines all key additional investigations important at triage. They can also be found on the SATS charts.

9. Warning: The lightbulb icon indicates a warning that usually follows immediately after an additional investigation, implying that some immediate action is required (e.g. a child whose oxygen saturation levels are found to be 80% requires oxygen administration and should be taken to the resuscitation area).

10. Additional tasks: The icon with a red cross represents additional tasks that are beneficial to the patient if initiated at triage. These additional tasks do not change the patient’s triage priority level. Examples include starting oral rehydration therapy for a child that is dehydrated, cooling a burn that occurred within 3 hours or applying direct pressure to an uncontrolled haemorrhage.
### Structural Requirements

<table>
<thead>
<tr>
<th>Does the triage area meet the following criteria:</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Is the triage area a dedicated space?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Is the triage area well signed?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Is the triage area secure (i.e., behind the security gate, or in easy view of security staff)?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Is the triage area at least 10 square meters in size (i.e., should be able to accommodate a nurse, patient in a wheelchair and relative or carer)?</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Content Requirements

<table>
<thead>
<tr>
<th>Does the triage area contain the following:</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. A desk and chair?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Triage paperwork for adult, children and infants?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. A wall clock with a second hand?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. A stethoscope?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. A low reading thermometer?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6. Dry dressings and bandages?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>7. Gloves?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>8. Sphygmomanometer (manual, digital or electronic)?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>9. Blood glucose monitor?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>10. A measuring tape OR marks displayed on wall in triage area to measure children (i.e., one mark at 95cm and one at 150 cm)?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>11. 2 x different SATS posters prominently displayed in triage area?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>12. SATS manual readily available for triage office as a source of info?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>13. SATS patient info leaflet prominently displayed in the waiting area?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>14. Triage register or computer with register?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>15. White board to track and communicate to other staff acuity of those triaged?</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Assessment Questions

Clearly indicate whether the following statements are true or false:

1. The purpose of triage is to prevent deterioration or death of a patient while waiting in the queue for their turn.
   - True    - False

2. The triage method should be known and applied by clinical nurse practitioners only.
   - True    - False

3. Streaming is the process of getting patients to wait for as long as possible.
   - True    - False

Choose the correct answer:

4. The benefits of triage are:
   - (a) To facilitate streaming of green patients
   - (b) To decrease the waiting time of life-threatening conditions
   - (c) To ensure that patients are appropriately prioritized by urgency
   - (d) To prevent children from dying in the waiting room
   - (e) All of the above

5. TEWS is short for:
   - (a) Triage Early Warning System
   - (b) Trauma Early Warning Scale
   - (c) Triage Emergency Warning System
   - (d) Triage Early Warning Score
   - (e) Trauma Emergency Waiting Score
THE SATS PROCESS FLOWCHART

Learning Objectives:
- Understand the five step approach and SATS process flowchart
- Be familiar with the two versions of the SATS chart
- Be familiar with the priority levels of SATS

2.1 The five step approach

Step 1: Look for emergency signs and ask for the presenting complaint
Step 2: Look for very urgent OR urgent signs
Step 3: Measure the vital signs and calculate the TEWS
Step 4: Check key additional investigations
Step 5: Assign final triage priority level

Figure 1: SATS five step approach

The process of triage starts with a question to the mother/carer/patient as to the reason for coming to the emergency centre. As this question is being asked and answered the triage process already commences with the triage practitioner rapidly assessing the patient for any Emergency clinical signs, The Airway, Breathing, Circulation, Coma, Convulsion, Dehydration. Other [ABC-c-c-do] approach is used for paediatric patients. If emergency clinical signs are found, the patient is assigned a Red priority level and taken straight to the resuscitation area without delay.

If no Emergency clinical signs are present then check for any Very Urgent or Urgent clinical signs. Whether these are present or not, vital signs are measured. The TEWS is calculated, key additional investigations are checked and the triage priority adjusted as shown in Figure 2.

It is important to note that if a patient has any emergency signs then a TEWS does NOT need to be calculated at triage. There should be no delay in taking the patient to the resuscitation area. Finally the senior healthcare professional’s (SHCP) discretion as seen in Figure 2, allows the clinical nurse practitioner or senior doctor to override the final triage priority assigned.

2.2 The SATS process flowchart

There are two versions of the SATS chart as seen in Figure 4 and 5. The paediatric version of the SATS chart is used to triage all patients younger than 12 years and smaller than 150 cm. The adult version of the SATS chart is used to triage patients older than 12 years or taller than 150 cm.

Both age specific versions have the exact same SATS process flowchart as depicted in Figure 2. The five steps in Figure 1 are integrated into this process flowchart. The differences are found in their respective clinical signs and their age appropriate TEWS. The next two sections describe in detail the adult and paediatric clinical signs respectively.

2.3 SATS priority levels

The South African Triage Scale has four priority levels as shown in Table 3. Each priority level should ideally be managed within the target time to treatment.

2.4 Terminology and key concepts

1. Red vs Resus: Patients may be triaged Red on the basis of their presentation, but not necessarily be a full resuscitation case. Conversely, if a patient presents to you as a resus you do not need a triage tool to tell you that they are a Red case. For those patients who present like this (e.g Cardiac arrest), triage before treatment is not necessary – if a patient is a resus, they are Red by definition.

2. Majors vs Minors: The majors area in a hospital is staffed by appropriately trained personnel and advanced equipment to deal with emergency, very urgent and urgent patients. The minors area is staffed by appropriately trained personnel and the respective equipment and resources to deal with routine or non-urgent patients.

<table>
<thead>
<tr>
<th>Priority COLOUR</th>
<th>Target time</th>
<th>Management</th>
</tr>
</thead>
<tbody>
<tr>
<td>RED</td>
<td>IMMEDIATE</td>
<td>Take to the resuscitation room for emergency management</td>
</tr>
<tr>
<td>ORANGE</td>
<td>&lt; 10 mins</td>
<td>Refer to majors for very urgent management</td>
</tr>
<tr>
<td>YELLOW</td>
<td>&lt; 1 hour</td>
<td>Refer to majors for urgent management</td>
</tr>
<tr>
<td>GREEN</td>
<td>&lt; 4 hours</td>
<td>Refer to designated area for non-urgent cases</td>
</tr>
<tr>
<td>BLUE</td>
<td>&lt; 2 hours</td>
<td>Refer to doctor for certification</td>
</tr>
</tbody>
</table>

Table 3: SATS priority levels and target times to be seen with-in

Assessment Questions

Clearly indicate whether the following statements are true or false:

1. There are two SATS charts – one for paediatric patients and one for adult patients.
   True   False

2. If an emergency sign is identified in the first step, the patient is taken to the resuscitation area immediately.
   True   False

3. If no emergency signs are identified in step one, but an urgent sign is identified in step two, the patient is immediately triaged yellow and asked to wait.
   True   False

Choose the correct answer:

4. The SATS priority level Orange is defined as:
   (a) Emergency requiring immediate intervention
   (b) Very Urgent requiring intervention within 10 minutes
   (c) Urgent requires intervention within 60 minutes
   (d) Routine requiring intervention within 240 minutes
   (e) Life threatening but not requiring any intervention

