

CADTH RAPID RESPONSE REPORT: SUMMARY OF ABSTRACTS

# Point of Care Ultrasound for Assessment of Patients with Deep Vein Thrombosis in Emergency Departments: Clinical Utility and Cost-Effectiveness

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**Authors:** Deba Hafizi, Jennifer Horton, Nina Frey

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## Research Questions

1. What is the clinical utility of point of care ultrasound for the assessment of patients with deep vein thrombosis in the emergency department?
2. What is the cost effectiveness of point of care ultrasound for the assessment of patients with deep vein thrombosis in the emergency department?

## Key Findings

One non-randomized study was identified regarding the clinical utility of point of care ultrasound for the assessment of patients with deep vein thrombosis in the emergency department. No relevant economic evaluations were identified regarding the cost-effectiveness of point of care ultrasound for assessing patients with deep vein thrombosis.

## Methods

A limited literature search was conducted by an information specialist on key resources including Medline, Embase, 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 ultrasounds and DVT. Where possible, retrieval was limited to the human population. The search was also limited to English language documents published between January 1, 2009 and August 19, 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 with deep vein thrombosis (DVT) or suspected DVT in the emergency department
<b>Intervention</b>	Point of care ultrasound (POCUS) in the emergency department
<b>Comparator</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, complications [e.g., venous thromboembolism, major bleeding], mortality, length of stay, time to transfer from ED, harms/benefits) 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 non-randomized study<sup>1</sup> was identified regarding the clinical utility of point of care ultrasound for the assessment of patients with deep vein thrombosis in the emergency department. No relevant health technology assessments, systematic reviews, meta-analyses, randomized controlled trials, or economic evaluations were identified.

Additional references of potential interest are provided in the appendix.

## Overall Summary of Findings

One non-randomized study<sup>1</sup> was identified regarding the clinical utility of point of care ultrasound for the assessment of patients with deep vein thrombosis in the emergency department. The authors aimed to compare emergency physician- and radiologist-performed point-of-care venous compression ultrasound on disposition time of patients with deep vein thrombosis (DVT).<sup>1</sup> The authors found that the median time elapsed from triage to performing ultrasound and the median time elapsed from triage to final disposition were significantly lower in the emergency physician group, than those in the radiology group.<sup>1</sup> The authors concluded that emergency physicians trained in performing point of care venous compression ultrasound in patients suspected of DVT could significantly reduce the time of patient's disposition in the emergency setting, and hence earlier treatment.<sup>1</sup>

## References Summarized

### Health Technology Assessments

No literature identified.

### Systematic Reviews and Meta-analyses

No literature identified.

### Randomized Controlled Trials

No literature identified.

### Non-Randomized Studies

1. Seyedhosseini J, Fadavi A, Vahidi E, Saeedi M, Momeni M. Impact of point-of-care ultrasound on disposition time of patients presenting with lower extremity deep vein thrombosis, done by emergency physicians. *Turkish Journal of Emergency Medicine*. 2018 Mar;18(1):20-24.  
[PubMed: PM29942878](#)

## Economic Evaluations

No literature identified.

## Appendix — Further Information

### Previous CADTH Reports

2. Point-of care-testing: Summary of evidence – January 2019 update. Ottawa (ON): CADTH; 2019: [Point-of-care testing: summary of evidence – January 2019 update](#) Accessed 2019 Aug 28
3. Point-of-care testing: Summary of evidence. Ottawa (ON): CADTH; 2017: [Point-of-care testing: summary of evidence](#) Accessed 2019 Aug 28
4. Portable ultrasound devices use by non-radiologists: clinical evidence and guidelines. Ottawa (ON): CADTH; 2016: [Portable ultrasound devices use by non-radiologists: clinical evidence and guidelines](#) Accessed 2019 Aug 28
5. Portable ultrasounds devices in the pre-hospital setting: A review of clinical and cost-effectiveness and guidelines. Ottawa (ON): CADTH; 2015: [Portable ultrasound devices in the pre-hospital setting: a review of clinical and cost-effectiveness and guidelines](#)
6. Evidence bundles: Evidence on point-of-care testing. Ottawa (ON): CADTH; 2019: <https://cadth.ca/evidence-bundles/point-care-testing> Accessed 2019 Aug 28

