

Society of Ambulatory Anesthesia (SAMBA) Consensus Statement on Perioperative Blood Glucose Management in Diabetic Patients Undergoing Ambulatory Surgery



*Review of the consensus statement and additional commentary
by Thelma Korpman, M.D., Associate Editor*

There seem to be inconsistencies regarding diabetic management in the ambulatory surgery center. The dreaded cancellation by the anesthesiologist because of a high blood sugar looms over the heads of the surgeons and is not consistent from anesthesiologist to anesthesiologist. And, if the decision is made to proceed with the case, then appropriate management becomes the issue. There is good reason for this lack of clarity. The literature on perioperative glycemic control for diabetic patients undergoing ambulatory surgery has been sparse and of limited quality. The SAMBA consensus panel attempted to fill this void by providing recommendations based on general principles of blood glucose control, drug pharmacology, data from the inpatient surgical population and clinical judgment. What follows are 11 clinical questions considered by the SAMBA consensus panel when developing the consensus statement on perioperative blood glucose management in diabetic patients undergoing ambulatory surgery and the recommendations that ensued:

1. What information specifically related to glycemic control should be obtained in the diabetic patient?
 - HbA1c (if available) and fasting blood glucose levels.
 - Ability of patients to reliably test their glucose levels, and the frequency of these measurements.
 - Type, and dose and time of antidiabetic therapy.
 - Frequency and manifestations of hypoglycemia and level at which hypoglycemic symptoms occur.
 - Hospital admissions due to glycemic issues.

2. How do we manage preoperative oral antidiabetic and non-insulin injectable therapy?
 - No oral antidiabetic drugs on the day of surgery.
 - Not necessary to discontinue such therapy on the day prior to surgery.
 - Patients do not develop hypoglycemia with oral antidiabetic drugs except on rare occasions with sulfonylureas, meglitinides, and non-insulin injectables. Most first generation sulfonylureas are no longer used. Second generation sulfonylureas include glyburide, glipizide and glimepride. They act by increasing the release of endogenous insulin and enhancing insulin receptor function by binding to ATP-dependent potassium ion channels in pancreatic beta cells. The duration of action is variable, but typically less than 24 hours. Meglitinides (repaglinide and nateglinide) act by stimulating insulin secretion by binding to ATP-dependent potassium ion channels in pancreatic beta cells. Non-insulin injectables include exenatide and pramlintide. Exenatide mimics incretins, the peptides that are secreted when a person eats, by enhancing insulin function, and it can be used in combination with a sulfonylurea or metformin. Pramlintide is a synthetic version of amylin, a peptide secreted along with insulin when a person eats, and it may be indicated for a type 2 diabetic who requires insulin.
 - Lactic acidosis is rare with metformin except in patients with renal dysfunction, hepatic compromise, or use of IV contrast. In these situations it may be discontinued one to two days prior to surgery. Metformin is a biguanide that decreases hepatic glucose output and increases insulin action.
3. How do we manage preoperative insulin therapy? *See table on page 62.*
4. Is there a preoperative blood glucose level above which one should postpone elective surgery?
 - Postpone surgery if there are significant complications of hyperglycemia (dehydration, ketoacidosis, hyperosmolar non-ketotic states).
 - It may be okay to proceed with surgery in patients with preoperative moderate hyperglycemia if there is adequate long-term glycemic control.
 - In chronically poorly controlled diabetics, the decision to proceed is made in conjunction with surgeon, taking into consideration

the presence of other comorbidities as well as the potential risks of surgical complications.

