Applying Gamification to Increase Confidence Securing Difficult Intravenous Access

Dr George Linfield-Brown (CT2), Dr Matt Duffield (CT2)

Anaesthetics Department , QAH Portsmouth

Introduction

During busy on-call periods, anaesthetists frequently receive difficult cannulation requests. Actioning this is often delayed due to our primary commitments. This leads to late administration of drugs and patient harm on wards.

Ultrasound (US) guided cannulation improves success rates in patients with difficult IV access. It is a challenging skill to master requiring precise alignment of the US probe and needle tip. To address this, we developed a safe learning environment for trainees to practice US cannulation without causing patient harm. Facilitators were able to provide constructive feedback before trainees transitioned onto supervised clinical procedures, improving patient care and increasing clinical confidence.

Materials

We have designed and produced an inexpensive, reusable ultrasound phantom which mimics both the acoustic properties of tissue and the sonographic appearance of blood vessels. The phantom contained fluid filled 'vessels' of varying diameters, depths and tortuosity to provide scaled levels of difficulty.

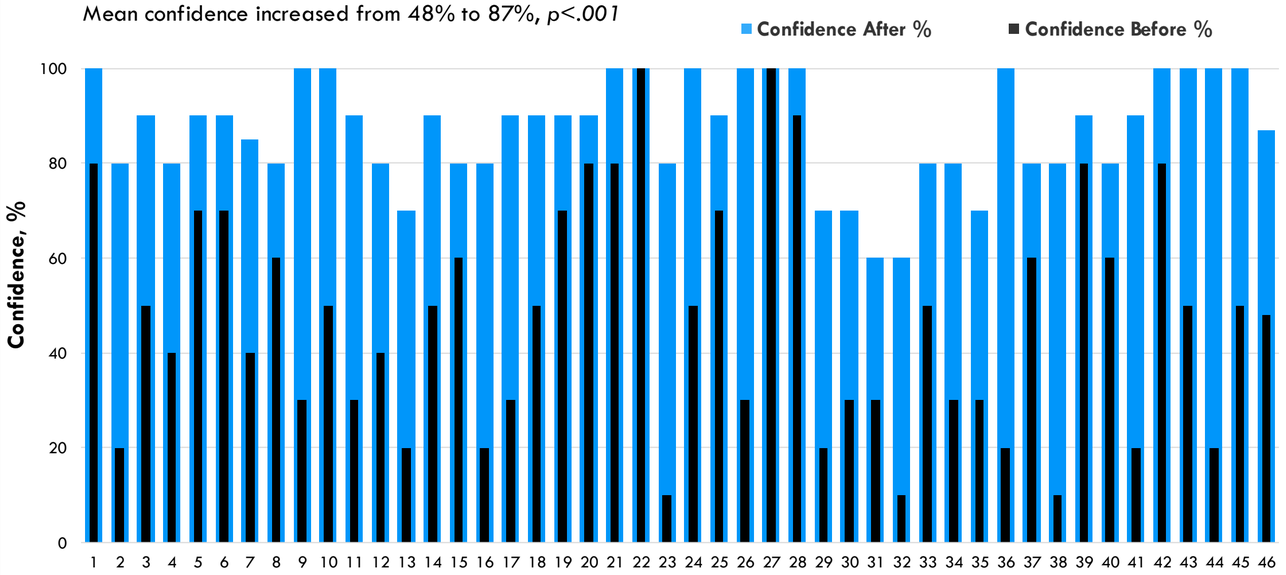
The model was used to simulate the insertion of a needle intravascularly. By introducing technical skill and competition amongst peers, gamification allows education to be more interactive and enjoyable. This increases participation and fosters trainee engagement. A total of 46 foundation year two doctors attended across three teaching sessions.

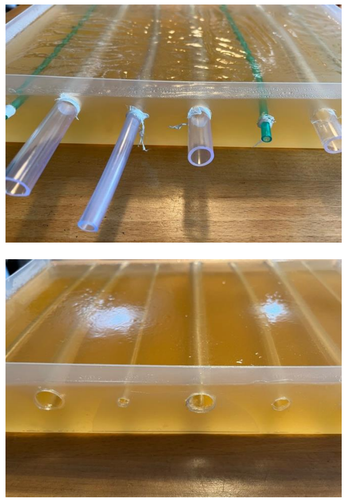
Fujifilm PX & ST US machines were kindly supplied by our local Sonosite representative.

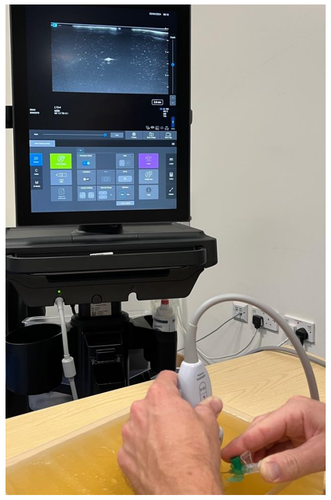
Results

Confidence Performing Ultrasound Guided Cannulation Before v After Gamification Training

Mean confidence increased from 48% to 87%, *p<.001*







In-plane sonographic appearance

Out-of-plane sonographic appearance

References QR code, If you have any further questions or comments, please email: George.Linfield-Brown@porthosp.nhs.uk

Please see this **QR code** if you are interested in making your own US phantom to teach US techniques at your hospital.

Methods

Pre-training Survey
- ✓ To assess trainees' experience and confidence using US prior to training.

Training Programme
- ✓ Simulation of US technique.
- ✓ Engagement is maintained by increasing the level of difficulty as trainees progress.

Post-training Survey
- ✓ To reassess trainees' confidence performing the procedure after training.

Feedback from Trainees

"Interactive - lots of time to practice - very useful skill."

"Clear and concise teaching relevant to our grade...one of the best teaching sessions we have received."

Conclusion

- Mean confidence performing US guided vascular access increased from **47.6%** to **87.2%** *(p-value<0.001)*.
- Trainees graded the teaching as follows: usefulness rated at 99%, appropriate for stage of training 100%, interest in session 99%, 'I learnt something new,' 98%, 'facilitators were engaging' 99%.

What Next?

- ✓ Faculty development - Trainee to teacher.
- ✓ Improving access - Incorporated into FY2 curriculum.
- ✓ Supervised practice - Increased stakeholder satisfaction.