Reviewer’s report

Title: Impact of Computerized Physician Order Entry (CPOE) System on the Outcome of Critically Ill Adult Patients: A Before-After Study

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Reviewer: eran bellin

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Overall:
The Authors are to be congratulated for systematically studying the impact of an institutional implementation of technology as part of their ongoing Quality Improvement efforts. Hopefully, this represents a generational shift where researchers participate in Quality Improvement efforts and QI people seek statistical and methodologic rigor. Criticism of "before/after designs" are inherent to this sort of work and are not diqualifying. The lack of increased mortality is reassuring pending the compulsory analysis described below. Writing is clear. The authors properly emphasize the sort of technical support available during the time of the transition from no cpoe to cpoe as well as active adjustments in the Information technology system as problems were detected.

Comments:

Major Compulsory revisions:

1. Authors fail to localize their study in calendar time. It would be appropriate to identify the years (dates) involved before cpoe and the years after cpoe so that the reader can intuit how this study might or might not have overlapped with technology changes or other works by the same authors.

2. Exclusion of groups of patients from consideration included brain death within 24 hours of admission, those with burn injury, and readmissions. These exclusions are unexplained. Were these decisions made in advance of any analysis? What would have been the impact on the mortality experience had these patients been included? Early deaths while potentially legitimately unpreventable could in theory also be highly sensitive to the workflow disruption engendered by the implementation of the cpoe system as described by the referenced article by Sittig and experienced by the pediatricians in the ICU of University of Pittsburgh (Han). I would like to see the analysis including these excluded groups and I would like a further explanation of why they were excluded. Is part of the reason that the trauma study was already reported? Or, does the previous brain trauma study and this study not overlap?

3. Power issue. The authors do not explicitly address the issue of power of their study to detect a difference in mortality should it have really been there. A simple statement such as the study had a power of 80% to detect a 25% improvement
or worsening of mortality using the observed mortality in the before period as baseline. (25% increase in mortality would have required 874 in each arm, 15% increase in mortality would have required 2412 in each arm; similarly 15% reduction in mortality would have required 2173 in each arm, and a 25% decrease in mortality would have required 760 in each arm - Power and precision software).

Minor essential revision

4. P.14 "easiness of use" should be "ease of use"

5. Please describe explicitly that in your hospital cpoe meant that the doctors wrote all the orders and therefore had direct feedback from the cpoe system without the intermediacy of people who entered orders for them.

6. You describe the decision support as moderate. It might be useful in your discussion to identify what "real serious decision support might include, especially in light of the fact that the study while not showing worsening mortality did not show improvement. What decision support if in place might have been useful in impacting on mortality or other measures in your tables?

7. In your description of the U of Pittsburgh failure emphasis should be placed on the disruption of workflow, interpersonal cooperation between doctors and nurses, and delay in registration until patient arrival as specific items responsible for the disruption of the work process. In your implementation how did doctor-nurse interactions change? Was there a delay in registering airlifted emergency cases into the hospital? See the sitting article and address point by point.

Level of interest: An article whose findings are important to those with closely related research interests

Quality of written English: Acceptable

Statistical review: No, the manuscript does not need to be seen by a statistician.

Declaration of competing interests:

I declare that I have no competing interests