Revisions to the Canadian Emergency Department Triage and Acuity Scale (CTAS) Guidelines

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INTRODUCTION

In 2008 the Adult and Paediatric Canadian Triage and Acuity Scale (CTAS) and the Canadian Emergency Department Information System (CEDIS) presenting complaint list were updated based on user and instructor feedback.[1–3] Since then the CTAS National Working Group (NWG) has revised the CTAS educational materials twice. Based on national feedback, several minor revisions were introduced. At the 2012 CTAS NWG meeting it was decided that the guidelines had reached a level of stability and usability that CTAS revisions would adopt a 4-year cycle with the next update in 2016, notwithstanding compelling reasons for earlier modifications.

FEEDBACK AND RESPONSE

1. *Concerns that triage contributes to access block*

A number of emergency physicians and nurses have raised concerns that the triage process is time consuming, leading to access delays, and have ascribed the problems to CTAS. Some have advocated for the elimination of triage altogether.

From a National Working Group perspective it is important to emphasize that CTAS was developed to support triage nurses to prioritize emergency patients based on level of acuity or high risk presentation to help "stream" them to the most appropriately resourced and available treatment area in the emergency department (ED).

The application of CTAS should take seconds for the seriously ill or injured (based on the "Critical first look"), to a few minutes for those patients who are less acute. In a common triage encounter for a stable patient, the triage nurse quickly screens for communicable disease (staff and patient safety), selects the most appropriate CEDIS presenting complaint, identifies the highest relevant first or second order modifier, and then assigns a CTAS score. Nurses are trained to assign a higher score if their clinical judgment suggests that the patient may be sicker than the score indicated applying the most relevant CTAS modifiers. The CTAS NWG does not approve assigning a lower score than CTAS indicates. Measuring the vital signs at triage is not indicated for unstable patients, as they should be streamed immediately to an appropriate treatment area for assessment and stabilization. While measuring vital signs may sometimes help select the most appropriate 1st order modifiers, this task can also be deferred to the primary nurse in the treatment area to streamline patient access. Triage documentation should be limited to a few salient points relevant to the presentation. The role of the triage nurse should not include: performing a complete nursing history at triage, documenting non triage relevant information, triaging patients to a crowded waiting room to be monitored, or performing non-triage tasks.

2. *Confusion between fever definition and SIRS criteria*

For adult CTAS the prior definition of fever was a temperature of $\geq 38.5^{\circ}C$. To assist triage nurses in

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identifying patients at risk for sepsis or severe sepsis, the SIRS criteria were included in CTAS in 2008. This led to some confusion as within the SIRS criteria, fever is defined as a temperature $> 38°C$. To resolve this conflict the adult CTAS definition of fever has been changed to $> 38°C$. For paediatric patients, a fever is still defined as $> 38.5°C$ unless children are under 3 months of age or are immunocompromised. For these two groups fever is defined as $> 38°C$.

3. *Challenges for triage nurses interpreting the paediatric physiologic parameter tables*

Tables of normal respiratory rate and pulse rate ranges by paediatric age groups, along with standard deviations as guides to CTAS acuity considerations, were published in 2008.[2] Concerns were expressed regarding how to decide which category to use for patients at the interphase between 2 age groups and were even more concerned about determining appropriate ranges for children between ages 3 and 6 and ages 6 and 10 as the table did not address the intermediate ages. To address these concerns new graphs were developed based on the first published systematic review of paediatric vital signs in 2011, that allow nurses to extrapolate the expected rates for each patient according to their specific age.[4] It is important to realize that while these ranges were derived based on the average and resting vital signs and not children who are momentarily agitated or screaming, there may be clear reasons for this behaviour that warrant a high acuity score. Some examples would include prolonged paroxysmal supraventricular tachycardia, myocarditis occult infections, unexplained pain, etc.

