

A Computerized System to Prompt Postoperative Patients to Breathe during Drug-Induced Respiratory Depression

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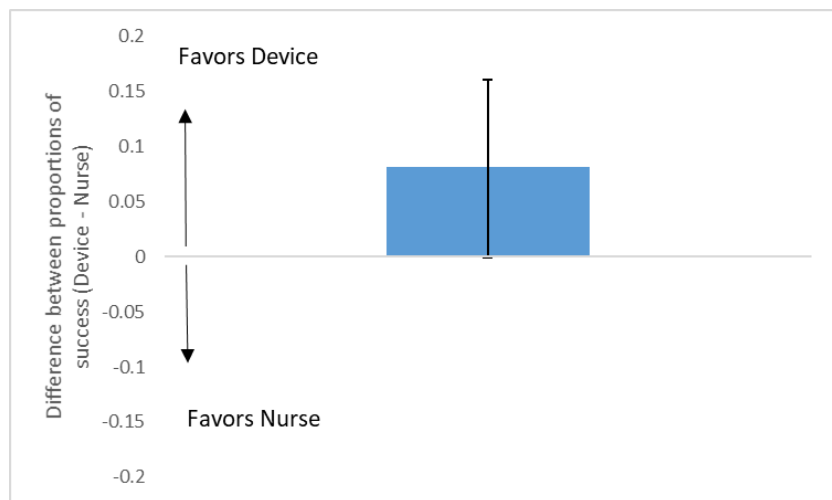
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Background: Adverse consequences of opioid therapy to treat postoperative pain include ventilatory depression and possibly airway obstruction if mixed with a sedative. These may cause significant morbidity and mortality during the first 72 hours after surgery.¹ In this preliminary analysis of our study data, we explored the effectiveness of a computerized system that prompts postoperative patients to breathe. Our hypothesis was that the device prompting success rate would not be inferior to the nurse prompting success rate.

Methods: After institutional approval and written informed consent, 70 postoperative patients were randomized to receive prompts to breathe by either a nurse or a computerized device. Prompts to breathe by the nurse were initiated by clinical standard of care. Prompts to breathe by the device were initiated by either a respiratory rate less than 9 breaths per minute or SpO₂ less than 90%. A positive response to prompting was defined as an increase in respiratory rate by at least 50% or a recovery of SpO₂ to above 90% within two minutes. We compared the proportions of success in R (R Foundation for Statistical Computing, Vienna, Austria) between the two groups using a 2-sample test for equality of proportions with continuity correction.

Results: The computerized system and nurse delivered 82 and 75 prompts, respectively. Of these, the computerized system was successful on 81 prompts (98.7%) and the nurse was successful on 68 prompts (90.7%).

The figure presents the difference between proportions of success between the device and the nurse for breath prompting. The p value was 0.051.



Conclusions: Our results from this preliminary data analysis confirmed our hypothesis that breath prompting by the device was not inferior to prompting by the nurse. Future work is warranted to explore whether computerized system prompting can diminish episodes of postoperative ventilatory depression in settings where nurse availability may be limited (e.g. the hospital floor).

Reference: 1) Lee, Lorri A, et al. "Postoperative Opioid-Induced Respiratory Depression: A Closed Claims Analysis." *Anesthesiology*, vol. 122, 3 Aug. 2015, pp. 659–665.