
# Prehospital Triage

# Prehospital Canadian Triage & Acuity Scale:

## Prehospital CTAS – Adult:

CTAS is based on a five-level scale with:

- **Level 1** (Resuscitation) representing the "sickest" patients.
- **Level 5** (Non-urgent) representing the least ill group of patients.

The determination of a CTAS level is achieved by establishing a relationship between a patient's presenting complaint (or chief complaint) and the potential causes as defined by sentinel events. Other factors known as modifiers further refine the application of an acuity level. Specific modifiers and their application in determining a CTAS level will be discussed later in this Guide.

- **Level 1 (Resuscitation)**

Conditions that are considered threats to life or limb or have an imminent risk of deterioration requiring immediate aggressive interventions.

These are patients that have arrested, or require active and aggressive resuscitation, or are pre-arrest or post arrest. Their treatment is often started in the prehospital setting and further aggressive or resuscitative efforts are required immediately upon arrival at the ED. It includes all arrests, any patient requiring airway support and ventilation or circulatory support. Essentially these patients have a problem with their ABCs requiring immediate intervention or continuing treatment.

- **Level 2 (Emergent)**

Conditions that are a potential threat to life, limb or function requiring rapid medical interventions and the use of condition specific controlled medical acts. These patients have serious illness or injury and have the potential for further deterioration that may then require resuscitation. They need prompt treatment to stabilize developing problems and treat acute conditions. These patients often have had controlled acts applied in the field but require further rapid intervention and treatment.

- **Level 3 (Urgent)**

Conditions that could potentially progress to a serious problem requiring emergency interventions. May be associated with significant discomfort or affect ability to function at work or activities of daily living. These patients have normal vital signs but their presenting problem suggests a more serious acute process. They often have moderate acute pain (pain scale 4-7/10) and it is this category of patients where the pain scales are used more often in the assignment of acuity.

- **Level 4 (Less-Urgent)**

Conditions that relate to patient age, distress, potential for deterioration or complications that would benefit from intervention or reassurance. These patients will typically have stable vital signs and lower pain scales. The potential seriousness of their problem based on the chief complaint is not as acute. The need for acute intervention is not as great and patients may not require the use of medical directives. Many patients with chronic illness without significant acute exacerbation of their illness may fall into this category.

- **Level 5 (Non-Urgent)**

Conditions that may be acute but non-urgent as well as conditions which may be part of a chronic problem with or without evidence of deterioration. The investigation or interventions for some of these illnesses or injuries could be delayed and the potential use of medical directives is limited. These are truly minor complaints that do not pose any immediate risk to the patient. The degree of pain is limited in these patients.

**Rules for Assigning a CTAS Level to Prehospital Patients:**

Unlike in the ED where the initial CTAS level is assigned on initial contact with the patient by a triage nurse and not changed (i.e. it is truly used as a triage tool prior to any treatment) the prehospital care patient will have CTAS applied and documented a minimum of two (2) times. This will reflect the **initial condition** of the patient and the condition of the patient following paramedic interventions in the prehospital care setting. Additional CTAS levels may need to be determined and documented if **a patient's condition changes prior to arrival** at hospital.

The **first CTAS** level will be determined on arrival at the patient and will reflect the **initial condition** of the patient prior to paramedic interventions and serve as a marker for response times as they relate to the patient's acuity. The additional information provided by the documentation of the Arrival CTAS will be useful when reviewing dispatch procedures, vehicle resources and patient care standards.

The **second CTAS** level will be determined at the time of departure from the scene or after the intervention has been done.

The **second CTAS** will aid in determining the destination
(e.g. CTAS Level 1 and 2 to the nearest/closest most appropriate receiving facility) and will also reflect any change in the patient's condition as a result of prehospital interventions on scene prior to transport.

These two CTAS levels are mandatory and must be documented on the E-PCR .

The **second CTAS** level will reflect the patient's current condition if there has been a change from the **first CTAS** level.

It is important for paramedics to notify the ED of any changes in the CTAS level enroute to allow the ED staff to prepare the appropriate resources for the patient. The ability and need to provide an additional CTAS score will be in large part determined by the transport time. With shorter transport times (e.g. 5 to 10 minutes) paramedics may not have an opportunity to update the CTAS level and notify the ED prior to arrival. With longer transport times (e.g. ≥20 minutes) there is a greater likelihood that the patient's condition may change thus changing the resources the ED must prepare in advance of patient. As well, there is generally more time for paramedics to update the ED of changes to the patient's CTAS level when transport times are longer. Attitude and empathy are important. Remaining consistent and non-judgmental toward all patients is important. Any element of prejudice leading to a moral judgement of patients can increase patient risk due to incorrect assignment of acuity levels. Do not prejudge patients based on appearance or attitude.

The following rules must be considered by paramedics when assigning CTAS levels to patients.

- **Rule #1**

A minimum of two (2) CTAS scores will be applied to each patient.

- **Rule #2**

The CTAS level reported to the receiving institution is the first CTAS level or the up dated one .

- **Rule #3**

For a patient who is vital signs absent (VSA) on arrival and who is resuscitated, the CTAS must stay as a CTAS 1.

- **Rule #4**

In cases where it is determined on arrival that a patient is "obviously dead", CTAS is required to be assigned and documented as a zero (0) on the E-PCR .

All CTAS Level 1 patients must be transported to **the nearest/closest most appropriate** receiving facility capable of providing the medical care required by the patient unless directed otherwise by **medical control**. The following guidelines are to be used when considering transport decisions for CTAS levels:

- Level 1 – nearest/closest most appropriate receiving facility.
- Level 2 – nearest/closest most appropriate receiving facility based on communication between paramedics, medical control and the receiving facility.
- Level 3, 4, 5 – most available receiving facility.

◊ **Quick Look**

The first step in the CTAS process is the "Quick Look". In some cases, the CTAS level can be determined quickly by simply conducting a "Quick Look" when the presenting complaint is obvious. This applies primarily to critically ill patients who appear in extremis on initial contact. "Quick Look" must not be used to place a patient in any CTAS level other that CTAS **Level 1**.

Many patients who may not appear ill may have subtle signs that modifiers will identify placing them in a more acute CTAS level than the "Quick Look" would indicate.

◊ **Presenting Complaint**

The second step is to determine the **presenting complaint** based on **the CEDIS category**. As with the "Quick Look", the presenting complaint should only be used to place the patient into CTAS Level 1.

An example of this is a patient in the cardiovascular category with a complaint of chest pain with cardiac features and signs of decompensation.

| CEDIS Categories | |
|---|---|
| • Cardiovascular<br>• ENT<br>• Environmental<br>• Gastrointestinal<br>• Genitourinary<br>• Mental Health<br>• Neurologic<br>• Obstetrics/Gynecology (OB/GYN) | • Ophthalmology<br>• Orthopedic<br>• Pediatric<br>• Respiratory<br>• Skin<br>• Substance Misuse<br>• Trauma<br>• General and Minor |

◊ **First and Second Order Modifiers**

In many cases however, it may not be obvious what the CTAS level should from the "Quick Look" and the presenting complaint alone.

In these cases, first and second order modifiers will be needed to assign a CTAS score. These modifiers are determined during the primary and secondary surveys and will help refine the severity of the presenting complaint to accurately determine the CTAS level. In addition, many presenting complaints will fall within more than one CTAS level and modifiers will be needed to accurately determine the CTAS level.

A good example of this is a patient that falls within the gastrointestinal category with a presenting complaint of abdominal pain where the presence of fever, vital sign abnormalities and pain severity will affect the CTAS level.

First and second order modifiers are the third and fourth steps in determining the CTAS level and their application in determining CTAS levels will be discussed in detail later in the Guide.

By following an organized approach for every patient that includes the "Quick Look", determining the presenting complaint and applying modifiers where applicable, paramedics will improve their ability to consistently assign CTAS scores. It is important to look for all modifiers that apply to the individual patient and not stop at the first modifier that is applied.

- ◊ **First Order Modifiers**

First order modifiers are applied once the presenting complaint has been determined and the modifiers are applied in two (2) steps/groups.

