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2024 ADA Standards of Care: Guidelines for Blood Pressure and Lipid Management

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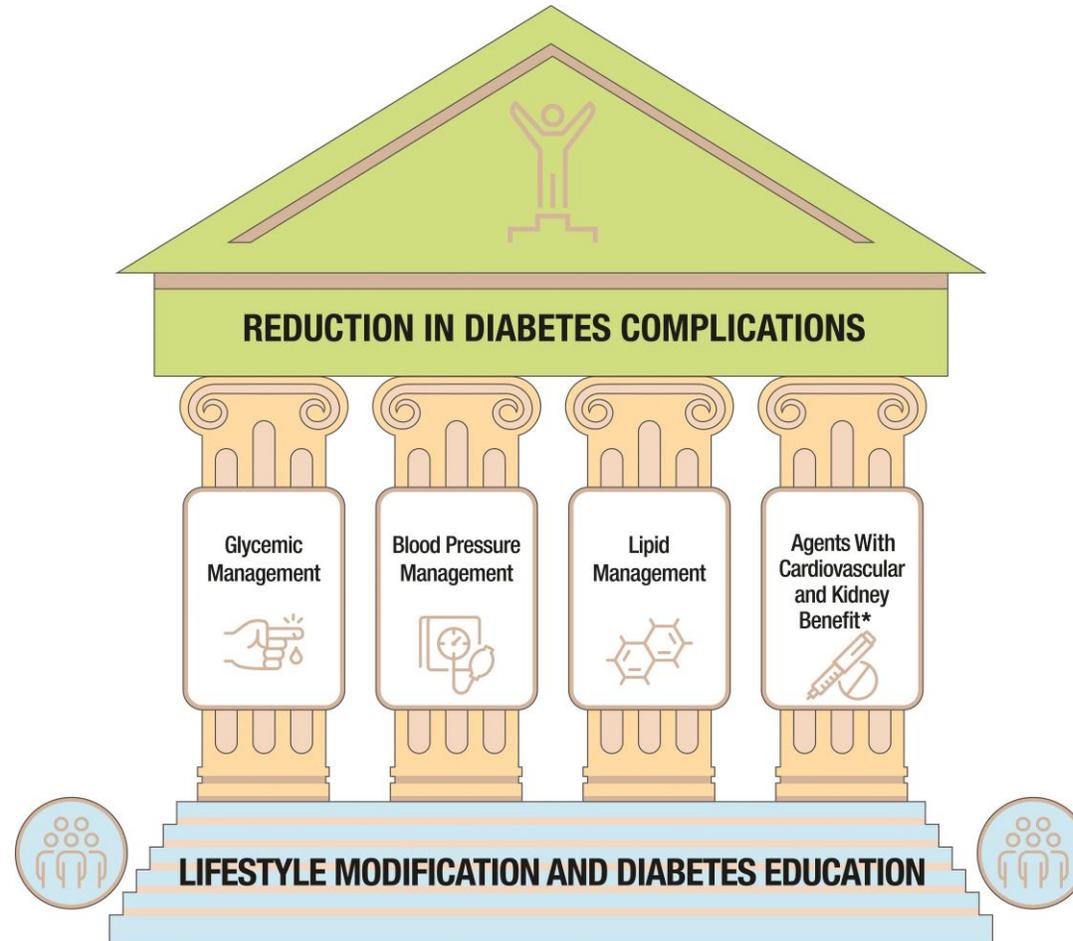
Overview

- Hypertension Diagnosis Cut-Offs
 - Treatment Goals
 - Lifestyle Recommendations
 - Medication Recommendations

- Lipid Management Recommendations for High-Risk Individuals
 - Treatment Goals
 - Lifestyle Recommendations
 - Medication Recommendations

- Team Considerations for Helping People Reduce their Risk of Cardiovascular Disease

Diabetes Care. 2023;47(Supplement_1):S179-S218. doi:10.2337/dc24-S010

**Figure Legend:**

Multifactorial approach to reduction in risk of diabetes complications. *Risk reduction interventions to be applied as individually appropriate.

