Reviewer’s report

Title: Evaluation of a targeted, theory-informed implementation intervention designed to increase uptake of emergency management recommendations regarding adult patients with mild traumatic brain injury: results of the NET Cluster Randomised Trial

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Reviewer: Eddy Lang

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This manuscript describes a cluster-randomized trial of 24 Australian emergency departments to test the effect of interventions designed to improve the care of patients who present with minor head injury. The investigators employed a variety of techniques to support implementation based largely on a multifaceted approach including opinion leaders and educational interventions as well as tailored approaches designed to address barriers. The methodology is comprehensive and robust and compliant with CONSORT although not entirely clear to me is if CONSORT for cluster-randomized trials was explicitly followed. The study's primary outcome was the use of a post trauma amnesia scale which is designed to be completed while in the emergency department and should serve as a guide to safe discharge. Other outcomes relate to the "appropriate" use for CT scanning and the provision of discharge information related to head injury.

The primary outcome seems to have been extracted by retrospective chart review and there was long-term patient interviews comparing patients seen in control and intervention sites. The primary outcome reported at two months was positive in comparison to controls but still somewhat disappointing with less than 20% uptake. The other interventions were essentially negative including long-term patient outcomes. The study was conducted in 2013.

This study demonstrates some of the challenges associated with achieving successful implementation in the context of a cluster-randomized trial. Despite a well-developed intervention the findings were disappointing. I think the paper is informative although a few areas merit concern.

It is unclear from the manuscript, beyond a note that these interventions were suited to the Australian context, why repeat completion of the PTA was deemed as such an important piece of evidence to translate. If there is a lack of compelling evidence for the importance of the intervention one can appreciate how uptake was disappointing.

The findings around appropriateness of CT use are difficult to follow and by the authors’ own admission were not readily measurable. The manuscript refers to expected rates of CT use but these seems high if in fact a validated instrument for true minor traumatic brain injury were used.

Finally the authors may want to speculate as to whether the results achieved were warranted based on the effort invested and if their implementation strategy merits replication. A recurrent theme of many of these trials is that the change expected seems to be largely imposed by the
research team rather than growing organically as something patients and providers feel they need. Was this a reason for most departments declining the study?

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