

A blood test may help predict confusion after surgery

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Many people experience an extended period of confusion when they awake after surgery. This acute confusional state, called delirium, particularly affects older adults and poses an important clinical challenge as it can lead to greater postoperative complications and may extend hospitalization.

In an effort to identify a biological marker to help guide intervention, a new study in *Biological Psychiatry* reports that [postoperative delirium](#) is associated with signs of inflammation - specifically elevations in the inflammatory marker C-reactive protein (CRP) - in patients 70 years of age or older. The study, led by co-senior authors Towia Libermann and Edward Marcantonio, both of Beth Israel Deaconess Medical Center (BIDMC) in Boston, Massachusetts, supports previous reports of associations between CRP and [delirium](#) after [surgery](#), and shows for the first time significant elevations of the blood-based marker before surgery.

"Our ability to pinpoint CRP levels as being significantly elevated before and after postoperative delirium onset establishes CRP as a risk marker, as well as a disease marker, for delirium," said Sarinnapha Vasunilashorn, co-first author of the study, along with Simon Dillon, also of BIDMC.

Blood samples were drawn at four time points before and after surgery from relatively healthy [older adults](#) who were undergoing major elective surgery. When Dillon and colleagues used a global proteomics approach

to compare all proteins in the blood from a subset of the patients, CRP emerged with the strongest association to postoperative delirium.

To validate the association, the researchers confirmed differences in CRP protein levels in the blood samples of cases (patients who developed postoperative delirium) and controls (patients who did not develop delirium). A discovery cohort of 39 matched case-control pairs revealed that cases had higher CRP levels before the surgery and two days after, when delirium peaks. In a replication cohort of 36 different matched pairs, cases had higher CRP levels immediately after surgery and two days later.

According to Vasunilashorn, the elevated preoperative CRP levels in patients who go on to develop delirium mean that CRP could be used as a risk predictor to stratify patients before surgery.

"This study is a step toward preventing postoperative delirium," said John Krystal, Editor of *Biological Psychiatry*. "With information about delirium risk, doctors can take steps before, during, and after surgery to reduce that risk," for example, by reducing inflammation in patients with higher levels of CRP.

The findings also provide insight into what causes delirium and what puts someone at risk. *"t suggests there are differences in the inflammatory response of [patients](#) who develop delirium even prior to the surgical insult," said Vasunilashorn, "a finding that will lead to new, important lines of investigation."*

More information: Simon T. Dillon et al. Higher C-Reactive Protein Levels Predict Postoperative Delirium in Older Patients Undergoing Major Elective Surgery: A Longitudinal Nested Case-Control Study, *Biological Psychiatry* (2017). [DOI: 10.1016/j.biopsych.2016.03.2098](https://doi.org/10.1016/j.biopsych.2016.03.2098)

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