

Inpatient Diabetes Management on a Medical Teaching Unit

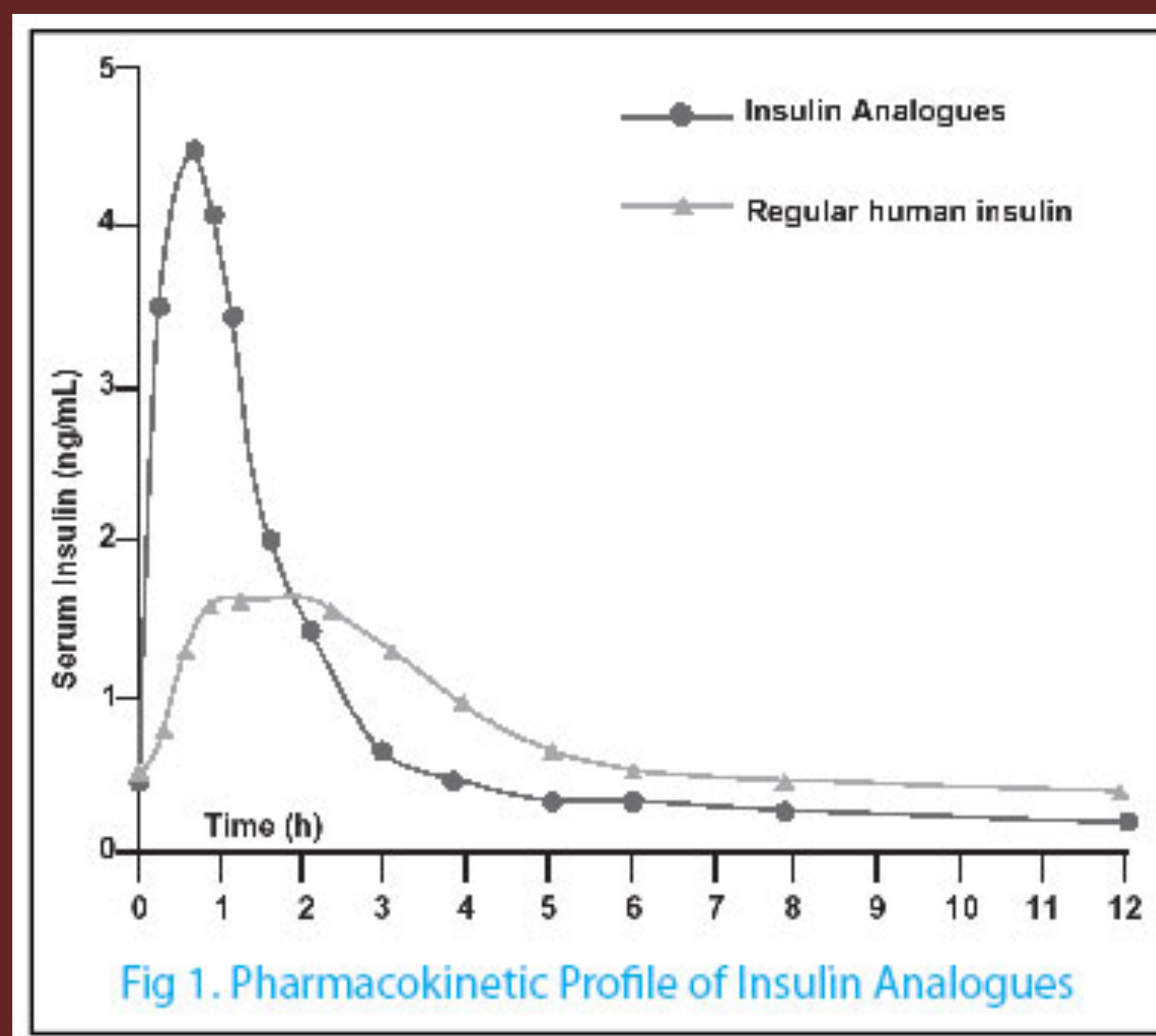
Shannon Ruzycki, Kirstie Lithgow
& Kara Nerenberg
Department of Medicine, University of Calgary

Introduction

- Optimization of **glycemic control** improves inpatient health outcomes
- A common **challenge** for inpatient diabetes care is the coordination of prandial insulin delivery with meal time
- This may, in part, be related to the **different pharmacokinetics** of prandial insulins that have different timings in relation to meals
 - **Regular insulin:** given 30 min before meals
 - **Rapid acting insulin:** given with the first bites

Improvement-related questions

1. What steps are involved in the process of insulin administration at meal times on a medical unit?
2. Is this process influenced by the specific type of insulin?



Rapid-acting insulins have quicker onset of action and higher peak than regular insulin, and should be given with the first bites of a meal. Regular insulin takes 30 minutes to reach peak effect and needs to be given before meals.