Hypertension Diagnosis Cut-Offs

- Hypertension is defined as \geq **130/80 mmHg** (prior to 2023 was defined as \geq 140/90 mmHg)
 - Antihypertensive therapy reduces ASCVD events, heart failure, and microvascular complications
 - This recommendation to support a blood pressure goal of $<$ 130/80 mmHg in people with diabetes is consistent with guidelines from the American College of Cardiology and American Heart Association
 - People with diabetes who have hypertension should be treated to blood pressure targets $<$ 130/80 mm/Hg

Hypertension Throughout the Lifespan

■ Adults

- Hypertension is defined as $\geq 130/80$ mmHg (prior to 2023 was defined as $\geq 140/90$ mmHg)

■ Older Adults

- Hypertension is defined as $\geq 130/80$ mmHg (prior to 2023 was defined as $\geq 140/90$ mmHg)
- STEP trial (included about 20% of people with diabetes) noted a decreased in cardiovascular events with treatment of hypertension to a blood pressure target of < 130 mmHg.
- SPRINT trial (excluded people with diabetes): treatment should not be targeted to $< 120/80$ mmHg, as a mean achieved blood pressure of $< 120/80$ mmHg is associated with adverse events – hypotension, syncope, electrolyte abnormalities, and acute kidney injury; though intensive treatment reduced MI, coronary syndromes, heart failure, or death from cardiovascular diseases by 25% in the intensive treatment group (< 120 mmHg).

■ Children and Adolescents

- If less than 13 years, hypertension is defined as ≥ 95 th percentile for age, sex, and height
- If ≥ 13 years old, hypertension is defined as $\geq 130/80$ mmHg

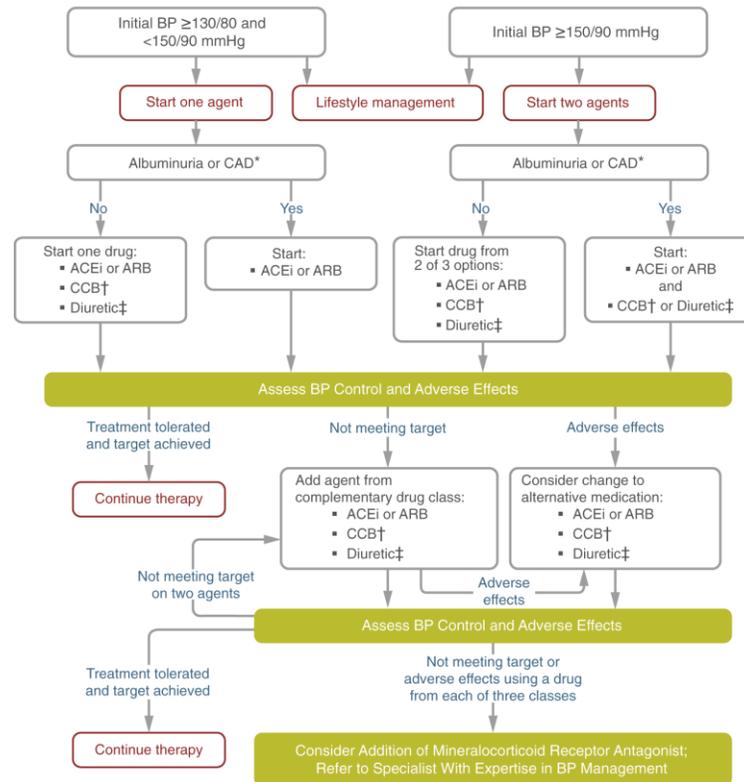
■ Diabetes in Pregnancy

- Initiation or titration of therapy at a blood pressure threshold of $140/90$ mmHg is associated with better pregnancy outcomes than reserving treatment for severe hypertension.

Screening and Diagnosis

- Blood pressure should be measured at every routine clinical visit by a trained individual.
- Diagnosis of hypertension should preferably be confirmed on a separate day; however, in individuals with blood pressure \geq to 180/110 mmHg and cardiovascular disease it is reasonable to diagnose hypertension at a single visit (this is the same recommendation as 2022 and 2023).
- All people with hypertension and diabetes should monitor their blood pressure at home.
 - Studies of individuals without diabetes found that home measurements may better correlate with ASCVD risk than office measurements.
 - **Home blood pressure monitoring may improve patient medication taking and thus help reduce cardiovascular risk.**

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 Recommendations for the Treatment of Confirmed
Hypertension in Nonpregnant People With Diabetes

Figure Legend:

Recommendations for the treatment of confirmed hypertension in nonpregnant people with diabetes. *An ACE inhibitor (ACEi) or angiotensin receptor blocker (ARB) is suggested to treat hypertension for people with coronary artery disease (CAD) or urine albumin-to-creatinine ratio 30–299 mg/g creatinine and strongly recommended for individuals with urine albumin-to-creatinine ratio ≥ 300 mg/g creatinine. †Dihydropyridine calcium channel blocker (CCB). ‡Thiazide-like diuretic; long-acting agents shown to reduce cardiovascular events, such as chlorthalidone and indapamide, are preferred. BP, blood pressure. Adapted from de Boer et al. (18).

