

## deprescribing.org | Antihyperglycemics Deprescribing Algorithm

Yes

Does your elderly (>65 years of age) patient with type 2 diabetes meet one or more of the following criteria:

- At risk of hypoglycemia (e.g. due to advancing age, tight glycemic control, multiple comorbidities, drug interactions, hypoglycemia history or unawareness, impaired renal function, or on sulfonvlurea or insulin)
- Experiencing, or at risk of, adverse effects from antihyperglycemic
- Uncertainty of clinical benefit (due to: frailty, dementia or limited) life-expectancy)

- Set individualized A1C and blood glucose (BG) targets (otherwise healthy with 10+ years life expectancy, A1C < 7% appropriate; considering advancing age, frailty, comorbidities and time-to-benefit, A1C < 8.5% and BG < 12mmol/L may be acceptable; at end-of life, BG < 15mmol/L may be acceptable) (good practice recommendation)
- Address potential contributors to hypoglycemia (e.g. not eating, drug interactions such as trimethoprim/sulfamethoxazole and sulfonylurea, recent cessation of drugs causing hyperglycemia – see reverse)

# Continue Antihyperglycemic(s) Still at risk?

Yes

# Recommend Deprescribing

- Reduce dose(s) or stop agent(s)
  - most likely to contribute to hypoglycemia (e.g. sulfonylurea, insulin; strong recommendation from systematic review and GRADE approach) or other adverse effects (good practice recommendation)
- Switch to an agent
  - with lower risk of hypoglycemia (e.g. switch from glyburide to gliclazide or non-sulfonylurea; change NPH or mixed insulin to determine or glargine insulin to reduce nocturnal hypoglycemia; strong recommendation from systematic review and GRADE approach)
- Reduce doses
  - of renally eliminated antihyperglycemics (e.g. metformin, sitagliptin; good practice recommendation) See guideline for recommended dosing

### Monitor daily for 1-2 weeks after each change (TZD - up to 12 weeks):

- For signs of hyperglycemia (excessive thirst or urination, fatigue)
- For signs of hypoglycemia and/or resolution of adverse effects related to antihyperglycemic(s)

Increase frequency of blood glucose monitoring if needed A1C changes may not be seen for several months

If hypoglycemia continues and/or adverse effects do not resolve:

Reduce dose further or try another deprescribing strategy

If symptomatic hyperglycemia or blood glucose exceeds individual target:

Return to previous dose or consider alternate drug with lower risk of hypoglycemia

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#### Antihyperglycemics and Hypoglycemia Risk

| Drug   | Causes hypoglycemia?   |
|--|--|
| Alpha-glucosidase inhibitor                            | No   |
| Dipeptidyl peptidase-4 (DPP-4) inhibitors              | No   |
| Glucagon-like peptide-1 (GLP-1) agonists               | No   |
| Insulin  | Yes (highest risk with regular insulin and NPH insulin)          |
| Meglitinides   | Yes (low risk)   |
| Metformin  | No   |
| Sodium-glucose linked transporter 2 (SGLT2) inhibitors | No   |
| Sulfonylureas  | Yes (highest risk with glyburide and lower risk with gliclazide) |
| Thiazolidinediones (TZDs)                              | No   |

#### Drugs affecting glycemic control

- Drugs reported to cause hyperglycemia (when these drugs stopped, can result in hypoglycemia from antihyperglycemic drugs) e.g. quinolones (especially gatifloxacin), beta-blockers (except carvedilol), thiazides, atypical antipsychotics (especially olanzapine and clozapine), corticosteroids, calcineurin inhibitors (such as cyclosporine, sirolimus, tacrolimus), protease inhibitors
- Drugs that interact with antihyperglycemics (e.g. trimethoprim/sulfamethoxazole with sulfonylureas)
- Drugs reported to cause hypoglycemia (e.g. alcohol, MAOIs, salicylates, quinolones, quinine, beta-blockers, ACEIs, pentamidine)

#### Engaging patients and caregivers

- Some older adults prefer less intensive therapy, especially if burdensome or increases risk of hypoglycemia
- Patients and/or caregivers may be more likely to engage in discussion about changing targets or considering deprescribing if they understand the rationale:
  - Risks of hypoglycemia and other side effects
  - Risks of tight glucose control (no benefit and possible harm with A1C < 6%)
  - Time to benefit of tight glucose control
  - Reduced certainty about benefit of treatment with frailty, dementia or at end-of-life
- Goals of care: avoid hyperglycemic symptoms (thirst, dehydration, frequency, falls, fatique, renal insufficiency) and prevent complications (5-10 years of treatment needed)
- Many countries agree on less aggressive treatment of diabetes in older persons
- Reviewing options for deprescribing, as well as the planned process for monitoring and thresholds for returning to previous doses will help engage patients and caregivers

#### Hypoglycemia information for patients and caregivers

- Older frail adults are at higher risk of hypoglycemia
- There is a greater risk of hypoglycemia with tight control
- Symptoms of hypoglycemia include: sweating, tachycardia, tremor BUT older patients may not typically have these
- Cognitive or physical impairments may limit older patient's ability to respond to hypoglycemia symptoms
- Some drugs can mask the symptoms of hypoglycemia (e.g. beta blockers)
- Harms of hypoglycemia may be severe and include: impaired cognitive and physical function, falls and fractures, seizures, emergency room visits and hospitalizations

#### Tapering advice

- Set blood glucose & A1C targets, plus thresholds for returning to previous dose, restarting a drug or maintaining a dose
- Develop tapering plan with patient/caregiver (no evidence for one best tapering approach; can stop oral antihyperglycemics, switch drugs, or lower doses gradually e.g. changes every 1-4 weeks, to the minimum dose available prior to discontinuation, or simply deplete patient's supply)
- Doses may be increased or medication restarted any time if blood glucose persists above individual target (12-15 mmol/L) or symptomatic hyperglycemia returns

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