5. The senior healthcare professional’s discretion refers to:
   (a) The junior nurse overriding the final triage decision
   (b) The clinical nurse practitioner overriding the final triage decision
   (c) The medical student overriding the final triage decision
   (d) The medical officer overriding the final triage decision
   (e) b and d above
**Adult SATS Chart**

**LOOK FOR EMERGENCY SIGNS AND ASK FOR PRESENTING COMPLAINT**

**TAKE TO RESUS**

**LOOK FOR VERY URGENT SIGNS**

**YES**

**NO**

**LOOK FOR URGENT SIGNS**

**YES**

**NO**

**MEASURE VITAL SIGNS**

**CALCULATE TEWS**

**ADDITIONAL INVESTIGATION**

**EMERGENCY TEWS 7 OR MORE**

**URGENT TEWS 5 OR 6**

**URGENT TEWS 3 OR 4**

**ROUTINE TEWS 0, 1 OR 2**

**DECREASED**

**SENIOR HEALTHCARE PROFESSIONAL’S DISCRETION**

---

**EMERGENCY**

- Obstructed Airway - not breathing
- Severe current
- Burn - facial / inhalation
- Hypoglycaemia - glucose less than 3
- Cardiac arrest

**VERY URGENT**

- High energy transfer (severe mechanism of injury)
- Shortness of breath - acute
- Level of consciousness reduced / confused
- Coughing blood
- Chest pain
- Stabbled neck
- Haemorrhage - uncontrolled (arterial bleed)
- Focal neurology - acute (stroke)
- Aggression
- Threatened limb
- Eye injury
- Dislocation of larger joint (not finger or toe)
- Fracture - compound (with a break in skin)
- Burn over 20%
- Burn - electrical
- Burn - circumbrochial
- Burn - chemical
- Poisoning / Overdose
- Diabetic - glucose over 11 & ketonuria
- Vomiting fresh blood
- Pregnancy and trauma
- Pregnancy and abdominal pain

**URGENT**

- Haemorrhage - controlled
- Dislocation of finger OR toe
- Fracture - closed (no break in skin)
- Burn - other
- Abdominal pain
- Diabetic - glucose over 17 (no ketonuria)
- Vomiting persistently
- Pregnancy and trauma
- Pregnancy and PV bleed
- Moderate pain

---

**ADULT TEWS**

<table>
<thead>
<tr>
<th>Age 12 years</th>
<th>Age under 12 yrs</th>
<th>Age over 12 yrs</th>
</tr>
</thead>
<tbody>
<tr>
<td>RR</td>
<td>HR</td>
<td>SBP</td>
</tr>
<tr>
<td>Cold</td>
<td>Cold OR Over 38.4˚</td>
<td>Cold OR Over 38.4˚</td>
</tr>
<tr>
<td>Alert</td>
<td>Alert Reacts to Voice</td>
<td>Alert Reacts to Voice</td>
</tr>
<tr>
<td>Mobility</td>
<td>Walking With Help Stretcher</td>
<td>Stretcher</td>
</tr>
</tbody>
</table>

---

**CHECK FOR ADDITIONAL INVESTIGATIONS**

- If RR scores 1 point or more on TEWS, Check SpO2 and hand over to SHCP to give O2.
- Do a finger prick glucotest if patient is diabetic.
- Reduced level of consciousness (not alert including confused), Do a finger prick glucotest and hand over to SHCP.
- Do a urine dipstick to check for ketones.
- Unable to sit up / need to lie down, Do a finger prick glucotest and hand over to SHCP.
- Chest pain, Immediate ECG and hand over to SHCP.
- Active seizure / fitting, Do a finger prick glucotest and hand over to SHCP.
- History of diabetes, Do a finger prick glucotest and hand over to SHCP.
- Hypoglycaemia (glucose 5 mmol/L or less), More to read hand over to SHCP and give something to eat or drink.
- Abdominal pain or backache, female, Urine dipsticks and Urine pregnancy test.

---

**Figure 4: Adult SATS chart**
Figure 5: Paediatric SATS chart
ADULT CLINICAL SIGNS

Learning Objectives:
- Be familiar with the adult emergency signs
- Be familiar with the adult very urgent and urgent signs

3.1 EMERGENCY SIGNS

<table>
<thead>
<tr>
<th>EMERGENCY</th>
</tr>
</thead>
<tbody>
<tr>
<td>Obstructed airway – not breathing</td>
</tr>
<tr>
<td>Seizures - current</td>
</tr>
<tr>
<td>Burn – facial /Inhalation</td>
</tr>
<tr>
<td>Hypoglycaemia – glucose less than 3 mmol/L</td>
</tr>
<tr>
<td>Cardiac arrest</td>
</tr>
</tbody>
</table>

It is important to note that if a patient has any emergency signs then a T E W S does NOT need to be calculated to categorise them as Red. There should be no delay in taking the patient to the resuscitation area. The first set of vitals may be obtained in the resuscitation area or in the ambulance.

Other emergency signs for adults include an obstructed airway (patient not breathing), a patient convulsing, and hypoglycaemia with a glucose less than 3 mmol/L or cardiac arrest.

3.2 VERY URGENT SIGNS

<table>
<thead>
<tr>
<th>VERY URGENT</th>
</tr>
</thead>
<tbody>
<tr>
<td>High energy transfer (severe mechanism of injury)</td>
</tr>
<tr>
<td>Focal neurology – acute (stroke)</td>
</tr>
<tr>
<td>Burn – circumferential</td>
</tr>
<tr>
<td>Shortness of breath - acute</td>
</tr>
<tr>
<td>Aggression</td>
</tr>
<tr>
<td>Burn – chemical</td>
</tr>
<tr>
<td>Level of consciousness reduced / confused</td>
</tr>
<tr>
<td>Threatened limb</td>
</tr>
<tr>
<td>Poisoning / Overdose</td>
</tr>
<tr>
<td>Coughing blood</td>
</tr>
<tr>
<td>Eye injury</td>
</tr>
<tr>
<td>Diabetic – glucose over 11 and ketonuria</td>
</tr>
<tr>
<td>Chest pain</td>
</tr>
<tr>
<td>Dislocation of larger joint (not finger or toe)</td>
</tr>
<tr>
<td>Vomiting fresh blood</td>
</tr>
<tr>
<td>Stabbed neck</td>
</tr>
<tr>
<td>Fracture - compound (with a break in skin)</td>
</tr>
<tr>
<td>Pregnancy and abdominal trauma</td>
</tr>
<tr>
<td>Haemorrhage – uncontrolled (arterial bleed)</td>
</tr>
<tr>
<td>Burn over 20%</td>
</tr>
<tr>
<td>Pregnancy and abdominal pain</td>
</tr>
<tr>
<td>Seizure – post ictal</td>
</tr>
<tr>
<td>Burn – electrical</td>
</tr>
<tr>
<td>Severe Pain</td>
</tr>
</tbody>
</table>

High energy transfer (severe mechanism of injury)
In our context this refers to high speed injuries. Examples of these include a motor vehicle accident of 40 km/h or more, pedestrian vehicle accident, a fall from a roof or a high velocity gunshot wound.

3.3 URGENT SIGNS

Haemorrhage - controlled
This refers to a situation where a patient presents with an active bleed and you as the triage provider apply direct pressure with a dry dressing and are able to control the bleed. This does not refer to a patient presenting with dry blood.