5. What is the optimal intraoperative period blood glucose level?
 - If diabetes is well controlled - 180 mg/dl or less.
 - Chronically elevated glucose levels should not be decreased acutely in the perioperative period.
6. How do we maintain optimal blood glucose levels?
 - Subcutaneous rapid-acting insulin analogs are used to achieve target levels.
 - **There is not enough evidence to recommend a dosing schedule to optimize the blood glucose levels.**
 - The “Rule of 1800 or 1500” can estimate the expected decrease in glucose for each unit of insulin administered. For example, if the patient’s total daily insulin dose is 60 units, then one unit of administered insulin would reduce the blood glucose level by 25-30 mg/dl (that is, $1500/60 = 25$ or $1800/60 = 30$).
7. What are the other considerations specific to glycemic control in diabetic outpatients?
 - Have patient bring insulin(s) to the facility.
 - Travel to and from the facility with hypoglycemic treatment.
 - Aggressive PONV prophylaxis is strongly recommended, but dexamethasone can elevate blood glucose levels.
8. What is the optimal perioperative glucose monitoring?
 - Check blood glucose on arrival to facility, and again prior to discharge.
 - It is not necessary to check glucose intraoperatively for procedures lasting less than two hours. However, such monitoring can be performed every 1-2 hours for longer procedures, and this determination also should take into account the type and amount of insulin that the patient has received.
 - More frequent checks should be considered if insulin was received in the morning and/or if the preoperative admitting glucose level was in a lower range.
9. How should we identify and manage perioperative hypoglycemia?
 - “Alert” value for hypoglycemia is less than 70.

SAMBA Consensus Statement (cont'd)

- Administer 15-20 gm glucose if the patient is symptomatic. Repeat this dose until the blood glucose rises and symptoms resolve.
10. What are the discharge considerations for diabetic outpatients?
 - Observe if perioperative insulin was given until possibility of hypoglycemia is ruled out.
 11. What advice should we give to patient for glucose control after discharge home?
 - Check glucose levels frequently if fasting.
 - Transition to daily preoperative antidiabetic regimens should be delayed if normal caloric intake is delayed.
 - Carry hypoglycemia treatment while traveling to and from the facility.

These consensus guidelines are broad enough to support the viewpoints of competent practitioners on both ends of the spectrum. Not only does it provide some rationale to the most conservative practitioner's management, but it also supports the position of the most liberal practitioner that rarely cancels a case. Of course, underlying this discussion is the fact that outpatient surgery is a tiny moment in the lifelong disease that is diabetes. During the perioperative period there is limited opportunity to cause significant harm. Nonetheless, the avoidance of even short periods of hypoglycemia or significant levels of hyperglycemia should be the goal for the management of the diabetic patient. Along this line of reasoning, the answer to question #4 dealing with the issue of cancellation is practical, yet addresses the issue of safety. Finally, no guideline consensus statement, or any part of it, is a substitute for good clinical judgment.

References

1. SAMBA Consensus Statement of Perioperative Blood Glucose Management in Diabetic Patients Undergoing Ambulatory Surgery. Girish P. Joshi, MBBS, M.D., FFARCSA. SAMBA Ambulatory Anesthesia Vol. 25, No. 3. July 2010. Also, available at www.sambahq.org
2. ASA Refresher Course 2008. Perioperative Management of the Diabetic Patient. Daniel R. Brown, M.D., Ph.D.

Managing Preoperative Insulin Therapy

Insulin Regiment	Day Before Surgery	Day of Surgery	Comments
Insulin pump	No change	“Sick day” or “sleep” basal rates	
Long-acting peakless insulins glargine (Lantus) or detemir (Levemir)	No change	Give 75-100% of morning dose on arrival to ambulatory surgery facility	<ul style="list-style-type: none"> • Reduce nighttime dose by 25% if history of nocturnal or morning hypoglycemia. • Glargine/detemir has an onset in 2-4 hours, no peak, and duration of 20-24 hours.
Intermediate-acting insulins (NPH)	<ul style="list-style-type: none"> • No change in daytime dose. • 75% of usual evening dose if insulin routinely taken in the evening 	50% of usual morning dose	<ul style="list-style-type: none"> • See comments for long acting insulins.
Fixed combination insulins	No change	50% of usual morning dose of intermediate-acting component.	<ul style="list-style-type: none"> • Aspart protamine 70/30 is available only in combination. On morning of surgery give 35% of total AM dosage as NPH insulin.
Short and rapid acting insulin	No change	Hold the dose	
Non-insulin injectables	No change	Hold the dose	