Treatment Goals

- Patients and clinicians should engage in a shared-decision making process to determine individual blood pressure targets.

- Lifestyle Intervention – recommendation for people with blood pressure > 120/80 mmHg

- Pharmacological Interventions –
 - For people with blood pressure \geq 130/80 mmHg consider recommending lifestyle interventions ALONG WITH initiation and titration of pharmacologic therapy.
 - For people with blood pressure \geq 150/90 mmHg (in 2023 this was \geq 160/100 mmHg) consider recommending in addition to lifestyle interventions prompt initiation and timely titration of two drugs (or a single-pill combination of drugs).

Lifestyle Interventions

- For people with blood pressure > 120/80 mmHg lifestyle interventions consist of:
 - Weight loss (if indicated)
 - A Dietary Approaches to Stop Hypertension (DASH)-style eating pattern
 - Increased physical activity (ideally at least 150 minutes of moderate-intensity aerobic activity per week)
- Lifestyle management is an important component of hypertension treatment because it lowers blood pressure, enhances effectiveness of some antihypertensive medications, promotes other aspects of metabolic and vascular health, and generally leads to few adverse effects.
- When hypertension is diagnosed ($\geq 130/80$ mmHg) consider recommending lifestyle interventions **ALONG WITH** initiation of pharmacologic therapy.

DASH-Style Eating Pattern

- Dietary Approaches to Stop Hypertension (DASH)-Style Eating Pattern:
 - ❑ Reducing sodium (< 2,300 mg per day) and increasing potassium intake
 - ❑ Increasing consumption of fruits and vegetables, ideally 8-10 servings per day
 - ❑ Increasing low-fat dairy products, ideally 2-3 servings per day
 - ❑ Avoiding excessive alcohol consumption (no more than 2 servings per day for men and no more than 1 serving per day for women)

An Update on the Mediterranean, Vegetarian, and DASH Eating Patterns in People With Type 2 Diabetes (May 2020)

<https://diabetesjournals.org/spectrum/article/33/2/125/32903/An-Update-on-the-Mediterranean-Vegetarian-and-DASH>

