

VUMC MDSCC Management Guideline

Guidelines for Routine Use of Perioperative Beta Blockade in Patients at Risk for Perioperative Myocardial Infarction

Recommendations for Perioperative Beta Blockade:

- Beta blockers should be continued in patients receiving long term beta blockade
- Beta blockers titrated to heart rate and blood pressure should be instituted in patients undergoing **high** risk surgical procedures with the presence of **1** or more clinical risk factor
- Beta blockers titrated to heart rate and blood pressure should be instituted in patients undergoing **intermediate** risk surgical procedures with the presence of **2** or more clinical risk factors
- It is uncertain if beta blockers should be given to patients undergoing **intermediate** risk surgery with **1** clinical risk factor or patients undergoing **low** risk surgery with **2** or more clinical risk factors
- Beta blockers should **NOT** be given to patients with contraindications to beta blockade
- Beta blockers should **NOT** be given in the absence of dose titration and may be harmful to patients undergoing **intermediate** or **low** risk surgical procedures in the **absence** of clinical risk factors

Contraindications for Perioperative Beta Blockade:

- Heart rate < 50 beats per minute or evidence of heart block on EKG
- Hypotension with SBP < 90 or vasopressor support requirement*
- Active congestive heart failure with pulmonary edema, cardiac index < 2.5, or inotropic support*
- Active wheezing or bronchospasm
- Allergy to beta blocker drug

*Patients on inotropic or vasopressor support may receive beta blockade in select clinical situations with SICU attending MD approval.

Surgical and Clinical Eligibility Criteria:

Surgical Risk Factors:

- *High Risk:* emergent, cardiac, vascular
- *Intermediate Risk:* abdominal, thoracic, orthopedic, ENT
- *Low Risk:* endoscopy, eye, breast, superficial

Clinical Risk Factors:

- Ischemic heart disease
- Heart failure
- Cerebrovascular disease
- Diabetes mellitus
- Renal insufficiency (Creatinine 2.0mg/dL or greater)

Implementation of Perioperative Beta Blockade:

Rationale:

Surgery is a physiologically stressful event and may precipitate myocardial infarction in high risk patients at any time during the perioperative period. Multiple studies have shown a significant reduction in perioperative myocardial infarction and death from cardiac causes with the institution of perioperative beta blockade. However, perioperative beta blockade has also been shown to be harmful in low cardiac risk patient populations. The above guidelines are a recommendation for the institution of perioperative beta blockade in patients at risk for perioperative myocardial ischemia.

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1. SICU Team assesses the need for perioperative beta blockade using the above criteria. Check if Anesthesiology or primary team has started the process if patient arrives as a postoperative case.
2. Once initiated, the protocol should be continued for seven days or at a minimum the duration of the patient's hospital stay. This plan should be communicated with the primary surgical team.
3. Recommended target heart rate should be 50-70 beats/min. This is provided that the blood pressure can be maintained to generate an adequate coronary perfusion pressure. Hold for HR <50 beats/min or SBP <90 mm Hg.

Preoperative Implementation:

- If taking beta blockade long term, the patient should receive dose the morning of surgery.
- If not previously on beta blockade but beta blockade is recommended, beta blockade should be initiated either in the preoperative area if adequate monitoring is available, the SICU if patient is located there preoperatively, or intraoperatively by the Anesthesiology team.

Postoperative Implementation:

- Beta blockade should be initiated in the SICU postoperatively if the patient meets recommended criteria and has not received preoperative or intraoperative beta blockade.
- Beta blockade should be continued and targeted to recommended heart rate and blood pressure for a minimum of seven days or the duration of the patient's hospital course.
- If the patient meets beta blockade recommendations, IV beta blockade should be scheduled until the patient is tolerating enteral intake, at which time PO or PT beta blockade should be instituted.

Available Beta Blocker Agents for Peri-ICU Use:

1. Metoprolol: may be titrated intravenously in 1-5 mg increments and repeated every 4-6 hours. Enteral dosing is 12.5-100 mg every 8-12 hours.
2. Atenolol: may be titrated intravenously in 1-5 mg increments and repeated every 6-12 hours. Enteral dosing is 25-100 mg every 12 hours.
3. Labetalol: may be titrated intravenously in 5-20 mg increments and repeated every 4-6 hours. Enteral dosing is 100-400 mg every 12 hours.
4. Propranolol: may be titrated intravenously in divided doses of 0.2-1.0 mg every 3-4 hours. Enteral dosing is 20-100 mg every 6-12 hours.
5. Esmolol: may be titrated by continuous infusion for patients who are at high risk for hemodynamic instability. The loading dose is 500 mcg/kg followed by an infusion of 50-200 mcg/kg/min. No enteral dosing.
6. Carvedilol: no intravenous formulation. Enteral dosing is 3.125-25 mg every 12 hours.

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References:

1. Fleisher LA et al. 2009 ACCF/AHA focused update on perioperative beta blockade incorporated into the ACC/AHA 2007 guidelines on perioperative cardiovascular evaluation and care for noncardiac surgery: a report of the American college of cardiology foundation/American heart association task force on practice guidelines. *Circulation*. 2009 Nov 24;120(21): e169-276.

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