

Reducing Heart Disease Risk in Patients with Diabetes: Insights from the Chronic Care Model

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Disclosures

Kent Alan Lee, MA, MD, FAAFP

- *Has no relevant financial relationships with ineligible companies to disclose.*
- *There are no conflicts of interest related to this educational content.*



Objectives

1. Identify the core components of the *Chronic Care Model* and their application in diabetes management to reduce cardiovascular risk.
2. Analyze evidence-based strategies for improving clinical outcomes in patients with diabetes and associated cardiovascular risk factors.
3. Apply practical approaches to enhance patient care and outcomes using the *Chronic Care Model* framework.



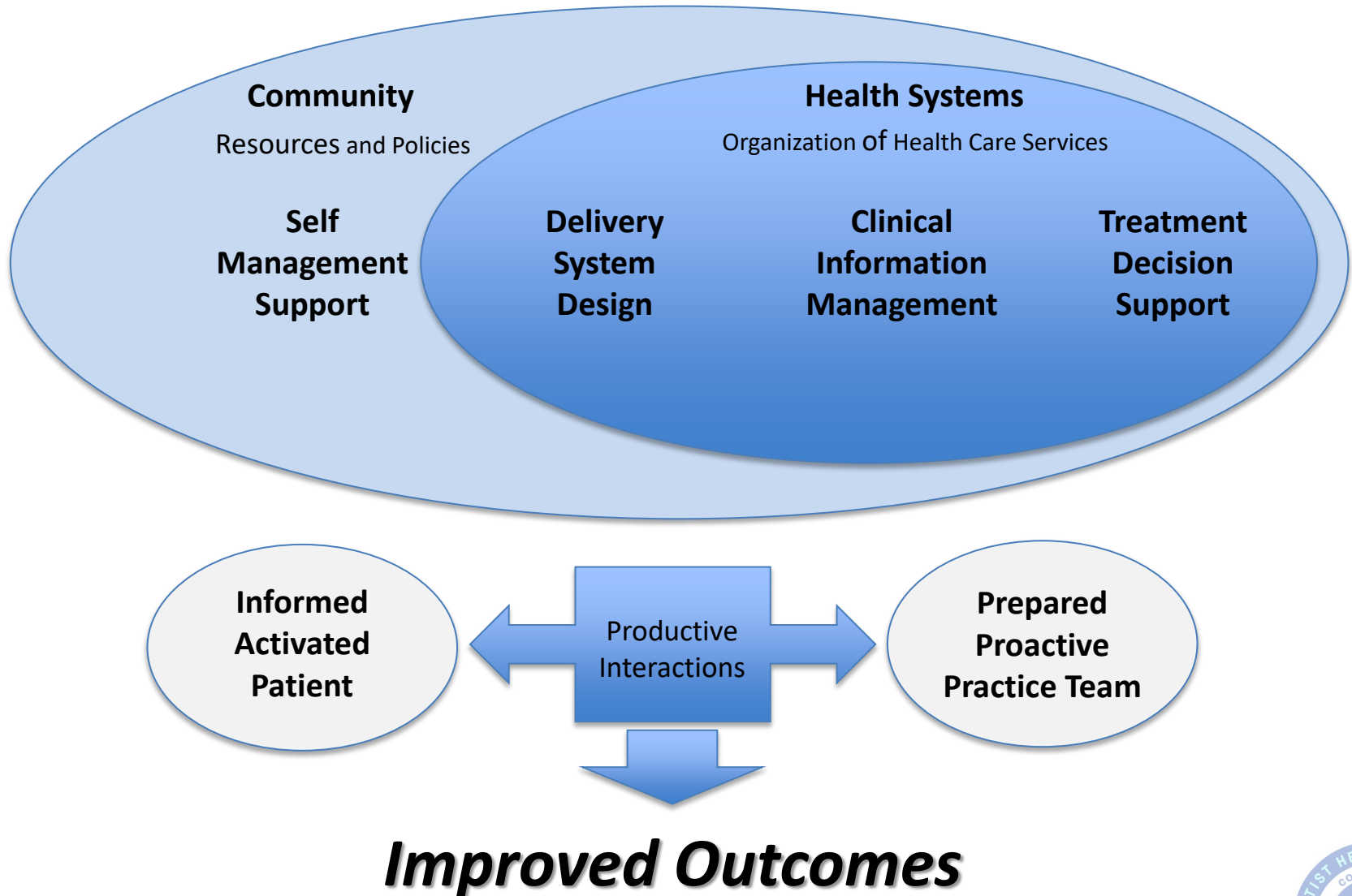
WHAT IS THE *CHRONIC CARE MODEL*?