Figures 1 and 3 show respiratory and pulse rates for children from birth to age 2. This is delineated by month - because the changes over that period are the most dramatic. Figures 2 and 4 show the rate ranges by year for children ages 2 to 18. The central green zone represents the normal range and is consistent with patients triaged as CTAS level 4 or 5. The yellow zones are 1 standard deviation outside the normal range and consideration should be given to assigning these patients a CTAS level 3 acuity, based on the abnormal respiratory or pulse rates. The red zones are 2 standard deviations away from normal and the blue zones 3 standard deviations from normal suggestive of "significantly ill or resuscitation patients" appropriate for assigning an acuity level of 2 and 1 respectively.

4. *The need to triage the newborn delivered in, or on the way to the ED*

In discussions with the CTAS NWG, the CEDIS NWG and the National Ambulatory Care Reporting System (NACRS) it was decided to add an additional presenting complaint to the CEDIS list. The new complaint is "Newly born" listed under General and Minor complaints as NACRS # 869 (http://caep.ca/sites/default/files/caep/CTAS/nacrs_presenting_complaint_list_v2_0_en_fr_pdf_pdf.pdf). These patients are to be triaged as a CTAS level 2 unless they exhibit severe respiratory distress, shock or unconsciousness, in which case they would be assigned a CTAS level 1.

5. *Concern that battery button risk not highlighted*

Feedback from several Paediatric CTAS Instructors has identified a need to better alert nurses and physicians

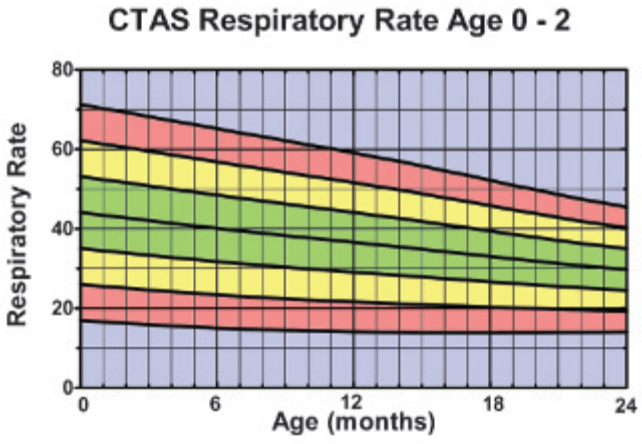

Figure 1. Respiratory rate ranges for infants 0 to 2 years.

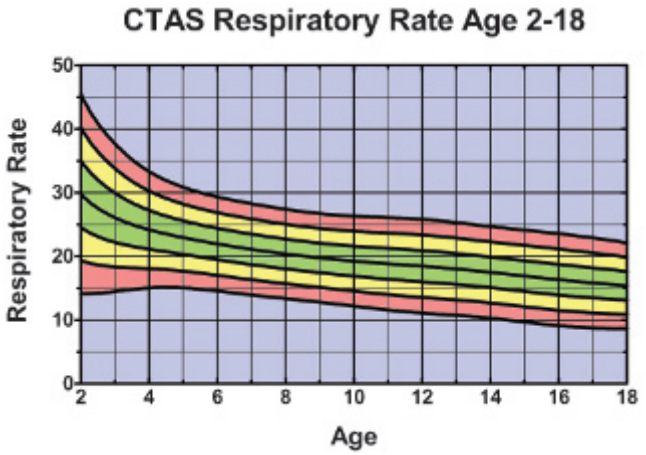

Figure 2. Respiratory rate ranges for children ages 2 to 18 years.