DASH-Style Eating Pattern Continued

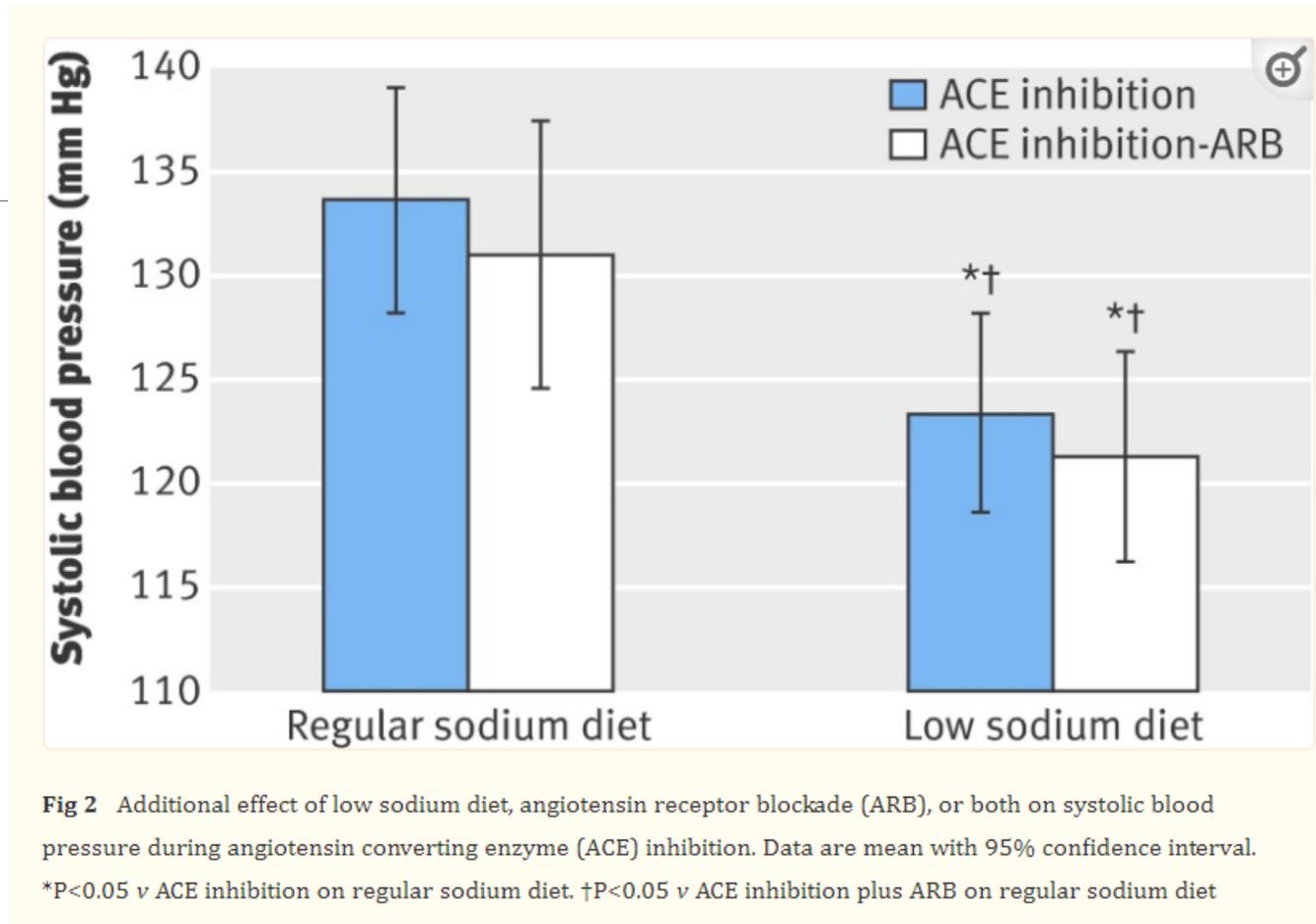
- Examples of nutrition tips to help someone get started:

- ❑ Add a vegetable or fruit to every meal (and snack).
- ❑ Eat at least 1 meatless meal each week.
- ❑ Ask to substitute a vegetable/salad for fries/white bread when dining out.
- ❑ Use herbs and spices to make food tastier without salt.
- ❑ Snack on almonds, pecans or other nuts instead of potato chips.

- DASH-Style Eating Pattern Resources:

- <https://diabetesjournals.org/spectrum/article/33/2/125/32903/An-Update-on-the-Mediterranean-Vegetarian-and-DASH>
- <https://health.usnews.com/best-diet/dash-diet>
- <https://dashdiet.org/>
- <https://www.heart.org/en/health-topics/high-blood-pressure/changes-you-can-make-to-manage-high-blood-pressure/managing-blood-pressure-with-a-heart-healthy-diet>

Low Sodium Eating Pattern Enhances Effectiveness of Some Antihypertensive Medications



Moderate dietary sodium restriction added to angiotensin converting enzyme inhibition compared with dual blockade in lowering proteinuria and blood pressure: randomised controlled trial. BMJ 2011.

<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3143706/>

Pharmacological Interventions

- When hypertension is diagnosed ($\geq 130/80$ mmHg) consider recommending:
 - Lifestyle interventions ALONG WITH
 - Initiation of pharmacologic therapy (including timely titration to achieve blood pressure goal)
- Individuals with confirmed office-based blood pressure $\geq 150/90$ mmHg:
 - Lifestyle interventions ALONG WITH
 - Initiation of two drugs or a single-pill combination of drugs demonstrated to reduce cardiovascular events in people with diabetes (including timely titration to achieve blood pressure goal).
- **ACE inhibitors OR angiotensin receptor blockers are recommended first-line therapy** for hypertension in people with diabetes and coronary artery disease.
- Multiple-drug therapy is generally required to achieve blood pressure targets (though combinations of ACE inhibitors and angiotensin receptor blockers should not be used).