The Chronic Care Model



The Chronic Care Model



1. E.H. Wagner, B. Austin, and M. Von Korff, **“Organizing Care for Patients with Chronic Illness,”** *Milbank Quarterly* 74, no. 4 (1996): 1–34
2. E.H. Wagner, B. Austin, and M. Von Korff, **“Improving Outcomes in Chronic Illness,”** *Managed Care Quarterly* 4, no. 2 (1996): 12–25



WHAT ARE THE KEY COMPONENTS OF *CHRONIC CARE MANAGEMENT*?



CCM Care vs. Standard Care

- Standard Care of chronic conditions emphasizes the PCP-Patient dyad, with all interventions based around one-on-one office visits.
- CCM Care is more intensive, with office-based, home-based and telehealth services all coordinated by a CCM team.
- The CCM team typically includes the PCP, Clinic Nurse, Pharmacist, and a Community Health Worker to assist with home resources.
- Because this increased level of care requires more work, it may be billed for separately from Standard Care office visit CPT codes.
- Requirements for using these codes are published by the Centers for Medicare and Medicaid Services (CMS).
- These include both patient characteristics for eligibility, and minimum required services to qualify for CCM billing.



CMS Requirements

1. Patients must have 2 or more chronic medical conditions expected to last 12 months or until the patient's death in order to qualify for CCM billing.
2. There must be an *Initiating Visit* during a comprehensive E/M exam, an Annual Wellness Visit (AWV) or an Initial Preventive Physical Exam (IPPE).
3. Patient consent, either written or verbal, to engage in CCM management services, must be documented in the chart at the time of that visit.
4. There must be a way for patients to reach managers/caregivers 24/7.
5. Contact methods should include phone, secure messaging, secure web, or patient portal methods.
6. These may also include telehealth visits, remote physiological monitoring (RPM), or remote therapeutic monitoring (RTM).



WHAT EVIDENCE DO WE HAVE THAT *CHRONIC CARE MANAGEMENT* WORKS?



A Systematic Review

- In 2017 ***E.K. Yeoh et al.*** published a review of all English-language research on using the CCM approach for patients with diabetes mellitus (DM) and hypertension (HTN) or cardiovascular disease (CVD) found in PubMed.
- 25 articles and studies of CCM in DM with HTN or CVD were identified.
- 18 showed *improvement in medical outcomes* using CCM.
- 14 showed *improved patient compliance with medical treatment* using CCM.
- 2 showed *reduction in medical services utilization* using CCM.
- 2 showed *reduction in heart failure or CVD* by using CCM.
- Implementations of CCM were found to be constrained by availability of social services, and lacked consistent academic robustness, however.
- Increased professional recognition of the value of CCM, tighter health care systems integration of the model, and sufficient financial reimbursement for CCM to remain economically viable, are needed to increase its use.



E.K. Yeoh, et al., **“Benefits and limitations of implementing Chronic Care Model (CCM) in primary care programs: A systematic review,”** *International Journal of Cardiology*, May 1, 2018, 1:258, pp 279–288

