Health Trifecta: Hypertension, Diabetes, and Hyperlipidemia Get a Makeover

Guidelines update

AAPA WE ARE FAMILY (Medicine) Conference, Phoenix, AZ 2023

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Disclosures

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I have no relevant relationships with ineligible companies to disclose within the past 24 months

Educational Objectives

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At the conclusion of this session, participants should be able to:

- Summarize current guidelines for hypertension, diabetes, and hyperlipidemia
- Recognize current screening guidelines from the USPSTF and other entities for identifying patients with hypertension, diabetes, and hyperlipidemia
- Apply current ACC/AHA diagnostic guidelines for hypertension and hyperlipidemia, and current ADA/AACE diagnostic guidelines for diabetes
- Choose optimal hypertension and hyperlipidemia management guidance from ACC/AHA, and interpret recent management updates as recommended in the 2023 ADA Standards of Care in Diabetes Guidelines
- Compare key differences in recommendations between various organizations

Acronyms

AACE - American Association of Clinical Endocrinologists
ACC - American College of Cardiologists
ACE - American College of Endocrinologists
ACE - Angiotensin-converting enzyme inhibitors
ACP - American College of Physicians
ADA - American Diabetes Association
AHA - American Heart Association
ARB - Angiotensin II receptor blockers
ASCVD – Atherosclerotic cardiovascular disease
CAC - Coronary artery calcium score
CKD - Chronic kidney disease
DPP-4 inhibitors - Dipeptidyl peptidase 4 inhibitors
ESC/ESH - European Society of Cardiology/European Society of Hypertension
FBG - Fasting blood glucose
FPG - Fasting plasma glucose
GDM - Gestational Diabetes Mellitus
GIP - Glucose-dependent insulinotropic polypeptide (known earlier as gastric inhibitory polypeptide or gastric inhibitory peptide)
GLP-1 RA - Glucagon-like peptide-1 receptor agonist
ISH - International Society of Hypertension
JNC – Joint National Committee on Detection, Evaluation, and Treatment of High Blood Pressure
NAFLD - Nonalcoholic Fatty Liver Disease
NHLBI - National Heart, Lung, and Blood Institute
NICE – National Institute for Health and Care Excellence
NIH – National Institutes of Health
PCOS – Polycystic Ovary Syndrome
PCSK9 - Proprotein convertase subtilisin/kexin type 9
RAA inhibitors - Renin-angiotensin-aldosterone blocking agents
SDOH - Social Determinants of Health
SGLT2i - Sodium-glucose cotransporter-2 inhibitor
SPRINT- Systolic Blood Pressure Intervention Trial
SU - Sulfonylureas
TG – Triglycerides
TZD - Thiazolidinediones
USPSTF - United States Preventive Services Task Force
VA – Department of Veterans Affairs

Hypertension

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USPSTF Final Recommendations for Hypertension Screening

Who?	All adults 18 +
What?	Screen all adults for HTN (Grade A recommendation)
Where?	Screen in office, then confirm at home • Patient education: BP should be taken at the brachial artery with an automated device in a seated position after 5 minutes of rest
When?	• Annual screening for adults 40+ • Annual screening for adults at any age at increased risk for HTN including: ✓ Black persons ✓ Persons with high-normal BP ✓ Persons who are overweight or obese • Ok to screen less frequently (every 3-5 years) for adults 18-39 not at increased risk for HTN and with a prior normal BP reading

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Guideline Concordance

- 1976-2014 – JNC reports
- **2017 ACC/AHA Guidelines for Hypertension**
  - Endorsed by 11 organizations, including **AAPA**
  - American Academy of Family Physicians (AAFP) and American College of Physicians (ACP) did not endorse
- VA, NHI, and other organizations
- Non-US
  - 2018 European Society of Cardiology/Society of Hypertension (ESC/ESH)
  - 2019 National Institute for Health and Care Excellence (NICE)
  - 2020 International Society of Hypertension (ISH): worldwide practice guidelines

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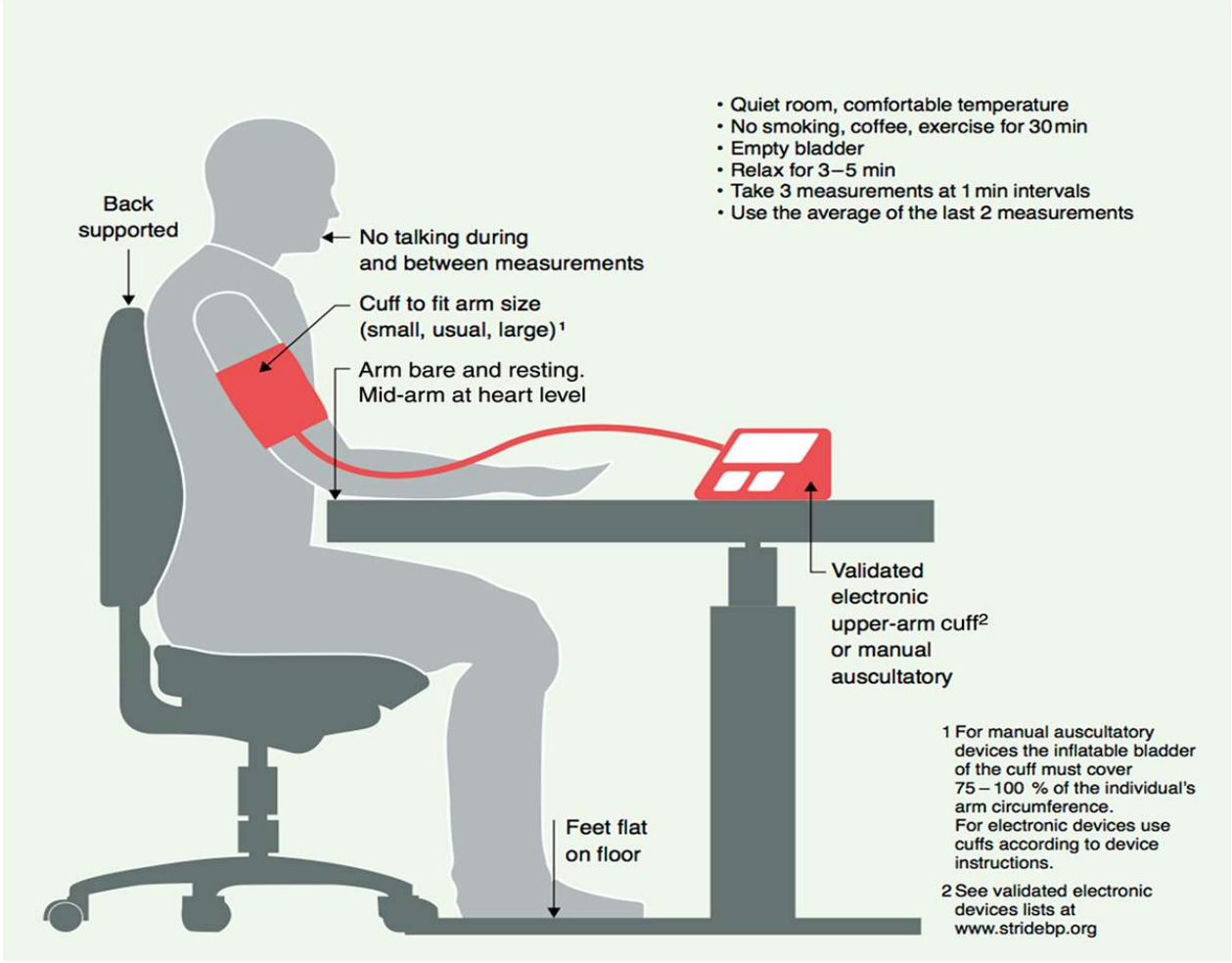
What was new in the ACC/AHA Guidelines for Hypertension?

- First update to comprehensive U.S. guidelines since 2003
- Proper measurement
- SPRINT study looked at all patients regardless of age
- Home blood pressure monitors
- New cut points
- Eliminated prehypertension category
- Preferred medication
  - Longer-acting (thiazide-like) diuretics
  - Single pill combinations
  - *Masked hypertension*


• Quiet room, comfortable temperature
• No smoking, coffee, exercise for 30 min
• Empty bladder
• Relax for 3–5 min
• Take 3 measurements at 1 min intervals
• Use the average of the last 2 measurements
Back supported
No talking during and between measurements
Cuff to fit arm size (small, usual, large)[1]
Arm bare and resting. Mid-arm at heart level
Validated electronic upper-arm cuff[2] or manual auscultatory
Feet flat on floor
1 For manual auscultatory devices the inflatable bladder of the cuff must cover 75 – 100 % of the individual's arm circumference. For electronic devices use cuffs according to device instructions.
2 See validated electronic devices lists at www.stridebp.org

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Blood Pressure Categories

American Heart Association | American Stroke Association

BLOOD PRESSURE CATEGORY	SYSTOLIC mm Hg (upper number)		DIASTOLIC mm Hg (lower number)
NORMAL	LESS THAN 120	and	LESS THAN 80
ELEVATED	120 – 129	and	LESS THAN 80
HIGH BLOOD PRESSURE (HYPERTENSION) STAGE 1	130 – 139	or	80 – 89
HIGH BLOOD PRESSURE (HYPERTENSION) STAGE 2	140 OR HIGHER	or	90 OR HIGHER
HYPERTENSIVE CRISIS (consult your doctor immediately)	HIGHER THAN 180	and/or	HIGHER THAN 120

*Individuals with SBP and DBP in 2 categories should be designated to the higher BP category. Blood pressure based on an average of ≥2 careful readings obtained on ≥2 occasions.

Full-text guidelines are available here

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Laboratory Tests for Primary Hypertension

Basic testing	Fasting blood glucose*
	Complete blood count
	Lipid profile
	Serum creatinine with eGFR*
	Serum sodium, potassium, calcium*
	Thyroid-stimulating hormone
	Urinalysis
	Electrocardiogram
Optional testing	Echocardiogram
	Uric acid
	Urinary albumin to creatinine ratio

*May be included in a comprehensive metabolic panel

*eGFR indicates estimated glomerular filtration rate

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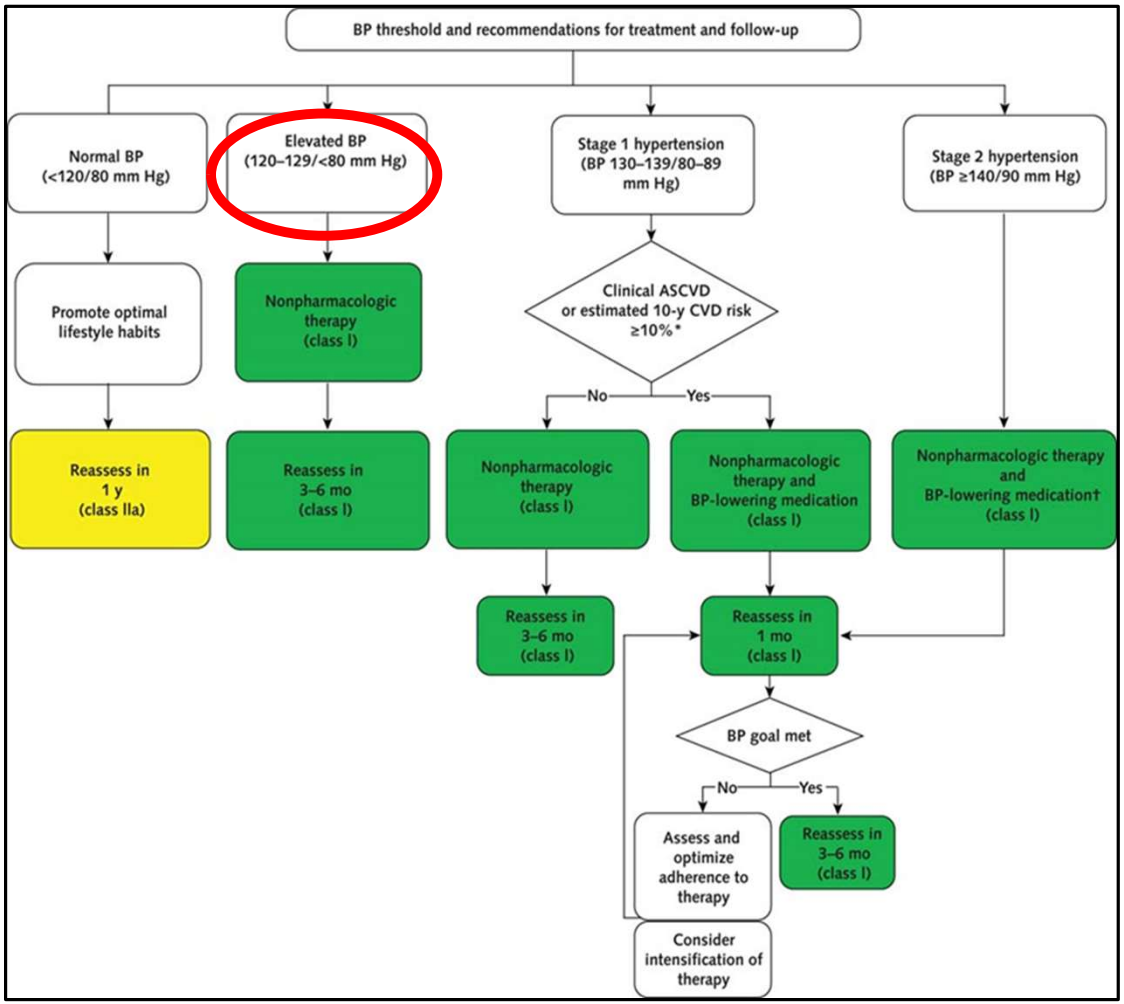
Elevated BP