The initial first order modifiers that are applied are related to airway, breathing and circulation (ABCs), level of consciousness (D-deficits) and vital signs. These include:

1. Respiratory Distress modifier ("A" and "B") using the respiratory rate, oxygen saturation (if available) and respiratory effort.
2. Hemodynamic Stability modifier ("C") using heart rate, blood pressure and signs of perfusion.
3. Level of Consciousness modifier ("D") using the patient's general level of consciousness and the Glasgow Coma Scale (GCS).
4. Temperature (if available)

◊ **The initial first order modifiers that are applied are related to airway, breathing and circulation (ABCs), level of consciousness (D-deficits) and vital signs.**

1. Respiratory Distress modifier ("A" and "B") using the respiratory rate, oxygen saturation (if available) and respiratory effort.

| Level of Distress | $O_2$ Saturation | CTAS Level |
|---|---|---|
| | | |
| **Severe:** Fatigue from excessive work of breathing, cyanosis, single-word speech, unable to speak, upper airway obstruction, lethargic or confused | <90% | **1** |
| **Moderate:** Increased work of breathing, speaking phrases or clipped sentences, significant or worsening stridor but the airway protected. | <92% | **2** |
| **Mild/Moderate:** Dyspnea, tachypnea, shortness of breath on exertion, no obvious increased work of breathing, able to speak in sentences, stridor without any obvious airway obstruction | 92-94% | **3** |
| **None** | ≥94% | **4, 5** |

2. Hemodynamic Stability modifier ("C") using heart rate, blood pressure and signs of perfusion.

| Hemodynamic Status | CTAS Level |
|---|---|
| | |
| **Shock.** Evidence of severe end-organ hypoperfusion: Marked pallor, cool skin, diaphoresis, weak or thready pulse, hypotension, postural syncope, significant tachycardia or bradycardia, ineffective ventilation or oxygenation, decreased level of consciousness. Could also appear as flushed, febrile, toxic, as in septic shock. | **1** |
| **Hemodynamic Compromise.** Evidence of borderline perfusion: pale, history of diaphoresis, unexplained tachycardia, postural hypotension (by history), feeling faint on sitting and standing, or suspected hypotension (lower than normal blood pressure or expected blood pressure for a given patient). | **2** |
| Vital signs at the upper and lower ends of normal as they relate to the presenting complaint, especially if they differ from the usual values for the specific patient. | **3** |
| Normal Vital signs | **4, 5** |

3. Level of Consciousness modifier ("D") using the patient's general level of consciousness and the Glasgow Coma Scale (GCS).

| Status – Level of Consciousness | GCS | CTAS Level |
|---|---|---|
| | | |
| **Unconscious**: Unable to protect airway, response to pain or loud noise only and without purpose, continuous seizure or progressive deterioration in level of consciousness | 3 - 9 | **1** |
| **Altered level of consciousness**: Response inappropriate to verbal stimuli, loss of orientation to person, place or time, new impairment of recent memory, altered behaviour | 10 - 13 | **2** |
| **Normal**: Other modifiers are used to define | 14 - 15 | **3, 4, 5** |

4. Temperature (if available)

| Temperature ≥38.5° | CTAS Level |
|---|---|
| | |
| **Immunocompromised:** neutropenia (or suspected), chemotherapy or immunosuppressive drugs including steroids | **2** |
| **Looks septic:** patient has evidence of infection, have 3 SIRS criteria positive, or show evidence of hemodynamic compromise, moderate respiratory distress or altered level of consciousness | **2** |
| **Looks unwell:** patient has <3 SIRS criteria positive but appear ill-looking (i.e. flushed, lethargic, anxious or agitated) | **3** |
| **Looks well:** patient has fever as their only positive SIRS criteria and appear to be comfortable and in no distress | **4** |

The second group of first order modifiers that are applied are related to specific conditions or symptoms. These include:

**1. Pain**

| Severity | Location | Duration | CTAS Level |
|---|---|---|---|
| | | | |
| Severe (8 – 10/10) | Central | Acute | **2** |
| | | Chronic | **3** |
| | Peripheral | Acute | **3** |
| | | Chronic | **4** |
| Moderate (4 – 7/10) | Central | Acute | **3** |
| | | Chronic | **4** |
| | Peripheral | Acute | **4** |
| | | Chronic | **5** |
| Mild (0 – 3/10) | Central | Acute | **4** |
| | | Chronic | **5** |
| | Peripheral | Acute | **5** |
| | | Chronic | **5** |

## 2. Bleeding Disorders

The Bleeding Modifier is to be applied to the following patients:

1. Patients with congenital bleeding disorders (e.g. hemophilia, Von Willebrand's Disease).
2. Patients with severe liver failure.
3. Patients taking anticoagulants (e.g. warfarin, apixaban).

| Bleeding Site | CTAS Level |
|---|---|
| | |
| • Head (intracranial) and neck<br>• Chest, abdomen, pelvis, spine<br>• Massive vaginal hemorrhage<br>• Iliopsoas muscle and hip<br>• Extremity muscle compartments<br>• Fractures or dislocations<br>• Deep lacerations<br>• Any uncontrolled bleeding | **2** |
| • Moderate, minor bleeds<br>• Nose (epistaxis)<br>• Mouth (including gums)<br>• Joints (hemathroses)<br>• Menorrhagia<br>• Abrasions and superficial lacerations | **3** |

### 3. Mechanism of Injury (MOI)

| Mechanism of Injury | CTAS Level 2 |
|---|---|
| **General Trauma** | **Motor Vehicle Collisions**<br>• Ejection (partial or complete) from vehicle<br>• Rollover<br>• Extrication time ≥20 minutes<br>• Significant intrusion into passenger's space (≥ 0.3 metres occupant site; ≥0.5 metres any site, including roof )<br>• Death in the same passenger compartment<br>• Impact ≥40 km/h (unrestrained) or impact ≥60 km/h (restrained)<br>**Motorcycle Collision**<br>• Impact with a vehicle ≥30 km/h, especially if rider is separated from motorcycle<br>**Fall**<br>• From ≥6 metres (one storey is equal to 3 metres)<br>**Penetrating Injury**<br>• To head, neck, torso or extremities proximal to elbow and knee |
| **Head Trauma** | **Motor Vehicle Collision**<br>• Ejection (partial or complete) from vehicle<br>• Unrestrained passenger striking head on windshield<br>**Pedestrian**<br>• Struck by vehicle<br>**Fall**<br>• From ≥1 metre or 5 stairs<br>**Assault**<br>• With blunt object other than fist or feet |
| **Neck Trauma** | **Motor Vehicle Collision**<br>• Ejection (partial or complete) from vehicle<br>• Rollover<br>• High speed (especially if driver unrestrained)<br>**Motorcycle Collision**<br>**Fall**<br>• From ≥1 metre or 5 stairs<br>**Axial Load to the Head** |

**Second Order Modifiers**

Second Order Modifiers are more **complaint-specific** and are applied after **the presenting complaint** is determined and the first order **modifiers have been applied**.

A second order modifier should not be used to downgrade the CTAS level in instances where a higher CTAS prevails due to the presenting complaint or where first order modifiers apply.

For example , if a patient has chest pain of suspected cardiac origin, shortness of breath with an oxygen saturation of 91% and a blood pressure of 210/100, the second order modifier of hypertension would class the patient as a CTAS level 3. The patient however, should stay at CTAS level 2 due to the presenting complaint of chest pain of ischemic origin and the first order modifier of Respiratory Distress with the oxygen saturation of 91%.

Second order modifiers are of **two (2) types**:

1. Second order modifiers are meant to supplement first order modifiers that may apply to more than one (1) or more presenting complaints:

**• Blood glucose**

| Blood Glucose Level | Symptoms | CTAS Level |
|---|---|---|
| | | |
| <3 mmol/ 60 mg/dl | Confusion, seizure, diaphoresis, behavioural change, acute focal deficits | 2 |
| | None | 3 |
| ≥18 mmo 324 mg/dl | Dyspnea, tachypnea, dehydration, thirst, weakness, polyuria | 2 |
| | None | 3 |

• **Hypertension**

| Blood Pressure | Symptoms | CTAS Level |
|---|---|---|
| | | |
| Systolic Blood Pressure ≥220 or Diastolic Blood Pressure ≥130 | **Any** other symptoms (e.g. headache, chest pain, shortness of breath or nausea). | **2** |
| Systolic Blood Pressure ≥220 or Diastolic Blood Pressure ≥130 | **No** symptoms. | **3** |
| Systolic Blood Pressure 200 - 220 or Diastolic Blood Pressure 110 - 130 | **Any** other symptoms (e.g. headache, chest pain, shortness of breath or nausea). | **3** |
| Systolic Blood Pressure 200 - 220 or Diastolic Blood Pressure 110 - 130 | **No** symptoms | **4, 5** |

• **selected adult second order modifiers**.

