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Difficult peripheral intravenous cannulation

The learning curve for ultrasound-guided peripheral intravenous cannulation in adults

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Gedreven door het leven.

Peripheral intravenous cannulation

Obtaining intravenous access is a basic and vital part of modern healthcare.[1]

Peripheral intravenous cannulation has an estimated prevalence up to 85% of hospitalized patients.[1,2]

Although peripheral intravenous cannulation is the most common invasive hospital procedure performed worldwide, it is associated with an unacceptable high overall failure rate.[3,4]

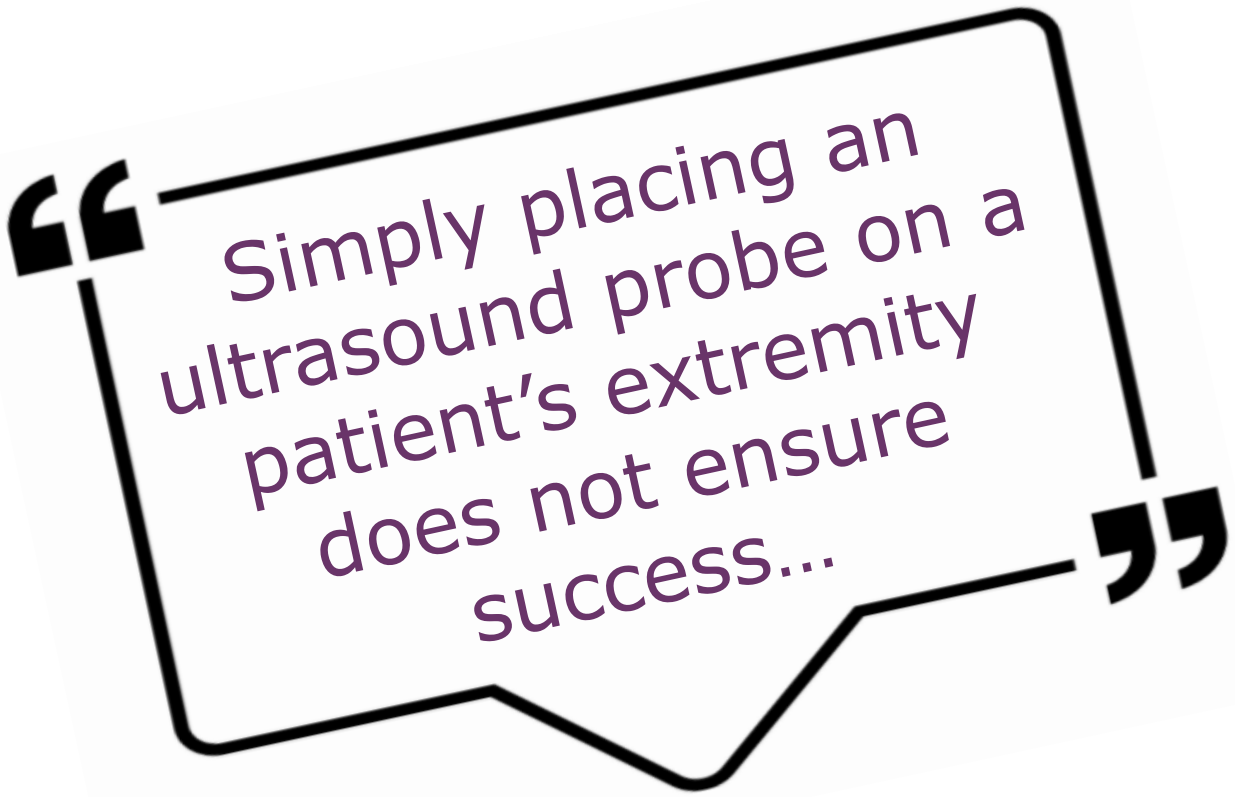
1. Vlaar APJ et al. (2018) Improving peripheral intravenous catheter failure rates.
2. Ruegg L et al. (2018) Emergency inserted peripheral intravenous catheters: a quality improvement project.
3. Helm RE et al. (2015) Accepted but unacceptable: peripheral IV catheter failure.
4. van Loon FHJ et al. (2018) Comparison of ultrasound guidance with palpation and direct visualisation for peripheral vein cannulation in adult patients: a systematic review and meta-analysis.

Ultrasound

- Increased first attempt success rate
- Reduced number of attempts to success
- Reduced time to vascular access
- Increased patient satisfaction

4. van Loon FHJ et al. (2018) Comparison of ultrasound guidance with palpation and direct visualisation for peripheral vein cannulation in adult patients: a systematic review and meta-analysis.