120-129/<80 mm Hg

Non-pharmacologic therapy
Reassess in 3-6 months



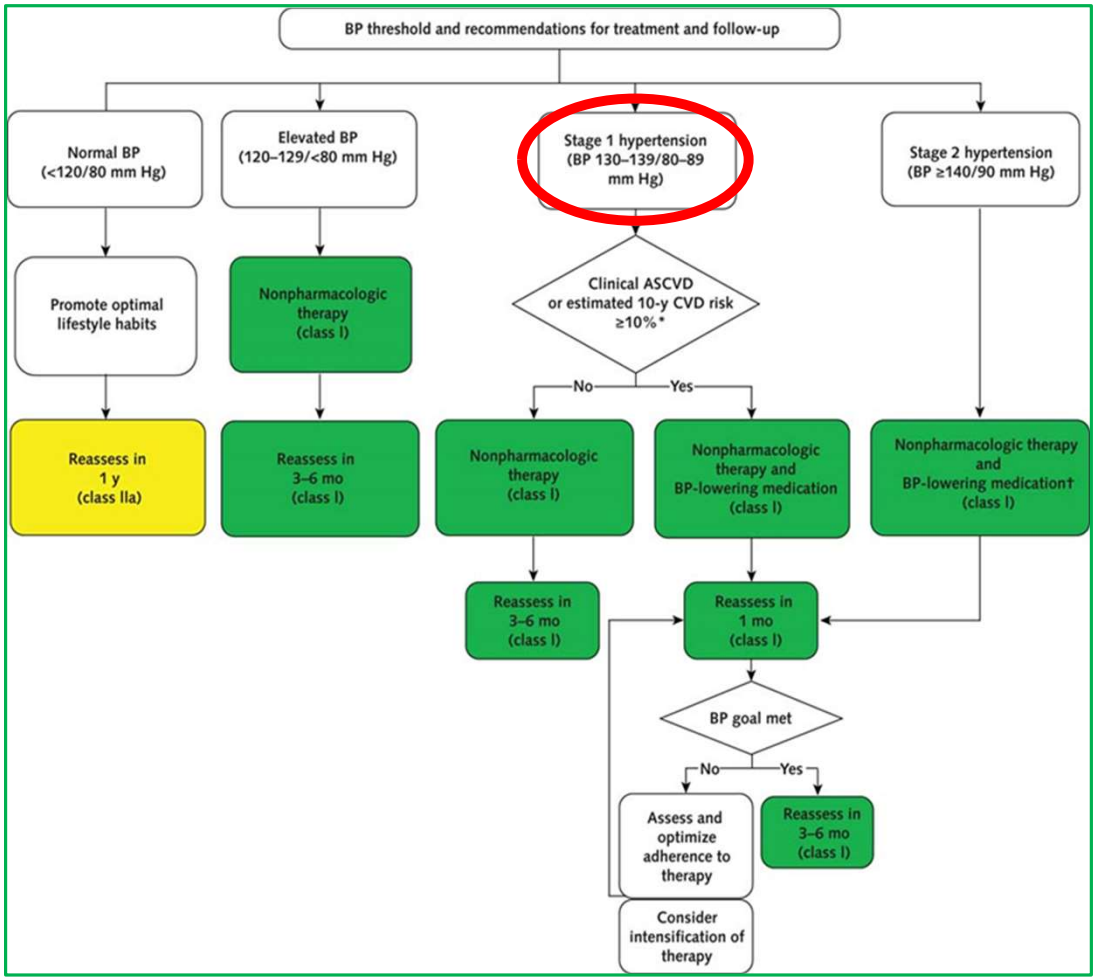
	Nonpharmacologi-cal Intervention	Dose	Approximate Impact on SBP	
			Hypertension	Normotension
Weight loss	Weight/body fat	Best goal is ideal body weight, but aim for at least a 1-kg reduction in body weight for most adults who are overweight. Expect about 1 mm Hg for every 1-kg reduction in body weight.	-5 mm Hg	-2/3 mm Hg
Healthy diet	DASH dietary pattern	Consume a diet rich in fruits, vegetables, whole grains, and low-fat dairy products, with reduced content of saturated and total fat.	-11 mm Hg	-3 mm Hg
Reduced intake of dietary sodium	Dietary sodium	Optimal goal is <1500 mg/d, but aim for at least a 1000-mg/d reduction in most adults.	-5/6 mm Hg	-2/3 mm Hg
Enhanced intake of dietary potassium	Dietary potassium	Aim for 3500–5000 mg/d, preferably by consumption of a diet rich in potassium.	-4/5 mm Hg	-2 mm Hg

	Nonpharmacological Intervention	Dose	Approximate Impact on SBP	
			Hypertension	Normotension
Physical activity	Aerobic	• 90–150 min/wk • 65%–75% heart rate reserve	-5/8 mm Hg	-2/4 mm Hg
	Dynamic resistance	• 90–150 min/wk • 50%–80% 1 rep maximum • 6 exercises, 3 sets/exercise, 10 repetitions/set	-4 mm Hg	-2 mm Hg
	Isometric resistance	• 4 × 2 min (hand grip), 1 min rest between exercises, 30%–40% maximum voluntary contraction, 3 sessions/wk • 8–10 wk	-5 mm Hg	-4 mm Hg
Moderation in alcohol intake	Alcohol consumption	In individuals who drink alcohol, reduce alcohol† to: • Men: ≤2 drinks daily • Women: ≤1 drink daily	-4 mm Hg	-3 mm

Stage 1

130-139/80-89 mm Hg

Assess ASCVD risk;
Non-pharm therapy and
+ - BP med depending on ASCVD risk



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BP[b] Category	Pressure Ranges	Recommendations
Normal BP	<120/<80 mmHg	Promote healthy lifestyle; reassess BP annually.
Elevated BP	120-129/<80 mmHg	Start with nonpharmacologic therapy, reassess BP in 3-6 months.
Stage1 Hypertension	130-139/80-89 mmHg	**ASCVD[c] or 10-year CVD[d] risk ≥10%:** Start with both nonpharmacologic and pharmacologic therapy. Reassess BP in 1 month. If at goal, reassess every 3-6 months. If not at goal, assess for adherence and consider intensification of therapy.
		No ASCVD and 10-year CVD risk <10%: Start with nonpharmacologic therapy, reassess BP in 3-6 months. If not at goal, consider initiation of pharmacologic therapy.
Stage 2 Hypertension	≥140/≥90 mmHg	Start with both nonpharmacologic and pharmacologic therapy. Reassess BP in 1 month. If at goal, reassess every 3-6 months. If not at goal, assess for adherence and consider intensification of therapy.

a: AHA/ACC, American Heart Association, American College of Cardiology.
b: BP, blood pressure.
c: ASCVD, atherosclerotic cardiovascular disease.
d: CVD, cardiovascular disease

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Current Age * 54

Age must be between 40-79

Sex * ✔ Male | Female

Race * ✔ White | African American | Other

Systolic Blood Pressure (mm Hg) * 138

Value must be between 90-200

Diastolic Blood Pressure (mm Hg) 86

Value must be between 60-130

Total Cholesterol (mg/dL) * 252

Value must be between 130 - 320

HDL Cholesterol (mg/dL) * 32

Value must be between 20 - 100

LDL Cholesterol (mg/dL) 188

Value must be between 30-300

History of Diabetes? * Yes | ✔ No

Smoker: * Yes | Former | ✔ No

On Hypertension Treatment? * Yes | ✔ No

On a Statin? Yes | ✔ No

On Aspirin Therapy? Yes | ✔ No

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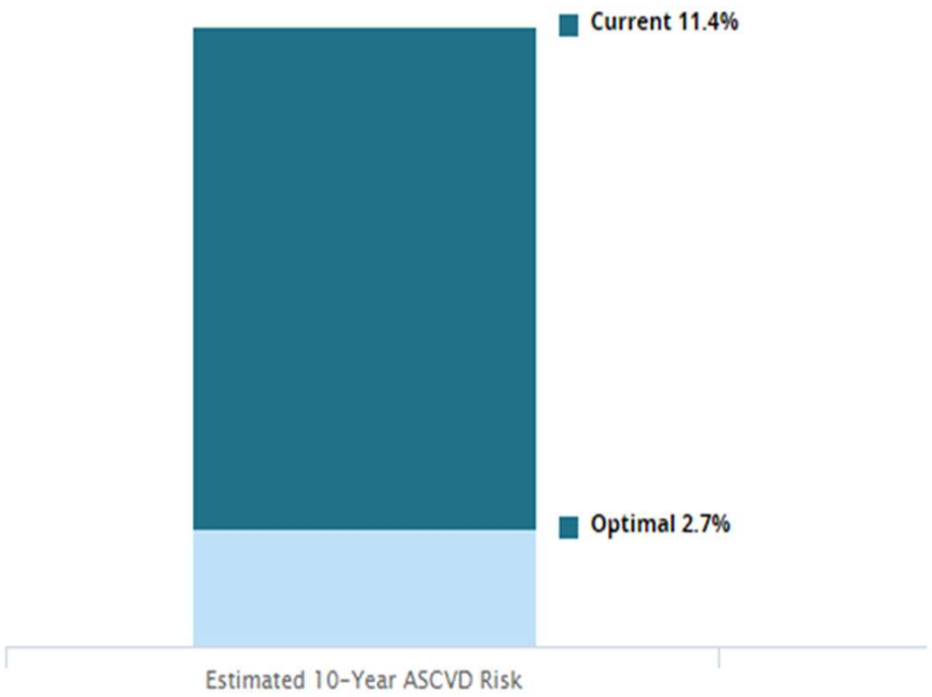
Estimated 10-Year ASCVD Risk Profile



Stage 1 HTN with ASCVD risk ≥ 10%:

- Lifestyle modifications *and* antihypertensive medication:
  - **Renin-angiotensin-aldosterone (RAA) blocking agents**
    - Angiotensin-Converting Enzyme Inhibitor (*e.g., lisinopril*)
    - Angiotensin Receptor Blockers (ARB) (*e.g., olmesartan*)
  - **Calcium channel blockers**
    - Dihydropyridine (*e.g., amlodipine*)
  - **Diuretics**
    - Thiazides (*e.g., Chlorthalidone: longer acting thiazide-like diuretics recommended*)

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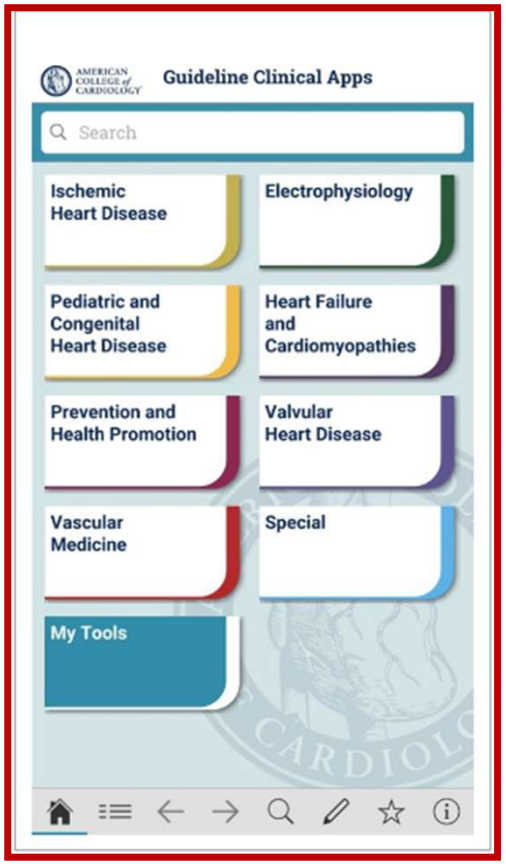
Major anti-hypertensive agent classifications

- Diuretics
  - Thiazide, loop, potassium sparing
- Renin-Angiotensin-aldosterone (RAA) blocking agents
  - ACE inhibitors, Angiotensin II blockers (ARB)
- Calcium channel blockers

- *Beta blockers**
- *Alpha blockers**
- *Peripheral (direct) vasodilators**
- *Centrally acting agents**

