These guidelines are based upon medical literature review and expert opinion and are intended to provide recommendations for **Perioperative Beta Blockade** in the care of critically ill patients.

**Best Practice Guidelines**

- 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 factors
- 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
- Beta blockers should be titrated to a target heart rate of 50-70 beats/min, provided that the blood pressure can be maintained to generate an adequate coronary perfusion pressure and that the patient does not have indication for higher heart rate

**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 heart failure
- Active wheezing or bronchospasm
- Allergy to beta blocker drug

**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)
Background Information and Implementation

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.

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 or intraoperatively by the Anesthesiology team.

Postoperative Implementation:
Beta blockade should be initiated in the ICU 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 (50-70) and blood pressure (SBP > 90) 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:
- 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.
- 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.
- 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.
- 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.
- 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.
- Carvedilol: no intravenous formulation. Enteral dosing is 3.125-25 mg every 12 hours.

References
Authors

Christopher G. Hughes, MD

Approval

_________________________   Date: ____________________