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Letter From a Type 2 Diabetes Insulin Pump Patient Regarding Hospitalization or Surgery

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

Patient name: DOB:
Endocrinologist:
Contact:

I have type 2 diabetes and use an insulin pump that infuses rapid-acting insulin subcutaneously at a continuous programmed amount (the basal rate) 24/7. People with type 2 diabetes treated with pumps generally make little of none of their own insulin.

During surgery or hospitalization, my pump should generally not be touched by anyone except me, unless a trained staff member familiar with my pump is available.

My insulin brand/name is:	
My usual total daily insulin dose is:	XX units in 24 hours.
My usual target blood glucose range is:	70 to 180 mg/dL.

☐ I wear the pump 24/7 using a case or clip. Tubing from the pump connects the infusion set to my infusion site (that I change every 3 days) with self-adhesive tape. I control my pump settings by pressing buttons on the pump. During surgery, I will need my clip/case and/or tape to attach the pump to my gown.
☐ I wear a "patch" pump 24/7. It has self-adhesive tape (no tubing) and I control it using a separate remote device.

Insulin

- **I need basal insulin whether or not I am eating**
- **My basal insulin** is generally 40 to 50% of my total daily insulin dose.
- "Sliding scale" rapid-acting insulin is NOT an adequate replacement for basal insulin. **Putting me on a sliding scale alone without scheduled long-acting basal insulin can result in the development of *iatrogenic* diabetic ketoacidosis (DKA) or severe hyperglycemia.**
- I will need additional pre-meal (bolus) insulin when I am eating. This bolus insulin should be given just before or right after the meal.
- My doctor may have recommended that I decrease my infusion rate to prevent the possibility of low blood glucose while not able to eat before surgery or a procedure.

Pump Adjustments Before Surgery:

☐ Open loop pump not guided by CGM results: decrease basal rate by ____ % starting ____ hours before surgery until post-op, awake and able to eat

☐ Closed loop pump guided by CGM results, such as Medtronic 630G, 670G, 730G or 780G, or T-Slim with Basal IQ or Control IQ: the pump can be generally continued in closed loop mode the night before and during surgery

☐ Closed loop pump guided by CGM results with **an available exercise mode** that targets a higher blood glucose: the pump can be generally continued in closed loop with exercise mode the night before and during surgery

☐ For surgery requiring intraoperative insulin drip: discontinue use of the pump just before surgery and start the insulin drip within 1 hour

☐Other: _____

Pump Adjustments During and After Surgery:

- If the pump is discontinued, then my 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 (Basaglar/Semglee/Lantus), insulin deglucdec (Tresiba), or insulin detemir (Levemir) that amounts to ½ of my usual daily needs, and not just a "sliding scale."
- If I am eating, pre-meal (bolus) rapid-acting insulin (aspart/NovoLog, fast insulin aspart/Fiasp, insulin lispro /Humalog or Admelog, insulin lispro-aabc/Lyumjev, insulin glulisine/Apidra or human regular insulin) will be needed.
- If I am not eating, corrective insulin or sliding scale can be given to correct a high blood glucose pre-meal or when on a schedule and to supplement my basal insulin, <u>but cannot be used as my only insulin</u>. It is possible my basal insulin dose may need to be decreased when not eating, but it cannot be stopped completely for the reasons already noted.

My Infusion Set and Site

- <u>Please verify where my infusion site is before surgery or procedures.</u> Care should be taken during transfer not to dislodge the infusion set from my infusion site (skin). The pump can be clipped or attached with tape to a gown.
- If the pump becomes dislodged and cannot be restarted within 2 hours, then I will need to be switched to another insulin using the guidelines above.

My Blood Glucose

☐ I use a glucose meter and strips to check my blood glucose levels.

☐ I use a Continuous Glucose Monitor (CGM):

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

My glucose should be checked before and at least every 30-60 minutes while in the operating room, as well as after the operation or procedure.

During surgery my CGM readings should not be used without verification because accuracy in an operative environment is not certain. For example, if I am lying on the sensor, this can lead

to a falsely low blood glucose reading. Blood glucose monitoring via fingerstick or lab with fast turnaround is recommended.