**not first line*

ACC Clinical Guideline **Mobile App**



Comprehensive Mobile App with all guidelines and calculators

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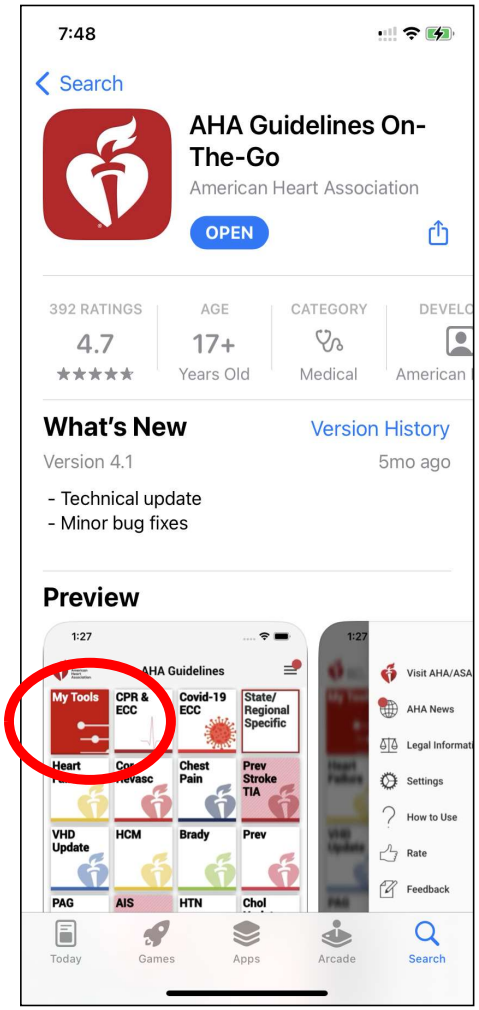
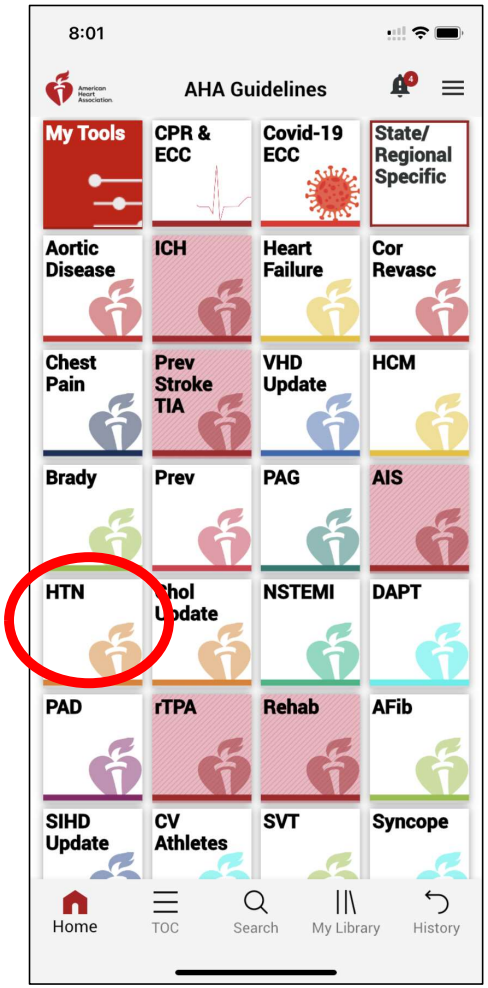
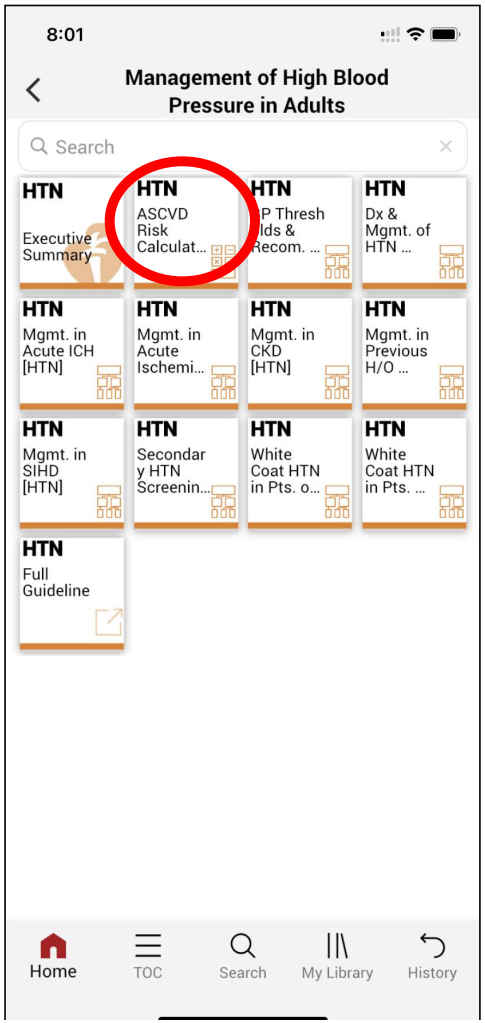
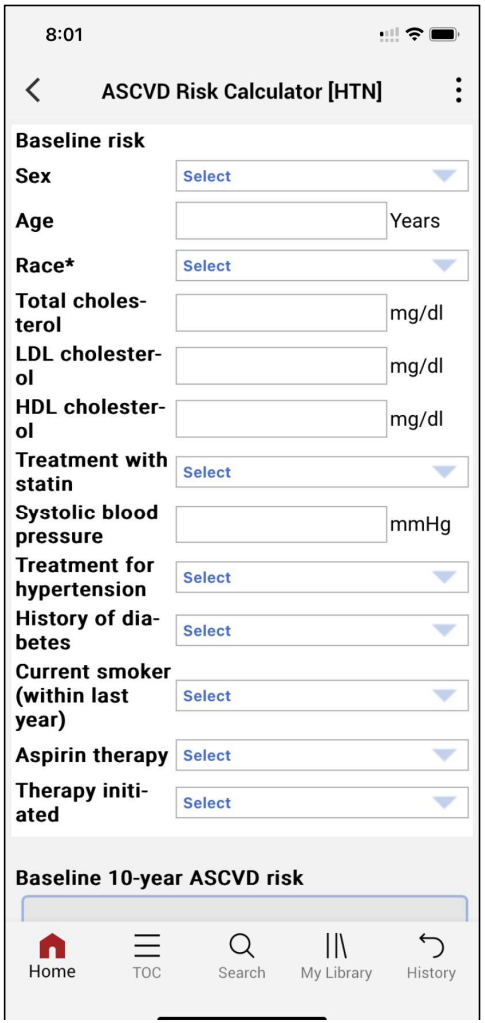




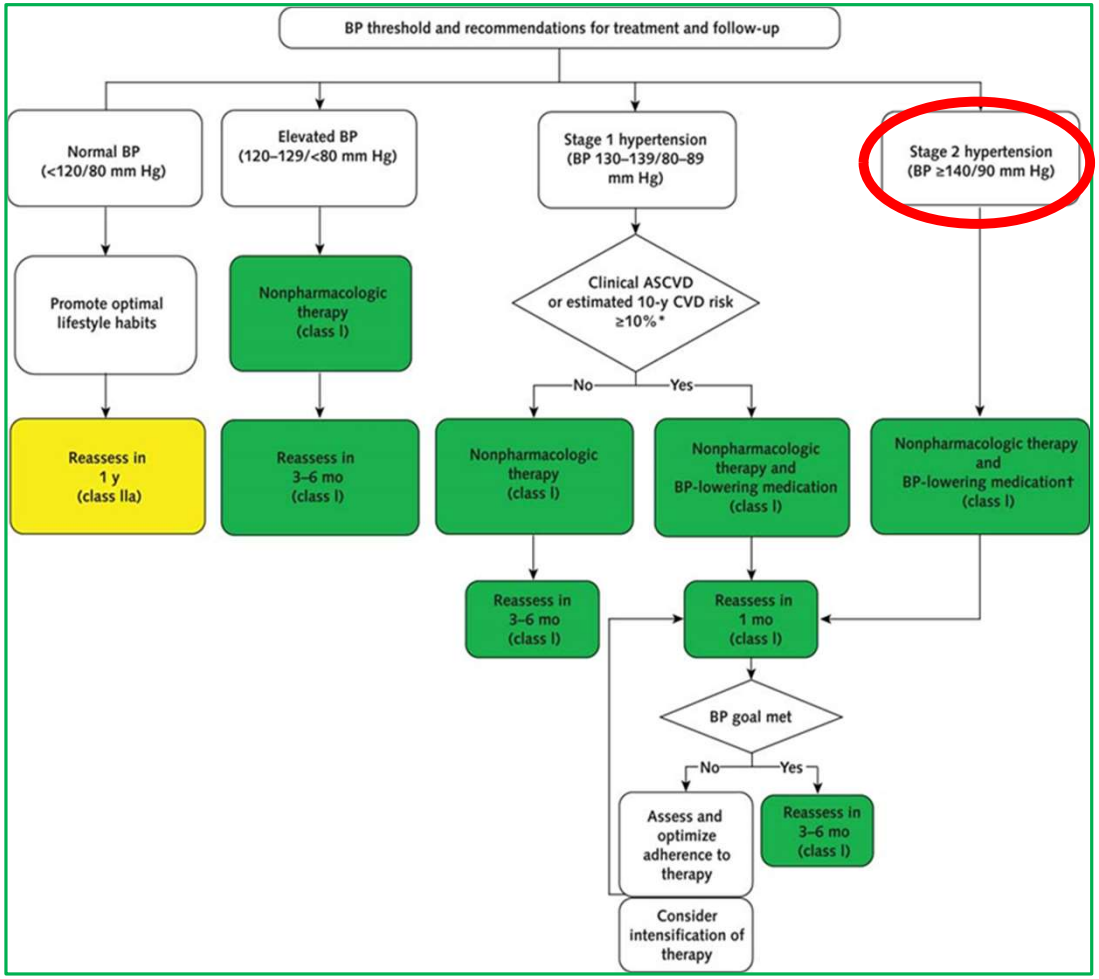




Stage 2

≥140/90 mm Hg

*NO ASCVD calculator; Non-pharm therapy and **two** BP meds from different classes*



- Reassess in **one month**
- If at goal, reassess in **3-6 months**
- If not at goal at one month, assess and optimize compliance and consider increasing dose or adding another agent

Clinician's Sequential Flow Chart for the Management of Hypertension

Clinician's Sequential Flow Chart for the Management of Hypertension
Measure office BP accurately
Detect white coat hypertension or masked hypertension by using ABPM and HBPM
Evaluate for secondary hypertension
Identify target organ damage
Introduce lifestyle interventions
Identify and discuss treatment goals
Use ASCVD risk estimation to guide BP threshold for drug therapy
Align treatment options with comorbidities
Account for age, race, ethnicity, sex, and special circumstances in antihypertensive treatment
Initiate antihypertensive pharmacological therapy
Insure appropriate follow-up
Use team-based care
Connect patient to clinician via telehealth
Detect and reverse nonadherence
Detect white coat effect or masked uncontrolled hypertension
Use health information technology for remote monitoring and self-monitoring of BP

ASCVD indicates atherosclerotic cardiovascular disease; BP, blood pressure; CVD, cardiovascular disease; and SBP, systolic blood pressure.

Diabetes

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American Diabetes Association.

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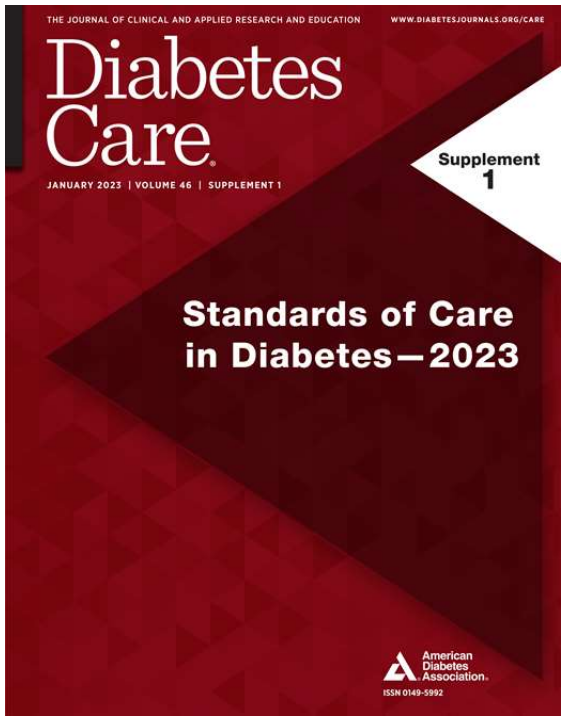

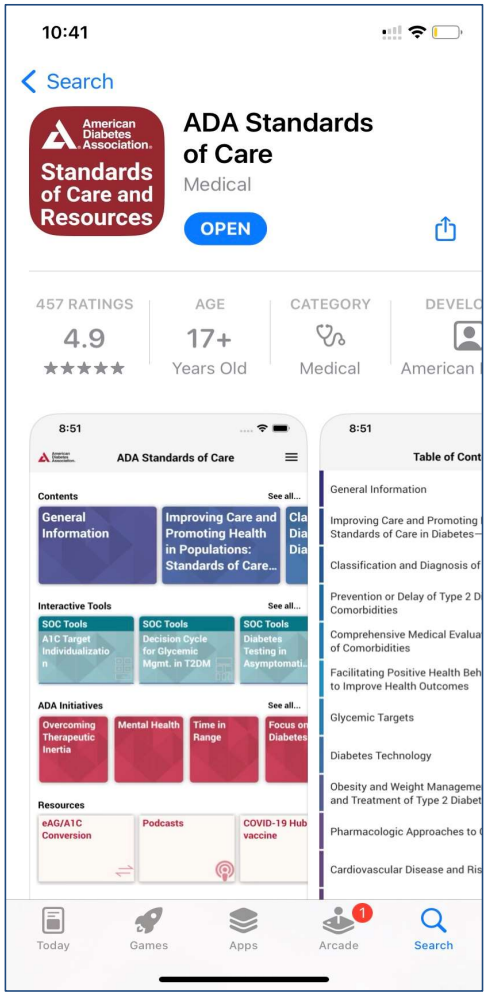

[2023 ADA Standards of Care in Diabetes]

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U.S. Preventive Services TASK FORCE

USPSTF Screening: Recommendations August 2021

- **Recommendation** (Grade B):
  - Screen for prediabetes/diabetes:
    - **Age 35-70** who have overweight or obesity (*previously age 40*)
    - Consider screening at BMI ≥23 in Asian Americans
    - *Without* symptoms of DM
- **Screening tests**:
  - Fasting blood glucose (FBG) *or* HbA1c *or* OGTT
- **Frequency**:
  - Interval is ***uncertain***

USPSTF Prediabetes & Diabetes Screening

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U.S. Preventive Services TASK FORCE

USPSTF Screening: Recommendations August 2021

- **Preventive Interventions:**
  - Lifestyle modifications ***and*** metformin have both demonstrated efficacy in slowing progression to diabetes
  - Metformin has not ***yet*** been FDA approved for prediabetes treatment

* ADA: metformin should be considered for prediabetes patients with a BMI >35 and under 60 years old

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American Diabetes Association.