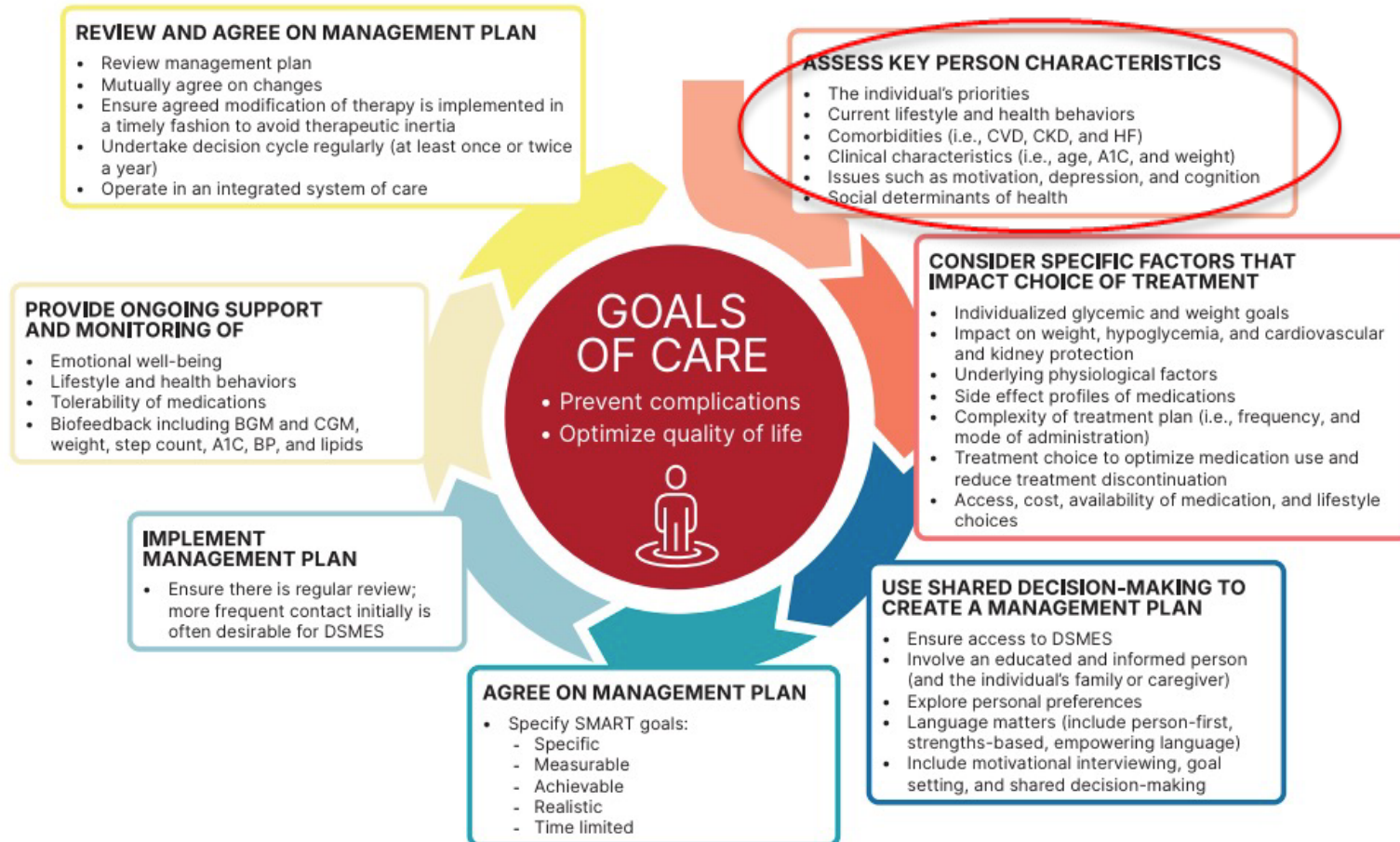


WHAT ARE THE CURRENT
AMERICAN DIABETES ASSOCIATION
2025 STANDARDS OF CARE
FOR REDUCING HEART RISK?



Screening

Decision Cycle for Person-Centered Glycemic Management in Type 2 Diabetes



Screening

- At the *Initiating Visit*, once patient consent has been obtained and documented, the ADA recommends certain baseline data be gathered.
- These data will guide the CCM team in the specifics of therapy.
- This data set is comprehensive, and requires history, physical exam, laboratory work, and in some cases medical imaging.
- This discussion will go over those related to DM and heart disease.
- The complete guideline is available from the 2025 ADA practice guide.



Screening

History:

1. Family history of any pertinent DM-related cardiovascular issues.
2. Personal history of:
 - a) Hypertension (HTN) or hyperlipidemia (HLD)
 - b) Macrovascular or microvascular disease
 - c) Hemoglobinopathies or anemia
 - d) Metabolic surgeries or transplants
 - e) Libido and dyspareunia or erectile dysfunction symptoms
3. Medications and allergies
4. Technological device use and support (insulin pumps, glucose monitoring)
5. Social determinants of health and home support



Screening

Physical Exam:

1. Routine age-appropriate physical exam.
2. Special emphasis:
 - a) BP, with orthostatic testing if indicated
 - b) Peripheral pulses, with ABI testing if PAD is suspected
 - c) Monofilament test
3. Skin integrity check
4. Bone or nail deformity suggestive of vascular compromise
5. Gait abnormalities or impaired joint range-of-motion
6. Cognitive or muscular deficits suspicious for neurovascular issues



