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Ohio Cardiovascular Health Collaborative

SCHOOL OF MEDICINE
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Cardi-OH ECHO Hypertension

Thursday, April 11, 2019

Disclosure Statements

The following planners, speakers, moderators, and/or panelists of the CME activity have financial relationships with commercial interests to disclose:

- Adam T. Perzynski, PhD reports being co-founder of Global Health Metrics LLC, a Cleveland-based software company and royalty agreements for forthcoming books with Springer publishing and Taylor Francis publishing.
- Siran M. Koroukian, PhD reports ownership interests in American Renal Associates, and Research Investigator subcontract support from Celgene Corporation.
- George L. Bakris, MD reports partial salary from Bayer as FIDELIO PI, partial salary from Janssen as CREDENCE Steering Committee, partial salary from Vascular Dynamics as Calm-2 Steering Committee, and receiving honorarium as a consultant to Merck, NovoNordisk.
- Luke J. Laffin, MD reports being a member of the Hypertension Committee for the CALM-2 Trial of endovascular baroreceptor amplification (EVBA) procedure from Vascular Dynamics.
- These financial relationships are outside the presented work.

All other planners, speakers, moderators, and/or panelists of the CME activity have no financial relationships with commercial interests to disclose.

Integrated Approach to Cardiovascular Risk Management

Luke J. Laffin, MD

Preventive Cardiology

Heart and Vascular Institute

Cleveland Clinic Foundation

Objectives

- In patients with hypertension, discuss the added impact of additional risk factors such as diabetes and tobacco use upon overall cardiovascular risk
- List and discuss current recommendations for screening for lipid disorders and diabetes mellitus
- List thresholds for pharmacological BP treatment and treatment goal for patients with type 2 diabetes
- Discuss new aspirin in primary prevention recommendations

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In patients with hypertension, discuss the added impact of additional risk factors such as diabetes and tobacco use upon overall cardiovascular risk

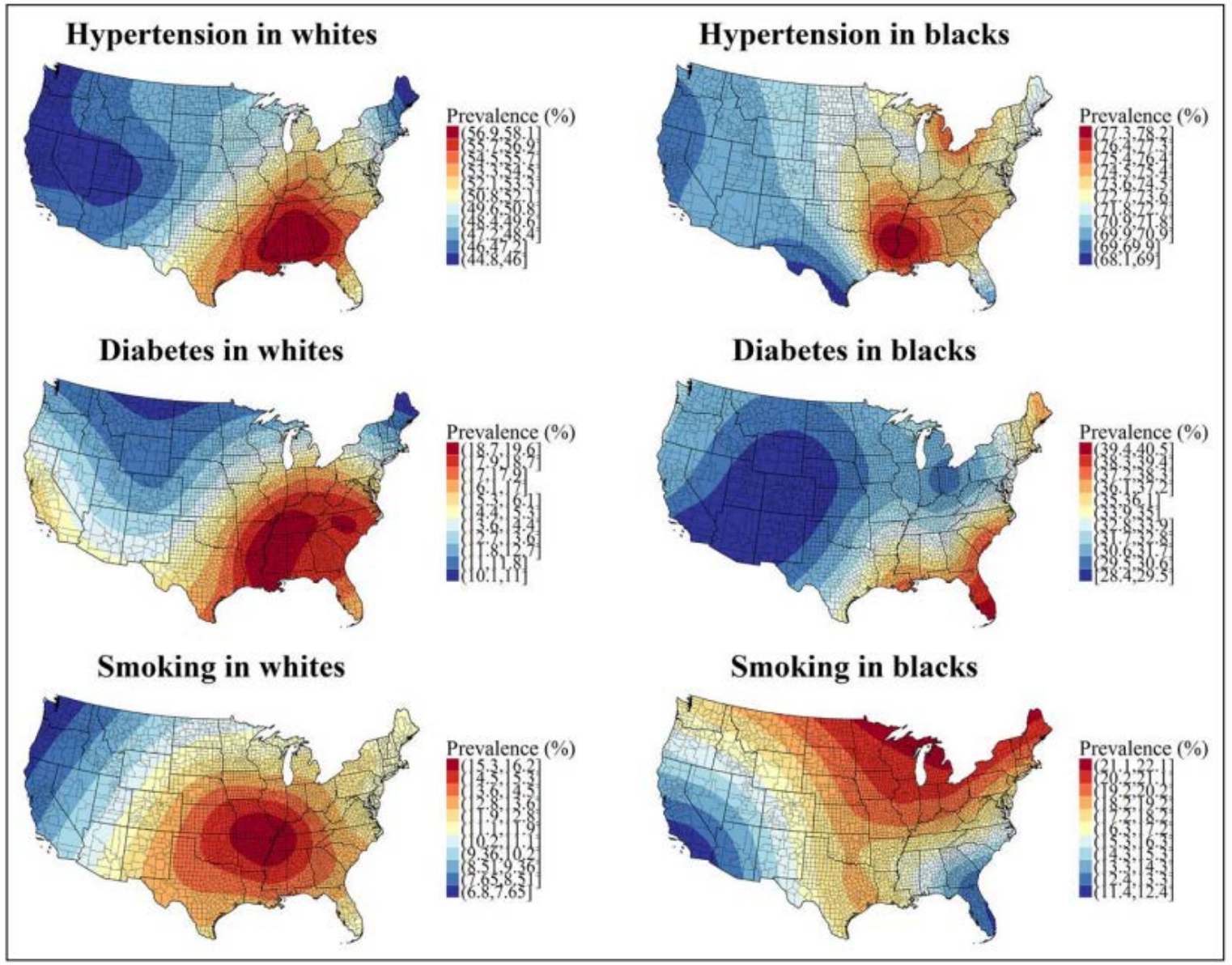

Figure 2. Maps of estimated hypertension, diabetes mellitus, and current smoking prevalence among whites and blacks, adjusted for age and sex. High prevalence is indicated by red, while low prevalence is indicated by blue. Predicted prevalences assumed a population with the same proportion of women for each race and the same age as the mean age of each race. Thus, the prevalences reflect the sex and age composition of REGARDS participants of each race. REGARDS indicates Reasons for Geographic and Racial Differences in Stroke.

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Circ Cardiovasc Qual Outcomes. 2017;10:e003350-00.

TABLE 5 CVD Risk Factors Common in Patients With Hypertension

Modifiable Risk Factors*	Relatively Fixed Risk Factors†
■ Current cigarette smoking, secondhand smoking	■ CKD
■ Diabetes mellitus	■ Family history
■ Dyslipidemia/hypercholesterolemia	■ Increased age
■ Overweight/obesity	■ Low socioeconomic/ educational status
■ Physical inactivity/low fitness	■ Male sex
■ Unhealthy diet	■ Obstructive sleep apnea
	■ Psychosocial stress

*Factors that can be changed and, if changed, may reduce CVD risk. †Factors that are difficult to change (CKD, low socioeconomic/educational status, obstructive sleep apnea), cannot be changed (family history, increased age, male sex), or, if changed through the use of current intervention techniques, may not reduce CVD risk (psychosocial stress).

CKD indicates chronic kidney disease; and CVD, cardiovascular disease.

Whelton et al. J Am Coll Cardiol 2018;71:e127–248

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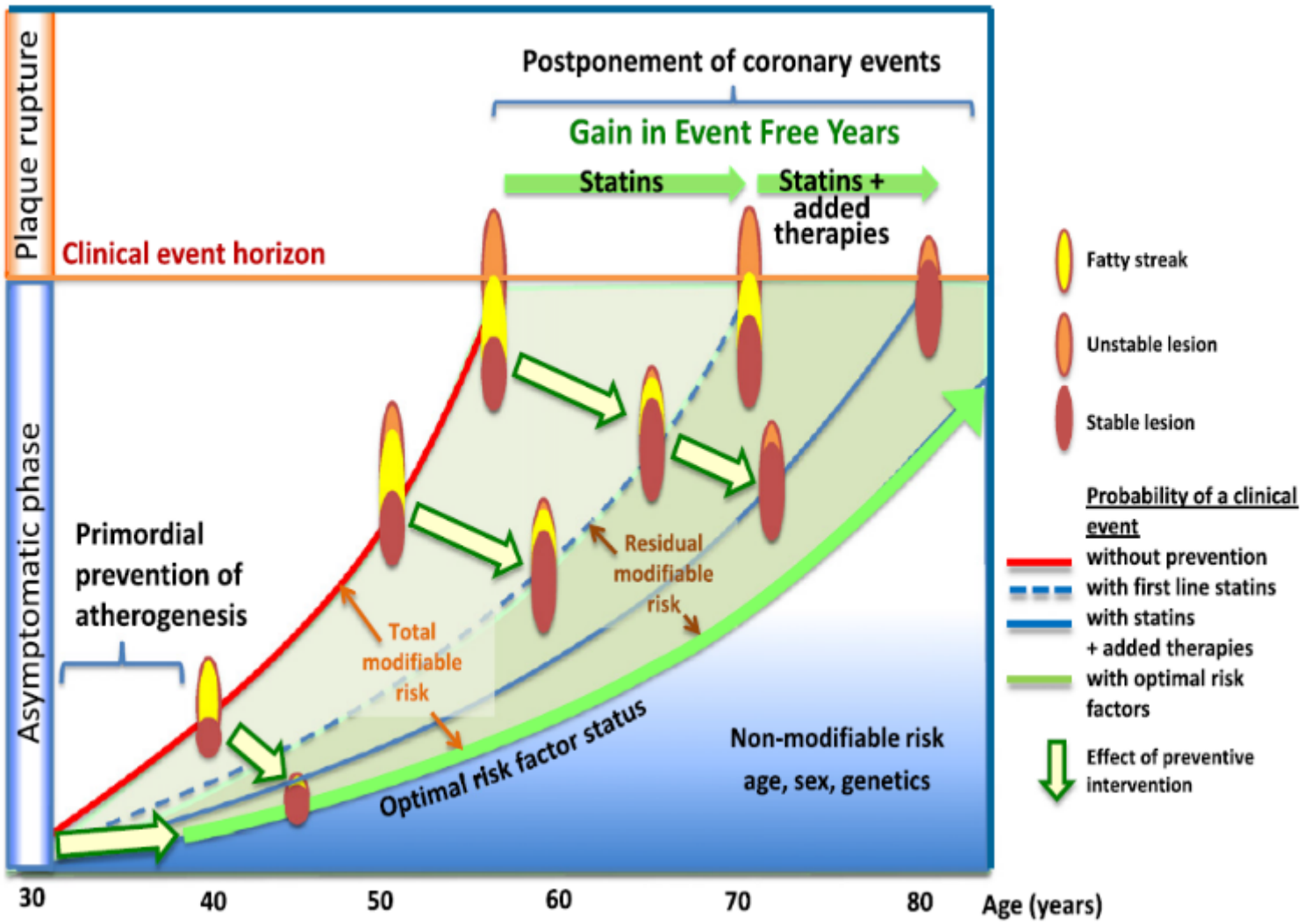
In patients with hypertension, discuss the added impact of additional risk factors such as diabetes and tobacco use upon **overall cardiovascular risk**

