Pharmacists Are Key Allies in Reducing Risk of Diabetes, Cardiovascular Disease

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Pharmacists can help patients through education, therapy, and lifestyle modifications.

Atherosclerotic cardiovascular disease (ASCVD) is the leading cause of morbidity and mortality, both globally and in individuals with type 2 diabetes (T2D).[1]

Individuals with diabetes are at greater risk of developing cardiovascular disease (CVD), with common risk factors including high blood pressure (BP), abnormal cholesterol levels and high triglycerides, obesity, physical inactivity, poorly controlled blood sugars, and smoking. Pharmacists, as part of an interdisciplinary team, can play an important role in helping patients

with prediabetes or diabetes reduce their risk of CVD through education, medications for risk reduction, and lifestyle modifications.

Prediabetes and Prevention of T2D

Approximately 88 million adults in the United States have prediabetes, which includes about 84% who do not realize they have it and are at risk of developing T2D and CVD.[2]

According to the American Diabetes Association (ADA), individuals who meet any 1 of the following criteria have prediabetes:

1. fasting plasma glucose of 100 mg/dL to 125 mg/dL,
2. 2-h plasma glucose during 75-g oral glucose tolerance test of 140 mg/dL to 199 mg/dL, or
3. glycated hemoglobin (A1C) of 5.7% to 6.4%.[3]

The ADA recommends annual monitoring for the development of T2D in patients with prediabetes.[3] Pharmacists can also screen patients for risk of developing T2D during medication therapy management consults using the 60-second ADA risk test.[4] This tool is available electronically and in print, and the results can be emailed to the patient. Individuals who score 5 or higher may have prediabetes, and these results along with lab work can serve as an important counseling and referral tool.[4]

Metformin pharmacotherapy for the prevention of T2D should be considered in patients with prediabetes, especially in the following individuals: body mass index greater than or equal to 35 kg/m2, individuals under 60 years of age, and women with prior gestational diabetes mellitus.[3] Patients should have their vitamin B12 levels monitored because long-term metformin therapy may cause vitamin B12 deficiency.[3]

Patients with prediabetes should be referred to an intensive lifestyle behavior program known as the National Diabetes Prevention Program (DPP) to achieve and maintain a 7% loss of initial body weight and increase moderate intensity physical activity to at least 150 minutes each week.[5] The National DPP was developed in 2010 by the CDC along with other organizations to prevent T2D in the United States, and patients must meet certain eligibility criteria to enroll (see **Table**).[6] The 1-year lifestyle change program is one of the key components of the National DPP for patients to reduce risk of developing T2D, and it includes a CDC-approved curriculum (approximately 24 hours of instruction), a lifestyle coach, and support group.[5,7] Evidence has shown that the National DPP reduces the risk of developing T2D by up to 58% (71% for those over 60 years of age) in participants who lost 5% to 7% of their body weight and added 150 minutes of exercise per week.[5]

Pharmacists can promote awareness about prediabetes and educate patients at risk about the National DPP.[8] Additionally, evidence demonstrates that more pharmacy sites are offering the program.9 Administering a blood glucose test is a great way to identify patients with prediabetes and communicate this information to the primary care physician or refer individuals to a health

care provider. Pharmacies can also deliver the National DPP by applying to become CDC recognized, and pharmacy residents, students, and technicians can help to support the program.[8]

Table. National Diabetes Prevention Program Eligibility Criteria[6]

- At least 18 years of age
- BMI $\geq$ 25 or $\geq$ 23 if Asian
- Not pregnant
- No previous diagnosis of type 1 or type 2 diabetes
- Prediabetes blood test results within the past year:
- A1C of 5.7% to 6.4% or,
- FPG of 100-125 mg/dL or
- 2-hour PG (after a 75-gm glucose load) of 140-199 mg/dL
- Previous clinical diagnosis of gestational diabetes or high risk for type 2 diabetes results from prediabetes risk test
- Medicare beneficiaries are required to have a blood test within the past year to qualify

A1C, glycated hemoglobin; BMI, body mass index; FPG, fasting plasma glucose; PG, plasma glucose.