Screening

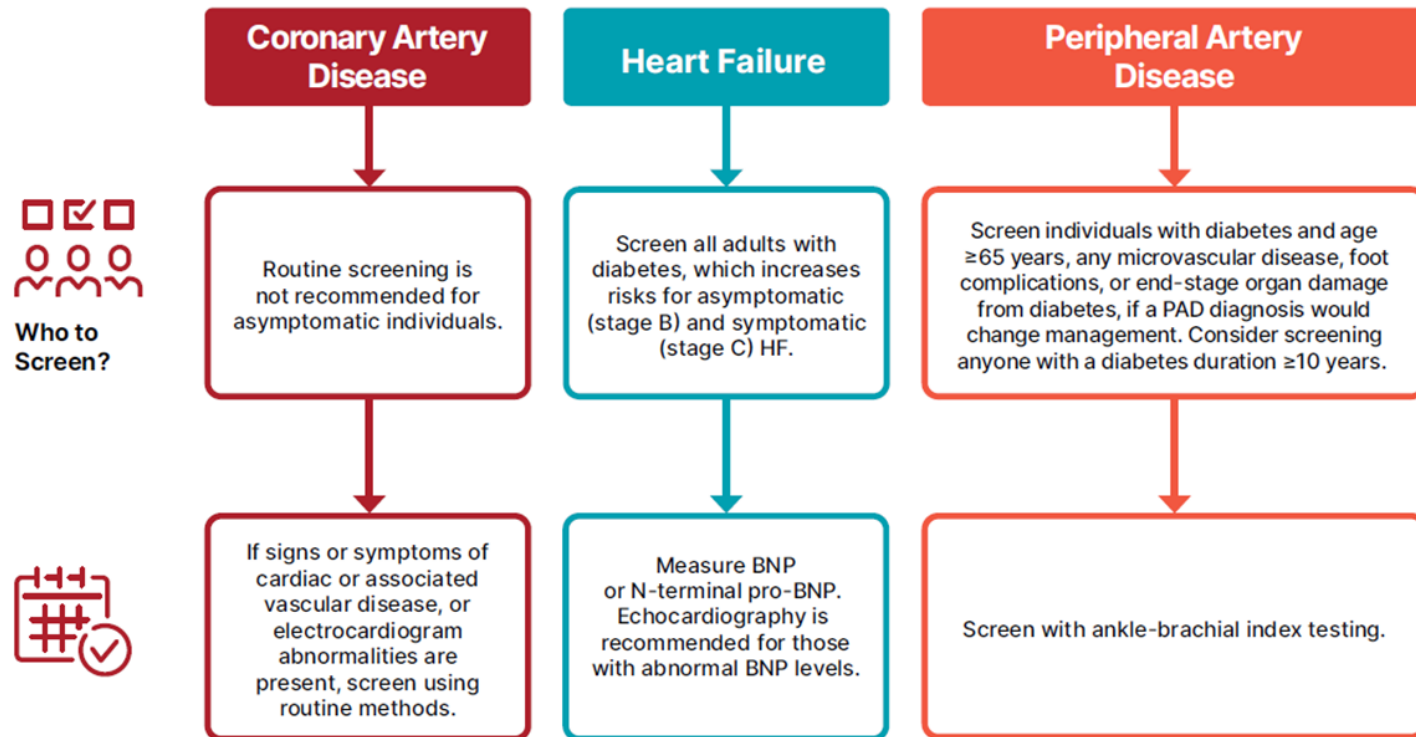
Laboratory tests:

1. Routine age-appropriate diabetic tests like HgbA1C, CBC and CMP.
2. Special emphasis:
 - a) Potassium level for those on ACEI, ARB, DRI, or diuretics
 - b) Lipid Pane including at least TC, LDL, HDL, and Triglycerides
 - c) Serum Creatinine and estimated GFR
3. Patients with DM 1 or autoimmune disease should be tested for thyroid and celiac disease as well.
4. BNP or Pro-BNP, with follow-up Echocardiogram if abnormal



