SAFE USE OF INSULIN

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INTRODUCTION

- Insulin is a hormone produced by the beta cells in the pancreas, it is released when blood glucose levels are raised for example after a meal.
- Insulin regulates the amount of glucose in the blood and is required for the body to function normally.
- Insulin in used to treat people with type 1 and type 2 diabetes and it is estimated that about 30% of people with diabetes are treated with insulin injections.

MONITORING

- Monitoring of blood glucose levels is vital in people with diabetes who are in hospital as acute illness or surgery can cause blood glucose levels to rise and insulin doses may need to be reviewed.

HIGH RISK

- Insulin is frequently referred to as a high risk medicine and insulin errors are commonly identified as a cause for hospital admissions or increased length of stay in hospital.
- The most common errors are:
  - The wrong type of insulin being prescribed/given
  - The wrong dose of insulin being prescribed/given
  - Insulin doses being given at the wrong time or omitted
- Some recent incidents

- “I realised I had made an administration error the day prior when a senior registered nurse was checking the insulin and said Penmix 30 was not the right insulin to give as Novomix 30 was charted. It was then I realised I had given the patient the wrong medications. I had given Penmix 30 the day before instead of Novomix 30 which was charted”

- “Our patient was transferred from a different ward last night. I noticed the patient’s insulin pen was incorrect. The patient had been given Novomix 30 and was self-administering despite Novorapid being charted”

- “I drew up and administered Novorapid instead of Novomix. My patient became hypoglycaemic and I had to get in contact with the house officer and nurse in charge to inform them of my mistake and assist in treating the patients hypoglycaemia.”

- “The patient was charted Novomix 30 units subcut BD. Unfortunately it is documented the patient received Protaphane 24 units subcut nocte. The patient became hypoglycaemic overnight. Appropriate treatment was initiated and the medical team and charge nurse were aware of the event.”

