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Portrait of prehospital trauma triage in Québec (2013-2023)

Evaluation of the implementation of the Québec prehospital trauma triage scale (EQTPT)

English summary

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Québec

SUMMARY

Portrait of prehospital trauma triage in Québec (2013-2023) - Evaluation of the implementation of the Québec prehospital trauma triage scale (EQTPT)

Introduction

The organization of trauma care services in Québec is based on an integrated model known as the trauma care continuum (TCC). Prehospital emergency services, which represent one link in this chain of care, ensure that individuals who have sustained traumatic injuries are assessed and transported in a timely manner to the appropriate level of trauma centre based on the severity of their injuries. In 2013, the Institut national d'excellence en santé et en services sociaux (INESSS) issued a number of recommendations regarding the prehospital triage of trauma patients and, among other statements, recommended adapting the American guideline for the field triage of injured patients established in 2011 by the Centers for Disease Control and Prevention and the American College of Surgeons Committee on Trauma (CDC-ACSCOT) to the particularities of Québec and its regions (INESSS, 2013). The Québec version, known as the Québec prehospital trauma triage scale (Échelle québécoise de triage préhospitalier en traumatologie – EQTPT), notably proposed a five-step triage process aimed at transporting patients with severe trauma more rapidly to higher-level trauma centres within a maximum time frame of 60 minutes, by allowing bypass of lower-level designated centres. Unlike the 2011 CDC-ACSCOT field triage guideline, the EQTPT includes a fifth step intended to identify less severe trauma cases. The addition of this step aimed to ensure the safety of using the scale and was intended to be temporary and limited to the implementation phase. The EQTPT was gradually introduced in the field between 2016 and 2018 across the various regions of Québec.

With the objective of evaluating and updating the EQTPT, the Ministère de la Santé et des Services sociaux (MSSS) mandated INESSS to provide an overview of its use, outcomes, and challenges encountered in Québec's regions since the deployment of the EQTPT, as well as to contextualize these findings using the scientific literature.

Methodology

The Québec Trauma Registry Information System (Système d'information du registre des traumatismes du Québec – SIRTQ) was used to identify all trauma patients who were transported by ambulance and admitted to one of the 59 designated trauma centres between April 1, 2013, and March 31, 2023. The portrait of prehospital triage of trauma patients using the EQTPT was produced using descriptive statistics to describe patient profiles (e.g., age, sex, mechanisms, types and severity of injuries), the rate of EQTPT documentation, patient triage according to EQTPT step, and prehospital time, as well as destination hospitals and patient care pathways. Prehospital triage of trauma patients using the EQTPT was reported according to the step recorded by paramedics in the prehospital record. Injury severity was assessed using the Injury Severity Score (ISS). An ISS greater than 15 (ISS > 15) was used to define patients with severe injuries. In

addition, trauma patients who were transported by ambulance and admitted to facilities without a trauma designation were identified using the provincial hospitalization database (MED-ECHO) and the common emergency department database (Banque de données communes des urgences – BDCU).

An advisory committee of managers and clinicians from both prehospital and hospital settings was consulted during the project to support data interpretation and contextualization, as well as to assist in the identification of variables used to select severely injured patients.

Finally, a review of the scientific and grey literature was conducted to support interpretation and to contextualize the evaluation results. A targeted literature search was also carried out to assess the performance of the CDC-ACSCOT field triage guideline and to identify maximum prehospital time thresholds for bypassing trauma centres with lower-level designations.

Results

Changes in the profile of trauma patients transported by ambulance in Québec

- From 2013-2014 to 2022-2023, the volume of trauma patients transported by ambulance increased (from 17,544 to 20,608 patients per year), a rise attributable to the growing number of patients aged 65 years and older hospitalized for their injuries.
- Over the course of the evaluation period, the proportion of injuries caused by falls increased, while those resulting from motor vehicle accidents decreased.
- Among patients transported by ambulance, the proportion who sustained severe injuries (defined as ISS > 15, calculated using hospital data) increased slightly from 2013-2014 to 2022-2023 (from 11.6% to 13.2%), particularly among males. Approximately two out of three severely injured patients were male overall.

Documentation of the EQTPT remains low across Québec

- In the period from 2019-2020 to 2022-2023 (following province-wide implementation of the scale), EQTPT documentation was available for 58.0% of all patients admitted to designated trauma centres in Québec, with wide variation across regions.
- According to the information collected, this low documentation rate may be partially explained by labour strikes involving paramedics during the evaluation period, as well as the loss of forms during interhospital transfers. However, despite the absence of written documentation regarding EQTPT use, the triage scale is reportedly widely used by paramedics in the field.

- Several barriers and facilitators related to EQTPT documentation were identified, highlighting the need for training and frequent reminders. The complexity of the EQTPT and a lack of clarity for some of the criteria were also reported as obstacles.