Assessing cardiovascular risk



Packard CJ et al. Vasc Pharmacol. 2015;71:37-39.

Assessing cardiovascular risk

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- Should quantify risk for ourselves and our patients
- It is less important which risk calculator you use, than just choosing one and using it regularly

There are region specific calculators:

- United States: ACC/AHA ASCVD Risk Calculator (pooled cohort equation)
- Canada: Cardiovascular life expectancy model and Framingham Risk Score
- United Kingdom: JBS3 risk estimator
- Western Europe : SCORE or JBS3 risk estimator
- China: China-PAR CVD risk calculator

2019 ACC/AHA Guideline on the Primary Prevention of Cardiovascular Disease

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2.2. Assessment of Cardiovascular Risk

Recommendations for Assessment of Cardiovascular Risk Referenced studies that support recommendations are summarized in Online Data Supplement 3.		
COR	**LOE**	**Recommendations**
I	B-NR	1. For adults 40 to 75 years of age, clinicians should routinely assess traditional cardiovascular risk factors and calculate 10-year risk of ASCVD by using the pooled cohort equations (PCE) (S2.2-1, S2.2-2).
IIa	B-NR	2. For adults 20 to 39 years of age, it is reasonable to assess traditional ASCVD risk factors at least every 4 to 6 years (S2.2-1–S2.2-3).
IIa	B-NR	3. In adults at borderline risk (5% to <7.5% 10-year ASCVD risk) or intermediate risk (≥7.5% to <20% 10-year ASCVD risk), it is reasonable to use additional risk-enhancing factors to guide decisions about preventive interventions (e.g., statin therapy) (S2.2-4–S2.2-14).
IIa	B-NR	4. In adults at intermediate risk (≥7.5% to <20% 10-year ASCVD risk) or selected adults at borderline risk (5% to <7.5% 10-year ASCVD risk), if risk-based decisions for preventive interventions (e.g., statin therapy) remain uncertain, it is reasonable to measure a coronary artery calcium score to guide clinician–patient risk discussion (S2.2-15–S2.2-31).
IIb	B-NR	5. For adults 20 to 39 years of age and for those 40 to 59 years of age who have <7.5% 10-year ASCVD risk, estimating lifetime or 30-year ASCVD risk may be considered (S2.2-1, S2.2-2, S2.2-32–S2.2-35).

Arnett DK, et al. JACC(2019)

When we are thinking about an "**integrated approach to CV risk management**" the most important thing to remember is that:

Elevated blood pressure and blood cholesterol are not like pregnancy

When we are thinking about an "**integrated approach to CV**

Blood pressure and blood cholesterol are continuously related to cardiovascular risk

blood cholesterol are not like pregnancy

Defining hypertension at an absolute threshold can be important, but I would urge you to think about hypertension as ***"the blood pressure level above which there would be substantial (or clinically significant) benefits from lowering blood pressure"***

Similar logic has been applied to defining hyperlipidemia, particularly in more recent lipid guidelines

Lancet 2005; 365: 434–41

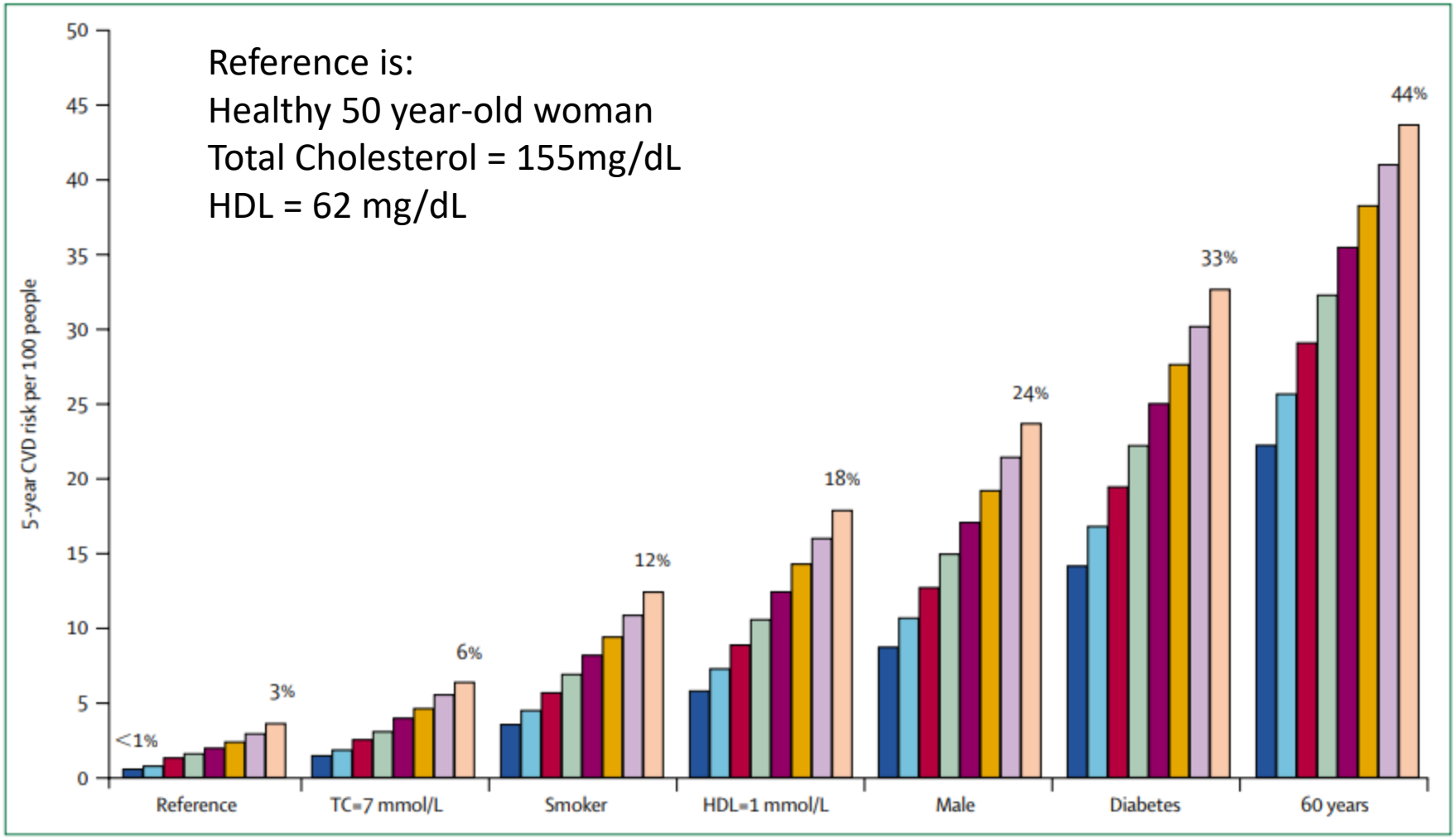


Figure 4: **Absolute risk of cardiovascular disease over 5 years in patients by systolic blood pressure at specified levels of other risk factors**[26]
Reference category is a non-diabetic, non-smoker female aged 50 years with total cholesterol of 4·0 mmol/L and HDL of 1·6 mmol/L. Risks are given for systolic blood pressure levels of 110, 120, 130, 140, 150, 160, 170, and 180 mm Hg. In the other categories additional risk factors are added consecutively, for example, the diabetes category is a diabetic 50-year-old male cigarette smoker, with a total cholesterol of 7 mmol/L and HDL of 1 mmol/L. TC=total cholesterol. Derived from data presented in the references cited.