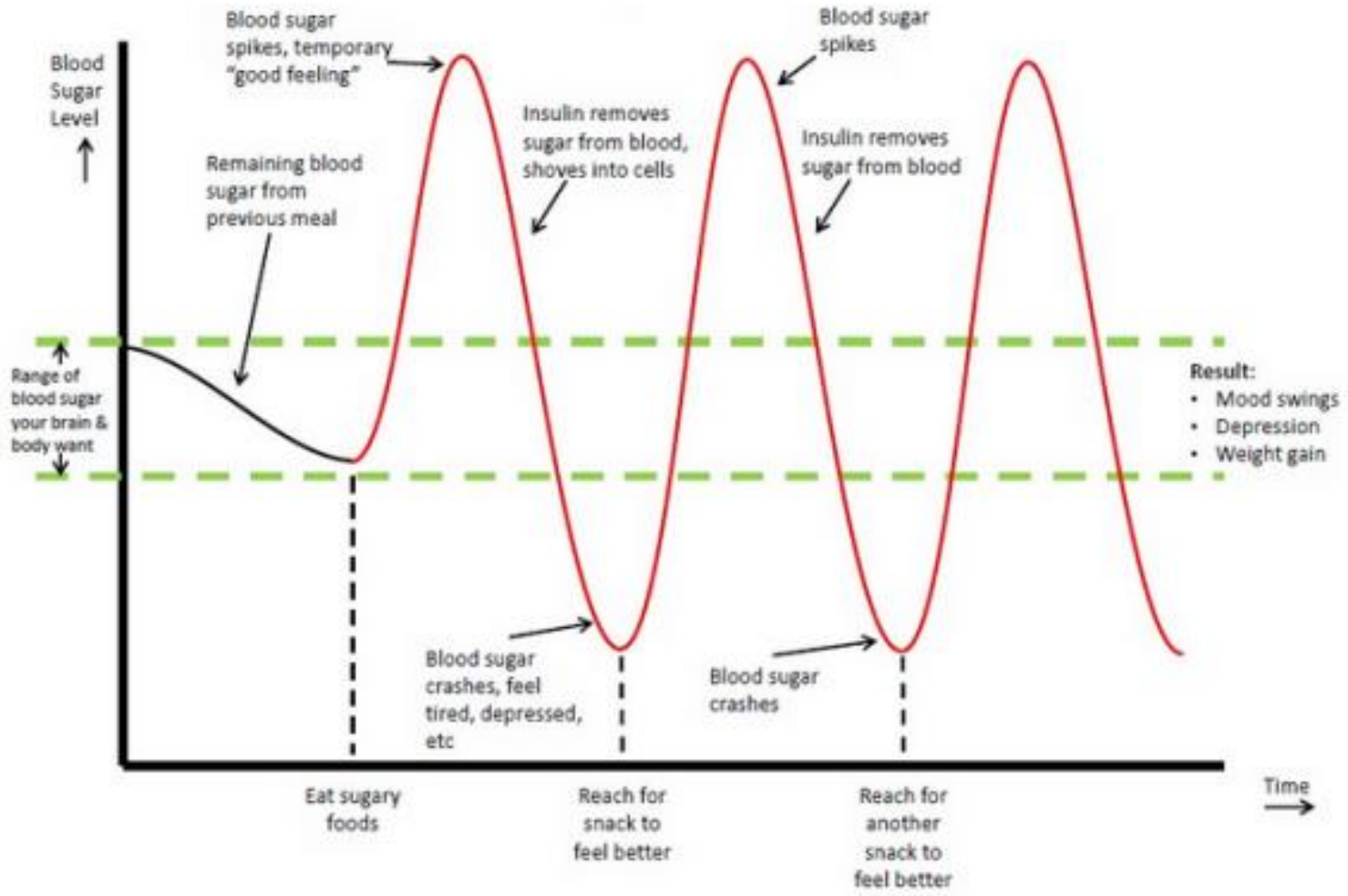
- “The patient was due for his mane insulin, upon checking his insulin pen, I noticed that Humalog 100units/mL was inserted instead of the prescribed Humalog Mix 50. The patient reported that it was replaced by his previous nurse and had already been administered to him twice.”

- “The patient was administered a 10 x overdose of her prescribed insulin – it was identified that nursing staff were unaware of the differences between an insulin syringe and a normal syringe.

IMPORTANT

- Throughout New Zealand there are currently over 15 different insulins that are in use in hospital settings as well as the community – many have similar sounding names, however they differ in how quickly they act and how long they act for.
- Some insulins need to be given in relation to food, e.g. rapid, short or premixed insulin
- Some insulins need to be administered to reduce persistent hyperglycaemia – these don't need to be administered with food.
- Timing is crucial if insulin is to be effective!

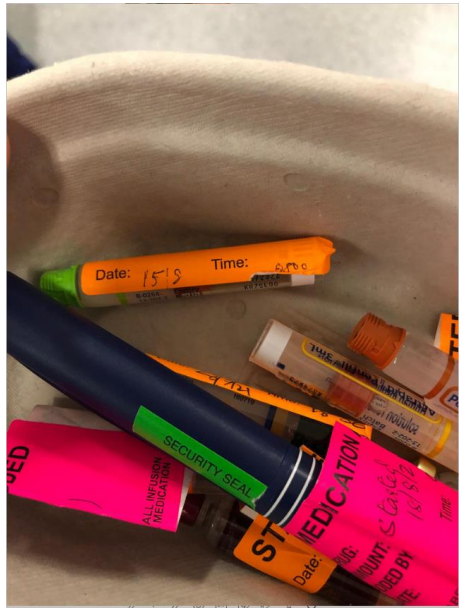
WHY ARE WE GIVING THIS AT THIS TIME?



BE AWARE OF YOUR EQUIPMENT

- Always utilise an insulin syringe or pen when administering insulin.
- A 1mL syringe can cause a 5-10 fold overdose of insulin.

STORAGE!!