Before Surgery: if I develop low blood glucose below 90 mg/dL):

- Consider allowing oral glucose tablets or glucose gel as treatment if available and if allowed by the requirements of the procedure. Glucose tablets and glucose gel leave no residual material in the stomach.
- If unable to take oral nutrients during the hospitalization, then IV glucose or IV nutrition is needed.

During the Surgery or in the Immediate Post-op Period: if I develop low blood glucose below 90 mg/dL:

- My insulin pump should generally be left alone and I.V. glucose should be given to correct the low blood glucose, with follow up blood glucose checking after 20 to 30 minutes. If hypoglycemia reoccurs, more glucose should be given. If the pump needs to be disconnected or suspended, then some form of basal insulin should be started within 2 hours.

Post-op:

- If on Medtronic CGM: Once it is feasible, I should not be given medications that contain acetaminophen (APAP)-Tylenol because they can give a false high glucose reading with the Medtronic CGM. When I am off such medications, I should be able to restart use of the Medtronic CGM and I can do this myself without assistance.
- If on a Freestyle Libre, Eversense, and the Dexcom G6-G7, it does not register false high glucose readings with APAP; therefore, medications that contain APAP could be given without affecting the accuracy of the CGM device.

In General:

- I should be allowed to stay on the pump during hospitalization, if possible, **as long as I am alert and not sedated,** my blood glucose levels are controlled, I am able to make changes in the pump settings if needed, and I have access to all necessary pump supplies and an insulin appropriate for use in my pump.
- I understand that I must provide all pump supplies for my pump; that the hospital cannot supply these, and that my usual pump insulin may not be available from the hospital.
- If I am not safe to operate the pump while in the hospital due to:
  1) Sedation or confusion, or
  2) I am physically unable to operate the pump and change the cartridge/reservoir and infusion sets and sites, or
  3) My blood glucose is uncontrolled while on the pump, or
  4) The attending provider thinks it is not safe for me to be on the pump, or
  5) I do not feel that I can handle or want to handle the pump myself in the hospital … then the pump should be stopped.
- I would need some basal insulin started immediately, for the reasons already noted above, in addition to a sliding scale and any nutritional insulin.
- If my insulin requirements increase substantially, typically seen with the use of glucocorticoids ('steroids') or parenteral nutrition (IV nutrition) or severe illness, then it may

be better to switch me from the pump to another insulin delivery form. Following the guidelines above would allow this to be done safely and effectively.

Medical Procedures—X-ray, CT scan, MRI scan

- The insulin pump and CGM systems should be temporarily removed during X-ray studies and CT or MRI scans.
- My infusion set would generally not need to be removed. However, if I am using a straight needle insulin infusion set or wearing a patch pump, I will need to remove the set/pump before an MRI.
- Wearing my pump or a CGM sensor during an MRI would result in damage to the pump or CGM transmitter.
- While it is prudent to remove the pump or CGM sensor during a CT scan or x-ray studies, the risk of pump or CGM dysfunction is remote (per the FDA).

Keeping blood glucose levels in a reasonable range is quite challenging in the hospital. Everything relevant to my insulin requirements changes in a hospital setting: activity decreases; stress increases; diet often decreases but almost always changes; and medications that increase the blood glucose (steroids, TPN, IV glucose, glucose containing IV medications) are often needed. Blood glucose levels above 200 mg/dl increase the risk of infection and impair healing; low blood glucose levels present an obvious danger that requires immediate action.

Please let me know when you order medicines or IV fluids that are likely to affect my blood glucose and increase my need for additional insulin, or if I need to fast for a test or procedure.

If you are having trouble keeping my blood glucose in an acceptable range, please consider consultation with a diabetes specialist or team, if available.

I understand that while I am under your care, I need to follow the instructions given from my medical team. I look forward to working with my medical team to do what I can do to keep my blood glucose controlled so I can recover as quickly as possible.

Patient signature: _____ Date: _____

This patient is well enough controlled from a diabetes standpoint to proceed with a procedure or surgery, with the above instructions on handling their diabetes.