

# Renal risk index: A clinical tool to predict the risk of end-stage renal disease

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End-stage renal disease is one of the major public health problems among solid organ transplant recipients that is associated with death after transplant and high cost of care.

Using the national data of 43,514 liver transplant recipients, researchers at University of Michigan researchers in collaboration with Arbor Research Collaborative for Health created and validated a [risk score](#) called renal [risk index](#) based upon the liver transplant recipient's characteristics at the time of transplant to predict the post- transplant end stage renal disease. Renal Risk Index was significantly associated with the higher 5-year cumulative incidence of post-transplant end stage renal disease and post-transplant death. The results were published in the *Journal of the American Society of Nephrology*.

"Our goal was to create a risk score based on the liver transplant recipient's factors to identify those who were at a higher risk of developing post-liver transplant end-stage renal disease," says Pratima Sharma, M.D., M.S., lead author of the study and assistant professor of Internal Medicine in the University of Michigan Medical School.

The renal risk index calculates a score by evaluating several recipient characteristics like age, race/ethnicity, history of hepatitis C, diabetes, BMI, serum creatinine levels and other factors. The renal risk index calculator is available at: <https://rri.med.umich.edu>.

In addition to previously described risk factors, the study also identified

body mass indexes (BMI) over 35 and hepatitis C as risk factor for post-transplant end-stage renal disease. Patients with BMI over 35 had a 28% increased risk of post-LT end stage renal disease compared to those with lower BMI. Diagnosis of hepatitis C was associated with 31% higher risk of post-transplant end stage renal disease compared to non-hepatitis C diagnoses. The study also showed that other factors, like serum sodium over 134 mEq/L at transplant were associated with a lower risk of post-transplant end-stage renal disease.

Sharma said the renal risk index is an objective score based upon readily available clinical and laboratory data that can help clinicians stratify liver [transplant recipients](#) into mild, moderate or high risk of post-[liver transplant](#) end-stage renal disease at the time of transplant.

"Knowledge of that future risk can help them reach making informed evidence-based decisions regarding post-transplant management including individualized tailoring of immunosuppression, stricter control of hypertension and diabetes, weight loss for obese patients as well as treatment of hepatitis C after transplant with newer antiviral agents," Sharma says.

"In the long run, risk stratification using renal risk index and risk modification among highest risk group can help prevent or delay the progression of kidney disease to end-stage [renal disease](#) and improve overall patient survival."

Sharma says future research should focus on using the renal risk index to personalize immunosuppression strategies and risk modification to improve patient outcomes.

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