

SUPPLEMENTARY DATA

ONLINE SUPPLEMENT

A comparison of the 2017 American College of Cardiology/American Heart Association blood pressure guideline and the 2017 American Diabetes Association diabetes and hypertension position statement for US adults with diabetes.

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Supplementary Table 1. Characteristics of US adults with diabetes not taking and taking antihypertensive medication, overall and by cardiovascular disease risk.

	Not taking antihypertensive medication			Taking antihypertensive medication		
	Overall(n=954)	High CVD risk*		Overall (n=1,312)	High CVD risk*	
		No (n=398)	Yes (n=556)		No (n=195)	Yes (n=1,117)
Age, years	54.9 (53.8, 56.0)	44.1 (43.0, 45.3)	62.9 (61.6, 64.2)	62.8 (62.1, 63.5)	50.7 (49.3, 52.1)	65.8 (65.1, 66.4)
Male, %	56.7(52.7, 60.7)	40.5 (33.6, 47.7)	68.8 (62.7, 74.3)	50.3 (46.5, 54.2)	34.6 (24.4, 46.5)	54.2 (50.3, 58.1)
Race/ethnicity, %						
Non-Hispanic White	54.6(47.1, 61.8)	43.9 (35.4, 52.7)	62.5 (54.1, 70.2)	60.5 (54.7, 66.0)	64.3 (54.4, 73.2)	59.5 (53.3, 65.4)
Non-Hispanic Black	13.0(9.7, 17.2)	15.4 (11.1, 20.9)	11.2 (8.0, 15.6)	18.8 (14.9, 23.5)	10.9 (7.3, 15.9)	20.8 (16.2, 26.2)
Non-Hispanic Asian	8.3(6.4, 10.6)	9.4 (7.1, 12.4)	7.4 (5.3, 10.2)	5.4 (3.9, 7.2)	4.9 (3.2, 7.6)	5.5 (3.9, 7.6)
Hispanic	20.8 (15.8, 26.9)	27.5 (20.5, 35.9)	15.9 (11.3, 21.8)	12.7 (9.2, 17.4)	18.5 (12.3, 26.8)	11.3 (7.9, 15.8)
< HS education, %	24.9(20.5, 29.8)	24.1 (18.7, 30.5)	25.4 (20.2, 31.4)	21.6 (18.5, 25.0)	16.5 (11.4, 23.1)	22.8 (19.4, 26.7)
Current smoking, %	19.8(17.1, 22.7)	13.0 (9.4, 17.6)	24.8 (20.5, 29.6)	14.3 (11.6, 17.3)	2.3 (0.6, 8.2)	17.2 (14.1, 20.8)
Body mass index, kg/m ²	32.5 (31.7, 33.4)	33.8 (32.6, 34.9)	31.6 (30.4, 32.8)	33.9 (33.3, 34.5)	36.5 (34.9, 38.1)	33.2 (32.6, 33.8)
Total cholesterol, mg/dL	191 (187, 196)	192 (186, 198)	191 (185, 197)	178 (174, 182)	181 (172, 189)	178 (173, 182)
HDL cholesterol, mg/dL	45.6 (44.3, 47.2)	47.4 (45.9, 48.9)	44.6 (42.6, 46.5)	47.3 (45.9, 48.7)	48.3 (45.5, 51.1)	47.0 (45.8, 48.3)
eGFR < 60 ml/min/1.73 m ² , %	10.5 (8.2, 13.5)	3.4 (1.3, 8.3)	15.8 (12.4, 20.0)	25.9 (23.0, 29.0)	7.6 (3.7, 15.3)	30.4 (27.0, 33.9)
ACR > 30 mg/g, %	22.1 (18.3, 26.4)	18.5 (13.9, 24.1)	24.7 (19.8, 30.5)	28.0 (24.9, 31.4)	17.7 (11.6, 26.0)	30.6 (26.8, 34.7)
Chronic kidney disease, %	28.7 (24.9, 32.9)	20.7 (15.5, 27.1)	34.7 (29.9, 39.8)	41.8 (37.9, 45.7)	20.0 (13.5, 28.6)	47.1 (42.5, 51.8)
SBP, mm Hg	127 (126, 129)	122 (120, 124)	132 (129, 134)	132 (131, 133)	122 (120, 124)	135 (133, 136)
DBP, mm Hg	72 (71, 73)	73 (72, 74)	70 (69, 72)	69 (68, 70)	73 (71, 74)	68 (67, 69)
SBP/DBP category, mm Hg						
<130/80	52.8 (47.7, 57.8)	63.1 (56.0, 69.7)	45.1 (38.7, 51.7)	45.3 (41.3, 49.4)	66.9 (57.5, 75.0)	40.0 (35.7, 44.4)
130-139 or 80 to 89 [†]	24.8 (20.6, 29.6)	25.2 (19.4, 32.0)	24.6 (19.3, 30.8)	24.8 (20.6, 29.6)	21.9 (14.3, 32.0)	25.5 (22.3, 29.0)
≥ 140/90	22.4 (19.2, 25.9)	11.7 (7.9, 17.0)	30.3 (25.2, 35.9)	29.9 (26.2, 34.0)	11.3 (6.9, 17.9)	34.5 (30.4, 38.9)
Mean 10-year CVD risk ^{††}	16.1 (14.9, 17.4)	3.8 (3.5, 4.2)	25.0 (23.0, 27.0)	26.5 (25.1, 27.9)	5.8 (5.3, 6.4)	30.8 (29.1, 32.6)
10-year ASCVD risk ≥10%, %	53.4 (49.1, 57.6)	0	100	77.1 (73.3, 80.5)	0	100
History of CVD, %	14.2 (11.6, 17.3)	0	24.7 (20.5, 29.6)	28.2 (25.2, 31.5)	0	35.2 (31.8, 38.8)
High risk*, %	57.4 (53.1, 61.6)	0	100	80.2 (76.6, 83.4)	0	100
Mean 30-year ASCVD risk ^{†††}	34.3 (31.8, 36.8)	25.0 (23.4, 26.6)	57.8 (54.6, 61.0)	46.3 (43.7, 48.9)	37.4 (34.5, 40.3)	57.2 (53.6, 60.8)

