

# Patient and paramedic engagement in prehospital emergency medicine research

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■ Cite as: *CMAJ* 2018;190(Suppl 1):S48-S49. doi: 10.1503/cmaj.180352

**H**alf a million patients with neck injury are transported to Ontario emergency departments each year for investigation for serious bone or spinal-cord damage, yet less than 1% have a fracture or ligament instability; even fewer patients (0.5%) have a spinal-cord injury or nerve damage.<sup>1</sup> Paramedics transport all patients with neck trauma by ambulance using a backboard, collar and head immobilizer. Patients with neck trauma can stay immobilized for hours until an emergency-department bed is made available or until radiography is completed, despite a low risk of serious injury. Prolonged immobilization causes patients discomfort and pain, contributes to overcrowding in the emergency department and prevents paramedics from being available for new emergencies, which is costly. We aimed to improve the care and comfort of patients with neck injury, and to facilitate more judicious use of scarce health care resources by developing a decision rule to help emergency personnel assess which patients can safely have neck immobilizers removed. We involved patients and paramedic partners in the study's development.

The Canadian C-Spine Rule was developed for use in alert and stable trauma patients; it uses elements of patient characteristics, mechanism of injury and physical examination.<sup>1-3</sup> The rule helps emergency physicians and triage nurses safely and selectively remove immobilization, without radiography and missed injury. We recently taught Ottawa paramedics to use the Canadian C-Spine Rule in the field.<sup>4</sup> They evaluated 4034 eligible patients, transported 60% without any immobilization, and fully immobilized all those with a later-confirmed injury to the cervical spine. We are currently evaluating paramedics' use of the rule in 7200 injured patients from 12 communities across Ontario using a pragmatic stepped-wedge cluster randomized trial (ClinicalTrials.gov NCT02786966). This design provides all participating communities with the opportunity to implement the study intervention over time. We are also prospectively validating the "adult" Canadian C-Spine Rule in a new pediatric population aged 8 to 15 years; if this proves successful, use of the Canadian C-Spine Rule could extend to paramedics across Canada.

Before embarking on the study, we interviewed a convenience sample of 12 patients who presented to the emergency department with spinal immobilization to gather information about patients' experience. We engaged a patient partner (coauthor E.H.), who had previously experienced being transported by

## KEY POINTS

- Patient identification and engagement in emergency-medicine research can be challenging owing to the unpredictable and brief relationship between patient and care provider.
- Successful incorporation of patient-relevant outcomes can substantially increase the relevance of research results for emergency-medicine patients.
- A collaborative relationship with paramedics is essential to the success of prehospital emergency-medicine research.
- The field of emergency medicine could benefit from the creation of a national patient council to facilitate the identification and engagement of patients in research.

ambulance with spinal immobilization. The patient partner's contribution to this project was critical. A radical change in direction resulted from her proposal that the primary outcome of the study be changed from purely an element of safety and reliability of paramedic use of the Canadian C-Spine Rule to the patient-centred primary objectives of measuring patients' pain and discomfort. The focus of previous prehospital studies involving the Canadian C-Spine Rule had always been to confirm the safety of the decision rule and its ability to identify all substantial cervical-spine injuries. Our patient partner also provided a critical review of grant-application documents, helped draft its lay summary, and advised on strategies to approach government agencies.

The change in focus from a safety-related to a patient-comfort outcome helped us to satisfy requirements of the funding agency for this project and helped with assuring the ethics review board of the impact of this project on patient care. We ultimately included additional patient-relevant outcomes such as the total time spent in the emergency department before discharge or admission to hospital, radiation exposure from resulting diagnostic imaging of the spine, and potential for skin-pressure injuries resulting from prolonged immobilization.

Prehospital studies have substantial operational and implementation challenges that could not be navigated without the help of paramedic partners. Challenges include practical considerations such as training, interaction with unions, and working with different electronic data-collection interfaces. We have long involved

paramedic partners in all aspects of prehospital studies and find paramedic engagement to be as important as patient engagement. The ongoing engagement of coauthor Brent McLeod (advanced care paramedic and chair of the study paramedic committee) and his colleagues has also been essential for patient recruitment. Successful interventions from studies in which paramedics have been involved and engaged are often readily adopted and maintained by paramedic colleagues following the completion of a study.

Engaging patients was challenging in our study. Following initial activity associated with the grant application and implementation-planning processes for the project, it became difficult to maintain patient engagement during the ensuing year-long patient-recruitment period. Our patient partner participated in early steering committee meetings. However, the nature of our collaborative efforts with ICES is such that we must wait for their data sources to be updated later this year before we can analyze our main results. We anticipate re-engaging with our patient partner at the time of result interpretation, research manuscript preparation and knowledge translation. In addition, although large networks are now reimbursing and expecting engaged patients to attend scientific meetings, it remains very challenging at the institutional level to compensate patients for their day-to-day participation in research activities without complicated contracts or policies, or an appropriate expense category.

