

SIP TDD Calculations

Method 1: Pre-SIP TDD

Method 2: Weight-based: $\text{kg} \times 0.5$ or $\text{lb} \times 0.23$

Clinical considerations on SIP TDD:

- Average values from methods 1 & 2
- Hypoglycemic patients → Start at lower value
- Hyperglycemic patients, elevated A1C, or pregnant → Start at higher value

SIP Dose Adjustment

Insulin to Carbohydrate Ratio (ICR)

$\text{ICR} = 450/\text{TDD}$

Clinical Guidelines:

- Adjust based on low-fat meals with known carbohydrate content
- Acceptable 2 hour postprandial rise is 30 mg/dL above preprandial blood glucose (BG)
- Adjust ICR in 10-20% increments based on postprandial BG

To verify ICR:

- Assess glycemic index of carbohydrate choices and macronutrient distribution (meals with >25 g of protein and >20 g of fat can raise the glucose higher than carbohydrate count would indicate)
- Optimal if glucose remains +/- 30 mg/dL of starting glucose 5 hours after dosing (preferably when there has been no bolus in the last 5 hours and no food in the last 3 hours)
- If glucose spikes after eating but returns to normal at 5 hours, ICR is likely correct. To avoid the spike, bolus earlier relative to eating or choose lower glycemic index, higher fiber, less processed carb choices or a lower carb meal
- Check each meal separately (may require different ICR at different meals)
- Keep normal routine when checking ICR; note if unusual stress, schedule changes, sleep disruptions, or illness.

Basal /Bolus Split

$\text{Starting Basal Dose} = \text{TDD} \times 0.5$

Clinical Guidelines:

- Adjust dose according to glucose trends over 2-3 days
- Adjust to maintain stability in fasting state (between meals and during sleep; < 30mg/dL change in BG)

Note:

- A basal insulin dose of >0.5 U/kg, > 50 mg/dL difference between bedtime and the next morning's AM BG value, or an absolute morning glucose level <70 mg/dL may indicate potential excess basal insulin.

To verify the basal dose:

- Have a healthy, moderate fat dinner
- Take usual doses of rapid and basal insulin
- Keep normal routine when checking basal dose; note if unusual stress, schedule changes, sleep disruptions, sickness
- Check bedtime blood glucose. If BG is <80 mg/dL, stop and treat low BG and try again another night.
- If BG is >250 mg/dL, give a correction dose of rapid-acting insulin and try again another night
- Check BG again in the morning before eating.
- If the BG rises more than 30 mg/dL, increase the basal dose by 10% and repeat the experiment.
- If the BG drops by more than 30 mg/dL, decrease the basal dose by 10% and repeat the experiment.
- Continue the experiments until the BG is steady

Insulin Sensitivity Factor (ISF)

$\text{SISF} = 1800 \text{ TDD}$

Clinical Guidelines:

- To assess ISF, BG should be checked 2 hours after correction; if BG is within 30 mg/dL of target, ISF is correct
- Make adjustments in 10-20% increments if 2 hour post correction BG is consistently above or below target

To verify ISF:

Check when glucose is >250 mg/dL and patient can wait to eat for another 5 hours

- Check BG every hour or use CGM.
- If BG < 70 mg/dL, stop the experiment and eat carbs
- Adjust ISF if needed for hypoglycemia (increase 10%) or hyperglycemia (decrease 10%) with the goal to consistently bring glucose to target within 4-5 hours without hypoglycemia

Verify Duration of Insulin Action (DIA):

- Check BG every 30 minutes after giving a correction bolus and verify when BG stops dropping.
- Patient should not eat, exercise, or take any more insulin until the BG or CGM tracing flattens

