

**Article details:** 2022-0062

**Title:** Inclusion of patient-level emergency department characteristics to classify potentially redirectable visits to sub-acute care: a modified Delphi consensus study

**Authors:** Ryan P. Strum BSc ACP, Walter Tavares PhD, Andrew Worster MD MSc, Lauren E. Griffith PhD, Andrew P. Costa PhD

**Reviewer 1:** Aaron Johnston

General comments (author response in bold)

My largest concern with this article is the significant under-representation of Family Physicians in the Delphi group. In the Limitations section the authors state "However Emergency Physicians were well equipped to make determinations in this study, and we do not anticipate this impacting the results." Although Emergency Physicians are experts on Emergency Care they have less expertise in Family Medicine. The study is looking at an interface point between Paramedicine, Emergency Medicine and Family Medicine and while Emergency Physicians certainly have a good idea about the context in the Emergency Department, but I am not sure that they have a complete understanding of the Family Medicine context or the challenges and opportunities around unscheduled acute patients in the non-hospital setting.

**This is a valid comment, please allow us to clarify. Our Delphi group was split equally between emergency physicians and family physicians. Though these physicians selected their primary clinical practice as emergency medicine, many of these family physicians operate in family/general medicine practice. Prior to beginning the study, we deliberately invited an equal number of emergency medicine and family medicine physicians to participate, of which we had equal representation based on their training. Our Delphi groups family medicine trained physicians operate in a clinical space that can comprehend the challenges and opportunities of unscheduled visits in non-ED settings, and brought these contributions/perspectives to the study.**

**We recognize these details were underreported in the study, and brought to our attention by the Editor. Please see our revisions made in "Editor – Results" point 1, and "Editor – Interp" point 2a. (p. 14)**

Given the a priori decision that 75% agreement would represent consensus and the Family Physicians only represent 13% of the Delphi group I think it is important to know if the Emergency Physicians and Family Physicians in the group generally agreed on the decisions. Would it be possible to calculate a kappa statistic between the groups or to discuss or show their agreement or lack of agreement in some way?

**Thank you for this comment. Our data shows that the disagreement of the characteristics was shared equally amongst both physician groups. We have added statements to the Interpretation to clarify disagreement was split evenly amongst emergency and family physicians, though disagreement in the study overall was very small.**

**Including a kappa calculation is good suggestion, though we contend is outside the scope of this paper. We did not specify a Kappa a priori, and would be difficult to justify an acceptable kappa post hoc. However, further analysis of this study is underway. We are conducting a parallel study to validate these results, of which a kappa will be implemented into the statistical plan.**

**Please see above our first response to both the Editor and Peer Reviewer 1, detailing that our Delphi group was well represented by family practice trained**

**physicians. Numerous edits have been made in the Methods and Limitations to recognize this detail that was missing in the original submission. (p. 10)**

I also wonder why paramedics were not considered for inclusion in the Delphi, I know that EMS directors were well represented but I wonder if it can safely be assumed that their views would mirror paramedics?

**Paramedics were not included in the study design as they do not readily have experience in the ED hospital setting, and do not have the clinical scope to make judgements of main diagnostics – as paramedics do not diagnose patients. We agree paramedic perspectives of patients classified for any potential redirection from an ED to a sub-acute healthcare centre are valuable and warrant research, but is outside the scope of this manuscript. We revised the Limitations section to describe our exclusion of paramedics and other stakeholders in Ontario’s paramedic practices, see “Editor – Interp” 2b. (p. 14)**

In spite of this limitation I think that this study does propose a categorization that is useful to researchers who wish to further develop this area and represents a valuable contribution to the literature.

**Thank you for your kind words of support and peer review. We certainly agree our findings are important to the literature and stakeholders of paramedic systems.**

**Reviewer 2:** Stephen DiTommaso

**Institution:** Département de médecine familiale, Université de Montréal  
General comments (author response in bold)

This study appears to be one in a series of steps by the same authors, with the intention of creating a triage tool designed to redirect certain patients away from the ER and towards “sub-acute care centres”.

The authors cited three previously published studies (2021, 2021, and 2022) on earlier steps in their process:

- 1) Could patients cared for in the ER have received adequate (or better) care elsewhere ? (ref 11)
- 2) Is the ER a more suitable treatment site for patients transported by ambulance than for patients who arrive by their own means ? (ref 25 and 26, which seem almost identical)

The next logical step in this progression would be to create a mechanism for deciding which site is the best destination for any given patient who either calls 911, or else who is being evaluated by paramedics.

I am familiar with the dilemma from many angles : as a former ER physician ; as a home care physician participating in a 12 hour x 7 day call service with the intent of avoiding unnecessary ER visits ; and as an office GP who does as much outpatient investigation as possible to avoid unnecessary ER visits.

The current study is only one of a series of steps, and not the ultimate one, in this process of attempting to direct patients to the best site for urgent and semi-urgent care. The authors intend to use the results of the proposed study on “patient characteristics” to create a “patient classification” to be used during a future study to determine retroactively which paramedic transported ED visits “may have been more suitable for redirection”.

So the proposed study would need to be followed by yet another step which might be followed by yet another step . . .before a useful clinical triage model could be elaborated.

**Thank you for these comments, you are correct this manuscript belongs to a series of research studies with the final output being a validated patient classification. This study constitutes a multi-stage, large endeavour to develop and validate a patient classification to retrospectively identify ED visits that were potentially suitable for a redirection to subacute care.**

**Your insight that research is warranted to follow this manuscript before development of any clinical application is certainly accurate. We are currently in the process of testing these results in a methodological study, and examining its criterion validity in another research study; both of which we intend to submit to CMAJ Open to continue this course of publication.**

Although surely necessary for research purposes, I am not sure that each step in this “evolving conceptual framework” requires publication in a general medical journal such as the CMAJ. This depends on the role of the CMAJ in the dissemination of research. I understand that research evolves over time, and that each step in a multi-step process does not necessarily lend itself to immediate practical application by clinicians, so one must be patient.

