Review of: "Machine learning-based prediction of acute kidney injury after nephrectomy in patients with renal cell carcinoma"

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While prediction of AKI in general mixed ICU patients are not new, the prediction in a highly selected population is novel. The specific population the authors focused on is those after nephrectomy, who are at increased risk of renal injury. Thus, the topic is timely for clinical practice. However, compared to the general ICU population, focusing on a highly selected subgroup poses the problem of limited sample size, which can be a major limitation in practicing machine learning algorithms. However, the authors collected more than 4000 such patients for the analysis, which is a large dataset for this highly selected population. The authors developed several ML models for the prediction purpose. The clinical utility is compromised because there are too many models and the users cannot make a choice by themselves. I personally prefer to make an ensemble model in such a situation[1]. A web APP would also be helpful for the clinical utility.

Finally, I would like to point something related to the model interpretation. There has been numerous algorithms to help humans and clinicians understand how the machine thinks[2]. These methods are helpful to disentangle the underlying risk factors in a personalized way. For example, some factors are risk factors in some patients, but may not be so in others. The authors displayed variable importance for this purpose, but there can be more choices such as Breakdown and LIME.

References

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2. ^*Zhongheng Zhang, written on behalf of AME Big-Data Clinical Trial Collaborative Group, Marcus W. Beck, David A. Winkler, et al. (2018). Opening the black box of neural networks: methods for interpreting neural network models in clinical applications. Ann. Transl. Med, vol. 6 (11), 216-216. doi:10.21037/atm.2018.05.32.*