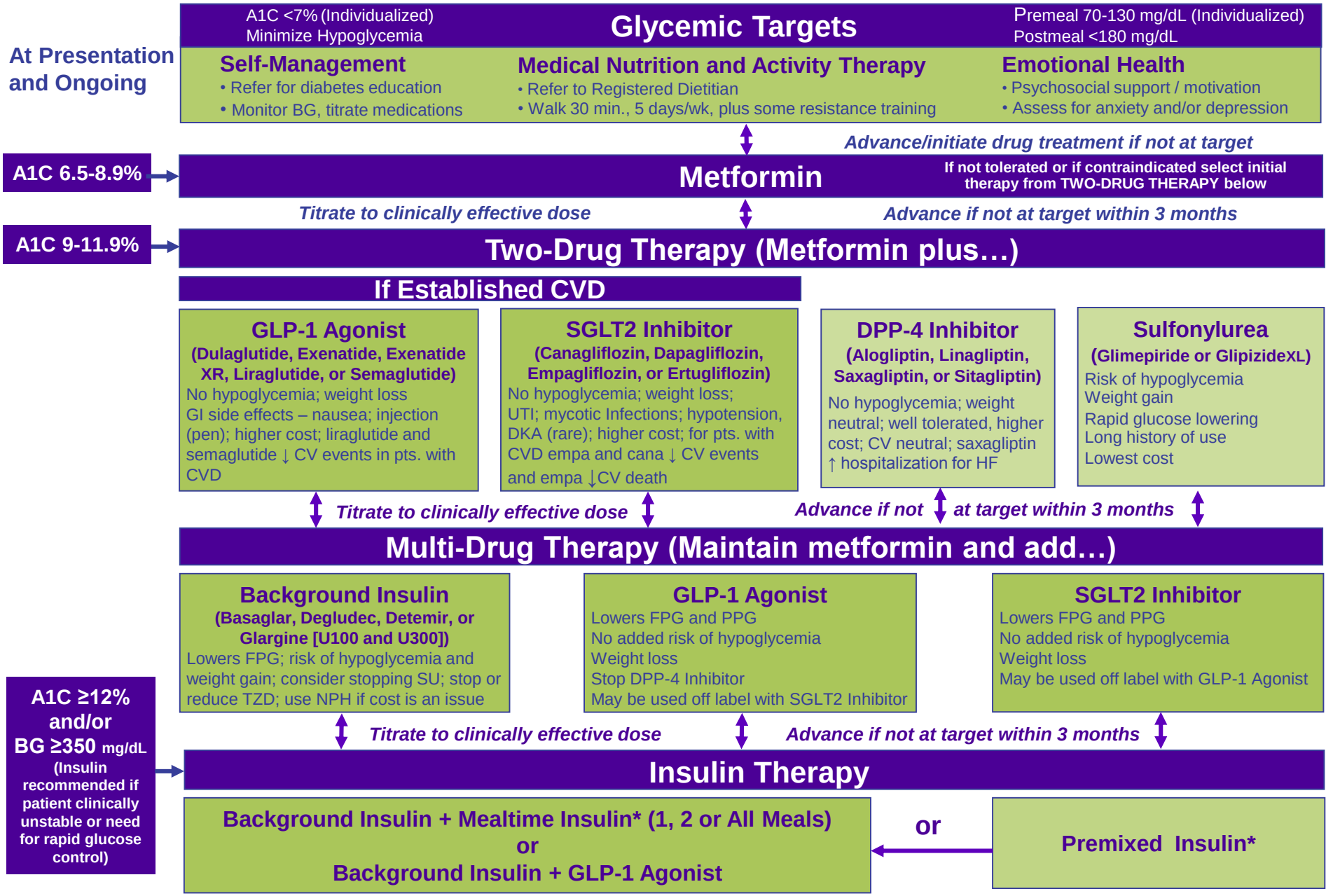
IDC Type 2 Diabetes Glycemic Control Algorithm



