

Does ultrasound-guided peripheral cannulation training for junior doctors reduce missed intravenous antibiotics doses? A teaching programme for foundation doctors in an acute medical unit

It is well established that delays in antibiotics increase morbidity and mortality in sepsis.¹ Difficult peripheral access is one of several factors that cause delays in initiating treatment.² Small studies have shown that ultrasound (US) guidance can aid timely insertion of difficult cannulas and that junior doctors are able to retain and incorporate this new skill into their practice.^{3,4} Our study assessed if the introduction of a training programme in US-guided peripheral cannulation would reduce rates of missed intravenous (IV) antibiotics due to lack of venous access. This was piloted within the acute medical unit (AMU) of a district general hospital.

Our hospital charity kindly awarded the AMU a grant for an US machine following our proposal for this intervention. We introduced drop-in sessions on the AMU in addition to integration within the foundation training programme at our hospital. This was to ensure all foundation doctors in the AMU received the training. We created simulated peripheral vein models from agar-agar and twisting balloons. The teaching sessions were composed of supervised practical training in US-guided access on these simulated models.

Our outcome measure consisted of missed antibiotic administration due to lack of IV access. Missed doses were defined as not given before the time of the next scheduled dose. We used repeated measures analysis of variance (ANOVA) to compare data for the 7 months post intervention with that of the year prior (June–December 2018 vs June–December 2017). This data was collected from the electronic prescribing and medicines administration (ePMA) system. We also used questionnaires based on the Kirkpatrick evaluation model to evaluate the effectiveness of our training.⁵

Post intervention, there was a reduction in number of missed antibiotics due to lack of venous access that was close to significance ($p=0.096$). Our questionnaires showed that 97.4% were likely or very likely to use this clinical skill in clinical practice, and that 83.33% were confident or very confident in using the US machine to aid peripheral venous cannulation at 3-months' follow-up.

With only 7 months of data on missed antibiotics administration, the study lacks power. Significance may be achieved as our data increases over time. It may also improve if the programme is extended to other wards. One significant limitation we encountered before starting the study was the variability in how staff interact with ePMA when scribing the reasons for a delayed dose. Consequently, it was only possible to collect reliable data on missed IV antibiotics, rather than also including *delayed*

administrations. This could be an area for future improvement and study following changes in the ePMA system and training.

In conclusion, US cannulation is a valuable and retainable skill for junior doctors in managing acutely unwell patients. Our study suggests that US-guided cannulation may reduce the number of missed antibiotics and reinforces the evidence that this is a retainable and useful skill for junior doctors. ■

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