Nearly half of trauma patients were triaged at step 4

- Among patients triaged using one of the five EQTPT steps, 41.8% were triaged at step 4. Slightly more than one-third of patients were triaged at steps 1 (14.1%), 2 (8.4%), and 3 (15.6%), while approximately 20.0% were triaged at step 5.
- Based on the information collected, the anticoagulation criterion included in step 4, which directs trauma patients on anticoagulant therapy to a designated trauma centre, appears to generate a high patient volume within the trauma care system. The results of the analyses show that approximately half of patients triaged at step 4 were on anticoagulant therapy or had a coagulopathy.

EQTPT criteria identify the majority of severely injured patients

- Among all severely injured patients for whom EQTPT documentation was available in the period from 2019-2020 to 2022-2023, the majority (82.1%) were triaged at one of the five EQTPT steps.
- On the other hand, more than one in six severely injured patients (17.9%) did not meet any EQTPT criteria (negative EQTPT). Most of these patients were aged 65 years or older and were injured in falls.
- Step 5, which was intended to be temporary during EQTPT implementation, triaged 15.1% of severely injured patients for whom EQTPT documentation was available.
- The criteria at steps 1 to 3 are less effective at identifying older patients with severe injuries. Fewer than one-third (32.5%) of severely injured patients aged 65 years and older were triaged at steps 1 to 3, whereas three-quarters (75.1%) of severely injured patients aged 64 years and younger were triaged at these steps.
- Most of the severely injured patients triaged at steps 1 to 3 were involved in motor vehicle accidents, while the majority of those triaged at steps 4 and 5 were injured in falls.

Limited data are available to set the maximum time to be spent bypassing lower-level trauma centres

- When the EQTPT was implemented, a maximum bypass time frame of 60 minutes was established for Québec. To date, data from the scientific literature do not allow for the establishment of an optimal and safe time limit for bypassing trauma centres with a lower-level designation for patients triaged at steps 1 to 3. However, certain patient groups, notably those with traumatic brain injuries (TBI) or penetrating trauma, may benefit from shorter prehospital times.

- The safety of bypassing lower-level trauma centres was questioned by some members of the advisory committee. No direct evidence currently confirms or refutes the safety of the present parameters with respect to mortality and morbidity. The current EQTPT-prescribed 60-minute maximum bypass time allows the majority (87.9%) of patients triaged at steps 1 to 3 to be transported directly to the definitive facility (where care was provided).
- Among patients triaged at steps 1 to 3 and transported directly to the definitive care facility where care was provided (n = 7,223), the median transport time was 19 minutes (Q1-Q3: 10 to 32 minutes), and 97.1% of these ambulance transports were completed within 60 minutes or less.
- Outside Québec, allowable bypass times vary from 30 to 90 minutes, with variation between urban and rural regions.

The EQTPT appears to direct a substantial proportion of trauma patients to the appropriate level of trauma centre

- Approximately three-quarters of patients triaged at steps 1 and 2 were directed to high-level trauma centres, whereas most patients triaged at steps 3, 4, and 5 were directed to centres with lower-level designation.
- Several regions adapted the EQTPT to direct certain patients triaged at steps 4 and/or 5 to lower-level designated trauma centres or to hospitals outside the trauma care network.
- From 2013-2014 to 2022-2023, the proportion of severely injured patients directed to high-level trauma centres increased (from 42.9% to 47.7%), while the proportion of patients with minor injuries directed to high-level trauma centres remained stable at approximately 28%.
- The proportion of severely injured patients transported directly to the definitive care facility increased over the course of the evaluation period (from 64.1% to 70.6%). A slight increase in direct transport was also observed among all trauma patients transported by ambulance (from 84.5% to 86.3%).

