## Systematic Review and/or Meta-Analysis Rationale

For systematic reviews / meta-analyses, authors need to provide the following information:

**1.Comment:** The rationale for conducting the systematic review / meta-analysis;

**Responds:** We do appreciate your suggestion. The AKI stage is an important time window in which key interventions may be initiated to alter the natural history of kidney disease; therefore, correct and efficient prediction of the onset of AKI is critical. Currently, the diagnosis of AKI is still based on changes in serum creatinine and urine output as well as some blood and urine biomarkers (such as SOFA score) associated with tubular damage. The diagnostic reliability of individual biomarkers is imprecise and lacks tissue correlation. Therefore, it is necessary to combine the changes in urine volume and creatinine with time to make an accurate diagnosis. Machine learning, as s subfield of artificial intelligence, can use large data sets to predict future events, which is helpful for doctors to make accurate diagnoses. Based on the refinement process including training, validation and testing, automatic adjustment of model parameters can improve performance. Existing studies demonstrate that machine learning is increasingly applied to the prediction and diagnosis of kidney disease, including acute kidney injury in pediatric intensive care, and predict kidney transplant survival. However, there is no relevant meta-analysis to evaluate the efficiency of machine learning models in predicting AKI in ICU patients. Therefore, this study summarizes previous studies and provides a new method for evaluating the predictive performance of machine learning for the risk of AKI in ICU patients, providing a basis for clinical practice.

**2.Comment:** The contribution that it makes to knowledge in light of previously published related reports, including other meta-analyses and systematic reviews.

**Responds:** We are so grateful for your suggestion. In recent years, machine learning has been used to predict and diagnose kidney disease, including acute kidney injury in pediatric intensive care, and predict kidney transplant survival. Previous meta-analyses analyzed the application of machine learning in the prediction of acute kidney injury associated with cardiac surgery and perioperative acute kidney injury. In contrast, this study incorporated 13 types of machine learning models to explore the c-index, sensitivity, and specificity of machine learning models for predicting AKI in ICU patients. Our research focuses on ICU patients, which to a certain extent reduces the impact of various diseases and factors on the stability of the results, making our research results more robust and providing more targeted recommendations for clinical practice. We find that machine learning had good performance in predicting the risk of AKI in hospital ICU patients and could be used as a prospective strategy for early identification and prevention of inflammation.