2. Presenting complaint specific modifiers - apply to specific presenting complaints that first order modifiers may not adequately address

| Presenting Complaint | Revised Modifier | CTAS Level |
|---|---|---|
| Chest pain, non-cardiac features | Other significant pain (ripping or tearing) | 2 |
| Extremity weakness/symptoms of CVA | Time of onset <4.5 hours | 2 |
| | Time of onset ≥ 4.5 hours | 3 |
| Difficulty swallowing/dysphagia | Drooling or stridor, hoarseness or dysphagia | 2 |
| | No distress but with difficulty swallowing | 3 |
| Upper or lower extremity | Obvious deformity | 3 |

- **Obstetrics ≥20 weeks gestation**

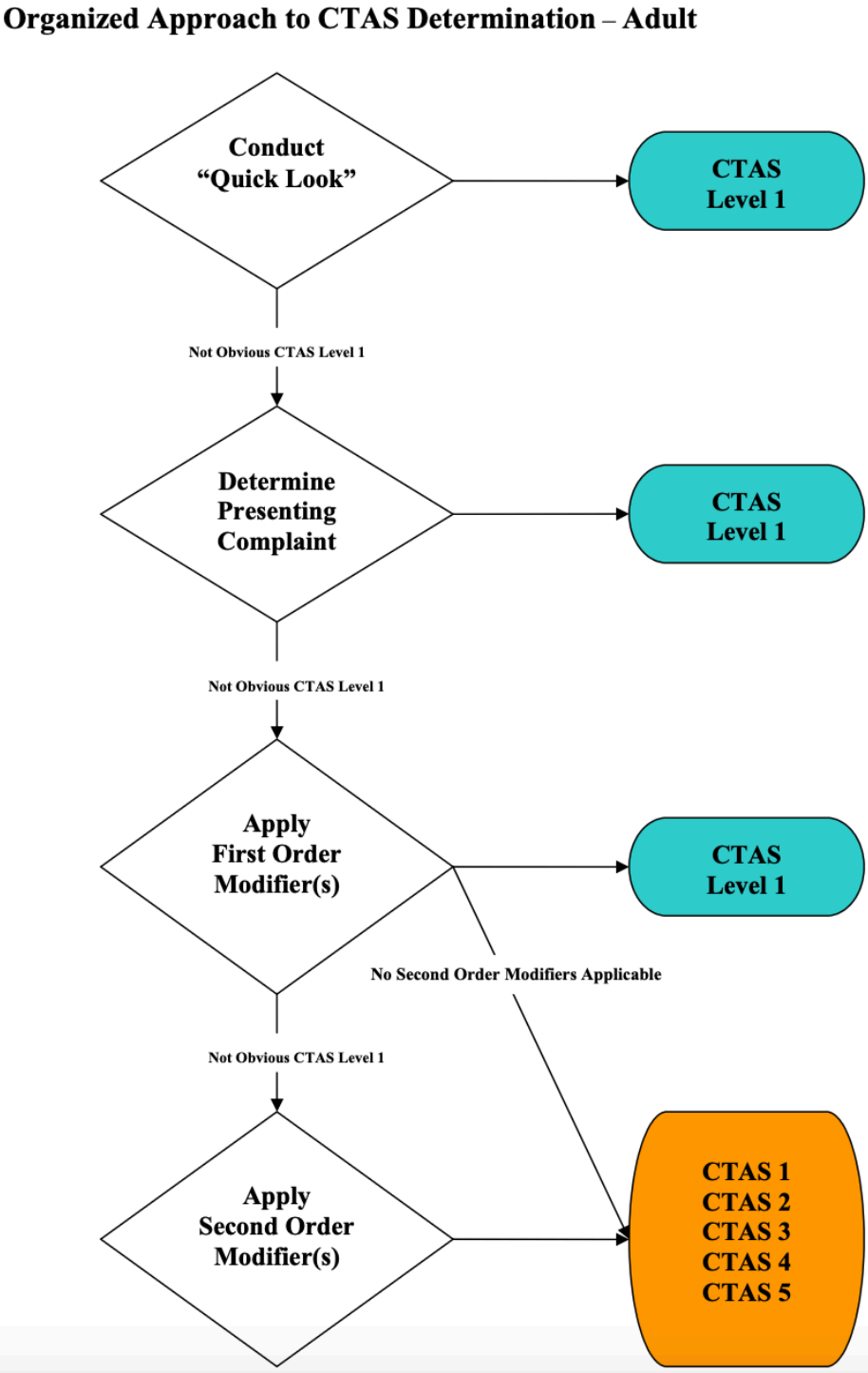
| Presenting Complaint | CTAS Level |
|---|---|
| | |
| Presenting fetal parts or prolapsed umbilical cord. | 1 |
| Vaginal bleeding in the third trimester (other than show). | 1 |
| Active labour (contractions <2 minutes apart). | 2 |
| No fetal movement or no fetal heart sounds. | 2 |
| Complex hypertension +/- headache, +/- edema, +/- abdominal pain. | 2 |
| Post delivery (mother and infant). | 2 |
| Active labour (contractions ≥2 minutes apart). | 3 |
| Possible leaking amniotic fluid (≥24 hours). | 3 |

- **Mental health**

| Presenting Complaint | Description | CTAS Level |
|---|---|---|
| Depression/Suicidal or deliberate self harm. | Attempted suicide, clear plan. | 2 |
| | Active suicide intent. | 2 |
| | Uncertain flight or safety risk. | 2 |
| | Suicidal ideation, no plan. | 3 |
| | Depressed, no suicidal ideation. | 4 |
| Anxiety/Situational Crisis | Severe anxiety/agitation. | 2 |
| | Uncertain flight or safety risk. | 2 |
| | Moderate anxiety/agitation. | 3 |
| | Mild anxiety/agitation. | 4 |
| Hallucinations or Delusions | Acute psychosis. | 2 |
| | Severe anxiety or agitation. | 2 |
| | Uncertain flight or safety risk. | 2 |
| | Moderate anxiety or agitation or with paranoia. | 3 |
| | Mild agitation, stable. | 4 |
| | Mild anxiety or agitation, chronic hallucinations. | 5 |
| Insomnia | Acute | 4 |
| | Chronic | 5 |
| Violent or Homicidal Behaviour | Imminent harm to self or others, or specific plan. | 1 |
| | Uncertain flight or safety risk | 2 |
| | Violent or homicidal ideation, no plan. | 3 |
| Social Problem | Abuse physical, mental, high emotional stress. | 3 |
| Bizarre Behaviour | Uncontrolled | 1 |
| | Chronic, non-urgent | 5 |

◊ **Patients Who Are Hard to Assign an Acuity Level**:

If a patient seems difficult to assign an acuity level to because they don't seem to fit any of the categories, paramedics need to either discuss the case SRCA medical control or make a judgement based on their experience.



| Triage CTAS Level | CEDIS categories | Cases |
|---|---|---|
| **LEVEL** 1 →**Resuscitation** | **Cardiovascular** | • Cardiac arrest - traumatic and non-traumatic<br>• Pre-arrest - severe end-organ hypoperfusion (e.g. tachycardia, hypotension)<br>• Patients with a return of spontaneous circulation (ROSC) following a cardiac arrest<br>• Chest pain with cardiac features - severe end-organ hypoperfusion |
| | **Environmental** | • burn - ≥25% body surface area<br>• Heat stroke with abnormal vital sign or decreased LOC |
| | **Mental Health** | • Violent/homicidal behavior - imminent harm to self or others or specific plans<br>• Bizarre behavior - uncontrolled |
| | **Neurological** | • Unconscious - GCS 3-9<br>• Seizures - actively seizing |
| | **Obstetrics/Gynecology** | • Pregnancy ≥20 weeks - presenting fetal parts, prolapsed cord<br>• Pregnancy ≥20 weeks - vaginal bleeding in 3rd trimester |
| | **Respiratory** | • Respiratory arrest<br>• Shortness of breath - severe respiratory distress |
| | **Trauma** | • Major trauma - severe hemodynamic compromise (shock)<br>• Traumatic amputation of an extremity |

| Triage CTAS Level | CEDIS categories | Cases |
|---|---|---|
| **LEVEL** 2 →**Emergent** | **Cardiovascular** | **Cardiovascular**<br>• Chest pain with cardiac features - borderline perfusion (e.g. tachycardia with low blood pressure)<br>• Hypertension - SBP ≥220 or DBP ≥130 with symptoms<br>• Syncope - history of new onset dysrhythmia/irregular pulse and/or known/suspected change in rate |
| | **Ears, Nose, Throat** | • Dental avulsion <1<br>• drooling or stridor, obvious edema/swelling of lips, tongue or oropharynx<br>• Neck pain - neck stiffness/meningismus +/- fever<br>• Epistaxis (active bleeding) - uncontrolled despite appropriate pressure |
| | **Environmental** | • Frostbite/cold injury - cold pulseless limb<br>• Hypothermia with severe symptoms<br>• Chemical exposure - eye(s)<br>• Chemical exposure - major burns to hand(s), feet, groin or face<br>• Allergic reaction - previous severe reaction<br>Heat stroke with normal vital sign and LOC ( drowse ) |

