Background, Problem Statement and Goal Statement:

Patients undergoing operative procedures, especially cardiac and vascular surgery, have demonstrated a high incidence of in-hospital acute kidney injury (AKI) that is often under recognized and associated with increased adverse outcomes. At present, the burden of post-operative AKI on surgical wards at UAH is unknown. Many surgeons, surgical trainees and nursing staff at the UAH are unaware of the consequences of post-operative AKI, and current practice does not regularly involve nephrologists in post-operative care. The morbidity and mortality of post-operative AKI has been well documented, contributing both to future adverse events, increased length of hospitalization and higher costs.

Problem Statements - March, 2017:
1) There is limited care provider education and awareness of postoperative AKI.
2) There is no standard approach to recognition, response and referral regarding post-operative AKI. This results in poor patient outcomes, potentially acute dialysis, increased hospital stay and cost.

Aim Statements - December 31, 2017;
1) Provide AKI education to physicians and unit care providers in an effort to increase AKI awareness.
2) Appropriate recognition, response and referral of AKI in > 90% of cases; appropriate involvement of nephrology / internal medicine / critical care services for severe / refractory AKI in > 80% of cases.
3) 20% reduction of the incidence of severe (defined as ≥ Stage 2 AKI as per KDIGO) post-operative AKI.

Process Assessment: Review of past literature that outlined an AKI algorithm and the 3Rs (recognition, response and referral) for appropriate management of post-operative AKI. Conducted a frontline care provider survey, a Gemba walk (direct observation) of surgical residents rounding and developed a process maps to identify areas of opportunities that were then discussed at a stakeholders meeting.

Collaboration & Communication Strategies:
- Held a mapping session with an interprofessional frontline units staff to collaboratively discuss current process strengths and areas of opportunity
- Nursing student developed a AKI overview to support education of frontline nursing staff and development of AKI Unit poster both supporting the proposed change interventions

Improvement Selection and Implementation Plan: Time frame: October 31 to December 31, 2017

<table>
<thead>
<tr>
<th>Recognition</th>
<th>Response</th>
<th>Referral</th>
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<tbody>
<tr>
<td>1. Chart creatinine daily for initial 72 hours post-op in/in sheet. Have baseline/ pre-surgery creatinine value on top of sheet.</td>
<td>1. Call/page the on-call resident. 2. Verbal follow-up between nursing and surgical team. 3. Continue ordering of appropriate lab tests.</td>
<td>1. Consult pharmacy if AKI persists &gt; 72 hrs. 2. Involve consultant services as required.</td>
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PDSA Initial measurement and results (October 31-November 15, 2017)
Outcome measure: Incidence of severe AKI (as defined by ≥ stage 2 AKI as per KDIGO).

Process measures:
1. Proportion of patients having appropriate initial monitoring.
2. Proportion of patients appropriately recognized as having AKI.
3. Proportion of patients with AKI undergoing appropriate AKI assessment—future state.
4. Proportion of patients undergoing AKI assessment who then progress to severe AKI.—future state.

Reinforce Ownership, Measurement, & Continuous Improvement:
- Pro-actively identify high-risk patients prior to surgery with an enhanced post-operative AKI prediction algorithm.
- Ensure that all patients presenting for surgery have a recent / baseline creatinine value.
- Provide an annual AKI educational session for unit staff by the CNE, and incorporate post-operative AKI teaching into the surgical foundations curriculum for all year 1 and 2 surgical residents.
- AKI care pathway incorporated into the new Clinical information system along with an alert process.

Lessons Learned:
- QI is a team sport and requires committed participation of all stakeholders, and that effective quality improvement requires a thorough understanding of the organizational / cultural / systemic barriers that oppose change
- Communication gaps are at the core of many problems encountered in the clinical environment and a potential target for QI. However, this is often not a easy gap to close.

References: