Type 2 diabetes in adults: choosing medicines

Factors to take into account when choosing, reviewing and changing medicines

Prescribing guidance

Rescue therapy
For symptomatic hyperglycaemia, consider insulin or a sulfonylurea and review when blood glucose control has been achieved.

Diet and lifestyle advice
At each point reinforce advice about diet and lifestyle.

Choosing treatments
Base the choice of medicine on:
- the person’s individual clinical circumstances, for example comorbidities, contraindications, weight, and risks from polypharmacy
- the person’s individual preferences and needs
- the effectiveness of the drug treatments in terms of metabolic response and cardiovascular and renal protection
- safety (see MHRA guidance, the BNF and individual SPCs) and tolerability of the drug treatment
- monitoring requirements
- the licensed indications or combinations available
- cost (if 2 drugs in the same class are appropriate, choose the option with the lowest acquisition cost)

Reviewing and changing treatments
At each point, think about and discuss the following with the person:
- stopping medicines that are not tolerated
- stopping medicines that have had no impact on glycaemic control or weight, unless there is an additional clinical benefit, such as cardiovascular or renal protection, from continued treatment
- how to optimise their current treatment regimen before thinking about changing treatments, taking into account factors such as:
  - adverse effects
  - adherence to existing medicines
  - the need to revisit advice about diet and lifestyle
  - prescribed doses and formulations
- whether switching rather than adding drugs could be effective
How to choose first-line medicines

Rescue therapy
For symptomatic hyperglycaemia, consider insulin or a sulfonylurea and review when blood glucose control has been achieved.

First-line treatment

Assess HbA1c, cardiovascular risk and kidney function

Not at high CVD risk

Offer
- Metformin
  - or if GI disturbance
    - Metformin MR

High risk of CVD

QRISK2 of 10% or higher

Offer
- Metformin
  - or if GI disturbance
    - Metformin MR
  - and as soon as metformin tolerability is confirmed, offer
    - An SGLT2 inhibitor ('flozin') with proven cardiovascular benefit

For information on using SGLT2 inhibitors for people with type 2 diabetes and chronic kidney disease, see the section on diabetic kidney disease in the guideline.

Consider
- DPP-4 inhibitor ('gliptin')
- Pioglitazone
- Sulfonylurea

An SGLT2 inhibitor ('flozin') for some people:
- Canagliflozin
- Dapagliflozin
- Empagliflozin
- Ertugliflozin

NICE technology appraisals recommend SGLT2 inhibitors as monotherapy options in people:
- who cannot have metformin
- for whom diet and exercise alone do not provide adequate glycaemic control.

The SGLT2 inhibitors are recommended only if a dipeptidyl peptidase-4 (DPP-4) inhibitor would otherwise be prescribed and a sulfonylurea or pioglitazone is not appropriate.

In February 2022, using ertugliflozin to reduce cardiovascular risk when blood glucose is well controlled was off label. See NICE's information on prescribing medicines.

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**Rescue therapy**
For symptomatic hyperglycaemia, consider insulin or a sulfonylurea and review when blood glucose control has been achieved.

**Treatment options if further interventions are needed**

- **At any point**
  - HbA1c not controlled below individually agreed threshold
  - Consider:
    - DPP-4 inhibitor or Pioglitazone
    - Sulfonylurea
  - SGLT2 inhibitors may also be an option in dual therapy:
    - Canagliflozin TA 315
    - Empagliflozin TA 336
    - Or in triple therapy:
      - Canagliflozin TA 315
      - Empagliflozin TA 336

- **At any point**
  - Cardiovascular risk or status change
  - If the person has or develops chronic heart failure or established atherosclerotic CVD
    - Switching or adding treatments
      - Offer An SGLT2 inhibitor (if not already prescribed)
    - Established atherosclerotic CVD includes coronary heart disease, acute coronary syndrome, previous myocardial infarction, stable angina, prior coronary or other revascularisation, cerebrovascular disease (ischaemic stroke and transient ischaemic attack) and peripheral arterial disease.
  - If the person has or develops a high risk of CVD (QRISK2 of 10% or higher)
    - Switching or adding treatments
      - Consider An SGLT2 inhibitor (if not already prescribed)

- **Insulin therapy**
  - When dual therapy has not continued to control HbA1c to below the person’s individually agreed threshold, also consider insulin-based therapy (with or without other drugs).
  - Dapagliflozin TA 288
  - Empagliflozin TA 336