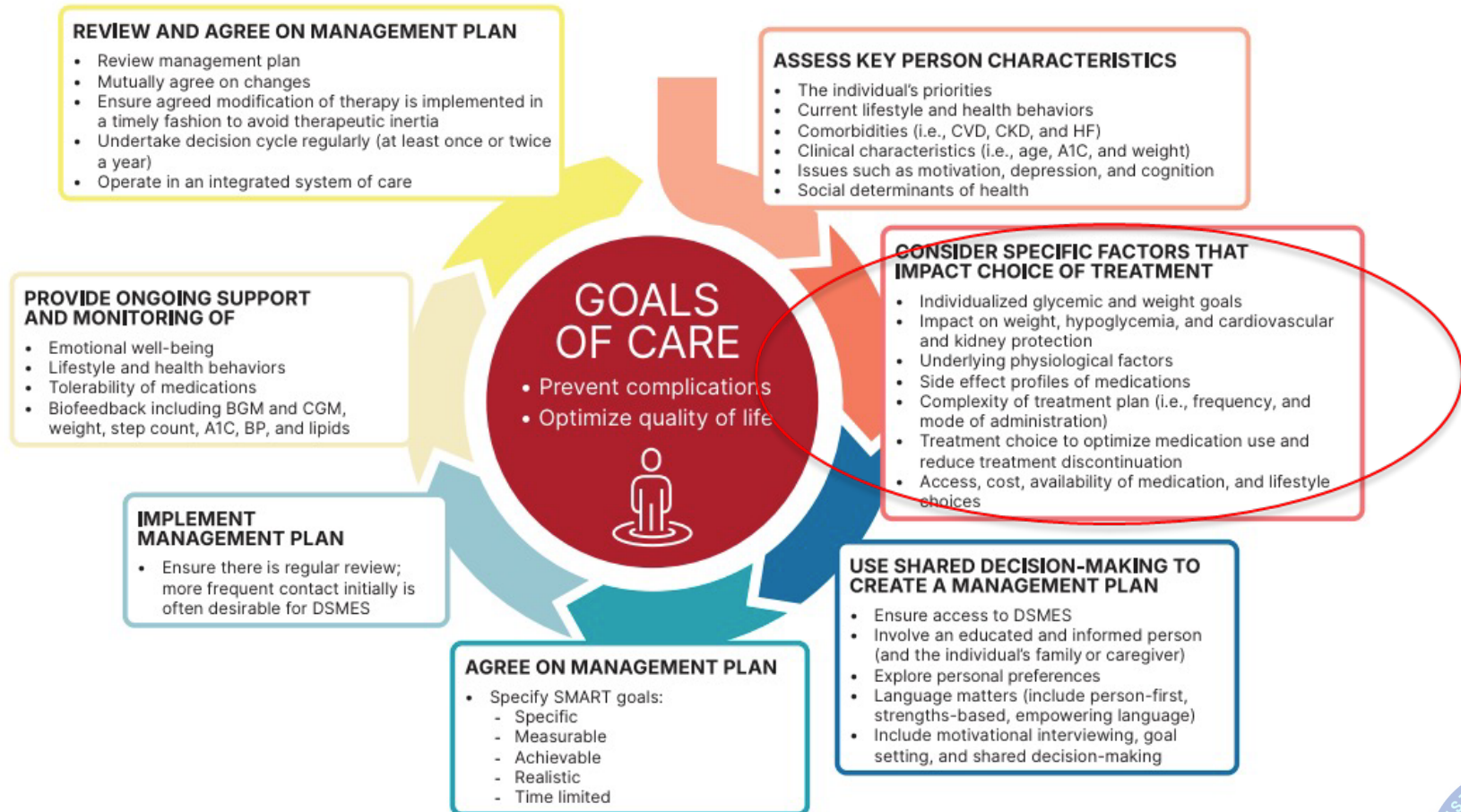
Screening

Screening for Undiagnosed Cardiovascular Disease

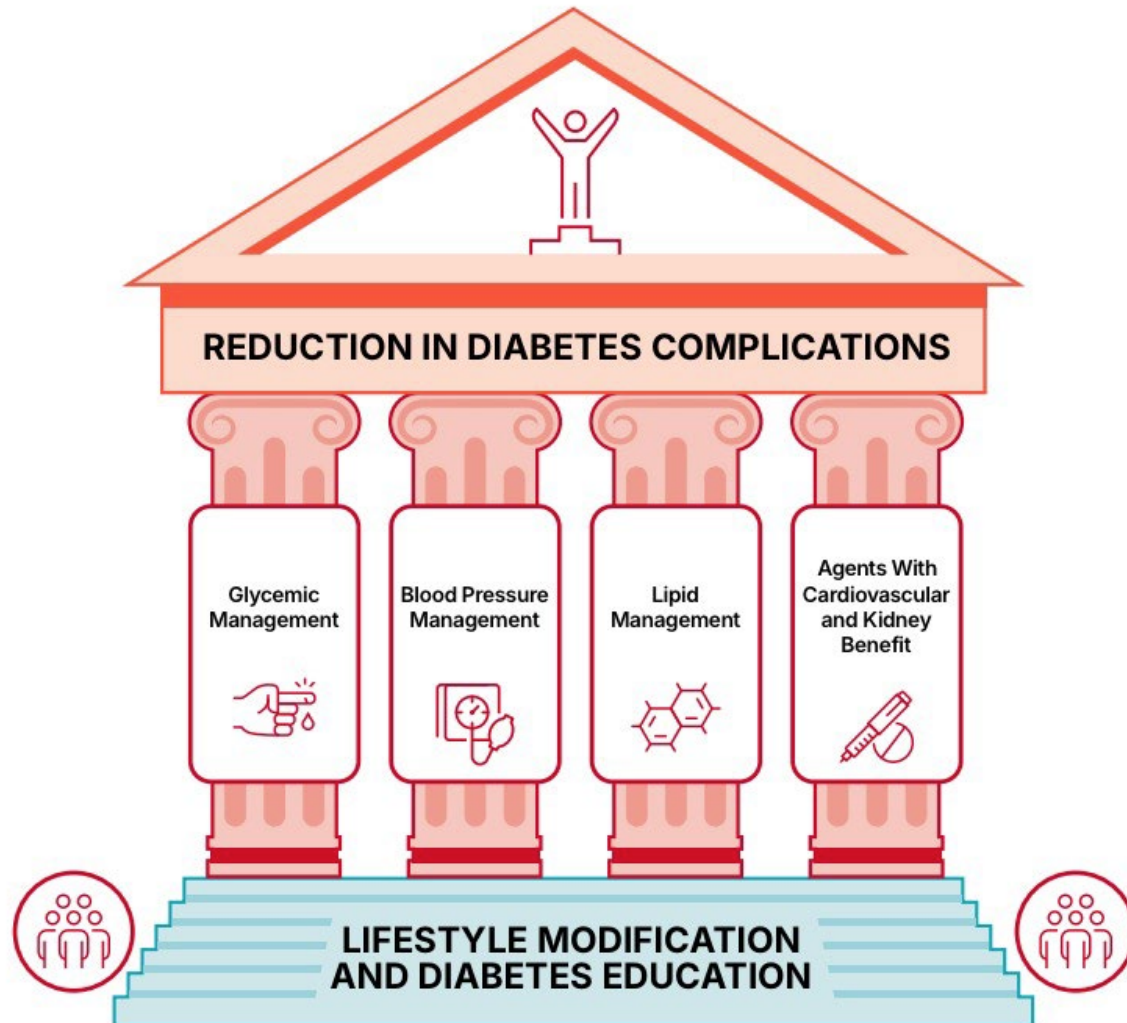


Treatment

Decision Cycle for Person-Centered Glycemic Management in Type 2 Diabetes



Treatment



From ADA: "Standards of Care in Diabetes – 2025"



Treatment

ADA evidence-grading system for “Standards of Care in Diabetes”

A *Clear evidence from well-conducted, generalizable randomized controlled trials that are adequately powered, including:*

- Evidence from a well-conducted multicenter trial
- Evidence from a meta-analysis that incorporated quality ratings in the analysis

Supportive evidence from well-conducted randomized controlled trials that are adequately powered, including:

- Evidence from a well-conducted trial at one or more institutions
- Evidence from a meta-analysis that incorporated quality ratings in the analysis



Treatment

ADA evidence-grading system for “Standards of Care in Diabetes”

- B** *Supportive evidence from well-conducted cohort studies, including:*
- Evidence from a well-conducted prospective cohort study or registry
 - Evidence from a well-conducted meta-analysis of cohort studies
- Supportive evidence from a well-conducted case-control study*



Treatment

ADA evidence-grading system for “Standards of Care in Diabetes”

- C** *Supportive evidence from poorly controlled or uncontrolled studies, including:*
- Evidence from randomized clinical trials with one or more major or three or more minor methodological flaws that could invalidate the results
 - Evidence from observational studies with high potential for bias (such as case series with comparison with historical controls)
 - Evidence from case series or case reports

Conflicting evidence with the weight of the evidence supporting the recommendation



Treatment

ADA evidence-grading system for “Standards of Care in Diabetes”

E *Expert consensus or clinical experience*



Basics

A

Blood pressure should be measured at every routine clinical visit, or at least every 6 months.



Basics

A

Hypertension is defined by the ADA as a systolic blood pressure (SBP) ≥ 130 mmHg or a diastolic blood pressure (DBP) ≥ 80 mmHg based on an average of two or more measurements obtained on two or more occasions.



Basics

E

