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USING LOW COST HIGH FIDELITY VASCULAR ACCESS MODELS TO TEACH ULTRASOUND GUIDED PERIPHERAL VENOUS CANNULATION TO UNDERGRADUATE MEDICAL STUDENTS

George Dykes[1]; [1]*Newcastle upon Tyne Hospitals NHS Foundation Trust, Newcastle upon Tyne, United Kingdom*

Correspondence: georgechristopher.dykes@nhs.net

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Introduction: Peripheral venous cannulation is an essential practical skill for undergraduate medical students. The journey towards procedural competence can be challenging and stressful due to infrequent opportunity for practice and fear of failure on real patients. In clinical practice ultrasonography can aid clinicians performing difficult peripheral venous cannulation. Teaching on ultrasound has not previously been widely incorporated into UK medical undergraduate education with cost cited as a significant barrier [1]. The increasingly widespread availability of ultrasound equipment provides an opportunity to give students an introduction to ultrasound whilst simultaneously developing competence and confidence with peripheral venous cannulation. We aimed to develop a cost-effective ultrasound guided intravenous access course for medical students to bring together these two learning requirements.

Methods: A pilot course was designed for undergraduate 4th year medical students with prior experience of cannulating approximately 10 patients and with no experience of using ultrasound. Two experienced faculty members led small group sessions for ten students using five ultrasound probes with a focus on hands-on learning. Eight sessions were delivered over two days reaching over 80 students. The three-hour session was divided into ultrasound for beginners (including arterio-venous sonoanatomy) and ultrasound guided cannulation on vascular access models. In order to minimise costs homemade models were used consisting of balloons, turkey steak and gelatine, keeping consumable expenses to under £8 per student.

Results: Post-course feedback was collated to assess the course delivery and its perceived usefulness. 100% of students described the course as "interesting" or "very interesting", with over 95% recommending for the course to be delivered to other medical students. All students felt the vascular access model was useful for learning the procedure with 95% reporting the course "definitely" increased their confidence with ultrasound guided cannulation. In addition, 58% of students felt more confident with non-ultrasound guided cannulation.

Discussion: Ultrasound guided peripheral venous cannulation is often perceived as an advanced skill only available to those working in high resource specialties such as anaesthesia. This pilot course has demonstrated that teaching this practical skill to undergraduate medical students using high fidelity simulation is both feasible and highly valued by students. For the majority of students using ultrasound improved confidence with basic cannulation skills possibly through improved procedural spatial awareness and anatomical understanding. Removing the need for commercially available vascular access models allows cost effectiveness and the possibility to scale up the course to a larger body of students.

Ethics Statement: As the submitting author, I can confirm that all relevant ethical standards of research and dissemination have been met. Additionally, I can confirm that the necessary ethical approval has been obtained, where applicable.

REFERENCES

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