CVD Risk Reduction Strategies

The American College of Cardiology (ACC) and American Heart Association (AHA) recommend a team-based approach for the prevention of CVD.[1]

Adults should consume a healthy diet that includes vegetables, fruits, nuts, whole grains, lean vegetable or animal protein, and fish. Additionally, the diet should minimize the intake of trans fats, processed red meats, refined carbohydrates, and sweetened beverages.[1] Evidence demonstrates that dietary sodium consumption of less than 1500 mg/d and reduced alcohol intake (men $\leq$ 2 drinks daily and women $\leq$ 1 drink daily) are nonpharmacological ways to reduce BP.[1] Individualswho are overweight or obese should receive counseling on caloric restriction to reduce their risk of CVD. Adults should also engage in at least 150 minutes per week of moderate-intensity physical activity or 75 minutes per week of vigorous-intensity physical activity.[1] Patients should also be assessed at every health care visit for tobacco use, and those who are smokers should receive smoking cessation support through a combination of behavioral interventions and pharmacotherapy (eg, nicotine replacement therapy).[1]

Individuals aged 40 to 75 years being assessed for CVD should routinely undergo the 10-year risk of ASCVD, and adults aged 20 to 39 years should be assessed every 4 to 6 years.[1] The ASCVD risk estimator is available as a free app that health care professionals can use at the point of care to help guide clinical decisions.[10] The 10-year risk for ASCVD is categorized as the following: low risk, less than 5%; borderline risk, 5% to 7.4%; intermediate risk, 7.5% to 19.9%; high risk, greater than or equal to 20%.[10] Most adults with diabetes have a 10-year ASCVD risk of greater than or equal to 10%.

Statin therapy is considered first-line treatment for primary prevention of ASCVD in patients with elevated low-density lipoprotein cholesterol levels (≥ 190 mg/dL), those with diabetes, individuals aged 40 to 75 years , and those determined to have a sufficient ASCVD risk.[1] The ACC/AHA guidelines discuss that aspirin should not be routinely used for the primary prevention of ASCVD in adults at any age who are at increased risk of bleeding.[1] Also, low-dose aspirin should not be given for the primary prevention of ASCVD in adults 70 years and older. Low-dose aspirin may be considered for the primary prevention of ASCVD among certain adults aged 40 to 70 years who are at higher risk of ASCVD but not at increased risk of bleeding.[1] Pharmacists can play an important role in counseling patients and educating other health care professionals about these new aspirin recommendations.

The ADA recommends that patients with diabetes have individualized BP goals.[11] If individuals with diabetes and hypertension are at higher risk of ASCVD or have a 10-year ASCVD risk greater than or equal to 15%, then a target BP of less than 130/80 mm Hg may be appropriate. Patients at lower risk for CVD (10-year ASCVD risk < 15%) should receive antihypertensive treatment to a target BP of less than 140/90 mmHg.[13] Evidence demonstrates that angiotensin-converting enzyme inhibitors, angiotensin receptor blockers, thiazidelike diuretics, and dihydropyridine calcium channel blockers can all reduce cardiovascular events in patients with diabetes, and any of these drug classes can be utilized as initial treatment for hypertension .[11]

The Community Preventive Services Task Force recommends tailored pharmacy-based interventions to enhance adherence in patients with CVD risk factors.[12] Evidence demonstrates that pharmacist interventions in the community and hospital settings increase medication adherence through pill boxes, medication cards, calendars, medication refill synchronization, and follow-up.[12] Additionally, improved medication adherence results in health care cost savings.[12] Pharmacists can communicate interventions with the patient's primary care provider as an interdisciplinary approach to CVD prevention.

