

# The National Emergency Medicine Programme

A strategy to improve safety, quality, access and value  
in Emergency Medicine in Ireland



## NATIONAL EMERGENCY MEDICINE PROGRAMME IRISH CHILDREN'S TRIAGE SYSTEM (ICTS)

## Foreword

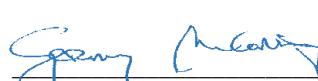
The National Emergency Medicine Programme presents the Irish Children's Triage System (ICTS) for the prioritisation and assessment of paediatric patients presenting to Emergency Departments (EDs) in Ireland. The system supports safer, more effective, timely ED care and reflects the importance of child and family experiences of emergency care. The ICTS makes a very significant contribution to the suite of clinical tools developed by the National Emergency Medicine Programme to drive improvement in the safety, quality and value of emergency care in Ireland.

The triage of children in EDs is an established standard of care in international and national practice. However the triage of children can be difficult compared to adults and additional triage parameters are recommended to reflect age-related physiological differences, children's presenting signs and symptoms, significant paediatric co-morbidities and common Paediatric Emergency Medicine diagnoses.

The development of the ICTS was prompted by the triage experiences of front-line ED nurses and doctors caring for children and advanced by the Emergency Nursing Interest Group (ENIG) of the National Emergency Medicine Programme as a safety and quality improvement initiative. The development and testing of the ICTS has been conducted under the guidance of a Steering Group composed of stakeholders from within Emergency Medicine and senior clinicians across a number of hospitals. The ICTS has undergone extensive stakeholder consultation and the National Emergency Medicine Programme and Office for Nursing and Midwifery Services Director are therefore pleased to endorse the recommendations outlined in this document and recommend that ICTS be adopted as the national standard of triage for children and should be adopted in all EDs in Ireland that see paediatric patients. Implementation of the ICTS will contribute significantly to paediatric patient care in our EDs and will promote safety, quality of care, improved access and patient experience in emergency care in Ireland.



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# Irish Children's Triage System (ICTS)

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<b>Summary</b>	This document describes the prioritisation and assessment of paediatric patients presenting to Emergency Departments (EDs) in Ireland. (Paediatric patient = up to the eve of 16th birthday)
<b>Contact</b>	emp@rcsi.ie
<b>Applies to</b>	Applies to all Emergency Departments in Ireland with paediatric attendances
<b>Audience</b>	All nursing, medical, clinical and administrative staff involved in the care of children who present to Emergency Departments in Ireland
<b>Author</b>	Irish Children's Triage System was developed under the guidance of ICTS National Steering Group and approved by the National Emergency Medicine Programme Working Group and the Emergency Nursing Interest Group.
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ICTS cannot cover all clinical scenarios. The ultimate responsibility for the interpretation and application of these guidelines, the use of current information and a patient's overall care and wellbeing resides with the multidisciplinary clinical team.

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# 1. Purpose

This document describes the Irish Children's Triage System (ICTS), a child-specific triage tool that should be followed for the prioritisation and assessment of paediatric patients presenting to an Emergency Department (ED) in Ireland.

Locally developed paediatric triage systems had been in place in two Paediatric EDs in Dublin, Our Lady's Children's Hospital, Crumlin (OLCHC) and Temple Street Children's University Hospital, (TSCUH). Formal evaluations of these systems indicated that they were safe and effective tools. As a quality improvement initiative, the National Emergency Medicine Programme (EMP) through its Emergency Nursing Interest Group (ENIG) convened an ICTS project subgroup comprising senior nurses from seven EDs (children's only and mixed) and specialists in Paediatric Emergency Medicine. This group collaboratively produced the national ICTS, based largely on the pre-existing tool in use in OLCHC with input from TSCUH.

The work of the project subgroup was overseen by a National Steering Group of key stakeholders and experts in the area of paediatric emergency care. The ICTS was successfully piloted and evaluated in six EDs across the country in 2013, namely:

- Cork University Hospital
- Galway University Hospital
- National Children's Hospital, Tallaght
- Our Lady of Lourdes Hospital, Drogheda
- Our Lady's Children's Hospital, Crumlin
- Temple Street Children's University Hospital

## 1.1 Objectives of the ICTS

- To develop a specific triage tool to clinically assess children attending EDs that facilitates the prompt recognition of acuity for ill or injured children.
- To develop a tool tailored to include clinical elements such as physiological vital signs, pain assessment, temperature and other special guidelines specific to the needs of children.
- To provide an evidence-based approach to the triage of children that supports clinical decision making with regard to the symptoms and clinical management of the patient.
- To provide a National Standard for Children's Triage which ensures that children receive the same standard and quality of care regardless of where in the country they present for treatment.

## 1.2 Approach

When developing the ICTS tool, the sub-group agreed to use a similar format to that of the Manchester Triage System (Mackway-Jones et al 1997, 2006 & 2014) as it was considered appropriate to build on a system that was already familiar to staff rather than introduce a completely new system that would require substantial re-education and training.

## 2. Introduction

The term triage comes from the French verb ‘trier’ meaning to separate, sort, sift or select. It was a concept originally developed by Dr Dominique Jean Larrey, a military surgeon during the Napoleonic Wars, and was used to sort soldiers wounded in battle for the purpose of establishing treatment priorities.

Changes in the health care delivery system in the United States forced EDs to consider alternative ways of handling an increase in the number of patient attendances during the 1950s and early 1960s (Gilboy et al 2005). EDs recognised that a method to sort patients and identify those needing immediate care was required. This provided the impetus to have ED triage systems in place. Doctors and nurses who had used the triage process effectively in the military environment introduced triage into civilian EDs. The transition of the triage process from the military environment to US EDs was considered very successful (Gilboy et al 2005).

Across the world EDs are faced with increasing numbers of patients presenting faster than they can be seen. Longer waits for care make the use of reliable, valid triage systems essential to patient safety (Storm-Versloot et al 2011). Triage is the rapid and preliminary assessment which identifies and sorts patients based on their need for or likely benefit from immediate medical treatment (Fitzgerald et al 2009). Additionally, there are patients who will not require major resources for assessment and treatment and could be seen in a low-intensity (fast-track/ambulatory unit) area by a doctor or an Advanced Nurse Practitioner. Identifying these patients as they present permits the ED to maximise resources and clinical space and allow appropriate resources to be invested in sicker patients at the same time as the less acute and less resource-dependent patients have their needs met.

International healthcare systems in the United Kingdom (Manchester Triage System 1997, 2006 & 2014), Canada (Canadian Paediatric Triage and Acuity Scale 2001 & 2008), and Australia and New Zealand (Australasian Triage Scale, ACEM 2013) have designed national triage systems to attend to patient needs based on acuity of presentation, improve patient safety and enhance satisfaction. Although the United States has a variety of triage tools (3-tier to 5-tier systems), the most commonly used triage system in the US is the 5-tier Emergency Severity Index (1998, 2012). Five-level triage systems have been shown to be more reliable and valid than three-level systems (Travers et al 2002, College of Emergency Nursing, Australia 2012).

### 3. The Generic Triage Process

To ensure transparency and uniformity, a formally structured triage system for ED patients is advocated. Internationally, the most commonly used triage processes are 5-tiered in nature and classify the acuity of a patient's condition based chiefly on the patient's presenting complaint and findings on assessment (Murray et al 2004, ACEM 2013). Acuity rating levels are used to prioritise patients for care and characteristically involve assigning a numeric score to patients, such as triage category 1 (most acute) to triage category 5 (least acute). The presenting complaint determines which flowchart is followed. Each flowchart is based on a five-step decision process that uses general and condition-specific discriminators at each step to assign patients to one of the five triage categories (Storm-Versloot et al 2009). The triage decision and acuity rating allocated to the patient determines the ideal maximum time to first contact with the treating clinician (Mackway Jones et al 2006) and this prioritisation influences and ultimately affects patient safety. It is imperative therefore, that patients in need of urgent care are identified immediately, as adverse outcomes may otherwise occur while the patient is waiting. Mackway-Jones et al (2006, 2014) maintain that triage is a fundamental element of ED clinical risk management. Inherent in the belief that triage is of value is the assumption that the outcome of some patients will be improved if they are seen sooner whilst other patients will not be adversely affected by delays in their care.

Triage is frequently the first instance of clinical contact for patients and their carers presenting to the ED. It is consistently the point at which emergency care begins in the acute hospital setting. Clinical decisions made by triage nurses require complex cognitive processes. The ability to make efficient clinical judgments and decisions is critical, and the quality and accuracy of triage decisions are central to appropriate and timely clinical care. Some authors suggest that response times (interval from time of triage categorisation to treating clinician review) are ideals and not standards, based on the need for timely interventions that improve outcomes (Warren et al 2001, PricewaterhouseCoopers and the Health Administration Corporation 2011). However ACEM (2013) suggests that the triage category outlines the maximum time that a patient should wait for a treating clinician assessment.

Triage also allows for the allocation of a patient to the most appropriate assessment and treatment area and contributes information that helps to describe case-mix in the ED (ACEM 2013). Patients who are identified as safe to wait longer may be seen by another caregiver such as an Advanced Nurse Practitioner (Veen & Moll 2009). The triage process should form the start of a documented care pathway for each individual patient (Comhairle na nOspideal 2002).

The aims of triage are:

- To rapidly identify patients with urgent, life threatening conditions;
- To ensure that patients are treated in the order of their clinical urgency;
- To initiate appropriate nursing interventions e.g. first aid, administer prescribed medication/analgesia and emergency interventions;
- To improve patient outcomes and safety within the department;
- To plan appropriate reassessment and management of patients who remain in a waiting area, dependent on their condition and time frames;
- To allocate patients to the most appropriate assessment and treatment area;
- To decrease congestion in emergency treatment areas;
- To assist in the identification of patients who could be seen by another health professional (e.g. Advanced Nurse Practitioner);
- To contribute information that helps to define departmental acuity and describe departmental case-mix;
- To facilitate patient and public education in relation to health promotion and injury prevention, when appropriate;
- To provide information to patients and families regarding services expected, care and waiting times;
- To act as the liaison for members of the public and other health care professionals.

(Beveridge et al 1999, Murray et al 2004, Mackway-Jones et al 2006, ACEM 2013)

The initial features used to assess urgency in the Irish Children's Triage System (ICTS) are a combination of:

- Presenting problem;
- General appearance;
- Physiological findings;
- Age of the child;
- Significant past medical history that may impact on the current attendance

Internationally, it is recommended that the triage assessment should take no longer than two to five minutes to obtain sufficient information to determine urgency and identify any immediate care needs (Warren et al 2001, Gilboy et al 2005, Gerdzt et al 2007, ACEM 2013). However Travers (1999) demonstrated that this target was only achieved 22% of the time. The triage process tends to incur delays especially in the younger age group of attendees.

Recording of vital signs in children, for example, is time consuming due to difficulty with cooperation (age-related), cognitive ability and comprehension. Privacy also needs consideration as exposing children for assessment and examination is mandatory in a number of circumstances, particularly where rashes need to be assessed or small infants need to be weighed and this can only be performed in a private cubicle. Parental anxiety is another factor that cannot be overlooked and is often reduced by the triage nurse. The commonly internationally accepted times associated with triage are based on adult triage.

