MOH/P/PK18.24(BUL)-e

MEDICATION SAFETY NEWSLETTER (VOLUME 1 / ISSUE 2 / 2024)

PHARMACEUTICAL SERVICES DIVISION, PERAK STATE HEALTH DEPARTMENT

MEDICATION SAFETY IN INSULIN

DID YOU KNOW?

Human insulin is designed to replace your body's natural insulin production. It's formulated as a liquid or a suspension of solids in a liquid to be injected under your skin, usually several times per day.

INSIDE THIS ISSUE:

MEDICATION ERRORS (NEAR MISS CASES) INVOLVING INSULIN

1. Patient was on **Actrapid** 16 units TDS and **Insulatard** 14 units ON but instead given **Insugen R** and **Insugen N**.
2. Patient was on **Insulatard** 6 units ON but instead given **Insugen N**
3. **Insugen 30/70 was wrongly filled for patient on Insugen N. Error was detected during dispensing before reaching the patient.**
4. **Patient previously on Basalog 22 units ON but doctor prescribed it as Insugen N 22 units ON**

FIGURE 1:
Examples of Category B Errors involving Insulin

Error Category	Description
Category A	Potential error
Category B	Near miss - did not reach patient
Category C	Actual Error - caused no harm
Category D	Error - additional monitoring required to preclude harm
Category E	Error treatment/intervention required
Category F	Error caused initial/prolonged hospitalization
Category G	Error caused permanent harm
Category H	Error caused near death event
Category I	Error caused death

FIGURE 2:
Category of Medication Errors

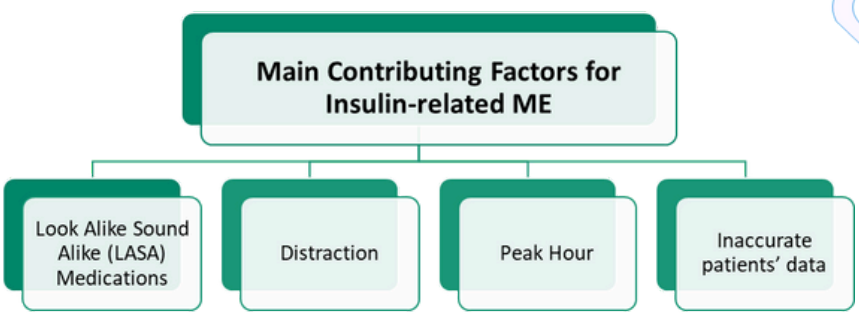


Figure 3:
Contributing factors associated with insulin-related ME at Hospital Parit Buntar in 2022

WHAT WE DID?

FIGURE 4:
Actions taken to prevent insulin-related ME at Hospital Parit Buntar in 2022

FUN FACT

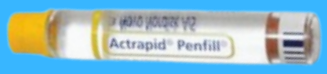
While insulin is best known and used for blood sugar regulation in diabetic patients, the hormone actually has many other functions in the body, including:

- **Promoting the storage of glucose (glycogen) in the liver and muscle tissue.**
- **Promoting fat storage in adipose tissue for later use for energy when blood sugar levels are low.**
- **Stimulating protein synthesis by facilitating the uptake of amino acids into cells.**

QUICK TIPS

- **Never store insulin in the freezer, direct sunlight, or in the glove compartment of a car.**
- **Check the expiration date before using, and don't use any insulin beyond its expiration date.**

COMPARISON BETWEEN INSULIN BRAND: BIOCON (INSUGEN) VS NOVO NORDISK

DIFFERENCES	BIOCON (INSUGEN)	NOVO NORDISK
REUSABLE PEN	Insupen 	Novopen 
MATERIAL	Made of plastic (body)	Made of metal (body)
COLOUR	Available in green color	Available in silver and blue color
DURABILITY	Designed to be used up to 3 years	Built to last up to 5 years
DOSE BUTTON	Cannot be locked	Can be locked
CATRIDGE	Metal end 	Plastic end 
VIAL FORM AVAILABILITY IN MOH	Insugen - R Insugen - N Insugen 30/70	Actrapid, Insulatard & Mixtard
COST COMPARISON (BASED ON MOH PRICE)	Higher cost	Lower cost
PRODUCTS AVAILABLE IN MOH	 Insugen-R Insugen-N Insugen - 30/70	 Actrapid Insulatard Mixtard

