

# **Postoperative Glycemic Control in Adults with CHD**

What the ICU Bedside Nurse Needs to Know

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## **Introduction**

Adult patients with and without diabetes who have increased glucose levels both intra-operatively and in the immediate post operative period have a 10-fold increase in postoperative complications including death. Higher glucose levels have been identified as an independent predictor of morbidity. Lowering perioperative glucose levels with insulin therapy shows a decrease in both morbidity and mortality in cardiac surgery patients. Tight glycemic control lowers the incidence of wound infections, reduces hospital length of stay, and enhances long-term survival.

Class 1 recommendation for all patients who require a median sternotomy for surgical repair.

## **Critical Thinking**

Glycemic control is best achieved with continuous insulin infusions rather than intermittent SQ or IV doses. Patients with and without diabetes should receive continuous IV insulin infusions to maintain serum glucose < 180mg/dL for their ICU stay. (Class 1 evidence) Patients who require  $\geq 3$  days ICU stay should keep blood glucose <150 mg/dL (Class B) Patients should be transitioned to subcutaneous insulin before IV insulin infusions are discontinued. (Class B)[Lazar et al, Ann Thorac Surg (2009) 664-5]

## **Treatment**

Order set directs regular insulin infusion by assessment of blood glucose levels. (Examples of order sets from Oregon Health and Science University available upon request).

## **Special considerations**

Evidence based nursing research comparing Point of Care (POC) glucose values with laboratory values supports several important considerations in the assessment of glucose values. (Cook, 2009; Denfeld, 2010; Shearer, 2009) These considerations include:

1. POC values are significantly different than laboratory glucose values by as much as 20mg/dL. *Individual institutions should compare the POC monitor that they use with their laboratory and adjust their glycemic control parameters to control the risk of inadvertent hypoglycemia.* (Note: OHSU goal for glycemic control recently changed from 80-109 mg/dL to 110-135 mg/dL based upon a nursing research study conducted in the OHSU Cardiac ICU comparing Point-of-Care and Laboratory Glucose.)

2. POC samples are less accurate with hypoglycemia.
3. POC values are affected by hematocrit --with decreased hematocrit glucose levels increase, with increased hematocrit glucose levels decrease. With hematocrits below 25 or greater than 60, glucose levels should be from laboratory analysis.
4. POC samples from central lines (either arterial or venous) have no significant difference from fingerstick samples. Fingerstick samples have a greater variation from laboratory samples.
5. Decreased mean arterial pressures, acidosis, finger edema do not affect glucose levels from fingerstick samples.
6. Consider pain from fingersticks and increased risk of infection from accessing central lines that do not have a closed system with reinfusion capability when deciding on POC sampling technique.

## References:

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