The assessment of initial features, presenting problem, general appearance, physiological findings, age of the child and significant past medical history should determine whether a patient is a category 1 (immediate) or 2 (very urgent) and accordingly should be seen within the appropriate timeframe. A more thorough assessment may be required to determine lower triage categories. The National Emergency Medicine Programme Report (2012) recommends that 95% of patients are triaged within 15 minutes of presentation to an ED.

The documentation of the triage assessment in ICTS should include as a minimum the following essential details (In category 1 and 2 patients, some or all of these details and assessments will be carried out in parallel with medical assessment):

- Date and time of assessment;
- Name of triage nurse;
- Chief presenting problem(s);
- Significant past history that may have an impact on current attendance;
- Relevant assessment findings;
- Appropriate vital signs, neurological observations, respiratory assessment, pain score, blood sugar depending on presentation and findings;
- Diagnostic, first aid or treatment measures initiated;
- Weight of the child as this is an essential component of paediatric medication calculations (critically ill patients will have their weight calculated using recognised locally agreed formula);
- Infectious contacts/immunocompromised patients identified to determine if the patient requires isolation;
- Vaccination status, medications and allergies;
- Initial triage category allocated;
- Ongoing patient assessments required;
- Waiting area/treatment area allocated.

(Beveridge et al 1999, ACEM 2013)

The role of the triage nurse also includes:

- Greeting the child and carer(s) in a warm, empathetic manner;
- Advising the child/carer to notify staff of any change in condition;
- Commencing the child on an appropriate observation regime dependent on their presenting complaint and triage category;
- Administering prescribed medication e.g. analgesia, following discussion with the treating clinician regarding presenting complaint, assessment findings, past medical history (including allergies);
- Administering first aid treatment to the child (e.g. application of sling, temporary dressing, other appropriate interventions);
- Advising the child's carer/family regarding waiting times and possible delays.

Triage nurses are always encouraged to use their experience and intuition to “up triage” the category (increase the acuity level), even if the patient does not seem to fit exactly with the parameter or definitions on the triage flowchart because: *'if they look sick then they probably are'.* Likewise a nurse should be encouraged to use his / her intuition and not 'down triage' if he/she has concerns (Beveridge et 1999).

## 4. Background to Irish Children's Triage System

### 4.1 Nursing Assessment

Prior to 2011, there were three triage systems in use for triaging children in Ireland: Manchester Triage System (MTS) in the majority of EDs and two modified triage systems designed, tested and audited locally in OLCHC and TSCUH by local Triage Committees consisting of Consultants in Emergency Medicine and senior ED nurses.

In June 2011, the Clinical Nurse Managers 3 (CNM3) from OLCHC and TSCUH were invited to present their triage tools to the Emergency Nursing Interest Group (ENIG). At ENIG meetings senior emergency nurses had expressed the view that MTS had limitations as a tool when triaging children in their departments as many of the decisions made regarding the allocation of triage categories were dependent on nurses' experience with no consideration given, in particular, to the importance of abnormal pulse and respirations in children. As a quality improvement initiative, a proposal was made by ENIG to the Emergency Medicine Programme Working Group that a subgroup should be set up to design an Irish Children's Triage System (ICTS). The objective was to standardise a formal, comprehensive triage tool that would improve consistency between users and be suitable for triaging children in all EDs with paediatric attendances in Ireland. The ICTS subgroup comprised of senior nurses from the three paediatric hospitals and four hospitals with both adult and paediatric attendances. Professor Ronan O'Sullivan and Dr Carol Blackburn (both OLCHC) were the medical leads and all Consultants in Emergency Medicine across the three paediatric EDs in Dublin supported the project.

A comprehensive analysis of the international contemporary triage systems (MTS, Canadian Paediatric Triage and Acuity Scale) had been previously undertaken by the two hospitals who had designed local triage tools. A review of the literature identified three options available when systems of triage are introduced into EDs (Fortes Lahdet 2009):

- Adopt an existing, well-recognised and validated method;
- Develop a national triage model that is suited to national needs;
- Design a local model that reflects specific needs and interests.

### 4.2 Manchester Triage System – Emergency Triage (MTS)

The MTS tool (1997, 2006 and 2014) is an example of a 5-tiered triage system which was referenced considerably whilst developing the two local child-specific triage tools. It uses a series of flow charts for various "presentations" with key "discriminators" to determine the triage category. MTS however, is primarily an adult triage tool (Beveridge et al in 1999, PricewaterhouseCoopers, Health Administration Corporation 2011) and authors suggest that general scales are less helpful (or reliable) at the extremes of age. In 2011, MTS (2006) had 50 flowcharts on the most common presenting complaints to ED; however only 7 of these were specific flow charts for triaging children (abdominal pain in children; crying baby; limping child; irritable child; shortness of breath in children; unwell child; worried parents). The current version of MTS (2014) has 55 flowcharts with 3 additional flowcharts which relate to children (unwell baby, unwell newborn, abused or neglected child).

In MTS, there are no child age-specific parameters available for abnormal pulse or respirations for children. The recommendation that 'age appropriate definitions of bradycardia and tachycardia should be used in children' (MTS 2014, p 161) was considered by the ICTS project sub-group to be too subjective for the assessment of children. In addition, 'increased work of breathing' (MTS 2014, p149) explains increased respiratory rate without providing guidance on age-related clinically relevant parameters.

### 4.3 Canadian Paediatric Triage and Acuity Scale Guideline (PaedCTAS)

PaedCTAS (Warren et al 2001, 2008) was the only child specific triage system identified and is also a 5-tiered triage scale. PaedCTAS was considered to be less user-friendly than MTS but included an age-specific physiologic parameter assessment. Warren et al (2008) identified that abnormal respiratory rate and heart rate may be the only indication of underlying sepsis or impending shock. With this in mind the 'Vital Signs Reference Grids' previously adapted in OLCHC from the age-specific physiologic parameter assessment used in PaedCTAS were incorporated into the Irish Children's Triage System (Appendix 1.1).

Education and training in PaedCTAS system of triage was not readily available in Ireland and this was considered an essential element in developing a formalised triage tool.

## 5. The Development of the Irish Children's Triage System (ICTS)

Neither MTS nor PaedCTAS on their own were considered to fully address the needs of the Irish paediatric patient population or the users of the system, thus the merits of both systems were identified and merged into one child-specific triage tool, namely the Irish Children's Triage System (ICTS).

It was agreed to use a similar format to that of MTS as the flow charts used in MTS were thought to be user friendly and easy to follow. It was also considered appropriate to build on a system that was already familiar to staff rather than introduce a completely new system that would require substantial re-education. Furthermore, ICTS adapted the use of numbering of categories and ideal time targets from MTS rather than target times recommended in the Canadian or Australasian triage tools. Finally, the physiologic parameters assessment of PaedCTAS, as modified previously for use in OLCHC, was incorporated into the new tool (5.2 Tables 1,2,3).

Hereafter, ICTS was developed using flowcharts representing the 22 most common paediatric presenting complaints to Irish EDs. As the presenting signs and symptoms of childhood illnesses can be insidious in nature and the presenting complaint may therefore not always fit neatly into one of the defined flowcharts, two additional default flowcharts of Unwell Child and Unwell Infant (*including pyrexia*) were developed that would be comprehensive enough to capture all potential clinical risk. It is vital, however, that if there is an alternative flowchart more specific to the patient's presenting complaint that this specialised flowchart is used and the flowcharts Unwell Child and Unwell Infant (*including pyrexia*) are only used where a more appropriate flow chart is not available.

### 5.1 Special Case Guidelines

There are some conditions where patients may present and appear well but their underlying condition indicates that these patients can deteriorate at a very rapid rate. With this in mind patients with a history of metabolic disorder, Sickle Cell Disease, patients with a tracheostomy and breathing difficulties or patients with ventriculo-peritoneal shunt problems should never receive a lower acuity than category 2.

In addition, the triage of patients with a co-existing medical problem or extremes of age provides particularly difficult challenges (Veen et al 2008). Patients with significant co-existing illness and co-morbidity are a group in which assessment and management is frequently complex, even with normal childhood illnesses. The ICTS project subgroup gave these children specific consideration (as well as children and babies < 3 months of age) and decided that in the absence of indicators for a higher category, these patients should never be categorised lower than category 3.

## **Children who should never be triaged less than Category**

**2**

- Patients with history of metabolic disorder
- Patient with Sickle Cell Disease
- Patient with a tracheostomy and breathing difficulties
- Patient with ventriculo-peritoneal shunt problems

## **Children who should never be triaged less than Category**

**3**

- Co-existing illness with significant morbidity:
  - Patients with airway problems
  - Significant respiratory history
  - Cardiac patients
  - Patients with significant renal history
  - Bleeding disorders
  - Oncology patients currently receiving oncology treatment
- Babies <3/12
- Immunocompromised patients

## 5.2 Vital Signs Reference Grids (Adapted from Warren et al 2008)

### Respiratory Rate Values

Table 1.

Age	$\leq -2 SD$	- 1 SD	Normal	+ 1 SD	+ 2 SD	$> + 2 SD$
0 – 3 months	< 20	21 – 30	30 – 60	60 – 70	70 – 80	> 80
4 – 6 months	< 20	20 – 30	30 – 60	60 – 70	70 – 80	> 80
7 -12 months	< 17	17 – 25	25 – 45	45 – 55	55 – 60	> 60
1 – 3 years	< 15	15 – 20	20 – 30	30 – 35	35 – 40	> 40
4 – 6 years	< 12	12 – 16	16 – 24	24 – 28	28 – 32	> 32
> 7 years	< 10	10 – 14	14 – 20	20 – 24	24 – 26	> 26

SD: standard deviation

### Heart Rate Values

Table 2.

Age	$\leq -2 SD$	- 1 SD	Normal	+ 1 SD	+ 2 SD	$> + 2 SD$
0 – 3 months	< 65	65 – 90	90 – 180	180 – 205	205 – 230	> 230
4 – 6 months	< 63	63 – 80	80 – 160	160 – 180	180 – 210	> 210
7 -12 months	< 60	60 – 80	80 – 140	140 – 160	160 – 180	> 180
1 – 3 years	< 58	58 – 75	75 – 130	130 – 145	145 – 165	> 165
4 – 6 years	< 55	55 – 70	70 – 110	110 – 125	125 – 140	> 140
> 7 years	< 45	45 – 60	60 – 90	90 – 105	105 – 120	> 120

SD: standard deviation

Colour	Triage category
Red	Triage category 1
Orange	Triage category 2
Yellow	Triage category 3
White	Triage category not determined by pulse or respiration rate

## Classification of Hypertension by Age Group

**Table 3.**

Age Group	Significant Hypertension (mm Hg)	Severe Hypertension (mm Hg)
Neonate (< 7 days)	Systolic BP $\geq$ 96	Systolic BP $\geq$ 106
Neonate (8 – 30 days)	Systolic BP $\geq$ 104	Systolic BP $\geq$ 110
Infant (< 2 years)	Systolic BP $\geq$ 112 Diastolic BP $\geq$ 74	Systolic BP $\geq$ 118 Diastolic BP $\geq$ 82
Children (3 – 5 years)	Systolic BP $\geq$ 116 Diastolic BP $\geq$ 76	Systolic BP $\geq$ 124 Diastolic BP $\geq$ 84
Children (6 – 9 years)	Systolic BP $\geq$ 122 Diastolic BP $\geq$ 78	Systolic BP $\geq$ 130 Diastolic BP $\geq$ 86
Children (10 – 12 years)	Systolic BP $\geq$ 126 Diastolic BP $\geq$ 82	Systolic BP $\geq$ 134 Diastolic BP $\geq$ 90
Adolescents (13 – 15 years)	Systolic BP $\geq$ 136 Diastolic BP $\geq$ 86	Systolic BP $\geq$ 144 Diastolic BP $\geq$ 92
Adolescents (16 – 18 years)	Systolic BP $\geq$ 142 Diastolic BP $\geq$ 92	Systolic BP $\geq$ 150 Diastolic BP $\geq$ 98

Colour	Triage category
Orange	Triage category 2
Yellow	Triage category 3

## 6. General Discriminators

The following is a list of the common discriminators that appear in every flow chart in ICTS and the recommended minimum triage category each specific discriminator should receive in the absence of a specific discriminator identifying a higher acuity level.

