Paramedic Critically Appraised Topic (CAT)
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Title: The usage of CTAS scale in the field of paramedicine
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Clinical Scenario: Paramedics are constantly dealing with offload delays caused by the surplus amount of patients brought in. As paramedics are the first to initiate patient contact, it is crucial they are able to accurately and precisely identify the acuity and resources needed upon patient arrival at hospital. Two paramedics are responding to a Code 4 for an individual who appears to be complaining of shortness of breath. Upon hospital arrival, paramedics label the patient as a CTAS 2 however upon patient delivery, the frustrated emergency nurse argues with the medics the inbound patient is considered a CTAS 3 and had unnecessarily wasted their time and resources in preparation.

PICO: In individuals working for an emergency care system, does the Canadian Triage Acuity Scale (CTAS) compared to other triaging classification systems accurately and precisely identify patient acuity and the necessary resources for proper care.

Search Strategy: ((paramedic or emergency nurse or EMS or EMT) AND prehospital AND (CTAS or triage)) used both CINAHL and PubMed
Search Outcomes: 144 Articles on CINAHL; 95 articles on Pubmed
Relevant Papers: 4 journal articles were chosen as relevant for this CAT; articles narrowed down to relevant within the past 4 years

Title (Author)	Design	Population	Intervention/ Comparison	Outcomes Measured	Results	Strengths/Weaknesses
Smith, D. (2015)	Propsective (Descriptive-correlational) study	2222 patients were analysed and CTAS levels recorded by emergency triage nurses and paramedics	ESI vs CTAS	Triage scores between emergency nurses and paramedics, triage systems and proper patient acuity and admission	Poor correlation between CTAS system and ESI system; Paramedics can accurately predict admission in comparison with emergency nurses, both tools have weaknesses to under and over triage	Weaknesses Limitations addressed; no other studies conducted to compare CTAS and ESI. Small sample sizes obtained for certain CTAS categories Subjectivity and biases exist; paramedics may have communicated with ED nurses Strengths: Utilises 2 established triaging systems to determine efficacy and reliability Research design

						allows for an objective view of current and relevant issues to be addressed
Leeies, M. (2017)	Prospective-observational cohort study	14378 patients transported by EMS system in Winnipeg, ON evaluated and CTAS levels were recorded by paramedics and triage nurses	Efficacy of CTAS	Final CTAS scores and Interrater reliability between nurses and paramedics	Moderate agreement (p<0.001) between ED nurses and paramedic interrater reliability; EMS CTAS and ED CTAS scores were matched 84.3% of the time; Hospital arrival EMS CTAS and final ED triage CTAS score showed moderate agreement (p<0.001)	<u>Weaknesses</u> Limitations addressed; overcrowding in ED may influence triage nurses' CTAS assignment Sample size localized to Winnipeg ONLY <u>Strengths:</u> Study design allows for the outlook across a period of time; yielding large amounts of data The study successfully answers hypothesis and sets the base for future prospective studies
Tsai, L. (2017)	Retrospective-cohort	4430 adult patients transported via EMS in norther Taiwan	Two-level Taiwan Prehospital Triage System (TPTS) and Five level Taiwan Triage and Acuity Scale (TTAS)	Comparing the acuity levels recorded of the TPTS and TTAS	25.2% and 74.8% classified as emergent and non emergent (respectively) by TPTS; 44.1% and 55.9% classified as level 1-2 and 3-5 by TTAS; 30.4% of non-emergent	<u>Weaknesses:</u> Study did not utilise and compare internationally established triaging system and thus there is no comparable outcome with CTAS research; Potential selection bias to occur as a result of study design → specifically small population size may have limited and impact results;

					TPTS transports classified as TTAS 1 and 2; TTAS 1-2 show better predictability than TPTS for hospitilisation TTAS levels 1-2 showed better predictability than TPTS emergent level for rate of hospitalization	Need to consider triaging methods were also based on transport duration rather than patient presentation Strengths: Evaluates Taiwan's current triaging system and allows for a direct comparison between TTAS and TPTS Study was able to evaluate hypothesis and formulate a concrete conclusion and necessary research for future prospective studies.
Goldstein, 2J. (2015).	Retrospective	Criteria included 30653 reports from Jan. 1 2010 to Dec 31, 2010 regarding older adults >65 years	Retrospective Analysis of data from a provincial (Nova Scotia) EMS database	No intervention/ comparator was stated	Mean age of older group was 79.9+/-8.5 years; Most were triaged as CTAS 3 and almost half had no intervention; Most common complaint was a patient who had fell; Most common clinical complaint identified for non-transported patients were wellness checks/no complaint	Weaknesses: Accuracy of CTAS level assigned was not validated and severity could have been underestimated; CTAS is not a valid measure of illness severity in non-transported patient Strengths: Large number of results to interpret findings related to geriatric patients and acuity levels

Comments:

The purpose of this CAT was to evaluate the Canadian Triage Acuity Scale (CTAS) with other triaging systems in order to evaluate the overall efficacy of the system. In addition to a comparison factor, the secondary outcome in our research looks to identify the ability of paramedics to classify patients severity level accordingly in order to establish the necessary resources upon patient admission at the hospital. The purpose of this CAT is to evaluate the current existing research on the efficacy of the CTAS system. The existing research included several retrospective studies, prospective studies, and descriptive-correlational studies. The research also varied in demographic which provides us a meaningful perspective in not just one particular area but across several countries. In Leeies et al's (2017) study and Goldstein et al's (2015) study both looked at data within Canada and evaluated only the CTAS system. Tsai et al's (2017) article was a study conducted in northern Taiwan. Although the Canadian Triage and Acuity Scale (CTAS) was not their focus, it is important to make note of their outcomes in a forward movement towards a 5-level system similarly to the CTAS system; previously replacing their 2-level triaging method. In Smith et al's (2015) and Leeies et al's (2017) study, both concluded that paramedics were able to effectively triage inbound patients with similar results of emergency triage nurses. Currently there is no gold-standard method in the classification of triage and to speculate, this may serve as a basis in developing a proper and concrete method of triage that will be accepted universally.

Clinical Bottom Line:

Based on the current available research, there are several different methods of triage that have been adopted by emergency health services and hospitals. Currently, there is no considered "gold-standard method" for triage. Based on the utilisation of the CTAS system, working paramedics can accurately predict, to the same degree as emergency nurses, on the acuity levels of patients. However, future studies should consider methods and criteria that would be beneficial in improving the existing triage systems to evaluate factors that exist and unidentified factors that affect patient disposition. Another perspective to take on for future studies include the means to analyze the criteria for a leveled triage system like the CTAS.

References

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