| | | |
|---|---|---|
| | | Snake bite<br><br>Scorpion bite |
| | **Gastrointestinal** | • Vomiting blood - active or significant hematemesis<br>• Rectal bleed - large amount of melena or rectal bleeding<br>• Abdominal pain (severe pain) |
| | **Mental Health** | • Attempted suicide or clear suicide plan<br>• Severe anxiety/agitation |
| | **Neurologic** | • Altered level of consciousness - GCS 10-13<br>• Headache (sudden, severe, worst ever)<br>• Seizure - post-ictal<br>• CVA - time of symptom onset <4.5 hours |
| | **Obstetrics/Gynecology** | • Vaginal bleeding - heavy +/- pregnancy<br>• Pregnancy ≥20 weeks - active labour (contractions <2 minutes apart)<br>• Pregnancy ≥20 weeks - complex hypertension +/- headache +/-edema +/-abdominal pain |
| | **Ophthalmology** | Acute vision loss |
| | **Respiratory** | • Shortness of breath - moderate respiratory distress<br>• Foreign body obstruction – drooling ( handle secretion ) or stridor, hoarseness or dysphagia or difficulty swallowing<br>• |

| | | |
|---|---|---|
| | **Trauma** | • Significant Mechanism of Injury - all patients with injuries, symptoms and complaints related to trauma<br>• Penetrating head, chest or abdomen<br>• Neurovascular compromise of an extremity<br>• Burns - ≥25% body surface area<br>• Abdominal pain (severe central pain) |
| **Triage CTAS Level** | **CEDIS categories** | **Cases** |
| **LEVEL** 3→**Urgent** | **Cardiovascular** | • Chest pain, non-cardiac features - acute onset, ongoing<br>• Hypertension - SBP ≥220 or DBP ≥130 with no symptoms<br>• Hypertension - SBP 200-220 or DBP 110-130 with symptoms |
| | **Environmental** | • Frostbite/cold injury - blanching of skin ( with pulse ) |

| | | |
|---|---|---|
| | | • Hypothermia - moderate symptoms<br>• Heat exhaustion |
| | **Gastrointestinal** | • Vomiting blood - "coffee-ground" emesis, small amount<br>• Rectal bleed - melena, small amount |
| | **Mental Health** | • Depression/suicidal (suicidal ideation, no plan)<br>• Moderate anxiety/agitation |
| | **Neurologic** | • Seizures - resolved, normal level of alertness<br>• CVA - onset of symptoms ≥4.5 hours OR resolved (TIA) |
| | **Obstetrics/Gynecology** | • Menorrhagia<br>• Pregnancy ≥20 weeks (active labour, contractions ≥2 minutes apart)<br>• Pregnancy ≥20 weeks - possible leaking amniotic fluid (≥≥24 hours) |
| | **Respiratory** | • Shortness of breath - mild/moderate respiratory distress<br>• Foreign body obstruction - no distress but with difficulty swallowing |
| | **Trauma** | • Burns - 5-25% body surface area<br>• Laceration/puncture (sutures required)<br>• Animal bites or bites with sutures required |

| Triage CTAS Level | CEDIS categories | Cases |
|---|---|---|
| **LEVEL 4→Less Urgent** | **Cardiovascular** | • Hypertension - SBP 200-220 or DBP 110-130 with no symptoms |
| | **Environmental** | • Hypothermia - mild with normal vital signs<br>• Heat cramp |
| | **Gastrointestinal** | • Constipation (mild pain < 4/10) |
| | **Genitourinary** | • Urinary tract infection complaints/symptoms (mild dysuria) |
| | **Mental Health** | • Mild anxiety/agitation |
| | **Neurologic** | • Confusion - chronic, no change from usual state |
| | **Obstetrics/Gynecology** | • Non pregnant vaginal bleeding - minor/spotting |
| | **Trauma** | • Burns - <5% body surface area<br>• Upper extremity injury |

| Triage CTAS Level | CEDIS categories | Cases |
|---|---|---|
| **LEVEL 5→ non -Urgent** | **Environmental** | • Minor bites (+/- mild pain <4) |
| | **General and Minor** | • Dressing change (plus normal vital signs ) |
| | **Respiratory** | • Sore throat/upper respiratory illness - no respiratory symptoms/compromise |
| | **Trauma** | • Minor contusions, abrasions or lacerations (not requiring closure by any means) |
| | **Gastrointestinal** | • Diarrhea (mild, no dehydration) |

**Pediatric Prehospital CTAS :**

For the purposes of determining a CTAS level, a pediatric patient is defined as a person <14 years of age.

**Comparison of Adult and Pediatric CTAS**

The basic process for determining the CTAS level for pediatric patients is the same as for adults including:

- The critical "First Look".
- The presenting chief complaint determination.
- Concurrently obtaining a pertinent history.
- The application of appropriate first and second order modifiers to make a final

**Assessment of Pediatric Patients**:

- **General Approach**

An accurate assessment is critical as the pediatric patient has the potential for rapid deterioration.

**An actual diagnosis is not as important as recognition of the potential for rapid deterioration based on the "First Look", history and physical findings.**

The pediatric assessment for determining the CTAS level consists of the following components:

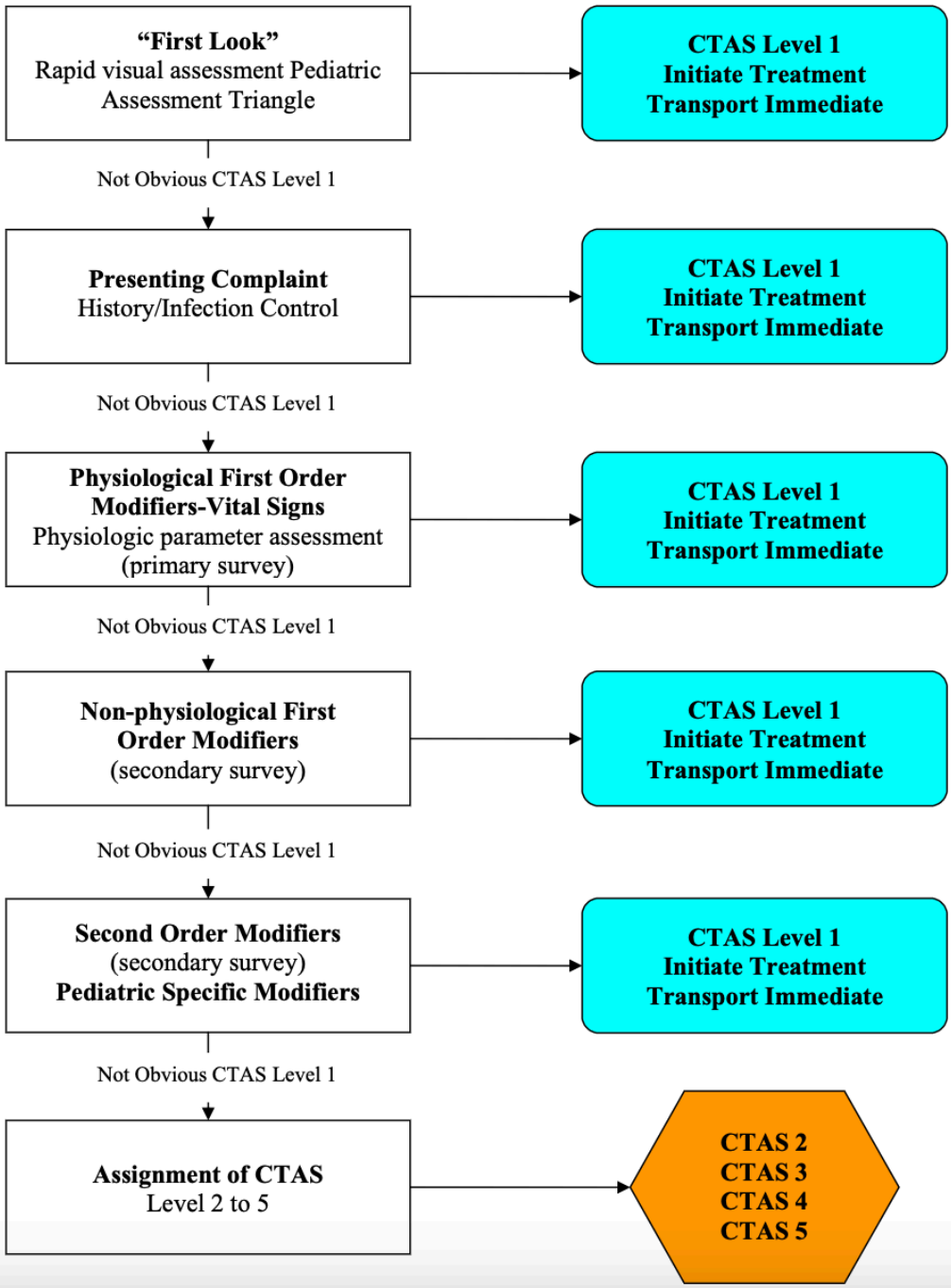
- The critical **"First Look**" using the **PAT**.
- Pediatric history (subjective data), a 2-3 minute interview concurrent with the PAT.
- Physical assessment (objective data) with the application of **physiological** first order modifiers.
- Application of **non-physiological** first order modifiers.
- Application **of second order** modifiers.
- Application of pediatric **specific** modifiers.

