Article details: 2015-0139	
Title	An environmental scan of quality indicators in critical care
Authors	Sabira Valiani, MD; Romain Rigal, PharmD, MSc; Henry T Stelfox, MD, PhD; John Muscedere, MD; Claudio M Martin, MD; Peter Dodek, MD, MHSc; François Lamontagne, MD, MSc; Robert Fowler, MD, MSc; Afshan Gheshmy, MD; Deborah J Cook, MD, MSc; Alan J Forster, MD, MSc, Paul C Hébert, MD, MSc
Reviewer 1	Peter J Gill, MD, MSc, DPhil
Institution	Paediatric Resident, The Hospital for Sick Children, University of Toronto; Honorary Fellow, Centre for Evidence-Based Medicine, University of Oxford; Director and Co-Founder, PedsCases (www.pedscases.com)
General comments (author response in bold)	Thank you for asking me to review this article on an environmental scan for quality indicators in critical care. The authors sought to identify a range of indicators which could be used in clinical practice to provide evidence of performance or improvements in care. The research exercise was done to inform decision makers and was Canadian focused, and was by design, not comprehensive. The authors focused on identifying quality indicators from organizations that had previously published quality indicators rather than completing a detailed literature search. Overall, the article is well written, interesting and will likely be useful to the critical care community. I have a few relatively minor comments and requests for clarification: 1. Page 7, Line 27-29: There should be literature cited to support this statement, in addition to the statement in the conclusion "Many authoritative organizations across the globe have begun to endorse quality indicators, bundles and dashboards with the aim of improving the care of the critically ill." **• The first sentence referenced here has been removed in order to achieve the required word count. Also for the statement in the conclusion, please see page 12, 457-458. The organizations which we refer to here are the ones included in this review.** 2. Page 7, Line 54: Did the expert panel assist in **• Incomplete question, please send the full question and we will address it** 3. Page 8, Line 28: The search is quite outdated, now at least 2.5 years since it was completed. Is there a reason it was not done recently, and should it be updated? **• Addressed in limitations section, page 12, line 448-449.** 4. Page 8, Line 32: By only using "quality indicator" as a search term, may have been overly narrow and missed indicators. Literature uses a wide range of terminology, including quality markers, standards, measures, etc. This should be mitigated by contacting the organizations. How many were contacted? **• See page 6, line 144. 12 organizations were contacted by email.** 5. Page 9, Line 10: It is interesting the authors excluded neonates, but included other children (i.e. not adult only). If the focus is on the critically ill, and on the intensive care setting, the indicators should be relevant. **• See page 7, line 171 for comment. Neonates were considered by the study team to be distinct from adult and pediatric critical care.** 6. Page 9, Line 18-27: Was a subset of organizations double checked for errors or missing data? **• See page 7, line 177. Unfortunately, a subset of data was not double checked for errors or missing data either.** 7. Page 9, Line 33, 38: Can you define "redundancy of quality indicators"? Can you explain the "staff work-life" term? **• Please see page 7, line 179-180 and 182-183.** 8. Page 10, Line 10: Was there much disagreement in identifying the overlap between the indicators? **• Please see page 7, 183-184. Unfortunately, we did not capture the number of disagreements. SV and AG essentially categorized the QIs by discussing the list together.** 9. Page 10, Line 30: Why were indicators only discussed if they were endorsed by four or more organizations? Is this a pragmatic approach, or simply consensus? **• Please see page 7, line 223. This was a pragmatic approach. We found a large number of indicators were endorsed by 1-2 organizations, but the number endorsed by 4 or more was manageable from a reporting standpoint.** 10. Page 11, Line 3-10: Did the organizations provide detail on the methodology used to develop indicators? I.e., did they complete a delphi consensus method, RAND/UCLA, etc.? **• See page 9-10, line 257-229. We did not capture data regarding the specific methodology used to develop indicators. However, a few organizations did state that they selected indicators due to the reasons outlined in this paragraph.** 11. Page 11, Line 27: Did the authors go into detail to determine the supporting evidence for the indicators from the literature? **• Please see comment on page 10, line 280-282. A review of the supporting evidence for the quality indicators was beyond the scope of this review. Please see Limitations section.** 12. Page 11, Line 42-48: What did the results show from implementation? Did they improve outcomes? **• Please see page 10, line 303-305.** 13. Page 17, Figure 1: Does this figure reflect the total number of indicators, or the number of unique indicators? **• This figure reflects the total number of unique indicators. However, because there was overlap in the domains that the unique indicators addressed, the total here adds up to 194 (see Table 2).** 14. Page 19: It's unclear why the total adds up to 194 when 222 indicators were identified? Presumably, the total should reflect all 222, or the revised number of 127. **• See comment in table 2. Because there was overlap in the domains that the unique indicators addressed, the total here adds up to 194.** 15. Page 21: The legend should also include a basic summary of what the level of evidence refers to for those that are unfamiliar. E.g. what is Level 1 evidence? 1A? high? Moderate? **• Please see updated legend for Table 3.** 16. Discussion is lacking on the depth of putting this study in context of the other quality indicator literature. Have other disciplines, outside of critical care, done similar exercises and implemented indicators into practice? There is a large body of work