*Recommend adding or maintaining metformin; discontinue sulfonylurea; discontinue or reduce dose of thiazolidinedione; consider maintaining DPP-4 inhibitor, GLP-1 agonist, or SGLT2 inhibitor if patient experienced positive response to medication

IDC Type 2 Diabetes Glycemic Control Algorithm Abbreviations and Clinical Considerations

Abbreviations:

A1C, Glycosylated hemoglobin A_{1C}; **CHF**, Congestive heart failure; **DPP-4**, Dipeptidyl peptidase-4 inhibitor; **FPG**, Fasting plasma glucose; **GI**, Gastrointestinal; **GLP-1**, Glucagon-like peptide-1 receptor agonist; **PPG**, Postprandial glucose; **SMBG**, Self-monitored blood glucose; **SU**, Sulfonylurea; **TZD**, Thiazolidinedione

Clinical Considerations:

1. Individualize glycemic targets: consider A1C <8%, FPG 90-150 mg/dL, 1-2 hour PPG <200 mg/dL for those with major medical comorbidities, hypoglycemia unawareness, frail elderly, or those whose therapy has been significantly intensified without seeing an improvement in A1C; consider lower A1C (closer to 6%) for recently diagnosed patients with no complications and low risk of hypoglycemia.
2. Self-management education includes disease state, glucose monitoring, injection technique and how to respond to daily glucose excursions.
3. Focus on modest weight loss of 5-10% total body weight for overweight and obese patients.
4. General nutrition recommendations include elimination of sweetened beverages and eating a minimum 3 meals/day, each containing approximately 2-4 carbohydrate choices (30-60 g carb/meal). Snacks of 0-2 carbohydrate choices (0-30 g carb/snack) can be consumed, but are not required unless hypoglycemia is a concern.
5. Recommend working up to 150 minutes/week of physical activity, for example, 30 minutes five days a week.
6. Consider referral to psychologist, social worker, or care coordinator if persistently elevated A1C to address non-medical barriers to BG control.
7. Check kidney and liver function prior to initiation of noninsulin therapies.
8. Avoid use of glyburide due to increased risk of hypoglycemia compared to other secretagogues.
9. Other noninsulin therapies to consider:
    a) Alpha-glucosidase inhibitor if A1C close to target and postmeal glucose elevated due to excessive carbohydrate intake.
    b) Nateglinide or repaglinide for postmeal hyperglycemia and there is a need for a flexible mealtime dosing schedule.
    c) Thiazolidinedione (Pioglitazone) should only be considered for very insulin resistant patients due to risk of weight gain, edema, CHF and long-term use association with bone fracture and bladder cancer
    d) Colesevelam if A1C close to target and LDL levels remain above target with current statin therapy.
    e) Bromocriptine QR if A1C is close to target; works through CNS-mediated improvement in insulin sensitivity.
10. If patient treated with metformin and FPG significantly elevated, consider adding background insulin.
11. If a clinically stable patient with A1C >12% and consuming excessive sweetened beverages, consider starting noninsulin agents along with elimination of sweetened beverage and re-evaluate need for insulin in 1-2 weeks.
12. Long-acting insulins glargine and detemir reduce risk of nocturnal hypoglycemia compared to intermediate-acting NPH; degludec and glargine (U300) have a flatter profile, longer action time and less risk of nocturnal hypoglycemia than standard long-acting insulins.
13. Background and mealtime insulin regimen is the most physiological and flexible regimen.
14. EMPA-REG OUTCOME trial showed that patients with established CVD receiving empagliflozin had reduced composite of nonfatal M.I., nonfatal stroke and CV death (HR 0.86) and death due to CV cause (HR 0.62); CANVAS program showed that patients with established CVD receiving canagliflozin had reduced composite of nonfatal M.I., nonfatal stroke and CV death (HR 0.86) and twofold increased risk of amputation primarily at level of the toe or metatarsal.

Reference: Simonson G, Cuddihy, R, Reader D, Bergenstal R. Diabetes Management 2011;1:175-189.

