

# Intraoperative Glycemic Management

---

**Melissa Silverstein, Allison Koepsell,  
Christina Martinez & LuLu Grant.**

# Background

---

- Anesthesia Protocol
  - Anesthesiologists have to check blood glucose levels every two hours during surgery if the patient received subcutaneous insulin prior to surgery.
- Why did the situation arise in the first place?
  - New Protocol
- Research findings

Note:

The protocol also includes patients on insulin pumps but only one was on a pump, so that data is not represented.

Why did the situation arise in the first place?

Director of surgical services wanted to know if protocol is being followed by anesthesiologists working for the department.

Research:

Increased glucose levels lead to delayed healing because high glucose levels impair innate immune response and disrupt inflammatory mechanism.

Hyperglycemia in the immediate post-operative period affects post-op medical and infectious complications.

Several studies have found that abnormal glucose levels are associated with longer hospital stays, ICU admissions, surgical site infections, neurological events, & mortality. Some hospital postponing surgery if H test is above a certain level.

Research has found that body injury and stress along with surgery increase glucose levels in both diabetic and non-diabetic patients.

Surgical tissue trauma + associated stress = ↑ endocrine system = ↑ production of glucose, ↓ insulin secretion or action, and insulin resistance = HYPERGLYCEMIA

# Research Question

---

- Are anesthesiologists following the glycemic management protocol intraoperatively?

# Objective

---

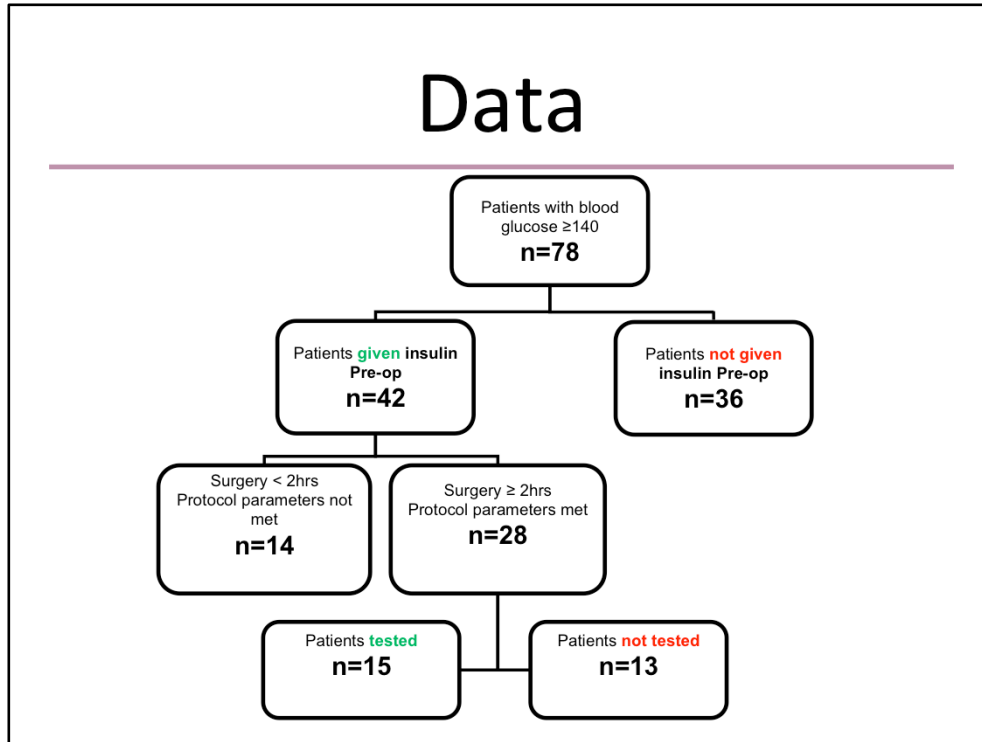
- Determine if anesthesiologists have been checking patients' blood glucose levels intraoperatively every two hours if the patients had subcutaneous insulin preoperatively.

# Methods

---

- Anesthesia surgery records audited for day of surgery.
- Patients' MARs checked for insulin administration.
- Evaluated December 2013 through February 2014.

# Data



Melissa

Discussion

Surgery greater than 2 hours n=15

Less than 2 hours n=21

# Results

---

- 46% (36 out of 78) of patients with a CBG above 140 were not treated.
- 46% (13 out of 28) of patients were not tested (who met protocol) by anesthesia.

# Discussion

---

- Data is conclusive
  - Not all anesthesiologists are following protocol.
  - Nurses are not treating all preoperative patients with insulin who have a CBG of 140 or above.
  - When patients went untreated with insulin preoperatively they went unnoticed by anesthesiologists intraoperatively.

15 PATIENTS WHO WERE UNTREATED BY THE NURSES PREOP WERE MISSED BY ANESTHESIOLOGISTS AND HAD SURGERIES ABOVE 2 HOURS. THEY SHOULD HAVE BEEN TESTED.



# Recommendations

---

- Hang laminated anesthesia protocol.
- Consider postponing surgery if Hemoglobin A1C is high.
- Have an in-service for preoperative nurses & OR nurses.
  - Improve communication
  - Explain importance of treating patients with CBG  $\geq 140$ .

# References

---

- Kittson, K. A. (2009). Glycemic control: A literature review with implications for perioperative nursing practice. *AORN journal*, 90, 714-722.
- Reategui, D., Sanchez- Etayo, G., Nunez, E., Tio, M., Popescu, D., Nunez, M., & Lozano, L. (2014). Perioperative hyperglycaemia and incidence of post-operative complications in patients undergoing total knee arthroplasty. Springer. DOI 10.1007/s00167-014-2907-7.
- Rutan, L., & Sommers, K. (2012). Hyperglycemia as a risk factor in the perioperative patient. *AORN Journal* , 95, 352-361.