Reviewer’s report

Title: Inclusion of a care bundle for fever, hyperglycaemia, and swallow management in a National Audit for acute stroke: evidence of upscale and spread

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Reviewer: Ralph Gonzales

Reviewer's report:

This review was completed jointly by Ralph Gonzales, MD and Anthony Kim, MD, Director, UCSF Stroke Service.

Purvis and colleagues report on the adherence to protocols for post-stroke fever, hyperglycemia, and swallow screening processes (FeSS) at over 110 centers across Australia in 2013, 2015, and 2017. These protocols had been previously evaluated in a cluster randomized trial (QASC) in 19 centers in NSW in 2005-2010 (published 2011), and subsequently rolled out across all 36 stroke centers in NSW in 2013-14 (QASCIP; published 2016), but the current analysis was focused on subsequent changes in adherence using data from a National Audit: a biennial survey of organizational features of centers across Australia and adherence to process measures based on audits of clinical records from 40 stroke patients at each site.

Investigators found that an increasing proportion of hospitals reported using protocols for FeSS from 2013 to 2017 and improvements in FeSS processes were evident across Australia in the post-QASCIP years, with former QASC/QASCIP hospitals showing greater improvements in relative adherence in 2017 compared to 2013 than non QASC/QASCIP hospitals. These data are consistent with the notion that there was ongoing passive dissemination of FeSS processes across Australia in the years after concentrated scale-up efforts across NSW for QASCIP had ended, though this was against the background of ongoing national audits and feedback on FeSS processes.

The manuscript is well-written and methodologically sound with transparency about how available measures were harmonized across the time course of the analysis. We have the following concerns and suggestions:

Methods:

1. Audit and feedback can be an effective tool for improving health care processes, as the authors discuss. However, it can also lead to bias in the measures when the abstraction/measurement is self-reported by each hospital. The authors should describe to what
degree the medical record abstractors were blinded to the study's hypotheses, and include this as a possible limitation in the Discussion section.

2. Inter-rater reliability sample size. 5 cases were re-audited for interrater reliability testing. I did not see any results from this testing, and am not sure that 5 cases is sufficient for adequately assessing inter-rater reliability/kappa statistics.

Results/Discussion:

3. While these data show improvements in FeSS process measures and although QASC and QASCIP showed impacts of processes improvements on death or dependency, this manuscript does not attempt to link these improvements and dissemination of process measures to patient outcomes. If possible, it would be very interesting to include some analysis of any relationships between these improvements in FeSS process metrics with changes in outcomes, and if such changes in outcomes are modified by previous QASC/QASCIP participation for instance. This is particularly relevant since definitive links have been difficult to make in certain instances (e.g. unclear effect of dysphagia screening protocols on reducing the rates of pneumonia, death, or dependency after stroke. Stroke. 2018;49:e123-e128; https://doi.org/10.1161/STR.0000000000000159)

4. Including any information on timing of any changes to associated guidelines related to FeSS processes on the timeline might be helpful.

5. I was surprised to read that adherence to composite outcome in 2013 was the same for QASC and non-QASC hospitals. The authors should consider discussing reasons why there was not greater adherence following the original QASC trial (2005-2010), and why subsequent years did not show an improvement.

6. If possible, please clarify or confirm whether the National Audits included FeSS-related measures in the years prior to 2013 to give some sense of the potential previous and ongoing influences that could be impacting secular trends during the 2013 to 2017 period.

7. While much of the manuscript is focused on ORs comparing 2013 to 2017 for instance, and although the absolute unadjusted adherence rates are included in Table 3, it might be helpful to highlight some sense of the absolute adherence rates in the abstract, and provide some rough comparisons about how these rates compare to other settings, GWTG-Stroke for the US instance, or European stroke registries.
8. In the discussion, the authors discuss audit-feedback mechanism as one possible explanation for the rising adherence rates between 2013 and 2017. However, they also discuss "passive dissemination" as an underlying mechanism. It seems contradictory to posit both an active intervention (audit-feedback) along with passive dissemination in an observational study. It's possible that in the absence of audit-feedback that passive dissemination could have led to increases in adherence, but with an observational study design there is no way to know... Since one can't control or exclude audit-feedback as the primary driver of changes in adherence rates, it seems more appropriate to minimize the discussion of passive dissemination as an explanatory factor. In particular, it doesn't seem warranted to include this study as an example of "passive dissemination" in the Conclusion given the audit-feedback that occurred with all hospitals.

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