Abdominal pain
In all females of child-bearing age additional investigations (i.e. urine dipstick and urine pregnancy test) should be performed to pick up a possible ectopic pregnancy.

Assessment Questions
Clearly indicate whether the following statements are true or false:

1. Sunged facial hairs and soot around the nose and mouth are an indication of inhalation burn in a patient that has been trapped in a burning house.
   - True
   - False

2. Haemorrhage controlled refers to a patient whose active bleed was controlled by the triage provider by applying direct pressure with a dry dressing.
   - True
   - False

3. A patient in cardiac arrest is immediately categorised Red.
   - True
   - False

Choose the correct answer:

4. Examples of high energy transfers include:
   (a) Motor vehicle accident at 60 km/h
   (b) Fall from a height of ten meters
   (c) Pedestrian vehicle accident at 50 km/h
   (d) High velocity gunshot wound
   (e) All of the above

5. A threatened limb may present as:
   (a) Pain in the affected limb
   (b) A pale, pulseless affected limb
   (c) A weak or numb affected limb
   (d) The affected limb is cold and has poor perfusion
   (e) All of the above
**PAEDIATRIC CLINICAL SIGNS**

**Learning Objectives:**
- Be familiar with the paediatric emergency signs
- Understand the ABC-c-c-DO approach for emergency signs
- Be familiar with the paediatric very urgent and urgent signs

### 4.1 EMERGENCY SIGNS: The ABC-c-c-DO approach

Triage of patients involves looking for signs of serious illness or injury. These emergency signs relate to the Airway-Breathing-Circulation/Coma/Convulsion-Dehydration-Other and are easily remembered as “ABC-c-c-DO”. Each letter refers to an emergency sign which, when identified, should alert you to a patient who is seriously ill and needs immediate intervention. It is important to note that if a patient has any emergency signs then a TEWS does NOT need to be calculated. There should be no delay in taking the patient to the resuscitation area. The first set of vitals may be taken in the resuscitation area or in the ambulance on the way to the hospital.

#### EMERGENCY

<table>
<thead>
<tr>
<th>Airway and Breathing</th>
<th>Not breathing or reported apnoea</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Obstructed breathing</td>
</tr>
<tr>
<td></td>
<td>Central cyanosis or SpO₂ less than 92%</td>
</tr>
<tr>
<td></td>
<td>Respiratory distress (severe)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Circulation</th>
<th>Cold hands + 2 or more of the following:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(i) pulse weak and fast</td>
</tr>
<tr>
<td></td>
<td>(ii) capillary refill time 3 sec or more</td>
</tr>
<tr>
<td></td>
<td>(iii) lethargic</td>
</tr>
<tr>
<td></td>
<td>Uncontrolled bleeding (not nosebleed)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Coma</th>
<th>AVPU: Responds only to Pain (P) OR Unresponsive (U)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Confusion</td>
</tr>
</tbody>
</table>

| Convulsions          | Convulsing or immediately post-ictal and not alert |

<table>
<thead>
<tr>
<th>Dehydration</th>
<th>Diarrhoea or vomiting + 2 or more of the following:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(i) Leathargy/Flabby infant</td>
</tr>
<tr>
<td></td>
<td>(ii) Very sunken eyes</td>
</tr>
<tr>
<td></td>
<td>(iii) Skin pinch very slow - 2 sec or more</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Other</th>
<th>Facial /Inhalation burn</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Hypoglycaemia recorded at any time - glucose less than 3 mmol/L</td>
</tr>
<tr>
<td></td>
<td>Purpuric rash</td>
</tr>
</tbody>
</table>

**HOW TO Triage?**

Keep in mind the ABC-c-c-DO steps:
- Airway, Breathing, Circulation, Coma, Convulsion, Dehydration and Other.

#### 4.1.1 AB AIRWAY AND BREATHING

**ARE USUALLY ASSESSED TOGETHER**

The letters A and B in “ABC-c-c-DO” represent “airway and breathing”. It is evident that an open (patent) airway is needed for breathing. An airway or breathing problem is life-threatening and must receive your attention before you move on to other systems. It is therefore convenient that the first two letters of the alphabet represent the two most important areas to look for emergency or priority signs. If there is no problem with the airway or breathing, you should look for signs in the areas represented by C.

**IS THE CHILD BREATHING?**

If active, talking, or crying, the child is obviously breathing. If in any doubt you must ASSESS three things to check if the child is breathing (see Figure 6):

- **LOOK** - to see if the chest is moving.
- **LISTEN** - for any breathing sounds.
- **FEEL** - Can you feel the breath at the nose or mouth of the child?

If the child is not breathing (or you are not sure if there is breathing), you need to take the child to the resuscitation area where the breathing needs to be artificially supported by ventilating the child with a bag valve mask (BVM) device whilst the child is further assessed and managed appropriately.

**IS THE BREATHING OBSTRUCTED?**

Noisy breathing can be a sign that the airway maybe threatened or partially obstructed. This is most common in patients with a decreased level of consciousness, upper respiratory tract infections or aspiration of foreign bodies. Obstructed breathing can also be due to blockage by the tongue or the patient’s own secretions if these are not being swallowed.

**ARE THERE ABNORMAL RESPIRATORY NOISES?**

- Does the child have nasal flaring or a grunting noise on expiration?
- Does the child have severe chest indrawing? This can be intercostal (between the ribs), subcostal (below the ribcage) , suprasternal (above the sternum) or sternal indrawing (the breastbone is sucked in on inspiration).
- Does the child have nasal flaring or a grunting noise on expiration?
- Is the child using the accessory muscles of the neck for breathing? This can cause the head to nod or bob with every breath. This is particularly seen in young babies.
- Exhaustion: If the child’s breathing is very laboured, especially if it has been like this for some time, then s/he may become exhausted? If this happens then the signs of increased work of breathing can actually decrease as the child is tired - this is a very dangerous sign.

If you see these signs then it is likely that the child has severe respiratory distress.

**IS THE CHILD SHOW CENTRAL CYANOSIS?**

**DEFINITION:** Cyanosis occurs when there is an abnormally low level of oxygen in the blood. This produces a bluish or purplish discoloration of the tongue, the inside of the mouth and the skin. This sign may be absent in a child who has severe anaemia.

To ASSESS for central cyanosis:

- **LOOK** - at the mouth and tongue. A bluish or purplish discoloration of the tongue and the inside of the mouth indicates central cyanosis.
- **MEASURE** - oxygen saturation monitoring is available you can check the child’s oxygen levels. First ensure that the probe is correctly sited and that a good regular trace is showing on the monitor. If oxygen saturation is < 92% in room air the child has low oxygen levels and this is an emergency.

**DOES THE CHILD HAVE SEVERE RESPIRATORY DISTRESS?**

To ASSESS whether the child has severe respiratory distress check for the following signs:

- Is the child having trouble getting breath so that it is difficult to talk, eat or breastfeed?
- Is the child breathing very fast?
- Does the child have severe chest indrawing? This can be intercostal (between the ribs), subcostal (below the ribcage) , suprasternal (above the sternum) or sternal indrawing (the breastbone is sucked in on inspiration).
- Does the child have nasal flaring or a grunting noise on expiration?
- Is the child using the accessory muscles of the neck for breathing? This can cause the head to nod or bob with every breath. This is particularly seen in young babies.
- Exhaustion: If the child’s breathing is very laboured, especially if it has been like this for some time, then s/he may become exhausted? If this happens then the signs of increased work of breathing can actually decrease as the child is tired - this is a very dangerous sign.

