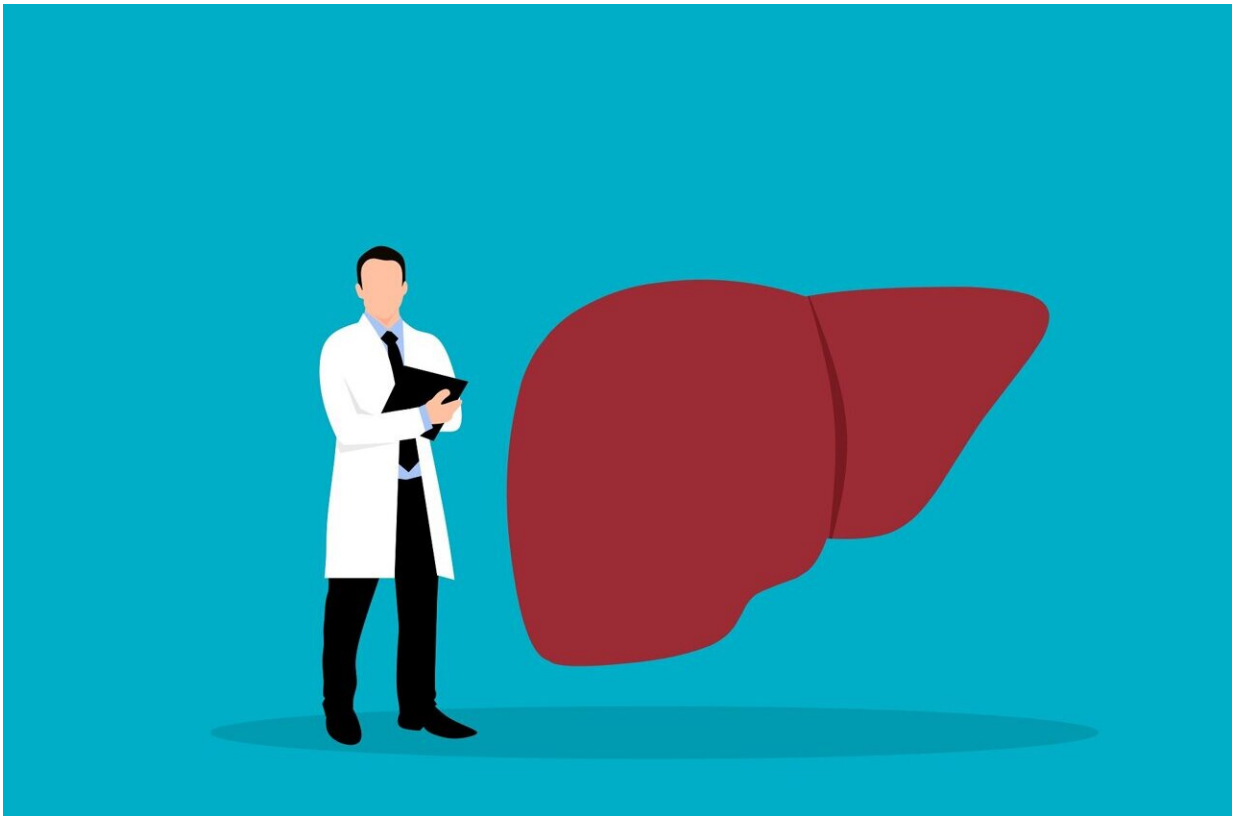


Smart phone application to increase safety in liver surgery

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Surgical removal of parts of the liver remains the only curative approach for patients with liver-specific cancer. An international team led by Patrick Starlinger from MedUni Vienna has developed a score that

provides an individualized risk assessment for patients prior to liver resection, which can significantly increase the safety of liver surgery.

This score can be calculated using a simple smartphone app and, compared to standard preoperative tests, offers a cheaper and less invasive option with comparable or better predictive power for postoperative [liver](#) failure. The effectiveness of the score was confirmed in an international multicenter study with more than 14,000 patients.

Normally, the liver can tolerate the [surgical removal](#) of up to 75% of its volume and can maintain its functions after surgery. However, depending on the underlying chronic liver disease, the type of cancer or the extent of resection, patients may be at higher risk of inadequate postoperative liver regeneration or even postoperative liver failure, the main cause of mortality after liver surgery.

As there is no treatment for this, a risk assessment before surgery is essential. However, the established tests for preoperative liver function testing are often associated with considerable cost, time and invasiveness and are rarely directly compared.

APRI + ALBI score facilitates preoperative liver function assessment

A team from 10 different international liver surgery centers led by Patrick Starlinger (Medical University of Vienna/University Hospital Vienna and Mayo Clinic, Rochester, U.S.) has developed a [multivariable model](#) based on basic patient: in characteristics and a preoperative score, the APRI + ALBI score, which enables a standardized and easily accessible preoperative liver function assessment.

The APRI + ALBI score is calculated using simple routine laboratory

parameters (GOT, platelets, albumin, bilirubin). It has already been shown to be closely related to preoperative liver function and chemotherapy-induced liver injury, and has significant predictive potential for the development of postoperative liver failure. The APRI + ALBI score provides a comprehensive assessment of liver function, especially compared to classical liver function tests, which usually only assess the excretory capacity of the liver.

The study included more than 14,000 patients from 10 different institutions and the National Surgery Quality Improvement Program (NSQIP), an algorithm-based database from the United States. The model showed significant predictive performance, which was validated in the international multicenter cohort.

"We are very pleased with the strong predictive potential of our model, which documents the significant clinical utility of our score and the associated smart phone app," says Jonas Santol, first author of the manuscript, a surgical resident at Klinikum Favoriten and a doctoral student at MedUni Vienna's Center for Physiology and Pharmacology, who is currently on a research residency at the Mayo Clinic.

The multivariable model based on the APRI + ALBI score is easy to calculate using routine laboratory values and basic patient characteristics, and can be calculated using a freely available smartphone app. Compared to established liver function tests, it shows equivalent or improved prediction of liver failure at a fraction of the cost, time required and invasiveness.

"We have taken an important step in translating this into [clinical practice](#) by developing a freely available smartphone application that allows us to calculate our score and thus individualize the risk assessment of patients before [liver resection](#). This sets a new standard in preoperative [risk assessment](#) and will significantly increase the safety of liver [surgery](#) for

our patients," says Patrick Starlinger from MedUni Vienna's Department of General Surgery of MedUni Vienna/University Hospital Vienna, who is currently based at the Mayo Clinic.

More information: Jonas Santol et al, An APRI+ALBI Based Multivariable Model as Preoperative Predictor for Posthepatectomy Liver Failure, *Annals of Surgery* (2023). DOI: [10.1097/SLA.00000000000006127](https://doi.org/10.1097/SLA.00000000000006127)

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Provided by Medical University of Vienna

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