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Handheld Ultrasound Devices for PIVC Insertion

Gimmick or Game-changer?

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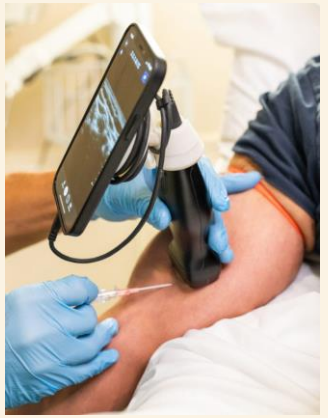
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Portable ultrasound devices pictured for illustration purposes only.



Purpose/Design

This scoping review explored the peer-reviewed literature for evidence regarding compact, lightweight, handheld and pocket ultrasound devices for PIVC insertion to identify the reported:

- uptake in clinical practice
- efficacy in improving insertion
- training and education strategies
- clinician and patient experience

Methods

Scoping review methodology

- Databases: Pubmed, CINAHL, Medline, Embase, Scopus
- Jan 2000–Jan 2023
- Point-of-care, handheld ultrasound devices weighing ≤ 3 kg for PIVC insertion (*Not cart-mounted models*)

Results

- 23078 studies retrieved, 9068 duplicates, 14010 screened title & abstract; 148 full-text articles read and assessed; **17 studies included in final review; 5118 PIVCs in 4576 patients.**
- In-hospital (15 studies), Pre-hospital (2 studies)
- USA (8), Japan (3), Australia (2), Czech Rep (1), Denmark (1), Italy (1), Netherlands (1)
- Prospective cohort (9), Pre-post (3), Randomized controlled trial (2), Retrospective chart audits (3)
- Adults only (14), Pediatrics only (2), Both (1)
- DIVA (39%), non-DIVA (61%)
- Ultrasound operators: Nurses (71%), Physicians (8%), Paramedics (20%), Sonographers (<1%)
- Dynamic technique (15 studies), Static technique (3 studies)
- Variety of skin prep techniques described
- Variety of training programs and competency assessments reported

Conclusion

- Portable handheld ultrasound devices are increasingly common and affordable, and could improve accessibility to ultrasound, especially for PIVC insertion.
- No studies compared ultrasound images between handheld and cart-mounted models
- No studies reported maintenance, disinfection or storage of devices
- More higher-level evidence is needed to demonstrate efficacy for PIVC insertion and management.

Disclosures

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Limitations

English language only; Possible publication bias (only results with favorable findings were published)

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