If you see these signs then it is likely that the child has severe respiratory distress.

**Signs of severe respiratory distress:**

- Very fast breathing
- Severe lower chest wall indrawing
- Use of auxiliary muscles
- Head nodding
- Inability to feed because of respiratory problems
- Grunting and flaring

**Figure 6: Look, listen and feel**
MEASURE: In any child with respiratory distress, you should check oxygen saturation levels if you have an oxygen saturation monitor. First ensure that the probe is well sited and that you have a good trace on the monitor – if the oxygen saturation is less than 92% in room air, this child has an emergency sign and needs oxygen therapy. However if a child is obviously in severe respiratory distress, oxygen saturation levels do not need to be checked at triage to confirm this emergency sign, rather take the child to the resuscitation area immediately.

If the child is breathing adequately, go to the next section to quickly continue the assessment for emergency signs. If the child has an airway or breathing problem, you should initiate appropriate treatment and then quickly resume the assessment.

4.1.2 CIRCULATION ASSESSMENT

FIRST FEEL THE CHILD’S HANDS – IF THEY ARE WARM YOU DO NOT NEED TO CHECK THE CIRCULATION ANY FURTHER. MOVE ON TO THE NEXT EMERGENCY SIGN.

IF THE HANDS ARE COLD OR COOL – YOU NEED TO RAPIDLY ASSESS FOR OTHER SIGNS OF CIRCULATORY SHOCK: PULSE VOLUME AND RATE; CAPILLARY REFLILL TIME AND LETHARGY.

IS THE PULSE WEAK AND FAST?
The radial pulse (the pulse at the wrist) should be felt. If this is strong and not obviously fast, the pulse is adequate; no further assessment is needed. The radial pulse is used as an initial screen because it is easy to access without undressing the patient.

If the radial pulse is difficult to find, you need to look for a more central pulse (a pulse nearer to the heart). In an infant (less than one year of age) the best place to look is at the middle of the upper arm, the brachial pulse. If the child is lying down you could look for the femoral pulse in the groin. The pulse should be strong. If the more central pulse feels weak, decide if it also seems fast. This is a subjective judgement and an exact count is not taken. If the central pulse is weak and fast, the child needs further assessment and possible treatment for shock.

All these procedures can and should be practised on yourself, your friends, your children and family, and finally on real patients. Practice is the best way to improve on finding pulses and measuring capillary refill.

Note that we do not recommend blood pressure to assess for shock at triage because of two reasons:
1) Low blood pressure is a late sign of shock in children and 2) the blood pressure in children is less predictive at triage than in adults.

4.1.3 C- COMA AND CONVULSIONS ASSESSMENT

IS THE CHILD IN A COMA?

A child who is awake is obviously conscious and you can move to the next component of the assessment. If the child is asleep, ask the mother if the child is just sleeping. If there is any doubt, you need to assess the level of consciousness.

Try to wake the child by talking to him/her, e.g. call his/her name loudly. A child who does not respond to this should be gently shaken. A light shake to the arm or leg should be enough to wake a sleeping child. If this is unsuccessful, apply a firmer squeeze to the nape of the neck, enough to cause some pain. A child who does not wake to voice or being shaken or to pain is unconscious.

To help you assess the consciousness level of a child, a simple scale (AVPU) is used:
- A: Is the child Alert? If not, V: Is the child responding to Voice? If not, P: Is the child responding to Pain?

The child who is Unresponsive to voice (or being shaken) AND to pain is Unconscious.

A child who is obviously in severe respiratory distress, oxygen saturation levels do not need to be checked at triage to confirm this emergency sign, rather take the child to the resuscitation area immediately.

If the child becomes less elastic - Does the child have very sunken eyes?

DOES A SKIN PINCH GO BACK VERY SLOWLY (2 SECONDS OR MORE)?

This is a simple test to look at how elastic the skin is. If the child is not dehydrated, the skin will be elastic and, when pinched and released, will return to normal straight away. Try this on yourself.

The dehydrated child will have lost fluid. The body moves fluid from less important places, such as the skin, to maintain the circulation. The skin becomes less elastic and, when pinched, is slow to return.

Locate the area on the child’s abdomen halfway between the umbilicus and the xiphoid process.

To assess if the child is severely dehydrated you need to know:
• Is the child lethargic?
• Does the child have very sunken eyes?
• Does a skin pinch take 2 seconds or more to go back?

IS THE CHILD LETHARGIC?

In the older child lethargy is quite easy to assess. You have already assessed the state of consciousness of the child using the AVPU scale. Now observe if the child appears drowsy and does not show interest in what is happening around him/her. A lethargic child may not look at the mother or watch your face when you talk. The child may stare blankly and appear not to notice what is going on around him/her.

Does the child know his/her name and answer questions sensibly? If the child responds to voice but remains drowsy, he/she is lethargic. In the younger child, signs of lethargy are harder to assess.

DOES THE CHILD HAVE VERY SUNKEN EYES?

Look at the child’s eyes to determine if they appear unusually sunken in their sockets. (See Figure 8). Ask the mother if the child’s eyes are more sunken than usual.

DOES A SKIN PINCH GO BACK VERY SLOWLY (2 SECONDS OR MORE)?

This is a simple test to look at how elastic the skin is. If the child is not dehydrated, the skin will be elastic and, when pinched and released, will return to normal straight away. Try this on yourself.

The dehydrated child will have lost fluid. The body moves fluid from less important places, such as the skin, to maintain the circulation. The skin becomes less elastic and, when pinched, is slow to return.

Locate the area on the child’s abdomen halfway between the umbilicus and the xiphoid process.

To assess if the child is severely dehydrated you need to know:
• Is the child lethargic?
• Does the child have very sunken eyes?
• Does a skin pinch take 2 seconds or more to go back?

IS THE CHILD CONVULSING NOW OR POST-ICHTAL?

This assessment depends on your observation of the child and on the history from the parent. Children who have a history of convulsion, but are alert during triage, will need a complete clinical history and investigation by a clinician, but at triage they are not assigned an emergency clinical sign, as they do not usually require any resuscitation immediately.

The child may be seen to have a convulsion during the triage process or while waiting in the outpatient department. You can recognize a convulsion by the sudden loss of consciousness associated with uncontrolled jerky movements of the limbs and/or the face. There is stiffening of the child’s arms and legs and uncontrolled movements of the limbs. The child may lose control of the bladder, and is unconscious during the convulsion and drowsy afterwards.

Sometimes, in small infants, the jerky limb movements may be absent, but there may be more subtle twitching movements of the face, mouth, eyes, hands or feet. You have to observe the infant carefully.
the umbilicus and the side of the abdomen. Avoiding using your fingertips, as this is painful. Pinch the skin in a vertical (head to foot) direction and not across the child’s body. You should pick up all the layers of the skin and the fat tissue underneath. Pinch for one second and then release. See whether the skin goes back very slowly (2 seconds or more). Severe dehydration is present if the child has a history of diarrhoea plus any two of the following signs: lethargy, sunken eyes or very slow skin pinch (2 seconds or more).