### Systematic Reviews and Meta-Analyses – Diagnostic Accuracy

7. Pomero F, Dentali F, Borretta V, et al. Accuracy of emergency physician-performed ultrasonography in the diagnosis of deep-vein thrombosis: a systematic review and meta-analysis. *Thromb Haemost.* 2013 Jan;109(1):137-145.  
[PubMed: PM23138420](#)

### Non-Randomized Studies – Diagnostic Accuracy

8. Dwyer KH, Rempell JS, Stone MB. Diagnosing centrally located pulmonary embolisms in the emergency department using point-of-care ultrasound. *American Journal of Emergency Medicine.* 2018 Jul;36(7):1145-1150.  
[PubMed: PM29174452](#)
9. Nazerian P, Volpicelli G, Gigli C, et al. Diagnostic accuracy of focused cardiac and venous ultrasound examinations in patients with shock and suspected pulmonary embolism. *Intern.* 2018 06;13(4):567-574.  
[PubMed: PM28540661](#)
10. Pedraza Garcia J, Valle Alonso J, Ceballos Garcia P, et al. Comparison of the accuracy of emergency department-performed point-of-care-Ultrasound (POCUS) in the diagnosis of lower-extremity deep vein thrombosis. *Journal of Emergency Medicine.* 2018 05;54(5):656-664.  
[PubMed: PM29306580](#)
11. Pujol S, Laurent J, Markarian T, et al. Compression with a pocket-sized ultrasound device to diagnose proximal deep vein thrombosis. *American Journal of Emergency Medicine.* 2018 Jul;36(7):1262-1264.  
[PubMed: PM29653786](#)

12. Mulcare MR, Lee RW, Pologe JI, et al. Interrater reliability of emergency physician-performed ultrasonography for diagnosing femoral, popliteal, and great saphenous vein thromboses compared to the criterion standard study by radiology. *J Clin Ultrasound*. 2016 Jul 08;44(6):360-367.  
[PubMed: PM26890934](#)
13. Abbasi S, Bolverdi E, Zare MA, et al. Comparison of diagnostic value of conventional ultrasonography by emergency physicians with Doppler ultrasonography by radiology physicians for diagnosis of deep vein thrombosis. *JPMA J Pak Med Assoc*. 2012 May;62(5):461-465.  
[PubMed: PM22755310](#)
14. Torres-Macho J, Anton-Santos JM, Garcia-Gutierrez I, et al. Initial accuracy of bedside ultrasound performed by emergency physicians for multiple indications after a short training period. *American Journal of Emergency Medicine*. 2012 Nov;30(9):1943-1949.  
[PubMed: PM22795427](#)

## Economic Evaluations – Population Not Specified

15. Van Schaik GWW, Van Schaik KD, Murphy MC. Point-of-care ultrasonography (POCUS) in a community emergency department: An analysis of decision making and cost savings associated with POCUS. *J Ultrasound Med*. 2019 Aug;38(8):2133-2140.  
<https://www.ncbi.nlm.nih.gov/pubmed/30593670>

## Review Articles

16. Tarrazo Suarez JA, Morales Cano JM, et al. Usefulness and reliability of point of care ultrasound in family medicine: Focused ultrasound in neck and emergency. *Atencion Primaria*. 2019 June - July;51(6):367-379.
17. Lewiss RE, Kaban NL, Saul T. Point-of-care ultrasound for a deep venous thrombosis. *Glob Heart*. 2013 Dec;8(4):329-333.  
[PubMed: PM25690634](#)
18. Fox JC, Bertoglio KC. Emergency physician performed ultrasound for DVT evaluation. *Thrombosis*. 2011;2011:938709.  
[PubMed: PM22084671](#)