DISCOVER THE MATHEMATICS OF INSULIN

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Mathematics of Insulin dosing

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Abbreviations

1. FPG = Fasting plasma glucose

2. TDD = Total Daily dose of insulin

3. ICR = Insulin to carb ratio

4. ISF = Insulin sensitivity factor

5. BIDose = Basal insulin dose

6. HBA1c = Glycosylated hemoglobin in %

Outpatient Type 2 Diabetes Insulin use formulae

Formula 1 - Which Insulin to Use for Type 2 Diabetes in OPD ?

$$X = \frac{\text{FPG}}{\text{HbA1c}}$$

$X < 20 - \text{Prefer premixed Insulin}$

$X \geq 20 - \text{Prefer Basal insulin}$

Formula 2.1 - Weight based basal insulin dose

$\text{Basal insulin dose} = \text{Weight in kg} \times 0.2$

Formula 2.2 - Holman-Turner formula

$$\text{Basal insulin dose} = \frac{\text{FPG} - 50}{10}$$

Formula 3 - Bolus dose calculation for Basal-plus therapy

$$\text{Bolus insulin dose} = \frac{\text{Post} - \text{meal glucose}}{36}$$

Outpatient Type 1 Diabetes management formulae

Formula 4- Total Insulin dose

$\text{TDD} = 0.52 \times \text{weight in kg}$

Formula 5- Basal dose

$\text{Basal dose} = 0.47 \times \text{TDD}$

$$\text{Basal dose} = 0.24 \times \text{Weight in Kg}$$

Formula 6.2 - Bolus dose based on Carb counting

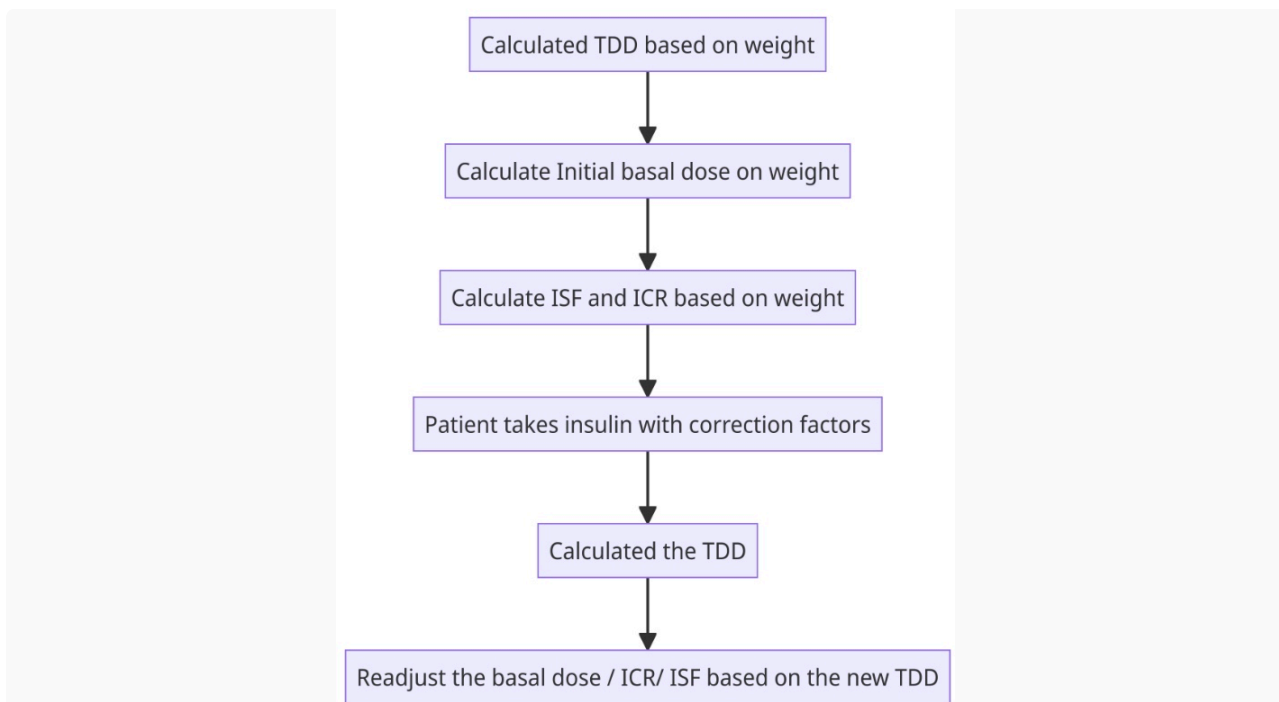$$\text{Bolus dose} = \frac{\text{Carb to be consumed}}{\text{ICR}}$$

$$\text{ICR} = \frac{(6.2 \times \text{weight in kg})}{\text{TDD over 24 hours}}$$

Formula 6.3 - Correctional insulin dose

$$\text{Correctional insulin} = \frac{(\text{Current glucose} - \text{premeal target glucose})}{\text{ISF}}$$

$$\text{ISF} = \frac{1700}{\text{TDD}}$$

Algorithm 1 For Insulin dose adjustment in Type 1 Diabetes

Inpatient ICU Insulin management

Formula 7 - Insulin infusion dosing

$$\text{Rate of infusion} = \frac{\text{blood glucose}}{100}$$

Formula 8 - Shifting from Infusion to Basal-bolus insulin

$$\text{Total subcutaneous insulin} = 0.8 \times (\text{Total insulin in last 6 hrs} \times 4)$$

$$\text{Basal dose} = 0.5 \times \text{Total subcutaneous insulin}$$

$$\text{Bolus dose before each meal} = \frac{(0.5 \times \text{Total subcutaneous insulin dose})}{3}$$

Inpatient Non-ICU Insulin management

Formula 9 - Basal insulin dose calculation- Lakhani- Kumar formula

$$\text{BIDose/kg} = 0.064 + 0.030 \times \text{HBA1c}$$

(BIDose = Basal insulin dose)

HBA1c in %

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