and improve communication between patient and provider.

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Commentary: Fast is fine, but accurate is essential

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The title of this commentary is an aphorism credited to the famous lawman of the American West, Wyatt Earp. Mr Earp participated in many gunfights, including the shootout at the O.K. Corral in Tombstone, Arizona. The O.K. Corral gun-play lasted less than 30 seconds and each side fired 17 shots. Three of the outlaw cowboys and none of the law officers died.¹ Wyatt was unharmed and lived until 1929, when he died in Los Angeles at age 80.

In their paper, Chen and associates² present another type of accuracy; namely, accuracy of a mathematical model that identifies patients early after cardiac surgery who will develop acute kidney injury and are at risk for postoperative mortality. Their model was developed with sophisticated statistical methods, including machine learning. It identified 2 cytokines (interleukin-8 and interleukin-16) from a panel of 32 candidate cytokines together with the change in serum creatinine level from preoperative to early postoperative as variables for a

Wyatt Earp 1848-1929

CENTRAL MESSAGE

The authors created a nomogram that uses measurements of 2 cytokines together with peri-operative change in serum creatinine to predict postoperative renal injury in cardiac surgery patients.

predictive nomogram. The model was generated from a group of patients at one hospital and validated in patients at another hospital. The nomogram for prediction of the composite outcome (Figure 3, A, with link to an online calculator) performed well in the training and the validation cohorts (Table 4).

What can we do with this information? The authors provide an answer in Figure 3, B, by comparing the projected outcomes from an accurate prediction (labeled nomogram) to strategies of treating all patients at risk or none of the patients at risk for acute kidney injury.

There is potential benefit from the accurate identification of patients who are early in the evolution of postoperative nephropathy.³ Delayed treatment of patients with renal failure places them at risk for fluid overload and possibly other problems. In similar fashion, there are costs and risks associated with a treat-all strategy for renal

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injury. The early initiation of renal-replacement therapy in accurately identified patients entering the early stages of postoperative nephropathy may attenuate the risk of death or permanent impairment of renal function. In addition, as pointed out in the paper, there are surgical techniques (eg, off-pump coronary artery bypass grafting) or novel drugs (mainly monoclonal antibodies) that may be effective in diminishing renal injury that evolves after a cardiac operation.

Further research will answer 3 important questions about the authors' predictive model. First, is the precision of the nomogram preserved in other patient populations across a wider scope of cardiac procedures? Second, do interleukin-8 and interleukin-16 play key roles in the etiology of renal failure as it evolves after a cardiac operation, or are the increases only correlated findings? Third, is it

possible to use the authors' model as an accurate metric to quantify the benefit of novel drugs and other interventions that avoid or ameliorate acute kidney injury following cardiac operations?

In summary, this novel predictive model for postoperative renal injury is fast, and it appears to be accurate. Wyatt Earp would have appreciated it.

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