Diabetes Screening: ADA Risk-Centered Approach

Overweight/obese and ≥1 risk factors

- First-degree relative with DM
- High-risk race/ethnicity
- History of CVD, HTN
- Abnormal Lipids
  - Low HDL (<35 mg/dL) and/or High TG (>250 mg/dL)
- Insulin resistance, such as PCOS
- Physical inactivity

Frequency

- Annually if prediabetes
- At least every 3 years

Special Populations

- H/o gestational diabetes (GDM): screening in 3-year intervals
- HIV patients

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Key Differences Between USPSTF and ADA Screening

USPSTF

- Screening initiated at **age 35** for any asymptomatic individual, and **no optimal screening interval** (but 3-year interval may be reasonable)

ADA

- **Prioritizes risk factors over start age** of 35 for initial screening
- **Prediabetes: annual** screening
- H/o **GDM: 3-year** screening interval
- **3-year** screening interval, or more frequent) depending on **risk factors** or **initial results**
- Patients with **HIV**

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Notable updates to the ***Standards of Care in Diabetes 2023***

- Emphasizes weight loss (up to 15%)
- New recommendations related to **sleep health and physical activity**
- Consideration of **social determinants of health** in guiding design/delivery of care
- New **hypertension diagnosis cut-offs**
- **Expanded role of SGLT2 inhibitor use**
- The **role of finerenone** in individuals with DM and CKD with albuminuria
- **Lower LDL goals** for high-risk individuals

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Other notable highlights

- Benefits of different modes of delivery
- The utility of **point-of-care A1C testing** for screening/diagnosis
- Expanded **Nonalcoholic Fatty Liver Disease** (NAFLD) subsection
- Screening for **food insecurity**
- The use of **technology in older adults with DM**
- **Person-first** and **inclusive language**
- Vaccination for people with DM
- **COVID-19 and DM** updates

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Diagnosis

American Diabetes Association®	Prediabetes	Diabetes
A1C	5.7–6.4% (39–47 mmol/mol)*	**≥6.5%** (48 mmol/mol)†
Fasting plasma glucose	100–125 mg/dL (5.6–6.9 mmol/L)*	**≥126** mg/dL (7.0 mmol/L)†
2-hour plasma glucose during 75-g OGTT	140–199 mg/dL (7.8–11.0 mmol/L)*	**≥200** mg/dL (11.1 mmol/L)†
Random plasma glucose	—	**≥200** mg/dL (11.1 mmol/L)‡

requires TWO results from the same or different/subsequent samples (except for random plasma glucose)

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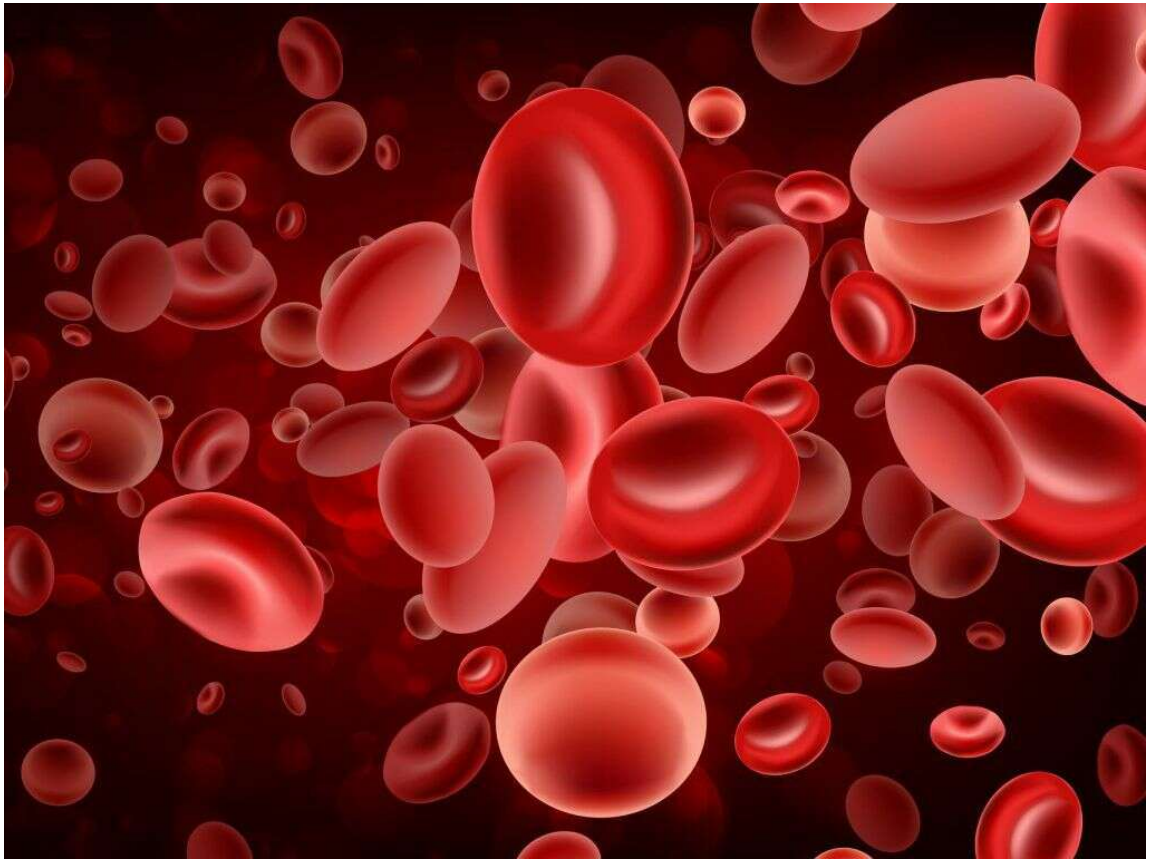
Target goals for HgbA1c

ADA <7%

AACE <6.5%

ACP 7-8%



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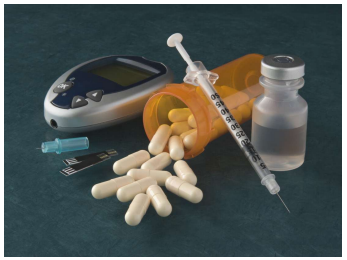
Pharmacologic approaches to glycemic treatment



Insulin

- **Basal:** Long acting
- **Prandial**: (aka: bolus)
  - Short acting, many options
- Start in **severe** hyperglycemia
  - FBG >250 mg/dL
  - Random >300 mg/dL
  - HbA1c at or above 9%

All others

- Metformin
- GIP/GLP-1 receptor agonist (eg. tirzepatide)
- GLP-1 receptor agonist (eg. semaglutide)
- SGLT-2 inhibitors (eg. dapagliflozin)
- Thiazolidinediones (TZD) (eg. pioglitazone)
- DPP-4 inhibitors (eg. sitagliptan)
- Sulfonylureas (SU) (eg. glipizide)

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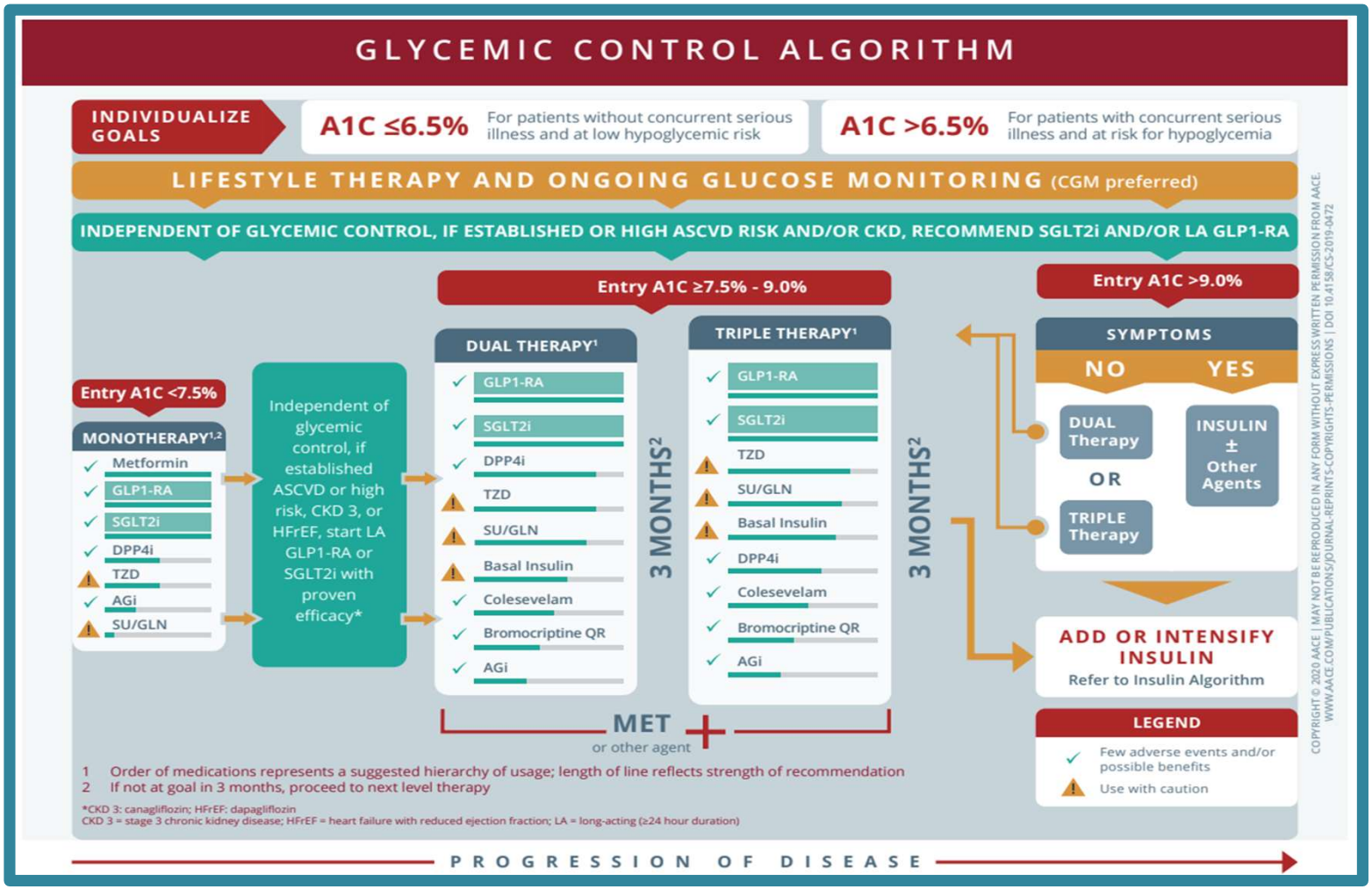
AACE American Association of Clinical Endocrinology

2020



American Diabetes Association®

USE OF GLUCOSE-LOWERING MEDICATIONS IN THE MANAGEMENT OF TYPE 2 DIABETES

HEALTHY LIFESTYLE BEHAVIORS; DIABETES SELF-MANAGEMENT EDUCATION AND SUPPORT (DSMES); SOCIAL DETERMINANTS OF HEALTH (SDOH)

TO AVOID THERAPEUTIC INERTIA REASSESS AND MODIFY TREATMENT REGULARLY (3–6 MONTHS)

Goal: Cardiorenal Risk Reduction in High-Risk Patients with Type 2 Diabetes (in addition to comprehensive CV risk management)*

+ASCVD†

Defined differently across CVOTs but all included individuals with established CVD (e.g., MI, stroke, any revascularization procedure). Variably included: conditions such as transient ischemic attack, unstable angina, amputation, symptomatic or asymptomatic coronary artery disease.