Definition	Triage categories	General discriminators
Colour	<b>Red</b>	Airway compromise Inadequate breathing Exsanguinating haemorrhage Currently seizing Abnormal age-related vital signs (Refer vital signs reference grids) GCS ≤ 12 Oxygen saturations ≤ 90%
Triage category	1	
Meaning of triage category	Immediate	
Recommended time to be seen by doctor/reassessment	Immediate (ongoing assessment)	
Colour	<b>Orange</b>	Severe pain (pain score 7-10) Uncontrollable major haemorrhage GCS 13 or 14
Triage category	2	Abnormal age-related vital signs (Refer vital signs reference grids)
Meaning of triage category	Very urgent	Signs of compensated shock
Recommended time to be seen by doctor/reassessment	≤ 10 minutes	Oxygen saturations ≤ 92%
Colour	<b>Yellow</b>	Moderate pain (pain score 4-6) Uncontrollable minor haemorrhage
Triage category	3	Abnormal age-related vital signs (Refer vital signs reference grids)
Meaning of triage category	Urgent	History of unconsciousness
Ideal time targets	≤ 60 minutes	
Colour	<b>Green</b>	Mild pain (Pain score 1-3) Problem <48 hours
Triage category	4	
Meaning of triage category	Standard	
Ideal time targets	≤ 120 minutes	
Colour	<b>Blue</b>	Problem > 48 hours
Triage category	5	
Meaning of triage category	Non urgent	
Ideal time targets	≤ 240 minutes	

## 7. Irish Children's Triage System Flowcharts

ICTS flowcharts are presented in alphabetical order and should be used in conjunction with additional decision making aids and reference charts available in **Appendix 1** of this document.

- **Abdominal Pain / Isolated Abdominal Trauma**
- **Airway / Breathing Difficulty**
- **Altered Blood Glucose (including patients with Diabetes Mellitus)**
- **Back Pain / Isolated Neck and / or Back Injury**
- **Burns / Scalds**
- **Chest Pain / Isolated Chest Injury**
- **Dental Problem**
- **Ear / Nose Problem**
- **Eye Injury / Problem**
- **Foreign Body - not inhaled**
- **Genitourinary Problem**
- **Head Injury / Headache / VP shunt**
- **Limb Problem / Limb Injury**
- **Major Trauma**
- **Overdose and Poisoning**
- **Psychosocial Problem (including self-harm)**
- **Rashes (Blanching / Non-Blanching)**
- **Seizure / Absent Episode / Collapse**
- **Testicular Pain**
- **Throat Problem**
- **Unwell Child (over 1 year) (including Pyrexia)**
- **Unwell Infant (less than 1 year) (including Pyrexia)**
- **Vomiting ± Diarrhoea**
- **Wounds / Signs of Local Inflammation**

### **IMPORTANT NOTES:**

- An electronic version of ICTS is currently available in some EDs in Ireland.
- In EDs where an electronic ICTS system is in use the reference material contained in **Appendix 1** should be made available in paper format .
- Training and education in the use of ICTS including the electronic version rests with an EDs Clinical Operational Group (COG).
- No alterations should be made to any material (hard copy or electronic) without the explicit consent of the National Emergency Medicine Programme.

## Abdominal Pain / Isolated Abdominal Trauma

A = Appendix 1 (Decision making aids and reference charts)

- Airway compromise
- Respiratory failure / respiratory arrest
- Exsanguinating haemorrhage
- Unresponsive / Glasgow Coma Scale Score (GCS)  $\leq$  12
- Abnormal age-related vital signs (Refer A 1.1)
- Penetrating / blunt abdominal / chest trauma with signs of shock

YES

1

NO

- Abnormal age-related vital signs (Refer A1.1)
- Glasgow Coma Scale Score (GCS) 13-14
- Temperature  $\geq$  40.0°C or  $\leq$  35.5°C
- Severe pain (7 - 10/10)
- $\geq$ 10% dehydration: Severe dehydration (Refer A1.2)
- Acute haematemesis / melaena / red currant stools
- Signs of compensated shock
- Significant history / mechanism of injury (Refer A1.3)
- Severe blood loss
- Penetrating / blunt abdominal / chest trauma
- Frank haematuria

YES

2

NO

- Abnormal age-related vital signs (Refer A1.1)
- Moderate pain (4-6/10)
- Moderate dehydration (Refer A1.2)
- Inconsolable by parents
- History inconsistent with injury
- Persistent vomiting / persistent diarrhoea
- Retention of urine
- Jaundice
- Drawing up legs
- ‘Small’ blood on urinalysis
- Suspicion of pregnancy

YES

3

NO

- Mild pain (1-3/10)
- Diarrhoea ± vomiting with no signs of dehydration
- Previous renal problem
- Recent problem (< 48 hours)

YES

4

NO

- Problem > 48 hours with no acute symptoms
- History of constipation – no pain

YES

5

## Airway / Breathing Difficulty

A = Appendix 1 (Decision making aids and reference charts)

- Airway compromise
- Respiratory failure / respiratory arrest
- SaO<sub>2</sub> ≤ 90% in room air
- Marked stridor with severe respiratory distress (Refer A1.4)
- Unresponsive / Glasgow Coma Scale Score (GCS) ≤ 12
- Abnormal age-related vital signs (Refer A1.1)
- Silent Chest
- Drooling
- ‘Tripod’ positioning
- Uncontrollable haemoptysis

YES

1

NO

- Abnormal age-related vital signs (Refer A1.1)
- Glasgow Coma Scale Score (GCS) 13-14
- SaO<sub>2</sub> < 92% in room air
- PEFR < 40% of normal value
- Severe pain (7-10/10)
- Severe respiratory distress (Refer A1.4)
- Signs of compensated shock
- History of floppiness with pallor / cyanosis
- History of apnoea lasting ≥ 20 seconds
- History of smoke inhalation
- Coughing fresh blood
- History of submersion

YES

2

NO

- Abnormal age-related vital signs (Refer A1.1)
- Moderate pain (4-6/10)
- SaO<sub>2</sub> 92%-94% in room air
- PEFR 40-70% of normal value
- Significant respiratory history (e.g. ICU admission)
- Moderate respiratory distress (Refer A1.4)
- History of inhalation / ingestion of foreign body
- History of haemoptysis
- Inhalation of sharp foreign body

YES

3

NO

- Mild respiratory distress (Refer A1.4)
- Mild pain (1-3/10)
- SaO<sub>2</sub> > 94% in room air
- PEFR >70% of normal value
- Recent problem (< 48 hours)
- Cough present with minimal or no distress

YES

4

NO

- No respiratory distress

YES

5

# Altered Blood Glucose (including patients with Diabetes Mellitus)

A = Appendix 1 (Decision making aids and reference charts)

- Airway compromise
- Respiratory failure / respiratory arrest
- Kussmaul breathing (deep sighing respirations)
- Currently seizing
- Unresponsive / Glasgow Coma Scale Score (GCS)  $\leq 12$
- Signs of cerebral oedema: headache, lethargy, irritability, confusion  
↓pulse, ↑BP
- Abnormal age-related vital signs (Refer A1.1)

YES

1

NO

- Abnormal age-related vital signs (Refer A1.1)
- Glasgow Coma Scale Score (GCS) 13-14
- Hypoglycaemia (blood sugar  $\leq 2.7\text{ mmol/L}$ )
- Blood glucose  $> 11\text{ mmol/L}$  with blood ketones  $> 1\text{ mmol/L}$
- Signs of compensated shock
- $\geq 10\%$  dehydration. Severe dehydration (Refer A1.2)
- Lethargy / listless / irritability / floppy
- History of both seizure and diabetes mellitus

YES

2

NO

- Abnormal age-related vital signs (Refer A1.1)
- Blood sugar  $2.8 - 3.4\text{ mmol/L}$  in an asymptomatic child
- Hyperglycaemia with blood ketones  $< 1\text{ mmol/L}$
- Vomiting / diarrhoea in patient with a history of diabetes
- Diabetic patient required to be fasting

YES

3

NO

- History of diabetes presenting with other (non-acute) problem
- Illness with normal blood sugar level

YES

4

These patients should never be triaged less than Category 4

## Back Pain / Isolated Neck and / or Back Injury

A = Appendix 1 (Decision making aids and reference charts)

- Airway compromise
- Respiratory failure / respiratory arrest
- Hypotension
- Unresponsive / Glasgow Coma Scale Score (GCS) ≤ 12
- Abnormal age-related vital signs (Refer A1.1)

YES

**1**

NO

- Abnormal age-related vital signs (Refer A1.1)
- Glasgow Coma Scale Score (GCS) 13-14
- Severe pain (7-10/10)
- Patient on spinal precautions
- Significant history / mechanism of injury (Refer A1.3)
- Signs of compensated shock
- Back pain with altered peripheral neurological status

YES

**2**

NO

- Abnormal age-related vital signs (Refer A1.1)
- Moderate pain (4-6/10)
- History inconsistent with injury
- Back trauma < 24 hours
- Difficulty walking
- History of bleeding disorder

YES

**3**

NO

- Mild pain (1-3/10)
- No focal neurological signs
- No limb deficits
- Recent problem (< 48 hours)

YES

**4**

NO

- Problem > 48 hours with no acute symptoms
- No pain / discomfort at present

YES

**5**

## Burns / Scalds

A = Appendix 1 (Decision making aids and reference charts)

- Airway compromise
- Respiratory failure / respiratory arrest
- $SaO_2 \leq 90\%$  in room air
- Unresponsive / Glasgow Coma Scale Score (GCS)  $\leq 12$
- Abnormal age-related vital signs (Refer A1.1)

YES

1

NO

- Abnormal age-related vital signs (Refer A1.1)
- Glasgow Coma Scale Score (GCS) 13-14
- $SaO_2 < 94\%$  in room air
- Temperature  $\geq 40.0^{\circ}C$  or  $\leq 35.5^{\circ}C$
- Severe pain (7-10/10)
- Flame burn with face/neck involvement / facial oedema
- Signs of compensated shock
- Significant history / mechanism of injury (Refer A1.3)
- Other injuries
- Burn  $\geq 10\%$  body surface area (BSA) or involving face, neck or perineum
- Circumferential hand, foot or chest involvement
- Chemical or electrical burn
- History of smoke inhalation/ smoke, dirt around nostrils/mouth

YES

2

NO

- Abnormal age-related vital signs (Refer A1.1)
- Moderate pain (4-6/10)
- History inconsistent with injury
- Delayed presentation
- Burn, partial thickness  $< 10\%$  BSA
- Burn, full thickness  $< 5\%$  BSA
- Localised cold injury