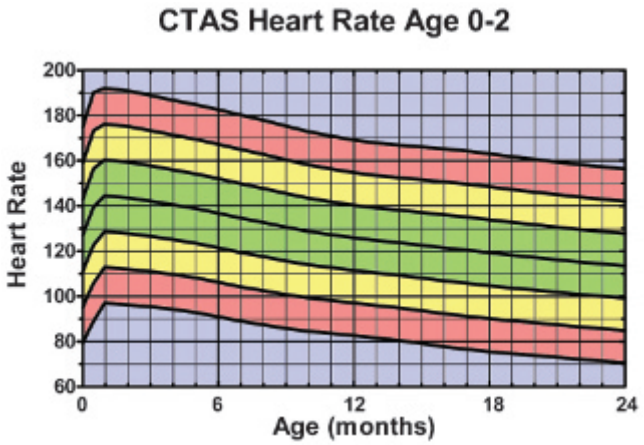

Figure 3. Pulse rate ranges for infants 0 to 2 years.

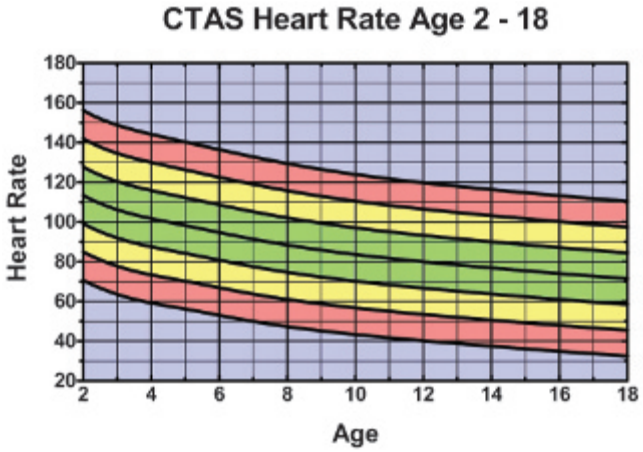

Figure 4. Pulse rate ranges for children 2 to 18 years.

that a child has ingested, aspirated, or inserted a button battery. While in asymptomatic patients nothing emergent needs to be done, it is important to recognize that failure to pass or be removed can lead to serious consequences. For the CEDIS complaints 'Oral / esophageal foreign body', 'Respiratory foreign body', and 'Foreign body nose' a second order modifier has been added. The modifier "button battery, no symptoms" is a CTAS level 3 and should alert staff to the importance of prompt further evaluation.

INTERNATIONALIZATION OF CTAS

The publications and revisions of CTAS guidelines, along with a number of research papers have generated global interest in the Canadian triage acuity scale. The CTAS NWG has received numerous requests for educational materials with an expressed interest in adopting or at least piloting this tool in their country or institutions. Because CTAS was developed and evolved to try to meet the needs of the Canadian emergency medicine environment and our patient and provider needs, the NWG felt it was important that a more formal arrangement than just providing educational materials was required. To that end two forms of collaborations were identified:

1. For countries wishing to adopt CTAS, a 'franchise' model was developed consisting of a letter of agreement between the CTAS NWG and an equivalent NWG, or in some countries the ministry of health, to allow for the use and adaptation of CTAS within their country. The requirement is for national nursing and national emergency physician bodies working together to translate, modify where required, and provide educational support for any and all institutions and providers requiring CTAS (or their country's version) training. To assist in getting started, a Lead CTAS NWG Instructor(s) may go to the partner country to help train their initial core instructors and first class of providers. On one occasion nurses came to Canada to receive their initial training, as well as observe how CTAS is applied in a Canadian emergency department setting.
2. For international institutional requests or smaller countries without the infrastructure to support an NWG, we have arranged to train local CTAS Instructors and Providers, and provided them access to CTAS educational materials to allow them to continue to train their own nurses moving forward. This has currently only involved English speaking countries or sites who have been trained using standardized CTAS materials. Under this arrangement they do not have permission to modify the materials (exceptions include using Imperial instead of metric in non metric countries). This is considered our 'subscription' model. The educational materials are also available for French speaking countries; however, to date no requests have been received.