CRITICAL THINKING

- Patients blood sugar pre-breakfast is 5.3
- They are allowed to eat and drink and they are eager to start their meal
- They have their regular insulin charted

- To give or not to give?

CHARACTERISTICS OF INSULIN

- **Onset** – the length of time before insulin reaches the bloodstream and begins lowering the blood sugar.

- **Peak** – the time during which insulin is at maximum strength in terms of lowering the blood sugar.

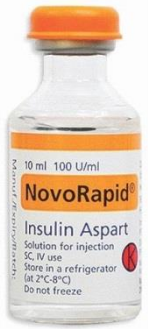
- **Duration** – how long insulin continues to lower the blood sugar

RAPID OR FAST ACTING INSULIN

- Acts quickly to minimise the rise in blood sugar which follows eating.

Onset	Peak	Duration
10-30 minutes	1-3 hours	2-5 hours

- Given **immediately** before meals
- To cover insulin needs for meals eaten at the same time or within 15 minutes of injection.
- Usually used in conjunction with a longer-acting insulin.
- Overnight correctional insulin



A FUN WAY TO REMEMBER…

- Most students pay attention in class for the first **10-30 minutes,** but they are ready for a break after **1-3 hours.** Their teachers expect their full attention for **2-5 hours.**

Onset	Peak	Duration
10-30 minutes	1-3 hours	2-5 hours

SHORT ACTING INSULIN

- Takes longer to start working than rapid-acting insulins

Onset	Peak	Duration
30 minutes	1.5-5hours	6-12 hours

- Short acting begins to lower blood glucose levels within 30 minutes, so you need to administer 30 minutes before eating.
- To cover insulin needs for meals eaten within 30-60 minutes.

AN EVEN FUNNIER WAY TO REMEMBER

- When Rachel goes for a run she can only last **30 minutes.** It takes her **1.5 - 5 hours** for her heart rate to return to normal and the lactic acid in her legs builds up after **6-12 hours**.

Onset	Peak	Duration
30 minutes	1.5-5hours	6-12 hours

INTERMEDIATE ACTING

- Usually administered morning and evening
- To cover insulin needs for about half the day or overnight
- Can often be used in conjunction with a rapid or short acting insulin.

Onset	Peak	Duration
1-2 hours	4-12 hours	14-24 hours

- **Don’t forget your 0200 BSL check**

REALITY…..

- It can take me **1-2 hours** to get my son to sleep. He will sleep anywhere between **4-12 hours** and then be ready to play for the next **14-24 hours.**

Onset	Peak	Duration
1-2 hours	4-12 hours	14-24 hours

LONG ACTING

- To cover insulin needs for about **one day**.
- Rapid or short acting insulin is used in conjunction when needed.
- Usually given in the morning or evening irrespective of meal times.

Onset	Peak	Duration
3-4 hours	No peak time, insulin is delivered at a steady level.	24 hours

HOW CAN WE REMEMBER THIS ONE?

- **3 or 4** climbers are better than 1 for a mountain that doesn't seem to have a peak. It may take an entire day (**24 hours**)

CRITICAL THINKING

- Knowing what you now know about insulin onset, peak and duration times:
  - Would you give the insulin to the patient with the blood sugar of 5.3 who is about to eat breakfast?