1mmol/L = 38.67 mg/dL

Lancet 2005; 365: 434–41

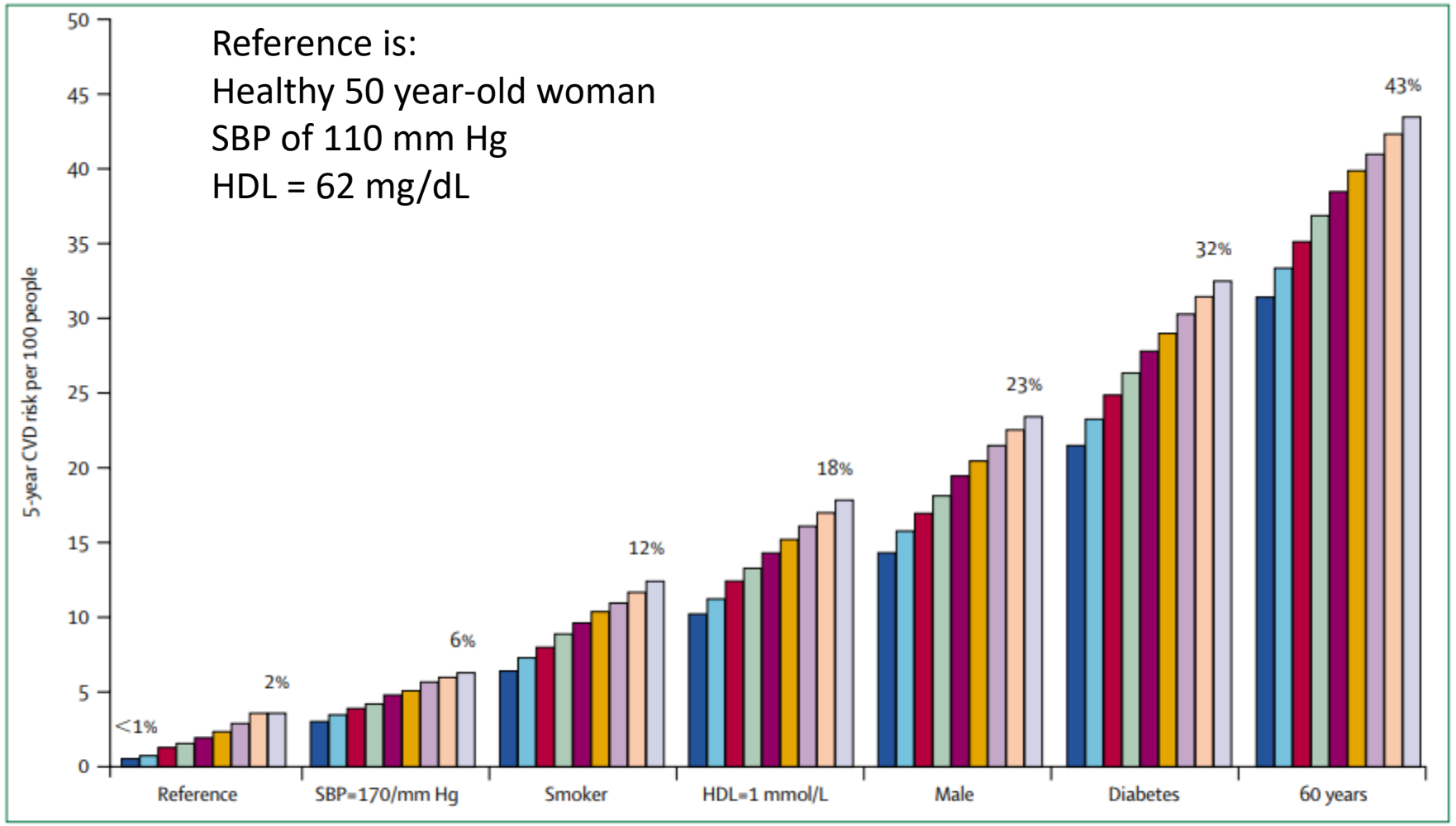


***Figure 5*: Absolute risk of cardiovascular disease over 5 years in patients by blood total cholesterol at specified levels of other risk factors**[26]

Reference category is a 50-year-old non-smoker, non-diabetic female with systolic blood pressure of 110 mm Hg, HDL of 1·6 mmol/L. Risks are given for total cholesterol concentrations of 4·0, 4·5, 5·0, 5·5, 6·0, 6·5, 7·0, 7·5, and 8·0 mmol/L. In each of the other categories additional risk factors are added consecutively, for example the HDL=1 mmol/L category is a 50-year-old, female cigarette smoker with systolic blood pressure of 170 mm Hg and HDL of 1 mmol/L. Derived from data presented in the references cited. SBP=systolic blood pressure.

1mmol/L = 38.67 mg/dL

Lancet 2005; 365: 434–41

Figure 1

Age	
35-39	0
40-44	1
45-49	3
50-54	4
55-59	6
60-64	7
65-69	9
70-74	10

HDL-C									
Total-C	25	30	35	40	45	50	60	70	80
160	8	7	5	5	4	3	2	1	0
170	8	7	6	5	4	4	2	1	0
180	9	7	6	5	5	4	3	2	1
190	9	8	7	6	5	4	3	2	1
200	9	8	7	6	5	5	3	2	1
210	10	8	7	6	6	5	4	3	2
220	10	9	8	7	6	5	4	3	2
230	10	9	8	7	6	6	4	3	2
240	10	9	8	7	7	6	5	4	3
250	11	9	8	8	7	6	5	4	3
260	11	10	9	8	7	6	5	4	3
270	11	10	9	8	7	7	5	4	3
280	11	10	9	8	8	7	6	5	4
290	12	10	9	9	8	7	6	5	4
300	12	11	10	9	8	7	6	5	4

Diabetes	Cigs
No = 0	No=0
Yes = 3	Yes = 4

SBP			
if untreated		if treated	
<110	0	<110	0
110-124	1	110-114	1
125-144	2	115-124	2
145-164	3	125-134	3
165-184	4	135-144	4
185-214	5	145-154	5
>=215	6	155-215	6
		>=215	6

Pts	2 -yr Probabilities	Pts	2 -yr Probabilities	Pts	2 -yr Probabilities
0	0%	14	1%	28	17%
2	0%	16	2%	30	24%
4	0%	18	3%	32	32%
6	0%	20	4%	34	43%
8	0%	22	6%		
10	1%	24	9%		
12	1%	26	12%		

Probability of initial CHD within 2 years for men aged 35 to 74 and free of cardiovascular disease.

D'Agostino, AHJ 2000

If not Menpausal, Age		Total-C	HDL-C 25	30	35	40	45	50	60	70	80
35-39	0	160	5	4	3	3	2	2	1	1	0
40-44	1	170	5	4	4	3	3	2	1	1	0
45-49	3	180	5	5	4	3	3	2	2	1	0
50-54	4	190	5	5	4	4	3	3	2	1	1
55-59	6	200	6	5	4	4	3	3	2	1	1
60-64	7	210	6	5	5	4	3	3	2	2	1
65-69	9	220	6	5	5	4	4	3	2	2	1
70-74	10	230	6	6	5	4	4	3	3	2	1
If Menpausal, Age		240	6	6	5	5	4	4	3	2	2
35-49	17	250	7	6	5	5	4	4	3	2	2
50-74	16	260	7	6	5	5	4	4	3	3	2
		270	7	6	6	5	5	4	3	3	2
		280	7	6	6	5	5	4	3	3	2
		290	7	6	6	5	5	4	4	3	2
		300	7	7	6	5	5	5	4	3	3

Diabetes No = 0 Yes = 3	Cigs No=0 Yes = 2

alcohol oz/wk	
0-4	0
6 to 40	-1

SBP if untreated		if treated	
<110	0	<114	0
110-114	1	115-124	2
115-124	2	125-134	3
125-134	3	135-144	4
135-154	4	145-154	5
155-164	5	155-164	6
165-184	6	165-194	7
185-194	7	195-214	8
195-214	8	215-234	9
215-234	9	>=235	10
>=235	10		

if has prevalent menopause use:

Pts	2 -yr Probabilities	Pts	2 -yr Probabiliti	Pts	2 -yr Probabilities
0	0%	14	0%	28	3%
2	0%	16	0%	30	6%
4	0%	18	0%	32	11%
6	0%	20	0%	34	18%
8	0%	22	1%	36	31%
10	0%	24	1%		
12	0%	26	2%		

if does not have prevalent menopause use:

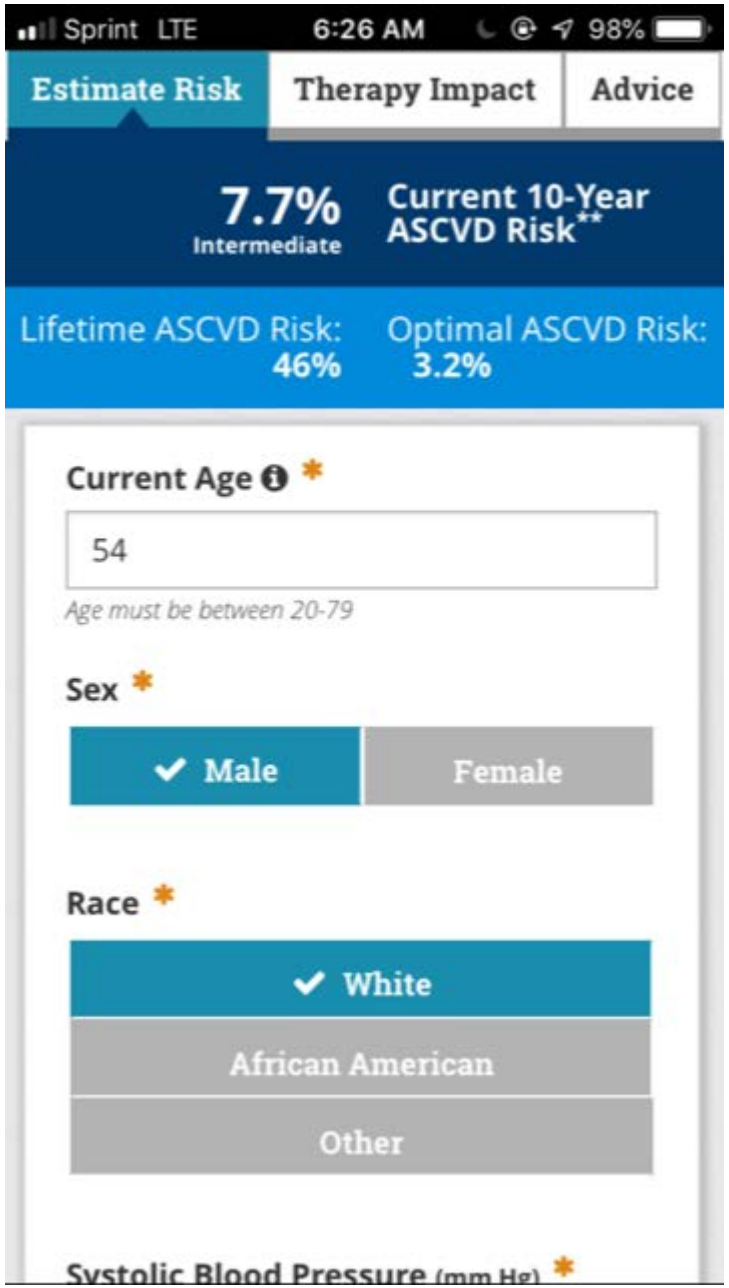
Pts	2 -yr Probabilities	Pts	2 -yr Probabilities
0	0%	14	2%
2	0%	16	3%
4	0%	18	5%
6	0%	20	9%
8	0%	22	16%
10	1%	24	27%
12	1%	26	43%

Probability of initial CHD within 2 years for women aged 35 to 74 and free of cardiovascular disease: Model without triglycerides.

D'Agostino, AHJ 2000

Example from a recent clinic:
54 year-old white man with hypertension (not on medication)
Clinic sitting blood pressure: 144/73 mm Hg
Total Cholesterol: 205 mg/dL
HDL: 41 mg/dL
LDL: 145 mg/dL

No diabetes mellitus
Non-smoker
No statin
No aspirin



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Example from a recent clinic:
54 year-old white man with hypertension (not on medication)
Clinic sitting blood pressure: 144/73 mm Hg
Total Cholesterol: 205 mg/dL
HDL: 41 mg/dL
LDL: 145 mg/dL

Has type 2 diabetes mellitus
Non-smoker
No statin
No aspirin

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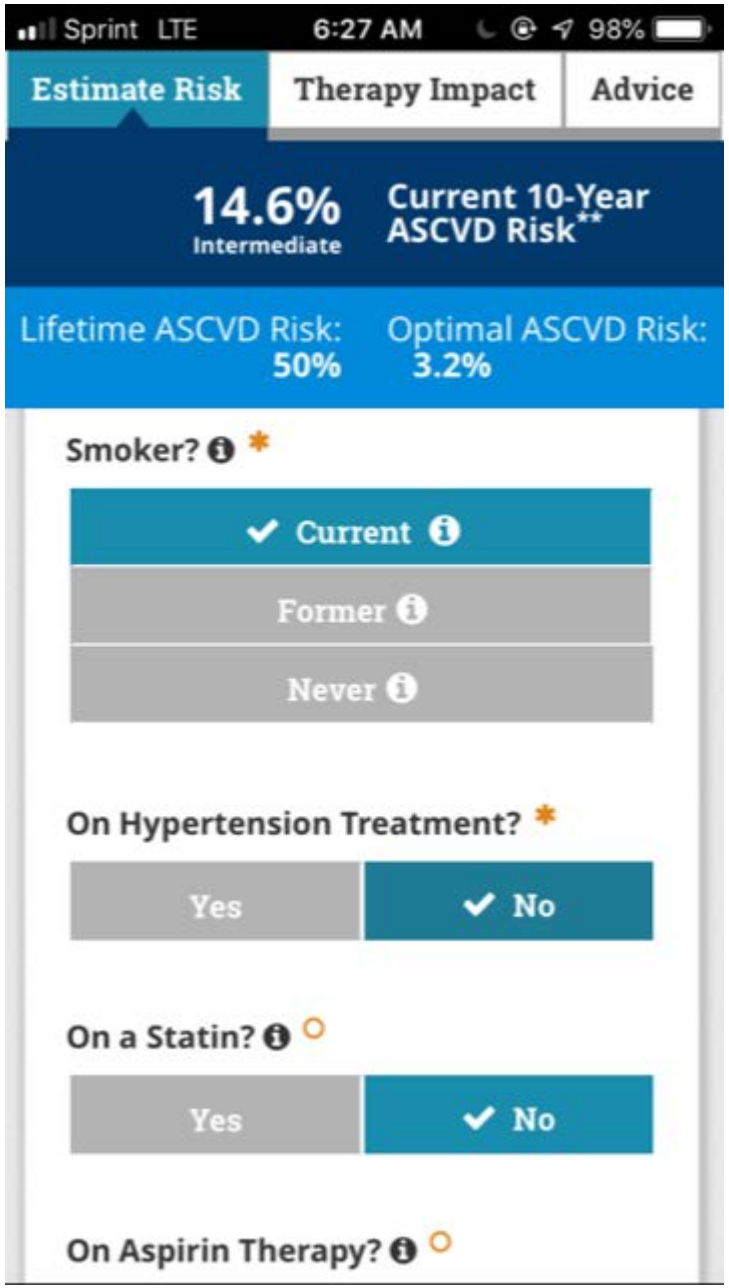

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Has type 2 diabetes mellitus
Smoker
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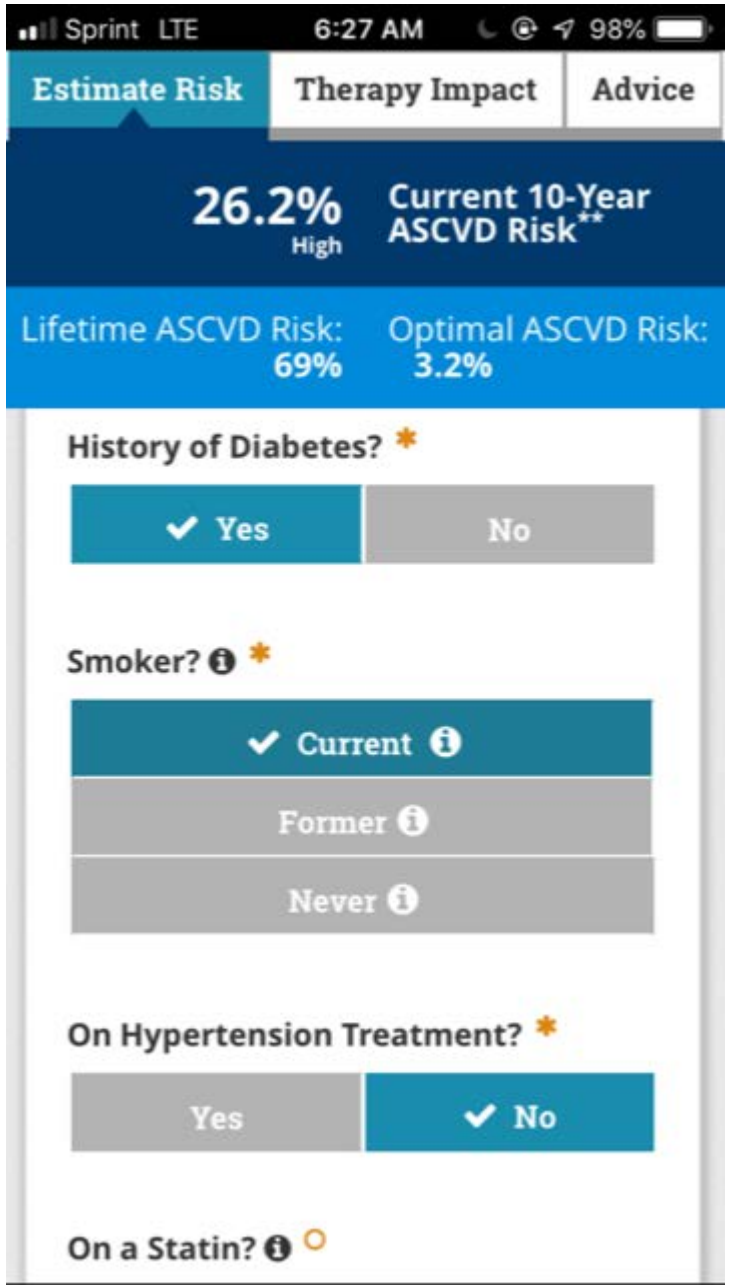
No aspirin



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4.5. Treatment of Tobacco Use

Recommendations for Treatment of Tobacco Use Referenced studies that support recommendations are summarized in Online Data Supplements 15 and 16.		
COR	**LOE**	**Recommendations**
I	A	1. All adults should be assessed at every healthcare visit for tobacco use and their tobacco use status recorded as a vital sign to facilitate tobacco cessation (S4.5-1).
I	A	2. To achieve tobacco abstinence, all adults who use tobacco should be firmly advised to quit (S4.5-2).
I	A	3. In adults who use tobacco, a combination of behavioral interventions plus pharmacotherapy is recommended to maximize quit rates (S4.5-2, S4.5-3).
I	B-NR	4. In adults who use tobacco, tobacco abstinence is recommended to reduce ASCVD risk (S4.5-4, S4.5-5).
IIa	B-R	5. To facilitate tobacco cessation, it is reasonable to dedicate trained staff to tobacco treatment in every healthcare system (S4.5-1).
III: Harm	B-NR	6. All adults and adolescents should avoid secondhand smoke exposure to reduce ASCVD risk (S4.5-6).