However, it is the eventual clinical model to support redirection decisions (which the authors hope to publish eventually) which interests readers of the CMAJ, and not the publication of many incremental steps as a research study progresses. Perhaps I am wrong. Perhaps this is the role of the CMAJ.

In fact, I had to reread the study several times before I was able to understand its application pure research. It is of interest to researchers and not to clinicians. This is not to say that the study should not be published anywhere. I just wonder whether the CMAJ is the best medium for it.

...

I wish the authors the best of luck. And I leave it to the CMAJ to decide whether this study is compatible with its mission. If so, then disregard my recommendation to not publish it.

[Editor’s note: The paper is suitable for CMAJ Open, hence the revision decision.]

**Thank you for this comment, allow us to provide contextualization. Before a clinical model for redirection can be constructed or implemented, epidemiological research is required to understand which patients could have been suitable for such a model. In doing so, future clinical models can be tested with knowledge of patients classified as suitable.**

**As you stated, this manuscript is of interest to researchers, which we undoubtedly agree with. A significant gap exists in the literature to identify potentially avoidable visits transported by paramedics, of which this manuscript speaks to specifically. Paramedic redirection from the ED to non-ED alternatives seems more likely a question of when, not if anymore, based on our conversations with the Ministry of Health. And this manuscript, like our previous CMAJ Open publication on redirection, is highly valued and sought by healthcare stakeholders that aim to reduce ED overcrowding whilst providing a high standard of patient care.**

**Lastly, we agree the implications of this manuscript cannot dictate clinical practices, and thus is not fitting for a general clinical based journal such as CMAJ. However, we feel that this manuscript satisfies CMAJ Open’s objectives, is of interest to their readership, highly citable, methodologically robust and continues from our previous CMAJ Open manuscript of Jan 2022. For these reasons, we**

**believe this manuscript is very suitable for CMAJ Open and would make a strong contribution to the journal.**

What are the “sub-acute care centres” which the authors assume to be more appropriate for a significant number of patients who ride ambulances ? I know of none in my large Canadian city, unless I simply don't recognize them as such. No clinical prediction rule for triage will be useful if such centres don't exist, ie if there is no alternative to the ER, or if their opening hours are too restrictive, or if they mostly return sick patients back to the ER, or if patients don't want to go there.

**Sub-acute care centres are defined in this study as non-ED community-based alternatives, which follow standard definitions of Ontario's Ministry of Health. In our series of research to construct this patient classification, these sub-acute centres include: urgent care centres, walk-in medical centres and nurse practitioner-led clinics. Though cited and justified in the protocol and previous CMAJ Open modified Delphi study, this was not clearly articulated in this manuscript. We agree this is important to state in the study that was missing; we have revised the Methodology to include which sub-acute centres are referenced in this study. Additionally, see response to “Editor – Intro”. (pp. 3, 4)**

Most ER's have an ambulatory division and an acute care division anyway. Given the difficulty in triaging patients before arrival at the ER, why spend all this effort when triage can be done upon arrival at the ER ? Maybe improving efficiency of the ambulatory divisions of ER's is a better option.

**This is a fair comment, as many ED clinicians may share this perspective: strengthen pre-existing systems before evaluating the potential of new care models. However, this comment supports our argument and shows the necessity for this research. Ambulatory care divisions within ED's have become more optimized to increase patient throughput within the ED when emergency medicine interventions are less likely to be required. Despite this implementation for the past decade or longer, ED wait times, visitation rates and workloads continue to increase. Therefore, challenges within ED ambulatory divisions still remain, and new care models are warranted to address continuing challenges to providing healthcare in the ED. The potential benefits and implications of paramedic redirection are plentiful for ED care, but the most critical feature needed to support a clinical protocol for redirection remains – there is no patient identification system validated for clinical application in the prehospital setting. Our study aims to address this by identifying ED visits in the past, which are capable of informing which ED visits to study in the future. We have added a statement in the Background to include this perspective, and will strengthen our rationale for this research. (p. 3)**

I am bothered that the proposed study does not value diagnosis (“main diagnostic category” as a valid triage criterion. It seems to me that “chest pain” or “acute dyspnea” would be useful criteria for paramedics! I am not sure how the data provided by this study will be of practical value. Would paramedics enter age, gender, and . . . what other patient characteristics to determine whether to transport patients to an ER or to an alternative destination ? How will characteristics such as "specialist consultation in the ED", "outcome of the ED visit". and other factors which are not useful in the triage setting, be informative to the paramedic who must decide rapidly where to orient his or her patient ?

**The objective of this research was to identify ED visits retrospectively, that in hindsight could have been suitable for redirection. Consensus was not achieved in this study to use main diagnostic category to retrospectively identify ED visits. Comments from the group suggested that the main diagnoses were not specific enough, in the context of intervention codes, to be used. Since the severity of a condition or their symptoms could not be known from broad categorization, this characteristic did not achieve consensus amongst the physicians for epidemiological purposes. We have added these comments to increase clarity in our Interpretation of this result of the main diagnostic category not receiving consensus in this study.**

**Your comments are valid, paramedics would require a clinical protocol to dictate circumstances where redirection at patient contact could be possible, and factoring the main complaint/condition would be valuable to include. (p. 14)**