The first franchise model country was Taiwan who initially piloted and compared CTAS (TTAS) to their existing 4-level triage in 2006 to show that it afforded better discrimination.[5] They then performed interrater reliability and validity studies using electronic clinical decision support tools, [6] showing even higher reliability and similar validity to previously published Canadian studies.[7–13]

Japan was the second franchise partner in 2008 and the JTAS NWG are collaborating with the Japanese government who are supporting the implementation of JTAS in the hospital emergency departments and the development of a national database. In addition they are evaluating the use of modified JTAS in an Emergency Medical Services (EMS) pilot. Trinidad became a subscription partner in 2008, along with a number of American hospitals. The Turks and Caicos adopted CTAS in 2009, and Costa Rica in 2012. In 2013 Korea, Hungary and Barbados have all signed letters of agreement and are all in the process of piloting CTAS in their countries.

The CTAS NWG receives feedback from many of these partner groups and some send representatives to our annual meeting, providing opportunities for both parties to share their challenges and successes.

FUTURE DIRECTIONS

1. There will be an ongoing focus on supporting education. The CTAS NWG educational package is refined based on instructor feedback. There will be an online CTAS education option developed and available within the next year with the goal of helping support providers in remote locations or those unable to access CTAS education in their area.
2. With the CTAS revisions of 2004, it was recognized that electronic clinical decision support to provide nurses access to the CEDIS complaint list and complaint specific modifiers in an efficient and usable format was the goal. Research has supported that premise.[6–9] To support this Complaint Oriented Triage (COT) a hyperlinked PowerPoint CTAS support tool was developed and is freely accessible on the CAEP website (http://caep.ca/resources/ctas). In addition, the CTAS Content Standard was developed for use by computer programmers to assist in building CTAS functionality into emergency department information systems and information about accessing this resource is also available on the same webpage. More recently the CTAS NWG and Pacific Rim Nursing Consultants have collaborated in the release of iPhone, Android, and Blackberry apps in both English and French that support users in applying an accurate CTAS acuity score. Plans are underway to translate the apps into other languages where CTAS is used.
3. International requests for more information about CTAS, how to access CTAS educational materials, how to train their staff, and how to adopt or adapt CTAS for use in their emergency care systems continue. As a working group we will look for ways to best meet their needs and assist in whatever manner we can, given the volunteer nature of the CTAS NWG and our human resource limitations.
4. Following the CTAS revisions in 2004 some emergency medical services (EMS) began training their pre-hospital providers in the use of CTAS hoping it could improve communication between the paramedics and the emergency department staff. The Ambulance Act, Ontario Regulation 257/00 was amended in 2011 (http://www.e-laws.gov.on.ca/html/regs/english/elaws_regs_000257_e.htm#BK9) to require ambulance services to develop a patient response plan based on CTAS acuity as assigned by the paramedic. The CTAS NWG recognizes that the pre-hospital environment and the use of CTAS in the field to determine acuity at the scene, and to monitor changes during transport, is very different from a triage nurse taking a quick snapshot in time, while prioritizing and streaming multiple patients to an appropriate treatment space. As a result of these differences, the CTAS NWG proposed to introduce the Pre-hospital Canadian Triage and Acuity Scale (PreCTAS). The goal was to recognize the different care environment and purpose for which the scale was being deployed. This will be addressed through the provision of educational and case materials that reflect that pre-hospital environment and provide an opportunity for research. Through trials the hope is to identify how to optimize benefits achieved through the application of PreCTAS. Working sessions with the EMS Chiefs of Canada, Paramedic Association of Canada, and Emergency Medical Services committee at Canadian Association of Emergency Physicians (CAEP) have been held with the goal of ongoing discussions. A cross section of physicians, nurses and pre-hospital providers collaborated on the initial development of PreCTAS educational materials with the expectation of revisions based on instructor and user feedback. Across Canada a number of jurisdictions have provided CTAS training to their paramedics and others have piloted PreCTAS. Research and evaluation is on-going

with reports and peer publications expected to help determine future directions.

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