Arnett DK, et al. JACC(2019)

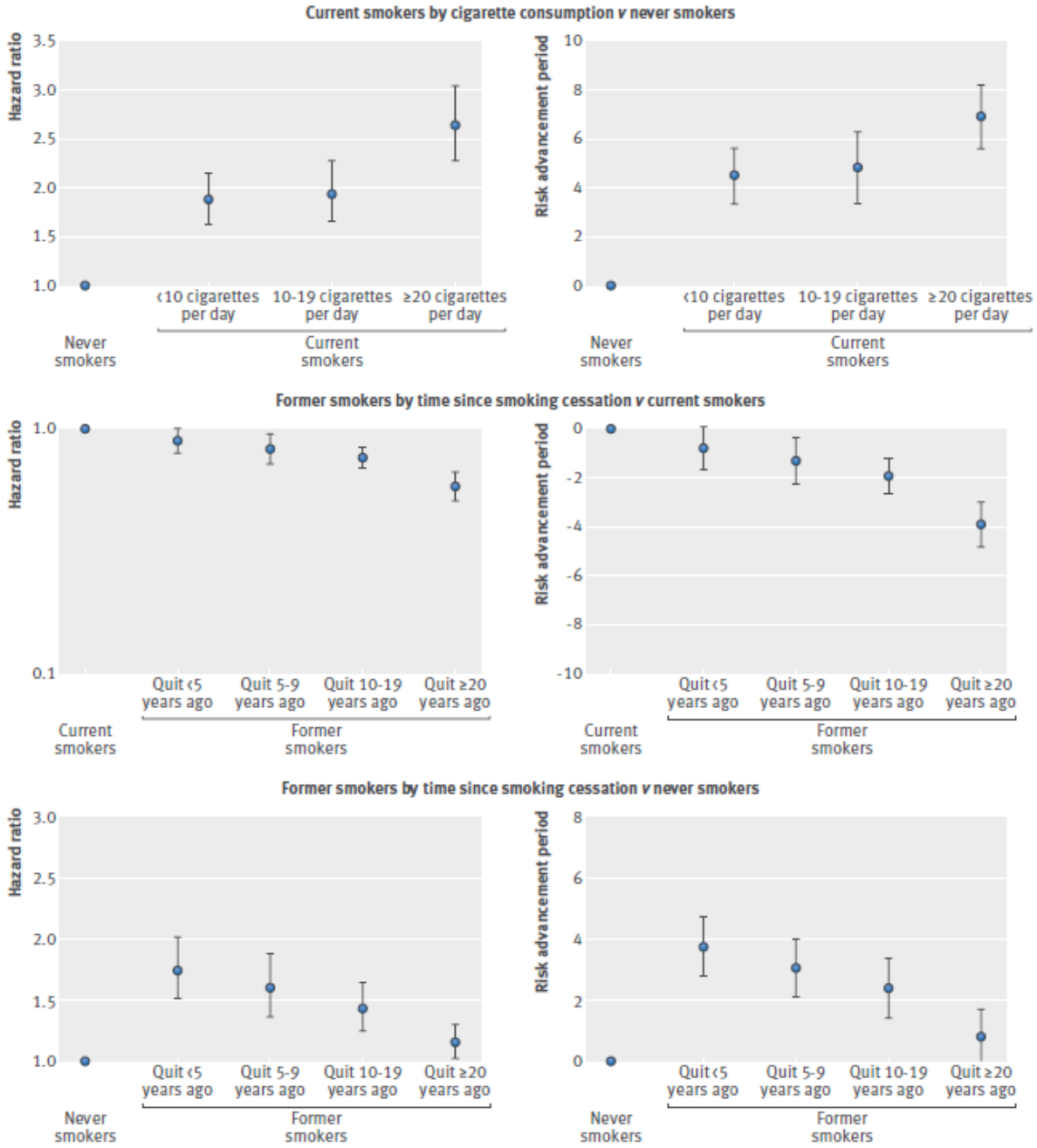

Fig 3 | **Cardiovascular mortality summary estimates (random effects model) of hazard ratios and risk advancement periods for categories of cigarette consumption and time since smoking cessation**

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List and discuss current recommendations for screening for lipid disorders and diabetes mellitus

Lipid screening recommendations

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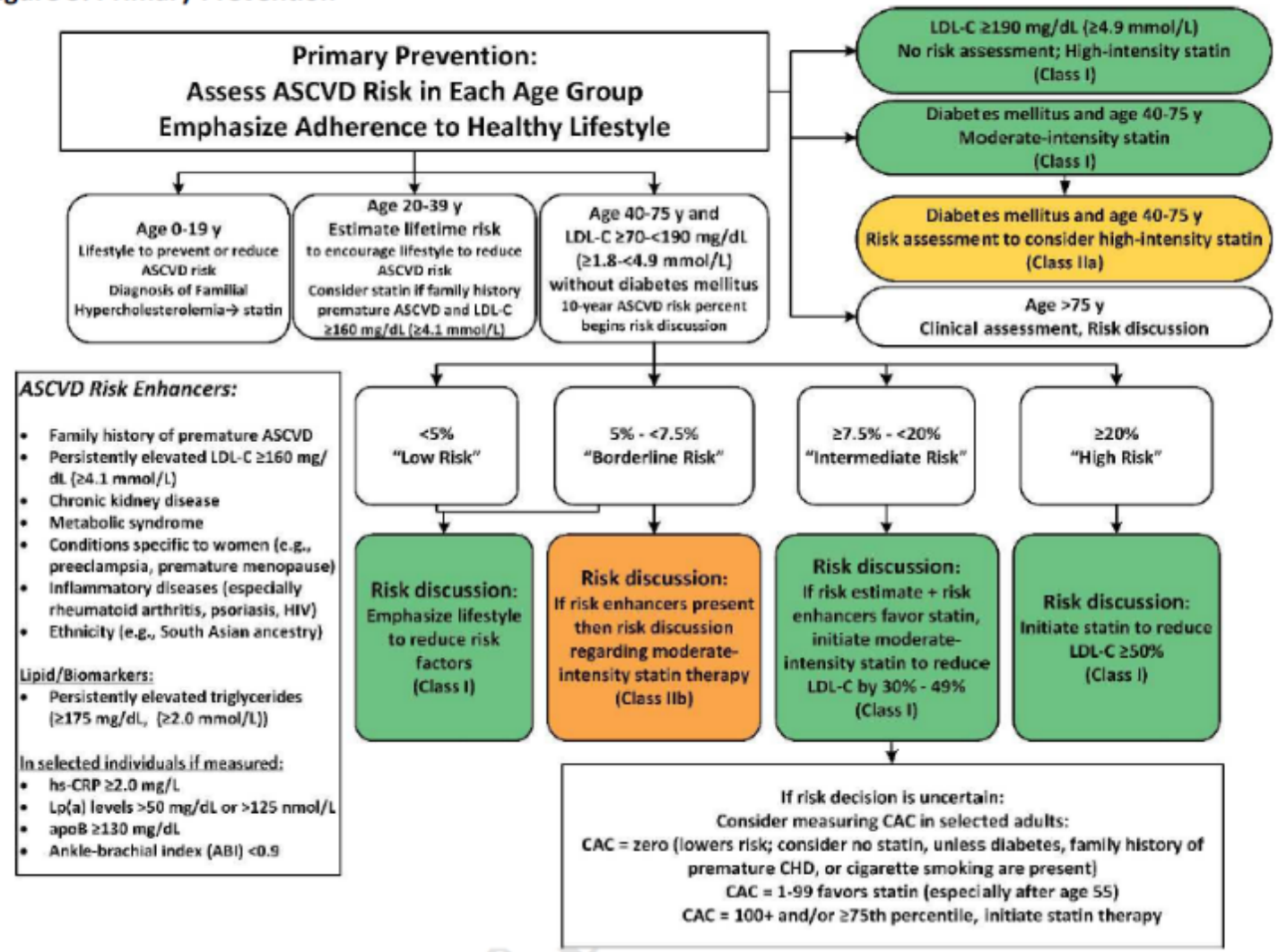
2.2. Assessment of Cardiovascular Risk

Recommendations for Assessment of Cardiovascular Risk Referenced studies that support recommendations are summarized in Online Data Supplement 3.		
COR	**LOE**	**Recommendations**
I	B-NR	1. For adults 40 to 75 years of age, clinicians should routinely assess traditional cardiovascular risk factors and calculate 10-year risk of ASCVD by using the pooled cohort equations (PCE) (S2.2-1, S2.2-2).
IIa	B-NR	2. For adults 20 to 39 years of age, it is reasonable to assess traditional ASCVD risk factors at least every 4 to 6 years (S2.2-1–S2.2-3).
IIa	B-NR	3. In adults at borderline risk (5% to <7.5% 10-year ASCVD risk) or intermediate risk (≥7.5% to <20% 10-year ASCVD risk), it is reasonable to use additional risk-enhancing factors to guide decisions about preventive interventions (e.g., statin therapy) (S2.2-4–S2.2-14).
IIa	B-NR	4. In adults at intermediate risk (≥7.5% to <20% 10-year ASCVD risk) or selected adults at borderline risk (5% to <7.5% 10-year ASCVD risk), if risk-based decisions for preventive interventions (e.g., statin therapy) remain uncertain, it is reasonable to measure a coronary artery calcium score to guide clinician–patient risk discussion (S2.2-15–S2.2-31).
IIb	B-NR	5. For adults 20 to 39 years of age and for those 40 to 59 years of age who have <7.5% 10-year ASCVD risk, estimating lifetime or 30-year ASCVD risk may be considered (S2.2-1, S2.2-2, S2.2-32–S2.2-35).