While developing our patient-engagement strategy for this project, we reviewed the guiding principles of the Strategy for Patient-Oriented Research Patient Engagement Framework,<sup>5</sup> and those published by INVOLVE<sup>6</sup> and the Patient-Centered Outcomes Research Institute.<sup>7</sup> Upon reviewing this work, it became apparent to us that the proposed strategies for patient identification and recruitment posed real challenges in emergency-medicine research. These were later exemplified in a publication from the 2016 Academic Emergency Medicine Consensus Conference on shared decision-making. The challenges include the unexpected nature of emergency visits,

the lack of preexisting relationships or ongoing follow-up care, the diverse nature of the patient population and of their medical conditions, and the urgency of emergency interventions.<sup>8</sup> We recently took part in a similar consensus exercise with the Canadian Association of Emergency Physicians (CAEP), using a mixed-method design. Among many other recommendations, CAEP identified the need to “create a national patient council as a partnership between a diverse group of patients and [emergency medicine] researchers.”<sup>9</sup>

Recruiting patients for participation in prehospital emergency-medicine research is challenging, but patients’ and paramedics’ contributions are essential to the identification of outcomes that matter to patients, as well as to successful study implementation and scalability.

## References

1. Stiell IG, Clement CM, Grimshaw J, et al. Implementation of the Canadian C-Spine Rule: prospective 12 centre cluster randomised trial. *BMJ* 2009;339: B4146.
2. Stiell IG, Wells GA, Vandemheen KL, et al. The Canadian C-Spine Rule for radiography in alert and stable trauma patients. *JAMA* 2001;286:1841-8.
3. Stiell IG, Clement C, McKnight RD, et al. Comparative validation of the Canadian C-Spine Rule and the NEXUS Low-Risk Criteria in alert and stable trauma patients. *N Engl J Med* 2003;349:2510-8.
4. Vaillancourt C, Charette M, Kasaboski A, et al. Evaluation of the safety of C-spine clearance by paramedics: design and methodology. *BMC Emerg Med* 2011;11:1.
5. Strategy for Patient-Oriented Research. Ottawa: Canadian Institutes of Health Research; 2011. Available: [www.cihir-irsc.gc.ca/e/41204.html](http://www.cihir-irsc.gc.ca/e/41204.html) (accessed 2018 Mar. 12).
6. INVOLVE: Briefing notes for researchers. London (UK): National Institute for Health Research; [updated 2016]. Available: [www.invo.org.uk/resource-centre/resource-for-researchers](http://www.invo.org.uk/resource-centre/resource-for-researchers) (accessed 2018 Mar. 12).
7. Engagement: influencing the culture of research. Washington (DC): Patient-Centered Outcomes Research Institute; 2014. Available: [www.pcori.org/engagement](http://www.pcori.org/engagement) (accessed 2018 Mar. 12).
8. Wright Née Blackwell R, Carden DL, Hess EP, et al. Adapting conceptual frameworks for patient engagement in emergency department research. *Acad Emerg Med* 2016;23:1332-6.
9. Archambault PM, McGavin C, Dainty KN, et al. Recommendations for patient engagement in patient-oriented emergency medicine research. *CJEM* 2018;20: 435-442.

More information on this project is available at [www.ossu.ca/IMPACTAwards](http://www.ossu.ca/IMPACTAwards).

**Competing interests:** Christian Vaillancourt reports a grant from OSSU (the Ontario SPOR [Strategy for Patient-Oriented Research] SUPPORT [Support for People and Patient-Oriented Research and Trials] Unit). No other competing interests were declared.

This article was solicited and has been peer reviewed.

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**Contributors:** All authors contributed to the conception and design of the work, drafted the manuscript, revised it critically for important intellectual content, gave final approval

of the version to be published and agreed to be accountable for all aspects of the work.

**Funding:** This report is based on patient and paramedic engagement in a project titled “A Pragmatic Strategy Empowering Paramedics to Assess Low-Risk Trauma Patients with the Canadian C-Spine Rule and Selectively Transport them Without Immobilization,” which received funding from OSSU. The Ontario SPOR SUPPORT Unit plays an important role in facilitating patient engagement.

**Acknowledgements:** The authors thank members of the study paramedic committee: Andy Benson (Central East Prehospital Care Program); Paul Bradford, Adam Dukelow, Susan Kriening (Southwest Ontario Regional Base Hospital Program); Northwest Region Prehospital Care Program; Bryan Laviolette, Kristy Campbell, Natalie Kedzierski, Victoria Rossander (York Region Paramedic Services); Gale Chevalier, Michael van Hartingsveldt (Frontenac Paramedic Services); Andrew Dillon (Superior North

Emergency Medical Services); Michael Franklin, Steve Fryers (Niagara Emergency Medical Services); Kristen Gilmartin (County of Simcoe Paramedic Services); Justin Lammers, Lori Poole, Stacey Shepley (Essex Windsor EMS); Shannon Leduc (Ottawa Paramedic Service); Gary Lewis (Region of Durham Paramedic Services); Jay Loosley (Middlesex-London Paramedic Service); Sylvie Michaud (Health Sciences North Centre for Prehospital Care); Don Oettinger, Chris Smith (Peterborough County-City Paramedics); Melissa Roney, Gino St-Jean, Shelley Bradley (Greater Sudbury Paramedic Services); Centre for Paramedic Education and Research; Julie Sinclair (Regional Paramedic Program for Eastern Ontario); and Mike Slatter (Hastings-Quinte Paramedic Services). At the time of publication, Elizabeth Hall is affiliated with Indigenous Services Canada, Education Branch, Regional Partnerships Directorate.

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