Individuals with blood pressure $\geq 180/110$ mmHg and evidence of cardiovascular disease can be diagnosed with hypertension at a single visit.



Basics

A

Counsel all people with hypertension and diabetes to monitor their blood pressure at home after appropriate education.



Basics

B

For people with diabetes and hypertension, blood pressure goals should be individualized through a shared decision-making process that addresses cardiovascular risk, potential adverse effects of antihypertensive medications, and individual preferences.



Basics

B

Adults with diabetes are at increased risk for developing asymptomatic cardiac structural or functional abnormalities (Stage B heart failure) or symptomatic (Stage C) heart failure. Consider screening adults with diabetes by measuring B-type Natriuretic Peptide (BNP) or N-terminal pro-BNP (NT-proBNP) to facilitate prevention of stage C heart failure.



Basics

A

In asymptomatic individuals with diabetes and abnormal natriuretic peptide levels, echocardiography is recommended to identify Stage B heart failure.



Basics

A

In asymptomatic individuals with diabetes aged >65 years, microvascular disease in any location, foot complications, or any end-organ damage from diabetes, screening for PAD with ankle-brachial index testing is recommended, if a PAD diagnosis would change management.



Basics

E

In individuals with diabetes duration of ≥ 10 years and high cardiovascular risk, screening for PAD should be considered.



Basics

E

Consider investigations for coronary artery disease (CAD) in the presence of signs or symptoms of cardiac or associated vascular disease (CVD), including carotid bruits, transient ischemic attack (TIA), stroke (CVA), claudication, PAD, or electrocardiogram abnormalities (e.g., Q waves).



Basics

E

For people with blood pressure $>120/80$ mmHg, lifestyle intervention consists of weight loss when indicated, a Dietary Approaches to Stop Hypertension (DASH)–style diet, including reducing sodium and increasing potassium intake, moderation of alcohol consumption, smoking cessation, and increased physical activity.



Basics

E

In adults with prediabetes or diabetes not taking statins or other lipid-lowering therapy, it is reasonable to obtain a lipid profile at the time of diagnosis, at an initial medical evaluation, annually thereafter, or more frequently if indicated.