Paramedics must obtain enough critical information in their history and assessment to determine patient acuity and the immediate care needs of the patient as well as a sense of the potential for deterioration.

In general, the first 3 parameters used to assign a CTAS level will be determined during the primary assessment while the fourth, second order and pediatric specific modifiers, will be determined during the secondary survey.

Some patient may be assigned to CTAS Level 1 (Resuscitation) or CTAS Level 2 (Emergent) categories prior to full assessment based on the initial presentation (e.g. respiratory arrest). Patients classified to lower acuity levels should have a full assessment completed to avoid missing subtle presentations of serious illness, particularly in young infants.

## Organized Approach to CTAS Determination – Pediatric



◊ **"First Look"**

The initial impression of the severity of illness from a quick assessment of general appearance, work of breathing and circulation (Pediatric Assessment Triangle) can often define the need for immediate attention. The value of this critical "First Look" cannot be over emphasized and it is important to note that it is different from the usual "ABCD" approach used with adults.

It is extremely important to identify CTAS Level 1 or Level 2 patients as soon as possible as they require immediate transport of the child to the emergency department for further assessment and treatment.

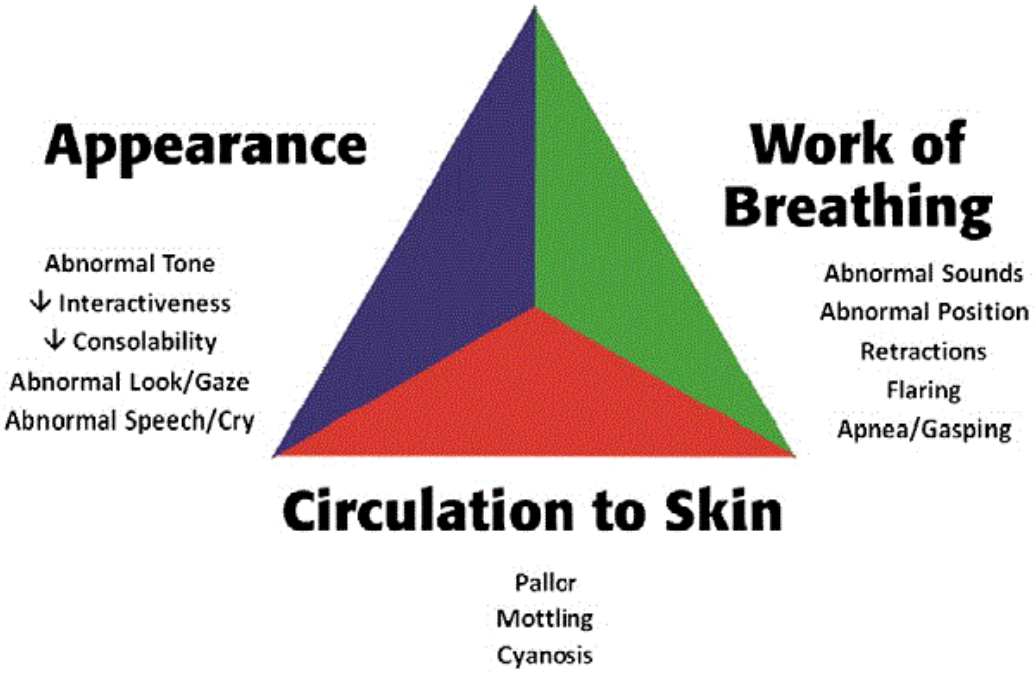
◊ **Pediatric Assessment Triangle**

The PAT is the most important tool that a paramedic can use to quickly identify those children with conditions that require immediate attention and transport. The PAT can be initiated concurrently with obtaining pertinent information about the history associated with the presenting complaint.

All pediatric patients must have the critical "First Look" noting the three components that are used in the PAT: general appearance, work of breathing and circulation. This part of the assessment may be limited if the patient requires rapid access to care/interventions (CTAS Level 1 & 2 patients). The first step in the PAT is the child's overall appearance looking at the child's degree of distress and emotional response. It may be severe distress to no apparent distress or anxious to indifferent. The child may be alert or appear very lethargic or "floppy". If they are lethargic, do they respond to stimulation?

The second step in the triangle is noting the work of breathing by looking at respiratory rate, respiratory effort (shallow breaths, indrawing, accessory muscle use) and listening for adventitious sounds (wheezing, grunting, stridor).

The third step is to determine the patient's circulatory status by observing skin colour and temperature. Look for signs of dehydration. Circulation to the skin will generally shutdown when a pediatric patient is in shock. The signs of poor circulation to the skin include pallor, mottling and cyanosis.




◊ **Presenting Complaint**

In pediatrics, assessment of the presenting complaint is often complicated by the limited ability of children to communicate their difficulties and a paramedic's reliance on the perceptions of caregivers. Many conditions are categorized differently in the pediatric population and there are a number of pediatric specific entities, e.g., neonatal jaundice.

The significance of certain presenting complaints in the pediatric population may be of greater importance compared to that in the adult population (e.g. vomiting).

Furthermore, many problems seen in pediatric patients may be categorized within multiple CTAS levels depending on the physiologic response of the child to their condition.

The five (5) most common presenting complaints are:

- Fever
- Respiratory difficulties
- Injuries
- Changes in behaviour
- Vomiting and/or diarrhea (dehydration)

**Pediatric History: Subjective Data**

The ability of young children to accurately describe symptoms, feelings and events should never be underestimated. Obtaining an accurate history in an efficient manner is dependant upon many variables that differ from obtaining a history from an adult. These variables include the child's age, developmental status, language, ability to interact and the ability to apply/assess for specific modifiers (e.g. pain). Other factors that may influence effective communication include cultural differences, the need for an interpreter, hearing disability and mental competency. In general, avoid leading questions as they may inadvertently bias the information given.

Open-ended questions help elicit feelings and perceptions along with the specifics of the presenting complaint. Closed questions (with yes or no answers) are useful for obtaining facts. In general, initial questions should be open-ended (subjective assessment) whereas closed questions (objective assessment) can be used to validate information. In many cases the information received from a parent/caregiver may be all that is available. Listen closely to the details given and also take into account their perception of the child's condition. Information is not solely obtained from verbal communication as non-verbal communication from observing the child and the parents/caregivers can be helpful.

It cannot be emphasized enough how significant non-verbal information is as an important source of information. Attitude and empathy are important. Remaining consistent and non-judgemental toward all patients is important. Any element of prejudice leading to a moral judgement of patients can increase patient risk due to incorrect assignment of acuity levels.

Do not prejudge patients based on appearance or attitude.

- **The following observations may also be helpful:**

    1. Does the child have age/developmentally appropriate behaviour and social interactions?
    2. Are the interfamilial dynamics appropriate?
    3. Are there any indications of child abuse or neglect?

Do not forget that the initial physical assessment (PAT) is done **concurrently** with the pediatric interview.

◊ **Pediatric Modifiers**

As with adults, if it is not clear what the CTAS level is from the "First Look" and the presenting complaint then first order modifiers are applied early to quickly identify patients who are of higher acuity.

The application of these modifiers is different in children as they are divided into physiological first order modifiers that include vital signs and non-physiological first order modifiers. The physiologic modifiers are applied first and if the CTAS level is not clear, then non-physiologic first order modifiers are applied. If it is still unclear as to what the CTAS level should be, then second order modifiers, including the pediatric specific modifiers, can be used to assist in assigning a CTAS level.

**Pediatric Modifier Considerations**:

❖ **Vital Signs Vital signs**

play an integral role in determining the CTAS level for pediatric patients as all vital signs are incorporated into a modifier. A complete set of vital signs are to be done for all patients as indicated in the BLS unless there are circumstances that prevent it. The range of normal vital signs is quite wide and very age dependant unlike in the assessment of adults where for all ages the vital signs either fall within or outside of what is considered a normal range. It may also be difficult to obtain certain vital signs due to the age, size and condition of the patient. For instance, it is often very difficult to obtain a blood pressure in an infant and paramedics may need to rely on pulses when assessing for circulation in some instances.

Whenever possible, vital signs should be done when the child is quiet so that the most accurate information can be obtained and used to assign a CTAS level. A child that is upset and crying can have an increased heart rate and respiratory rate that may result in a different CTAS score than if the CTAS level is determined after the child quiets down.

❖ **Fever**

Febrile illness is a common presentation but it should be noted that the degree of temperature elevation does not necessarily reflect the severity of illness. Paramedics should rely on the parent's measurement of the child's temperature if it is stated to be elevated. The paramedic should ask how the temperature was taken (axillary, oral or rectal) and what the temperature reading was.

Unlike in adults, elevated temperatures at different ages have different implications (e.g. fever in patients less than three months of age is considered more serious than in older children). Remember that extremely ill children may also present with a diminished temperature (hypothermia) due to their inability to regulate temperature.

