

# Understanding Inpatient Diabetes Management on the Medical Teaching Unit

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## Introduction

- Optimizing glycemic control is an important component of inpatient care
- Coordinating prandial insulin delivery with meal time is difficult for nursing staff
- There are two groups of prandial insulin with different pharmacokinetics that need to be timed differently with meals
  - Regular insulin must be given 30 min before meals
  - Insulin analogues should be given with the first bites

## Methods

- Create a process map encompassing the role of nursing, food services, pharmacy and physicians in the planning and delivery of insulin to medical inpatients
  - Shadowed several members from above services
- Conduct informal interviews with involved staff members to gain feedback and further insight into the process
- Clarify identified barriers
  - Recorded meal tray delivery times to determine how variability in predicting meal times impacted delivery

## Nursing feedback

“I measure blood sugar when I take vitals. No matter when the insulin is ordered, I don't think it's safe to give insulin before the meal trays arrive because you never know when they will arrive. Also, your patient might be taken for a test during the meal time. And they're sick, so they might vomit, or decide not to eat, or only eat half of their meals.”

“As soon as I hear the trays arrive on the unit, I take their blood sugar, and calculate the insulin ordered. Then once the tray is in front of them and they're planning on eating, I give the insulin. It doesn't matter how the insulin is ordered.”

“It's not safe to give insulin before you know that the patient is actually going to be able to eat on time. None of us do it, no matter what the order says. If the patient doesn't eat or the meal is late, you'll be checking the sugar all day and giving juice”.

## Key Lessons learned:

- Humulin R and Novolin R are currently not being administered appropriately on our medical teaching unit
- Meal times are reasonably predictable
- Safety is a key concern

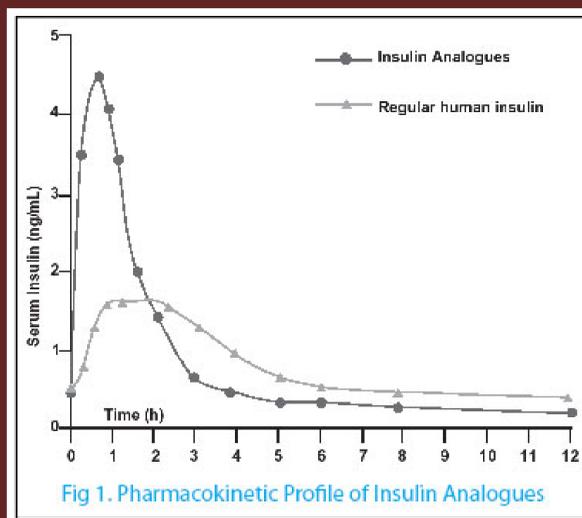


Figure: The onset of and duration of insulin analogues is different than regular insulin. Insulin analogues have quicker onset of action and higher peak, and should be given with the first bites of a meal. Regular insulin takes 30 minutes to reach peak effect and need to be give before meals.

## Improvement-related question

What steps are involved in the process of insulin administration at meal times on a medical unit, and is this process influenced by the insulin regimen for a given patient?

## Results

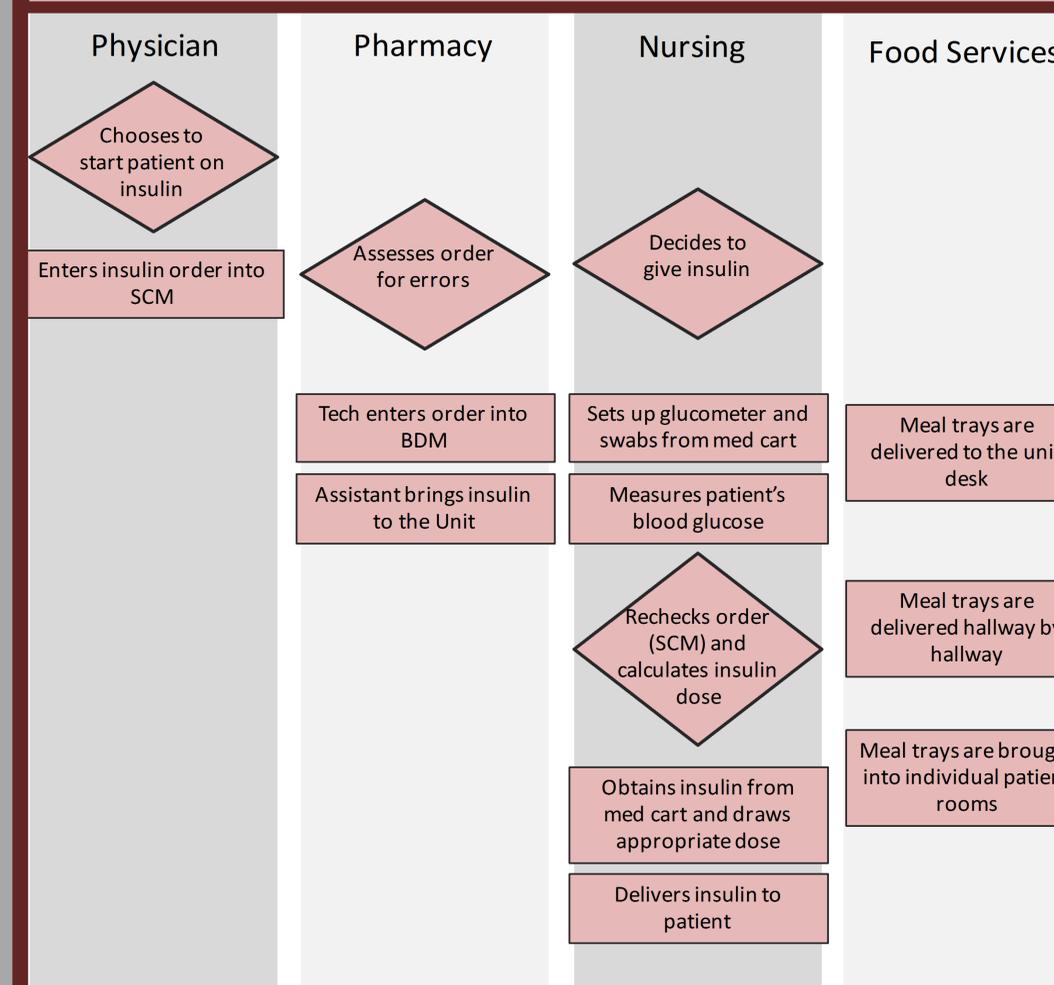


Figure: Process map of prandial insulin delivery on the medical teaching unit. Roles involved across the top.



Decisions



Actions

## Future Directions

- Announce meal tray arrival times overhead or over Vocera
- Provide education to nursing staff around insulin pharmacokinetics and the rationale for dosing of different insulin preparations
- Encourage MDS to utilize rapid acting insulin regimens when possible



Figure. In response to nursing feedback that meal delivery is unpredictable, we measure delivery times over a two week period. The standard deviation for delivery time was 6, 7, and 8 minutes for breakfast, lunch and supper trays.