INSTRUCTIONS
Selected Best Practices and Suggestions for Improvement

What is this tool? The purpose of this tool is to provide:

- Detailed description of best practices, including supporting evidence, suggestions for improvement, prescribed process steps, and additional resources.
- Sufficient information to complete a Gap Analysis (Tool D.5), make a decision to implement (or not to implement) a process, and develop an Implementation Plan (Tool D.6).

These tools provide information on evidence-based best practices when available, as well as information gathered from real-world experience in working with hospitals. These tools are not meant to replace validated guidelines. Rather, these documents are meant to supplement various improvement process projects related to the AHRQ Quality Indicators.

The information used to populate these documents is derived from professional association guidelines, the research literature, and experience and lessons learned from hospitals' work on previous AHRQ Quality Indicator implementation efforts. The references cited were not derived from a full systematic evidence-based literature review. Rather, the list includes more well-known research and publications on the subject, where available.

The information contained in these documents should be used to review and compare against your organization's current processes to determine where gaps may exist. As always, the final decision regarding whether to implement the guidance provided in this document should be made by a multidisciplinary quality improvement team in your hospital and should be based on information specific to your organization.

Who are the target audiences? The primary audiences include quality improvement leaders, clinical leaders, and multidisciplinary frontline staff members.

How can the tool help you? The Best Practices and Suggestions for Improvement Tool details each of the following components of a best practice and its implementation:

- Indicator Specifications
- Literature Support
- Best Processes/Systems of Care
- Additional Resources

How does this tool relate to others? The Best Practices and Suggestions for Improvement Tools are used to prepare the Gap Analysis (Tool D.5) and the Implementation Plan (Tool D.6).

Instruction Steps

1. See instructions for Gap Analysis (Tool D.5).

2. Use the appropriate Selected Best Practices and Suggestions for Improvement Tool to populate the Gap Analysis (Tool D.5).

Selected Best Practices and Suggestions for Improvement

Patient Safety Indicator Specifications

PSI 10: Postoperative Physiologic and Metabolic Derangement

Numerator: Discharges among cases meeting the inclusion and exclusion rules for the denominator with International Classification of Diseases (ICD)-9 codes for physiologic and metabolic derangements in any secondary diagnosis field
OR
with ICD-9 codes for acute renal failure in any secondary diagnosis field
AND
with ICD-9-CM procedure code for dialysis.

Denominator: All elective surgical discharges 18 years and older defined by specific diagnosis-related groups (DRGs) or Medicare Severity (MS)-DRGs and an ICD-9-CM code for an operating room procedure.

Exclude cases:

- With preexisting condition (principal diagnosis or secondary diagnosis present on admission) of physiologic and metabolic derangements.
- With acute renal failure (see Numerator) where a procedure for dialysis occurs **before or on the same day** as the first operating room procedure.

  Note: If day of procedure is not available in the input data file, the rate may be slightly lower than if the information were available.
- With both a secondary diagnosis code of ketoacidosis, hyperosmolarity, or other coma (subgroups of physiologic and metabolic derangements coding) **and** a principal diagnosis of diabetes.
- With both a secondary diagnosis code for acute renal failure (subgroup of physiologic and metabolic derangements coding) **and** a principal diagnosis or secondary diagnosis present on admission of acute myocardial infarction, cardiac arrhythmia, cardiac arrest, shock, hemorrhage, gastrointestinal hemorrhage, or chronic renal failure **or** a secondary diagnosis present on admission.
- Major diagnostic category (MDC) 14 (Pregnancy, Childbirth, and Puerperium).
- With missing gender (SEX=missing), age (AGE=missing), quarter (DQTR=missing), year (YEAR=missing), or principal diagnosis (DX1=missing).

