

Effect of a Quality Improvement (QI) Intervention with Daily Round Checklists, Goal Setting, and Clinician Prompting on Mortality of Critically Ill Patients: A Randomized Clinical Trial

Take Away Points

- Implementation of a multifaceted QI intervention with daily checklists, goal setting, and clinician prompting did **not** reduce in-hospital mortality or greatly influence care processes and ICU safety climate.
- Key points learned from this study included:
 - Even with modest funding, a large randomized study of ICUs was able to be conducted and relevant data successfully captured.
 - The observation period of an intervention needs to be sufficiently long (potentially >6 months) in order to detect an effect.

The Issue

Checklists have been proposed as tools to ensure that essential components of care are not omitted. Using checklists combined with daily goals assessment and clinician prompting may improve: communication, adherence to care processes and clinical outcomes. Checklists, read aloud by team members, have successfully flattened hierarchical structures in a number of settings, improving work climate and process adherence.

In this study, the authors examined using checklists and the resulting effects on the work climate, care processes, and mortality in adult ICUs across Brazil.

Study Methods and Design

A cluster randomized trial was conducted to assess the effect of a multifaceted quality improvement (QI) intervention focused on in-hospital mortality of critically ill patients that promoted:

- A daily checklist
- Goal setting during multidisciplinary rounds
- Clinician prompts

Phase 1 entailed an observational study collecting baseline data on work climate, care processes and clinical outcomes for adult patients. This ran from September 2013 through March 2014.

Phase 2 involved randomization of ICUs to receive the multifaceted QI intervention or routine care, and ran from April 2014 through November 2014 (6 months), as stipulated by the funders and ICU leaders who wished the control group to receive the intervention in a timely fashion.

To avoid selection bias, written consent was obtained at the cluster level from the director of each institution. The funders had no role in the analysis or publication decision.

Source

Writing Group for the Checklist-ICU Investigators and the Brazilian Research in Intensive Care Network (BRICNet). (2016). Effect of a QI Intervention with Daily Round Checklists, Goal Setting, and Clinician Prompting on Mortality of Critically Ill Patients: A Randomized Clinical Trial. *JAMA* 2016;315:1480-90. <http://jama.jamanetwork.com.ezproxy.uky.edu/article.aspx?articleid=2512785>

Key Findings and Limitations

- The primary outcome was in-hospital mortality, truncated at 60 days. Exploratory outcomes were adherence to care processes, ICU safety climate, and clinical outcomes.
- This study found no decrease in in-hospital mortality or other clinical outcomes from standard care, after the introduction of the multifaceted QI invention. Potential improvements were noted in 4 of 7 care processes and 2 safety climate domains, although except for 1 outcome, urinary catheter use, these findings were not significant after adjustment for multiple comparisons.
 - In-hospital mortality: Deaths among patients in the intervention group (n=1096 patients, 32.9%) and the control group (n=1196, 34.8%) showed no difference (adjusted odds ratio [OR], 1.02; 95% CI, 0.82 to 1.26; P=.88).
 - Adherence to care processes: The QI intervention improved adherence for 4 of 7 care processes that had poor baseline adherence: increased use of low tidal volume; patient-days receiving light sedation or being alert and calm among patients under mechanical ventilation; decreased use of central venous catheters; and urinary catheters.
 - ICU safety climate: Staff for the intervention group reported more positive answers for teamwork climate and safety climate than the control group.
 - Clinical outcomes: The QI intervention had no effect on the clinical outcomes examined in the study: ICU mortality, central-line associated bloodstream infection, ventilator-associated pneumonia, urinary tract infection, mean ventilator-free days, mean days receiving mechanical ventilation, and mean ICU or hospital length of stay.
- The authors list several explanations for the lack of effect on mortality noted in this study:
 - The effect on care processes was modest and questionable due to the multiple unadjusted comparisons, although adherence to the QI intervention was adequate.
 - As with many intervention studies, adequate time after initial implementation is necessary to detect change. The six-month window for this study may have been too short, not allowing for sufficiently increased trust and teamwork to change care delivery with demonstrable effects on patient outcomes.
 - The checklist items used may actually have negligible effects on mortality, although these items are recommended by guidelines. Studies examining checklists and clinician prompting have found contradictory results.
- Strengths of the study
 - Proof of feasibility. A government-sponsored initiative in a middle-income country was successfully launched to assess the effects of a multifaceted QI intervention over a relatively short time frame.
 - Bias was minimized through allocation concealment and through independent data collection by staff uninvolved with patient care.
- **Limitations**: The duration of the intervention was limited. Eligibility criteria for ICU patients (requiring a stay of at least 48 hours) may have led to a theoretical risk imbalance between groups. However, other baseline characteristics were well balanced. Care processes addressed on the checklist (e.g., VTE prophylaxis or semirecumbent position) were unlikely to benefit those who were discharged early from the ICU or to prevent early deaths.

Final Thoughts

Although this study found no effect on in-hospital mortality from implementing a multifaceted QI intervention consisting of daily checklist, goal setting, and clinician prompting, it did provide useful information on how QI interventions might be implemented, especially in low-resource settings.