Numbers in table are mean (95% confidence interval) or percentage (95% confidence interval).

ADA – American Diabetes Association, ACC/AHA – American College of Cardiology/American Heart Association, HS – High School, eGFR – Estimated glomerular filtration rate, ACR – Albumin-to-creatinine ratio, CVD – Cardiovascular disease, ASCVD – Atherosclerotic cardiovascular disease.

* High CVD risk was defined as a history of cardiovascular disease or a 10-year predicted atherosclerotic cardiovascular disease risk ≥ 10%.

[†] This category included participants with systolic blood pressure between 130 and 139 mm Hg or diastolic blood pressure between 80 and 89 mm Hg with systolic blood pressure < 140 mm Hg and diastolic blood pressure < 90 mm Hg.

^{††} Mean 10-year atherosclerotic cardiovascular disease risk was calculated among participants without a history of cardiovascular disease.

^{†††} Mean 30-year atherosclerotic cardiovascular disease risk was calculated among participants 20 to 59 years of age without a history of cardiovascular disease

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Supplementary Table 2. Percentage of US adults with diabetes: who have hypertension (top panel); who are recommended antihypertensive medication initiation among those not taking antihypertensive medication (middle panel); and with above goal blood pressure among those taking antihypertensive medication (bottom panel).

Hypertension according to the:				
		ACC/AHA guideline		
		No	Yes	Total
ADA position statement	No	22.9% (20.0%, 26.1%)	10.8% (9.0%, 12.8%)	33.7% (30.9%, 36.6%)
	Yes	0%	66.3% (63.4%, 69.1%)	66.3% (63.4%, 69.1%)
	Total	22.9% (20.0%, 26.1%)	77.1% (73.9%, 80.0%)	100%
Overall concordance: 89.2% (87.2%, 91.0%) Overall discordance: 10.8% (9.0%, 12.8%)				

Antihypertensive medication initiation recommended by the:				
		ACC/AHA guideline		
		No	Yes	Total
ADA position statement	No	52.8% (47.7%, 57.8%)	24.8% (20.6%, 29.6%)	77.6% (74.1%, 80.8%)
	Yes	0%	22.4% (19.2%, 25.9%)	22.4% (19.2%, 25.9%)
	Total	52.8% (47.7%, 57.8%)	47.2% (42.2%, 52.3%)	100%
Overall concordance: 75.2% (70.4%, 79.4%) Overall discordance: 24.8% (20.6%, 29.6%)				

Above goal blood pressure according to the:				
		ACC/AHA guideline		
		No	Yes	Total
ADA position statement	No	45.3% (41.3%, 49.4%)	4.3% (2.8%, 6.6%)	49.6% (45.8%, 53.5%)
	Yes	0%	50.4% (46.5%, 54.2%)	50.4% (46.5%, 54.2%)
	Total	45.3% (41.3%, 49.4%)	54.7% (50.6%, 58.7%)	100%
Overall concordance: 95.7% (93.4%, 97.2%) Overall discordance: 4.3% (2.8%, 6.6%)				

Estimates from NHANES data using definitions from the 2017 American College of Cardiology/American Heart Association blood pressure guideline and the American Diabetes Association diabetes and hypertension position statement.

ACC/AHA – American College of Cardiology/American Heart Association; ADA – American Diabetes Association.

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Supplementary Table 3. Percentage of US adults with diabetes with above goal blood pressure among those taking antihypertensive medication in a sensitivity analysis defining high cardiovascular disease risk in the ADA position statement as a history of cardiovascular disease or 10-year predicted cardiovascular disease risk $\geq 20\%$.

