

TESTING A NOVEL MANUAL COMMUNICATION SYSTEM FOR MECHANICALLY VENTILATED ICU PATIENTS

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Introduction: Available communication methods for intubated patients in the ICU are insufficient to meet patient needs. Both ICU patients and their care providers report broadly unsuccessful communication attempts, resulting in less effective medical care and undue stress^{1,2}. Use of existing methods - including letter boards, writing, and mouthing words - for mechanically ventilated (MV) patients has led to a consensus that new methods are required³. We report on the testing of a new system designed to address the communication needs of MV patients that is currently being tested in a low- to medium- acuity surgical ICU⁴.

Methods: We have developed several generations of prototypes designed to address patient communication needs. Design of this device has focused on ICU-specific communication needs, including ICU-specific content, infection control, simple design, and capitalizing on motor movements that can be easily performed by most ICU patients. Initial testing, starting with non-MV patients able to give more detailed feedback, has begun in a low- to medium- acuity surgical ICU. Recently developed prototypes combine custom-built tablet software, focusing on the needs that nurses believe patients wish to express in the ICU setting, with a newly designed manually operated access device. The system produces visual and auditory output to allow patients to answer basic questions and effectively convey information.

Results: Initial patient impressions are encouraging, particularly among patients who have recently experienced mechanical ventilation. Many patients are unfamiliar with tablet software or struggle with manual dexterity required to access the tablet screen directly, further indicating the need for an external access method as part of the system. The content suggested by nurses via a previously conducted survey has been confirmed by patients as relevant to their experience.

Conclusions: A novel manually operated communication system has elicited both positive reviews and helpful feedback from patients.

References:

1. Broyles LM, Tate JA, Happ MB. Use of augmentative and alternative communication strategies by family members in the intensive care unit. *Am J Crit Care*. 2012 Mar;21(2):e21-32. PMID: PMC3607206.
2. *Heart & Lung: The Journal of Acute and Critical Care*, 1994, 23(4), p323-27.
3. Poster presented at the 2016 Annual Meeting of the International Anesthesia Research Society, San Francisco, CA, May 21-24, 2016. *Anesth Analg*, May 2016, Vol 122(5S_Suppl): S-424.
4. Poster presented at the 2016 Annual Meeting of the International Anesthesia Research Society, San Francisco, CA, May 21-24, 2016. *Anesth Analg*, May 2016, Vol 122(5S_Suppl): S-470.

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