

Improving Diabetes Care in a Pediatric Post-Anesthesia Care Unit (PACU)



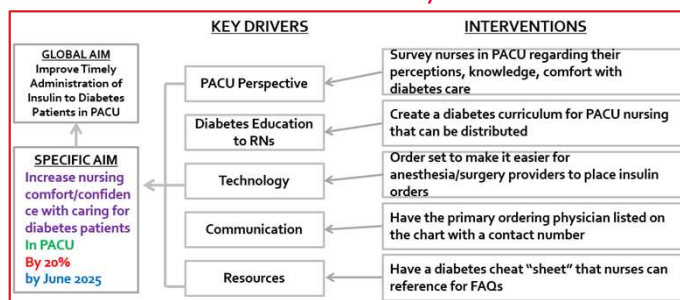
Children's National®

Chaitanya Sambangi, DO, MPH; Kimberly Ho, BSN, RN, CPN, CDCES; Abby Meyers, MD; Shideh Majidi, MD, MSCS

OBJECTIVE

- Despite preoperative diabetes plans, pediatric patients with diabetes often experience delays in insulin administration in the post-anesthesia care unit (PACU)
- Informal feedback from PACU RNs highlighted discomfort and limited understanding regarding diabetes care
- Specific aim: increase PACU nursing confidence in managing diabetes by 20% over one year
- Global aim: improve timely insulin delivery in PACU
- A fishbone analysis was conducted to identify contributing factors. Interventions and key drivers are noted in Figure 1

FIGURE 1. Fishbone Analysis



INTERVENTION #1 – PACU QI SURVEY

- Surveyed PACU RNs (n=45) using a REDCap survey (PACU QI) regarding their perceptions and knowledge of diabetes care
- After three rounds of outreach to the PACU RN team- total of 10 responses (22% response rate)
- 80% reported delays in diabetes care at least half the time**
- 70% were unsure who to contact for insulin orders**
- 60% had experienced insulin order delays**

INTERVENTION #2 - INFORMATION SHEET

- Survey results highlighted gaps in knowledge and communication and informed the development of a diabetes information sheet (Figure 2)
- Uptake to be being monitored via intranet click tracking

INTERVENTION #3 – EDUCATION SESSION

- Developed a PACU-tailored education session delivered in two separate PACU meetings with a pre + post PACU QI survey
- 21 individuals participated: only 11 completed both pre + post surveys
- "On a scale of 0-10 (10 being the highest), rate the following statement: I feel confident taking care of diabetes patients post-op" - mean improved from 5.74 to 6.83; 11% increase in confidence managing diabetes. By unpaired t-test this change was not statistically significant (p=0.18)

FIGURE 2. Information Sheet

HELPFUL HINTS FOR DIABETES CARE IN PACU

WHO TO CONTACT?	<ul style="list-style-type: none"> The surgical or anesthesia team is responsible for diabetes orders in PACU. The admitting team takes over after the patient leaves PACU. The ordering physician should consult the endocrine team for diabetes management questions.
DIABETES KEY TERMS	<p>Target: Blood glucose (BG) level to correct to (goal blood glucose).</p> <p>Threshold: BG value above which a BG correction dose should be administered (sometimes the same as the target number).</p> <p>Correction Factor (CF): Also known as Insulin Sensitivity Factor (ISF). This patient-specific number is used to calculate BG correction and determines how much 1 unit of short-acting insulin should lower the BG level.</p> <p>Carbohydrate Ratio (CR): Also referred to as Insulin-to-Carbohydrate Ratio (ICR). This patient-specific number is used to calculate carbohydrate coverage, indicating how many grams of carbohydrates are covered by 1 unit of insulin.</p>
BLOOD GLUCOSE (BG) MONITORING	<ul style="list-style-type: none"> Check POC hourly if on insulin drip. Check POC every 3 hours if ketones are present. Check POC every 3 hours if on IV fluids. Check POC before meals if taking orally. Use patient's CGM (Dexcom/Libre) for BG between 70-300 mg/dL. *Can not dose insulin on this value*
TYPES OF INSULIN	<ul style="list-style-type: none"> Lantus (insulin glargine): Long-acting, once every 24 hours. Humalog (insulin lispro): Short-acting, for BG correction and carbohydrate coverage, every 3 hours max.
HOW TO CALCULATE INSULIN DOSE	<p>*utilize the insulin bolus calculator*</p> <p>Number of units of insulin for blood sugar correction: (Current Blood Glucose (BG) - Target Blood Glucose (usually 150)) ÷ Correction Factor</p> <p>Number of units for carbohydrate coverage: Number of Carbohydrates ÷ Carbohydrate Ratio</p>
HYPERGLYCEMIA (BG > 300) GUIDELINES	<ul style="list-style-type: none"> Gather the following information: <ul style="list-style-type: none"> Check for urine ketones. Note the time of the last dose of insulin lispro (rapid-acting insulin). Determine if the patient consumed carbohydrates without insulin coverage. Notify the overseeing physician (surgery/anesthesia team).
HYPOGLYCEMIA TREATMENT	<ul style="list-style-type: none"> If the patient can take orally, administer 15 grams of carbohydrates (e.g., juice) and reassess blood glucose levels in 15 minutes. Continue this process until blood glucose exceeds 70 mg/dL. If the patient is unable to take orally, administer a D10 bolus (2cc/kg) and reassess blood glucose levels in 15 minutes. Repeat this procedure until blood glucose exceeds 70 mg/dL.

Children's National. Created by Endocrine Division - PACU Diabetes QI Project 2025

CONCLUSION

- Discomfort with diabetes management was addressed through two different methods: an information sheet and an education session
- General feedback to the education was very positive, especially as a refresher specific to PACU team. Hands-on skill session was suggested to further improve comfort with managing diabetes
- Limitation: capturing only a portion of the PACU RN team - nursing turnover, often require float RNs or travel RNs to assist in the unit

FUTURE DIRECTIONS

- PACU RN education session with hands-on skills
- Target the anesthesia providers with similar education- including logistics surrounding insulin timing and orders