

Example: Protocol driven SC Insulin Order Set – (Institutional insulin choices will vary.)

1. **Diagnosis:** Uncontrolled (glucose > 180 mg / dL) –or– Controlled
 Diabetes type: T1DM T2DM Stress/situational hyperglycemia
2. **Glycemic Target (pre-meal)** 90 – 130 mg/dL 100 – 150 mg / dL (hypoglycemia risk factors)
3. **Monitoring** HbA1c (order if not available in last 30 days and no recent transfusion.)
 POC Glucose testing q ac & hs (eating) q 6 hours (tube feeding or NPO) Other _____
4. **Any diet ordered needs to meet constant carbohydrate standard (see separate orders for specific diet.)**
5. **Discontinue all other anti-hyperglycemic agents (recommended in most situations.)**
6. **Consultation and Education - all patients: education protocol per nursing**
 Glycemic team consult (pager ___) Nutritionist consult (ext ___) Diabetes Educator consult (pager ___)
7. **Estimate Total Daily Dose (TDD) of insulin (dose patient would need with full nutritional intake.)**

Total Daily Dose _____ **units** (see reverse for assistance in estimating TDD)

8. **Basal Glargine (Lantus®) dose** _____ **units q** HS AM
 Or **NO basal insulin (do not use this option in Type 1 DM or if glucose consistently above target range!)**
Dosing guidance: 50% x TDD (NPO or eating) 40% x TDD (tube feeding)
Give basal glargine insulin even if patient is NPO (when dosed by protocol). Don't mix glargine with other insulin.

9. **Nutritional Insulin:** *Dosing guidance: if NPO or clear liquids = NO nutritional insulin*
If eating full meals: 50% of TDD in 3 divided doses of lispro (Humalog ®) { q AC} - 60% of TDD if bolus TF
If on full dose continuous tube feedings: 60% of TDD in 4 divided doses of Regular insulin {q 6 hours}
REDUCE DOSE ESTIMATE for REDUCED or UNCERTAIN NUTRITION

<input type="checkbox"/> Lispro (Humalog ®) insulin SC with: (for eating patients)	_____ units Breakfast	_____ units Lunch	_____ units Dinner	
<input type="checkbox"/> Regular insulin SC q 6 hours: (for continuous enteral nutrition)	_____ units 0600	_____ units 1200	_____ units 1800	_____ units 2400
<input type="checkbox"/> Give NO scheduled nutritional SC insulin (patients with no significant nutrition)				

Hold nutritional insulin if nutrition is interrupted (e.g. NPO status for tests, tube feeds are interrupted, etc.).
 If a patient has an order for a diet, but it is suspected that the patient may not tolerate a meal (based on pre-meal nursing assessment), give the nutritional insulin *after* the patient has attempted to eat, in proportion to the amount of the meal consumed.
 Insulin administration times: Lispro: within 15 minutes of eating Regular: 30 minutes before eating

10. **Correction Insulin:** Correction dose insulin as per scale indicated below No correction insulin
Regular insulin SC q 6 hours if NPO or continuous tube feeding. Insulin lispro q ac & HS if eating or on bolus tube feeds. To be administered in addition to scheduled insulin dose to correct pre-meal hyperglycemia.

Glucose	<input type="checkbox"/> Low Dose TDD ≤ 40 units/day	<input type="checkbox"/> Medium Dose TDD 40-80 units /day	<input type="checkbox"/> High Dose TDD >80 units/day	<input type="checkbox"/> Other	<input type="checkbox"/> Bedtime (if eating, lispro)
< 70 mg/dl	Follow hypoglycemia protocol, give half of scheduled nutritional amount				
70-175 mg/dl	No change	No change	No change		0
176-200 mg/dl	+1 units	+2 units	+4units		0
201-225 mg/dl	+2 units	+4 units	+6 units		1 unit lispro
226-250 mg/dl	+3 units	+6 units	+8 units		2 units lispro
251-300 mg/dl	+4 units	+8 units	+10 units		3 units lispro
301-350 mg/dl	+5 units	+10 units	+12 units		4 units lispro
351-400 mg/dl	+6 units	+12 units	+14 units		5 units lispro
> 400 mg/dl	Give same amount as in above row and notify ordering physician.				

11. **Hypoglycemia Protocol for all patients with suspected hypoglycemia or glucose < 70 mg/dL**
 If patient can take PO, give 15 grams of fast acting carbohydrate (4oz fruit juice/non diet soda, 8oz low fat milk, or 3 glucose tablets)
 If patient cannot take PO, give 25ml of D50 as IV push: if no IV access, administer glucagon 1 mg IM.
 Check finger capillary glucose q15 minutes and repeat above if BG<80: Examine regimen, recent nutritional intake, and risk factors for hypoglycemia. **Modify baseline regimen if appropriate.**

Signature / ID # _____ Date / Time _____

Example: Protocol driven SC Insulin Order Set – (Institutional insulin choices will vary.)

