

GLYCEMIC MANAGEMENT POCKET CARD

ADULT INPATIENT 2016-2017: WEILL CORNELL & LOWER MANHATTAN CAMPUSES

This pocket card was developed by the Inpatient Glycemic Management Team at Weill Cornell to promote safe and effective glycemic management. This serves as a general guide and is not meant to replace clinical judgment. Doses may be adjusted as a prescriber deems appropriate on an individual patient basis.

Inclusion Criteria: Adult inpatients with Type 1 or Type 2 diabetes or “new” hyperglycemia as defined below

GENERAL PRINCIPLES

- Hyperglycemia in the inpatient setting is associated with poor outcomes. Both hyperglycemia (blood glucose > 180 mg/dL) and hypoglycemia (blood glucose < 70 mg/dL) require identification and appropriate management whether the patient has diabetes or new hyperglycemia. Persistent hyperglycemia (BG > 180 mg/d x 2 in 24 h) requires both BG monitoring and insulin therapy. Oral hypoglycemics are generally inappropriate in the inpatient setting. Consider use in clinically stable patients eating regular meals and without contraindications close to day of discharge. Many hospitalized patients have co-morbidities, procedures and nutritional states that contraindicate the use of oral hypoglycemics. Insulin therapy is the preferred method for achieving glycemic control for most patients in the hospital.

NYP Glycemic Goals Guidelines

Blood glucose (BG) goals should be individualized to the patient. Consider less restrictive goals for patients at risk of hypoglycemia (e.g., elderly, renal and hepatic impairment)

Location	BG Goals (mg/dL)
Non-ICU	
• Pre-meal	100-140 if <i>clinically stable</i> or 140-180 if <i>clinically unstable</i>
• Other times	140-180 for most patients
ICU	100-140 or 140-180
Peripartum Insulin Infusions	80-120

Blood Glucose (BG) MONITORING AND DIAGNOSIS

- Obtain A1c for all patients with diabetes and those with new hyperglycemia (BG >140 mg/dL x2 in 24 hours) if none available from previous 2 months. A1c > 6.5% considered diagnostic of diabetes, 5.7-6.4% indicates high risk of diabetes. All patients with history of diabetes, new hyperglycemia (BG > 140 mg/dL x2 in 24h) and patients on therapies associated with hyperglycemia e.g. enteral or parenteral feedings, corticosteroids or octreotide, need BG monitoring before meals and at bedtime or q6 hours if NPO. May discontinue BG monitoring in patients with new hyperglycemia or therapies associated with hyperglycemia if all BGs <140 mg/dL for 48 hours.

BG ASSESSMENT AND INSULIN SUBCUTANEOUS DOSE ADJUSTMENTS

- Evaluate blood glucose levels and insulin usage daily: See Glycemic Control section in DataVis tab in Allscripts
- If not at goal, adjust insulin every 24-48 hours
- If 2 or more fasting blood glucoses (FBG) not at goal (BG 100-180 mg/dL): Adjust glargine
- If 2 or more pre-lunch, pre-dinner or bedtime BGs not at goal (BG 100-180 mg/dL): Adjust aspart
- For continuous enteral tube feedings: Adjust both basal (glargine or NPH) and bolus (aspart) by same amount (%).

Dose Adjustment Guideline Table

Step 1: Dose adjustments based on BG Step 2: How to increase aspart insulin dose when **High Dose Order Set** is not enough

BG (mg/dL)	Dose adjustment	High Dose prandial aspart: starting dose, +10%, +20%			
		BG (mg/dL)	Starting dose (units)	+10% for BG 180-250 (units)	+20% for BG >250 (units)
<50	Decrease by 50%*	70-100	2	3	4
		101-150	6	7	8
		151-200	8	9	10
50-69	Decrease by 20%*	201-250	10	11	12
		251-300	12	13	14
		301-350	14	15	17
70-99	Decrease by 10%*	351-400	16	18	19
		>400	18	20	22
		Bed Time aspart			
100-180	No changes	70-199	0	0	0
		200-250	0	0	0
		251-300	0	2	3
181-250	Increase by 10%**	301-350	4	5	6
		351-400	6	7	8
		>400	8	9	10
>250	Increase by 20%**				

*Determine root causes of hypoglycemia to reduce risk.

**Caution with patients with renal/hepatic impairment, elderly or Type 1 DM: use smaller dose increases.

Patients with End Stage Renal Disease (ESRD)

- Have significantly decreased insulin requirements due to prolonged insulin actions
- Are at increased risk for hypoglycemia, particularly in the fasting state
- For insulin naive patients, initial insulin glargine starting dose should not exceed 0.1 units/kg (very low dose order set)

DIABETES/ENDOCRINE CONSULT

REQUIRED	STRONGLY CONSIDER
<ul style="list-style-type: none"> Patients with own insulin pump mandatory Endocrine consult consult Maternal Fetal Medicine for pregnant patients 	<ul style="list-style-type: none"> For patient who wish to self-manage diabetes in hospital Patients with total pancreatectomy Patients with Type 1 DM: Newly diagnosed, poorly controlled, on steroids, on tube feeds, recurrent DKA <ul style="list-style-type: none"> Difficult to control Type 2 DM

NYP/WC: Endocrine fellow: 746-9589 **Diabetes NP Weill Cornell:** Pager 30020 **NYP/LMH:** Diabetes NP: Pager 21629

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DIABETES MEDICATION ADJUSTMENT GUIDELINES PRIOR TO PROCEDURE AND SURGERY