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ABC Method to Managing Diabetes

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A – **A1C** – average blood glucose over the last 2 to 3 months

Blood glucose goals:
A1C <7%
Pre-meal glucose 80-130 mg/dL
Post-meal glucose <180 mg/dL (1-2 hours after beginning a meal)

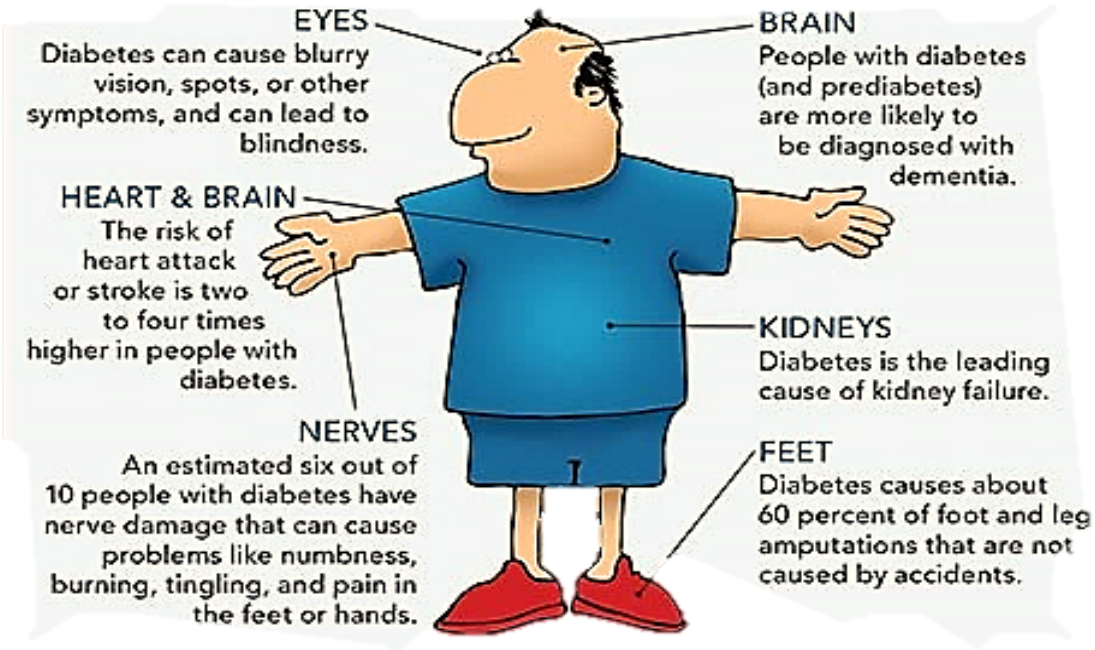
B – **Blood pressure** – goal is <130/80 (or the target your doctor sets)

High blood pressure raises your risk for eye and kidney problems and makes your heart work harder than it should.

C – **Cholesterol** – ask your doctor what your numbers are

HDL is good cholesterol that protects your heart
High LDL can clog your vessels
High Triglycerides can raise your risk for heart attack and stroke

Over time, high blood glucose damages your blood vessels. This damage can lead to complications that affect the whole body. Complications include heart attack, stroke, kidney disease, vision problems, blindness, nervous system problems and risk of lower-limb loss. But, by controlling your blood glucose, blood pressure and cholesterol, you can help reduce your risk of complications.



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Centers for Disease Control and Prevention. https://www.cdc.gov/features/preventing-diabetes-complications/index.html. Accessed April 2, 2018.

Helpful Hints to Managing Your Diabetes

Physical Activity

Goal: 150 minutes of moderate activity each week

- Be Safe! Start slow and go slow.
- Check blood glucose before and several hours after.
- Make a plan – realistic, specific, doable, flexible and FUN!
- Benefits
  - ✓ Helps your body use insulin
  - ✓ Reduces stress
  - ✓ Increases strength
  - ✓ Healthier weight

Healthy Eating

- Eat From All the Food Groups
  - ✓ Non-starchy vegetables – 2-3 fistfuls daily
  - ✓ Fruits – 2 fistfuls fresh/frozen daily
  - ✓ Lean proteins – 2 decks of cards daily
  - ✓ Low-fat dairy
  - ✓ Grains – choose whole grain options
- When you eat is as important as what you eat – do not skip meals.