Reference: AHRQ Patient Safety Indicators Technical Specifications, Version 4.3, August 2011

Recommended Practice: Details of Recommended Practice	
Implement Blood Glucose Monitoring Requirements	Implement blood glucose monitoring for appropriate patients with results readily available to all care providers.
Manage Prevention Strategies for Postoperative Patients	Avoid risk factors for acute renal failure in postoperative patients.

Literature Support

Implement Blood Glucose Monitoring Requirements

"All patients with diabetes should have an order for blood glucose monitoring, with results available to all members of the health care team."

ICU Patients. "Critically ill patients: Insulin therapy should be initiated for treatment of persistent hyperglycemia starting at a threshold of no greater than 180 mg/dl (10 mmol/l). Once insulin therapy is

started, a glucose range of 140-180 mg/dL (7.8-10 mmol/l) is recommended for the majority of critically ill patients."

Non-ICU Patients. "Non-critically ill patients: There is no clear evidence for specific blood glucose goals. If treated with insulin, the premeal blood glucose target should generally be <140 mg/dl (7.8 mmol/l) with random blood glucose <180 mg/dl (10.0 mmol/l), provided these targets can be safely achieved."

American Diabetes Association Standards of medical care in diabetes position statement. Diabetes Care 2011;34:S11–S61.

"Hyperglycemia is a risk factor that, once identified, could minimize adverse outcomes for cardiac surgical patients."

"Hyperglycemia has been associated with increased in-hospital morbidity and mortality for multiple medical and surgical conditions."[4]

Manage Prevention Strategies for Postoperative Patients

"The successful prevention of PO-ARF [postoperative acute renal failure] depends on identification of patients who are at risk for developing PO-ARF; maintenance of adequate intravascular volume; and pharmacological prophylaxis."

Reddy VG. Prevention of postoperative acute renal failure. J Postgrad Med 2002;48(1):64-70. Available at: http://www.jpgmonline.com/text.asp?2002/48/1/64/148.

Best Processes/Systems of Care

Introduction: Essential First Steps

- Engage key procedural personnel, including nurses, physicians, dietitians, and representatives from the quality improvement department, to develop evidence-based protocols for care of the patient postoperatively at risk for physiologic and metabolic derangement.
- The above team:
  - Identifies the purpose, goals, and scope and defines the target population.
  - Analyzes problems with guidelines compliance, identifies opportunities for improvement, and communicates best practices to frontline teams.
  - Establishes measures to indicate if changes are leading to improvement, identifies process and outcome metrics, and tracks performance using these metrics.
  - Determines appropriate facility resources for effective and permanent adoption of practices.

Recommended Practice: Implement Blood Glucose Monitoring Requirements

- Ensure that all diabetic patients have their diabetes documented in the medical record.[1]
- Consider obtaining an endocrinology consultation.
- Consider obtaining a dietary consultation with a focus on inpatient dietary needs and an assessment of the patient's dietary self-management skills.
- Carefully monitor and set up protocols for risk factors for hypoglycemia[5]:
  - Status of nothing by mouth or reduction of oral intake.
  - Discontinuation of enteral feeds, total parenteral nutrition, intravenous dextrose discontinuation.
  - Premeal insulin with no/little meal consumption.
  - Unexpected transport from nursing unit after rapid-acting insulin administration.
- Implement process where patients are monitored for physical symptoms of hyperglycemia (frequent urination/urination during the night, unusual thirst, fatigue, blurred vision, etc.) and hypoglycemia (rapid heart rate, sweating, confusion, disorientation, etc.).
- Ensure that the nurse reviews each bedside blood glucose level and alerts the physician of levels outside of threshold as specified by protocol.

- Ensure that the physician assesses blood glucose levels daily and adjusts treatment as needed. If adjustments are made to the insulin regimen, assessments of blood glucose levels are to be conducted more frequently.
- Track markers of poor glycemic management outcomes:
  - Hypoglycemic events (plasma glucose <70 mg/dL).[1]
  - Ketosis events.