	around primary care indicators for example. Further, the conclusion should highlight potential solutions to ameliorate the problem in the methodology and in the gaps in indicators. How can equity indicators be developed, for example? Are there examples of other disciplines that have filled the gap, or have exemplary indicators which could be utilized? **• Please see the updated discussion, particularly, pg 11-12, line 436-443.** 17. There is also a lack of consideration of the difference, if it is relevant, of use the quality indicators for adult vs pediatric care. Were most of the indicators adult based, and if so, is there a paucity of indicators for children? **• We reviewed the raw data again. There were only 3 indicators specific to pediatric populations, namely pressure ulcer rate (NQMC), PICU standardized mortality ratio (NQF), and VAP bundle for pediatrics (CPSI). Please see page 8, line 210.** 18. Is more detailed information available for interested knowledge users on the actual indicators (e.g. numerator, denominator, data source, etc.)? The authors have done a large amount of work, and it seems like it would be helpful to create a resource to help knowledge users apply the information into practice. The supplementary table is fairly basic. **• See updated Supplementary table with numerator/denominator. Although we did extract some detailed data, given the time frame between the review and publication, we feel that a listing of the primary sources, listed in Table 1, is the best resource for further up to date information.** 19. The table and figures do not have numbers. **• Thank you, this has been corrected.** 20. Several of the references need to be properly formatted. **• Thank you, this has been corrected.**
Reviewer 2	Mr. Eric Mercier
Institution	Centre de recherche du CHU de Quebec, Population Health and Optimal health Practices Research Unit (Trauma - Emergency - Critical Care Medicine); Université Laval
General comments (author response in bold)	Thank you for giving me the opportunity to review the manuscript: An environmental scan of quality indicators in critical care. This is an environmental scan of quality indicators in critical care reported by critical care and quality improvement focused organizations that were identified by a panel of experts (n=10). The authors summarized indicators specific to the care of critically ill patients and categorized them per the Donabedian and the Institute of Medicine frameworks. From the 28 selected organizations, they identified 127 unique quality indicators. They showed that the rationale behind the indicator selection were infrequently reported and only 21% were accompanied by a formal grading of evidence. Quality assessment based on quality indicators is an evolving topic that I consider relevant to CMAJ Open's readership. The methodology used is adequate. Overall, the manuscript is coherent and well written. Major comment: 1. My main concern is unfortunately the long delay (at least 4 years) since the environment scan was performed (August 2012 to January 2013). There is a high likelihood that some organizations have modified their proposed quality indicators and that some of the quality indicators might now have some supporting evidence. I believe a quick update would be beneficial if deemed possible. **• Addressed in limitations section.** Minor comments/suggestions: ABSTRACT: 1. Please consider adding the absolute number with the proportions. **• We have included the absolute numbers with the proportions in the abstract, see page 3, line 45-51. However, these numbers may cause some confusion as the denominators are different. For the 127 unique quality indicators, there were 63 (32%) safety and 61 (31%) effectiveness indicators. Because some of the 127 unique QIs overlapped in domains addressed, the denominator here is 194. For the rationale for selection, the denominator is the total number of quality indicators, which is 222. For the evidence grading, we used the pooled evidence provided for the 127 unique quality indicators.** METHODS: 2. Maybe expand the 10 selected experts' description (expertise related to quality indicators, geographic distribution, etc.). **• See page 6-7, line 115-128.** 3. It is unclear to me if the authors have selected quality indicators that could be related to critical care amongst all of those proposed by the organizations or if the quality indicator in question needed to be explicitly associated to critical care by the organizations. Please clarify. **• See page 7, line 171-172.** RESULTS: 4. Maybe add the number of quality indicators proposed/selected per organization. **• This information is partially available in the supplementary table. We thought it would be more useful to the reader to know which QIs have multiple organizations endorsing them, versus which organizations endorse multiple QIs. Also please see page 8, line 204-206 for the top 3 contributing organizations.** 5. IOM Classification: please refer to the figure presented on page 2/23 somewhere in this section **• Please see page 9, line 248.** CONCLUSION: 6. Maybe add a sentence about the quality indicators that have the highest grade of supporting evidence as this is a relevant data. **• See page 12, line 458-460.** TABLES: 7. Please add the tables' titles. **• Thank you, this has been added.**

	8. Quality indicators: I am unsure why is prevention of VTE associated with the VAP bundle? **• This bundle is called "Prevent Ventilator Associated Pneumonia" by the IHI, however, their rationale in including VTE prevention within this bundle was that VTE prevention constitutes optimal care for ventilated patients, who are at a high risk of VTE.**