+Indicators of high risk

While definitions vary, most comprise ≥55 years of age with two or more additional risk factors (including obesity, hypertension, smoking, dyslipidemia, or albuminuria)

+ASCVD/Indicators of High Risk

GLP-1 RA# with proven CVD benefit **EITHER/OR** SGLT2i§ with proven CVD benefit

If A1C above target

- For patients on a GLP-1 RA, consider adding SGLT2i with proven CVD benefit or vice versa
- TZD^

+HF

Current or prior symptoms of HF with documented HFrEF or HFpEF

+HF

SGLT2i§ with proven HF benefit in this population

+CKD

eGFR <60 mL/min per 1.73 m² OR albuminuria (ACR ≥3.0 mg/mmol [30 mg/g]). These measurements may vary over time; thus, a repeat measure is required to document CKD.

+CKD (on maximally tolerated dose of ACEi/ARB)

PREFERABLY

SGLT2i§ with primary evidence of reducing CKD progression

Use SGLT2i in people with an eGFR ≥20 mL/min per 1.73 m²; once initiated should be continued until initiation of dialysis or transplantation

OR

GLP-1 RA with proven CVD benefit if SGLT2i not tolerated or contraindicated

If A1C above target, for patients on SGLT2i, consider incorporating a GLP-1 RA or vice versa

If additional cardiorenal risk reduction or glycemic lowering needed

Goal: Achievement and Maintenance of Glycemic and Weight Management Goals

Glycemic Management: Choose approaches that provide the efficacy to achieve goals:

Metformin OR Agent(s) including COMBINATION therapy that provide adequate EFFICACY to achieve and maintain treatment goals

Consider avoidance of hypoglycemia a priority in high-risk individuals

In general, higher efficacy approaches have greater likelihood of achieving glycemic goals

Efficacy for glucose lowering

Very High:
Dulaglutide (high dose), Semaglutide, Tirzepatide

Insulin

Combination Oral, Combination Injectable (GLP-1 RA/Insulin)

High:
GLP-1 RA (not listed above), Metformin, SGLT2i, Sulfonylurea, TZD

Intermediate:
DPP-4i

Achievement and Maintenance of Weight Management Goals:

Set individualized weight management goals

General lifestyle advice: medical nutrition therapy/eating patterns/ physical activity

Intensive evidence-based structured weight management program

Consider medication for weight loss

Consider metabolic surgery

When choosing glucose-lowering therapies:
Consider regimen with high-to-very-high dual glucose and weight efficacy

Efficacy for weight loss

Very High:
Semaglutide, Tirzepatide

High:
Dulaglutide, Liraglutide

Intermediate:
GLP-1 RA (not listed above), SGLT2i

Neutral:
DPP-4i, Metformin

If A1C above target

Identify barriers to goals:

- Consider DSMES referral to support self-efficacy in achievement of goals
- Consider technology (e.g., diagnostic CGM) to identify therapeutic gaps and tailor therapy
- Identify and address SDOH that impact achievement of goals

* 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.

First line treatments ***(ADA/ACE/AACE)***

Lifestyle modifications

- Diet
- Exercise
  - AHA recommends weekly goals of:
    - 150 mins of moderate intensity exercise
    - or 75 mins of vigorous intensity exercise

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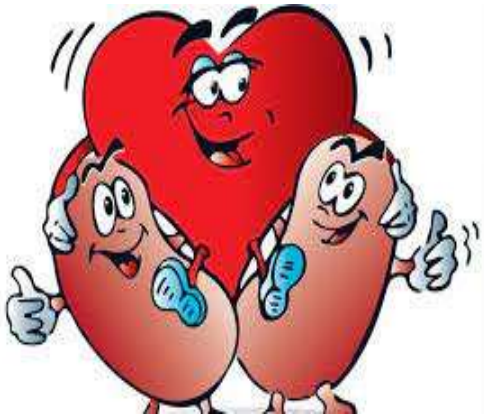

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+ASCVD†

Defined differently across CVOTs but all included individuals with established CVD (e.g., MI, stroke, any revascularization procedure). Variably included: conditions such as transient ischemic attack, unstable angina, amputation, symptomatic or asymptomatic coronary artery disease.

+Indicators of high risk

While definitions vary, most comprise ≥55 years of age with two or more additional risk factors (including obesity, hypertension, smoking, dyslipidemia, or albuminuria)

+HF

Current or prior symptoms of HF with documented HFrEF or HFpEF

+CKD

eGFR <60 mL/min per 1.73 m² OR albuminuria (ACR ≥3.0 mg/mmol [30 mg/g]). These measurements may vary over time; thus, a repeat measure is required to document CKD.

+ASCVD/Indicators of High Risk

GLP-1 RA# with proven CVD benefit — EITHER/OR — SGLT2i§ with proven CVD benefit

If A1C above target

- For patients on a GLP-1 RA, consider adding SGLT2i with proven CVD benefit or vice versa
- TZD^

+HF

SGLT2i§ with proven HF benefit in this population

+CKD (on maximally tolerated dose of ACEi/ARB)

PREFERABLY

SGLT2i§ with primary evidence of reducing CKD progression

Use SGLT2i in people with an eGFR ≥20 mL/min per 1.73 m²; once initiated should be continued until initiation of dialysis or transplantation

OR

GLP-1 RA with proven CVD benefit if SGLT2i not tolerated or contraindicated

If A1C above target, for patients on SGLT2i, consider incorporating a GLP-1 RA or vice versa

If additional cardiorenal risk reduction or glycemic lowering needed

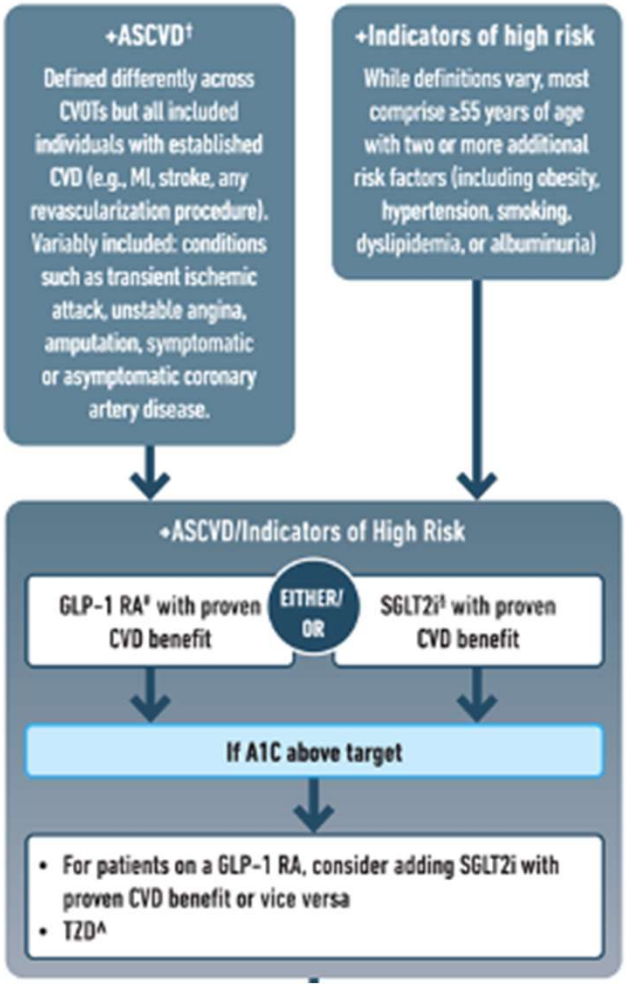
First Line Therapeutics:
ASCVD or High-Risk Indicators

GLP-1 RA

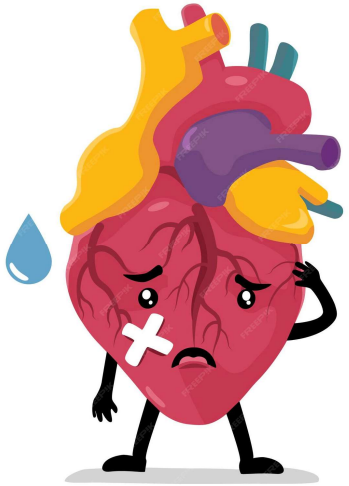
- Do NOT use in thyroid cancer, pancreatitis, or MEN syndrome
- Side effects: GI nausea, reflux, diarrhea/constipation

SGLT2i

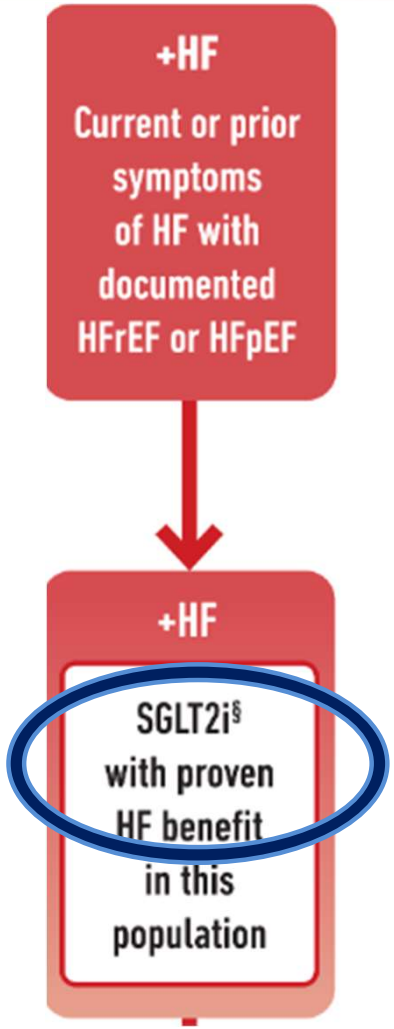
- Side effects: GU yeast infection
- Slight weight loss, diuresis may lower BP
- Do not use in GFR <30



First Line Therapeutics: *Heart Failure*

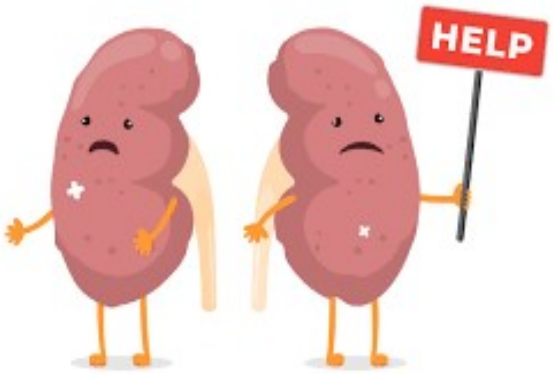


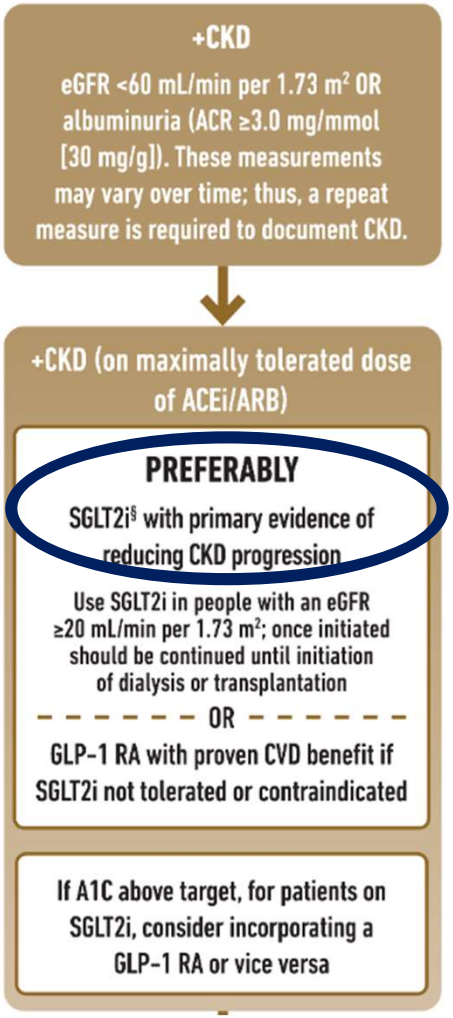
- **Use SGLT2i**
- Consider medications with **proven HF benefit** such as *canagliflozin, dapagliflozin, empagliflozin or ertugliflozin*



First Line Therapeutics: Chronic Kidney Disease (CKD)

- **SGLT2i** with evidence of reducing CKD progression
- Consider meds with **CKD reduction benefit** *(canagliflozin, dapagliflozin or empagliflozin)*
  - Hold 3-4 days before surgery, during critical illness/prolonged fasting
  - *Side effect*: GU mycotic infections and glycosuria





American Diabetes Association

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Goal: Achievement and Maintenance of Glycemic and Weight Management Goals

