

A ROBOT TO REDUCE THE TIME AND NUMBER OF STEPS TO DELIVER INTRAVENOUS MEDICATION DURING ANESTHESIA

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Background: Conventional method of delivering intravenous medication during anesthesia is timeconsuming, requiring 45 seconds and 41 steps to administer one medication. We introduce a robot to reduce the time and number of steps.

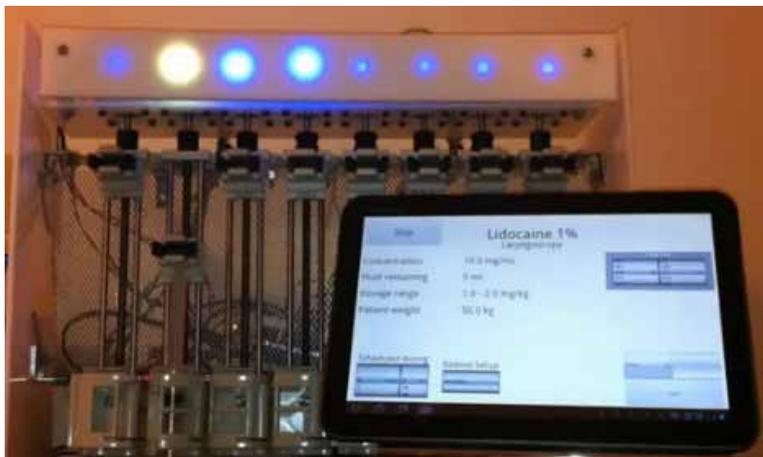
Method: The robot consists of eight syringe pumps controlled by an app running on an Android tablet (Google, Mountain View, CA). In the first study, thirty trials are conducted with the robot, which requires 3 steps: inspecting cartridge, placing cartridge into device, and selecting medication. The timing of medication administration begins when a syringe is selected and ends when the pump is activated. Another thirty trials are performed in another study with medications prepared in advanced, reducing the step to 1: selecting medication. The time starts when a button is selected from the tablet to control the pump and ends at the same point as the first study.

Results: In the first study, medication is prepared and administered in 5.0 seconds +/- 1.2 seconds (mean +/- standard deviation). This represents a savings of 89% for time and 93% for steps compared to conventional methods. The second study shows that medication can be delivered in 2.8 seconds +/- 0.4 seconds, a reduction of 94% for time and 98% for steps.

Discussion/Conclusion: The use of an anesthesia robot speeds the delivery of medication by reducing the 41 required steps to as few as 1. The delivery of intravenous medications can be performed faster by pressing electronic buttons on a touch screen with an anesthesia robot than by conventional methods.

References

1. Levitzky, B.E., et al., Moderate sedation for elective upper endoscopy with balanced propofol versus fentanyl and midazolam alone: a randomized clinical trial. Endoscopy, 2011.



Medication preparation and administration times