- Emotional health is as important as physical health.
- Stress has many physical effects – raise/lower blood glucose, raise blood pressure and weaken the immune system.
- Find ways to reduce stress:
  - ✓ Physical activity
  - ✓ Journaling
  - ✓ Prayer/meditation
  - ✓ Make time for hobbies
  - ✓ Have fun

- Take your medications every day as prescribed by your doctor.
  - ✓ Tell you doctor about any side effects.
  - ✓ Ask for help if you have trouble remembering.
- Attend all your regular checkup appointments.
- Check your feet daily for sores, cuts or blisters.
- Have your eyes checked at least once a year.
- See a dentist at least twice a year.

Reviewed by Aimee Henderson, PharmD, BC-ADM, CDCES 4/5/2021

123 KNOW YOUR NUMBERS

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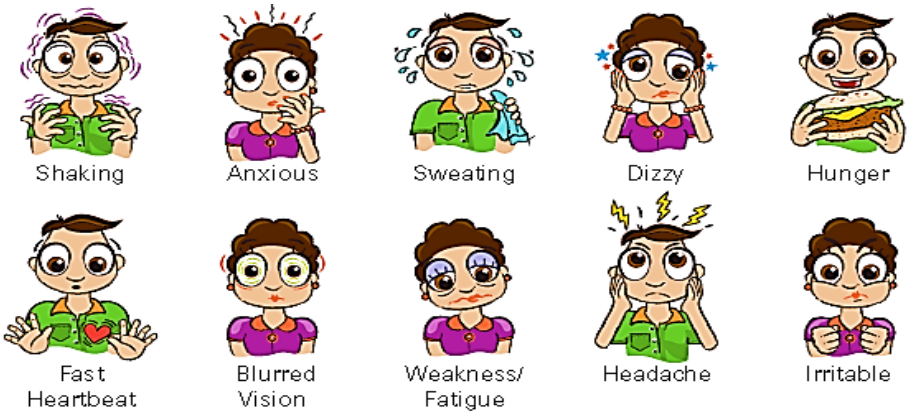
Hypoglycemia- (low blood sugar)- Less than 70 mg/dL

Signs and Symptoms



What to do if you think your blood glucose is low:

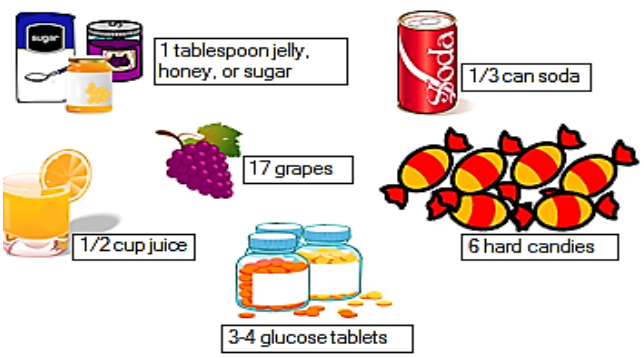
CHECK if *< 70 mg/dL* →

TREAT → wait 15 minutes →

CHECK if above 70 mg/dL→

EAT *if < 70mg/dL repeat*

TREATMENT



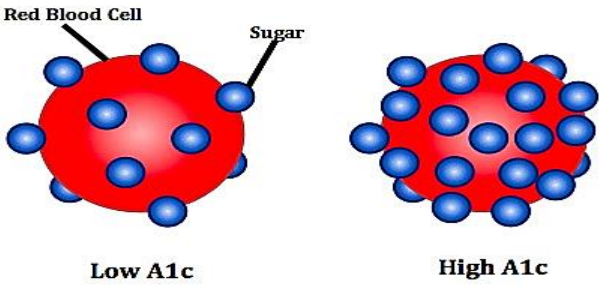
Hyperglycemia- (high blood sugar)- Over 200 mg/dL or as directed by your healthcare provider