HYPOGLYCAEMIA MANAGEMENT

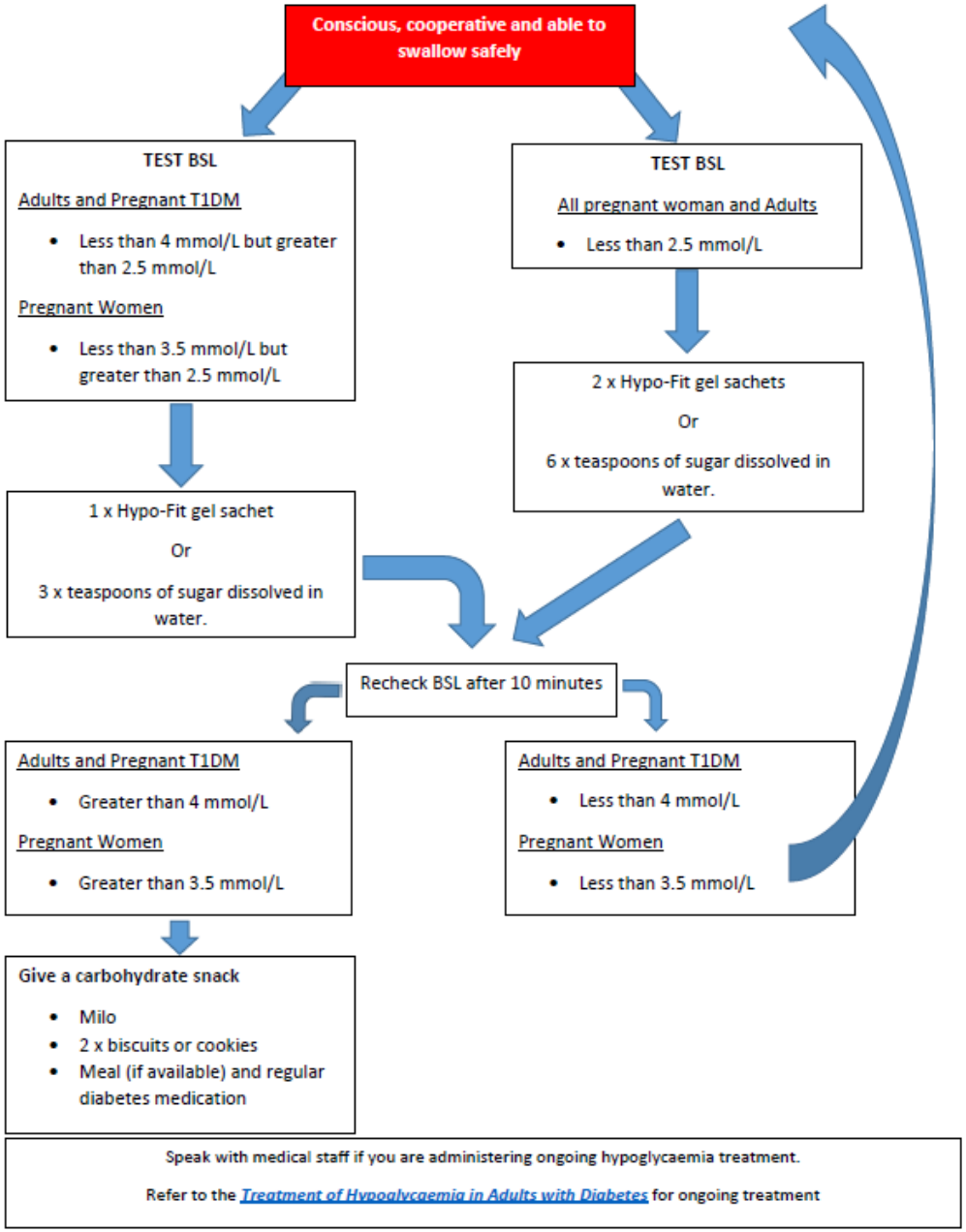
- Common causes of hypoglycaemia include:
  - Too much insulin
  - Not enough to eat
  - Poor appetite due to illness
  - Increased activity
  - A late or missed meal

- Signs and Symptoms of hypoglycaemia include:
  - Pallor, tremor and sweating
  - Nausea, palpitations and feeling anxious
  - Slurred speech, confusion, loss of concentration and drowsiness
- If left untreated hypoglycaemia can lead to loss of consciousness and seizures

HYPOGLYCAEMIA GUIDELINE

- Does your area of work have a hypoglycaemia guideline?
- Do you know it?
- Unless specifically documented as contraindicated you can initiate hypoglycaemic treatment even if not charted on the drug chart.

