

# Blood test may predict how quickly patients recover from surgery

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A simple blood test taken before surgery may predict how quickly patients recover from their procedure, suggests a new study in the December issue of *Anesthesiology*, the official medical journal of the American Society of Anesthesiologists (ASA). According to the study, identifying a patient's immune state from blood samples taken before surgery, revealed patterns that may predict speed of recovery from postoperative pain and dysfunction.

Immune states are patient-specific immune responses to "stressors" that are released by cells during surgery, injury or trauma.

"Patients and physicians alike want to know how long pain and dysfunction will last after surgery, but the rate at which [patients](#) recover is highly variable and differs for every patient," said Martin Angst, M.D., study author and professor of anesthesia at Stanford University School of Medicine, California. "Our research indicates that we can capture important aspects of each individual patient's biology that accurately predict how they will handle and recover from surgery. This may ultimately enable us to provide personalized, cost-conscious approaches to aid recovery and have a major impact on perioperative medicine."

In the current study, researchers examined whether inducing immune responses in pre-surgical blood samples correlated with the clinical recovery profile of 25 individual patients undergoing hip surgery. A patient's pre-surgical immune state was identified in blood samples by

inducing a signaling response, similar to the immune system's response to surgery or trauma, across all major immune cell subsets found within the blood. The immune responses were then measured against outcomes contributing to prolonged recovery including [postoperative pain](#), hip dysfunction and disability.

Patients recovered at very different rates (speed) ranging from days to weeks and even months in extreme cases. The authors observed a significant correlation between patients' pre-surgical immune states and their speed of recovery from pain and hip dysfunction after surgery, which accounted for nearly 50 percent of the variability associated with the speed at which patients recovered. Although preoperative immune states were predictive of recovery across several domains including postsurgical pain and hip dysfunction, no significant correlation was observed regarding speed of recovery from fatigue and resulting disability. The current study using a single blood sample was much more predictive of clinical recovery than demographic or psychological factors.

"Our ultimate goal is to develop a blood test that can assess key attributes of a patient's immune system, be applied to daily clinical practice, be performed in regular clinical laboratories and be predictive of an individual patient's recovery profile," said Dr. Angst. "Predictions could be used to counsel patients and manage their expectations or to stratify them prior to surgery by assigning patients at risk of slow recovery into prehabilitation programs or postponing [surgery](#)."

An accompanying editorial authored by James C. Eisenach, M.D., editor-in-chief of Anesthesiology and Francis M. James, III professor of anesthesiology, physiology and pharmacology at Wake Forest University in North Carolina, commented favorably on the study:

"The current study represents an important step forward in the

prediction and potential manipulation of speed of recovery," wrote Dr. Eisenach. "This work will likely spur research to determine whether a high-risk group can be easily identified for interventional trials and whether preoperative or postoperative immune modulation, such as with glucocorticoids (steroids), might speed recovery."

Previously, the authors identified a strong immune correlation in postsurgical blood samples that predicted rate of [recovery](#).

One of the study authors has a personal interest in Fluidigm, the manufacturer of the mass cytometer used to assess the [blood samples](#) in the study.

Provided by American Society of Anesthesiologists

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