4.2 VERY URGENT signs
epidemiology.

The frequency with which children showing these very urgent signs appear in your emergency centre depends on the local epidemiology.

4.1.5 OTHER EMERGENCY SIGNS

Facial inhalational burns
Any child in whom the airway has potentially been exposed to heat (e.g. trapped in a house fire, hot water burn to face with possible steam inhalation or chemical burn to face or mouth) may get rapid swelling of the airway. Children presenting with this emergency sign should be triaged Red.

Glucose <3mmol/L at any time
Children with a low blood sugar are often very sick and need to be seen immediately. They should be triaged Red if found to have a blood glucose concentration of less than 3 mmol/L.

Purpuric Rash
Children who present with a complaint of a rash - should be assessed to see if the spots blanch with pressure from fingerpinct or glass test (i.e. turns white when pressure is applied). If the spots are non-blanching (i.e. does not turn white when pressure is applied) - then there is a risk of meningococcal disease. Children presenting with this emergency sign should be triaged Red. If you are unsure about a child presenting with a rash ask the senior healthcare professional.

You have now learned how to recognize the obvious emergency signs in paediatric signs. The next section will cover the very urgent and urgent signs respectively. It is important to note that if a patient has any emergency signs then a TEWS does NOT need to be calculated. There should be no delay in taking the patient to the resuscitation area. The first set of vital may be taken in the resuscitation area or in the ambulance on the way to the hospital.

If any EMERGENCY signs have been found the TEWS should NOT be calculated at triage, the child is within the RED category and should be taken to the resuscitation area.

Children within the RED category need emergency care and should be seen immediately.

Always ensure that the child with emergency signs is handed over directly to a SHCP.

4.2 VERY URGENT SIGNS

If the child does not have any of the emergency ABC-c-c-DO signs, the triage provider proceeds to assess the child on the very urgent signs. This should not take more than a few seconds. Some of these signs will have been noticed during the ABCD triage discussed so far, and others need to be re-checked. Follow the list of very urgent signs to quickly complete this section to decide whether the child has any very urgent or urgent signs that need prompt management.

The presence of obvious very urgent signs does not automatically make the child’s triage priority ORANGE. Always calculate the TEWS and check key additional investigations to ensure that the child does not need to be assigned to the RED category and taken for emergency care.

The frequency with which children showing these very urgent signs appear in your emergency centre depends on the local epidemiology.

Tiny baby (less than two months of age)
If the child appears very young, ask the mother his age. If the child is obviously not a young baby, you do not need to ask this question. Small babies are more difficult to assess properly, more prone to getting infections (from other patients), and more likely to deteriorate quickly if unwell. All tiny babies of under two months of age should therefore be seen very urgently.

Inconsolably crying/ severe pain
The inconsolably crying child is conscious but cries constantly and will not settle. Ask the parent of caregiver if the child is upset/frighen by the unfamiliar environment or whether this is the presenting complaint. If a child has severe pain and is in agony, s/he should be prioritized to receive very urgent assessment and pain relief. Severe pain may be due to severe conditions such as acute abdomen, meningitis, etc. You are not required to do a formal pain scale assessment, but for your information there are some examples of pain scales appended at the end of part four.

Presenting complaint - ‘more sleepy than normal’

When the mother complains that her child that is more sleepy than normal (NOT just in natural sleep), the child may be in the early stages of serious conditions such as meningitis, hypoglycaemia, septicaemia etc, and will need to be identified and managed very urgently. Even if the child appears alert at triage still assign a Very Urgent clinical sign as we have to take seriously the mothers concern.

Poisoning or Overdose
A child with a history of swallowing drugs or other dangerous substances needs to be assessed very urgently, as s/he can deteriorate rapidly and might need specific treatment depending on the substance taken. The mother will tell you if she has brought the child because of possible intoxication. Consult SHCP for advice regarding very urgent management.

Focal neurology acute
A child who is fully conscious but has new focal neurological signs will need very urgent assessment. In this case, the child does not require emergency treatment because they do not have any ABCD emergency signs, but may need urgent imaging and intervention. Examples of focal neurological signs include cranial nerve palsies and acutely paralysed limbs - their presence may indicate a form of vascular stroke and management may be time dependent. The child may have a weakness on one side of the body and may not be able to move as normal. The parent may also complain that their child has a new onset of a squint or a paralysed face.

Severe Trauma – severe mechanism of injury

Usually this is an obvious case, but one needs to think of motor vehicle accident injuries, falls from a height greater than one metre in height, gunshot wounds and other traumatic mechanisms of injury in this category. Remember the ABC-c-c-DO assessment would already have identified any life-threatening problems requiring immediate resuscitation.

Burns
These include: Circumferential, Electrical, Chemical and any burn involving 10% or more of body surface area.

Burns are extremely painful and children who seem quite well can deteriorate rapidly.

Severe dehydration is present if the child has a history of diarrhoea plus any two of the following signs: lethargy, sunken eyes or very slow skin pinch (2 seconds or more). Severe dehydration is present if the child has a history of diarrhoea plus any two of the following signs: lethargy, sunken eyes or very slow skin pinch (2 seconds or more).
The size of the burn needs to be determined using the Rule of Nines method (the palmor method is more suitable for smaller burns - see page 22). For any child with a major burn resuscitation must be commenced. Follow the provincial burns management guidelines 2011 including analgesia.

The example left is of a one year-old child. Refer to Table in the provincial Emergency Management of Severe Burns manual for different ages.

**Fracture – open**

An open fracture may be associated with a large volume of blood loss that may be very obvious (external) or may be concealed (internal) – perhaps only recognisable by swelling around the fracture area. This needs very urgent attention.

**Dislocation of large joint (not finger or toe)**

Apart from being very painful, a large joint dislocation may compromise blood and nerve supply to the limb distal to the affected joint. Damage to the neurovascular bundle implies serious injury and needs very urgent attention.

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**APPENDIX B: Examples of different pain scales**

**Behavioral Observation Pain Rating Scale**

<table>
<thead>
<tr>
<th>Categories</th>
<th>Scoring</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Face</strong></td>
<td></td>
</tr>
<tr>
<td>No particular expression or smile; disinterested</td>
<td>Occasional grimace or frown, withdrawn</td>
</tr>
<tr>
<td>Legs</td>
<td></td>
</tr>
<tr>
<td>No position or relaxed</td>
<td>Uneasy, restless, tense</td>
</tr>
<tr>
<td>Activity</td>
<td></td>
</tr>
<tr>
<td>Lying quietly, normal position, moves easily</td>
<td>Squirming, shifting back and forth, tense</td>
</tr>
<tr>
<td>Cry</td>
<td></td>
</tr>
<tr>
<td>No crying (awake or asleep)</td>
<td>Moans or whimpers, occasional complaint</td>
</tr>
<tr>
<td>Consolability</td>
<td>Content, relaxed</td>
</tr>
</tbody>
</table>

Each of the five categories: (F) Face; (L) Legs; (A) Activity; (C) Cry; (C) Consolability is scored from 0 - 2, which results in a total score between 0 and 10.

Observe the child and score the child’s pain according to the ‘FLACC’ scale.

- **‘Faces’ Pain Rating Scale**
  - Ask the older child to point to the face that best describes how s/he feels.