Pharmacological Interventions Continued

- ACE inhibitors OR angiotensin receptor blockers are recommended first-line treatment for hypertension in people with diabetes AND
 - urinary albumin-to-creatinine ratio ≥ 300 mg/g creatinine (A evidence) or
 - urinary albumin-to-creatinine ratio 30-299 mg/g creatinine (B evidence) at the maximum tolerated dose of an ACE inhibitor or angiotensin receptor blocker. If one class is not tolerated, the other should be substituted
- For patients treated with an ACE inhibitor, angiotensin receptor blocker, MRA, or diuretic:
 - **serum creatinine/estimated glomerular filtration rate AND**
 - **serum potassium levels should be monitored within 7-14 days after initiation of treatment and at least annually**

Pharmacological Interventions Throughout the Lifespan

- Adults – blood pressure $\geq 130/80$ mmHg qualify for initiation and titration of pharmacological therapy
 - **ACE inhibitors or angiotensin receptor blockers are recommended first-line therapy** for hypertension in people with diabetes AND coronary artery disease as well as for hypertension in people with diabetes AND urinary albumin-to-creatinine ratio ≥ 300 mg/g creatinine (A) or 30-299 mg/g creatinine (B)
 - Multiple-drug therapy is generally required to achieve blood pressure targets (though combinations of ACE inhibitors and angiotensin receptor blockers should not be used)
- Older Adults
 - ACE inhibitors or angiotensin receptor blockers are recommended first-line therapy for hypertension in people with diabetes AND coronary artery disease as well as for hypertension in people with diabetes AND urinary albumin-to-creatinine ratio ≥ 300 mg/g creatinine (A) or 30-299 mg/g creatinine (B)
 - Multiple-drug therapy is generally required to achieve blood pressure targets (though combinations of ACE inhibitors and angiotensin receptor blockers should not be used)
- Children and Adolescents
 - ACE inhibitors or angiotensin receptor blockers are recommended first-line therapy
- Diabetes in Pregnancy
 - Antihypertensive drugs known to be effective and safe in pregnancy: methyldopa, labetalol, and long-acting nifedipine (hydralazine may be considered in the acute management of hypertension in pregnancy)
 - ACE inhibitors, angiotensin receptor blockers, and spironolactone are contraindicated as they may cause fetal damage (diuretics are not recommended for managing blood pressure in pregnancy but may be used during late-stage pregnancy if needed for managing volume)

Lipid Management Recommendations for High-Risk Individuals

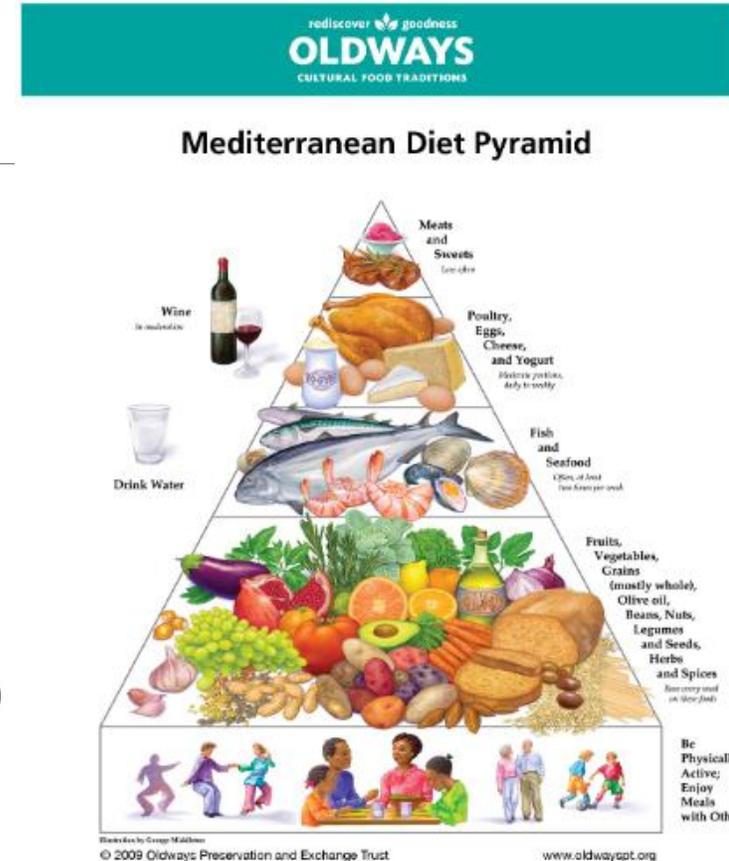
- Evidence supporting **LOWER LDL CHOLESTEROL GOALS** in people **WITH AND WITHOUT** established cardiovascular disease (this change came in 2023).
- **Individuals with diabetes aged 40-75 years at higher risk, including those with one or more ASCVD risk factor(s)**
 - Recommend the use of **high-intensity statin therapy** to reduce LDL cholesterol by $\geq 50\%$ from baseline AND to **target an LDL cholesterol goal of < 70 mg/dL**.
 - Consider adding treatment with ezetimibe or a PCSK9 inhibitor to maximum tolerated statin therapy in these individuals.
- **Individuals with diabetes and established ASCVD**
 - Recommend treatment with **high-intensity statin therapy** to reduce LDL cholesterol of $\geq 50\%$ from baseline AND to target an **LDL cholesterol goal < 55 mg/dL**.
 - If LDL cholesterol goal of < 55 mg/dL is not achieved on maximum tolerated statin therapy, the addition of ezetimibe or a PCSK9 inhibitor is now recommended.