Signs and Symptoms

Hemoglobin A1c Test

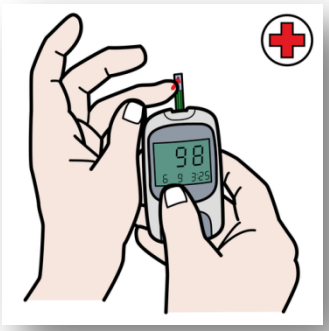
Number	Percent
eAG mg/dl	A1C%
97	5
111	5.5
126	6
140	6.5
154	7
169	7.5
183	8
197	8.5
212	9
226	9.5
240	10
255	10.5
269	11
283	11.5
298	12

Hemoglobin A1c is a measure of how much glucose (sugar) is "stuck" to your red blood cells. This test measures the percent of glucose that is covering your red blood cell and gives you an average of your blood sugar over the last 2 to 3 months.



*Goal A1c for those with diabetes = <7% **
**Your goal may vary depending on age, gender, how long you have had diabetes, and other conditions you have.*

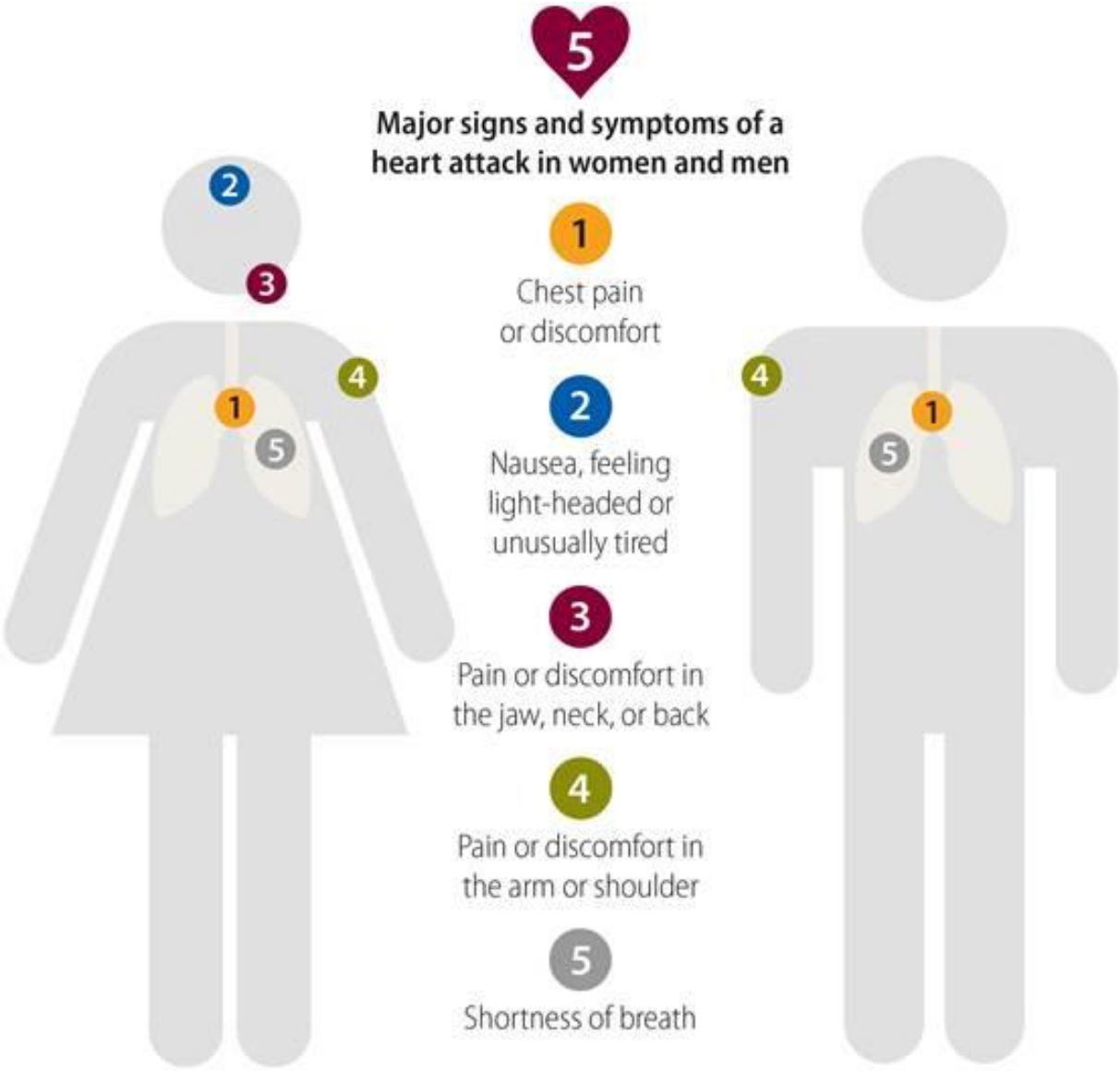
Glucose Monitoring



- Not always required but gives you an idea of what your blood glucose (sugar) is doing day to day before you have labs drawn.
- Target range:
  - 80-130 mg/dL on empty stomach
  - Less than 180 mg/dL up to 2 hours after eating
- How to check your blood glucose:
  - Wash and dry your hands well or ensure they are clean. (Food and other substances can give you an inaccurate reading.)
  - Insert a test strip into your meter.
  - Prick the side of your fingertip with the needle (lancet) provided with your test kit.
  - Touch and hold the edge of the test strip to the drop of blood. The meter will display your blood sugar level on a screen after a few seconds.
  - Write number in your blood glucose log or use the meter to keep a diary of readings.

Adapted from TMF Health Quality Institute Illustrations by Missi Jay, Gigglebox Studios, Austin, Texas reviewed by ADH 4/5/2021