**4.3 URGENT SIGNS**

These children do not have any of the emergency ABC-c-c-DO signs nor do they have any of the very urgent signs. The triage provider should proceed to assess the child on the urgent signs. This should not take more than a few seconds.

Even if there are obvious urgent signs – calculate the TEWS and carry out additional investigations to ensure that the patient is not possibly within the RED or ORANGE category.

Some respiratory distress

When you assessed the airway and breathing, did you observe any respiratory distress? If the child has severe respiratory distress, this is an emergency. There may however, be signs present that you do not think are severe, e.g. some lower chest wall indrawing (but not severe), or slight increase

---

**Additional Investigation**

- RR scoring 1 point or more → measure oxygen saturation
Malnutrition with visible severe wasting

Severe wasting is a form of severe malnutrition. These children are easy to pick up because their muscles are very wasted and they have loose skin folds particularly noticeable around their upper thighs, buttocks and upper arms. If you are concerned that a child might be malnourished look rapidly at these body areas. Severely malnourished children are prone to hypothermia, hypoglycaemia and infections and need to be managed urgently according to the WHO severe malnutrition guidelines to prevent complications.

Malnutrition with pitting oedema of both feet

This is another form of severe malnutrition. It is as dangerous as the one described above and is recognised by the pitting oedema of both feet; they may also present with general body swelling. If you are concerned that a child might be malnourished look rapidly at the child’s feet and check for oedema of both feet. These children often appear listless and apathetic and have skin and hair changes. They are also prone to hypothermia, hypoglycaemia and infections and need to be managed urgently according to the WHO severe malnutrition guidelines to prevent complications.
Assessment Questions
Clearly indicate whether the following statements are true or false:

1. Grunting and nasal flaring are signs of severe respiratory distress.
   - True  False

2. Oxygen saturation levels should always be checked in a child that looks blue.
   - True  False

3. If no emergency sign is identified in step one, but an urgent sign is identified in step two, the patient is immediately taken to the majors area for urgent management.
   - True  False

Choose the correct answer:

4. In the ABC-c-c-DO approach ABC stands for airway, breathing, circulation. What does c-c-D stand for?
   (a) convulsions, chest pain, dehydration
   (b) coma, cancer, disabilities
   (c) coma, convulsions, dehydration
   (d) coma, craniofaryngioma, dehydration
   (e) chronic pain, constipation, dehydration

5. The following are emergency signs
   (a) oxygen saturation levels more than 92%
   (b) facial or inhalation burn
   (c) stridor, snoring and secretions
   (d) closed fracture
   (e) b and c above

Learning Objectives:
- Be familiar with the different age appropriate versions of the TEWS
- Understand how to calculate the TEWS in paediatric and adult patients

The TEWS is a composite score representing physiologic parameters at triage. There are different age appropriate versions: the younger child TEWS is for patients younger than 95cm or younger than 3 years (see Figure 12); the older child TEWS is for patients 96cm to 150cm or 3 years to around 12 years (see Figure 13); and the adult TEWS is for patients older than 12 years or taller than 150cm. Older children, where you are unsure which form to use, should be measured. If they are over 150cm then the adult version should be used. This standardised scoring system has been validated and many of the boxes in the TEWS calculator are shaded grey. These boxes cannot be assigned a score. This means that for temperature, for example, it is only possible to score 0 or 2 points, depending on the value of the recording.

**Figure 12: Younger Child TEWS (younger than 3 years)**

**Figure 13: Older Child TEWS (age 3 - 12 years)**

<table>
<thead>
<tr>
<th>YOUNGER THAN 3 YEARS / SMALLER THAN 95 cm</th>
<th>3</th>
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<tr>
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<tr>
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<td>26 - 39</td>
<td>40 - 49</td>
<td>50 or more</td>
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<td>Feels Cold Under 35˚</td>
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</table>
If there is no response to either 'P'. pressure or sternal rub – if the child responds to the response to a painful stimulus (e.g. nailbed pressure or sternal rub) – if the child remains drowsy then he is a “V”. If he makes no response to voice then the triage provider need to assess the response to a painful stimulus (e.g. nailbed pressure or sternal rub) – if the child responds to this s/he is a “P.” If there is no response to either verbal or pain stimuli the patient is labelled as unresponsive.

### MOBILITY

Mobility is observed by noting the mode in which the patient has to be mobilised. A small baby is carried by the carer – as might a small infant or child. You need to assess if the level of movement is normal for that particular child. In the event that the child or adult is in a wheelchair due to permanent paralysis 2 points are given for mobility as the child in a wheelchair is more at risk.

### TRAUMA

Trauma is present if there is ANY injury to the patient within the past 48 hours.

#### 5.2 Terminology and key concepts

1. **Confusion:** An older child may be reported to have confused behaviour or this may be discovered at triage. A confused child appears disorientated, s/he may not be interacting normally with the carer or the environment. s/he may be delirious or hallucinating. A confused child may be taking a lot and aggressive or s/he may be quiet and fearful looking. This sign is difficult to detect in younger children who are usually pre-verbal - so it is only included on the TEWS for the older child.

2. **Acute vs Chronic:** Many patients in South Africa are chronically unwell with serious conditions such as TB or HIV/AIDS. In these patients, daily resting physiology such as respiratory rate may be abnormal. It is important to bear in mind, as their TEWS will be high and they will be given an overall high triage code (they may be overtriaged). It is not for the inexperienced triage provider to decide whether this is the case or not, as sick patients may be missed. However, it is appropriate to ask a senior doctor or sister to review the patient’s triage code.

3. **The younger and older child:** Younger and older children have different resting vital signs to adults. These are often difficult to obtain, and the patients often cry, which pushes up their respiratory and heart rate. The values still need to be recorded as you measure them, so that a correct score can be given in the TEWS, but tell the senior doctor or sister that the child was crying when they were recorded. These staff members can then decide whether the child has been overtriaged or not.

#### Assessment Questions

Clearly indicate whether the following statements are true or false:

1. If a child is nine years old we use the older child TEWS.
   - True
   - False

2. Always undress a child and weigh them so that it is easier to obtain their vital signs.
   - True
   - False

3. To accurately obtain a respiratory rate always start when the patient is at rest, count respirations for 30 seconds and multiply by two.
   - True
   - False

#### Choose the correct answer:

4. The adult TEWS consists of the following parameters:
   - (a) Mobility, respiratory rate, heart rate, temperature and blood pressure
   - (b) Mobility, capillary refill time, heart rate, temperature and blood pressure
   - (c) Mobility, respiratory rate, heart rate, temperature, systolic blood pressure, AVPU and trauma
   - (d) Mobility, respiratory rate, heart rate, temperature, AVPU and trauma
   - (e) Mobility, respiratory rate, oxygen saturation level and blood glucose concentration

5. The older child TEWS consists of the following parameters:
   - (a) Mobility, respiratory rate, heart rate, temperature and blood pressure
   - (b) Mobility, capillary refill time, heart rate, temperature and blood pressure
   - (c) Mobility, respiratory rate, heart rate, temperature and trauma
   - (d) Mobility, respiratory rate, heart rate, temperature, AVPU and trauma
   - (e) Mobility, respiratory rate, oxygen saturation level and blood glucose concentration
**ADDITIONAL INVESTIGATIONS**

**Learning Objectives:**

- Be familiar with the additional investigations and when to perform them
- Know how additional investigations may change the triage priority level

For all patients (especially children) immediate additional investigations may be indicated to identify potentially serious complications of their presenting conditions. Check if the patient has any of the conditions listed below and act accordingly.