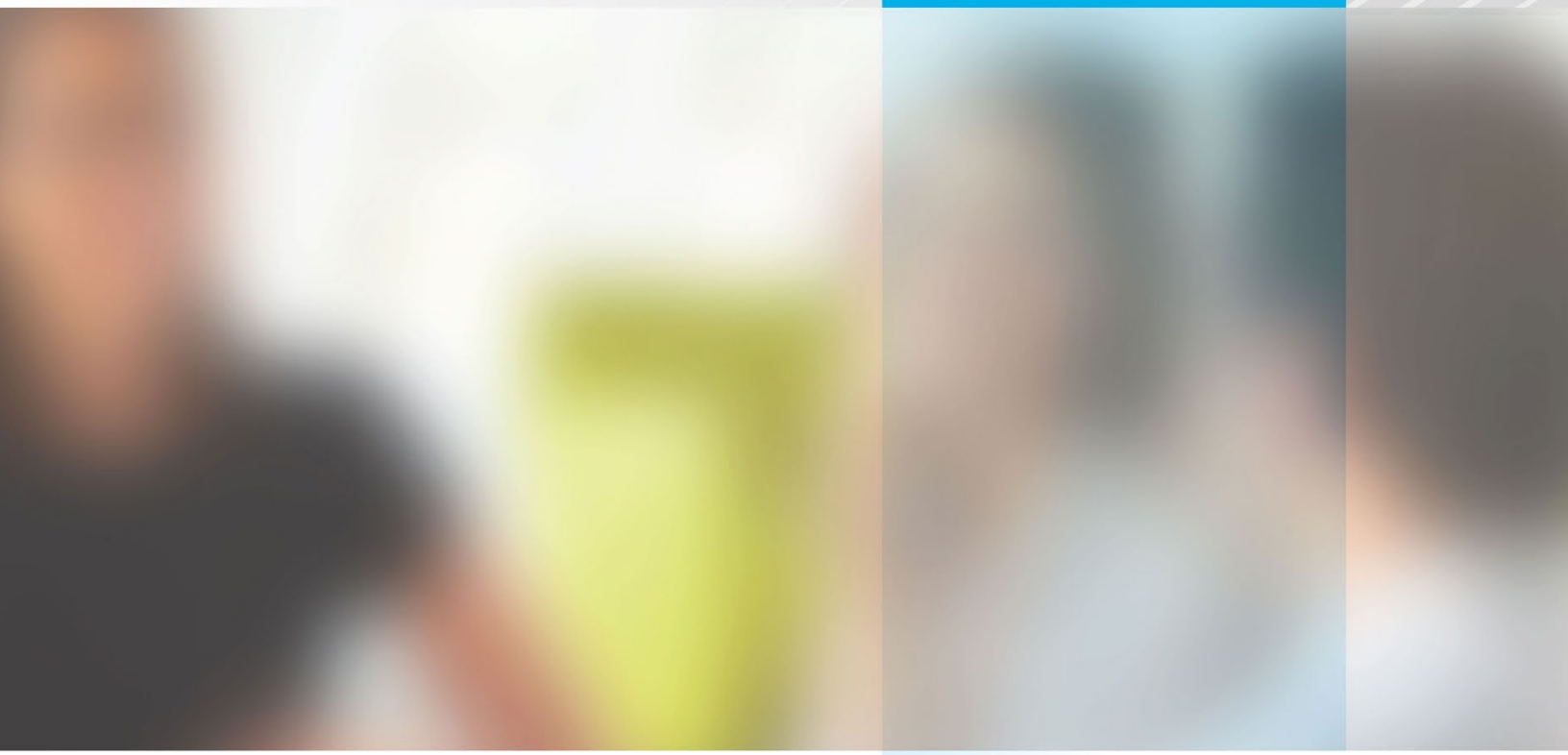
A small proportion of patients with significant traumatic injuries were admitted to facilities without a trauma designation

- Among trauma patients transported by ambulance and admitted outside the trauma care network (n = 68,524) across the period from 2013-2014 to 2022-2023, 4.9% (n = 3,390) required urgent or specialized trauma care interventions.
- Within this patient group, the proportions of men and women, often older, were similar. Injuries were mainly related to falls, and fractures were the predominant diagnoses.
- Most of these patients were admitted to hospitals located in the Capitale-Nationale and Montréal regions.

Conclusion

Overall, the findings presented in this report suggest that the use of the EQTPT appears to support, at least in part, the initial objectives being pursued at the time of its implementation. In the years following the introduction of the EQTPT, the proportion of severely injured patients directed to high-level trauma centres increased, without resulting in an influx of patients with minor injuries to these same facilities. In addition, the proportion of severely injured patients transported directly to the facility where definitive care was provided increased over the course of the evaluation period, indicating a reduction in the number of interhospital transfers. Moreover, nearly all direct transports of patients triaged at EQTPT steps 1 to 3 are completed within 60 minutes or less. Taken together, these results point to a more efficient use of prehospital and hospital resources.

Although prehospital triage following the implementation of the EQTPT appears appropriate for most trauma patients, several improvements could nonetheless be made. The present evaluation identifies a number of elements that should be considered for an eventual update of the EQTPT. In particular, certain criteria could be added or clarified to improve the triage of specific patient groups (older adults, patients on anticoagulant therapy, and victims of falls), to reduce subjective interpretation of some criteria, and to facilitate decision-making by paramedics. In addition, criteria included in step 5 would merit being maintained or moved to other steps of the scale, since they identify an important number of severely injured patients. The 2021 update of the CDC-ACSCOT field triage guideline could serve as a point of reference. Finally, measures could be implemented to increase EQTPT documentation and to minimize regional disparities in EQTPT documentation across Québec.



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