MARYLAND ENDOCRINE PA

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Type 1 Diabetes Insulin Pump Use in the Peri-operative Period

DATE:
TO: **Anesthesiology/Surgery/Hospitalist**

Re: DOB:

This patient has type 1 diabetes and uses an insulin pump. They are well enough controlled from a diabetes standpoint to proceed with a procedure or surgery, with the following instructions on handling their diabetes.

Total Daily Dose: XX units per day
Endocrinologist:
Contact:

☐ The pump has tubing that connects to the patient's infusion set with self-adhesive tape at their infusion site and is worn using a case or clip. The patient controls their pump settings by pressing buttons on the pump. During surgery, the patient will require tape or another means to have the pump attached to their gown. OR,
☐ The pump has self-adhesive tape (no tubing) and is controlled by a remote device.

- Rapid-acting insulin is infused subcutaneously 24/7 at continuous programmed hourly rate (the basal rate).
- The continuous infusion is the patient's background or basal insulin that would prevent the development of diabetic ketoacidosis (DKA).
- Basal insulin should generally be ½ of the patient's total daily insulin dose.
- **The patient needs basal insulin whether or not they eat.**
- **"Sliding scale" insulin is NEVER an adequate replacement for basal insulin and can result in the development of *iatrogenic* diabetic ketoacidosis.**

Medical Staff Instructions

- During surgery, the pump should **NOT** be removed, or the settings changed. The patient's doctor may have instructed the patient to decrease the basal infusion rate prior to surgery to reduce the risk of hypoglycemia before and during surgery. However, one would risk the development of DKA if the insulin pump is stopped or removed and basal (background) insulin is not quickly replaced in some way.
- If the pump is removed (disconnected), the patient's basal insulin must be replaced by either continuous IV insulin infusion or a SQ regimen that includes scheduled basal insulin (NPH

human insulin, insulin glargine/Basalgar/Lantus/ Semglee/Toujeo, insulin detemir/Levemir or insulin degludec/Tresiba), **and not just a "sliding scale."**

- If the patient is eating, then pre-meal rapid-acting insulin (insulin aspart/NovoLog; fast insulin aspart/Fiasp; insulin lispro/Humalog-Admelog, insulin lispro-aabc/Lyumjev; insulin glulisine/Apidra; or human regular insulin) will also be needed.
- Care should be taken not to dislodge the pump infusion set from the site during transfer.
- If the pump infusion set becomes dislodged, or if the pump is disconnected or suspended and cannot be reattached or reactivated within 2 hours, basal insulin replacement will be needed **within 2 hours**.
- If the patient were to develop low (<90 mg/dL) blood glucose **before** the operation and if IV is not available, consider oral glucose tablets or glucose gel as treatment if allowed by the requirements of the procedure. NOTE: glucose tablets or gel leave no residual material in the stomach. If unable to take by mouth, then IV glucose is needed as **discussed below.**
- Blood glucoses should be checked every 30-60 minutes while the patient is under anesthesia and treatment with IV glucose given for a level <90 mg/dL. **If the patient is using a continuous glucose monitor system (CGM) (see below), the results should not be acted on without fingerstick verification, since accuracy in an operative environment is uncertain.**
- If the patient develops hypoglycemia **during** the operation or in the post-op period, the insulin pump should generally be left alone and IV glucose should be given immediately to correct the low blood glucose.
- If the patient is thought to be unsafe to operate the pump post-operatively due to sedation, confusion, or physical impairment, then the pump should be stopped. The patient would need basal insulin **started within 2 hours** in addition to any sliding scale and meal insulin, for the reason noted above.

If patient uses a Continuous Glucose Monitor (CGM) for their blood glucose monitoring:

☐ Not applicable, this patient is not on CGM

☐ Patient using CGM

- ☐ Dexcom G6 or G7
- ☐ Freestyle Libre
- ☐ Guardian Connect with Medtronic (530G, 630G, 670G, 730G, 780G)
- ☐ Eversense implanted CGM

- The CGM device reading should not be used without verification during surgery because accuracy in an operative environment is not certain. For example, the person lying on the sensor can lead to a falsely low blood glucose reading.
- Blood glucose monitoring via fingerstick or lab with fast turnaround is recommended as verification.
- If on a Medtronic CGM: Post-op, once it is feasible, s/he should not be given medications that contain acetaminophen-APAP because they give a false high glucose reading with Medtronic CGM. Once the patient is off such medications, s/he should be able to restart use of their Medtronic CGM, which they can do themselves.
- If on a Dexcom G6/G7, Freestyle Libre, or Eversense CGM, s/he may be given medications with APAP without affecting the accuracy of the CGM device.

If you have any questions, call the physician responsible for the patient's diabetes care, or if admission needed, consult an endocrinologist or diabetes team if available.

Patient Instructions:

Bring this letter with you when going for your surgery or procedure.
Remember to bring pump supplies and CGM (if applicable) supplies with you.

Pump adjustment: one of the following
☐ Open loop pump: change basal rate before surgery
Decrease to_____% of normal basal rate_____ hours before surgery
☐ Closed loop pump with exercise mode setting:
Activate the exercise mode _____ hours before surgery
☐ Medtronic 630G, 670G, 770G, 780G or T-Slim X2 with Basal IQ or Control IQ:
Allow the pump to continue in the closed loop function without exercise mode

Signed