AI may predict survival after heart surgery

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A technology from the 19th century meets one from the 21st to better help doctors predict who'll survive a heart surgery.

Cardiologists from three major U.S. hospitals gathered data from the electrocardiograms (ECGs, invented in 1895) of almost 46,000 patients. They then fed that data into a cutting-edge AI algorithm.

AI was 83% correct in gauging which patients would still be alive 30 days after their heart surgery, the study found.

That beat the 67% accuracy of the standard method doctors use to predict such risks, called the Revised Cardiac Risk Index.

"This is the first electrocardiogram-based AI algorithm that predicts post-operative mortality [death]," said study co-author Dr. Da Ouyang, a cardiologist at the Smidt Heart Institute at Cedars-Sinai, in Los Angeles.

He explained that AI's accuracy in estimating the risks around a surgery "helps inform the actual decision to do surgery" in the first place.

The study drew on ECG data from patients treated at three major U.S. health care systems: Cedars-Sinai, Stanford University and Columbia University. ECGs measure the heart's electrical activity and function.

The AI algorithm compared the pre-surgical ECG data to 30-day outcomes for patients post-surgery.

Patients whose pre-op ECGS helped AI identify them as being high-risk had a nine-fold increased risk of dying in the month after their surgery, Ouyang and colleagues said.

"Current clinical risk prediction tools are insufficient," he noted in a Cedars-Sinai news release. "This AI model could potentially be used to determine exactly which patients should undergo an intervention and which patients might be too sick."

The researchers are now investigating whether the AI technology might be uploaded to the internet, where it could be readily accessed by doctors and patients everywhere.

The findings were published recently in The Lancet Digital Health journal.

More information: David Ouyang et al, Electrocardiographic deep learning for predicting post-procedural mortality: a model development and validation study, *The Lancet Digital Health* (2023). DOI: 10.1016/S2589-7500(23)00220-0