**RESPIRATORY RATE (RR) SCORES MORE THAN 1 POINT ON TEWS:**

- **ADDITIONAL INVESTIGATION**
  - Measure oxygen saturation (for children on finger, toe, hand or earlobe, depending on available saturation probe and co-operation)

A raised RR for age may indicate serious underlying pathology such as chest infection requiring supplemental oxygen.

**REDUCED LEVEL OF CONSCIOUSNESS**

- All patients that are not fully alert (i.e. confused or only responding to verbal or painful stimulus) need to have a finger prick glucotest done and should be handed over to the senior healthcare professional.

If the child is not alert, or the caregiver volunteers that the child is more sleepy than normal, this may indicate a serious evolving medical condition such as meningitis or if associated with a history of trauma there could be a traumatic brain injury.

Any sick child who has not been feeding well or has been vomiting may become drowsy because of a low blood sugar level. Tiny babies and malnourished children are particularly at risk of hypoglycaemia.

**UNABLE TO SIT OR MOVE AS NORMAL**

- If the patient is unable to walk or move as normal or the caregiver reports that the child is lethargic or unable to move as usual, this may also be a sign of serious illness or of a low blood sugar level.

**RECENT SEIZURE/FIT**

- The patient who is actively fitting will have been taken to the resuscitation area. In any child with a history of recent seizure there could be easily identifiable and treatable causes, including hypoglycaemia, pyrexia (febrile seizure) or high blood pressure.

**HISTORY OF DIABETES**

- All patients with diabetes are at risk of either becoming hypoglycaemic (usually drowsy or confused) or hyperglycaemic with diabetic ketoacidosis (DKA). All therefore need a glucotest done at presentation.

**DIABETES AND HYPERGLYCAEMIA (GLUCOTEST 11 OR MORE)**

- All patients with a glucose concentration of 11 mmol/L or more require a urine dipstick to check for ketones.

**CHILD HAS MALNUTRITION WITH SEVERE VISIBLE WASTING OR WITH FITTING OEDema OF BOTH FEET**

- This child is at risk of hypoglycaemia, as well as hypothenmia

**PERFORM A FINGER PRICK GLUCOTEST IN THE FOLLOWING CASES:**

- Reduced level of consciousness
- Unable to sit or move as usual
- Current or recent seizure
- Known with diabetes
- Severe malnourishment

**ABDOMINAL PAIN OR BACKACHE IN FEMALES**

- The adult female with abdominal pain may have an ectopic pregnancy leading to severe pain and discomfort as time progresses. She may be at risk for a ruptured ectopic or other complications in pregnancy requiring emergency surgery. These additional investigations may rapidly identify very ill patients and change their category. They also prevent and/or identify serious complications.

**Assessment Questions**

Clearly indicate whether the following statements are true or false:

1. A patient with a glucose of 11 mmol/L needs to have a urine dipstick done to check for ketones in the urine.
   - True  [ ] False  [ ]

2. Check the finger prick haemoglobin on all patients that have a history of diabetes.
   - True  [ ] False  [ ]

3. Do a urine dipstick and urine pregnancy test on all adult females presenting with abdominal pain.
   - True  [ ] False  [ ]

Choose the correct answer:

4. Perform a finger prick glucotest on the following cases:
   - (a) Current or recent seizure
   - (b) Facial burn
   - (c) Reduced level of consciousness
   - (d) History of diabetes
   - (e) a, c and d

5. The following two additional investigations may upgrade a patient to the Red category:
   - (a) Oxygen saturation levels in children and finger prick haemoglobin
   - (b) Finger prick haemoglobin levels and urine dipstick
   - (c) Urine dipstick test and oxygen saturation levels
   - (d) Finger prick glucotest and oxygen saturation levels
   - (e) Finger prick glucotest and finger prick haemoglobin
Learning Objectives:

- Be familiar with the additional tasks
- Know when to perform additional tasks

For all patients (especially children) whether triaged RED, ORANGE, YELLOW OR GREEN immediate additional tasks may be indicated to stabilise the patient and/or identify or prevent potentially serious complications. Check if the child has any of the conditions listed below and act accordingly.

**TINY BABY UNDER 2 MONTHS**

Small babies under 2 months are more difficult to assess, their symptoms are often non-specific, they have lower immunity than other children so are more prone to infections, and they deteriorate more quickly. They therefore need to be assessed as a priority.

**POISONING OR OVERDOSE**

Toxins are inquisitive and like to explore their environment. They may accidentally ingest a variety of household substances, pesticides or medications. A child who has ingested a poison can deteriorate quickly. They may require a specific antidote and if a poison or medication has been ingested recently immediate intervention may be needed (e.g. activated charcoal). It is therefore important to consult a SHCP for children and adults even if the patient appears stable.

**IF CHILD APPEARS TO BE IN PAIN OR IS INCONSOABLY CRYING**

This may be due to a medical cause like an ear infection or from severe headache due to meningitis. Or there may be an obvious cause such as a fracture or laceration. Pain is obviously unpleasant for both the child and carer. It is good practice to initiate analgesia as soon as possible for children and adults.

**BURN**

The patient will be experiencing pain and especially children have the potential to deteriorate rapidly from significant fluid losses and may develop hypothermia. If the burn is recent (<3hrs) immediate intervention may limit the extent of tissue damage.

**TEMPERATURE 38.5˚C OR MORE**

A very high temperature will result in physiological changes that may affect the TEWS, and make the patient feel uncomfortable and in some children may be associated with a febrile seizure.

**TEMPERATURE 35.5˚C OR LESS**

Hypothermia might be a sign of severe sepsis with very small babies, ex-premature babies and severely malnourished children being the most at risk.

**DIARRHOEA & VOMITING**

Even if the child has no or some dehydration, the child is at risk of becoming dehydrated whilst waiting to be seen and should receive oral rehydration to treat and/or prevent further dehydration.

**ADDITIONAL TASKS**

- **ADDITIOnAL TASK** Tiny baby under 2 months → refer to SHCP
- **ADDITIOnAL TASK** Poisoning / overdose → refer to SHCP
- **ADDITIOnAL TASK** Pain or intractable crying → check with SHCP for initiation of analgesia and review
- **ADDITIOnAL TASK** Pain → check with SHCP for initiation of analgesia and review
- **ADDITIOnAL TASK** If the burn occurred recently (within 3hrs) → it is still worthwhile to cool the burn area with water, for example, by running cool tap water over the burn area for 30 minutes. The child should then be dried and wrapped in a clean sheet or blanket to avoid hypothermia.
- **ADDITIOnAL TASK** Low temperature → warm the patient with additional blankets for children with a cap if available and hand over to SHCP
- **ADDITIOnAL TASK** Diarrhoea & vomiting → take child to ORT corner and advise caregiver to start ORT by cup and spoon

**VOMITING WITHOUT DIARRHoeA AND THE CHILD IS DEHYDRATED**

Vomiting alone which is severe enough to result in dehydration may indicate a diagnosis other than simple gastroenteritis e.g. urinary tract infection; a surgical problem with bowel obstruction; diabetic ketoacidosis or even meningitis or another severe infection. It may not be appropriate to automatically commence this child on a trial of oral rehydration – and so senior advice should be sought.