Glycemic Management: Choose approaches that provide the efficacy to achieve goals:

[illegible] including COMBINATION therapy that provide adequate EFFICACY to achieve and maintain treatment goals

Consider avoidance of hypoglycemia a priority in high-risk individuals

In general, higher efficacy approaches have greater likelihood of achieving glycemic goals

Efficacy for glucose lowering

Very High:
Dulaglutide (high dose), Semaglutide, Tirzepatide

Insulin

Combination Oral, Combination Injectable (GLP-1 RA/Insulin)

High:
GLP-1 RA (not listed above), Metformin, SGLT2i, Sulfonylurea, TZD

Intermediate:
DPP-4i

Achievement and Maintenance of Weight Management Goals:

Set individualized weight management goals

General lifestyle advice: medical nutrition therapy/eating patterns/ physical activity

Intensive evidence-based structured weight management program

Consider medication for weight loss

Consider metabolic surgery

When choosing glucose-lowering therapies:
Consider regimen with high-to-very-high dual glucose and weight efficacy

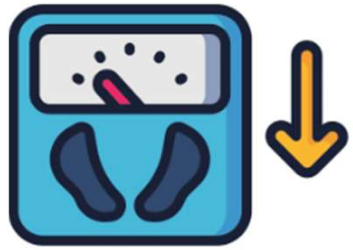
Efficacy for weight loss

Very High:
Semaglutide, Tirzepatide

High:
Dulaglutide, Liraglutide

Intermediate:
GLP-1 RA (not listed above), SGLT2i

Neutral:
DPP-4i, Metformin



Next Line Therapeutics: Glycemic Management

- EFFICACY while minimizing **hypoglycemia**
- **Metformin** OR Agent(s) such as *combination* medications that effectively achieve and maintain glycemic goals

Glycemic Management: Choose approaches that provide the efficacy to achieve goals:

Metformin OR Agent(s) including COMBINATION therapy that provide adequate EFFICACY to achieve and maintain treatment goals

Consider avoidance of hypoglycemia a priority in high-risk individuals

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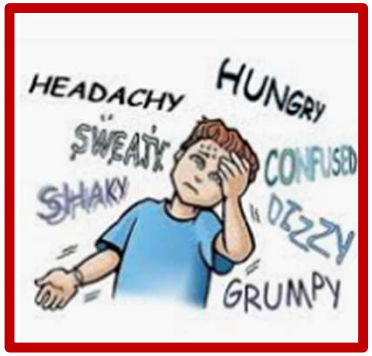
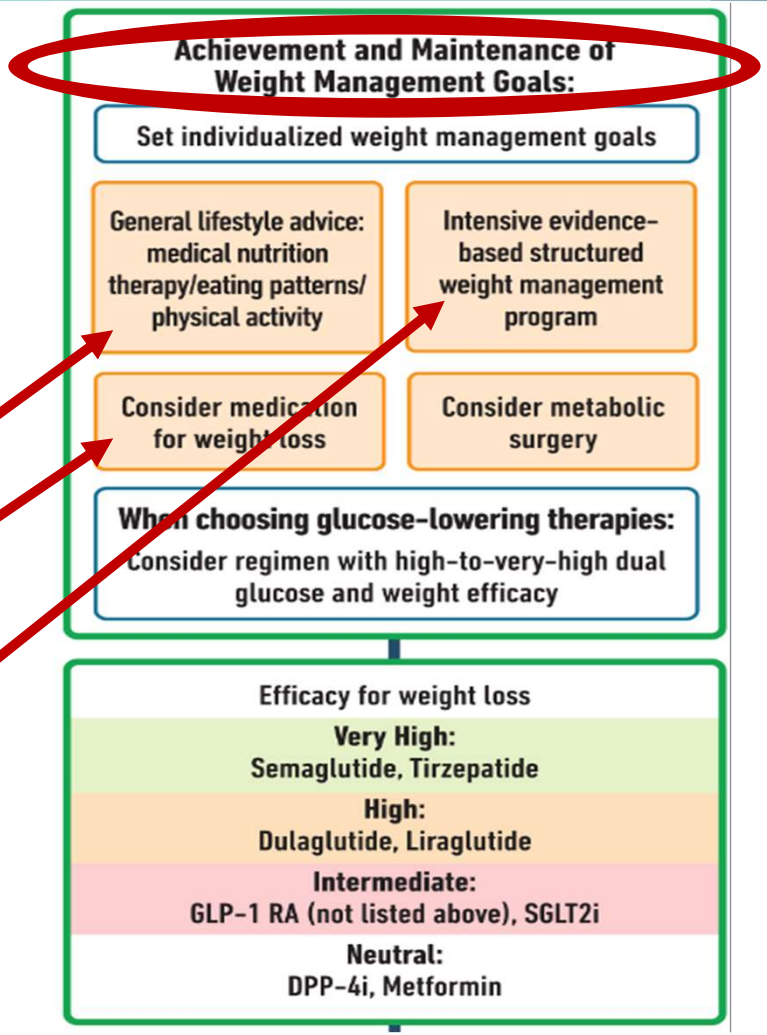
Intermediate:
DPP-4i



Next Line Therapeutics: Weight Management

- Select diabetes therapies that will control BOTH glucose and weight
- General lifestyle modification counseling
- Consider referral to surgery or weight loss medications
- Implement evidence-based weight management



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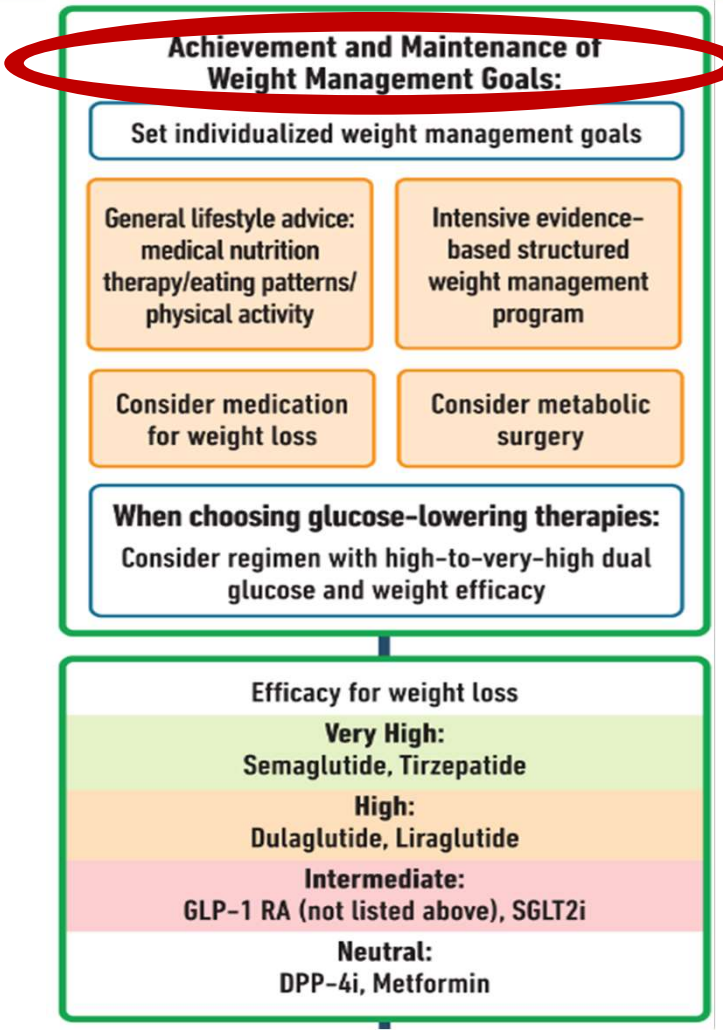
Select therapies based on
WEIGHT LOSS EFFICACY

Very High: Semaglutide, Tirzepatide

High: Dulaglutide, Liraglutide

Intermediate: GLP-1 not listed above (such as Exentide), SGLT2i

Neutral: DPP-4i, Metformin



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Diabetes Treatment: *Metformin*

- Neutral to potential effect on cardiovascular risk
- Low risk of hypoglycemia, low to modest weight loss
- CKD implications
  - Can be used in eGFR >30
  - Reduce dose between eGFR 30-45
- Recommended for prediabetes by ADA and AACE

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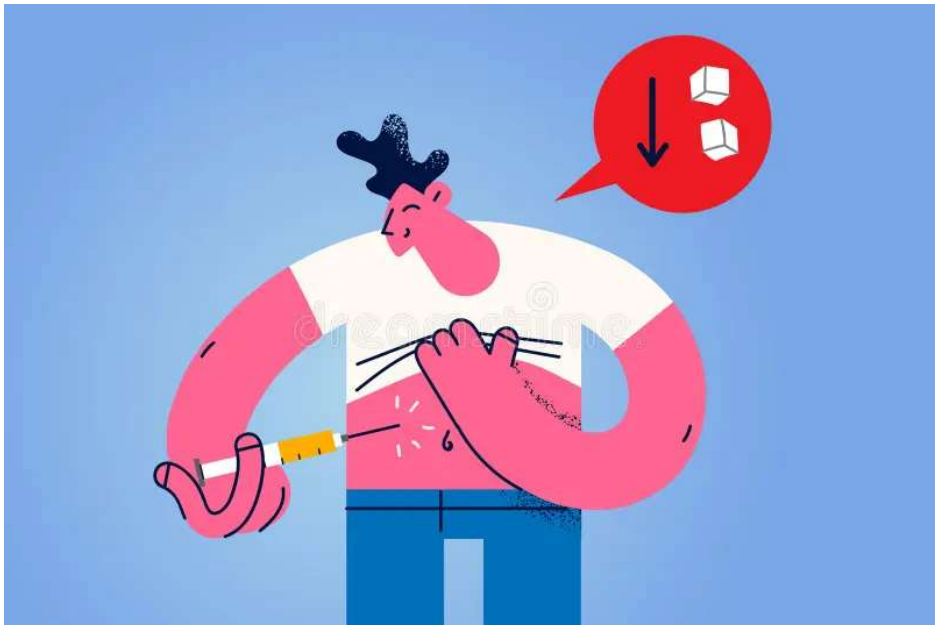
Diabetes Treatment: *Tirzepatide (GIP/GLP-1)*

Dual glucagon-like peptide 1/glucose–dependent insulinotropic polypeptide receptor agonist

- Very high weight loss potential and was recently approved for weight loss
- Very high cost
- Cardiovascular and renal benefit studies are underway



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More aggressive targets for lipids and blood pressure

Age 40-75, increased CVD risk:	**High-intensity statin** to reduce LDL by ≥50% from baseline	Target LDL below **70 mg/dL** (previously 100 mg/dL)	**Consider** adding ezetimibe or PCSK9 inhibitor
Age 40-75, established CVD:	**High-intensity statin** to reduce LDL by ≥50% from baseline	Target LDL below **55 mg/dL** (previously 70 mg/dL)	**Stronger rec** for ezetimibe or PCSK9 inhibitor
People with DM >75 years:	If on statins, **continue**	If not on statins, consider **moderate-intensity statin** after discussing benefits and risks	

BP <130/80 mm Hg

Aligns with AHA/ACC

Considerations for SDOH

- **Health Care Access and Quality**
  - Does patient live alone or have limited assistance?
  - Distance/transportation issue to clinics/hospitals?
  - Is cost of medications/testing a barrier?
    - ***Telemedicine, medication selection, generic meds***

- **Education Access and Quality**
  - Limited health literacy of patient AND caregivers?
  - Language barrier?
    - ***Provide materials in native language***
    - ***Consider limited access to internet***

- **Economic Stability**
  - Is patient on fixed income or unemployed?
    - ***Assistance options (GOODRX or COVERAGE app)***