Arnett DK, et al. JACC(2019)

Any role for advanced or additional lipid testing?

Figure 3. Primary Prevention



Colors correspond to Class of Recommendation in Table 1.

ABI indicates ankle-brachial index; apoB, apolipoprotein B; ASCVD, atherosclerotic cardiovascular disease; CAC, coronary artery calcium; CHD, coronary heart disease; HIV, human immunodeficiency virus; hs-CRP, high-sensitivity C-reactive protein; LDL-C, low-density lipoprotein cholesterol; and Lp(a), lipoprotein (a).

Arnett DK, et al. JACC(2019)

Screening and Testing for Prediabetes and Type 2 Diabetes in Asymptomatic Adults

Diabetes Care 2019;42(Suppl. 1):S13–S28

2. Classification and Diagnosis of Diabetes: *Standards of Medical Care in Diabetes—2019*

American Diabetes Association

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1) Screening for prediabetes and type 2 diabetes with an informal assessment of risk factors
or validated tools should be considered in asymptomatic adults.

2) Testing for prediabetes and/or type 2 diabetes in asymptomatic people should be considered in adults of any age who are overweight or obese(BMI >25kg/m^{2}or >23 kg/m^2 in Asian Americans) and who have one or more additional risk factors for diabetes.

3) For all people, testing should begin at age 45 years.

4) If tests are normal, repeat testing carried out at a minimum of 3-year intervals is reasonable.

5) To test for prediabetes and type 2 diabetes, fasting plasma glucose, 2-h plasma glucose during 75-g oral glucose tolerance test, and A1C are equally appropriate.

6) In patients with prediabetes and type 2 diabetes, identify and, if appropriate, treat other cardiovascular disease risk factors.

Diabetes Care 2019;42(Suppl. 1):S13–S28

2. Classification and Diagnosis of Diabetes: *Standards of Medical Care in Diabetes—2019*

American Diabetes Association

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1) Screening for prediabetes and type 2 diabetes with an informal assessment of

Table 2.3—Criteria for testing for diabetes or prediabetes in asymptomatic adults

1. Testing should be considered in overweight or obese (BMI ≥25 kg/m^2 or ≥23 kg/m^2 in Asian Americans) adults who have one or more of the following risk factors:
   - First-degree relative with diabetes
   - High-risk race/ethnicity (e.g., African American, Latino, Native American, Asian American, Pacific Islander)
   - History of CVD
   - Hypertension (≥140/90 mmHg or on therapy for hypertension)
   - HDL cholesterol level <35 mg/dL (0.90 mmol/L) and/or a triglyceride level >250 mg/dL (2.82 mmol/L)
   - Women with polycystic ovary syndrome
   - Physical inactivity
   - Other clinical conditions associated with insulin resistance (e.g., severe obesity, acanthosis nigricans)
2. Patients with prediabetes (A1C ≥5.7% [39 mmol/mol], IGT, or IFG) should be tested yearly.
3. Women who were diagnosed with GDM should have lifelong testing at least every 3 years.
4. For all other patients, testing should begin at age 45 years.
5. If results are normal, testing should be repeated at a minimum of 3-year intervals, with consideration of more frequent testing depending on initial results and risk status.

glucose during 75-g oral glucose tolerance test, and A1C are equally appropriate.

6) In patients with prediabetes and type 2 diabetes, identify and, if appropriate, treat other cardiovascular disease risk factors.

Diabetes Care 2019;42(Suppl. 1):S13–S28

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6) In patients with prediabetes and type 2 diabetes, identify and, if appropriate, treat other cardiovascular disease risk factors.

Diabetes Care 2019;42(Suppl. 1):S13–S28

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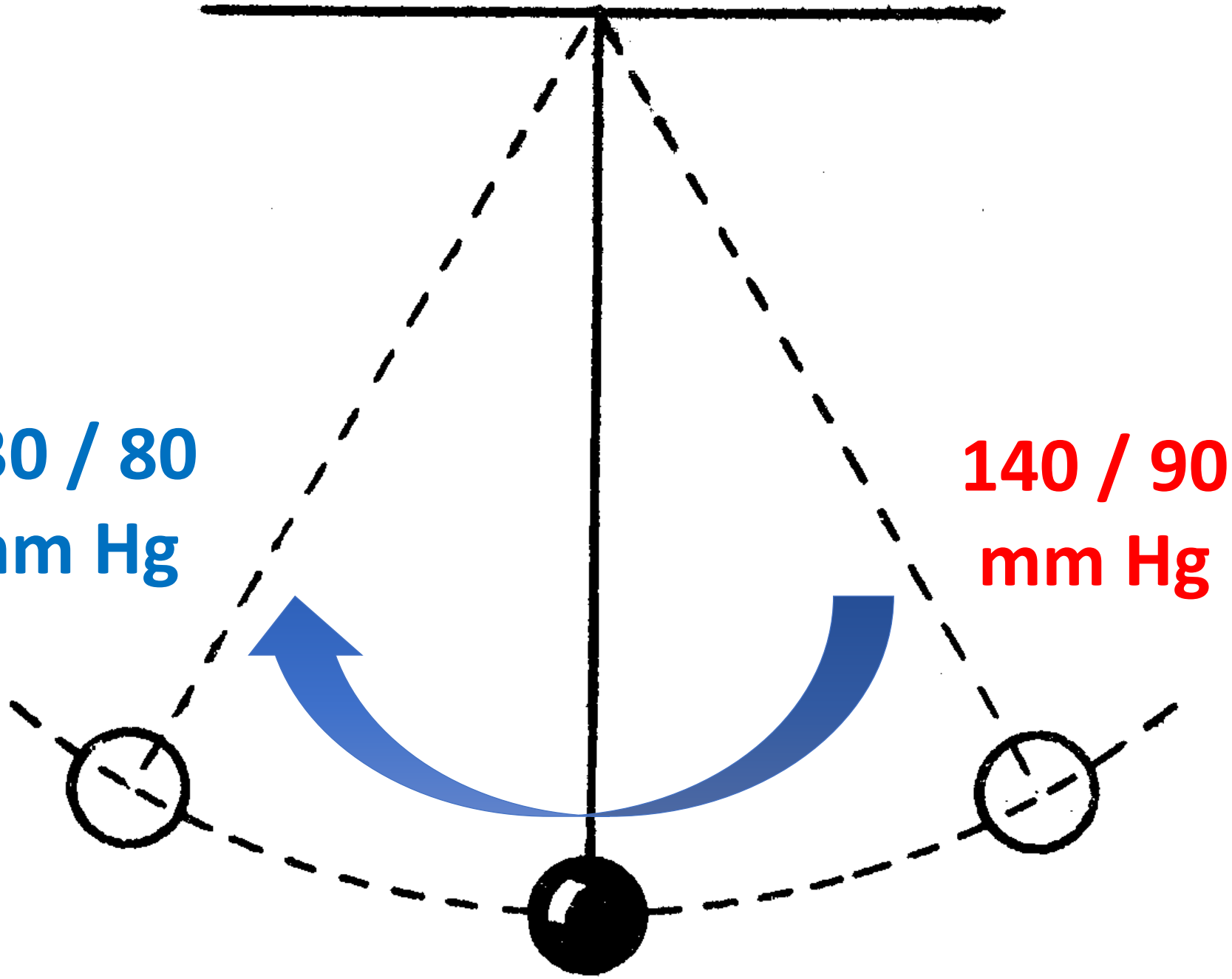
List thresholds for pharmacological BP treatment and treatment goal for patients with type 2 diabetes



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ACC/AHA 2017 Guidelines

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Diabetes Mellitus

COR	LOE	Recommendations for Treatment of Hypertension in Patients With DM
I	SBP: B-R^{SR}	In adults with DM and hypertension, antihypertensive drug treatment should be initiated at a BP of 130/80 mm Hg or higher with a treatment goal of less than 130/80 mm Hg.
	DBP: C-EO	
I	A^{SR}	In adults with DM and hypertension, all first-line classes of antihypertensive agents (i.e., diuretics, ACE inhibitors, ARBs, and CCBs) are useful and effective.
IIb	B-NR	In adults with DM and hypertension, ACE inhibitors or ARBs may be considered in the presence of albuminuria.

SR indicates systematic review.