Estimating the Total Daily Dose (TDD) of insulin - The TDD is the amount of insulin required when the patient is getting 100% of usual nutrition. Three main methods:

1. From **recent insulin infusion requirements**: Calculate the average hourly drip rate. Then, multiply by 20 to get a conservative estimate of the insulin need. Then, determine whether that dose represents basal insulin (infusion insulin only covered basal needs, multiply this basal need by 2 to arrive at TDD estimate) or TDD (infusion covered basal AND nutritional needs).
2. Use **total insulin required at home** (all types added together) adjust for control achieved with home regimen.
3. **Calculate/ estimate insulin requirement** as follows based on body size:
 - a. **Dialysis, hypoglycemia risk factors** use **0.3** units/kg/day
 - b. **Lean** (BMI < 25), new steroid induced hyperglycemia or new diagnosis of DM: use **0.4** units/kg/day
 - c. **Overweight** (BMI 25-30) use **0.5** units/kg/day,
 - d. **Obese** (BMI > 30) use **0.6** units/kg/day

Assess and adjust insulin regimen at least daily in hospitalized patients.

Adjust by pattern of response to your regimen. Call Glycemic team consult (pager xxxx) if questions or difficulty keeping patient in glycemic target range. If hypoglycemic and no obvious inciting interruption in nutrition, reduce antihyperglycemic agent doses!

Target blood glucose range

Optimal/tightest range is 90-130; set the goal to 100-150 in elderly patients or those with w/ end-stage disease, renal or hepatic failure, malnutrition, cognitive impairment, hypoglycemia unawareness, or any patient in whom hypoglycemia is a concern.

Stopping oral diabetes medications

Oral antidiabetic medicines are slow to titrate to effect may lead to hypoglycemia or other complications in inpatients. Metformin should be discontinued in patients with a serum creatinine >1.5 or in whom there is a risk of nephrotoxicity; sulfonylureas should not be used in the NPO patient; and TZDs should be discontinued in patients with CHF exacerbations or volume overload. In general, adjustments in these oral medications take too long to be effective in the hospital. Oral agents may be restarted in the hospital as part of the DC process, as long as there are no contraindications.

For patients eating meals or receiving bolus tube feeds

Peakless long acting basal insulin (our formulary drug is glargine, brand name Lantus®) is recommended in these patients. Rapid acting analogue (RAA) insulin (our formulary RAA is lispro, brand name Humalog®) is more appropriate than regular insulin for nutritional doses due to its shorter, more predictable half-life and correspondence with inpatient meal times. A basal / nutritional ratio of 50/50 is appropriate for the eating patient, while 40/60 (or even lower) may be better for the patient on tube feedings. Adjust dose down if nutritional intake is <100%. If patient is taking only clear liquids, consider treating them as an NPO patient as outlined below.

For patients receiving continuous enteral nutrition

A. Glargine basal insulin is the preferred basal insulin in our institution. Glargine can be continued without or with minimal (i.e. 0-20%) dose adjustment when nutrition is suspended, providing that dosing follows protocol. Regular insulin is recommended as our nutritional insulin rather than a RAA insulin in this setting-- because of its longer half-life, it can be dosed q6h instead of q4h. Adjust the dose down if nutritional intake is < 100%. A basal / nutritional insulin ratio of 40/60 (or even lower) is preferred.

B. If the tube feeds are held or interrupted, the nutritional regular insulin doses should/will also be stopped, consider D10 to replace calories provided by tube feedings until nutritional regular insulin is metabolized or tube feedings resume.

For patients on TPN – we recommend intravenous insulin, Keep insulin separate from PN until a stable dose is reached. see full protocol and infusion insulin orders.

For the NPO patient

A. Patients with prolonged NPO status should have a low-dose dextrose infusion (D5 at 75-125 cc/hr) along with their basal insulin.

B. Glargine is recommended over NPH as the basal insulin in this setting (longer half-life, “peakless”) which mimic physiologic basal insulin secretion. Nutritional or scheduled short-acting insulin should not be given to patients without a nutritional source.

Special Situations

A. If patient is receiving nocturnal tube feeds, consider adding additional NPH or regular insulin when feeds are started to cover this time period.

B. Steroids – suggest Glycemic team consult pager _____. See full protocol for other suggestions.

C. If transitioning off of IV insulin infusion, calculate TDD as outlined above. Give SC insulin BEFORE you stop infusion.

Discharge Planning

A. Communicate specific glycemic diagnosis, and f/u needs to PCP.

B. Take patient’s knowledge base, insurance status, HbA1c, expected change in medication, and severity of illness into account when determining discharge medications/home regimen. See full protocol for further guidance in this important transition.