INSULIN THERAPY FOR TYPE 2 DIABETES ALGORITHM

Expiry date: 30 June 2024

Start basal insulin

Continue lifestyle management + other hypoglycaemic agents. Refer for dietitian input.
- Consider using continuous glucose monitoring.

- Start isophane or glargine insulin at 0.1 – 0.2 units/kg nocte
- Monitor fasting blood glucose (FBG) levels + educate on how to manage hypoglycaemia
- If 3 consecutive FBG > 7 mmol/L then ↑ dose by 10% or 2 units (i.e. can ↑ dose every 3 days)
- Stop uptitration of basal insulin if any of the following occurs:
  - Hypoglycaemia (< 4 mmol/L) **OR** FBG < 7 mmol/L **OR** Doses reach 0.5 units/kg/day

Repeat HbA1c in 3 months

If target HbA1c reached → Repeat HbA1c 6 monthly

If target HbA1c not reached

Add bolus insulin OR switch to premixed insulin

Continue lifestyle management + other glucose lowering therapies
Once established, consider reducing sulfonylureas once regimen established
Consider referral to dietitian to allow matching of insulin and carbohydrate intake
The choice of bolus or premixed insulin should be based on patient data + preference
- Consider using continuous glucose monitoring

Favours basal-bolus	Factors to consider	Favours premixed
Yes	Needs flexibility for work patterns, exercise etc	No
Yes	Prefers varied diet + timing of meals	No
Yes	Will likely need rapid intensification of insulin therapy	No
Good ability	Ability to inject (e.g. cognitive ability, dexterity, supervised environment)	Reduced ability
Comfortable with more frequent monitoring	Monitoring of glucose levels	Prefers less frequent monitoring
Comfortable with more frequent injections	Number of injections per day	Prefers fewer injections

Bolus (rapid-acting insulin) / Premixed

If predominately 1 large meal per day / If multiple meals per day

Add bolus insulin with largest meal – 'basal plus'

- Start rapid-acting insulin at 4 units or 10% of basal dose
- Monitor BGLs before + 2 hours after meal
- ↑ dose by 2 units if 3 x BGL checks with meal show increase > 3 mmol/L
- Consider early addition of bolus insulin at other meals
- Can add correction doses to treat pre-meal hyperglycaemia
- NB: Doses of basal insulin may need to be ↓ to prevent hypoglycaemia, especially if HbA1c < 64 mmol/mol

Start premixed insulin with largest meal

- Convert daily dose of basal insulin to premixed insulin before largest meal
- Monitor BGLs before + 2 hours meal
- ↑ dose by 10% if 3 x BGL checks with meal show increase > 3 mmol/L AND 3 x fasting BGLs are > 10 mmol/L

Start premixed insulin with breakfast + dinner

- Convert daily dose of insulin to premixed insulin with half the dose pre-breakfast + half pre-dinner
- Consider different ratio (e.g. 2/3rd to 1/3rd) if one meal larger than other
- Monitor BGLs before + 2 hours after breakfast and dinner
- ↑ Breakfast dose by 10% if 3 x BGL checks with meal show increase > 3mmol/L AND 3 x pre-dinner BGLs are > 10mmol/L
- ↑ Dinner dose by 10% if 3 x BGL checks with meal show increase > 3 mmol/L AND 3 x pre-breakfast BGLs are > 10 mmol/L

Repeat HbA1c in 3 months

If target HbA1c reached → Repeat HbA1c 6 monthly

If target HbA1c not reached

Add bolus insulin with other meals

- Start rapid-acting insulin at 4 units or 10% of basal dose at other meals
- Monitor BGLs before + 2 hours after meals
- ↑ dose by 2 units every 3 days if BGL rise with meal is > 3 mmol/L

Repeat HbA1c in 3 months

If target HbA1c reached → Repeat HbA1c 6 monthly

If target HbA1c not reached

Tips for insulin prescribing

- Use different coloured pens for different types of insulin
- BD fine 4-5 mm needles are associated with ↑ absorption + ↓ trauma
- Change needles regularly (at least every 2nd day)
- Premixed insulin needs to be mixed by gently inverting before each use
- Encourage patients to rotate their injection sites
- Premixed + bolus insulin should be injected before meals
- Ensure adherence + check injection technique before altering doses
- Provide clear instructions for patients on how to self-titrate insulin
- Pens that use ½ unit increments are useful in insulin sensitive patients
- Memory adjuncts (e.g. NovoPen Echo, InsulCheck etc.) may be useful
- Doses of insulin may need to be reduced around exercise

If HbA1c remains above target

- Check insulin injection technique and injection sites
- Ensure adherence to all therapy including lifestyle management
- Optimise non-insulin glucose lowering therapies – NB: doses of insulin may need to be reduced to prevent hypoglycaemia
- Screen for depression
- Re-refer to dietitian and consider carbohydrate awareness
- Consider doses of rapid acting insulin with snacks
- An increase in basal insulin may be required if BGLs are ↑ overnight
- Consider correction doses of rapid acting insulin pre-meals
- Consider switching insulin regimens particularly if increases in premixed insulin are prevented by hypoglycaemia

Sick day management

- All patients on insulin should have a sick day management plan
- If reduced oral intake will likely need reduction/ omission of bolus insulin and 20-30% reduction in basal + premixed insulin
- Patients should monitor their glucose levels at least 3-4 times per day
- Treatment for hypoglycaemia should be readily available
- Correction insulin can be used to treat hyperglycaemia
- High dose steroids often require a ~ 30% ↑ in insulin doses during day