Medications	Day Before Procedure/Surgery	Day of Procedure/Surgery
Oral sulfonylureas: Glyburide (Micronase [®]), glipizide (Glucotrol [®]), glimepiride (Amaryl [®])	Take only morning and/or lunch doses	None
Sodium-Glucose Co-Transporter 2 Inhibitor (SGLT-2): canagliflozin (Invokana [®]), dapagliflozin (Farziga [®]), empagliflozin (Jardiance [®])	Stop taking any medications including combinations containing SGLT-2s 3-5 days before surgery or procedure	None
All other oral agents	Take usual dose(s)	None
Non-insulin injectables: GLP-1s: albiglutide (Tanzeum [®]), dulaglutide (Trulicity [®]), exenatide (Byetta [®] , Bydureon [®]), liraglutide (Victoza [®])	Take usual dose(s)	None
Rapid/Short acting insulins: Regular (Humulin [®] R, Novolin [®] R), Lispro (Humalog [®]), Aspart (Novolog [®]), Glulisine (Apidra [®])	Before meals: Take usual dose No bedtime dose	None
Insulin NPH Humulin [®] N, Novolin [®] N	Morning dose: Take usual dose Dinner/bedtime dose: Type 1 DM: Reduce dose by 20% Type 2 DM: Reduce dose by 30%	Type 1 DM: Reduce dose by 30% Type 2 DM: Reduce dose by 50%
Long-acting basal insulin U100 glargine (Lantus [®]), U100 detemir (Levemir [®]), Longer-acting basal insulin U300 glargine (Toujeo [®]), U100 & U200 degludec (Tresiba [®])	Long-acting basal: Morning dose: Take 100% Dinner/bedtime dose: reduce by 20% Longer-acting basal: Reduce AM and/or PM dose by 20%	Type 1 DM: Reduce dose by 20% Type 2 DM: Reduce dose by 50%
Pre-Mixed Insulin Humulin [®] 70/30/Novolin [®] 70/30, Novolog [®] Mix 70/30, Humalog [®] Mix 75/25, Humalog [®] Mix 50/50	Ask patient to contact PCP or endocrinologist OR Morning dose: Take 100% Type 1 DM: Reduce dinner dose by 20% Type 2 DM: Reduce dinner dose by 30%	Ask patient to contact PCP/endocrinologist OR Type 1 DM: Reduce dose by 50% Type 2 DM: Do not take
Insulin Pumps	Ask patient to contact PCP/endocrinologist for orders, otherwise reduce all basal rates by 20% for outpatients. Endocrine or Maternal Fetal Medicine consult mandatory for all inpatients	

DISCHARGE PLANNING

- If A1c on admission is at goal (<7% for most patients), consider discharging patient on home diabetes regimen; **evaluate new medical conditions and medications that may prevent the use of certain agents or require dose adjustments.**
- If A1c on admission is above goal, consider maximizing diabetes home regimen and/or adding insulin(s) depending on patient ability to perform self-care safely.
- Initiate diabetes education by RN as needed early in the hospital stay especially if blood glucose monitoring and/or insulin therapy is a new skill or regimen has been intensified. Call Diabetes NP if patient is having difficulty learning.
- **Recommend contacting outpatient provider to communicate diabetes discharge regimen and schedule f/up.**

Transition Guide For Patients From Inpatient to Outpatient Regimen

A1c < 7%	A1c 7-9%	A1c > 9%
Return to same home regimen unless contraindicated	Restart home regimen if not contraindicated, keep basal at 50-100% of inpatient dose	Best option: Basal insulin at 75-100% of current dose & bolus insulin with meals at fixed or calculated dose Other options: <ul style="list-style-type: none"> • Basal Plus: basal insulin + bolus insulin at largest meal • Pre-mixed insulin before breakfast & dinner • Basal insulin once daily + repaglinide with meals • Basal insulin once daily & GLP-1 injectable daily or weekly to cover prandial needs
Basal insulin: U100 & U300 glargine, U100 detemir, U100 & U200 degludec Bolus insulin: aspart, lispro, glulisine Pre-Mixed insulin analogs: 70/30, 75/25, & 50/50		

Ordering Insulin & Diabetes Supplies in RX Writer: Check Edit & free text for all supplies EXCEPT Insulin Pens.

Drug Search Term	Instructions
BOLUS: NovoLog Flexpen [®] or Humalog KwikPen [®]	Take (range, up to) _____ units before meals
BASAL: Lantus [®] U100 or Toujeo [®] U300 Solostar Pen [®] or Levemir [®] or Tresiba [®] U100 or U200 FlexTouch Pen [®]	Take _____ units at _____ AM/PM OR
PREMIX: NovoLog Mix 70/30 Flexpen [®] or Humalog Mix 75/25 KwikPen [®]	Take _____ units at _____ AM and
NPH: Humulin N Kwik Pen [®]	Take _____ units at _____ PM
BD Nano 4mm or DUO (safety) pen needles	Dispense #100 (or #200) use as directed
BD Ultrafine 6 mm 1/2 ml insulin syringe (Holds up to 50 units)	Dispense #100 (or #200) use as directed
BD Ultrafine 6 mm 1 ml insulin syringe (Holds up to 100 units)	Dispense #100 (or #200) use as directed
Accu-Chek Connect, Bayer Contour Next EZ, FreeStyle Freedom LITE OR OneTouch Verio IQ blood glucose meters	Dispense: 1 meter, use as directed
Accu-Chek Connect, Bayer Contour Next EZ, FreeStyle Freedom LITE OR	Test BG ____ x/day,