❖ **Pain**

An age/developmentally appropriate pain scale should be used on children to attempt to quantify pain. Although pain scales are less helpful (or reliable) at the extremes of age they are still helpful in determining a CTAS level. It would also be unwise to exclude serious problems when pain is not described as severe while at the same time severe pain can be associated with

benign processes (otitis media). The parents may be able to give an indication of the severity of pain as pain scales are not absolute, but do allow the patient or parent to communicate the intensity of a problem from their perspective. This evaluation is used in conjunction with the presenting complaint, to assign patients with similar complaints to different acuity levels. The more intense the pain (e.g. 8-10/10) the more paramedics should be concerned about the need to identify or exclude serious illnesses and attempt to offer empathy and interventions that will diminish unnecessary pain and suffering. Pain perception is very individual and may be influenced by age, past experience and cultural differences.

The first pain someone has may be by definition 10 out of 10, if the question is asked as the worst pain you have ever had (as opposed to the worst pain imaginable). Providers should never assume that a patient's pain is not severe.

On the other hand, when patients report high pain levels (more than 7 out of 10) with a presenting complaint that suggests a minor injury or problem, paramedics may take this into consideration when assigning a CTAS level.

One of the major differences compared to the adult CTAS is that in the pediatric pain modifier there is no distinction between central and peripheral pain. The reason for this is that it is often very difficult to distinguish between the two in very young children who cannot talk and the communication skills are often limited in children

**Pediatric CTAS – Common Prehospital Presentations**

The following are lists of categories and typical presenting complaints by CTAS level:

| Triage CTAS Level | CEDIS categories | Cases |
|---|---|---|
| **LEVEL 1→Resuscitation** | **Cardiovascular** | • Cardiac arrest<br>• Shock/hypotension<br>• Exsanguinating hemorrhage |
| | **Behavior** | Unresponsive |
| | ***ENT** | • Difficulty swallowing with airway/respiratory compromise (can not handle secretion) |
| | ***Trauma** | • Abdominal trauma - penetrating/blunt - signs/symptoms of shock<br>• Major trauma<br>• Poly trauma with abnormal vital sign<br>• Head trauma GCS <8<br>• Fracture with neurovascular compromised<br>• Drowning (unresponsive) |
| | **Child Abuse** | Unstable situation or conflict |
| | **Gynecological** | • Vaginal bleeding, patient with abnormal vital signs |

| | | |
|---|---|---|
| | **Endocrine** | • Diabetic - altered consciousness |
| | **Hematologic/Immunologic** | • Anaphylaxis |
| | **Infection** | • Septic shock |
| | **Musculoskeletal** | • Traumatic amputation - extremity<br>• Major cold injury - hypothermia |
| | **Neurological** | • Hydrocephalus (unresponsive)<br>• Unconscious/unresponsive<br>• Active seizure state |
| | **Respiratory** | • Airway compromise<br>• Severe Respiratory Distress, inadequate breathing<br>• Critical asthma<br>• Chest trauma with respiratory distress |
| | **Skin** | • Burn ≥25% body surface area or airway involvement |

| Triage CTAS Level | CEDIS categories | Cases |
|---|---|---|
| **Level 2 → Emergent** | **Cardiovascular** | • Significant tachycardia *<br>• Bradycardia<br>• Severe dehydration<br>• Uncontrolled major hemorrhage |
| | **Behavior** | Lethargic child |
| | **Gastrointestinal** | • Acute bleeding, vomitus or rectal<br>• Abdominal pain with vomiting/diarrhea/abnormal vital signs |
| | **Neurological** | • Moderate head injury with altered mental state<br>• Altered consciousness<br>• Shunt dysfunction - patient appears ill<br>• Sudden onset of confusion, weakness, severe headache |
| | **Hematologic/Immunologic** | • *Bleeding disorder with (ex: trauma, active bleeding)<br>• Fever - neutropenia/sickle cell disease |
| | **Endocrine** | • Diabetic ketoacidosis/hypoglycemia |

| | | |
|---|---|---|
| | **Infection** | • Any infant or child with toxic (or septic) appearance<br>• Infant <3 months, Temperature <36°C or ≥38.5°C |
| | **Musculoskeletal &Trauma** | • Traumatic amputation<br>• Fracture, open or with no neurovascular impairment<br>• Back pain with neurologic deficit<br>• Avulsed permanent tooth <1 h<br>• Drowning ( responsive ) |
| | **Neurological** | • Major head injury GCS> 8<br>• Unconscious/unresponsive |
| | **Genitourinary** | • Severe testicular pain<br>• Urine retention<br>• Paraphimosis, priapism |
| | **Eye/Ear/Nose/Throat** | • Chemical substance in eye<br>• Burn, penetration, of eye<br>• Orbital infection<br>• Impaled object or amputation of ear<br>• Uncontrolled epistaxis/post tonsillectomy bleeding , Airway compromise<br>• Sore throat with drooling, stridor, and/or difficulty swallowing |

| | | |
|---|---|---|
| | | • Hoarseness, sudden onset with history of trauma to larynx |
| | **Respiratory** | • Marked stridor<br>• Moderate respiratory distress<br>• Severe asthma<br>• Foreign Body aspiration with respiratory distress<br>• Inhalation of toxic substances |
| | **Skin** | • Burn - ≥10% body surface area or face/hand/foot involvement<br>• Burn, chemical or electrical<br>• Purpuric rash |

***In case significant tachycardia:**

- if the patient calmed recheck vital sign , if tachycardia improved the patient can be in another level ( downgrade ) , if the patient still have tachycardia classified him in C-TAS 2

| Triage CTAS Level | CEDIS categories | Cases |
|---|---|---|
| **LEVEL 3 → Urgent** | **Skin** | • Burn, partial thickness and <10% body surface area<br>• Burn, full thickness <5% body surface area<br>• Localized cold injury<br>• Cellulitis - patient appears ill, or is febrile<br>• Complex lacerations |
| | **Respiratory** | • Mild respiratory distress<br>• Moderate asthma<br>• Foreign body aspiration, cough present, with no distress<br>• Constant cough, appears distressed |
| | **Psychiatry** | • Ingestion requiring observation<br>• Moderate risk of harm to self/others<br>• Disruptive/distressed |
| | **Neurological** | • Minor head injury GCS <15<br>• History of altered consciousness<br>• Headache<br>• Possible shunt obstruction with no distress |

| | | |
|---|---|---|
| | | • Seizure prior to paramedic arrival, not actively seizing |
| | **Musculoskeletal** | • Probable fracture with no neurovascular deficit<br>• Tight cast with possible neurovascular impairment<br>• Joint pain with fever<br>• Dental trauma<br>• Laceration/puncture (sutures required) |
| | **Infection** | • Infant 3-36 months, temperature >38.5oC |
| | **Hematologic/Immunologic** | • Sickle cell crisis<br>• Moderate allergic reaction |
| | **Gynecological** | • Vaginal bleeding with normal vital signs |
| | **Genitourinary** | • Inguinal bulge with pain<br>• Scrotal trauma |
| | **Gastrointestinal** | • Persistent vomiting of bile<br>• Vomiting and/or diarrhea <2 years<br>• Possible appendicitis |
| | **Endocrine** | • Diabetic – Hyperglycemia<br>• GI symptoms with metabolic disease |

| | | |
|---|---|---|
| | **Ears/Eyes/Nose/Throat** | • Foreign body in nose causing pain or possible risk of aspiration<br>• Epistaxis, controlled/history of post tonsillectomy bleeding<br>• Puncture wound of soft palate<br>• Tonsil pustules with difficulty swallowing<br>• Hearing problem - acute onset<br>• History of postoperative bleeding - tonsillectomy and/or adenoidectomy ( a bleed in the first 24 hours, Primary bleeds often require a return to theatre )<br>• Foreign body in ear<br>• Periorbital swelling with fever<br>• Sudden vision changes |
| | **Child Abuse** | • Physical assault<br>• Sexual assault<br>• History of ongoing risk<br>• |
| | **Behaviour** | • Inconsolable infant<br>• Infant not feeding<br>• Abnormal Crying |
| | **Cardiovascular** | • Signs of dehydration<br>• Uncontrolled minor hemorrhage |

| Triage CTAS Level | CEDIS categories | Cases |
|---|---|---|
| **LEVEL 4 → Less Urgent** | **Skin** | • Minor cold injury - no discoloration - minimal pain<br>• Localized cellulitis, minor burn |
| | **Respiratory** | • Mild asthma<br>• Possible foreign body aspiration with no history of distress<br>• Minor chest injury with no respiratory distress<br>• |
| | **Psychiatry** | • • Depression - Low risk of harm to self or others<br>• |
| | **Neurological** | • Minor head injury - no vomiting or altered consciousness GCS 15<br>• Chronic or repeating headache with no acute distress<br>• |
| | **Musculoskeletal** | • Sprain/strain, extremity swelling<br>•<br>• |