YES

3

NO

- Mild pain (1-3/10)
- Local tenderness
- Redness / inflammation
- Local infection
- Minor burn

YES

4

NO

- Planned Review (not fasting)

YES

5

## Chest Pain / Isolated Chest Injury

A = Appendix 1 (Decision making aids and reference charts)

- Airway compromise
- Respiratory failure / respiratory arrest
- Severe trauma with respiratory distress
- Exsanguinating haemorrhage
- $\text{SaO}_2 \leq 90\%$  in room air
- Cardiac arrhythmias
- Unresponsive / Glasgow Coma Scale Score (GCS)  $\leq 12$
- Abnormal age-related vital signs (Refer A1.1)
- Penetrating / blunt chest / abdominal trauma with signs of shock

YES

**1**

NO

- Abnormal age-related vital signs (Refer A1.1)
- Glasgow Coma Scale Score (GCS) 13-14
- $\text{SaO}_2 < 92\%$  in room air
- Temperature  $\geq 40.0^\circ\text{C}$  or  $\leq 35.5^\circ\text{C}$
- Severe pain (7-10/10)
- Signs of compensated shock
- Significant history/mechanism of injury (Refer A1.3)
- Significant bruising to chest or abdomen
- Any penetrating / blunt chest / abdominal trauma

YES

**2**

NO

- Abnormal age-related vital signs (Refer A1.1)
- Moderate pain (4-6/10)
- History inconsistent with injury
- Pleuritic pain
- Minor haemorrhage
- History of haemoptysis
- Minor chest injury with no respiratory distress
- Significant medical or surgical history

YES

**3**

NO

- Mild pain (1-3/10)
- Local inflammation
- Recent problem ( $< 48$  hours)
- Local infection

YES

**4**

NO

- Problem  $> 48$  hours with no acute symptoms
- No pain / discomfort at present

YES

**5**

## Dental Problem

A = Appendix 1 (Decision making aids and reference charts)

- Airway compromise
- Respiratory failure / respiratory arrest
- Uncontrollable major haemorrhage
- Marked stridor with severe respiratory distress
- Cyanosis
- Unresponsive / Glasgow Coma Scale Score (GCS)  $\leq 12$
- Abnormal age-related vital signs (Refer A1.1)

YES

**1**

NO

- Abnormal age-related vital signs (Refer A1.1)
- Glasgow Coma Scale Score (GCS) 13-14
- Temperature  $\geq 40.0^{\circ}\text{C}$  or  $\leq 35.5^{\circ}\text{C}$
- Severe pain (7-10/10)
- Central capillary refill time (CRT)  $> 2$  seconds
- Difficulty swallowing
- Significant history / mechanism of injury (A1.3)
- Actively bleeding with history of bleeding disorder / ITP
- Signs of compensated shock
- Acutely avulsed permanent tooth

YES

**2**

NO

- Abnormal age-related vital signs (Refer A1.1)
- Moderate pain (4-6/10)
- History inconsistent with injury
- Uncontrollable minor haemorrhage
- History of bleeding disorder - not actively bleeding at present
- Significant facial redness and swelling

YES

**3**

NO

- Mild pain (1-3/10)
- Facial swelling
- Recent problem ( $< 48$  hours)
- Oral laceration with no dental involvement

YES

**4**

NO

- Problem  $> 48$  hours with no acute symptoms
- Loss of deciduous teeth
- No pain / discomfort at present

YES

**5**

## Ear / Nose Problem

A = Appendix 1 (Decision making aids and reference charts)

- Airway compromise
- Respiratory failure / respiratory arrest
- Uncontrollable major haemorrhage
- Marked stridor with severe respiratory distress
- Cyanosis
- Unresponsive / Glasgow Coma Scale Score (GCS)  $\leq 12$
- Abnormal age-related vital signs (Refer A1.1)

YES

**1**

NO

- Abnormal age-related vital signs (Refer A1.1)
- Glasgow Coma Scale Score (GCS) 13-14
- Temperature  $\geq 40.0^{\circ}\text{C}$  or  $\leq 35.5^{\circ}\text{C}$
- Severe pain (7-10/10)
- Central capillary refill time (CRT)  $> 2$  seconds
- Difficulty swallowing
- Significant history / mechanism of injury (Refer A1.3)
- Actively bleeding with history of bleeding disorder / ITP
- Signs of compensated shock
- Bruising or swelling behind the ear over the mastoid process
- Clear fluid leaking from nose or ear with history of trauma

YES

**2**

NO

- Abnormal age-related vital signs (Refer A1.1)
- Moderate pain (4-6/10)
- History inconsistent with injury
- Foreign body in nose
- Uncontrollable minor haemorrhage
- History of bleeding disorder - not actively bleeding at present
- Any swelling behind the ear
- History of recent head injury

YES

**3**

NO

- Mild pain (1-3/10)
- Swelling / deformity / auricular haematoma
- Discharge from ear / nose
- Recent problem ( $< 48$  hours)

YES

**4**

NO

- Problem  $> 48$  hours with no acute symptoms
- Foreign body in ear
- No pain / discomfort at present

YES

**5**

## Eye Injury / Problem

A = Appendix 1 (Decision making aids and reference charts)

- Penetrating eye trauma
- Sudden loss of vision
- Chemical eye injury
- Abnormal age-related vital signs (Refer A1.1)

YES

**1**

NO

- Abnormal age-related vital signs (Refer A1.1)
- Severe pain (7-10/10)
- Significant eye / head trauma
- Hyphaema
- Abnormal pupil following trauma
- Orbital cellulitis

YES

**2**

NO

- Abnormal age-related vital signs (Refer A1.1)
- Moderate pain (4-6/10)
- History inconsistent with injury
- Significant history
- Foreign body
- Peri-orbital swelling / cellulitis
- Acute reduced visual acuity

YES

**3**

NO

- Mild pain (1-3/10)
- Sticky eye
- Red eye
- Recent problem (< 48 hours)
- Discharge from eye

YES

**4**

NO

- Problem > 48 hours with no acute symptoms
- No pain / discomfort at present

YES

**5**

## Foreign Body - not inhaled (for inhaled foreign body use Airway/Breathing Algorithm)

A = Appendix 1 (Decision making aids and reference charts)

- Airway compromise
- Respiratory failure / respiratory arrest
- Exsanguinating haemorrhage
- Unresponsive / Glasgow Coma Scale Score (GCS)  $\leq 12$
- Abnormal age-related vital signs (Refer A1.1)
- Penetrating eye trauma

YES

1

NO

- Abnormal age-related vital signs (Refer A1.1)
- Glasgow Coma Scale Score (GCS) 13-14
- Temperature  $\geq 40.0^{\circ}\text{C}$  or  $\leq 35.5^{\circ}\text{C}$
- Severe pain (7-10/10)
- Significant history / mechanism of injury (Refer A1.3)
- Substance of high toxicity (check Toxbase®)
- Central capillary refill time (CRT)  $> 2$  seconds
- Difficulty swallowing
- Signs of compensated shock
- History of cyanosis

YES

2

NO

- Abnormal age-related vital signs (Refer A1.1)
- Moderate pain (4-6/10)
- History inconsistent with injury
- Uncontrollable minor haemorrhage
- Substance of moderate toxicity (check Toxbase®)
- Foreign body in nose / history of swallowing sharp object
- History of bleeding disorder - not actively bleeding at present

YES

3

NO

- Mild pain (1-3/10)
- Local inflammation
- Local infection
- Red eye
- Substance of low toxicity (check Toxbase®)
- Swelling / deformity
- Purulent discharge from affected area
- Recent hearing loss
- Recent problem ( $< 48$  hours)

YES

4

NO

- Problem  $> 48$  hours with no acute symptoms
- No pain / discomfort at present

YES

5

## Genitourinary Problem

A = Appendix 1 (Decision making aids and reference charts)

- Airway compromise
- Respiratory failure / respiratory arrest
- Uncontrollable major haemorrhage
- Unresponsive / Glasgow Coma Scale Score (GCS)  $\leq 12$
- Currently seizing
- Abnormal age-related vital signs (Refer A1.1)

YES

1

NO

- Abnormal age-related vital signs (Refer A1.1)
- Severe hypertension (A1.1)
- Glasgow Coma Scale Score (GCS) 13-14
- Temperature  $\geq 40.0^{\circ}\text{C}$  or  $\leq 35.5^{\circ}\text{C}$
- Severe pain (7-10/10)
- History of injury
- Priapism (especially with Sickle Cell Disease)
- Testicular pain or swelling  $< 48$  hours
- Scrotal trauma
- Signs of compensated shock
- Frank haematuria
- History of renal transplant/currently on dialysis

YES

2

NO

- Abnormal age-related vital signs (Refer A1.1)
- Significant renal history with significant hypertension (A1.1)
- Moderate pain (4-6/10)
- Urinary retention
- History inconsistent with injury/illness
- Inguinal swelling with pain

YES

3

NO

- Mild pain (1-3/10)
- Discharge
- Paraphimosis
- Previous renal problem
- History of vaginal bleed
- Recent problem ( $< 48$  hours)

YES

4

NO

- Problem  $> 48$  hours with no acute symptoms
- No pain / discomfort at present

YES

5

## Head Injury / Headache / VP shunt

A = Appendix 1 (Decision making aids and reference charts)

- Airway compromise
- Respiratory failure / respiratory arrest
- Unresponsive / Glasgow Coma Scale Score (GCS)  $\leq 12$
- Currently seizing
- Abnormal age-related vital signs (Refer A1.1)
- Penetrating Injury

YES

1

NO

- Abnormal age-related vital signs (Refer A1.1)
- Glasgow Coma Scale Score (GCS) 13-14
- Severe pain (7-10/10)
- Mechanism of injury (Refer A1.3)
- History of bleeding disorder
- Significant medical or surgical history
- Ventriculo-peritoneal shunt
- Persistent vomiting
- New neurological symptoms(\*see footnote)
- History of loss of consciousness  $\geq 30$  seconds
- Blood or serous fluid in nose or ear(s)
- Bruising around the eyes or behind ears
- History of blurred vision or seizure
- Patient on spinal precautions
- Large scalp laceration with pulsatile bleeding
- Boggy temporal, parietal or occipital swelling

YES

2

NO

- Abnormal age-related vital signs (Refer A1.1)
- Moderate pain (4-6/10)
- Inconsistent history
- History of loss of consciousness  $< 30$  seconds
- Amnesia
- Infant  $< 1$  year

YES

3

NO

- Mild pain (1-4/10)
- No loss of consciousness / no amnesia

YES

4

NO

- Problem  $> 24$  hours with no acute symptoms
- No vomiting

YES

5

\* New neurological symptoms = Sudden onset of confusion, weakness / irritability or drowsiness. Symptoms may also include altered level of consciousness, loss of sensation, weakness of the limbs or alterations in bladder or bowel function

## Limb Problem / Limb Injury

A = Appendix 1 (Decision making aids and reference charts)

- Airway compromise
- Respiratory failure / respiratory arrest
- Exsanguinating haemorrhage
- Unresponsive Glasgow Coma Scale Score (GCS) ≤ 12
- Abnormal age-related vital signs (Refer A1.1)

