

Machine-Learning-Based Prediction Models for AKI



Acute Kidney Injury (AKI) is a common occurrence for critically ill patients in the ICU, and its early diagnosis has proven to be challenging. The accuracy of the online, machine-learning-based prediction model, [AKIpredictor](#), was analysed for its use in a clinical setting.

The study, which took place over five ICUs in Belgium, compared the predictions of AKIpredictor with physician predictions. The patient information for 250 individuals with no prior evidence of AKI or end-stage renal disease before ICU admission was used. Physicians then predicted AKI progression at three stages: at the initial admission, on the patient's first morning in the ICU and 24 hours later. Physician predictions were then compared against those made by the AKIpredictor, which uses collected patient information.

At the end of the study, 12% of the cohort had developed AKI-23 (AKI in either stage 2 or 3). The discriminative performance of AKIpredictor and the physician predictions were found to be similar. However, results showed that AKIpredictor had overall a higher net benefit, as physicians commonly overestimated AKI development in patients.

The results indicate a benefit to using a machine-learning-based model for AKI predictions for the removal of false positives. In a clinical setting, false positives of AKI predictions hold no real threat to patients with there being no treatment available and current measures being mainly supportive. However, in a clinical trial, AKIpredictor could reduce costs and selection bias by only highlighting those with a high risk, eliminating unnecessary exposure to patients that will not develop AKI.

Researchers also noted that whilst results were similar for both physicians and AKIpredictor, physicians usually took more time to make their predictions. The reliability of the machine-learning-based model is also an attractive benefit in the busy ICU setting. However, due to the limited sample size of the study, further research would be needed, particularly on how decisions were made by both physicians and the machine-learning algorithm.

Source: [Critical Care](#)

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