Lifestyle Recommendations

- Weight loss (if indicated)
- Mediterranean eating pattern or
- Dietary Approaches to Stop Hypertension (DASH) eating pattern
- **Reduction of saturated fat** and *trans* fat
- Increase of dietary n-3 fatty acids
- **Viscous fiber** (oats, legumes, citrus) - https://www.lipid.org/sites/default/files/viscous_fiber_and_your_cholesterol.pdf
- Plant stanols/sterols intake
- Increased physical activity

Mediterranean Eating Pattern

- Mediterranean Eating Pattern (based on 2,000 calories per day):
 - Vegetables - 2.5 cups-eq each day
 - Fruit – 2 cup-eq each day
 - Nuts/seeds – 5 oz-eq each week
 - Legumes – 1.5 c-eq each week
 - Extra-virgin olive oil preferred as the main source of fat (2 Tbs per day)
 - Fish/seafood – 15 oz-eq each week
 - Use of herbs and spices encouraged



An Update on the Mediterranean, Vegetarian, and DASH Eating Patterns in People With Type 2 Diabetes (May 2020)

<https://diabetesjournals.org/spectrum/article/33/2/125/32903/An-Update-on-the-Mediterranean-Vegetarian-and-DASH>

Mediterranean Eating Pattern Continued

- Examples of nutrition tips to help someone get started:

- ❑ Add a vegetable or fruit to every meal (and snack).
- ❑ Think of meat as the side dish and whole grains or vegetables as the main dish.
- ❑ Choose fish/legumes as the protein source instead of processed meat/red meat at least 1 time per week.
- ❑ Use a small portion of fruit as the sweet finish to your meal (instead of cookies/cake/ice cream).
- ❑ Use olive oil instead of butter.

- Mediterranean Eating Pattern Resources:

- <https://diabetesjournals.org/spectrum/article/33/2/125/32903/An-Update-on-the-Mediterranean-Vegetarian-and-DASH>
- <https://health.usnews.com/best-diet/mediterranean-diet>
- <https://oldwayspt.org/traditional-diets/mediterranean-diet>
- <https://www.heart.org/en/healthy-living/healthy-eating/eat-smart/nutrition-basics/mediterranean-diet>

Statin Treatment – Primary Prevention

■ Adults

- 40-75 years without ASCVD – use moderate-intensity statin therapy in addition to lifestyle therapy
- **40-75 years with 1 or more ASCVD risk factor(s) – use high intensity statin therapy to target an LDL < 70 mg/dL**
- **40-75 years with established ASCVD – use high intensity statin therapy to target an LDL < 55 mg/dL**
- 20-39 years with additional ASCVD risk factors, it may be reasonable to initiate therapy in addition to lifestyle therapy. (Very little clinical trial evidence exists for people with type 2 diabetes under the age of 40 years or for people with type 1 diabetes of any age.)

■ Older Adults

- In adults with diabetes > 75 years already on statin therapy, it is reasonable to continue statin treatment.
- In adults with diabetes > 75 years, it may be reasonable to initiate moderate-intensity statin therapy after discussion of potential benefits and risks.

