Author’s response to reviews

Title: Definition of hourly urine output influences reported incidence and staging of acute kidney injury

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Dr Kashani,
Editor, BMC Nephrology

Dear Dr Kashani,

Please find attached the third revision of our manuscript manuscript (BNEP-D-19-00379R3). We are grateful to reviewer 3 for their constructive comments and we have provided answers below.
Yours sincerely,

The corresponding authors,

David Gardner and Mark Devonald

Friday, 15 November 2019

Reviewer reports:

Reviewer #3:

1) Urine output is normalized by body weight. What type of body weight did you use to calculate urine output per kg per hour? It is worth citing or discussing the article "Actual versus ideal body weight for acute kidney injury diagnosis and classification in critically ill patients." (PMID 25398596).

We agree that this paper adds weight to our argument. We have cited the paper published in BMC Nephrology and report on the type of bodyweight estimation (page 5, methods). We also include a statement similar to the conclusions of this paper, that for ICU use of ‘ideal’ as opposed to actual body weight can affect estimated incidence of AKI (page 9, bottom).

2) Oliguria is important prognostic factor for patient outcome regardless of elevated serum creatinine.

i) compare C-statistic for predictive performance of UOcon vs. UOmean for mortality.
We have added the likelihood ratio and P-value to Table 3 so that a comparison can be made between diagnostic criteria (mean vs consecutive). We believe it is now clear with the LR reported and we are grateful for the suggestion. We do not believe any further reporting of the AUROC would add to the paper. A recent paper suggested that, “pre-implementation evaluation of EWSs [Early Warning Scores] should include at least two metrics: sensitivity; and either the positive predictive value, number needed to evaluate, or estimated rate of alerts” (Romero-Brufau et al. Crit Care 2015 [PMID: 26268570]). We believe that readers will be able to interpret comparisons between methods through the PPV, NPV and associated statistics now presented in Table 3.

ii) investigate the outcomes of patients who had discrepancy in AKI diagnosis or staging based on UOcon and UO mean.

This is an interesting suggestion but we feel it would require a far larger dataset than presented here and is likely best approached as a wholly separate meta-analysis of papers reporting problems with the definition of AKI. We believe that it is beyond the scope of the current paper.

iii) what is the kappa agreement for AKI diagnosis or staging based on UOcon and UO mean. This information will guide what type of urine output we should use for AKI diagnosis and staging.

This is another interesting suggestion. Since our outcomes are binomial, that is a definition of AKI (yes/no) according to either SCr (current gold standard) versus UO (consecutive or mean) then kappa agreement values are not the only or the best comparison to report statistics of levels of agreement. In preference, we report the positive or negative agreement, which may be calculated from columns of binomial data and gives the proportion of specific agreement (Ciccetti & Feinstein, 1990; Spitzer & Fleiss, 1974). If both PA and NA are satisfactorily large, there is arguably less merit in comparing actual to chance-predicted agreement using a kappa statistic. PA and NA provide more information relevant to understanding and improving ratings than a single omnibus index (see Cicchetti and Feinstein, 1990). This has been now added to table 3, methods and references.