Basics

C

Intensify lifestyle therapy and optimize glycemic management for people with diabetes with elevated triglyceride levels (≥ 150 mg/dL) and/or low HDL cholesterol (< 40 mg/dL for men and < 50 mg/dL for women).



Basics

A

Obtain a lipid profile at initiation of statins or other lipid-lowering therapy, 4 to 12 weeks after initiation or change in dose, and annually thereafter.



Pharmacological Interventions

A

For people with diabetes aged 40–75 years without ASCVD, use moderate intensity statin therapy in addition to lifestyle therapy.



Pharmacological Interventions

C For people with diabetes aged 20–39 years with additional ASCVD risk factors, it may be reasonable to initiate statin therapy in addition to lifestyle therapy.



Pharmacological Interventions

A

For people with diabetes aged 40–75 years at higher cardiovascular risk, including those with one or more additional ASCVD risk factors, high-intensity statin therapy is recommended to reduce LDL cholesterol by $\geq 50\%$ of baseline and to obtain an LDL cholesterol goal of < 70 mg/dL.



Pharmacological Interventions

B

For people with diabetes aged 40–75 years at higher cardiovascular risk, especially those with multiple additional ASCVD risk factors and an LDL cholesterol ≥ 70 mg/dL, it may be reasonable to add *Ezetimibe* or a *PCSK9 inhibitor* to maximum tolerated statin therapy.



Pharmacological Interventions

B

In adults with diabetes aged >75 years already on statin therapy, it is reasonable to continue statin treatment.



Pharmacological Interventions

C

In adults with diabetes aged >75 years, it may be reasonable to initiate moderate-intensity statin therapy after discussing potential benefits and risks.



Pharmacological Interventions

C

Individuals with fasting triglyceride levels ≥ 500 mg/dL should be evaluated for a secondary cause of hypertriglyceridemia and medical therapy considered, in order to reduce the risk of pancreatitis.



Pharmacological Interventions

A

In people with diabetes intolerant to statin therapy, *Bempedoic Acid* is a recommended therapy to reduce cardiovascular event rates, as an alternative cholesterol lowering plan.



Pharmacological Interventions

B

In individuals with ASCVD or other cardiovascular risk factors on a statin with managed LDL cholesterol but elevated triglycerides (150–499 mg/dL), the addition of *Icosapent Ethyl* can be considered to reduce CVD risk.



Pharmacological Interventions

A

Using statin plus fibrate combination therapy has not been shown to improve ASCVD outcomes and is generally not recommended.



Pharmacological Interventions

A

Using statin plus niacin combination therapy has not been shown to provide additional cardiovascular benefit above statin therapy alone, may increase the risk of stroke, with additional unwanted side effects, and is generally not recommended.



Pharmacological Interventions

A

Aspirin therapy (75–162 mg/day) may be considered as a primary prevention strategy in those with diabetes who are at increased cardiovascular risk after a comprehensive discussion with the individual on the benefits versus the comparable increased risk of bleeding.



Pharmacological Interventions

A

Use aspirin therapy (75–162 mg/day) as a secondary prevention strategy in those with diabetes and a history of ASCVD.



Pharmacological Interventions

B

For individuals with ASCVD and documented aspirin allergy, *Clopidogrel* (75 mg/day) should be used.



Pharmacological Interventions

A

Combination therapy with aspirin plus low-dose *Rivaroxaban* should be considered for individuals with stable coronary artery disease (CAD) and/or peripheral artery disease (PAD) and low bleeding risk to prevent major adverse limb and cardiovascular events.



Pharmacological Interventions

A

Individuals with Type 2 diabetes who have established ASCVD or established CKD, a Sodium–Glucose cotransporter 2 (SGLT2) inhibitor or Glucagon-Like Peptide 1 Receptor Agonist (GLP-1 RA) with demonstrated CVD benefit is recommended as part of the comprehensive cardiovascular risk reduction and/or glucose-lowering treatment plans.



Pharmacological Interventions

A

In people with Type 2 diabetes and established ASCVD or multiple risk factors for ASCVD, combined therapy with an SGLT2 inhibitor with demonstrated cardiovascular benefit, and a GLP-1 RA with demonstrated cardiovascular benefit, may be used for additive reduction of the risk of adverse ASCVD and CKD events.



Pharmacological Interventions

A

For individuals with Type 2 diabetes and CKD with albuminuria treated with maximum tolerated doses of ACEI or ARB, recommend treatment with a nonsteroidal MRA with demonstrated benefit to improve cardiovascular outcomes and reduce the risk of CKD progression.



Pharmacological Interventions

A

For individuals with diabetes and asymptomatic Stage B heart failure, ACEIs or ARBs and B-blockers are recommended to reduce the risk for progression to symptomatic Stage C heart failure.



