Researchers create new tool for assessing risk of kidney injury after chemotherapy

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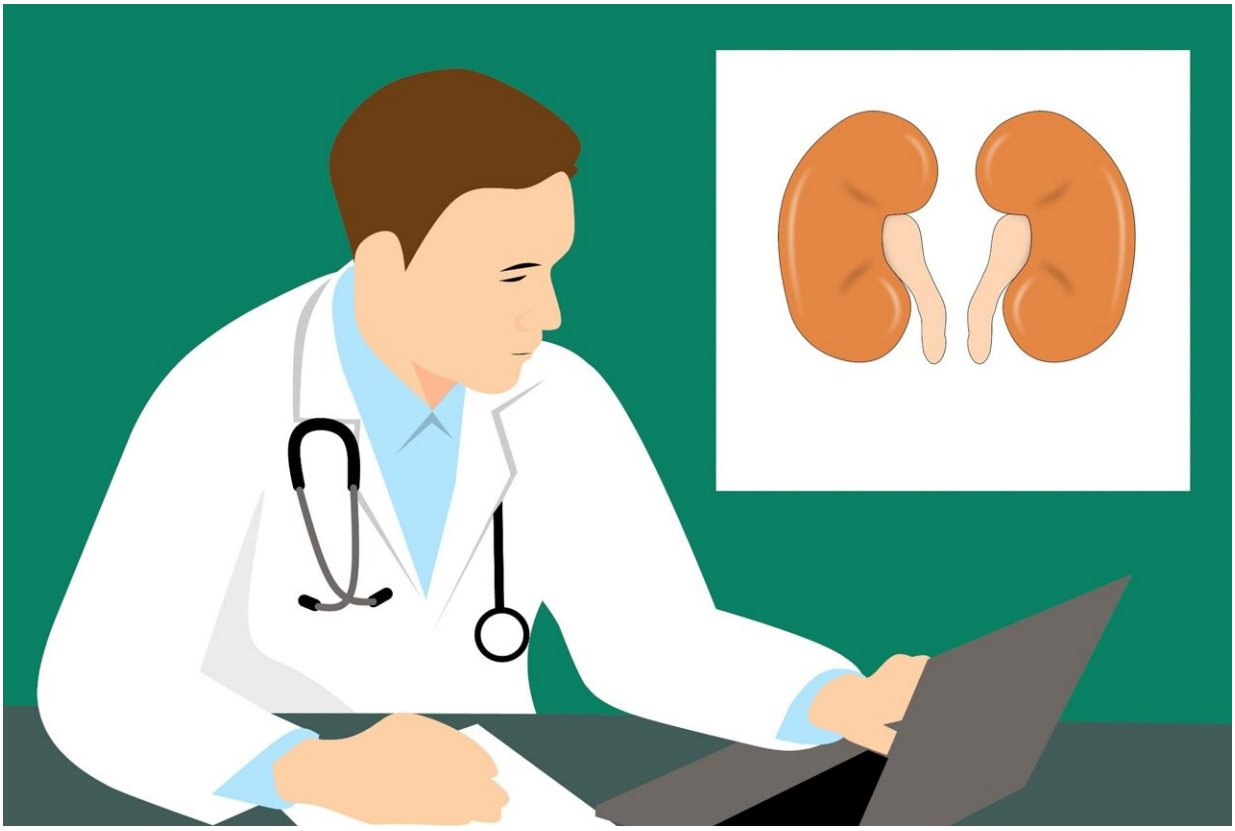

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Using patient data from six major U.S. cancer centers, Brigham researchers and collaborators developed a risk prediction model for moderate-to-severe kidney injury after receiving the chemotherapy drug

cisplatin in the largest, first generalizable study of its kind

Cisplatin is a highly effective chemotherapy that has been used to treat cancer for decades, but it can cause kidney injury that can potentially lead to the discontinuation of life-saving cancer treatments. Investigators from Brigham and Women's Hospital (BWH), a founding member of the Mass General Brigham health care system, with researchers from the Dana-Farber Cancer Institute and other institutions, developed a comprehensive tool to predict which patients are at highest risk of moderate-to-severe kidney injury after cisplatin.

They found that the highest-risk patients had as much as a 20-fold higher risk of developing kidney injury after cisplatin than those in the lowest-risk group.

"Patients receiving treatment for cancer are increasingly affected by kidney injury, which is associated with higher mortality and can jeopardize eligibility for other therapies," said first author Shruti Gupta, MD, MPH, director of Onco-nephrology at BWH and Dana-Farber and a physician in BWH's Division of Renal Medicine.

"Cisplatin is a well-known kidney toxin, and even though there are newer treatments available, it remains a cornerstone of therapy for patients with cancer globally. This large, multicenter collaboration and resulting risk prediction model is an important step in the care of patients who are getting cisplatin."

The researchers examined data from over 24,000 patients across six major U.S. cancer centers, including Dana-Farber Brigham Cancer Center, Mass General Cancer Center, Memorial Sloan Kettering Cancer Center, MD Anderson Cancer Center, University of Colorado, and Northwell Health, and analyzed the risk of moderate-to-severe acute kidney injury within the first 14 days following a single, first IV dose of

cisplatin.

The model developed by the research team included several important risk factors for kidney injury, including age, high blood pressure, diabetes, laboratory findings from routinely available bloodwork, and higher doses of cisplatin. They found that patients who developed kidney injury from cisplatin had a considerably higher risk of death compared to those who did not.

Another key finding was that lower levels of magnesium were an important risk factor for acute kidney injury. The researchers plan to use the same rich database to try to identify therapies that might prevent kidney injury, including magnesium.

Using the risk score, the research team created a simple online calculator that will be made available for use at MDCalc.com. A patient or physician can use this calculator to quantify the risk of kidney injury by inputting information, including whether the patient has high blood pressure, diabetes, or other diseases or medical conditions, along with results from their bloodwork.

"This new tool can help an oncologist and a patient have more informed conversations about the risks and benefits of cisplatin. If a patient is at high risk, their clinical team can consider preventative measures such as administering more IV fluids before receiving cisplatin or monitoring their kidney function more closely afterward," said senior author David E. Leaf, MD, MMSc, director of clinical and translational research in acute kidney injury at BWH's Division of Renal Medicine.

"The clinical characteristics and lab values that are incorporated in our model are readily available and easily obtainable from medical records, so our hope is that this tool can be implemented anywhere cisplatin is given."

The research is published in the *BMJ*.

More information: Shruti Gupta et al, Derivation and external validation of a simple risk score for prediction of severe acute kidney injury after IV cisplatin: cohort study, *BMJ* (2024). DOI: 10.1136/bmj-2023-077169

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