General Medicine/Surgical Floor Analog Insulin Inpatient Glucose Control Guidelines at Cook County Health System

1. Order Blood Glucose (BG) fingersticks TID AC & bedtime if eating meals or order BG fingersticks Q 6 hrs if nutrition per tube feedings, TPN, IV with dextrose or NPO.
2. Order Baseline Hemoglobin A1c
3. Start insulin on any patient with a random BG > 200mg/dL or a pre-prandial BG > 180 mg/dL x 2 readings within 24 hours. Use insulin both basal (on **all** patients) and prandial (only with meals). Choose supplemental insulin algorithm (order the same insulin as prandial) according to daily insulin requirements (see below).
4. Targets are **BG 140-180mg/dL** pre-prandial and fasting periods. Stable patients with low risk of hypoglycemia can be kept in the 110-140 mg/dL range.
5. Reassess patients **every 24 hours** and incorporate patient's supplemental requirements into scheduled insulin by adding the total supplemental doses received over 24 hours, divide the total by 3 (i.e. 3 meals) and add each to the prandial doses

Diabetes Analog Insulin Protocol For Type 1 and Type II

Initiating Insulin **Basal** **Prandial & Supplemental (patient eating)**	▪ Total daily dose (TDD) can be calculated based on weight: **for GFR>30ml/min** calculate **0.5 units/kg/day**,**for GFR<30ml/min** calculate**0.25 units/kg/day**. One half of TDD should be basal insulin, remaining half is prandial divided by 3 into TID AC ▪ Or if patient had been on insulin at home: Discuss and verify the home dose with the patient. After verifying dose with patient add up the total daily dose and order: 50% as basal insulin (Glargine) and 50% as prandial (Lispro) divided by three (TID AC) if eating. Hold prandial insulin if NPO. ▪ Oral meds: discontinue metformin; may continue short acting glipizide if criteria not met for insulin. If criteria for initiating insulin are met, start insulin, discontinue glipizide ▪ **Begin Glargine (Lantus): Routine dose at 9:00 p.m.** **Type 2 DM**: Initial dose according to time of order placement. If order placed between: ❖ 12 noon until 9 p.m. give scheduled full dose at 9 p.m. ❖ 9 p.m. until 2 a.m. give full dose of Glargine ordered as **NOW** ❖ 2 a.m. until 12 noon give 1/3 of dose ordered as **NOW** then the **full dose** that evening at 9 p.m. **(1/3 of the dose is given once for immediate basal requirements)** **Type 1 DM**: Give the full dose regardless of the time of patient arrival ▪ **Begin Lispro (Humalog) TID AC Prandial and Supplemental:** If pre-prandial BG is not at goal, add PRN supplemental Lispro to prandial dose (see supplemental algorithms on page 3). If initiating insulin while NPO then follow guidelines below (page 2) for prolonged NPO.
Precautions:	➢ **Dose reduction of 50% is also recommended for: 1) hepatic impairment 2) hypoglycemia prone patients (i.e,weight based insulin calculated at 0.25 units/kg/day).**

	➢ **If TPN or tube feedings stopped or patient is made NPO after insulin given start D5W** ➢ **If treatment with steroid is tapered or discontinued patient will require less insulin, doses may need aggressive reduction or insulin discontinued if not required previously**

NPO & Prolonged NPO	▪ CONTINUE BASAL INSULIN ▪ PRANDIAL LISPRO INSULIN (TID AC) is held during NPO or for a clear liquid diet (Clear Liquid Diet has insufficient calories to be considered a meal and is treated the same as NPO) ▪ SUPPLEMENTAL LISPRO INSULIN: is used during prolonged NPO (miss 3 meals or more). When ordering supplemental in place of prandial insulin, the order should be every 6 hours PRN for BG>200mg/dL, begin with Low Dose Algorithm, order accuchecks every 6 hours. Recommend ordering an IV with dextrose

NPO, Tube Feeds, TPN

Tube Feedings **Or** **TPN**	▪ If continuous tube feedings or TPN is initiated and blood glucose results satisfy criteria for insulin, use initial basal dosing for Glargine and use supplemental Lispro: 1. Order Low Dose Lispro supplemental algorithm in PRN orders to be given every 6 hours for BG >200mg/dL 2. Order accuchecks to be done every 6 hours 3. Upward titrate basal insulin (Glargine) for blood glucose control by calculating the total supplemental Lispro required for 24 hours and adding 50% of that total to Glargine. ▪ If tube feedings are given per bolus then continue TID AC guidelines for Glargine and Lispro. ▪ If tube feedings or TPN are interrupted or discontinued then decrease insulin dose and/or: 1. If discontinuing tube feedings then begin IV with dextrose (D5) 2. If discontinuing TPN then begin IV with dextrose (D10) at the same rate that TPN had been given.

Supplemental Algorithm for Hyperglycemia (Lispro/Humalog) – give ***in addition*** to prandial insulin

Pre-meal BG (mg/dL)	**Very Low Dose Algorithm** <15 units insulin/day	**Low Dose Algorithm** 15-40 units insulin/day	**Medium Dose Algorithm** 40-80 units of insulin/day	**High Dose Algorithm** >80 units of insulin/day
150-199	0 unit	1 unit	1 unit	2 unit
200-249	1 unit	2 units	3 units	4 units
250-299	1 unit	3 units	5 units	6 units
300-349	2 units	4 units	7 units	8 units
>349	2 units (>400 call MD)	5 units	9 units	10 units

Insulin Adjustment Based on BG

Abnormal Blood Glucose	Insulin Dose to Adjust	Meal to Target
Pre-lunch	Pre-breakfast RA***** insulin	Breakfast or mid- morning snack
Pre-dinner	Pre-lunch RA***** insulin	Lunch +/- mid afternoon snack
Bedtime	Pre-dinner RA***** insulin	Dinner
Morning Fasting BG	Evening Glargine	Bedtime snack

*****RA = RAPID ACTING

Adjusting Basal Insulin

Blood glucose target	Glargine insulin dose adjustment
If FBG is <50 mg/dL or severe hypoglycemia event	Decrease dose by 50%
If FBG is < 50 to 70 mg/dL	Decrease dose by 20%
If FBG is 70-100mg/dL	Decrease by 10%
If FBG is >180mg/dL and < 200 mg/dL and no hypoglycemic episodes	Increase dose by 10% of the previous dose
If FBG is > 200 mg/dL and <250 mg/dL and no hypoglycemic episodes	Increase dose by 20% of the previous dose
If FBG is > 250 mg/dL and no hypoglycemic episodes	Increase dose by 30% of the previous dose

Adjusting Prandial Insulin

Prandial insulin is adjusted according to the amount of supplemental insulin given the day before. If the pre-prandial BG is > than 150mg/dL and the patient was given supplemental doses of insulin the day before, the total of all supplemental doses from the day before will be divided by 3 and added to each prandial dose of insulin.

If no supplemental dose was given the day before and the non-fasting pre-prandial blood glucose is above 150mg/dL, the prandial dose may be increased by 10% of the previous dose. Please ensure supplemental is given.