Reducing Medication Error Intraoperatively- Feedback on the Additional Verification of Intravenous Drug (AVOID) Error System

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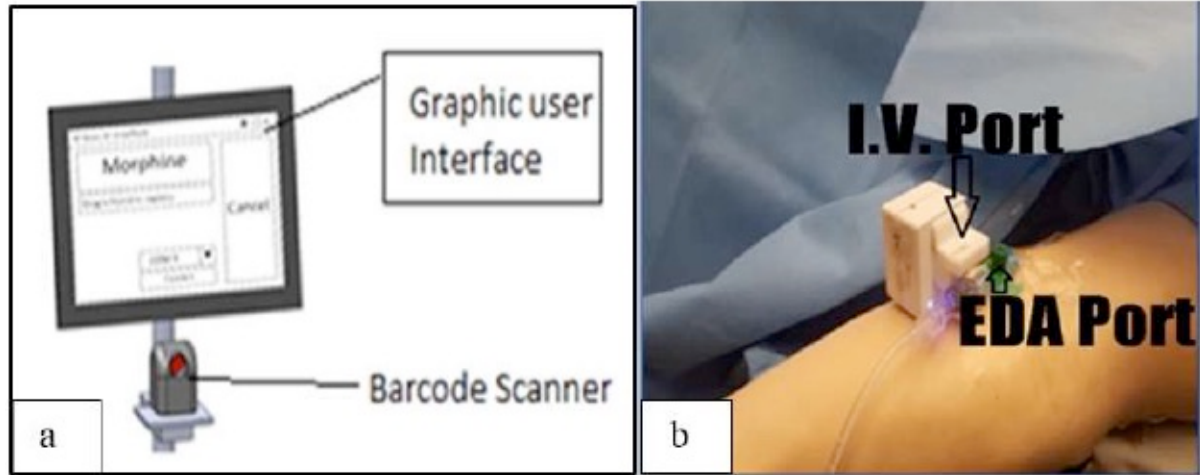**Co-Author:** Shariq Ali Khan[2]

Figure 1: Hardware components of the AVOID-error system. (1a): The AVOID-error system touch screen Graphic user interface with a barcode scanner. (1b) The AVOID-error patient intravenous port and emergency drug administration (EDA) port

Introduction: Medication error (ME) is defined as failure to complete a required action in the medication administration process, or the use of an incorrect plan or action to achieve a patient care aim.[1] Incorrect dosing and substitution errors, defined as, drawing a drug from the wrong ampoule (ampoule swap) and/or administration of wrong drug-filled syringe (syringe swap), are responsible for up to 60% of medication errors in anaesthesia.[2] Perioperative medication administration often bypasses standard safety checks. Furthermore, high-stress and time-sensitive nature of operating room care may lead to both higher rates of MEs.[1] Merry *et al.* have shown that a system allowing syringe labels to be scanned immediately before administration with visual and auditory medication verification reduced perioperative MEs by 21%.[3] We developed the "Additional verification of intravenous drug (AVOID) -error System" (Fig 1) which includes a "lock-like" device that attaches to the patient's intravenous (IV) tubing, and allows injection of the drug only after the user performs a confirmatory scan of the barcode on the syringe label. This system was designed to reduce syringe and ampoule swaps, prevent accidental administration of allergic medication, while coming with an emergency drug administration port.

Objective: Assess the incidence of medication error amongst the local anaesthetists and gather feedback on the AVOID error system.

Materials and methods: 40 anaesthetists from Singapore General Hospital, Sengkang General Hospital, Changi General Hospital and KK Women's and Children's hospital were asked to watch a video we produced that introduced the AVOID system, followed by filling a questionnaire that gave feedback on this system. This study was conducted from June 2019 to August 2019.

Results: 40 anaesthetists (23 consultants, 17 junior anaesthetists) with a median of 7.5years (IQR 4-20) of experience participated in this study.
>98% of participants agree that ampoule swap and syringe swap are potential medication errors. Of the 40 anaesthetists polled, 88% have been distracted before perioperatively with a near miss ampoule or syringe swap. 65% of participants have had a medication error

before, of which 19% experienced it in the last year. The top 3 features of the AVOID system that participants rated most important are prevents injection of allergic drug, emergency injection port in case of device failure, integration with electronic charting system respectively. Overall, participants rated this device in terms of user-friendliness a median score of 6/10(IQR 5-7).

Conclusion: ME is common in anaesthesia with 65% of anaesthetists reporting at least 1 ME in their careers. The AVOID error system has several features that reduces MEs as well as easily integrated with current workflows of drug administration. It has high potential for further developments.

References:
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