Pharmacological Interventions

A

In individuals with Type 2 diabetes and asymptomatic Stage B heart failure, or with high risk of or established cardiovascular disease, treatment with an SGLT inhibitor with proven heart failure prevention benefit is recommended to reduce the risk of hospitalization for heart failure.



Pharmacological Interventions

A

In individuals with Type 2 diabetes, obesity, and symptomatic Stage C heart failure with preserved ejection fraction, therapy with a GLP-1 RA with demonstrated benefit for reduction of heart failure related symptoms, physical limitations, and exercise function is recommended.



Pharmacological Interventions

B

In people with Type 2 diabetes with stable heart failure, metformin may be continued for glucose lowering if estimated glomerular filtration rate remains >30 mL/min, but should be avoided in unstable or hospitalized individuals with heart failure.



Pharmacological Interventions

A

For individuals with confirmed office based blood pressure $\geq 130/80$ mmHg, pharmacologic therapy should be initiated and titrated to achieve the recommended blood pressure goal of $<130/80$ mmHg.



Pharmacological Interventions

A

Individuals with confirmed office based blood pressure $\geq 150/90$ mmHg should, in addition to lifestyle therapy, prompt initiation and timely titration of *two drugs* or a single-pill combination of drugs is demonstrated to reduce cardiovascular events in people with diabetes.



Pharmacological Interventions

A

Treatment for hypertension should include drug classes demonstrated to reduce cardiovascular events in people with diabetes.



Pharmacological Interventions

A

Angiotensin Converting Enzyme Inhibitors (ACEIs) or Angiotensin Receptor Blockers (ARBs) are the recommended first-line therapy for hypertension in people with diabetes and coronary artery disease.



Pharmacological Interventions

A

Avoid combinations of ACEIs and ARBs, and combinations of ACEs or ARBs (including ARBs and Neprilysin inhibitors) with Direct Renin Inhibitors (DRIs).



Pharmacological Interventions

B

If one class (ACEI or ARB) is not tolerated, the other should one be substituted.



Pharmacological Interventions

A

An ACEI or ARB, at maximum tolerated dose indicated for blood pressure treatment, is the recommended first-line treatment for hypertension in people with diabetes and urinary albumin-to-creatinine ratio ≥ 300 mg/g.



Pharmacological Interventions

B

Monitor for increased serum creatinine, and for increased serum potassium levels, when ACEIs, ARBs, and Mineralocorticoid Receptor Antagonists (MRAs) are used, and for hypokalemia when diuretics are used.



Pharmacological Interventions

A

Individuals with hypertension who are not meeting blood pressure goals on three classes of antihypertensive medications (including a diuretic) should be considered for MRA therapy.



Pharmacological Interventions

A

ACEIs, ARB, MRAs, DRIs, and Neprilysin inhibitors should be avoided in sexually active individuals of childbearing potential who are not using reliable contraception and are contraindicated in pregnancy.



Pharmacological Interventions

A

In pregnant individuals with diabetes and chronic hypertension, a blood pressure threshold of 140/90 mmHg for initiation or titration of therapy is associated with better pregnancy outcomes than reserving treatment for severe hypertension, with no increase in risk of small-for-gestational-age (SGA) birth weight.



Pharmacological Interventions

A

A blood pressure goal of 110–135/85 mmHg is suggested in the interest of reducing the risk for accelerated maternal hypertension.



Pharmacological Interventions

E

There are limited data on the optimal lower limit in pregnancy, but therapy should be de-intensified for blood pressure $<90/60$ mmHg.



Pharmacological Interventions

B

In most circumstances, lipid-lowering agents should be stopped prior to conception and avoided in sexually active individuals of child-bearing potential who are not using reliable contraception.



Behavioral Interventions

A

Lifestyle modification focusing on weight loss, following a Mediterranean or DASH diet, reduction of saturated and trans fats, increase of dietary N-3 fatty acids, fiber, and plant stanol/sterol intake, and increased physical activity, should all be recommended, to improve the lipid profile and reduce atherosclerotic cardiovascular disease (ASCVD) risk in people with diabetes.



Behavioral Interventions

C

In adults with hypertriglyceridemia (fasting triglycerides >150 mg/dL or non-fasting triglycerides >175 mg/dL), clinicians should address and treat lifestyle factors (obesity and metabolic syndrome), secondary factors (diabetes, chronic liver or kidney disease and/or nephrotic syndrome, and hypothyroidism), and medications that raise triglycerides.



Treatment

Decision Cycle for Person-Centered Glycemic Management in Type 2 Diabetes





Treatment



About the Diabetes Self-Management Education and Support (DSMES) Toolkit

Find out how you can use this comprehensive resource to achieve success with DSMES services.

<https://www.cdc.gov/diabetes-toolkit/php/index.html>



Thank You!