Recommended Practice: Manage Prevention Strategies for Postoperative Patients

- Implement the following strategies to prevent acute renal failure into the care of postoperative patients[2, 3]:
  - Identify patients at risk.
  - Avoid nephrotoxins or use with caution.
  - Limit increases in abdominal pressure.
  - Use volume expansion, vasodilators, and inotropes cautiously and avoid hypovolemia.

Educational Recommendation

- Plan and provide education on protocols to physician, nursing, dietary, and all other staff involved in caring for these patients. Education should occur upon hire, annually, and when this protocol is added to job responsibilities.

Effectiveness of Action Items

- Track compliance with elements of established protocol by using checklists, appropriate documentation, etc.
- Evaluate effectiveness of new processes, determine gaps, modify processes as needed, and reimplement practices.
- Produce monthly glycemic management outcome reports and use to provide group and individual feedback to key stakeholders; physicians, nursing, nutrition and pharmacy staff; and senior medical and administrative leadership.
  - Develop plan of action for clinicians whose patients consistently have above target blood glucose levels, frequent hypoglycemia events, and ketosis events.
- Mandate that all personnel follow the safety protocols developed by the team and develop a plan of action for staff in noncompliance.
- Provide feedback to all stakeholders (physician, nursing, nutrition, and other ancillary staff; senior medical and administrative leadership) on the level of compliance with processes developed.
- Monitor and evaluate performance regularly to sustain improvements achieved.

Additional Resources

√ *Systems/Processes*

- Clement S. Braithwaite SS, Magee MF, et al. Management of diabetes and hyperglycemia in hospitals. Diabetes Care 2004;(27)2:553–91.

√ *Tools*

- American Healthways. Inpatient Management Guidelines for People With Diabetes. Available at: http://www.healthways.com/success/library.aspx?id=873.
- National Guideline Clearinghouse. Standards of medical care in diabetes. VIII. Diabetes care in specific settings. Available at: http://guideline.gov/content.aspx?id=25334.
- Campbell K, Braithwaite S. Preadmission treatment plan with history of blood glucose monitoring. In: Hospital management of hyperglycemia. Clin Diabetes 2004;22(2):81–88.

√ *Staff Required*

- Physicians, nurses, pharmacists, dietitians, clinical diabetic educator, and nursing assistants.

√ *Equipment*

- Point of care glucose monitors.

√ *Communication*

- Detailed communication between the physician, pharmacist, nurse, and patient (including the family if applicable) regarding medication reconciliation and the outpatient medication regimen.
- Communication between patient, physician, nurse, and diabetes educator regarding patient education and the patient's diabetic self-management plan as an outpatient.

√ *Authority/Accountability*

- Attending physician/resident, registered nurse, patient care technician/nursing assistant, nutritionist, pharmacist.

Supporting Literature

1. American Diabetes Association. Standards of medical care in diabetes position statement. Diabetes Care 2011;34:S11–S61.
2. Reddy VG. Prevention of postoperative acute renal failure. J Postgrad Med 2002;48(1):64–70. Available at: http://www.jpgmonline.com/text.asp?2002/48/1/64/148.
3. Dwinnell BG, Anderson RJ. Diagnostic evaluation of the patient with acute renal failure. In Berl T, Benventre JV, eds. Atlas of Kidney Diseases. Vol. 1. Chapter 12. Available at:http://www.kidneyatlas.org/book1/adk1_12.pdf.
4. The Joint Commission. Specifications Manual for National Hospital Inpatient Quality Measures Discharges 04-01-11 (2Q11) through 12-31-11 (4Q11). Available at: http://www.jointcommission.org/specifications_manual_for_national_hospital_inpatient_quality_measures/. Accessed September 28, 2011.
5. National Kidney Foundation. KDOQI™ Clinical Practice Guidelines and Clinical Practice Recommendations for Diabetes and Chronic Kidney Disease. Am J Kidney Dis 2007;49 (suppl 2):S1-S180.