| | | |
|---|---|---|
| | **Hematologic/Immunologic** | • Local allergic reaction<br>• Sign of Infection<br>• • Child ≥36 months with temperature >38.5oC, nontoxic appearance |
| | **Genitourinary** | • Possible urinary infection |
| | **Gastrointestinal** | • Constipation; not eating; cramps<br>• Abdominal pain with vomiting or diarrhea ≥2 years old<br>• |
| | **Ears/Eyes/Nose/Throat** | • Corneal foreign body/abrasion<br>• Crusting, matting, discharge from eye<br>• Ear drainage<br>• Ear ache |
| | **Behaviour** | • Irritable, inconsolable infant atypical behavior |
| | **Cardiovascular** | • •Chest pain with normal vital signs<br>• |
| | **Child Abuse** | • • Signs or history of family violence<br>• |

| Triage CTAS Level | CEDIS categories | Cases |
|---|---|---|
| **LEVEL 5 → Non-Urgent** | **Skin** | • Superficial burn<br>• Minor lacerations, abrasions, contusions<br>• Localized rash<br>• Minor bite ( not puncture )<br>• |
| | **Gastrointestinal** | • Vomiting or diarrhea, no pain or dehydration, normal vital signs |
| | **Ears/Eyes/Nose/Throat** | • Sore throat, laryngitis, minor mouth sores<br>• Nasal congestion, allergy or upper respiratory infection<br>• Conjunctivitis |
| | **Psychiatry** | • Chronic symptoms with no acute changes |

◊ **CTAS Modifiers First Order/Physiological Modifiers**

❖ Pediatric CTAS Modifiers First Order/Physiological Modifiers The first order modifiers are assessed after the First Look using the Pediatric Assessment Triangle.

First order modifiers for pediatric patients can be divided into:

A. **physiological**
B. **non-physiological modifiers**.

A. The **physiological** modifiers will be assessed in the primary survey and include formal assessment of

◊ respiratory rate/effort (A & B).
◊ heart rate/circulatory status (C) .
◊ level of consciousness (D).

-Temperature is also considered a physiological first order modifier and can be used (if available).

- Fever may be used as a modifier when obtained by history or when obtained directly by the paramedic (if available). If obtained directly by the paramedic it should be done at the very end of the primary survey or at the beginning of the secondary survey.

-Age-specific physiologic parameter assessment is essential for evaluating children and thus the tables for pulse rate and respiratory rates with standard deviations are essential in evaluating the CTAS level.

-When appropriate, attempts to measure vital signs should be done while the child is quiet. Vital sign measurement and general appearance must both be considered in acuity level assignment.

Three of the first order modifiers are assessed using vital signs as a key component.

They are:

• Respiratory Distress (respiratory rate and effort)

• Hemodynamic Stability (heart rate, blood pressure and appearance)

• Level of Consciousness (Glasgow Coma Scale and Level of Consciousness scale)

- Pediatric Vital Signs The following table illustrates normal ranges for respiratory and hearts rates for pediatric patients based on the patient's age:

| Age | Normal Range Respiratory Rate | Normal Range Heart Rate |
|---|---|---|
| 0 – 3 months | 30 – 60 | 90 – 180 |
| 3 months – 6 months | 30 – 60 | 80 – 160 |
| 6 months – 1 year | 25 – 45 | 80 - 140 |
| 1 year – 3 years | 20 – 30 | 75 – 130 |
| 6 years* | 16 – 24 | 70 – 110 |
| 10 years* | 14 - 20 | 60 - 90 |

- Respiratory Status The patient's respiratory status is assessed using the respiratory rate, the level of distress and O2 saturation. The respiratory rate is highly dependent upon the age of the child. For the purposes of assigning a CTAS level, rate is divided into normal and +/- one and two standard deviations as shown in the table below:

| Physiologic Range Respiratory Rate | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Level** | **1** | **2** | **3** | **4/5** | **3** | **2** | **1** |
| 0 – 3 months | <10 | 10 - 20 | 20 - 30 | 30 - 60 | 60 - 70 | 70 - 80 | >80 |
| 3 – 6 months | <10 | 10 - 20 | 20 - 30 | 30 - 60 | 60 - 70 | 70 - 80 | >80 |
| 6 – 12 months | <10 | 10 - 17 | 17 - 25 | 25 - 45 | 45 - 55 | 55 - 60 | >60 |
| 1 – 3 years | <10 | 10 - 15 | 15 - 20 | 20 - 30 | 30 - 35 | 35 - 40 | >40 |
| 6 years* | <8 | 8 - 12 | 12 - 16 | 16 - 24 | 24 - 28 | 28 - 32 | >32 |
| 10 years* | <8 | 8 - 10 | 10 - 14 | 14 - 20 | 20 - 24 | 24 - 26 | >26 |

- **Respiratory Distress**

| Level of Distress | Oxygen Saturation | CTAS Level |
|---|---|---|
| | | |
| **Severe**: Fatiguing from excessive work of breathing. Signs may include cyanosis; lethargy, confusion, inability to recognize caregiver, decreased response to pain; single word or no speech; tachycardia or bradycardia; tachypnea or bradypnea, apnea, irregular respirations; exaggerated retractions, grunting; signs of upper airway obstruction. | <90% | **1** |
| **Moderate**: Increased work of breathing, restlessness, anxiety, or combativeness; tachypnea; hyperpnea; mild increased use of accessory muscles, retractions, speaking phrases or clipped sentences, prolonged expiratory phase. | <92% | **2** |
| **Mild**: No obvious increase in work of breathing. Signs may include tachypnea; mild shortness of breath on exertion; able to speak in sentences. | <92 – 94% | **3** |
| **None** | ≥94% | **4, 5** |

- **Hemodynamic Status**

Hemodynamic status is assessed using the age specific heart rate. As with the respiratory rate, the heart rate is divided into normal range and +/- one and two standard deviations as shown in the table below:

| Physiologic Range Heart Rate | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Level** | **1** | **2** | **3** | **4/5** | **3** | **2** | **1** |
| 0 – 3 months | <40 | 40 - 65 | 65 - 90 | 90 - 180 | 180 - 205 | 205 - 230 | >230 |
| 3 – 6 months | <40 | 40 - 63 | 63 - 80 | 80 - 160 | 160 - 180 | 180 - 210 | >210 |
| 6 – 12 months | <40 | 40 - 60 | 60 - 80 | 80 - 140 | 140 - 160 | 160 - 180 | >180 |
| 1 – 3 years | <40 | 40 - 58 | 58 - 75 | 75 - 130 | 130 - 145 | 145 - 165 | >165 |
| 6 years | <40 | 40 - 55 | 55 - 70 | 70 - 110 | 110 - 125 | 125 - 140 | >140 |
| 10 years | <30 | 30 - 45 | 45 - 60 | 60 - 90 | 90 - 105 | 105 - 120 | >120 |

Along with the heart rate, other factors associated with hemodynamic stability are used to determine the CTAS level.

These factors include: blood pressure, capillary refill, skin changes, LOC, urine output and the general appearance of the child

- **Hemodynamic Status**

| Hemodynamic Stability | CTAS Level |
|---|---|
| **Shock**: Evidence of severe end-organ hypoperfusion such as marked pallor, cool skin, diaphoresis, weak or thready pulse, hypotension, postural syncope, significant tachycardia or bradycardia, ineffective ventilation or oxygenation, decreased level of consciousness; could also appear as flushed, febrile toxic, as in septic shock. | **1** |
| **Hemodynamic compromise:** Delayed capillary refill, tachycardia, decreased urine production and skin changes suggest poor tissue perfusion; vomiting and diarrhea secondary to gastrointestinal infection are a common etiology; the signs of dehydration are not always reliable, particularly in younger patients; hemorrhage in moderate trauma may be masked by the child's ability to maintain his or her blood pressure. | **2** |
| **Volume depletion with abnormal vital signs** | **3** |
| **Normal Vital Signs** | **4, 5** |

- **Level of Consciousness**

Use of GCS may be appropriate depending on the age of the patient. If an accurate GCS can be determined then it should be used. The GCS is shown below:

| | | >1 year | <1 year | |
|---|---|---|---|---|
| Eye opening | 4 | Spontaneously | Spontaneously | |
| | 3 | To verbal command | To shout | |
| | 2 | To pain | To pain | |
| | 1 | No response | No response | |
| Best motor response | 6 | Obeys | Spontaneous movements | |
| | 5 | Localizes pain | Localizes pain | |
| | 4 | Flexion-withdrawal | Flexion-withdrawal | |
| | 3 | Abnormal flexion | Abnormal flexion | |
| | 2 | Abnormal extension | Abnormal extension | |
| | 1 | No response | No response | |
| | | **>5 years** | **2–5 years** | **0–23 months** |
| Best verbal response | 5 | Oriented and converses | Appropriate words and phrases | Coos and smiles appropriately |
| | 4 | Disoriented and converses | Inappropriate words | Cries |
| | 3 | Inappropriate words | Cries and/or screams | Inappropriate crying and/or screaming |
| | 2 | Incomprehensible sounds | Grunts | Grunts |
| | 1 | No response | No response | No response |

| Pediatric Coma Scale =GCS | | |
|---|---|---|
| **Eye Opening** | **Verbal Response** | **Motor Response** |
| 4 Spontaneous<br>3 To speech<br>2 To pain<br>1 None | 5 Coos or babbles<br>4 Irritable/constantly cries<br>3 Cries to pain<br>2 Moans to pain<br>1 None | 6 Obeys commands<br>5 Withdraws from touch<br>4 Withdraws from pain<br>3 Flexion to pain<br>2 Extension to pain<br>1 None |

