Glucose Control Factsheet

## Facts About Glucose Control and the Prevention of Surgical Site Infections

### Definition of Tight Glucose Control

Tight glucose control refers to getting as close to a normal (nondiabetic) blood glucose level as you safely can. Ideally, this means levels between 70 and 130 mg/dL before meals, and less than 180 mg/dL 2 hours after starting a meal, with a glycated hemoglobin A1C level less than 7 percent. The target number for glycated hemoglobin will vary depending on the type of test doctor's laboratory uses.1

### Glycemic Control for Prevention of Surgical Site Infections

A 2017 guideline from the Centers for Disease Control and Prevention recommends perioperative glycemic control using a target blood glucose level less than 200 mg/dL regardless of whether the patient has diabetes.2

* The evidence review did not identify randomized controlled trials that evaluated lower target levels. It noted that some other organizations have published recommendations based on observational evidence.

### Glucose Control and Cardiac Surgery Complications

* The Society for Healthcare Epidemiology of America (SHEA) and the Infectious Diseases Society of America (IDSA) recommend focusing glucose control on patients undergoing cardiac surgery since most of the supporting literature involves this patient population. This also harmonizes with Surgical Care Improvement Project/National Quality Forum measures.3, 4
* In one prospective cohort study, 6 percent of cardiothoracic surgery patients had evidence of undiagnosed diabetes. Their surgical site infection (SSI) rate equaled that of known diabetic patients.5
* To be consistent with the Surgical Care Improvement Project measures, SHEA and IDSA suggest focusing postoperative glucose control on patients undergoing cardiac surgery. Consider specifying targets for glucose control (e.g., less than 200 mg/dL on postoperative days 1 and 2).3
* Intraoperative and perioperative glycemic control guidelines recommend glucose control (180 mg/dL or lower) in cardiac surgery patients in the time frame of 18–24 hours after anesthesia end time. *4 , 6-9*

### Evidence of an Association Between Hyperglycemia and Postoperative Complications

* Although tight glucose control has not been studied rigorously in the general surgery population, studies have revealed an association between hyperglycemia and postoperative complications.10-14
* In a study of general surgery patients, postoperative blood glucose was the only significant predictor of SSI after multivariate analysis.15
* Poor long-term glucose control as evidenced by elevated hemoglobin A1C values are considered a predictor of SSI.16, 17

### Need More Research To Confirm Significant Association Between Hyperglycemia and Postoperative Complications

* Despite this research, evidence for tight glucose control is equivocal.18, 19 A recent Cochrane review found that there was insufficient evidence to support strict perioperative glycemic control for SSI prevention.20
* Intensive postoperative glucose control (targeting levels less than 110 mg/dL) has not been shown to reduce the risk of SSI and may actually lead to higher rates of adverse outcomes, including stroke and death.21

### How To Measure Compliance With Glucose Control?

Measure the percentage of procedures for which serum glucose meets the selected target, e.g., 180 mg/dL or lower within 18–24 hours, by using the following calculations: 4, 6-9

* Numerator: number of patients with appropriately maintained serum glucose using the selected target (e.g., 180 mg/dL or lower) in the timeframe of 18–24 hours after anesthesia end time following cardiac surgery.
* Denominator: total number of cardiac procedures performed.
* Multiply by 100 so that the measure is expressed as a percentage after anesthesia end time for all cardiac surgery patients.

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