



EVIDENCE • POLICY • PROCESS • PRACTICE at the POINT of CARE
(EP⁴OC)

SCIP Card-2 Measure:

Surgery Patients on Beta-Blocker Therapy Prior to Arrival Who Received a Beta-Blocker During the Perioperative Period

Measure Description: Surgery patients on beta-blocker therapy prior to arrival should continue their beta-blocker during the perioperative period. The perioperative period for the SCIP cardiac measures is defined as 24 hours prior to surgical incision through discharge from the post-anesthesia care/recovery area.

Evidence for the Measure—Annotated Bibliography

Beta-Blockers and Reduction of Cardiac Events in Non-cardiac Surgery
Auerbach A, & Goldman L (2002).
JAMA; 287: 11, 1435–1444.

The authors reviewed five randomized controlled trials identified through a Medline search that met their criteria for analysis. Criteria for study analysis included those trials that assessed perioperative cardiac ischemia, myocardial infarction (MI), cardiac, or all-cause mortality. Study findings were not consistent and the study itself was hampered by the variations in the trials.

Statistically significant evidence was found for the effectiveness of beta-blockade in reducing perioperative cardiac events. Post-operative ischemia and post-operative MI were reduced when beta-blockade was maintained throughout the perioperative period. Evidence included reduction in all-cause mortality at two years.

The cited adverse effects of beta-blockade included bradycardia that infrequently required treatment with atropine. Post-operative adverse events were rare and did not require discontinuation of the medication.

Additional benefits of beta-blockade were identified in one study. These benefits included that patients were extubated more quickly, required less pain medication, and were more alert sooner after surgery.

The use of perioperative beta-blockade in patients who had not been receiving beta-blockers may pose a risk resulting in the possibility of worse outcomes. The authors caution that study findings were not consistent and were hampered by variations in the studies. They recommend that additional study is warranted.

The authors also include a perioperative beta-blockade algorithm for clinician consideration.

The Case for Beta-Adrenergic Blockade as Prophylaxis Against Perioperative Cardiovascular Morbidity and Mortality

Selzman, C, Miller, S, Zimmerman, M, & Harken, A. (2001).

Archives of Surgery; 136, 286–290.

The authors described the pathophysiology associated with surgery including the neurohormonal stress of surgery, the oxygen demand of the heart, and the role of catecholamines and the work of the heart. This discussion is the basis of the role of perioperative beta-adrenergic blockade.

The 1996 study by Mangano and colleagues, as well as Poldermans' 1999 study, are described. These two randomized controlled trials demonstrated that patients in the control group (those not receiving beta-blockade) experienced a higher rate of two-year mortality (Mangano) and a higher rate of cardiac events at 30 days (Poldermans). Limitations of both studies were explained and included discussion of patient severity and the characteristics of Mangano's population. Additionally, Mangano's study included patients already on beta-blockade, whereas Poldermans' study did not include patients on beta-blockers prior to surgery.

The authors offered four specific recommendations for patients undergoing major elective noncardiac surgery. These included: (1) Identify high risk patients, (2) Continue or initiate beta-blockade, (3) Continue beta-blockade throughout the hospitalization, and (4) Continue beta-blockade as an outpatient.

The authors' conclusion states in part that "perioperative administration of beta-adrenergic blocking agents for the prevention of surgical cardiovascular morbidity and mortality is based on physiologic principles and is supported by randomized prospective trials."

Perioperative Beta-Blocker Therapy and Mortality After Major Noncardiac Surgery

Linderenauer, P, Pekow, P, Wang, K, Mamidi, D, Gutierrez, B, & Benjamin, E. (2005).

New England Journal of Medicine 353;4: 349–361.

A retrospective cohort study of 782,969 surgical patients was conducted by the authors using data from 329 hospitals. Patients were classified as having prophylactic beta-blocker treatment if they received a beta-blocker during the first two days of hospitalization. Patients were compared with similar patients who had not received a beta-blocker during the first two hospital days. Comparison was based upon a revised cardiac risk index (RCRI).

