

CADTH RAPID RESPONSE REPORT: SUMMARY OF ABSTRACTS

# Point of Care Ultrasound for Assessment of Patients with Physical Trauma in Emergency Departments: Clinical Utility and Cost- Effectiveness

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## Research Questions

1. What is the clinical utility of point of care ultrasound for the assessment of patients with physical trauma in the emergency department?
2. What is the cost-effectiveness of point of care ultrasound for the assessment of patients with physical trauma in the emergency department?

## Key Findings

One randomized controlled trial and one non-randomized study were identified regarding the clinical utility of point of care ultrasound for the assessment of patients with physical trauma in the emergency department. No relevant economic evaluations were identified regarding the cost-effectiveness of point of care ultrasound for the assessment of patients with physical trauma in the emergency department.

## Methods

A limited literature search was conducted by an information specialist on key resources including Medline, the Cochrane Library, the University of York Centre for Reviews and Dissemination (CRD) databases, the websites of Canadian and major international health technology agencies, as well as a focused Internet search. The search strategy was comprised of both controlled vocabulary, such as the National Library of Medicine’s MeSH (Medical Subject Headings), and keywords. The main search concepts were point-of-care ultrasound or ultrasonography, wounds and injuries, and hospital emergency services. No filters were applied to limit the retrieval by study type. Where possible, retrieval was limited to the human population. The search was also limited to English language documents published between Jan 1, 2009 and Sep 3, 2019. Internet links were provided, where available.

## Selection Criteria

One reviewer screened citations and selected studies based on the inclusion criteria presented in Table 1.

**Table 1: Selection Criteria**

<b>Population</b>	Adult patients presenting to emergency departments with physical trauma
<b>Intervention</b>	Point of care ultrasound (POCUS) in the emergency department
<b>Comparators</b>	Q1-Q2: Ultrasound performed in the radiology ward (also known as radiology-performed ultrasound) No ultrasound/POCUS
<b>Outcomes</b>	Q1: Clinical utility (safety, length of stay, severity of trauma, survival, transfer rate to ward) Q2: Cost-effectiveness
<b>Study Designs</b>	Health technology assessments, systematic reviews, meta-analyses, randomized controlled trials, non-randomized studies, economic evaluations

## Results

Rapid Response reports are organized so that the higher quality evidence is presented first. Therefore, health technology assessment reports, systematic reviews, and meta-analyses

are presented first. These are followed by randomized controlled trials, non-randomized studies, and economic evaluations.

One randomized controlled trial<sup>1</sup> and one non-randomized study<sup>2</sup> were identified regarding the clinical utility of point of care ultrasound for the assessment of patients with physical trauma in the emergency department. No relevant economic evaluations were identified regarding the cost-effectiveness of point of care ultrasound for the assessment of patients with physical trauma in the emergency department.

Additional references of potential interest are provided in the appendix.

## Overall Summary of Findings

One randomized controlled trial<sup>1</sup> and one non-randomized study<sup>2</sup> were identified regarding the clinical utility of point of care ultrasound for the assessment of patients with physical trauma in the emergency department.

Mishra et al.<sup>1</sup> conducted a randomized controlled trial comparing point-of-care ultrasound (POCUS) to clinical examination during endotracheal tube placement, confirmations, and in identification of potentially fatal conditions when performing rapid sequence intubation in trauma resuscitation. The abstract did not provide enough data to summarize the trial results; however, the authors concluded that POCUS was useful during all three phases of rapid sequence intubation.

Socransky et al.<sup>2</sup> conducted a non-randomized trial comparing POCUS to clinical examination in the perception of reduction status of distal radius fractures. There was no significant difference in the clinical perception between POCUS and the clinical examination in the assessment of the initial reduction status. However, there were significantly fewer cases of uncertainty when POCUS was used to determine adequacy of the initial reduction. Furthermore, there was a significant difference in the clinical perception between POCUS-determined and clinical examination-determined adequacy of repeat reduction. Overall, the authors concluded that POCUS enhances certainty regarding reduction adequacy compared to clinical examination.

## References Summarized

### Health Technology Assessments

No literature identified.