YES

1

NO

- Abnormal age-related vital signs (Refer A1.1)
- Glasgow Coma Scale Score (GCS) 13-14
- Temperature ≥ 40.0°C or ≤ 35.5°C
- Severe pain (7-10/10)
- Deformity ± compound fracture ± significant swelling
- Neurovascular compromise
- Central capillary refill time (CRT) > 2 seconds
- Signs of compensated shock
- Critical skin over fracture site
- Traumatic amputation, > 50% partial / degloving injury
- Penetrating trauma
- History of sickle cell disease
- History of bleeding disorder with swelling present

YES

2

NO

- Abnormal age-related vital signs (Refer A1.1)
- Moderate pain (4-6/10)
- History inconsistent with injury / significant delayed presentation post injury
- Tight cast with possible neurovascular compromise
- Limp / joint pain with fever/hot joint
- Unable to weight-bear with history of trauma
- History of bleeding disorder

YES

3

NO

- Mild pain (1-3/10)
- Recent problem (< 48 hours)
- Pain over joint
- Reduced weight-bearing
- Swelling present
- History of pyrexia
- Inflammation
- Non-weight bearing with no history trauma / injury
- History minor penetrating wound

YES

4

NO

- Review (not fasting) to other specialities
- Problem > 48 hours with no acute symptoms
- Minor lacerations, abrasions, contusions
- Damaged/wet/broken cast

YES

5

## Major Trauma

A = Appendix 1 (Decision making aids and reference charts)

- Airway compromise
- Respiratory failure / respiratory arrest
- Exsanguinating haemorrhage
- Unresponsive / Glasgow Coma Scale Score (GCS)  $\leq 12$
- Currently seizing
- Abnormal age-related vital signs (Refer A1.1)
- Penetrating trauma to head / chest / abdomen / pelvis with signs of shock

YES

1

NO

- Abnormal age-related vital signs (Refer A1.1)
- Glasgow Coma Scale Score (GCS) 13-14
- Temperature  $\leq 35.5^{\circ}\text{C}$
- Severe pain (7-10/10)
- Significant history/mechanism of injury (Refer A1.3)
- Altered respiratory pattern
- Signs of compensated shock
- History of bleeding disorder
- Severe deformity
- Neurovascular compromise
- Patient on spinal precautions
- History of loss of consciousness  $\geq 30$  seconds
- Persistent vomiting
- Blood or serous fluid in nose or ear(s)
- Bruising around the eyes or behind ears
- Penetrating trauma
- Frank haematuria/blood in perineum

YES

2

NO

- Abnormal age-related vital signs (Refer A1.1)
- Moderate pain (4-6/10)
- History of loss of consciousness  $< 30$  seconds
- Amnesia
- Limb deformity
- Open wound
- Minor haemorrhage

YES

3

These patients should never be triaged less than Category 3

## Overdose and Poisoning

A = Appendix 1 (Decision making aids and reference charts)

- Airway compromise
- Respiratory failure / respiratory arrest
- Unresponsive / Glasgow Coma Scale Score (GCS)  $\leq 12$
- Currently seizing
- Abnormal age-related vital signs (Refer A1.1)

YES

1

NO

- Abnormal age-related vital signs (Refer A1.1)
- Glasgow Coma Scale Score (GCS) 13-14
- Severe pain (7-10/10)
- Substance of high toxicity (check Toxbase©)
- Ingestion of unknown substance/quantity
- Intentional self-harm / high risk of further self-harm
- Increased / decreased work of breathing
- Signs of compensated shock
- Cardiac arrhythmias
- Hypoglycaemia (blood sugar  $\leq 2.7$  mmol/L)
- Hypotension / hypertension (Refer A1.1)

YES

2

NO

- Abnormal age-related vital signs (Refer A1.1)
- Moderate pain (4-6/10)
- Substance of moderate toxicity (check Toxbase©)
- Blood sugar 2.8-3.4 mmol/L
- Persistent vomiting
- Inconsistent history

YES

3

NO

- Substance of low toxicity (check Toxbase©)
- Mild pain (1-3/10)

YES

4

NO

- Ingestion time  $> 48$  hrs with no toxicity (check Toxbase©)

YES

5

If patient exhibits a psychosocial problem, refer to  
“Psychosocial Problem (including self-harm)”

## Psychosocial Problem (including self-harm)

A = Appendix 1 (Decision making aids and reference charts)

- Airway compromise
- Respiratory failure / respiratory arrest
- Unresponsive / Glasgow Coma Scale Score (GCS)  $\leq 12$
- Currently seizing
- Abnormal age-related vital signs (Refer A1.1)
- Violent behaviour / Immediate risk of harm to self and others
- Violent behaviour / possession of a weapon
- Self-destructive behaviour in the ED / requires restraint

YES

1

NO

- Abnormal age-related vital signs (Refer A1.1)
- Glasgow Coma Scale Score (GCS) 13-14
- Signs of compensated shock
- Probable risk of harm to self or others
- Extreme agitation / physically / verbally aggressive
- Confused/unable to co-operate
- High risk of absconding
- Auditory / visual hallucinations
- Attempted threat of self-harm
- Threat of harm to self / others
- Acts of deliberate self-harm
- Expressing suicidal intent/ideation

YES

2

NO

- Abnormal age-related vital signs (Refer A1.1)
- Disclosure of abuse
- Significant behaviour change
- Recent assault
- Agitation / restlessness / intrusive behaviour
- Bizarre, disorganised behaviour
- Withdrawn and uncommunicative
- Ambivalent about treatment
- Moderate risk of absconding
- Suicidal ideation
- Presence of psychotic symptoms of affective disorder (depressed or elated)

YES

3

NO

- Vague social problem
- Eating disorder with normal vital signs

YES

4

**These patients should never be triaged less than Category 4**

## Rashes (Blanching/Non-Blanching)

A = Appendix 1 (Decision making aids and reference charts)

- Airway compromise
- Respiratory failure / respiratory arrest
- Marked stridor with severe respiratory distress
- SaO<sub>2</sub> ≤ 90% in room air
- Unresponsive / Glasgow Coma Scale Score (GCS) ≤ 12
- Currently seizing
- Abnormal age-related vital signs (Refer A1.1)

YES

1

NO

- Abnormal age-related vital signs (Refer A1.1)
- Glasgow Coma Scale Score (GCS) 13-14
- SaO<sub>2</sub> < 92% in room air
- Temperature ≥ 40.0°C or ≤ 35.5°C
- Severe pain / itch (7-10/10)
- Severe respiratory distress (Refer A1.4)
- Oedema of the tongue
- Non-blanching rash / purpura / petechiae
- Signs of compensated shock
- Signs & symptoms of severe anaphylaxis

YES

2

NO

- Abnormal age-related vital signs (Refer A1.1)
- Moderate pain / itch (4-6/10)
- Moderate respiratory distress (Refer A1.4)
- Widespread discharge or blistering
- History of haematological problems
- History inconsistent with injury
- Unexplained bruising

YES

3

NO

- Mild respiratory distress (Refer A1.4)
- Localised signs of allergic reaction
- Mild pain / itch (1-3/10)
- Blanching rash
- Recent problem (< 48 hours)

YES

4

NO

- Problem > 48 hours with no acute symptoms
- No pain / discomfort at present

YES

5

## Seizure / Absent Episode / Collapse

A = Appendix 1 (Decision making aids and reference charts)

- Airway compromise
- Respiratory failure / respiratory arrest
- Imminent respiratory failure / respiratory arrest
- Cyanosis
- Unresponsive / Glasgow Coma Scale Score (GCS)  $\leq 12$
- Currently seizing
- Abnormal age-related vital signs (Refer A1.1)

YES

1

NO

- Abnormal age-related vital signs (Refer A1.1)
- Glasgow Coma Scale Score (GCS) 13-14
- Temperature  $\geq 40.0^{\circ}\text{C}$  or  $\leq 35.5^{\circ}\text{C}$
- Severe pain (7-10/10)
- Signs of compensated shock
- Hypoglycaemia (blood sugar  $\leq 2.7\text{ mmol/L}$ )
- Significant medical conditions
- Signs of meningism
- New neurological symptoms (see footnote)
- History of both seizure and Diabetes Mellitus
- History or suspicion of ingestion

YES

2

NO

- Abnormal age-related vital signs (Refer A1.1)
- History of seizures - well now
- Blood sugar 2.8 – 3.4 mmol/L
- Moderate pain (4-6/10)

YES

3

NO

- Mild Pain 1 – 3/10
- No neurological symptoms

YES

4

\* New neurological symptoms = Sudden onset of confusion, weakness / irritability or drowsiness. Symptoms may also include altered level of consciousness, loss of sensation, weakness of the limbs or alterations in bladder or bowel function

## Testicular Pain

A = Appendix 1 (Decision making aids and reference charts)

- Airway compromise
- Respiratory failure / respiratory arrest
- Unresponsive / Glasgow Coma Scale Score (GCS)  $\leq 12$
- Abnormal age-related vital signs (Refer A1.1)

YES

**1**

NO

- Abnormal age-related vital signs (Refer A1.1)
- Temperature  $\geq 40.0^{\circ}\text{C}$  or  $\leq 35.5^{\circ}\text{C}$
- Severe pain (7-10/10)
- Significant skin colour change to scrotum
- Frank haematuria
- History of testicular pain or swelling <48 hours

YES

**2**

NO

- Abnormal age-related vital signs (Refer A1.1)
- Moderate pain (4-6/10)
- Scrotal swelling
- Vomiting

YES

**3**

NO

- Mild pain (1-3/10)
- Dysuria
- Penile discharge

YES

**4**

NO

- Chronic problem

YES

**5**

## Throat Problem

A = Appendix 1 (Decision making aids and reference charts)

- Airway compromise
- Drooling
- ‘Tripod’ positioning
- Stridor with severe increase in work of breathing
- Respiratory failure / respiratory arrest
- Hoarseness – sudden onset
- Cyanosis
- Trauma (A1.3)
- Uncontrollable bleeding post-tonsillectomy
- Unresponsive / Glasgow Coma Scale Score (GCS)  $\leq 12$
- Abnormal age-related vital signs (Refer A1.1)

YES

1

NO

- Abnormal age-related vital signs (Refer A1.1)
- Glasgow Coma Scale Score (GCS) 13-14
- Temperature  $\geq 40.0^{\circ}\text{C}$  or  $\leq 35.5^{\circ}\text{C}$
- Severe pain (7-10/10)
- Stridor at rest  $\pm$  foreign body inhalation / ingestion
- Central capillary refill time  $> 2$  seconds
- Difficulty swallowing
- Bleeding post-tonsillectomy
- Signs of compensated shock

YES

2

NO

- Abnormal age-related vital signs (Refer A1.1)
- Moderate pain (4-6/10)
- History of bleed post-tonsillectomy but not actively bleeding at present

YES

3

NO

- Mild pain (1-3/10)
- Tolerating oral fluids
- Recent problem ( $< 48$  hours)

YES

4

NO

- Planned review (not fasting)
- Problem  $> 48$  hours with no acute symptoms
- No pain / discomfort at present

YES

5

## Unwell Child (over 1 year) (including Pyrexia)

A = Appendix 1 (Decision making aids and reference charts)

- Airway compromise
- Respiratory failure / respiratory arrest
- Unresponsive / Glasgow Coma Scale Score (GCS)  $\leq$  12
- Hypoglycaemia with altered neurological status
- Currently seizing
- $\text{SaO}_2 \leq 90\%$  in room air  $\text{SaO}_2 \leq 90\%$  in room air
- Abnormal age-related vital signs (Refer A1.1)

