Insulin Therapy in Type 2 Diabetes

Insulin treatment

- If an adult with type 2 diabetes is symptomatically hyperglycaemic, consider insulin or a sulfonylurea, and review treatment when blood glucose control has been achieved.
- In other patients, if other measures do not keep HbA1c to < 59 mmol/mol [7.5%] (or other agreed target), discuss benefits and risk of insulin treatment.
- **Initiate with a structured programme including patient education and management plan.** Continue metformin for people without contraindications or intolerance, but review other blood glucose lowering therapies.
- Insulin therapy should be initiated from a choice of a number of insulin types and regimens by a practitioner with the appropriate knowledge, competencies and experience to choose the most appropriate starting regime tailored to each patient.
- NICE guidance is that there is no evidence of a clinical benefit of analogue insulins over human insulins in type 2 diabetes. It recommends
    - Considering both NPH and short-acting insulin either separately or together as pre-mixed (biphasic) human insulin regimens, especially when HbA1c ≥ 75 mmol/mol.
    - Considering, as an alternative to NPH insulin, insulin detemir or glargine if the person needs assistance to inject insulin, lifestyle is restricted by recurrent hypoglycaemia or twice-daily NPH with oral agents would otherwise be required.
    - Considering pre-mixed (biphasic) preparations containing short-acting analogues rather than human insulin if the person prefers to inject immediately before eating, hypoglycaemia is a problem or there is significant post-prandial hyperglycaemia.
    - Recurrent symptomatic hypoglycaemia should prompt a re-examination of the current insulin regime, injection sites, a search for other co-morbidities (such as liver or renal disease) and a review of the agreed HbA1c target. If tight control is still required, then consider a trial of analogue insulin.
    - If a patient requires once daily insulin administration because a carer or healthcare professional is needed to administer the insulin injection, and once daily NPH insulin does not provide sufficient control, then consider a trial of basal insulin analogue.
    - Note that insulin degludec may only be initiated by a specialist for type 1 diabetes (red on the traffic lights system).
    - Monitor a person using a basal insulin regimen (NPH or a long-acting insulin analogue [insulin glargine/detemir]) for the need for mealtime insulin (or a pre-mixed insulin preparation). If blood glucose control remains inadequate (not to agreed target levels without problematic hypoglycaemia), move to a more intensive, twice/three times daily mixed insulin or mealtime plus basal insulin regimen.
    - Human insulins (such as Humulin S®, Actrapid®, Insuman Rapid®, Isophane insulin, biphasic isophane insulin) should be considered as first line therapy before moving to analogue or analogue mixtures. Insulin analogues should only be considered if one of the above criteria is met.
    - Monitor a person using pre-mixed insulin once or twice daily for the need for a further pre-prandial injection or for an eventual change to a mealtime plus basal insulin regimen, based on human or analogue insulins, if blood glucose control remains inadequate.

Use of GLP1 analogues in combination with insulin

- Lixisenatide, liraglutide, exenatide and dulaglutide are all licensed for addition to patients currently receiving insulin.
- Patients being considered for this combination must fulfil the following criteria;
    - Significantly overweight (BMI >35) **and**
    - HbA1c > 75mmol/mol (9%) **and**
    - Currently using insulin
- This regimen must be initiated by a specialist, with on-going support from a consultant-led multi-disciplinary team.

- **Continue the GLP1 in combination with insulin only if the person has a reduction in HbA1c of ≥11 mmol/mol (1.0 %) [1] and a 3% loss of initial bodyweight in 6 months**.

Intensifying the insulin regime

- Monitor those using basal insulin regimens for the need for short acting insulin before meals or pre-mixed insulin.
- Monitor those using premixed insulin once or twice daily for need for further injections of short acting insulin before meals or change to mealtime plus basal regimen.

SGLT-2i plus insulin

NICE recommends that an SGLT-2i in combination with insulin with or without other anti-diabetic drugs is an option.

Insulin delivery devices

- Offer education to a person who requires insulin about using an injection device (usually a pen injector and cartridge or a disposable pen) that they and/or their carer find easy to use.
- Appropriate local arrangements should be in place for the disposal of sharps.
- Only insulin detemir (Levemir®) and Insulatard® can be used with the Innolet® device.
- If a person has a manual or visual disability and requires insulin, offer a device or adaptation that:
  - takes into account his or her individual needs
  - he or she can use successfully.

[1] A 0.5% difference in HbA1c is equivalent to a difference of about 5.5mmol/mol, and a 1% difference is equivalent to a difference of about 11mmol/mol. Note that these are rounded equivalents.