Hyperlipidemia

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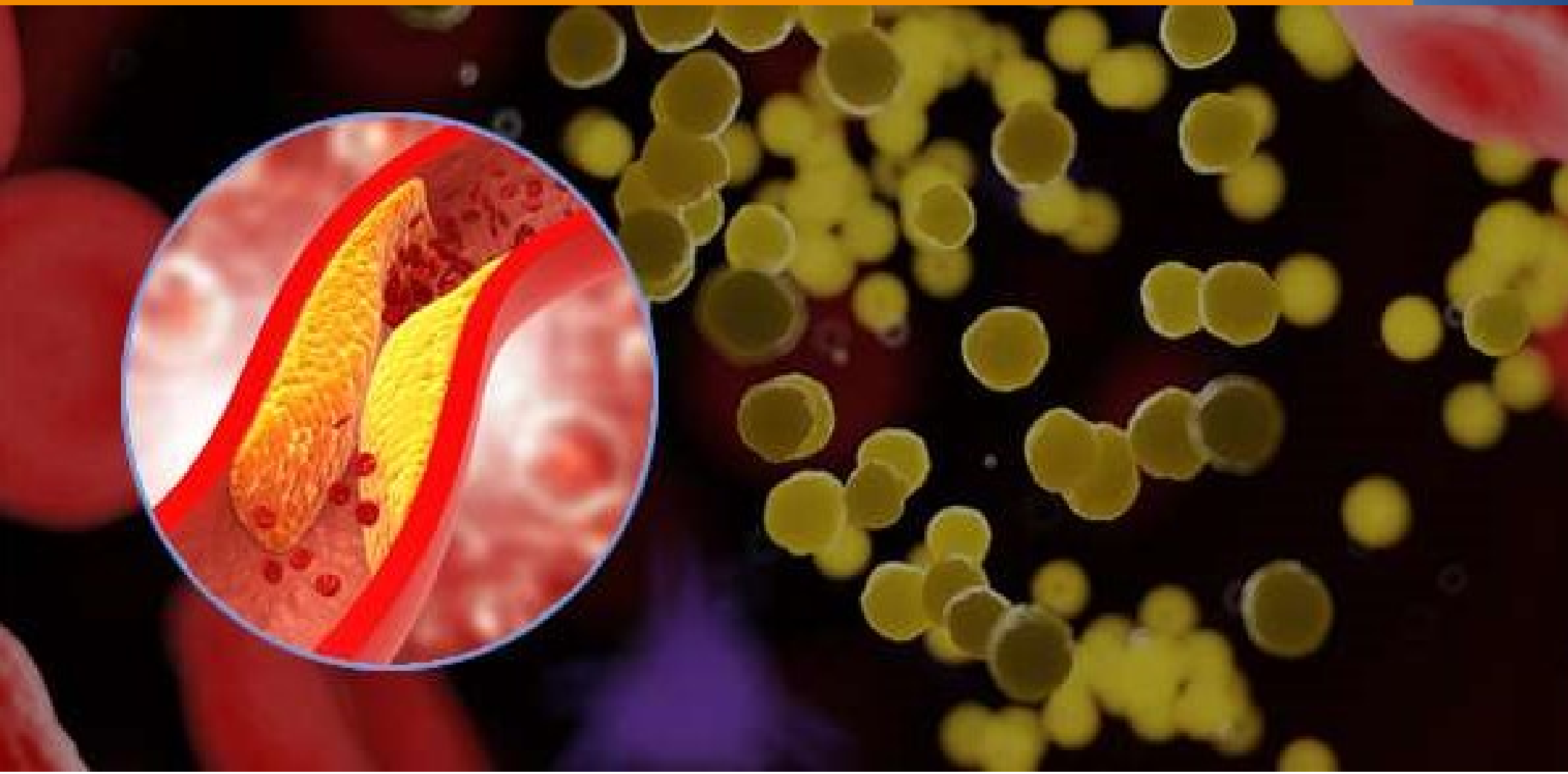

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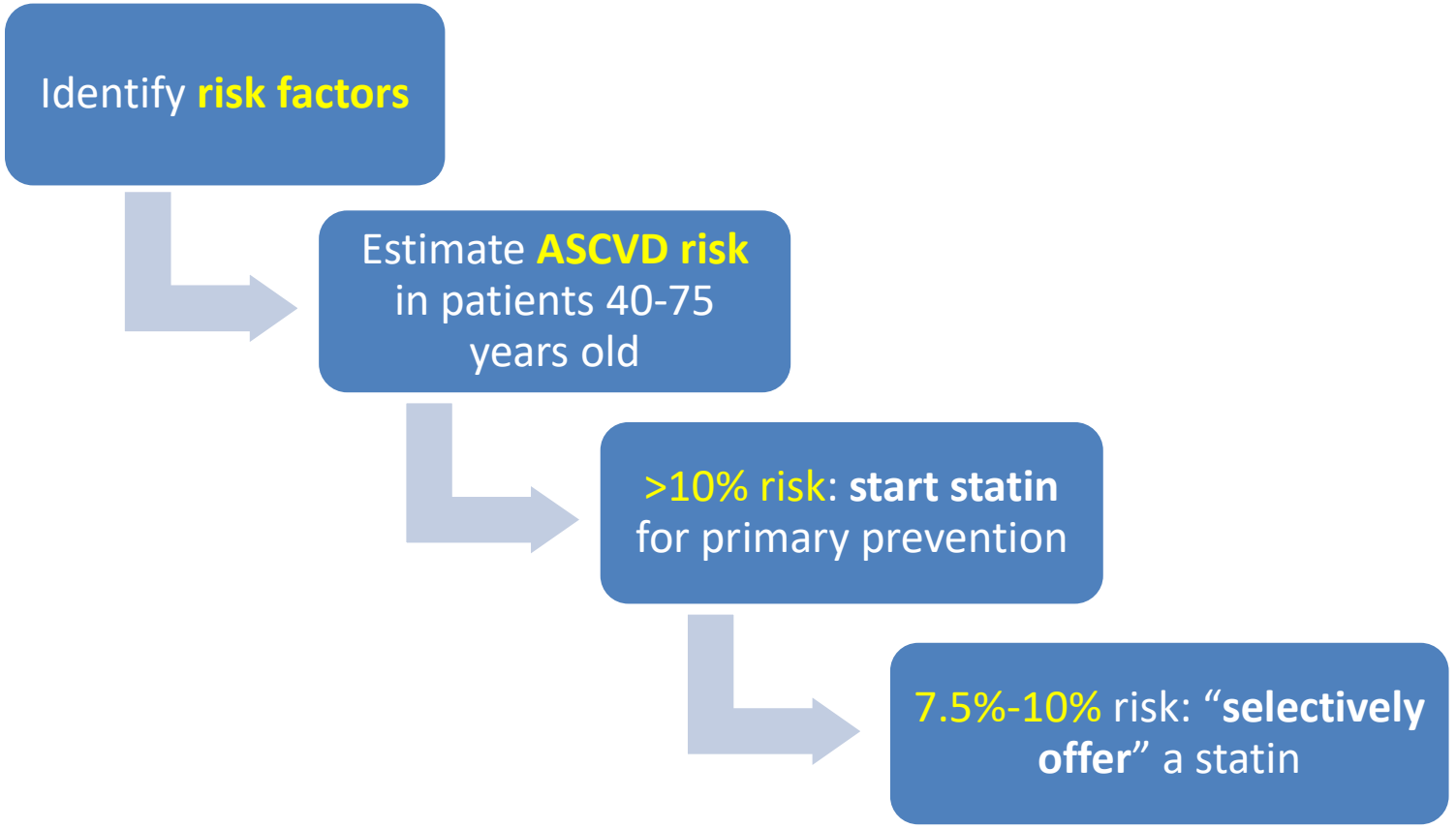
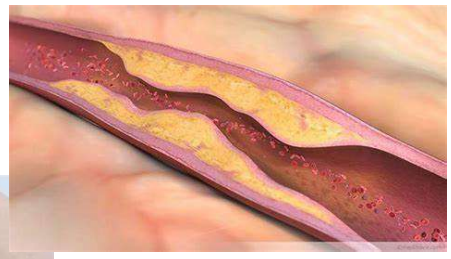
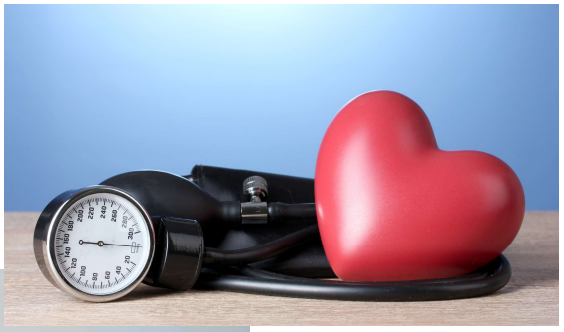
U.S. Preventive Services TASK FORCE

ASCVD/Lipids Screening: USPSTF 2022



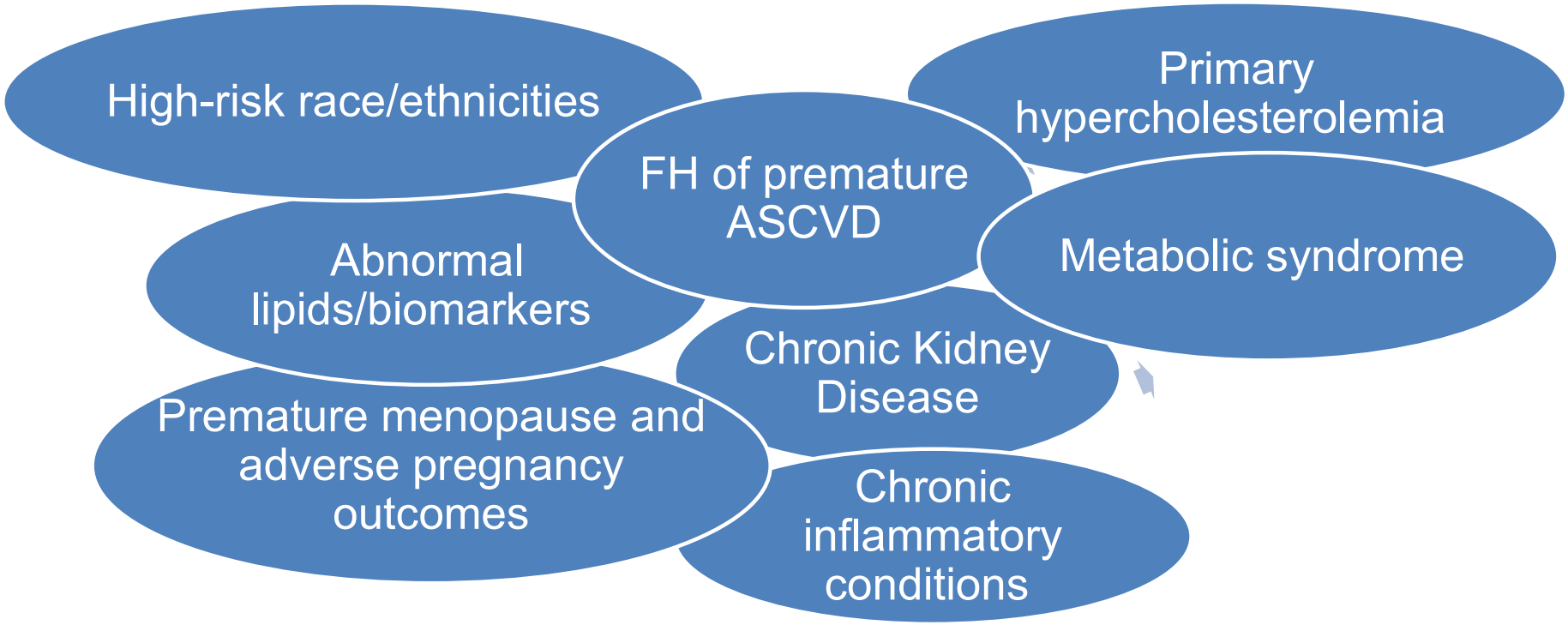
USPSTF ASCVD Risk Factors





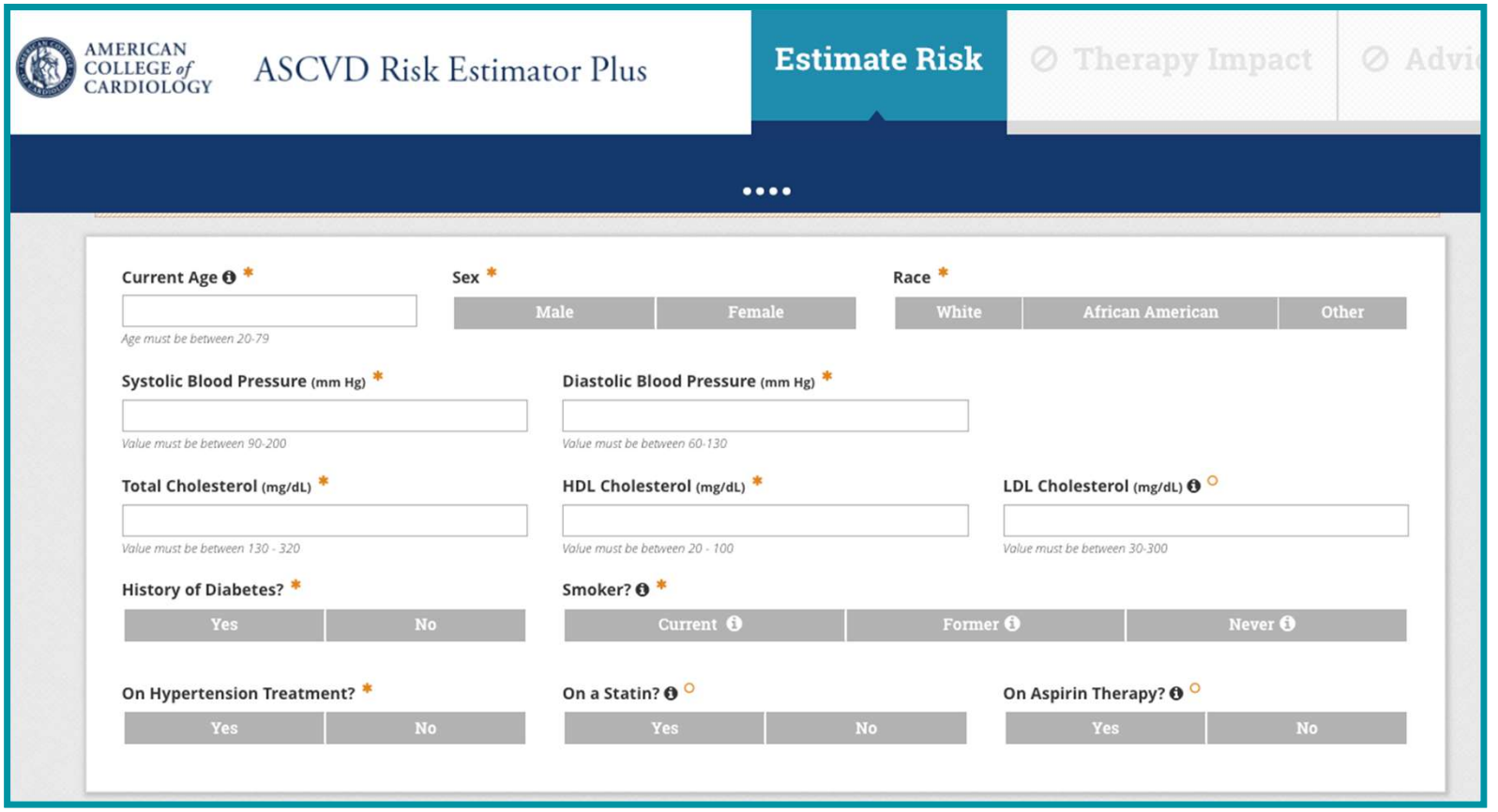
- Diabetes
- Hypertension
- Dyslipidemia
- Smoking
- Obesity/overweight
- CKD and Albuminuria
- Family history of premature coronary disease