Heart Attack Signs and Symptoms



Reference:
https://www.cdc.gov/heartdisease/signs_symptoms.htm

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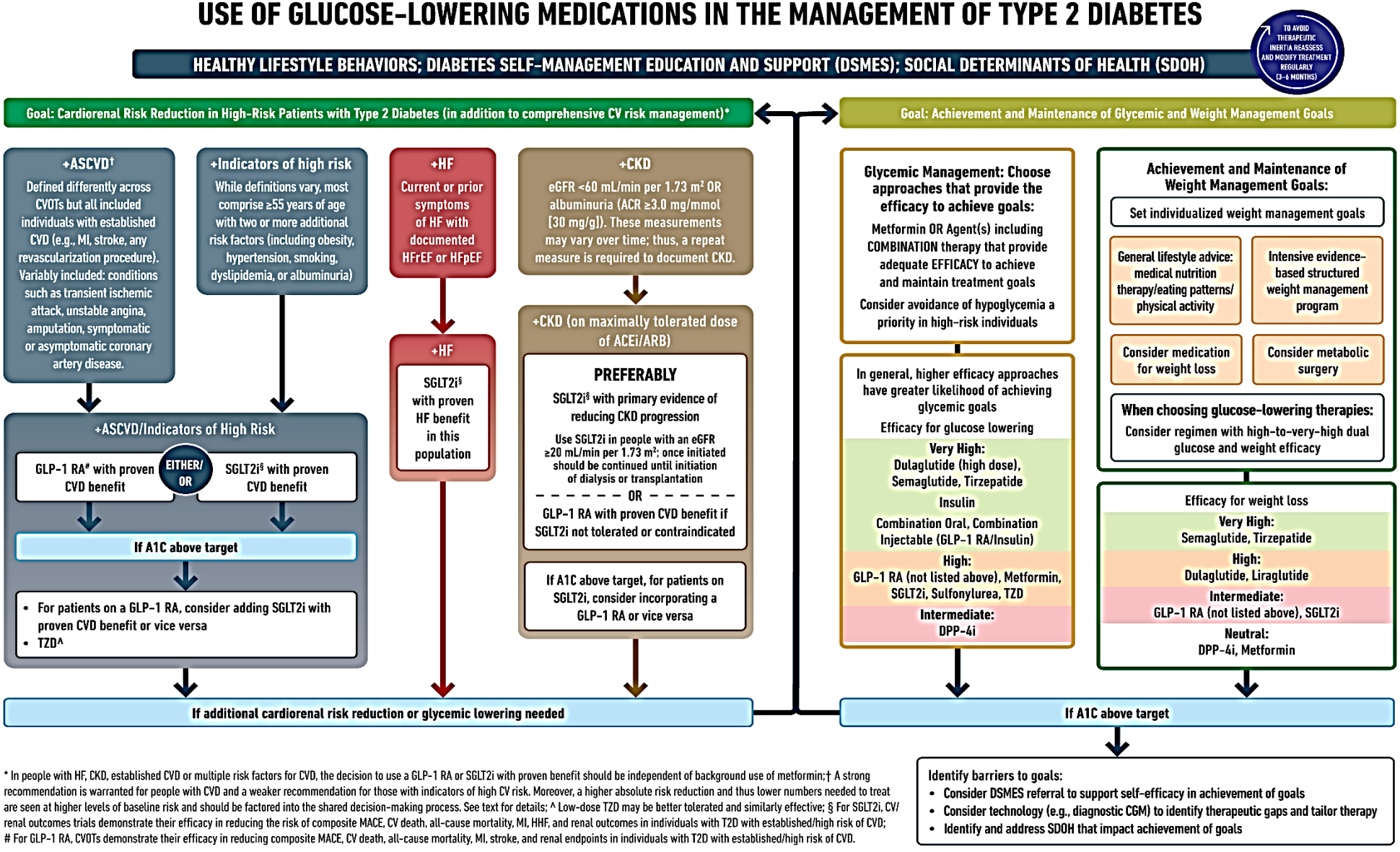
2023 American Diabetes Association Treatment Guidelines



* In people with HF, CKD, established CVD or multiple risk factors for CVD, the decision to use a GLP-1 RA or SGLT2i with proven benefit should be independent of background use of metformin;† A strong recommendation is warranted for people with CVD and a weaker recommendation for those with indicators of high CV risk. Moreover, a higher absolute risk reduction and thus lower numbers needed to treat are seen at higher levels of baseline risk and should be factored into the shared decision-making process. See text for details; ^ Low-dose TZD may be better tolerated and similarly effective; § For SGLT2i, CV/ renal outcomes trials demonstrate their efficacy in reducing the risk of composite MACE, CV death, all-cause mortality, MI, HHF, and renal outcomes in individuals with T2D with established/high risk of CVD; # For GLP-1 RA, CVOTs demonstrate their efficacy in reducing composite MACE, CV death, all-cause mortality, MI, stroke, and renal endpoints in individuals with T2D with established/high risk of CVD.

Use of glucose-lowering medications in the management of type 2 diabetes. ACEi, ACE inhibitor; ACR, albumin-to-creatinine ratio; CVOT, cardiovascular outcomes trial; DPP-4i, dipeptidyl peptidase 4 inhibitor; GLP-1 RA, glucagon-like peptide 1 receptor agonist; HHF, hospitalization for heart failure; SGLT2i, sodium-glucose cotransporter 2 inhibitor; T2D, type 2 diabetes. Adapted from Davies MJ, Aroda VR, Collins BS, et al. Diabetes Care 2022;45:2753–2786.