- **GLP-1 mimicetic treatments**
  - If triple therapy with metformin and 2 other oral drugs is not effective, not tolerated or contraindicated, consider triple therapy by switching one drug for a GLP-1 mimic for adults with type 2 diabetes who:
    - have a body mass index (BMI) of 35 kg/m² or higher (adjust accordingly for people from Black, Asian and other minority ethnic groups) and specific psychological or other medical problems associated with obesity or
    - have a BMI lower than 35 kg/m² and:
      - for whom insulin therapy would have significant occupational implications or
      - weight loss would benefit other significant obesity related comorbidities.
When exercising their judgement, professionals and practitioners are expected to take this guideline fully into account, alongside the individual needs, preferences and values of their patients or the people using their service. It is not mandatory to apply the recommendations, and the guideline does not override the responsibility to make decisions appropriate to the circumstances of the individual, in consultation with them and their families and carers or guardian.

This information is a summary of the recommendations, please consult the guideline for the full recommendations. All supplementary information is taken from the BNF or the SPCs.

In February 2022, using ertugliflozin to reduce cardiovascular risk when blood glucose is well controlled was off label. See NICE’s information on prescribing medicines.

See summaries of product characteristics (SPCs), British national formulary (BNF) or the Medicines and Healthcare products Regulatory Agency (MHRA) for up-to-date information.
## Summary of medicines for further treatment

<table>
<thead>
<tr>
<th>Medicine</th>
<th>Options and BNF link</th>
<th>Form</th>
<th>Contraindications</th>
<th>Effect on weight</th>
<th>Hypoglycaemia risk</th>
<th>Renal impairment</th>
<th>Hepatic impairment</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>DPP-4 inhibitor</strong></td>
<td>Alogliptin, Linagliptin, Saxagliptin, Sitagliptin, Vildagliptin</td>
<td>Tablet</td>
<td>Ketoacidosis (not for linagliptin and saxagliptin)</td>
<td>None</td>
<td>Low</td>
<td>Dose reduction or caution (not for linagliptin)</td>
<td>Caution or avoid (not for linagliptin and sitagliptin)</td>
</tr>
<tr>
<td><strong>GLP-1</strong></td>
<td>Dulaglutide, Exenatide, Liraglutide, Lixisenatide, Semaglutide</td>
<td>Tablet or injection</td>
<td>Ketoacidosis (not for dulaglutide) Severe gastro‑intestinal disease (not for liraglutide and semaglutide) Liraglutide: diabetic gastroparesis, inflammatory bowel disease</td>
<td>Loss</td>
<td>Low</td>
<td>Dose reduction or caution or avoid (not for dulaglutide, liraglutide or semaglutide) Check the BNF monographs for eGFR thresholds</td>
<td>Caution or avoid (not for dulaglutide, exenatide, and lixisenatide) Check the BNF monographs for severity</td>
</tr>
<tr>
<td><strong>Insulin</strong></td>
<td>Insulin treatment summary See BNF monographs</td>
<td>Injection</td>
<td>None</td>
<td>Gain</td>
<td>High</td>
<td>Dose reduction</td>
<td>Dose reduction</td>
</tr>
<tr>
<td><strong>Pioglitazone</strong></td>
<td>Pioglitazone</td>
<td>Tablet</td>
<td>History of heart failure, previous or active bladder cancer, uninvestigated macroscopic haematuria</td>
<td>Gain</td>
<td>Low</td>
<td>No warnings</td>
<td>Avoid</td>
</tr>
<tr>
<td><strong>SGLT2 inhibitor</strong></td>
<td>Canagliflozin, Dapagliflozin, Empagliflozin, Ertugliflozin</td>
<td>Tablet</td>
<td>Ketoacidosis</td>
<td>Loss</td>
<td>Low</td>
<td>Dose reduction or caution or avoid. Check the BNF monographs for eGFR thresholds</td>
<td>Caution or avoid Check the BNF monographs for severity</td>
</tr>
<tr>
<td><strong>Sulfonylurea</strong></td>
<td>Gliclazide, Glimepiride, Glipizide, Tolbutamide</td>
<td>Tablet</td>
<td>All sulfonylureas: ketoacidosis Gliclazide and tolbutamide: avoid where possible in acute porphyrias</td>
<td>Gain</td>
<td>Moderate</td>
<td>Dose reduction or caution or avoid. Check the BNF monographs for eGFR thresholds</td>
<td>Caution or avoid Check the BNF monographs for severity</td>
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