ACC/AHA ASCVD Risk-Enhancing Factors



ACC ASCVD Risk Estimator

ACC ASCVD Risk Estimator



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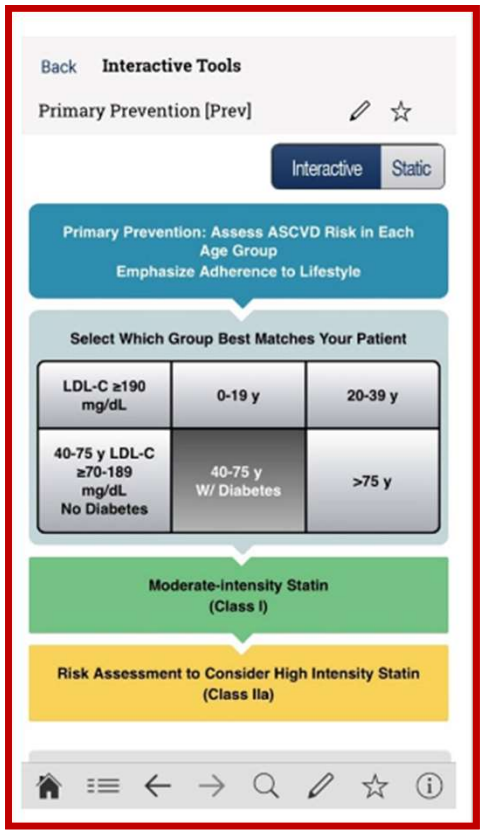
AMERICAN COLLEGE of CARDIOLOGY

ACC Clinical Guideline **Mobile App**



Comprehensive Mobile App with all guidelines and calculators

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Intensity of Statins

High (≥50%)

Atorvastatin 40-80 mg

Rosuvastatin 20-40 mg

Moderate (30%-49%)

Atorvastatin 10-20 mg

Rosuvastatin 5-10 mg

Simvastatin 20-40 mg

Pravastatin 40-80 mg

Lovastatin 40 mg

Low (<30%)

Simvastatin 10 mg

Pravastatin 10-20 mg

Lovastatin 20 mg

ACC/AHA Treatment: Severe Hypercholesterolemia

LDL-C ≥ 190 mg/dL*

Start treatment in 20 to 75 y/o with maximally tolerated high intensity* STATIN therapy

Add EZETIMIBE if:

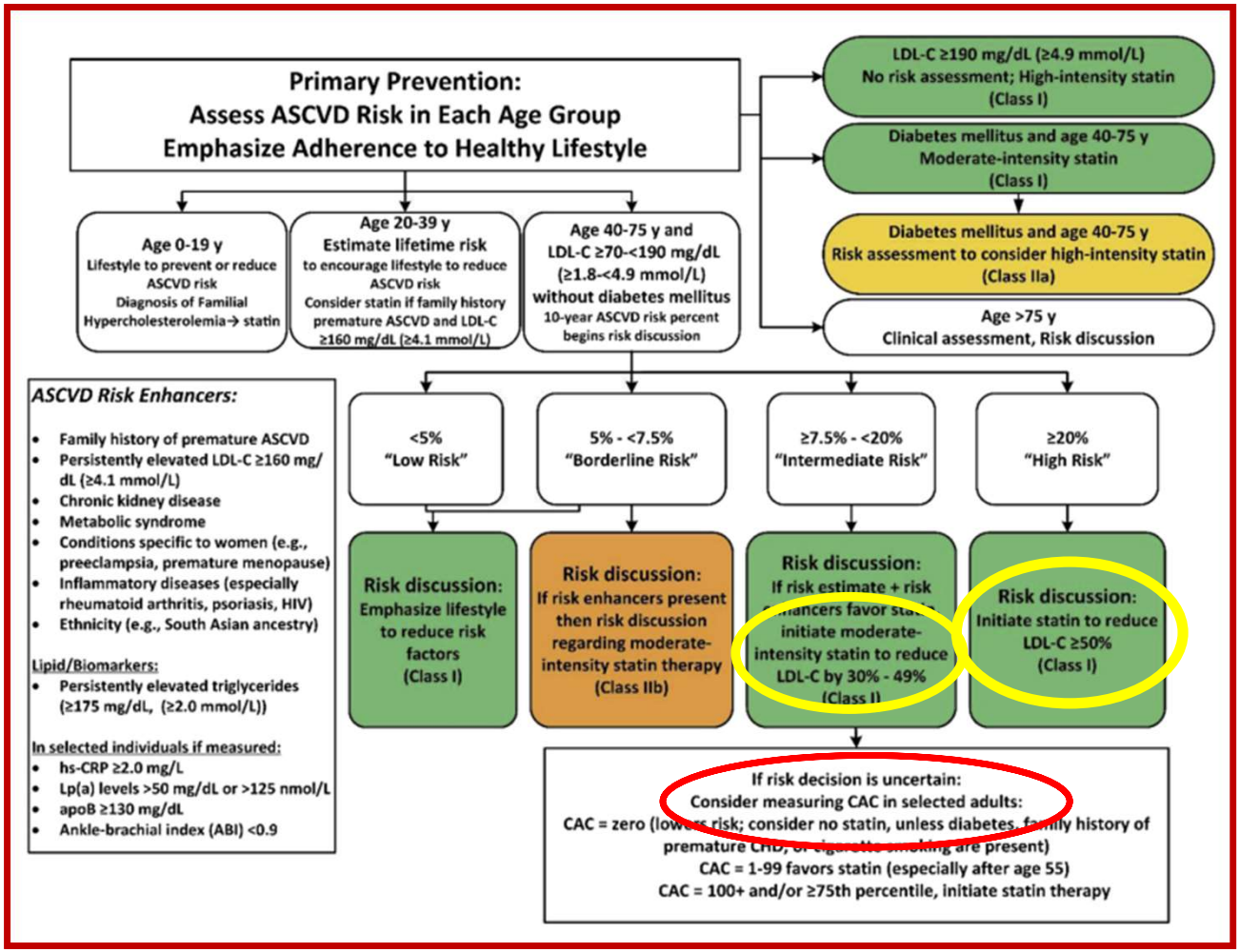
- Patient achieves <50% LDL-C reduction
- LDL-C is >100 mg/dL

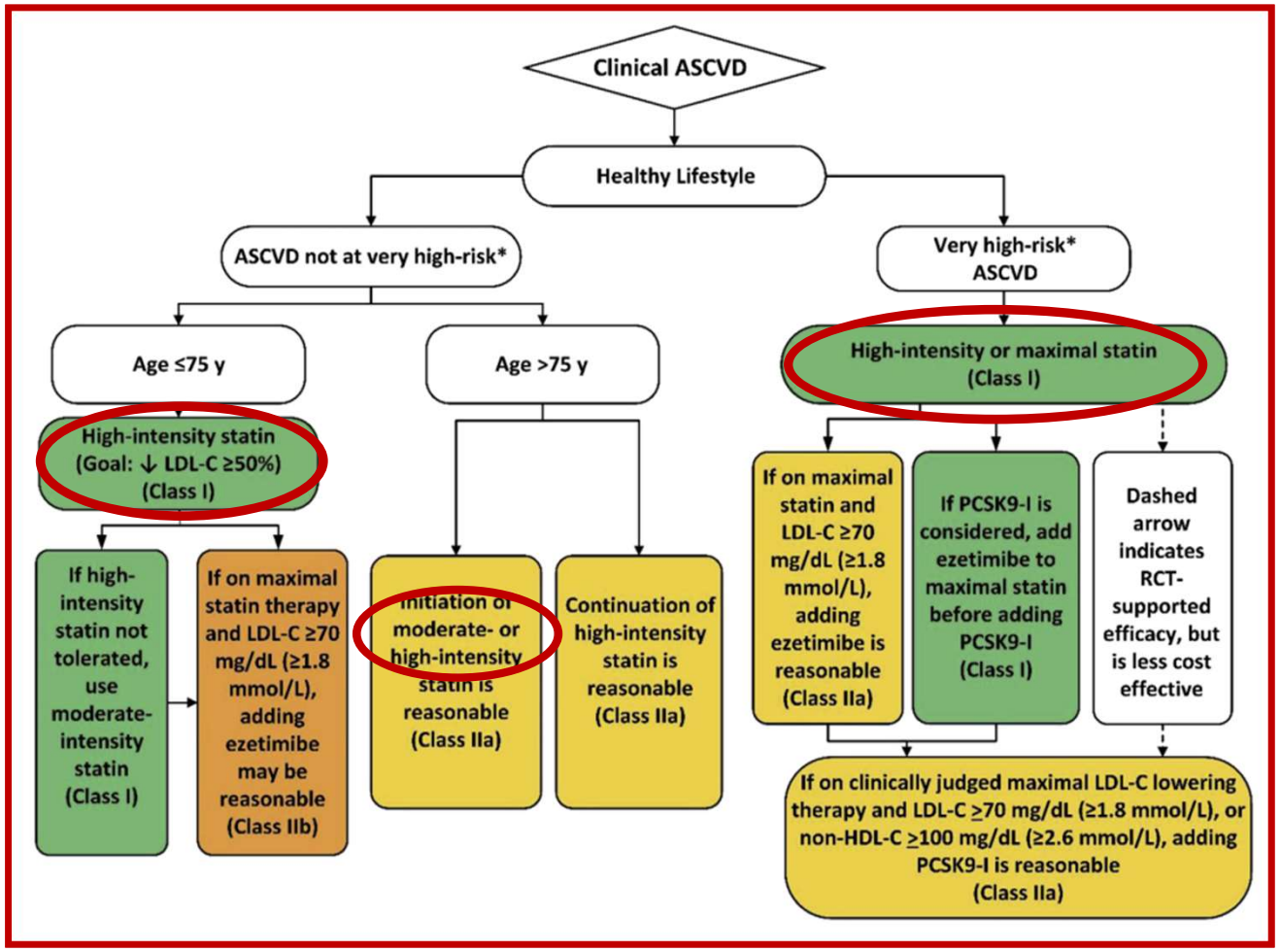
Add BILE ACID SEQUESTRANT if fasting TG >300 mg/dL and other goals not met

ACC/AHA Treatment:

ASCVD

Primary Prevention





ACC/AHA Treatment:

ASCVD

Secondary Prevention

American Heart Association | AMERICAN COLLEGE of CARDIOLOGY

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Triglycerides: ACC

Severity of hypertriglyceridemia	**Management**
Moderate (175-499 mg/dL)	Treat lifestyle factors and address medications that increase TG in adults > 20 years old
Moderate or Severe (≥ 500 mg/dL) *and* ASCVD risk ≥ 7.5%	Start statin if TG are persistently elevated after lifestyle and secondary factors are addressed in adults 40-75 y/o
Severe (≥ 500 mg/dL, fasting) *and* ASCVD risk ≥ 7.5%	Start statin and address reversible causes of high TG

- ***AACE 2022 Update:*** fibrates or icosapent ethyl if fasting TG are persistently *over >200 mg/dL*
- Still not at goal, **refer your patient to *endocrinologist or cardiologist***

Key Takeaways

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- The mainstay of treatment is lifestyle modification
- Diagnosis and management of hypertension, diabetes, and hyperlipidemia is driven by ASCVD risk estimation
- Agents that reduce the risks of ASCVD, heart failure and chronic kidney disease, and that promote weight loss, are considered first-line for diabetes
- Statin therapy is the preferred treatment for hypercholesteremia and hypertriglyceridemia
- Staying informed and adapting to evolving guidelines is crucial for optimal patient care

Questions?

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