The authors reviewed the limitations of their study design and process.

The authors discussed their findings, which included significant mortality reduction in patients with the highest RCRI score of 3 or higher. Patients with a RCRI score of 2 appeared to benefit from the administration of beta-blockers. Patients with a RCRI score of 1 or 0 did not appear to benefit from the administration of beta blockers.



Policy

- Purpose: Patients who routinely receive medications that are classified as “beta-blockers” should continue to receive their medications without interruption while hospitalized. Patients who are scheduled for surgery and are ordered NPO should continue to receive their beta-blocker despite their NPO status.
 - Policy: When patients are ordered NPO for surgery, their medications should be reviewed by their surgeon, anesthesiologist, hospitalist, or other physician to ensure that all appropriate medications, including beta-blockers, are not interrupted.
 - Inclusions: All patients ordered NPO prior to surgery.
 - Exclusions: Patients receiving beta-blockers who meet physician criteria for holding their medications, e.g., heart rate < 50 beats per minute.
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Process

- Procedure:
 - When the physician orders the patient NPO prior to surgery, the nurse should ask the physician about continuing medications with a sip of water on the day of surgery.
 - The nurse should review the current list of medications, including beta-blockers, with the physician to determine which medications should be administered prior to surgery while the patient is NPO.
 - Medications can be safely given to most patients with a sip of water.
 - Patients who are scheduled for surgery prior to their daily administration time should receive their medications at a time agreed upon by the physician: e.g., patients who routinely receive their beta-blocker at 9:00 a.m. and are scheduled for surgery at 7:00 a.m. can receive their routine daily dose at 6:00 a.m. with a sip of water.
 - Documentation: Documentation considerations include, but are not limited to:
 - Physician orders for medications to be continued while the patient is NPO.
 - Documentation on the medication administration record that the patient received his or her medication, with the time the patient received the medication.
 - Other Considerations: Medications should be administered with as little water as necessary for the patient to swallow the medications. Other fluids, such as juice or soda, should NOT be substituted for water.
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Links, Resources, and References

Making Health Care Safer, Chapter 25: Beta-blockers and Reduction of Perioperative Cardiac Events

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<http://www.ahrq.gov/clinic/ptsafety/chap25.htm>

National Quality Forum (NQF) Endorsed Measure: Surgery patients on beta blocker therapy prior to admission who received a beta blocker during the perioperative period

http://www.qualityforum.org/Standards/Measures/Surgery_patients_on_beta_blocker_therapy_prior_to_admission_who_received_a_beta_blocker_during_the_perioperative_period.aspx



www.fmqai.com



www.hsag.com

Beta-Blockers and Reduction of Cardiac Events in Noncardiac Surgery: Scientific Review

Andrew D. Auerbach, MD, MPH; & Lee Goldman, MD (2002).

JAMA; 287:1435–1444.

<http://jama.ama-assn.org/cgi/content/full/287/11/1435>

ACC/AHA Release Revised Guidelines for the Prophylactic Use of Beta Blockers to Minimize Cardiac Risk Around Time of (Noncardiac) Surgery

<http://americanheart.mediaroom.com/index.php?s=43&item=851>

ACC/AHA 2006 Guideline Update on Perioperative Cardiovascular Evaluation for Noncardiac Surgery: Focused Update on Perioperative Beta-Blocker Therapy

A Report of the American College of Cardiology/American Heart Association Task Force on Practice Guidelines

<http://www.acc.org/qualityandscience/clinical/guidelines/perioperiobetablocker.pdf>

Perioperative beta-blockers in noncardiac surgery: Evolution of the evidence. Brian Harte, MD. (2008). *Cleveland Clinic Journal of Medicine*, 75; 7.

<http://www.ccjm.org/content/75/7/513.full.pdf+html>

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