Whelton PK, et al. 2017 High Blood Pressure Clinical Practice Guideline

American Diabetes Association Guidelines

1) For patients with diabetes and hypertension, blood pressure targets should be individualized through a shared decision-making process that **addresses cardiovascular risk**, potential adverse effects of antihypertensive medications, and patient preferences.

2) For individuals with diabetes and hypertension at higher cardiovascular risk (**existing ASCVD or 10-year ASCVD >15%**), a blood pressure target of, 130/80 mmHg may be appropriate, if it can be safely attained.

3) For individuals with diabetes and hypertension at lower risk for cardiovascular disease (10-year ASCVD <15%), treat to a blood pressure target of 140/90 mmHg

Diabetes Care 2019;42(Suppl. 1):S13–S28

Are the changes in **accord**ance with the available data?

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Are the changes in **accord**ance with the available data?

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New lower blood pressure thresholds driven by data from **SPRINT**

120 mm Hg SBP versus 140 mm Hg in non-diabetic patients

Stand in contrast to data from **ACCORD-BP**

120 mm Hg SBP versus 140 mm Hg in diabetic patients

Are the changes in **accord**ance with the available data?

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Important points to remember:

1) SPRINT enrolled twice the number of participants as ACCORD-BP

2) SPRINT **captured more CV events** in its primary endpoint compared with ACCORD-BP. The additional major adverse CV event category, **acute decompensated heart failure** is the most important of these.

3) Heart failure accounted for 29% of all events observed in SPRINT and the difference in heart failure events between intensive and standard BP targets drove the primary end- point (hazard ratio 0.62, 95% confidence interval [CI] 0.45-0.84).

4) In ACCORD-BP, heart failure was a secondary endpoint, and thus, ACCORD-BP's primary outcome included a higher proportion of CV events that are less sensitive to BP reduction

Laffin and Bakris. Diabetes Obes Metab. 2018;1–2

Post hoc analyses

Outcomes of Combined Cardiovascular Risk Factor Management Strategies in Type 2 Diabetes: The ACCORD Randomized Trial

Diabetes Care 2014;37:1721–1728 | DOI: 10.2337/dc13-2334

Intensive BP or intensive glycemia treatment alone improved major CVD outcomes by 26% compared with combined standard treatment, without additional benefit from combining the two

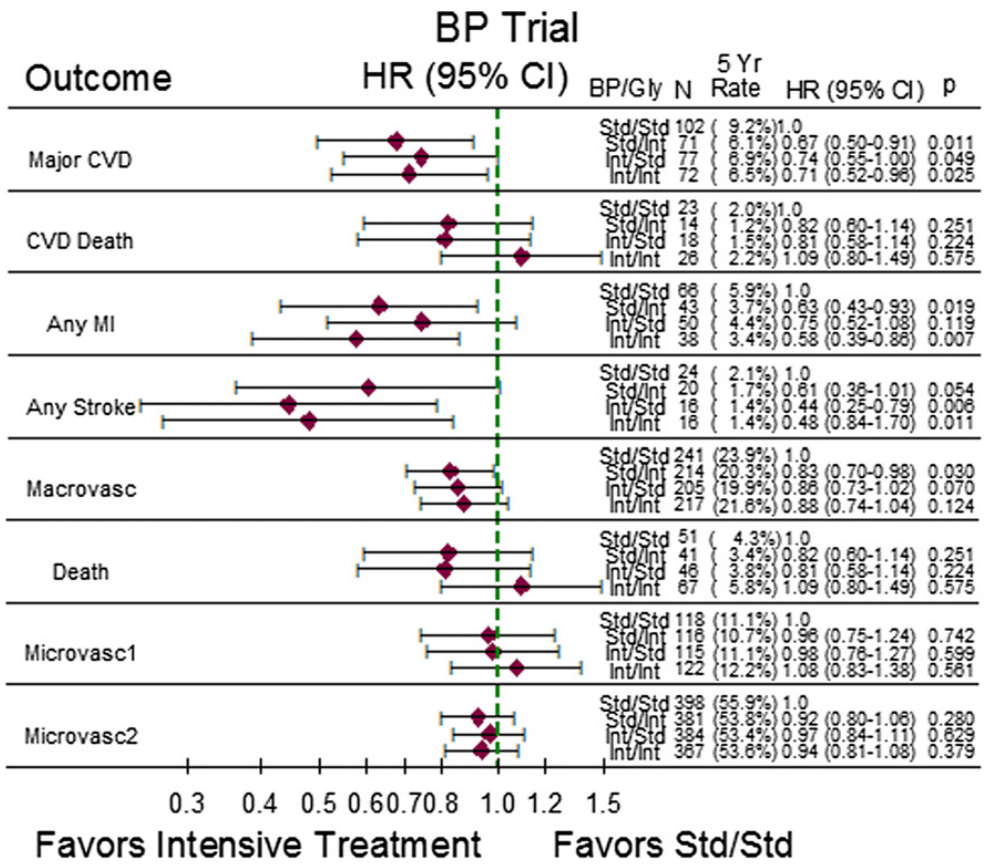

Figure 1—Five-year event rates, HR, and corresponding 95% CI for comparisons of the three more intensively treated groups to the standard BP-lowering/standard glucose-lowering treatment group in the ACCORD BP trial. *P* values are for pairwise comparisons of more intensively treated groups with the standard/standard group. BP, blood pressure; Gly, glycemia; std, standard; int, intensive; macrovasc, macrovascular end point; microvasc, microvascular end point.

Margolis KL, et al. Diabetes Care 2014;37:1721–1728

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- 3957 (87%) surviving ACCORD BP Participants consented to post-trial follow-up of up to 60 months
- After 4.9 years of intensive BP-lowering, there was no reduction in the rate of CV events or mortality over a median follow- up of 8.8 years
- However, significant interaction (P = .03) in the intense glucose therapy group, with **evidence of benefit for intensive BP-lowering in participants randomized to standard glycaemia therapy** (hazard ratio 0.79, 95% CI 0.65-0.96).

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ACCORD TRIAL FOLLOW-ON STUDY

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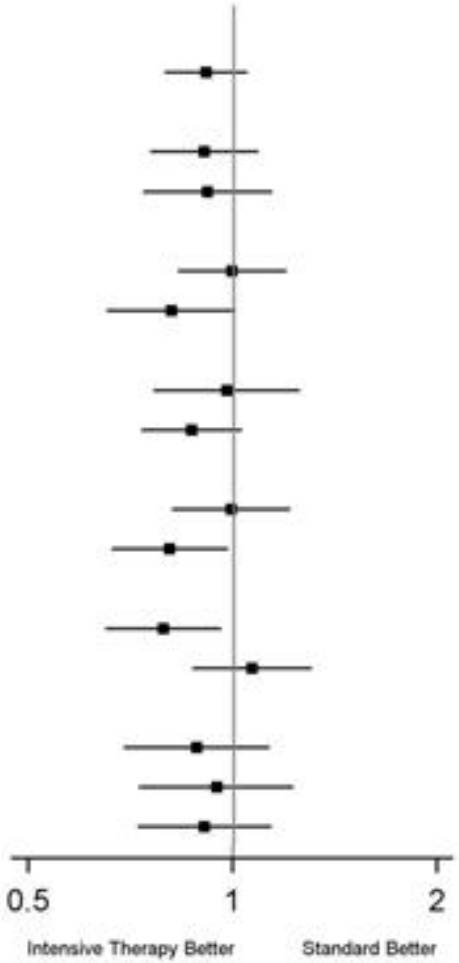
		Intensive Therapy #events/N (%)	Standard Therapy #events/N (%)	Hazard Ratio (95% CI)	P Value for Interaction
Overall		369/2342(15.76)	410/2350(17.45)	0.91 (0.79, 1.05)	
Gender					
	Male	217/1224(17.73)	239/1238(19.31)	0.91 (0.75, 1.09)	.939
	Female	152/1118(13.6)	171/1112(15.38)	0.92 (0.74, 1.14)	
Age					
	<65 years	225/1556(14.46)	228/1536(14.84)	0.99 (0.83, 1.19)	.159
	>=65 years	144/786(18.32)	182/814(22.36)	0.81 (0.65, 1.01)	
Race					
	Non-White	118/897(13.15)	133/953(13.96)	0.98 (0.76, 1.25)	.443
	White	251/1445(17.37)	277/1397(19.83)	0.87 (0.73, 1.03)	
Prior CVD					
	No	186/1547(12.02)	196/1566(12.52)	0.99 (0.81, 1.21)	.147
	Yes	183/795(23.02)	214/784(27.3)	0.81 (0.66, 0.98)	
Glycemia Arm					
	Standard	182/1177(15.46)	222/1169(18.99)	0.79 (0.65, 0.96)	.037
	Intensive	187/1165(16.05)	188/1181(15.92)	1.06 (0.87, 1.30)	
SBP					
	< 133	122/823(14.82)	131/779(16.82)	0.88 (0.69, 1.13)	.934
	133-144	104/729(14.27)	123/791(15.55)	0.94 (0.73, 1.22)	
	>144	143/790(18.1)	156/780(20)	0.91 (0.72, 1.14)	



Also examined DBP tertiles (p=0.16), HbA1c (p=21) and number of screening meds (p=0.31)