Seshiah and Balaji 2009

Methods

- **Development of a process map** encompassing the roles of nursing, food services, pharmacy and physicians
 - Shadowed several members from above services to determine step by step process
- **Informal interviews** with involved staff members to gain feedback and further insight into the process and challenges
- **Detailed description of identified barriers**
 - Recorded meal tray delivery times to determine how variability in predicting meal times impacted delivery

Results

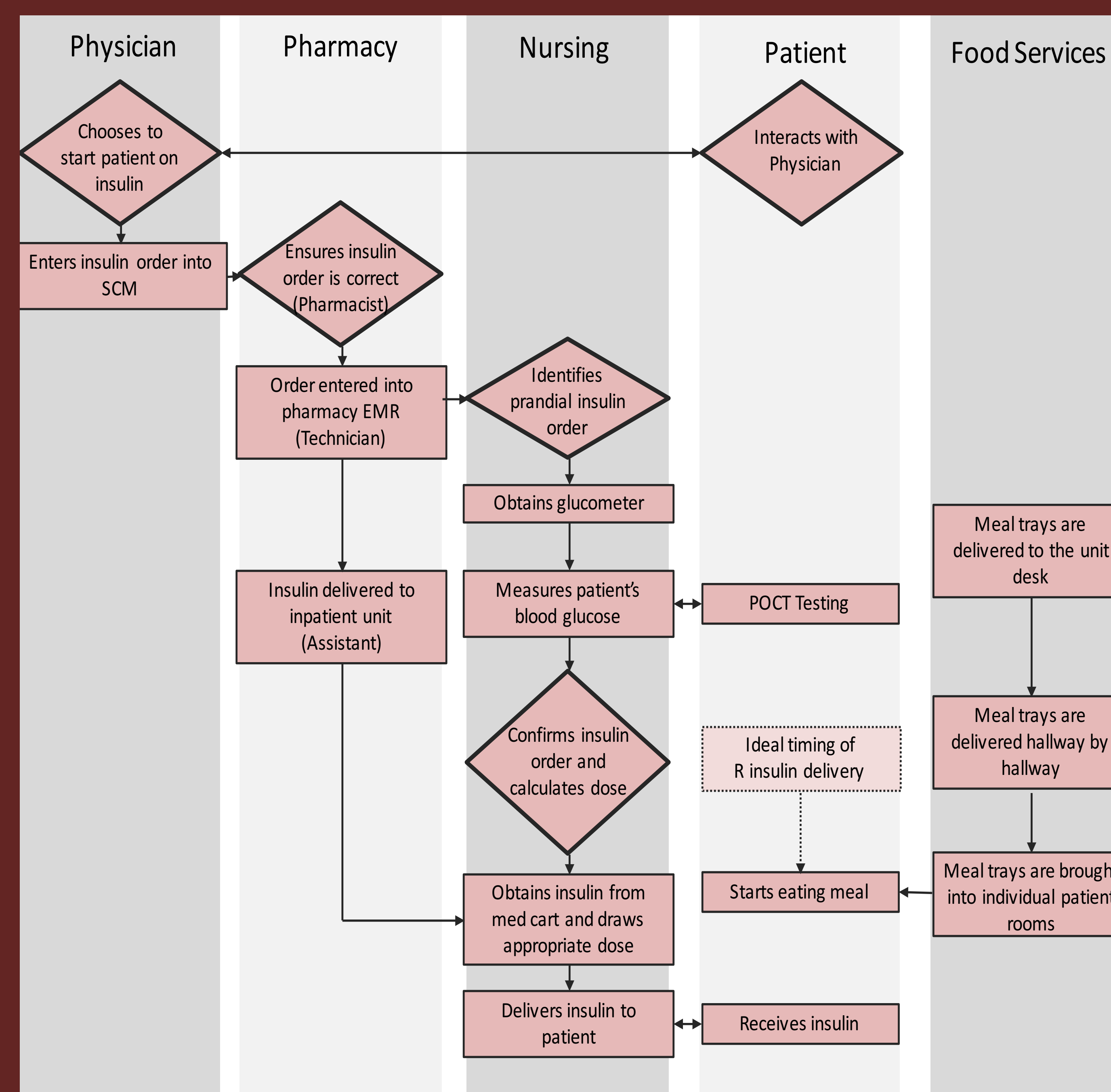
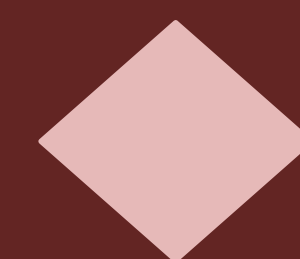


Figure 2: Process map of prandial insulin delivery on the medical teaching unit. Interdisciplinary team members involved represented across the top. SCM=Sunrise Clinical Manager, our institution's electronic health record.



Decisions



Actions

Nursing feedback on insulin delivery

RN	Comments	Themes
1	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 mealtime. And they're sick, so they might vomit, or decide not to eat, or only eat half of their meals.	Safety Mealtime Variability
2	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.	Safety Unit Culture Mealtime Variability
3	I understand the different types of insulin and the orders and everything, but when we are on the unit we are taught to wait until the patient is eating to give insulin for safety.	Safety Unit Culture
4	No one on the unit gives insulin before the meal tray is here because it isn't safe. It's dangerous to give a bunch of insulin and then wait for an hour for the food.	Safety Unit Culture Mealtime Variability

Mealtray Delivery Times

Meal	Tray delivery	Meal tray delivery times were tracked over a 14-day period on the MTU (mean and standard deviation)
Breakfast	8:46 ± 6 minutes	
Lunch	12:46 ± 7 minutes	
Supper	17:56 ± 8 minutes	

Key Lessons:

- Regular and rapid-acting insulins are administered with the same timing on the MTU
- This is primarily due to RN concern of delayed meal delivery and risk of hypoglycemia
- Meal times are reasonably predictable
- Safety is a key concern

Future Directions

- Implement a strategy to simplify insulin regimens through using only rapid-acting for prandial & correction insulin
- Provide education to stakeholders about rationale and expected benefits
- Evaluate this strategy's impacts on glycemic control (hyper/hypoglycemia) using a pre/post design