YES

1

NO

- Abnormal age-related vital signs (Refer A1.1)
- Glasgow Coma Scale Score (GCS) 13-14
- Temperature  $\geq 40.0^{\circ}\text{C}$  or  $\leq 35.5^{\circ}\text{C}$
- Hypoglycaemia (blood sugar  $\leq 2.7\text{mmol/L}$ )
- Lethargy / listless / irritability / floppy
- Central capillary refill  $> 2$  seconds
- Not responding to parents
- New neurological symptoms (see glossary)
- Severe pain (7-10/10) / distress
- Signs of compensated shock
- Purpura / Petechiae
- $\text{SaO}_2 \leq 92\%$  in room air
- Signs and symptoms of meningism

YES

2

NO

- Abnormal age-related vital signs (Refer A1.1)
- Moderate pain (4-6/10)
- Blood sugar 2.8 – 3.4 mmol/L
- History of seizure/ syncope episode / rigors / hallucinations
- Oliguria
- PEG tube problem / nasogastric tube problem
- Jaundice
- Reduced feeding with clinical signs of dehydration (Refer A1.2)
- Moderate increase in work of breathing
- History inconsistent with illness/injury
- Significant medical or surgical history

YES

3

NO

- Mild pain (1-3/10)
- Off form
- Facial weakness
- Recent problem (< 48 hours)

YES

4

NO

- No signs of dehydration
- Problem > 48 hours with no acute symptoms
- No pain / discomfort at present

YES

5

# Unwell Infant (less than 1 year) (including Pyrexia)

A = Appendix 1 (Decision making aids and reference charts)

- Airway compromise
- Respiratory failure / respiratory arrest
- Unresponsive / Glasgow Coma Scale Score (GCS)  $\leq 12$
- Hypoglycaemia with altered neurological status
- Currently seizing
- $\text{SaO}_2 \leq 90\%$  in room air
- Abnormal age-related vital signs (Refer A1.1)

YES

1

NO

- Abnormal age-related vital signs (Refer A1.1)
- Glasgow Coma Scale Score (GCS) 13-14
- Central capillary refill time (CRT)  $> 2$  seconds
- Abnormal cry
- Not responding to parents
- Severe pain (7-10/10)
- Temperature  $\geq 40.0^{\circ}\text{C}$  or  $\leq 35.5^{\circ}\text{C}$
- Mottled / cold infant
- Purpura / Petechiae
- Signs and symptoms of meningism
- New neurological symptoms (see glossary)
- Signs of compensated shock
- $\text{SaO}_2 \leq 92\%$  in room air
- Lethargy / listless / irritability / floppy
- History of floppiness with pallor / cyanosis
- History of apnoea lasting  $\geq 20$  seconds
- Bulging fontanelle / sunken fontanelle
- Hypoglycaemia (blood sugar  $\leq 2.7\text{mmol/L}$ )

YES

2

NO

- Abnormal age-related vital signs (Refer A1.1)
- Atypical behaviour
- Moderate pain (4-6/10) / distress
- Blood sugar 2.8 – 3.4 mmol/L
- Reduced feeding / projectile vomiting
- PEG tube problem / nasogastric tube problem
- Jaundice
- Reduced urinary output / dry nappies
- Prolonged crying
- Inconsolable by parents
- History inconsistent with injury / illness
- History of seizure / jittery episode
- Drawing up legs
- Infant  $< 3$  months

YES

3

NO

- Consolable infant
- Mild pain (1-3/10)

YES

4

NO

- Problem  $> 48$  hours with no acute symptoms

YES

5

## Vomiting ± Diarrhoea

A = Appendix 1 (Decision making aids and reference charts)

- Airway compromise
- Respiratory failure / respiratory arrest
- Unresponsive / Glasgow Coma Scale Score (GCS)  $\leq 12$
- Currently seizing
- Abnormal age-related vital signs (Refer A1.1)

YES

1

NO

- Abnormal age-related vital signs (Refer A1.1)
- Glasgow Coma Scale Score (GCS) 13-14
- Central capillary refill time (CRT)  $> 2$  seconds
- Temperature  $\geq 40.0^{\circ}\text{C}$  or  $\leq 35.5^{\circ}\text{C}$
- Hypoglycaemia (blood sugar  $\leq 2.7\text{ mmol/L}$ )
- Severe pain (7-10/10)
- Acute haematemesis / melaena / red currant stools
- Signs of compensated shock
- Abnormal cry
- Not responding to parents
- Purpura / Petechiae
- Signs and symptoms of meningism
- Severe dehydration (Refer A1.2)
- Lethargy / listless / irritability / floppy
- Bulging fontanelle / sunken fontanelle
- Sunken eyes
- Anuria
- Metabolic illness

YES

2

NO

- Abnormal age-related vital signs (Refer A1.1)
- Moderate pain (4-6/10)
- Significant medical or surgical history
- Persistent vomiting
- Persistent diarrhoea with abdominal pain
- Moderate dehydration (Refer A1.2)
- Blood sugar 2.8 – 3.4 mmol/L in an asymptomatic child
- Reduced feeding with clinical signs of dehydration (Refer A1.2)
- Reduced skin turgor
- Oliguria

YES

3

NO

- Mild pain (1-3/10)
- Recent problem ( $< 48$  hours)
- Mild Dehydration (Refer A1.2)
- Decreased oral intake

YES

4

NO

- No signs of dehydration
- Problem  $> 48$  hours with no acute symptoms
- No pain / discomfort at present

YES

5

## Wounds/Signs of Local Inflammation

A = Appendix 1 (Decision making aids and reference charts)

- Airway compromise
- Respiratory failure / respiratory arrest
- Exsanguinating haemorrhage
- Unresponsive / Glasgow Coma Scale Score (GCS) ≤ 12
- Abnormal age-related vital signs (Refer A1.1)

YES

1

NO

- Abnormal age-related vital signs (Refer A1.1)
- Glasgow Coma Scale Score (GCS) 13-14
- Severe pain (7-10/10)
- Signs of compensated shock
- Significant history / mechanism of injury (Refer A1.3)
- Traumatic amputation >50% partial/degloving injury

YES

2

NO

- Abnormal age-related vital signs (Refer A1.1)
- Moderate pain (4-6/10)
- History inconsistent with injury
- Delayed presentation
- Moderate haemorrhage
- Inflammation with tracking
- Infant under 3 months
- Needle-stick injury with known blood borne infection

YES

3

NO

- Mild pain (1-3/10)
- Mild haemorrhage
- Foreign body
- Local infection and inflammation
- Needle-stick injury
- Recent problem (< 48 hours)

YES

4

NO

- Superficial wound
- Suspicion of bite or injury
- Chronic problem (> 48 hours)
- Change of dressing / removal of sutures
- No pain / discomfort at present

YES

5

## 8. Educational Requirements for Performing ICTS

There is no consensus in relation to the minimum clinical experience a nurse needs prior to undertaking triage. Some systems recommend that the nurse must be an 'experienced' nurse without quantifying what defines a nurse as 'experienced' (Beveridge et al 1998, O'Neill & Molczan 2003, ACEM 2005, Gilboy et al 2005). Morgan & Whelan (2000) recommended that the nurse should have at least 18 months of emergency nursing experience. However, Wulp et al (2008) have not found any association between work experience and interrater reliability at triage. Gilboy et al (2005) recommend a 2-4 hour mandatory educational programme for staff whilst Maldona & Avner (2004) recommend 6 hours of formalised triage training.

Crellin & Johnson (2003) previously suggested that nurses not specifically trained in paediatrics may find triaging paediatric patients challenging due to lack of expertise in the physiological and cognitive differences in children. This potentially leads to children being allocated a lower priority triage category (category 5) less often.

While it is acknowledged that some ED experience is essential to assist the nurse in identifying a critically ill patient, the ICTS Project Subgroup consider that education of staff in the use of the tool is essential prior to undertaking unsupervised triage. Education of staff involves formal teaching sessions, supervised triage episodes and completion of a competency sign off booklet. However, if there are concerns in relation to a nurse's performance in relation to appropriate/accurate triage decisions, he/she may undertake the triage workbook again to ensure further support/evaluation is provided. It is recommended that ongoing concerns regarding triage performance should be managed through local nursing practice development structures.

## 9. Pilot Phase

ICTS was piloted in six sites from March 2013 – February 2014. In preparation for the pilot phase of ICTS, permission was sought from the Directors of Nursing of each participating hospital. No data protection or patient confidentiality risks were identified.

All pilot sites identified local champions who would lead on training in their own ED. Formal teaching sessions, which comprised an eight-hour study day were organised for each participating pilot site. This education was provided by the Clinical Nurse Managers (CNM3) from the three paediatric EDs who had been pivotal in developing the ICTS tool.

The champions train-the-trainer approach ensured that training of all staff was standardised across the six sites. Clinical training and instruction of nurses has been previously identified as assisting in optimising the usage and interpretation of triage systems (Veen & Moll 2009). The pilot phase was managed by the ICTS project subgroup who addressed operational issues and provided support to each site. Prior to and during the pilot phase the project subgroup carried out audits, staff questionnaires and inter-rater reliability studies, to support on-going evaluation and validation of the tool.

The pilot phase was planned to take place over a 3-month period, however, the tool was found to be so beneficial that all six EDs opted to continue to use the ICTS after the end of the pilot period. As a result, audit data was gathered from the participating hospitals for the period March 2013 - February 2014. The additional audit period allowed the project subgroup to ensure that the results of audit were not influenced by seasonal variation. Data was gathered from the six EDs for the year preceding the introduction of ICTS (i.e. March 2012 - February 2013). This allowed the allocation of triage categories to be compared pre and post introduction of ICTS.

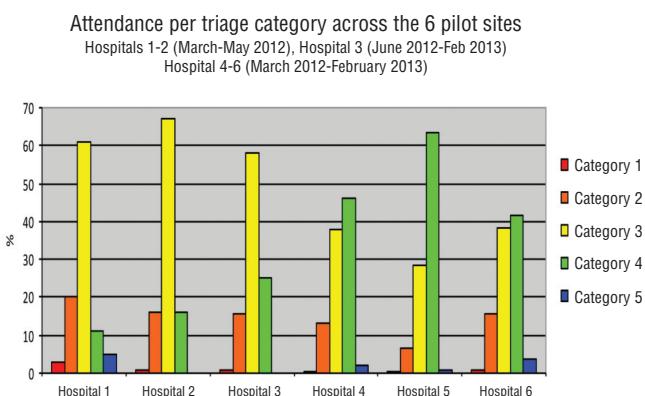
### 9.1 Audit

The information contained in Figures 1a, 1b, 2a and 2b represents data from hospitals coded 1, 2 and 3 which are EDs that see both adult and paediatric patients. Hospitals coded 4, 5 and 6 represent the three paediatric (only) EDs in Dublin.

