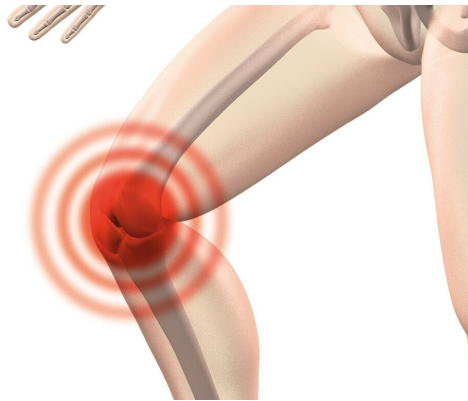


High risk of acute kidney injury in patients undergoing treatment for infected total knee replacement

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Acute kidney injury (AKI) occurred in nearly 20 percent of patients who underwent surgery with implantation of antibiotic-loaded "spacers" and intravenous (IV) antibiotics for the treatment of deep infections after total knee arthroplasty, reports a study in *The Journal of Bone & Joint Surgery*.

Patients with preexisting [chronic kidney disease](#) (CKD) are at particularly high risk of AKI, according to the new research by Matthew P. Abdel, MD, and colleagues of the Mayo Clinic, Rochester, Minn.

High doses of antibiotics in bone cement linked to higher risk of AKI

Deep, periprosthetic joint infections are a devastating complication of failed [total knee arthroplasty](#). The most common treatment is two-stage exchange arthroplasty, in which the knee implant is removed to enable treatment of the infection. This is often followed by placement of antibiotic-loaded bone cement (ALBC) spacers, which deliver high doses of [antibiotics](#) directly and

continuously to the site of the infection. Once the infection has been eradicated, another operation is performed to place a new knee prosthesis.

However, there is a risk that high doses of antibiotics from the spacers, in addition to IV antibiotics, may result in a toxic effect on the kidneys. This toxicity could contribute to AKI: a serious complication marked by a sudden decline in [kidney](#) function. Orthopaedic surgeons have little evidence about the risk of AKI related to ALBC spacers and IV antibiotics, and even less evidence regarding the long-term outcomes of patients who develop AKI.

Dr. Abdel and colleagues analyzed the rates, risk factors, and outcomes of AKI in 424 patients who underwent two-stage exchange arthroplasty with ALBC spacers and IV antibiotics for chronically infected knee replacements. The patients were managed at the Mayo Clinic between 2000 and 2017. Before surgery, 15 percent of patients had preexisting CKD.

Overall, 19 percent of patients developed AKI while the ALBC spacers were in place and IV antibiotics were administered. Patients with preexisting CKD were significantly more likely to develop AKI compared with patients without preexisting CKD (45 percent versus 14 percent). After adjusting for other factors, patients with CKD were five times more likely to develop AKI (odds ratio 5.0).

The study identified several [risk factors](#) for AKI, including high doses of antibiotics used in the ALBC spacers (especially the commonly used antibiotics vancomycin and aminoglycoside). Certain factors linked to reduced [blood flow](#) to the kidneys, including high blood pressure, low blood volume, and atrial fibrillation (a heart rhythm disorder), also predicted an increased risk of AKI.

Diabetes was another important risk factor.

Most patients who developed AKI regained kidney function. However, at an average of 6 years postoperatively, eight patients had developed CKD while four were on dialysis.

Acute kidney injury is a relatively common complication of many medical conditions and procedures, including orthopaedic surgery and heart surgery. The study provides new evidence on AKI in a large series of patients treated for infected total knee replacements at a single medical center.

The findings highlight the particularly high risk of AKI among patients with preexisting CKD. Dr. Abdel and colleagues emphasize the importance of screening to identify patients with possible decreases in kidney function before two-stage exchange arthroplasty.

The study also draws attention to the risk of AKI related to toxicity from ALBC spacers and IV antibiotics. Dr. Abdel and coauthors have taken steps to limit the doses of certain antibiotics used in spacers. However, they add, "While higher antibiotic doses in ALBC spacers can lead to AKIs, these doses are also a crucial factor for infection eradication."

More information: Louis Dagneaux et al. Acute Kidney Injury When Treating Periprosthetic Joint Infections After Total Knee Arthroplasties with Antibiotic-Loaded Spacers, *Journal of Bone and Joint Surgery* (2021). [DOI: 10.2106/JBJS.20.01825](https://doi.org/10.2106/JBJS.20.01825)

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