Statin Treatment – Primary Prevention Cont.

■ Youth and Adolescents

- After the age of 10 years, addition of a statin may be considered in youth with type 1 diabetes who, despite medical nutrition therapy and lifestyle changes:
 - Continue to have LDL cholesterol > 160 mg/dL OR
 - LDL cholesterol > 130 mg/dL AND one or more cardiovascular disease risk factors
 - The goal of therapy is an LDL cholesterol value < 100 mg/dL
- Type 2 diabetes in youth and adolescents:
 - If LDL cholesterol remains > 130 mg/dL after 6 months of dietary intervention, initiate therapy with a statin
 - The goal of therapy is an LDL cholesterol value < 100 mg/dL

■ Diabetes in Pregnancy

- Statin therapy is contraindicated in pregnancy.
- Statins should be avoided in individuals of childbearing age who are not using reliable contraception.

Statin Therapy – Secondary Prevention

- For people of all ages with diabetes and ASCVD – high-intensity statin therapy should be added to lifestyle interventions
- High-intensity statin therapy is recommended to target an LDL cholesterol reduction of $\geq 50\%$ from baseline AND an LDL cholesterol goal of < 55 mg/dL.
- Addition of ezetimibe or a PCSK9 inhibitor with proven benefit in this population is recommended if LDL cholesterol goal of < 55 mg/dL is not achieved on maximum tolerated statin therapy.
- For individuals who do not tolerate the intended intensity, the maximum tolerated statin dose should be used.

Intolerance to Statin Therapy

- Bempedoic acid treatment for people with diabetes and without established cardiovascular disease
- Bempedoic acid or PCSK9 inhibitor therapy with monoclonal antibody treatment or inclisiran as alternative cholesterol-lowering therapy

Pharmacological Interventions

- Ezetimibe – FDA-approved in 2002, most commonly used nonstatin agent, lowers LDL-C levels by 13% to 20%. Ezetimibe is an inhibitor of intestinal cholesterol absorption.
- PCSK9 inhibitor – FDA approved in 2015, injection every 2-4 weeks, reduces the risk of heart attack by 27%, cuts cholesterol levels by an average of 50-60%. PCSK9 inhibitors reduce the degradation of LDL receptors and increase the clearance of LDL-cholesterol.
- Inclisiran – FDA approved in 2021, should be reserved for those who cannot use a PCSK9 monoclonal antibody, injection by health care provider – initial injection, 3 months later, and then every 6 months. Inclisiran is an siRNA directed against PCSK9.
- <https://www.ncbi.nlm.nih.gov/books/NBK532879/#:~:text=Ezetimibe%20is%20a%20dyslipidemic%20agent,inhibitor%20of%20intestinal%20cholesterol%20absorption>
- <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6686613/#:~:text=PCSK9%20is%20a%20proprotein%20convertase,on%20the%20surface%20of%20hepatocytes>
- <https://www.ncbi.nlm.nih.gov/books/NBK588654/>

Team Considerations for Helping People Reduce their Risk of Cardiovascular Disease

- Embrace a Team Approach!
- Use the D5 for Diabetes – Empower Your Team to Help Patients and Providers Attain and Maintain All 5
 - <https://mncm.org/measurement-resources/>
- Hypertension – train your team to measure, have a plan when an individual is not meeting their target, utilize home blood pressure monitoring
- Statins and LDL targets – help teach individuals with diabetes, help educate providers around the updated LDL targets and recommendations for high-risk individuals, utilize pharmacists to help
- A1c – promote DSMES services, place order for A1c/coach people with diabetes that A1c should be checked every 3-6 months (especially for $A1c \geq 7.0\%$), empower your team to facilitate timely A1c checks

References

Standards of Care in Diabetes – 2024

https://diabetesjournals.org/care/issue/47/Supplement_1

Questions

- Why do the acceptable levels for BP change?
- Please discuss what BP meds should be started first when needed and how to know when to increase in MGs or add new BP medications and in what order should they be added?
- Any info on RN led BP management/visits in Primary Care would be great!
- Curious how recommendations change, if at all, when working with patients with Heart Failure as a comorbidity.
- Recommendations for patient handouts or materials, such as TargetBP from AHA or JNC8 guidelines.