Introduction:
The impact of mild acute kidney injury (AKI) observed in the immediate postoperative period after major surgery on long term renal function remains poorly studied. According to the “Kidney Disease: Improving Global Outcomes” (KDIGO) classification, a mild injury corresponds to a KDIGO stage 1, characterized by an increase in creatinine of at least 0.3 mg/dl or 1.5 to 1.9 times the baseline level. We tested the hypothesis that patients who underwent moderate-to-high-risk abdominal surgery and developed mild AKI in the following days would be at an increased risk of long-term renal injury compared to patients with no postoperative AKI.

Methods:
This single center retrospective cohort study analyzed all consecutive adult patients without chronic kidney disease who underwent elective moderate to high-risk abdominal surgery at Erasme Hospital between 2014 and 2019 and who had three relevant creatinine measurements: before surgery, during the first seven postoperative days, and long-term (1 year). The study population was divided into three groups according to the postoperative renal function: no renal injury, mild AKI (KDIGO stage 1) and moderate to severe AKI (KDIGO stages 2 and 3).

Results:
A total of 815 patients were analyzed. Overall, postoperative AKI (stage 1 to 3) incidence was 13.4% (10% with a mild AKI and 3.4% with a moderate to severe AKI). The median long-term follow-up was 360, 354 and 353 days for the three groups respectively (P=0.190). Compared to patients without postoperative AKI, those developing mild AKI had a higher risk of long-term renal injury (odds ratio [95%CI] of 3.1 [1.7-5.5]; P=0.0001). This effect is even stronger when accounting for other perioperative covariates (adjusted odds ratio [95%CI] of 4.5 [1.8-11.4]; P=0.0001).

Conclusion:
Patients undergoing moderate to high-risk abdominal surgery who develop a mild postoperative AKI more than tripled the odds of having renal injury one year after surgery compared with patients who did not develop any postoperative AKI.