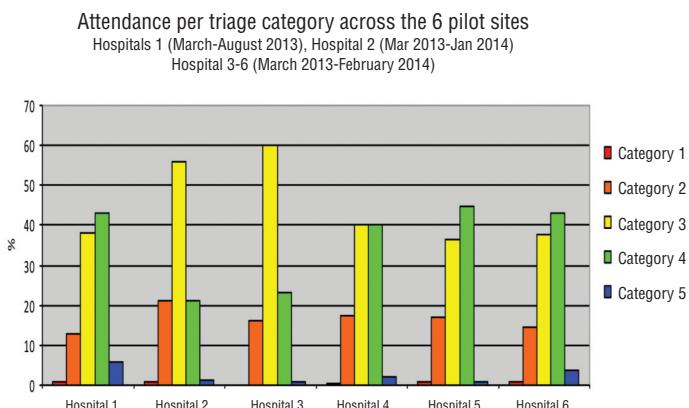
#### Data collection

Data collected by the Clinical Nurse Managers in the pilot sites included:

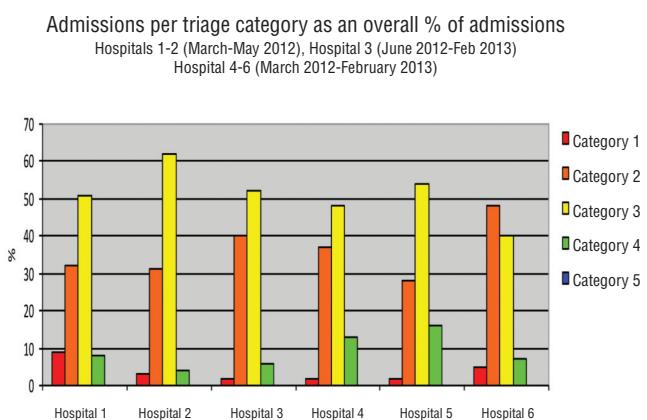
- Daily reviews/monthly reports of attendance rate of each triage category (Figures 1a & 1b);
- Daily reviews/monthly reports of admission rates of each triage category (Figures 2a & 2b);



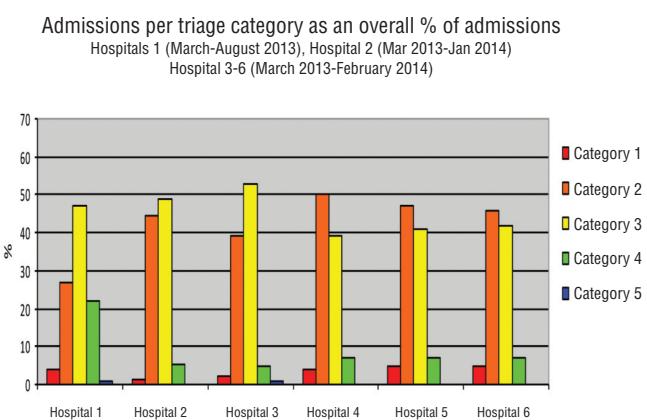
**Figure 1a Attendance per triage category March 2012-February 2013**



**Figure 1b Attendance per triage category March 2013-February 2014**



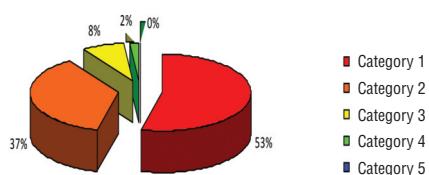
**Figure 2a Admission % per triage category March 2012-February 2013**



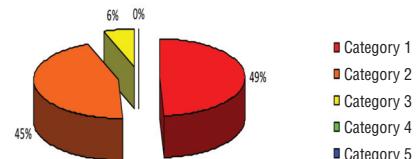
**Figure 2b Admission % per triage category March 2013-February 2014**

In addition to the data collected by all six hospitals the three paediatric EDs were able to review the triage categories of children who required admission to Paediatric Intensive Care (PICU) for the year before and year after the introduction of the ICTS (Tables 3a & 3b).

Triage categories of patients admitted to PICU  
March 2012-February 2013 (n=230)



Triage categories of patients requiring admission to PICU  
March 2013-February 2014 (n=293)



**Fig 3a Admission to PICU per triage category  
March 2012-Feb 2013**

**Fig 3b Admission to PICU per triage category March 2013-Feb 2014**

### Observations on data results

Nurses who do not have paediatric training may find the triaging of paediatric patients challenging (Crellin & Johnson 2003). In addition, nurses who do not work exclusively with paediatrics may be hesitant to use lower acuity categories (Figures 1a and 1b). However, following the ICTS training in the pilot sites there was a notable change in the use of triage category 4 in Hospital 1. Hospital 2 shows a small increase in the use of the lower triage categories with little change in Hospital 3.

In relation to the three paediatric hospitals (Hospitals 4-6), there was a significant difference in the allocation of triage categories between Hospitals 4 and 6 and Hospital 5 but following the introduction of ICTS, the three paediatric EDs showed very similar patterns of attendance by triage category.

Although a triage tool is not designed to determine whether a child would subsequently require admission to hospital, the ICTS project subgroup attempted to establish a correlation between the higher acuity triage categories and admission rates (Figures 2a & 2b). Hospital 1 had a reduction in the overall % of lower triage categories 4. Hospitals 2, 4 and 5 had a significant increase in the percentage of higher triage category 2 being admitted (admission rate as an overall percentage of admissions). However there was little change noted in Hospitals 3 and 6.

The admission rate per triage category as an overall proportion of admissions was much more consistent. Yet again, after the introduction of ICTS the three paediatric EDs were very similar in admissions per triage category as an overall percentage of admissions.

The three paediatric EDs were in a position to collect data on children admitted to PICU. Gravel et al (2009) reports that 90% of patients admitted to intensive care were categorised as category 1 or 2 (using the Canadian Paediatric Triage and Acuity Scale). Prior to the introduction of the ICTS, the 3 paediatric EDs reported a similar categorisation pattern for children admitted to ICU. However, at that time, 8% of those admissions to PICU had received a triage category 3 and 2% had received a triage category 4 (Figure 3a). Following the introduction of the ICTS, 94% of admissions to PICU were either a triage category 1 or 2 and no patient received a triage category 4 or 5 (Figure 3b). The findings in relation to initial acuity assessment and the need for PICU beds would suggest that the ICTS tool can identify acutely ill children and ensure that these children receive immediate and urgent medical attention.

## 10. Limitations of Irish Children's Triage System

Triage systems are designed to appreciate the value of human life and health with fairness and the efficient use of resources (Fitzgerald et al 2009). Triage should only be used if there is a delay in patients receiving medical attention, thereby reducing clinical risk. Consequently, if there are no patients waiting for medical review, there should be no delay in the patient receiving medical attention and the patient should receive a nursing and medical assessment simultaneously.

The triage process tends to incur delays, especially in the younger age group of attendees. Therefore, it is recommended that consideration should be given to develop a local contingency plan when there are delays for triage to ensure that all patients are seen by a nurse or doctor in a timely fashion.

Triage is sometimes used by hospital managers and service planners as a marker of acuity and complexity of care within EDs, hospitals and networks of care. This has led to considerations that patients in 'lower' triage categories (triage categories 3-5) could be easily and safely managed in alternative healthcare settings. This misuse of triage data is potentially dangerous because triage is essentially a tool to facilitate 'clinical justice' identifying which patients need to be seen sooner; it is not a marker of how complex or qualified that medical care is.

One of the major limitations of any triage tool is difficulty in its validation. A number of audits of ICTS have been undertaken to ensure that it is a robust and comprehensive tool (outlined in the previous section). Further audit and evaluation is planned as EDs throughout Ireland commence implementation of ICTS. The recommendation from the National Emergency Medicine Programme and ICTS project subgroup is that continuous audit should be carried out at local level and all variations analysed locally and discussed within ED multidisciplinary teams. Learning from local audits should be shared with the National Emergency Medicine Programme and used to inform further refinement of the tool.

## 11. Conclusion

The National Emergency Medicine Programme consistently strives to improve the care that is delivered to patients, their families and carers who attend EDs throughout the country. The triage system outlined in this document aims to assist in ensuring that children who attend Irish EDs receive the best possible effective and timely care.

Overall feedback on the pilot phase of the project was very positive from staff in all participating EDs. Emergency nurses found that ICTS was a safe and user friendly tool which guided them to quickly recognise sick children presenting to their department.

In conclusion the recommendation of the National Emergency Medicine Programme is that the Irish Children's Triage System should be adopted as the national standard of triage for children and should be implemented in all EDs in Ireland with paediatric attendances.

## 12. Glossary of Terms

Term	Explanation
<b>Acutely avulsed permanent tooth</b>	A permanent tooth that has been forcibly and traumatically displaced from its normal position, completely forced from its alveolar socket within the last 24 hours
<b>Allergic reaction</b>	Symptoms and signs of an allergic reaction include any, some, or many of the following: <ul style="list-style-type: none"> <li>• Skin: irritation, redness, itching, swelling, blistering, weeping, crusting, rash, eruptions or hives (itchy bumps or welts)</li> <li>• Lungs: wheezing, tightness, cough, shortness of breath</li> <li>• Head: swelling or bumps on the face and neck, eyelids, lips, tongue, or throat, hoarseness of voice, headache</li> <li>• Nose: stuffy nose, runny nose (clear, thin discharge), sneezing</li> <li>• Eyes: red (bloodshot), itchy, swollen, or watery or swelling of the area around the face and eyes</li> <li>• Abdomen: abdominal pain, nausea, vomiting and/or diarrhoea,</li> <li>• Other: fatigue, sore throat</li> </ul>
<b>Anaphylaxis</b>	A potentially life-threatening, rapidly developing allergic reaction that affects a number of different body systems at one time. Anaphylaxis is a medical emergency, and requires immediate treatment
<b>BSA</b>	Body Surface Area
<b>Burns</b> (Thermal injury)	<p><b>Burn:</b> An injury to flesh or skin caused by heat, chemicals, chemicals, radiation or radiation</p> <p><b>Circumferential burn:</b> The burn encircles an entire body part. May cause neurovascular compromise to the body part</p> <p><b>Chemical burn:</b> A burn caused by a chemical substances</p> <p><b>Electrical injuries:</b> Relatively uncommon. Children with electrical burns are predominantly injured in the household setting. The spectrum of electrical injury is broad, ranging from minimal injury to severe multi-organ involvement to death</p> <p><b>Flame burn:</b> A burn caused by heat or flame also called a thermal burn</p> <p><b>Scald:</b> Caused by hot liquids or steam</p> <p><b>Full thickness:</b> Third degree burn occurs with destruction of the entire epidermis and dermis, leaving no residual epidermal cells to repopulate</p> <p><b>Partial thickness:</b> This burn destroys the epidermal layer and portions of the dermis. Since it does not extend through both layers, it is termed a partial thickness burn</p> <p><b>Minor burn:</b> A minor burn is confined exclusively to the outer surface and is not considered a significant burn. No barrier functions are altered</p>
<b>Central capillary refill time</b>	Capillary time is the rate at which blood returns to the capillary bed after cutaneous pressure on the sternum for 5 seconds (normal ≤ 2 seconds). It should never be measured in isolation and should be considered along with other clinical signs
<b>Compensated shock</b>	Blood flow to vital organs i.e. heart and brain is spared at the expense of non-essential organs. A child in this phase is typically mildly agitated or confused, tachycardic and has cool, pale skin with decreased capillary refill time