- **Temperature**

**Table 21 - Temperature <36°C (Pediatric)**

| Age | Temperature | CTAS Level |
|---|---|---|
| | | |
| 0 – 3 months | <36°C | 2 |
| ≥3 months | <32°C | 2 |
| ≥3 months | 32°C – 35°C | 3 |

**Table 22 - Elevated Temperatures (Pediatric)**

| Age | Temperature | CTAS Level |
|---|---|---|
| | | |
| 0 – 3 months | ≥38°C | 2 |
| 3 months–3 years | ≥38.5°C<br>Immunocompromised (e.g. neutropenia, transplant steroids) | 2 |
| | ≥38.5°C<br>Looks unwell. | 2 |
| | ≥38.5°C<br>Looks well. | 3 |
| ≥3 years | ≥38.5°C<br>Immunocompromised (e.g. neutropenia, transplant steroids) | 2 |
| | >38.5°C<br>Looks unwell (consider heart rate and respiratory rate). | 3 |
| | ≥38.5°C<br>Looks well. | 4 |

- "Looks unwell" refers to patients who are flushed, in a hyperdynamic state (tachycardic, tachypneic) and anxious, agitated or confused. If the critical "First Look", presenting complaint, respiratory status, hemodynamic status or LOC indicates the child is a CTAS Level 1, then this will always override the temperature modifier.
- "Looks well" refers to patients who look comfortable, are in no distress, have normal pulse quality and are alert and oriented.

**B. First Order/Non-physiological Modifiers**

The non-physiological first order modifiers are considered after the physiologic modifiers and after the vital signs are obtained. This usually takes place during the secondary survey. These modifiers include pain and mechanism of injury.

- **Pain**

| Severity | Duration | CTAS Level |
|---|---|---|
| | | |
| Severe (8 – 10/10) | Acute | **2** |
| Moderate (4 – 7/10) | Acute | **3** |
| Mild (0 – 3/10) | Acute | **4** |

-

- **Mechanism of Injury (MOI):**

| Mechanism of Injury | CTAS Level 2 |
|---|---|
| | |
| **General Trauma** | **Motor Vehicle Collisions**<br>• Ejection (partial or complete) from vehicle<br>• Rollover<br>• Extrication time ≥20 minutes<br>• Significant intrusion into passenger's space ( ≥0.3 metres occupant site; ≥0.5 metres any site, including roof )<br>• Death in the same passenger compartment<br>• Impact ≥40 km/h (unrestrained) or impact ≥60 km/h (restrained)<br>**Motorcycle Collision**<br>• Impact with a vehicle ≥30 km/h, especially if rider is separated from motorcycle<br>**Fall**<br>• From ≥6 metres (one storey is equal to 3 metres)<br>**Penetrating Injury**<br>• To head, neck, torso or extremities proximal to elbow and knee |
| **Head Trauma** | **Motor Vehicle Collision**<br>• Ejection (partial or complete) from vehicle<br>• Unrestrained passenger striking head on windshield<br>**Pedestrian**<br>• Struck by vehicle<br>**Fall**<br>• From ≥1 metre or 5 stairs<br>**Assault**<br>• With blunt object other than fist or feet |
| **Neck Trauma** | **Motor Vehicle Collision**<br>• Ejection (partial or complete) from vehicle<br>• Rollover<br>• High speed (especially if driver unrestrained)<br>**Motorcycle Collision**<br>**Fall**<br>• From ≥1 metre or 5 stairs<br>**Axial Load to the Head** |

◊ **Second Order Modifier**

Second order modifiers are applied after the first order modifiers, usually during the secondary survey. Glucose determination is the same as with adults however, the remainder of the second order modifiers are pediatric specific modifiers that are obtained from the history or through observing the child.

Second order modifiers include:

- **Glucose Determination**
- **Pediatric Specific Modifiers**

    - Concern for Patient's Welfare.
    - Disruptive Behavior.
    - Stridor
    - Apneic Spells in Infants.
    - Inconsolable Crying in Infants.
    - Floppy Child.
    - Pediatric Gait Disorder/Painful Walking.
    - Congenital Disorders.

**#Glucose Determination**

| Blood Glucose Level | Symptoms | CTAS Level |
|---|---|---|
| | | |
| <3 mmol/L (54 mg/dl) | Confusion, seizure, postictal, diaphoretic, behavioural change or infant <1 year. | **2** |
| | None | **3** |
| ≥18 mmol/L (324 mg/dl) | Dyspnea, dehydration, weakness. | **2** |
| | None | **3** |

**#Pediatric Specific Modifiers**

o Concern for Patient's Welfare

| Second Order Modifier | CTAS Level |
|---|---|
| | |
| Conflict or unstable situation. | 1 |
| Risk of flight or ongoing abuse. | 2 |
| Physical or sexual assault. | 3 |
| History/signs of abuse or maltreatment. | 4 |

o Disruptive Behaviour

| Second Order Modifier | CTAS Level |
|---|---|
| | |
| Uncertain flight or safety risk/family distress. | 2 |
| Acute difficulties with others/environment. | 3 |
| Persistent problematic behaviour. | 4 |
| Chronic unchanged behaviour. | 5 |

o Stridor

| Second Order Modifier | CTAS Level |
|---|---|
| | |
| Airway compromise. | 1 |
| Marked stridor. | 2 |
| Audible Stridor. | 3 |

o Apneic Spells in Infants

| Second Order Modifier | CTAS Level |
|---|---|
| | |
| Apneic episode on presentation. | 1 |
| Recent spell consistent with apnea or respiratory compromise. | 2 |
| History of spell consistent with apnea. | 3 |

o Inconsolable Crying in Infants

| Second Order Modifier | CTAS Level |
|---|---|
| | |
| Inconsolable infant - abnormal vital signs. | 2 |
| Inconsolable infant – stable vital signs. | 3 |
| Irritable but consolable. | 4 |

o Floppy Child

| Second Order Modifier | CTAS Level |
|---|---|
| | |
| No tone, unable to support head. | 2 |
| Limited/less than expected muscle tone. | 3 |

o Pediatric Gait Disorder/Painful Walking

| Second Order Modifier | CTAS Level |
|---|---|
| | |
| Gait or limp problems with fever. | 3 |
| Caregivers identifying need for care, walking with difficulty. | 4 |

o Congenital Disorders

| Second Order Modifier | CTAS Level |
|---|---|
| | |
| Conditions/protocol letters identifying concerns for rapid deterioration or need for immediate therapy. | 2 |
| Vomiting/diarrhea in a child with inherited metabolic disease, Type 1 diabetes or adrenal insufficiency. | |
| Caregivers identifying need for care. | 3 |
| Stable child with congenital disease with potential for problems. | 4 |

**#References:**

---


- https://eyeandear.org.au/wp-content/uploads/2021/08/Post-Tonsillectomy-Bleeding-Clinical-Practice-Guideline.pdf
- Version 2.0Emergency Health Services Branch Ministry of Health and Long-Term Care ( ONTARIO)
- https://www.health.gov.on.ca/en/pro/programs/emergency_health/edu/docs/ctas_paramedic_guide_v2_0_en.pdf
- https://www.google.com.sa/url?sa=i&url=https%3A%2F%2Fwww.researchgate.net%2Ffigure%2FPediatric-Glasgow-Coma-Scale-pGCS-score-10_tbl1_322624974&psig=AOvVaw1p_SFVRngzitSuLVMxjcYM&ust=1685083053911000&source=images&cd=vfe&ved=0CBAQjhxqFwoTCNDRnOHtj_8CFQAAAAAdAAAAABBF
- https://medictests.com/units/pediatric-assessment


---


**Written by:**

-DR.Abdullah ALHamdan

-DR.Abdulaziz ALSaawi

**Approved by:**

-DR.Mohammed ALTuwaijri

- DR. Fahad Samarkandy

- DR. Mohammed AL-Sultan

- DR.Nawfal AL-Jerian

- DR.Omar Othman

- DR.Nasser AL-Rajeh

- DR.Mohammed Arfat

- DR.Abdulrahman AL-Dhabib

- DR.Jameel Abualenain

- DR.Bader AL-Osaimi