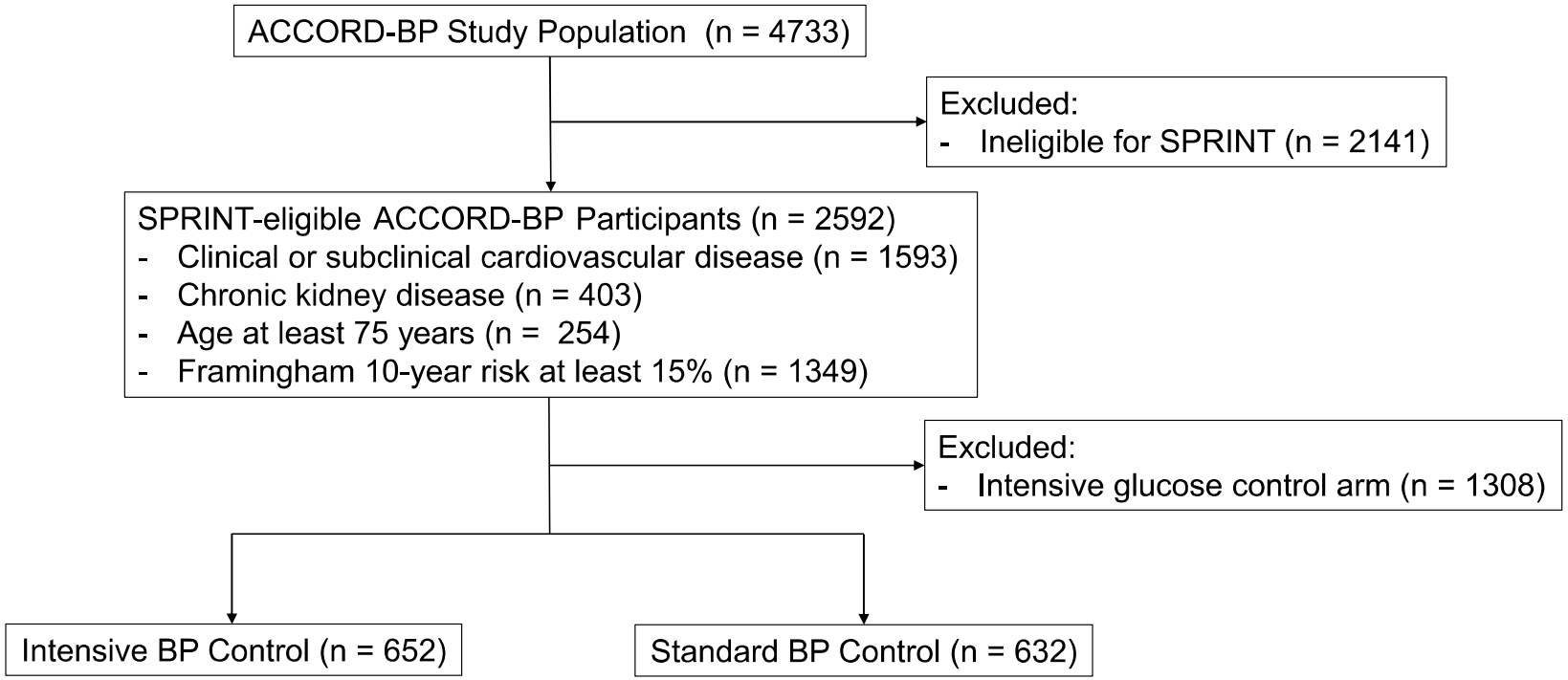
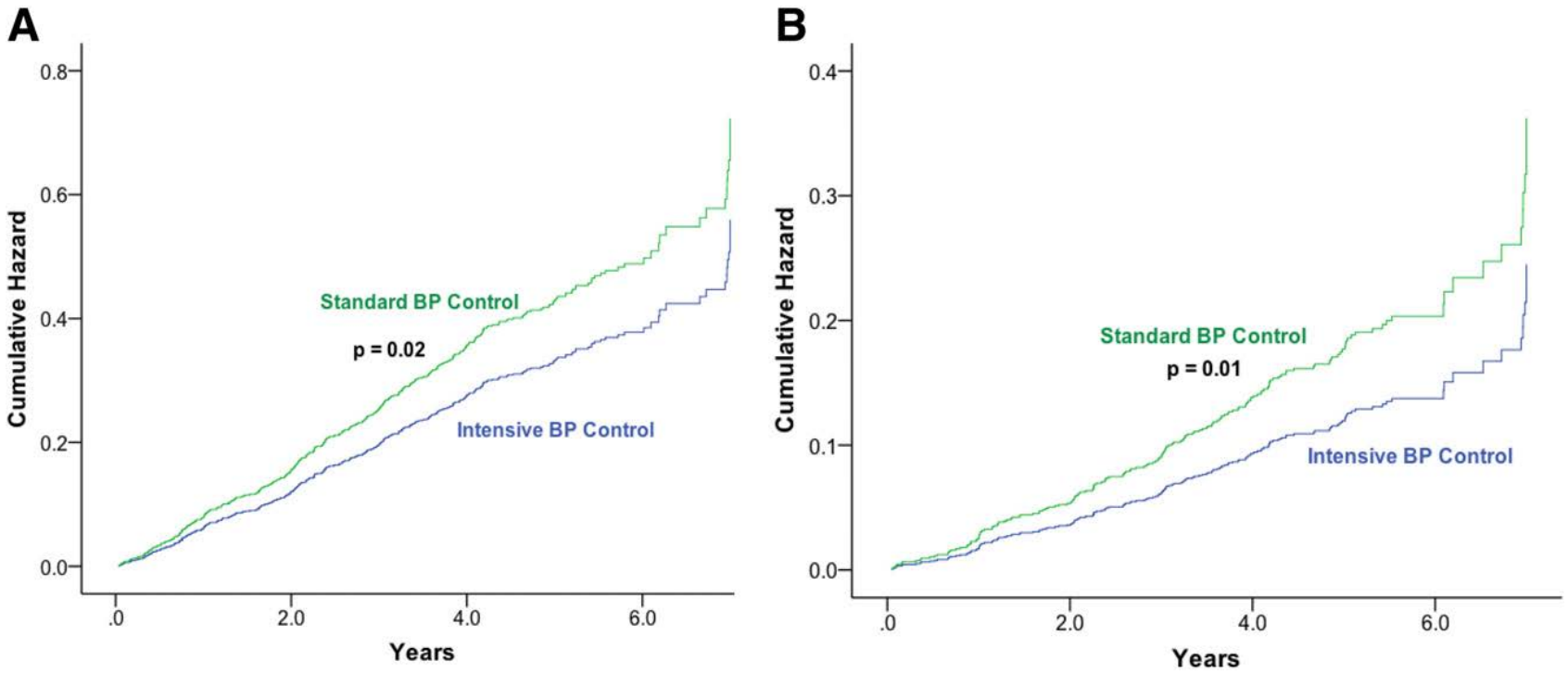


Figure 1—CONSORT diagram for SPRINT-eligible ACCORD-BP participants.

Buckley LF, et al. Diabetes Care 2017;40:1733–1738



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Bottom line

- **SPRINT** provides the most contemporary RCT data for BP treatment targets, and demonstrates clear benefit for more aggressive blood pressure lowering.

- Although it did not enroll patients with diabetes, its findings **should be applied to patients with an elevated risk of cardiovascular disease**, including patients with diabetes.

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Discuss new aspirin for primary prevention recommendations

4.6. Aspirin Use

Recommendations for Aspirin Use Referenced studies that support recommendations are summarized in Online Data Supplements 17 and 18.		
COR	**LOE**	**Recommendations**
IIb	A	1. Low-dose aspirin (75-100 mg orally daily) might be considered for the primary prevention of ASCVD among select adults 40 to 70 years of age who are at higher ASCVD risk but not at increased bleeding risk (S4.6-1–S4.6-8).
III: Harm	B-R	2. Low-dose aspirin (75-100 mg orally daily) should not be administered on a routine basis for the primary prevention of ASCVD among adults >70 years of age (S4.6-9).
III: Harm	C-LD	3. Low-dose aspirin (75-100 mg orally daily) should not be administered for the primary prevention of ASCVD among adults of any age who are at increased risk of bleeding (S4.6-10).

Arnett DK, et al. JACC(2019)

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Examples of scenarios associated with an increased risk of bleeding include:

- History of previous gastrointestinal bleeding or peptic ulcer disease or bleeding from other sites
- Age >70 years
- Thrombocytopenia
- Coagulopathy
- Chronic kidney disease
- Concurrent use of other medications that increase bleeding risk, such as NSAIDs, steroids, direct oral anticoagulants, and warfarin

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4.6. Aspirin Use

"Prophylactic aspirin in primary-prevention adults >70 years of age is potentially harmful and, given the **higher risk of bleeding** in this age group, difficult to justify for routine use"

Harm		age (S4.6-9).
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Who are these “select” adults?

- Post-hoc study of older trials suggests that the benefit–risk ratio for prophylactic aspirin generally becomes more favorable at >10% estimated 10-year ASCVD risk
- Relative benefits of aspirin, specifically in preventing nonfatal MI and perhaps stroke (with a trend to lower mortality), have been **less evident in more recent trials**
- In recent trials, the estimated ASCVD risk has generally exceeded the actual risk observed during follow-up

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Need to consider the totality of available evidence for ASCVD risk

- This includes risk-enhancing factors such as,
  - strong family history of premature ASCVD
  - inability to achieve lipid or BP or glucose targets
  - significant elevation in coronary artery calcium score or other elevated non-traditional biomarkers

- Tailor decisions about prophylactic aspirin to patient and clinician preferences

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Thank you!

Questions/Discussion