



Measure Abbreviation: AKI 01 (QCDR Measure ID: ASPIRE19)

Data Collection Method: This measure is calculated based on data extracted from the electronic medical record combined with administrative data sources such as professional fee and discharge diagnoses data. This measure is explicitly not based on provider self-attestation.

Description: Percentage of cases that the baseline creatinine does not increase more than 1.5 times within 7 postoperative days or the baseline creatinine level does not increase by ≥ 0.3 mg/dL within 48 hours postoperatively.*

NQS Domain: Effective Clinical Care

Measure Type: Outcomes

Scope: Measured on a per case basis.

Measure Summary: AKI 01 identifies when there is an increase of 1.5 times the baseline serum creatinine observed in first 7 postoperative days OR when the baseline creatinine increases greater than or equal to 0.3 mg/dl in 48 hours after anesthesia end. Baseline serum creatinine is defined as the most recent serum creatinine resulted in the last 60 days preoperatively.

Inclusions: All anesthetic cases

Exclusions:

- ASA 5 & 6
- Patients with pre-existing renal (stage 4 or 5) failure based upon BSA-Indexed EGFR < 30 mL/min/1.73 m²
- Patients undergoing procedures affecting kidneys
 - Urologic surgery on kidney/ureter – CPT 00862, 00864, 00870, 00872, 00873, 00865, 00908, 00910, 00912, 00914, 00916, 00918, 00860, 00942
 - Renal & Liver Transplants – CPT 00868, 00796
- Non-Operative Procedures:
 - Obstetric Non-Operative Procedures – CPT 01958, 01960, 01967
 - Pain Procedures – CPT 01991, 01992, 01996
 - Electroconvulsive Therapy – CPT 00104
- Patients where a creatinine lab is not available within 7 postoperative days.
- Patients that do not have a baseline creatinine within 60 days preoperatively

Exclusions (continued):

- For patients with more than one case in a 7-day period, the first case will be excluded if a postop creatinine is not documented for that first case. For example, a patient that has surgery twice in a 7-day period, the first surgery is excluded if a creatinine is not drawn in between cases.
- Case duration less than 45 minutes.

*Algorithm for determining Case Length:

Case Start:

1. Anesthesia Induction End. If not available, then
2. Anesthesia Induction Begin. If not available, then
3. Procedure Start. If not available, then
4. Patient in Room. If not available, then
5. Anesthesia Start

Case End:

1. Patient Extubated. If not available, then
2. Procedure End. If not available, then
3. Patient Out of Room. If not available, then
4. Anesthesia End.

Success:

1. The creatinine level does not go above 1.5x the baseline creatinine within 7 days post-op
2. The creatinine level does not increase by ≥ 0.3 mg/dL obtained within 48 hours post-op (anesthesia end).

Threshold: 90% success.

Responsible Provider:

1. The provider signed in during the case when the BP 01 measure failed (it is possible to have more than one provider).
2. If there is no failure for the BP 01 measure, then the responsible provider is the provider signed in the longest.

Risk Adjustment (for outcome measures):

To evaluate provider-level risk adjustment we will calculate the observed to expected outcomes ratio (O/E). The O/E is calculated using a logistic regression model and predicts (given a set list of dependent patient and hospital level variables) the expected probability of having a kidney injury. We adjust for surgery risk score, emergent procedures, ASA, gender, age, body mass index, laboratory values, and teaching versus private hospital. Patient specific comorbidities are evaluated as well.

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*Only Stage 1 Acute Kidney Injuries were included for the 2016 performance year. Stage 1, 2, and 3 Acute Kidney Injuries were included for 2017.

AKI Stages:

Stage 1: Creatinine increase of $\geq 50\%$ baseline creatinine (≥ 1.5 times baseline) within 7 days postoperatively.

Stage 2: Creatinine increase of $\geq 100\%$ baseline creatinine (≥ 2.0 times baseline) within 7 days postoperatively.

Stage 3: Creatinine increase of $\geq 200\%$ baseline creatinine (≥ 3.0 times baseline) or >4.0 mg/dL within 7 days postoperatively.

References:

1. Abelho FJ, Botelho M, Fernandes V, Barros H. Determinants of postoperative acute kidney injury. *Critical care (London, England)*. 2009;13(3):R79.
2. Bellomo R, Ronco C, Kellum JA, Mehta RL, Palevsky P. Acute renal failure - definition, outcome measures, animal models, fluid therapy and information technology needs: the Second International Consensus Conference of the Acute Dialysis Quality Initiative (ADQI) Group. *Critical care (London, England)*. Aug 2004;8(4):R204-212.
3. Biteker M, Dayan A, Tekkesin AI, et al. Incidence, risk factors, and outcomes of perioperative acute kidney injury in noncardiac and nonvascular surgery. *American journal of surgery*. Jan 2014;207(1):53-59.
4. Chertow GM, Burdick E, Honour M, Bonventre JV, Bates DW. Acute kidney injury, mortality, length of stay, and costs in hospitalized patients. *J Am Soc Nephrol*. Nov 2005;16(11):3365-3370.
5. Kellum JA, Lameire N. Diagnosis, evaluation, and management of acute kidney injury: a KDIGO summary (Part 1). *Critical care (London, England)*. 2013;17(1):204.
6. Kheterpal S, Tremper KK, Englesbe MJ, et al. Predictors of postoperative acute renal failure after noncardiac surgery in patients with previously normal renal function. *Anesthesiology*. Dec 2007;107(6):892-902.
7. Kheterpal S, Tremper KK, Heung M, et al. Development and validation of an acute kidney injury risk index for patients undergoing general surgery: results from a national data set. *Anesthesiology*. Mar 2009;110(3):505-515.2.
8. Mehta RL, Kellum JA, Shah SV, et al. Acute Kidney Injury Network: report of an initiative to improve outcomes in acute kidney injury. *Critical care (London, England)*. 2007;11(2):R31.
9. Michaels WM, Grootendorst D.C., Verduijn M, Elliott EG, Dekker FW, Krediet RT; Performance of the Cockcroft-Gault, MDRD and New CKD-Epi Formulas in Relation to GFR, Age and Body size, Clin J Am Soc Nephrol 5: 1003-1009, 2010
10. Schwartz GJ and Work DF. Measurement and estimation of GFR in children and adolescents. *J Am Soc Nephrol*. 2009; Nov; 4(11):1832-643.
11. Sun LY, Wijeyesundera DN, Tait GA, Beattie WS. Association of intraoperative hypotension with acute kidney injury after elective noncardiac surgery. *Anesthesiology*. Sep 2015;123(3):515-523.
12. Thakar CV, Christianson A, Freyberg R, Almenoff P, Render ML. Incidence and outcomes of acute kidney injury in intensive care units: a Veterans Administration study. *Critical care medicine*. Sep 2009;37(9):2552-2558.
13. Xue JL, Daniels F, Star RA, et al. Incidence and mortality of acute renal failure in Medicare beneficiaries, 1992 to 2001. *J Am Soc Nephrol*. Apr 2006;17(4):1135-1142.