

Inpatient Diabetes Management

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Oral meds Ask them: *What do you do with oral diabetes meds at admission?*

We typically hold them, replace with insulin (but remember to resume them at discharge if appropriate)

Metformin can cause lactic acidosis (very rare but dangerous when it happens), more likely if AKI or hemodynamic changes

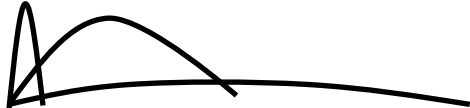
Sulfonylureas can cause hypoglycemia, especially if NPO

Not a lot is known about the newer agents, but they are typically held.

Types of Insulin: *I draw the table and complete the first 2 columns. They help me complete the rest of the table (note: this table presents simplified numbers).*

	Type	Examples	Onset (hr)	Peak (hr)	Duration (hr)
Bolus	Short-acting	Regular Aspart Lispro Glulisine	15-30 min	1	3
Basal	Medium-acting	NPH	2	6	24
	Long-acting	Glargine Detemir	2	none	24

Draw this to visually illustrate the difference between types:



Ask them: Based on the chart, if a patient has DKA and you're converting from a continuous insulin drip to glargine, how long do you need to overlap? (1-2 hours)

Insulin regimens:

If on insulin at home, you can either continue it as prescribed or reduce the dose.

If not on insulin, here are your options. *Ask them: what the pros and cons are of each?*

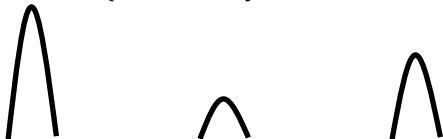
Prn only ("sliding scale insulin," or "correction factor")

Pros: doesn't require much thinking, easy to give minimal or no insulin

Cons: always playing catch-up (that is, glucose is already high when it's given)

Conclusion: only use if minimal needs or for a short time to gauge needs

(Remember you can't use this in type 1; you always need to have some basal)



Basal (+prn)

Pros: easy to order and administer, always have some insulin present

Cons: does not account for mealtime surges

Conclusion: reasonable choice as long as the control remains good

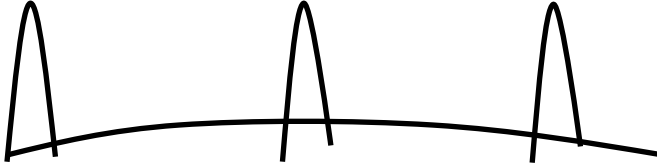


Basal/bolus (+prn)

Pros: best matches physiologic glucose changes, provides tightest control

Cons: regimen a little more complicated to prescribe/adjust, multiple injections for the patient

Conclusion: probably optimal for most, especially if uncontrolled at baseline or with above regimens



Dosing

Basal/bolus

Total daily dose insulin: 0.2-0.5units/kg/day (depending on blood glucose)

If elderly or CKD, use lower end

If significantly uncontrolled, use higher end

Divide this into 50% basal and 50% bolus

Divide bolus into thirds for each meal

I demonstrate this on 60kg person:

Using low-end (0.2u/kg): total daily dose is 12, 6 is basal, 6 is bolus (2 for each meal)

Basal only: 10 units or 0.2units/kg

Adjusting the regimen

Ask them: what's our goal? (typically premeal <140 and random <180)

Ultimately we want to balance hyperglycemia (worsening infection, diuresis) with hypoglycemia

Ask them: what do we do if the glucose values are too high on basal/bolus?

If morning value high, increase basal

If premeal value high, increase bolus (for all three meals or just the preceding one)

Case Answers *You can distribute the scenarios and let each person attempt one or discuss them all as a group.*

1. Hold oral meds, start insulin, basal or basal/bolus, use low end of scale given age and new to insulin
(calculate doses together: 9 units glargine, 3 units aspart with each meal)
2. Keep it the same unless he's found to be uncontrolled (increase overall insulin)
3. Keep glargine, hold aspart since she'll be NPO
4. Increase glargine (eg, 12 units)
5. Separate the basal (NPH) from the bolus (regular), change basal to glargine to avoid peak, could consider decreasing basal dose, hold bolus since she'll be NPO

Reference: Management of Hyperglycemia in Hospitalized Patients in Non-Critical Care Setting: An Endocrine Society Clinical Practice Guideline. *J Clin Endocrinol Metab* 97: 16-38, 2012.

Cases for Discussion

1. 72yo M (88kg) admitted for decompensated heart failure. On metformin 500mg BID and glipizide 5mg daily at home.
2. 57yo M (95kg) admitted for pneumonia. On detemir 10units QHS and lispro 5units QAC at home.
3. 49yo F (79kg) with DM-1 admitted with pancreatitis. On glargine 20units QAM and regular 8units QAC at home.
4. 63yo M (110kg) admitted with PE. On glargine 10units QPM and aspart 4units QAC in hospital. Fingersticks before meals have been 206 (breakfast), 148 (lunch), 156 (dinner), 168 (bedtime).
5. 45yo F (67kg) with upper GI bleed. On insulin 70/30 15units BID at home.