Ultrasound

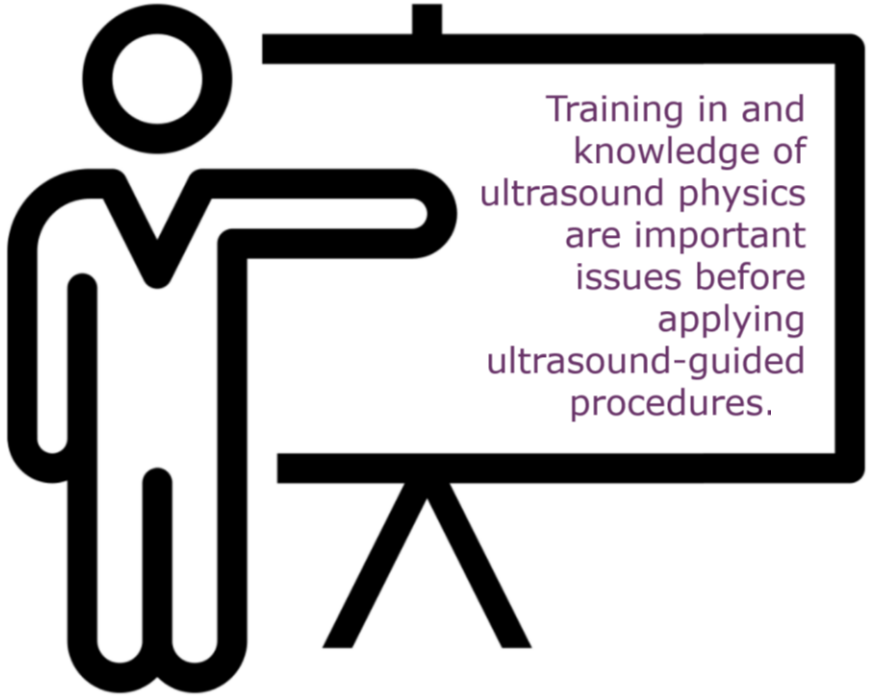

Simply placing an ultrasound probe on a patient's extremity does not ensure success…

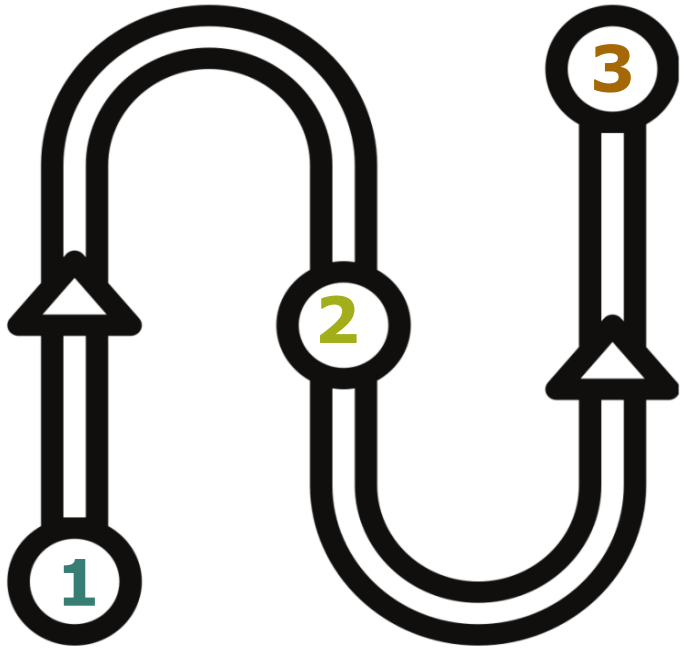
Aim of the study

The study focused on the number of ultrasound-guided cannulations that is required in adult patients before a practitioner can be labelled as being competent.

Competency is determined as the relation of first attempt cannulation success and the time needed for an attempt. In fact, optimal performance of ultrasound-guided cannulation has to be completed in the least amount of time with the highest success rate.