Treatment of Hypoglycaemia in Adults with Diabetes



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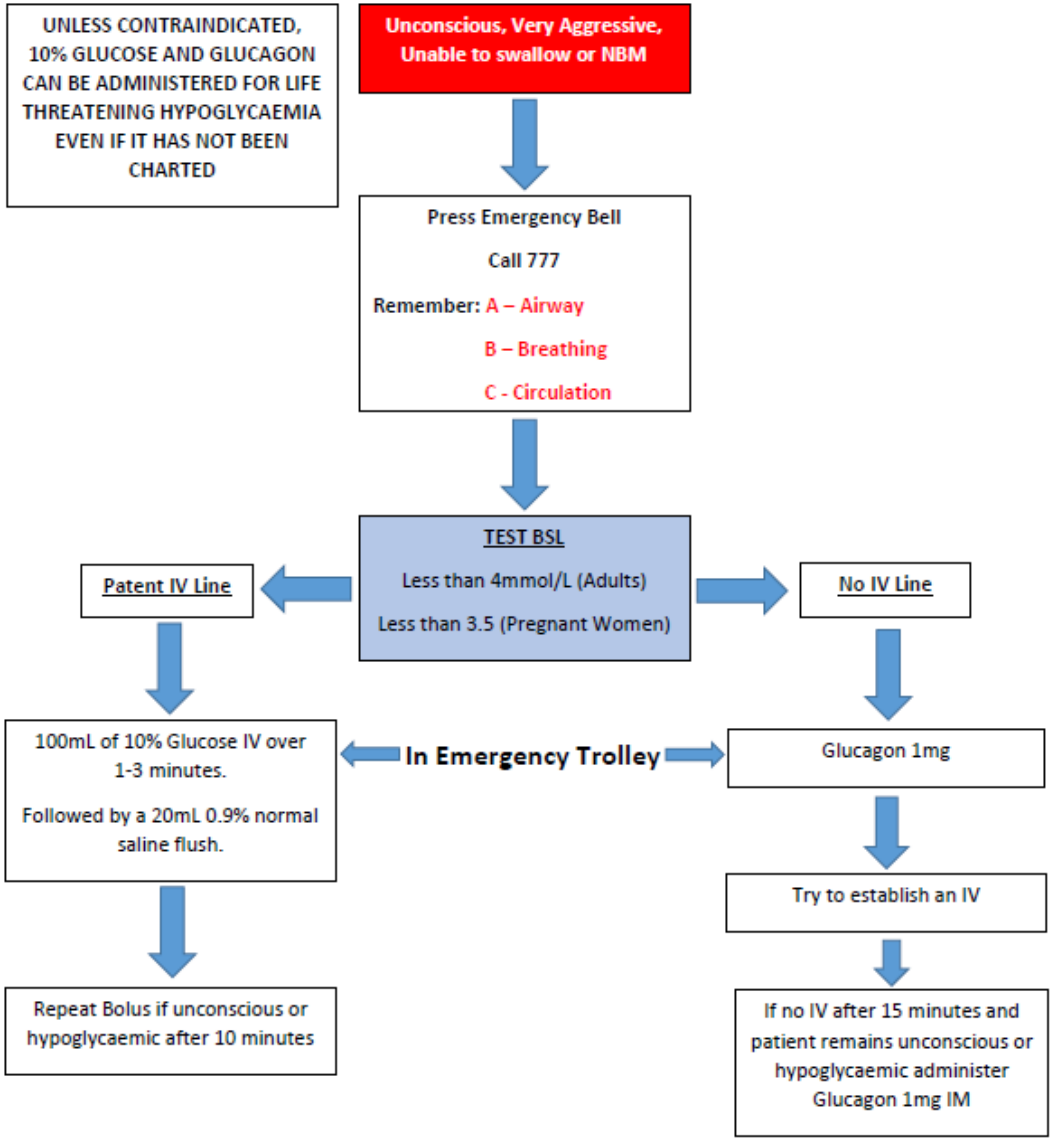


Any Questions