<b>Expressing suicidal intent/ideation</b>	<p>Suicidal Intent</p> <ul style="list-style-type: none"> <li>• Subjective expectation and desire for a self-destructive act to end in death.</li> </ul> <p>Suicidal Ideation</p> <ul style="list-style-type: none"> <li>• Thoughts of serving as the agent of one's own death. May vary in seriousness depending on the specific detailing of suicide plans and the degree of suicidal intent</li> </ul>
<b>New neurological symptoms</b>	Sudden onset of confusion, weakness / irritability or drowsiness. Symptoms may also include altered level of consciousness, loss of sensation, weakness of the limbs or alterations in bladder or bowel function
<b>Pain</b>	<p>An unpleasant sensation ranging from mild discomfort to agonised distress</p> <p><b>Severe:</b> Pain that is unbearable, often described as the worst ever; 7-10 (out of 10) on a validated pain score tool (e.g. Wong Baker pain scale/Pain ruler/FLACC Pain Scale/Alder Hey pain score tools)</p> <p><b>Moderate:</b> Pain is bearable but intense; 4-6/10 on a validated pain score tool (e.g. Wong Baker pain scale/Pain ruler/FLACC Scale/Alder Hey pain score tools)</p> <p><b>Mild:</b> Mild stinging causes few problems, can do most things; 1-3/10 on a validated pain score tool (e.g. Wong Baker pain score/Pain ruler/FLACC Scale/Alder Hey pain score tools)</p>
<b>Petechiae</b>	Pinpoint, flat round red spots under the skin surface caused by intradermal haemorrhage. They do not blanch when pressure is applied. This rash should be considered as an emergency in triage and should never receive less than a triage category 2
<b>Rigors</b>	An attack of shivering that occurs when the heat-regulating centre malfunctions. There is a rapid increase in body temperature which remains elevated until profuse sweating takes place
<b>Sudden loss of vision</b>	Sudden visual loss is a common complaint with variable presentations among patients of different ages. Some patients describe their symptoms as a gradually descending gray-black curtain or as blurring, fogging, or dimming of vision. Symptoms usually last a few minutes but can persist for hours. Variation in frequency ranges from a single episode to many episodes per day; recurrences may continue for years but more frequently occur over seconds to hours
<b>Tripod Positioning</b>	A position that may be assumed during respiratory distress to facilitate the use of respiratory accessory muscles. The patient sits leaning forward, with hands placed on the bed or a table with arms braced.

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## **Appendix 1**

- 1.1 Vital Signs Reference Grid(s)**
- 1.2 Levels of Dehydration**
- 1.3 Major Trauma Guidelines**
- 1.4 Levels of Respiratory Distress**

## 1.1 Vital Signs Reference Grids (Adapted from Warren et al 2008)

### Respiratory Rate Values

Table 1.

Age	≤ - 2 SD	- 1 SD	Normal	+ 1 SD	+ 2 SD	> + 2 SD
0 – 3 months	< 20	21 – 30	30 – 60	60 – 70	70 – 80	> 80
4 – 6 months	< 20	20 – 30	30 – 60	60 – 70	70 – 80	> 80
7 -12 months	< 17	17 – 25	25 – 45	45 – 55	55 – 60	> 60
1 – 3 years	< 15	15 – 20	20 – 30	30 – 35	35 – 40	> 40
4 – 6 years	< 12	12 – 16	16 – 24	24 – 28	28 – 32	> 32
> 7 years	< 10	10 – 14	14 – 20	20 – 24	24 – 26	> 26

SD: standard deviation

### Heart Rate Values

Table 2.

Age	≤ - 2 SD	- 1 SD	Normal	+ 1 SD	+ 2 SD	> + 2 SD
0 – 3 months	< 65	65 – 90	90 – 180	180 – 205	205 – 230	> 230
4 – 6 months	< 63	63 – 80	80 – 160	160 – 180	180 – 210	> 210
7 -12 months	< 60	60 – 80	80 – 140	140 – 160	160 – 180	> 180
1 – 3 years	< 58	58 – 75	75 – 130	130 – 145	145 – 165	> 165
4 – 6 years	< 55	55 – 70	70 – 110	110 – 125	125 – 140	> 140
> 7 years	< 45	45 – 60	60 – 90	90 – 105	105 – 120	> 120

SD: standard deviation

Colour	Triage category
Red	Triage category 1
Orange	Triage category 2
Yellow	Triage category 3
White	Triage category not determined by pulse or respiration rate

## Classification of Hypertension by Age Group

**Table 3.**

Age Group	Significant Hypertension (mm Hg)	Severe Hypertension (mm Hg)
Neonate (< 7 days)	Systolic BP $\geq$ 96	Systolic BP $\geq$ 106
Neonate (8 – 30 days)	Systolic BP $\geq$ 104	Systolic BP $\geq$ 110
Infant (< 2 years)	Systolic BP $\geq$ 112 Diastolic BP $\geq$ 74	Systolic BP $\geq$ 118 Diastolic BP $\geq$ 82
Children (3 – 5 years)	Systolic BP $\geq$ 116 Diastolic BP $\geq$ 76	Systolic BP $\geq$ 124 Diastolic BP $\geq$ 84
Children (6 – 9 years)	Systolic BP $\geq$ 122 Diastolic BP $\geq$ 78	Systolic BP $\geq$ 130 Diastolic BP $\geq$ 86
Children (10 – 12 years)	Systolic BP $\geq$ 126 Diastolic BP $\geq$ 82	Systolic BP $\geq$ 134 Diastolic BP $\geq$ 90
Adolescents (13 – 15 years)	Systolic BP $\geq$ 136 Diastolic BP $\geq$ 86	Systolic BP $\geq$ 144 Diastolic BP $\geq$ 92
Adolescents (16 – 18 years)	Systolic BP $\geq$ 142 Diastolic BP $\geq$ 92	Systolic BP $\geq$ 150 Diastolic BP $\geq$ 98

Colour	Triage category
Orange	Triage category 2
Yellow	Triage category 3

## Notes

- SD = Standard Deviation
- Children with a heart or respiratory rate less than or equal to minus two standard deviations ( $\leq - 2 \text{ S/D}$ ) from the normal range should never be triaged less than **Category 1 (Red)** even in the absence of any other clinical indicator.
- Children with a heart or respiratory rate greater than plus two standard deviations ( $> + 2 \text{ S/D}$ ) from the normal range should never be triaged less than **Category 2 (Orange)** even in the absence of any other clinical indicator.
- Children less than one year with a heart rate of minus one standard deviation ( $- 1 \text{ S/D}$ ) from the normal range should never be triaged less than **Category 1 (Red)** even in the absence of any other clinical indicator.
- Children greater than 1 year with a heart rate of minus one standard deviation ( $- 1 \text{ S/D}$ ) from the normal range should never be triaged less than **Category 2 (Orange)** even in the absence of any other clinical indicator.
- Children with a respiratory rate of minus one standard deviation ( $- 1 \text{ S/D}$ ) from the normal range should never be triaged less than **Category 3 (Yellow)** even in the absence of any other clinical indicator.
- Children with a heart or respiratory rate plus two standard deviations ( $+ 2 \text{ S/D}$ ) from the normal range should never be triaged less than **Category 3 (Yellow)** even in the absence of any other clinical indicator.
- In children with renal conditions, severe hypertension should never be triaged less than **Category 2 (Orange)** even in the absence of any other clinical indicator.
- In children with renal conditions, significant hypertension should never be triaged less than **Category 3 (Yellow)** even in the absence of any other clinical indicator.

## 1.2 Levels of Dehydration

### Severe Dehydration

- >10% loss of body weight
- Poor peripheral perfusion with prolonged capillary refill time
- Cool peripheries
- Low blood pressure
- Anuria
- Lethargic to comatose

### Moderate Dehydration

- > 5% loss of body weight
- Tachycardia (Appendix 1.1)
- Poor tear production
- Decreased skin turgor
- Sunken eyes
- Sunken/bulging fontanelle
- Oliguria
- Restless to lethargic

### Mild Dehydration

- 5% loss of body weight
- Slightly dry mucous membranes
- Slightly decreased urine output
- Increased thirst
- Irritable

## 1.3 Major Trauma Guidelines

**The conscious patient with any of the following:**

- A mechanism of injury that may indicate high risk:
  - Pedestrian / cyclist hit > 30km/hr.
  - Passenger - collision > 60km/hr.
  - Fall from significant height
  - More than twice the child's height and / or fall onto an unyielding surface
  - Kick/fall from a horse
  - Rolled over by a car
  - Ejected from vehicle
  - Thrown over handlebars of bike
  - Fall down flight of stairs
- Death of other victim(s) of the incident
- Unrestrained passenger
- History of submersion
- Multiple trauma
- Significant injury above clavicles
- Trauma & unexplained hypotension
- History of neck trauma / spinal cord trauma
- Neurological deficit
- Other major injuries (e.g. fractured limbs in 2 or more body regions, abdominal injury, pelvic injury, back, femur)
- Penetrating injury to chest, head, neck, abdomen, groin or back
- Burns > 10% body surface
- Clear fluid leak from ear or nose
- New neurological symptoms
  - Sudden onset of confusion, weakness / irritability or drowsiness

**Physical findings:**

- Airway obstruction
- Shallow breathing
- Cyanosis
- Signs of significant shock
- Altered Glasgow Coma Scale

## 1.4 Levels of Respiratory Distress

### Severe Respiratory Distress

- Stridor at rest
- Severe increase in work of breathing
- Sighing / grunting respirations
- Nasal flaring
- Unable to talk in sentences / single words only
- Marked limitation of ability to talk
- Agitated / Distressed
- Minimal respiratory effort
- Moderate – marked accessory muscle use / recession
- Tachycardia
- Head bobbing in the infant
- O<sub>2</sub> saturation < 92%
- PEFR < 40%

### Moderate Respiratory Distress

- Tracheal tug, intercostal / subcostal recession, nasal flaring, chest pain
- Mild stridor
- Constant cough – appears distressed
- Normal mental state
- Some accessory muscle use / recession
- O<sub>2</sub> saturation 92-94% in air
- Tachycardia
- Some limitation of ability to talk
- PEFR 40-70%

### Mild Respiratory Distress

- Normal mental state
- Subtle or no accessory muscle use / recession
- O<sub>2</sub> saturation > 94% (may be normal even in severe asthma)
- Able to talk normally
- PEFR > 70%

## **Appendix 2**

### **ICTS Validation Sample Audit Tool**

## Irish Children's Triage Audit

Name of Nurse:	Time:	Flowchart:	Discriminator:	Pain Scale:	Cat.:	Signature:	Obs:	Stamp:	Registration to Triage:	ID Band	Result:

## **Appendix 3**

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## **Appendix 4**

### **Key Stakeholder Consultation List**

## **Key Stakeholder Consultation List (2013-2014)**

Clinical Directors

Clinical Strategy and Programmes Division

Directors of nursing/midwifery strategic reference group (clinical care programmes)

Faculty of Paediatrics Royal College of Physicians of Ireland

Health Information and Quality Authority

Hospital management teams

HSE Acute Hospitals Office

Irish Association of Directors of Nursing and Midwifery (IADNM)

Irish Association for Emergency Medicine

National Ambulance Service

National Emergency Medicine Programme / Emergency Nursing Interest Group

National Paediatric Clinical Care Programme

Nursing & Midwifery Board of Ireland

Nursing and Midwifery Planning and Development Units , HSE

Office of Nursing and Midwifery Services Director, HSE

Patient representatives / HSE Advocacy Unit

Quality and Patient Safety Directorate

Regional development officer programme Implementation Leads

State Claims Agency