CHOOSING RIGHT SYRINGE

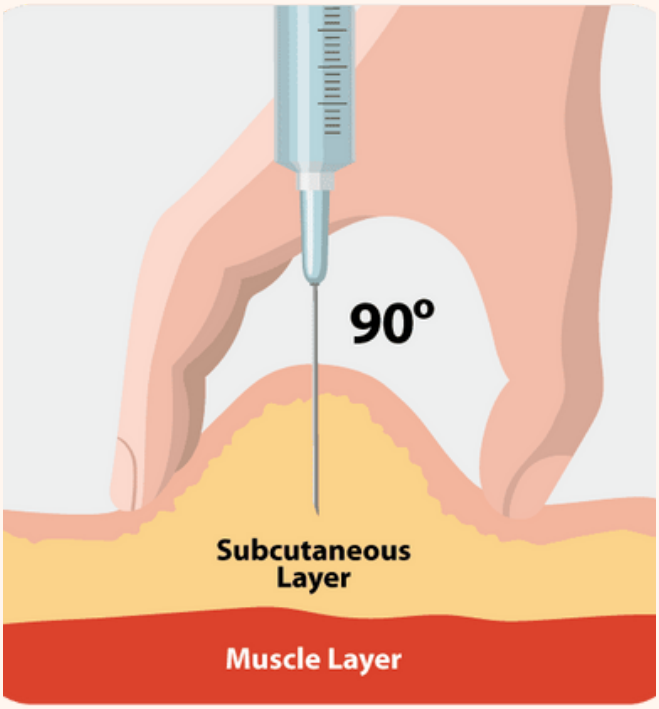
SIMILAR BUT NOT INTERCHANGEABLE

Apart from penfill cartridges, the syringe and needle is also a common administration method to allow diabetic patients to self-inject insulin into subcutaneous tissue.

Choosing the right insulin needle and syringe is important to ensure treatment effectiveness and to enhance patients' injection experience. Subsequently, this will improve patients' adherence towards insulin therapy.

There are varieties of syringes and needles available and they are intended for a specific purpose. A common misconception is that all syringes are interchangeable.

Using the wrong type of syringe can lead to inappropriate dosages, improper administration, and increased risk of complications.



Using the right needle size can improve patient injection experience because shorter needle lengths pose minimal intramuscular risk, less hypoglycaemic events and less pain.

Using a longer needle can pierce too deep, delivering an intramuscular injection. This can increase the insulin absorption potentially leading to hypoglycaemia. The amount of insulin leakage are comparable for both short and long needles.

Additionally, patients using a shorter needle experience less pain. Hence, many studies have shown that shorter, thinner-gauge needles are favoured by patients and consequently affect patients' adherence.

Studies have confirmed that needle lengths of 4mm-6mm is efficacious and safer for all adult patients regardless of the BMI.

MATCH YOUR DOSE TO THE RIGHT SIZE

0.3 mL syringes are for insulin doses under 30 units of insulin

0.5 mL syringes are for 30 to 50 units of insulin

1.0 mL are for doses more than 50 units of insulin

Use the smallest syringe that can contain your largest dose. This facilitates drawing out the accurate dose as the unit markings are more spaced out. This helps in minimizing dosing errors.

KEY DIFFERENCES BETWEEN INSULIN SYRINGE AND REGULAR SYRINGE

PARAMETERS	INSULIN SYRINGE & NEEDLE	REGULAR SYRINGE & NEEDLE
SIZE	Insulin syringes are generally smaller and hold up to 1 ml of fluid	Regular syringes can vary significantly in size
MEASUREMENT MARKING	A 1 ml syringe equivalent to 100 units of insulin	They are usually marked in mililitres
NEEDLE LENGTH & GAUGE	Insulin syringes usually have a shorter and thinner needle designed for subcutaneous injections	Regular syringes can come with a variety of needle lengths and gauges, depending on the intended use
INTENDED USE	Insulin syringe specifically designed for the subcutaneous administration of insulin	Regular syringes are used for a variety of purposes, including intravenous injections and fluid withdrawal

INSULIN SAFETY NEEDS YOU!

SAY YES TO SAFETY AND NO TO ERRORS

REFERENCES

1. Insupen Pro Ifu. (n.d.). https://www.biocon.com/docs/domestic-market-pi/metabolics/INSUPen%20Pro%20IFU.pdf
2. NovoPen® 4. Novo Nordisk. (n.d.). https://www.novonordisk.com/our-products/pens-and-needles/novopen-4.html
3. Understanding insulin syringes sizes, Healthline. https://www.healthline.com/health/diabetes/insulin-syringes-sizes
4. Nontraditional Considerations With Insulin Needle Length Selection. Diabetes spectrum : a publication of the American Diabetes Association, 28(4), 264–267. https://doi.org/10.2337/diaspect.28.4.264
5. Medication Error Reporting Syestem (MERS), Ministry of Health (MOH), Malaysia. http://mers.pharmacy.gov.my
6. Malaysian Patient Safety Goals, Ministry of Health (MOH), Malaysia. http://patientsafety.moh.gov.my
7. Ministry of Health Medicines Formulary (FUKKM) Bil. 2/2023, Ministry of Health, Malaysia.