Ultrasound-guided cannulation





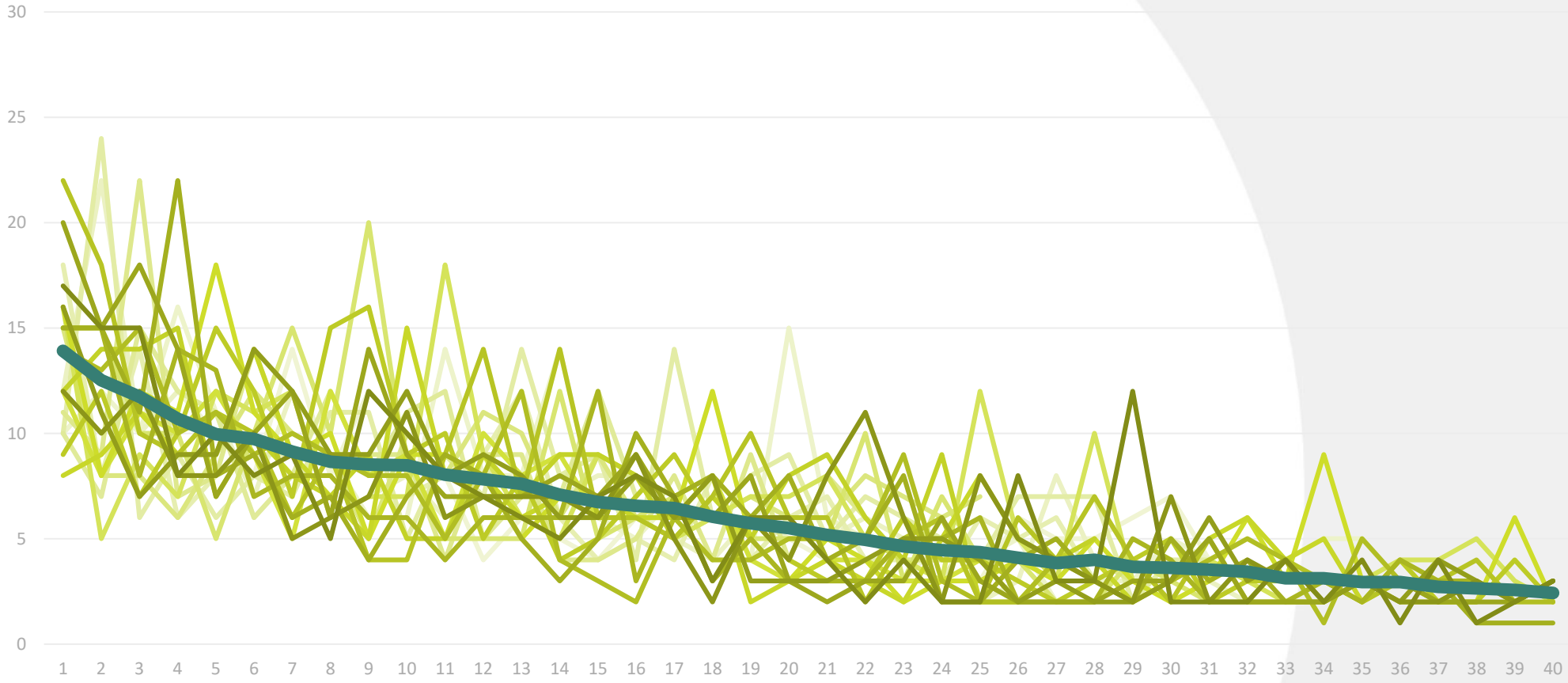
1. **Theoretical training**
2. **Hands-on training**
3. **Life-case training**

5. van Loon FHJ et al. (2019) Establishing the required components for training in ultrasound guided peripheral intravenous cannulation: a systematic review of available evidence.

Learning curve

6. van Loon FHJ et al. (2021) The learning curve for ultrasound-guided peripheral intravenous cannulation in adults.

Learning curve



6. van Loon FHJ et al. (2021) The learning curve for ultrasound-guided peripheral intravenous cannulation in adults.

Conclusion

Nurses were competent in the procedure after performing 35 procedures.

Competency in ultrasound-guided peripheral intravenous cannulation can be gained after following a fixed educational curriculum.

6. van Loon FHJ et al. (2021) The learning curve for ultrasound-guided peripheral intravenous cannulation in adults.

References

1. Vlaar APJ, Hunt BJ. Improving peripheral intravenous catheter failure rates. Lancet. 2018 Aug 4;392(10145):366-367.
2. Ruegg L, Faucett M, Choong K. Emergency inserted peripheral intravenous catheters: a quality improvement project. Br J Nurs. 2018 Jul 26;27(14):S28-S30.
3. Helm RE, Klausner JD, Klemperer JD, Flint LM, Huang E. Accepted but unacceptable: peripheral IV catheter failure. J Infus Nurs. 2015 May-Jun;38(3):189-203.
4. van Loon FHJ, Buise MP, Claassen JJF, Dierick-van Daele ATM, Bouwman ARA. Comparison of ultrasound guidance with palpation and direct visualisation for peripheral vein cannulation in adult patients: a systematic review and meta-analysis. Br J Anaesth. 2018 Aug;121(2):358-366.
5. Loon FHV, Scholten HJ, Erp IV, Bouwman AR, Daele ATDV. Establishing the required components for training in ultrasoundguided peripheral intravenous cannulation: a systematic review of available evidence. Med Ultrason. 2019 Nov 24;21(4):464-473.
6. van Loon FHJ, Scholten HJ, Korsten HHM, Dierick-van Daele ATM, Bouwman ARA. The learning curve for ultrasound-guided peripheral intravenous cannulation in adults. Submitted to Eur J Anaesthesiol.

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THANK YOU

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