### Systematic Reviews and Meta-analyses

No literature identified.

### Randomized Controlled Trials

1. Mishra PR, Bhoi S, Sinha TP. Integration of Point-of-care Ultrasound during Rapid Sequence Intubation in Trauma Resuscitation. *J Emerg Trauma Shock*. 2018 Apr-Jun;11(2):92-97.  
[PubMed: PM29937637](#)

## Non-Randomized Studies

2. Socransky S, Skinner A, Bromley M, et al. Ultrasound-Assisted Distal Radius Fracture Reduction. *Cureus*. 2016 Jul 07;8(7):e674.  
[PubMed: PM27551652](#)

## Economic Evaluations

No literature identified.

## Appendix — Further Information

### Previous CADTH Reports

3. Portable Ultrasound Devices for the Assessment of Trauma in Rural or Remote Settings: Clinical Effectiveness. (*CADTH Rapid Response report: reference list*) Ottawa (ON): CADTH; 2014. <https://www.cadth.ca/portable-ultrasound-devices-assessment-trauma-rural-or-remote-settings-clinical-effectiveness>
4. Portable Ultrasonography in Small Emergency Departments: A Systematic Review of the Guidelines and Clinical-Effectiveness. (*CADTH Health technology assessment*) Ottawa (ON): CADTH; 2009. <https://www.cadth.ca/portable-ultrasonography-small-emergency-departments-systematic-review-guidelines-and-clinical-0>

### Systematic Reviews and Meta-analyses

#### *Diagnostic Accuracy*

5. Gottlieb M, Holladay D, Peksa GD. Point-of-care ultrasound for the diagnosis of shoulder dislocation: A systematic review and meta-analysis. *Am J Emerg Med.* 2019 Apr;37(4):757-761. [PubMed: PM30797607](#)
6. Netherton S, Milenkovic V, Taylor M, Davis PJ. Diagnostic accuracy of eFAST in the trauma patient: a systematic review and meta-analysis. *CJEM* 2019 Jul 18:1-12 <https://doi.org/10.1017/cem.2019.381>
7. Chartier LB, Bosco L, Lapointe-Shaw L, Chenkin J. Use of point-of-care ultrasound in long bone fractures: a systematic review and meta-analysis. *CJEM.* 2017 Mar;19(2):131-142. [PubMed: PM27916021](#)
8. Nishijima DK, Simel DL, Wisner DH, Holmes JF. Does this adult patient have a blunt intra-abdominal injury? *JAMA.* 2012 Apr 11;307(14):1517-1527. [PubMed: PM22496266](#)
9. Wilkerson RG, Stone MB. Sensitivity of bedside ultrasound and supine anteroposterior chest radiographs for the identification of pneumothorax after blunt trauma. *Acad Emerg Med.* 2010 Jan;17(1):11-17. [PubMed: PM20078434](#)

### Randomized Controlled Trials

#### *Unclear Population*

10. Atkinson PR, Milne J, Diegelmann L, et al. Does Point-of-Care Ultrasonography Improve Clinical Outcomes in Emergency Department Patients With Undifferentiated Hypotension? An International Randomized Controlled Trial From the SHoC-ED Investigators. *Ann Emerg Med.* 2018 Oct;72(4):478-489. [PubMed: PM29866583](#)

### Review Articles

11. Montoya J, Stawicki SP, Evans DC, et al. From FAST to E-FAST: an overview of the evolution of ultrasound-based traumatic injury assessment. *Eur J Trauma Emerg Surg*. 2016 Apr;42(2):119-126.  
[PubMed: PM26038031](#)

### Additional References

#### *Position Statement*

12. Lewis D, Rang L, Kim D, et al. Recommendations for the Use of Point-of-Care Ultrasound (PoCUS) by Emergency Physicians in Canada. (*CAEP Position Statement*). Ottawa (ON): Canadian Association of Emergency Physicians (CAEP). 2018.  
<https://caep.ca/wp-content/uploads/2018/11/CAEP-PoCUS-Position-Statement-Full-Text-2018-V7-draft.pdf>