**IF THE CHILD HAS A CLOSED FRACTURE**

These children will be experiencing significant pain - both medication and immobilization of the affected limb will provide some relief from the pain and should be initiated prior to formal assessment.

**ACTIVE ONGOING BLEEDING**

Children have a small circulating blood volume, and are at risk of becoming shocked quickly if there is ongoing bleeding from a trauma site.

**PRESENTING COMPLAINT IS ABDOMINAL PAIN**

Abdominal pain is a common complaint in children and it has a wide variety of possible causes including urinary tract infection, diabetic ketoacidosis, hepatitis or other causes. A urine stick for children and adults will assist in excluding or diagnosing these.

**ADDITIONAL TASKS**

- **ADDITIOnAL TASK** Vomiting only with dehydration
- **ADDITIOnAL TASK** Very high or very low temperatures
- **ADDITIOnAL TASK** Vomiting only with dehydration
- **ADDITIOnAL TASK** The severely malnourished child
- **ADDITIOnAL TASK** A child with active bleeding

**A senior healthcare professional should be alerted in the following cases:**

- Tiny baby younger than 2 months old
- Reduced level of consciousness
- A child in pain including fractures and burns
- Poison ingestion or overdose

**Additional Tasks at triage**

**ADULT PATIENTS**

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<thead>
<tr>
<th>PROBLEM</th>
<th>IMMEDIATE TASKS</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Temperature 38.5˚C or more</td>
<td>Paracetamol 1 g orally start (document in the notes)</td>
</tr>
<tr>
<td>2. Temperature 35˚C or less</td>
<td>Warm the patient with blankets if available</td>
</tr>
<tr>
<td>3. Diabetes and hyperglycaemia</td>
<td>Urine dipstick to check for ketones</td>
</tr>
<tr>
<td>[glucose &gt;11 mmol/L or more]</td>
<td>Finger prick haemoglobin</td>
</tr>
<tr>
<td>4. History of bleeding</td>
<td>Finger prick haemoglobin</td>
</tr>
<tr>
<td>5. Bleeding PR, PO or from the site of trauma</td>
<td>Finger prick haemoglobin</td>
</tr>
<tr>
<td>6. Abdominal pain or backache in males</td>
<td>Urine dipsticks</td>
</tr>
<tr>
<td>7. PV bleeding</td>
<td>Urine dipsticks, Urine pregnancy test Finger prick haemoglobin</td>
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</table>
**8.1 Pre-Hospital**

The use of triage within a pre-hospital setting is generally well accepted and understood universally. Whilst this need is quite obvious (even critical) during major incidents, it’s the daily application of triage principles in the despatch of ambulance resources where it has the most benefit. In these scenarios, triage permits the EMS dispatcher to apply rules based decision making to what is an otherwise impossible choice.

The pre-hospital use of triage in the field varies from region to region, but is generally categorised into four priorities (represented by the colours red, yellow, green and blue). Such triage typically uses instability of vital signs to differentiate high from low priority patients. Discrepancies in triage appear when personnel of differing levels of medical experience and qualifications need to assess patients as there are no clear definitions of ‘unstable’ physiology. The terms ‘stable’ and ‘unstable’ are poorly understood and fail to accurately reflect the patient’s clinical condition.

Accurate pre-hospital triage is essential for appropriate call out of secondary resources; accurate notification of receiving hospitals, and quality assessment and audit of the ambulance service. This is particularly pertinent in aeromedical callout requests and use of this specialised resource. For these reasons triage tools based on objective physiological discriminators are essential.

**8.2 Patient streaming**

Triage assigns the patient to an acuity level, which then dictates the amount of time the patient can wait safely before being seen: Red immediate, Orange within 10 minutes, Yellow within an hour and Green within four hours. It is the recommended practice to “stream” these patient categories to different areas and/or healthcare providers within the facility. The normal streaming pattern would be Reds to resus, Oranges and Yellows to Majors and Greens to minors, which would be manned by staff dedicated to these areas. For the most part, streaming patients according to acuity will also stream them according to resource use: full monitoring, access to high-powered drugs and interventions with full team response is necessary to effectively treat the Red patient, while a room with a chair and a single practitioner may be all that is necessary to see and treat the patients in the Green stream. How and where patients are streamed depends on the load, manning and infrastructure of the Emergency Centre or Health Facility. It is important in any system that prioritises order-to-be-seen by anything other than “first-come-first-served” to have a plan to see the lower priority patients. Streaming is a possible mechanism to achieve this. Without streaming, the Green patient will keep being pushed to the back of the queue by the patient of higher acuity, who by necessity should be seen first. With streaming, the higher acuity patients are seen before they die while the lower acuity patients are seen in another area before they leave!

**8.3 Infrastructure**

Triage is a process, not a place, but for the most part will need an area for triage of those patients not sent directly through to resus or majors. This area should allow for privacy and be set up in order to perform the vital signs for the TEWS, additional investigations and tasks. The room should preferably allow for one-way flow of patients from the waiting room into a subwaiting area in the area to which they have been streamed. If not possible, some sort of demarcation of the area or patients should be made in order to separate those already triaged from those who have not been assessed by the triage officer.

**8.4 Alignment of staff to temporal flow of patients**

It is important that triage, the tool to ensure that patients are assessed timeously, does not become the bottleneck in the system. Importantly, if the doctor is ready for the next patient, but cannot see them as they are “first getting triaged”, the object is being defeated.

More often the bottleneck occurs due to failure to align staff with the flow of patients. For the most part, it is possible to predict the times of day when the flow of patients into the EC is heavier (typical “saddle-shaped” curve). Staffing for triage needs to reflect this flow. There should also be some sort of plan in place to deal with unexpected influx of patients: each facility should have an upper limit of patients that they are willing to have waiting for triage, over which a contingency plan needs to be activated; eg a regional hospital has an agreement that if there are five or more patients needing triage, a nurse is called from majors to help triage the patients until the level is back down to less than five waiting.
SUMMARY

Triage is an essential first step in efficient and effective emergency care – whether on the roadside or in the public or private hospital arena. A robust triage tool will help to save lives and reduce morbidity. The South African Triage Scale has been derived by a panel of experts in Emergency Medicine (doctors, nurses and paramedics), and is scientifically proven. It has been shown to improve waiting times and make the emergency centre run more smoothly. However, attention needs to be paid to those patients triaged Green, especially in peak times, and the SATG recommends the use of streaming with a clinical nurse practitioner or doctor to see this group.

The SATS has been validated as part of a Masters in Philosophy (MPhil) with 700 public sector patients, an MPhil with 2000 private sector patients and a PhD. Feedback following publication in four major journals has contributed to the process.

This is Edition 3 and we accept that the tool may not be perfect, that is why your feedback is so important. In addition, there will be ongoing research aimed at keeping the tool accurate and appropriate. If necessary, subsequent editions will follow.

Online resources:
For further information please visit www.emssa.org.za/sats

Contact details:
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SATS Implementation Advisor
082 850 3281
micheletwomey@gmail.com

REFERENCES