		Above goal blood pressure according to the:		
		ACC/AHA guideline		
		No	Yes	Total
ADA position statement	No	45.3% (41.3%, 49.4%)	9.2% (7.0%, 11.9%)	54.5% (50.4%, 58.5%)
	Yes	0%	45.5% (41.5%, 79.6%)	45.5% (41.5%, 79.6%)
	Total	45.3% (41.3%, 49.4%)	54.7% (50.6%, 58.7%)	100%
Overall concordance: 90.8% (88.1%, 93.0%) Overall discordance: 9.2% (7.0%, 11.9%)				

Estimates from NHANES data using definitions from the 2017 American College of Cardiology/American Heart Association blood pressure guideline and the American Diabetes Association diabetes and hypertension position statement.

In this sensitivity analysis, goal blood pressure was defined as:

- 2017 American College of Cardiology/American Heart Association blood pressure guideline: systolic blood pressure < 130 mm Hg and diastolic blood pressure < 80 mm Hg for all individuals.
- American Diabetes Association diabetes and hypertension position statement: systolic blood pressure < 130 mm Hg and diastolic blood pressure < 80 mm Hg for those with history of cardiovascular disease or 10-year predicted cardiovascular disease risk $\geq 20\%$ and systolic blood pressure < 140 mm Hg and diastolic blood pressure < 90 mm Hg for individuals without a history of cardiovascular disease and with a 10-year predicted cardiovascular disease risk < 20%.

ACC/AHA – American College of Cardiology/American Heart Association; ADA – American Diabetes Association

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Supplementary Table 4. Characteristics of US adults with diabetes taking antihypertensive medication with above goal blood pressure according to the ACC/AHA blood pressure guideline and the ADA diabetes and hypertension position statement

	Above goal blood pressure according to:		
	Neither ACC/AHA BP guideline or ADA position statement(n=523)	ACC/AHA BP guideline but not ADA position statement (n=47)	ACC/AHA BP guideline and ADA position statement (n=742)
Age, years	60.5 (59.4, 61.7)	51.2 (48.4, 53.9)	65.8 (64.9, 66.7)
Male, %	49.7 (44.5, 54.8)	36.5 (18.7, 58.8)	52.2 (46.8, 57.5)
Race/ethnicity, %			
Non-Hispanic White	64.1 (56.2, 71.2)	70.2 (53.7, 82.7)	56.4 (48.7, 63.8)
Non-Hispanic Black	13.9 (10.3, 18.5)	12.4 (5.9, 24.0)	23.8 (18.3, 30.3)
Non-Hispanic Asian	5.0 (3.3, 7.4)	2.0 (0.5, 8.1)	6.0 (4.0, 8.9)
Hispanic	13.3 (9.3, 18.6)	15.4 (8.1, 27.5)	11.9 (8.2, 16.9)
< HS education, %	17.1 (13.6, 21.3)	26.3 (14.1, 43.7)	25.2 (21.4, 29.4)
Current smoking, %	16.9 (12.3, 23.0)	1.7 (0.2, 12.0)	12.9 (10.1, 16.4)
Body mass index, kg/m ²	34.5 (33.3, 35.7)	37.3 (34.5, 40.1)	33.1 (32.4, 33.7)
SBP, mm Hg	117.3 (116.1, 118.5)	129.4 (127.0, 131.8)	145.7 (144.2, 147.2)
DBP, mm Hg	65.3 (64.5, 66.1)	79.0 (77.4, 80.6)	71.1 (69.7, 72.4)
Total cholesterol, mg/dL	172.0 (165.7, 178.3)	191.4 (171.8, 211.0)	182.4 (178.4, 186.4)
HDL cholesterol, mg/dL	45.9 (43.3, 48.5)	49.6 (45.1, 54.1)	48.3 (46.9, 49.6)
eGFR < 60 ml/min/1.73 m ² , %	22.4 (17.8, 27.7)	4.0 (0.8, 17.6)	30.9 (27.1, 35.0)
ACR > 30 mg/g, %	17.8 (14.0, 22.3)	20.8 (8.7, 42.0)	37.9 (33.2, 42.8)
Chronic kidney disease, %	32.5 (26.5, 39.1)	21.8 (9.3, 43.1)	51.8 (47.1, 56.5)
Mean 10-year ASCVD risk [†]	10.6 (9.4, 12.0)	6.5 (5.6, 7.3)	33.8 (32.1, 35.5)
10-year ASCVD risk ≥10%, %	65.5 (58.7, 71.6)	0.0	94.2 (91.3, 96.2)
History of CVD, %	29.5 (25.5, 33.8)	0.0	29.5 (24.3, 35.3)
High CVD risk*, %	70.8 (64.0, 76.7)	0.0	95.6 (93.0, 97.2)
Mean 30-year ASCVD risk ^{††}	41.4 (38.3, 44.6)	41.9 (37.2, 46.6)	56.7 (53.6, 59.8)

ADA – American Diabetes Association, ACC/AHA – American College of Cardiology/American Heart Association, HS – High School, eGFR – Estimated glomerular filtration rate, ACR – Albumin-to-creatinine ratio, CVD – Cardiovascular disease, ASCVD – Atherosclerotic cardiovascular disease.

[†] The group without above goal blood pressure according to either the ACC/AHA guideline or ADA position statement had systolic blood pressure < 130 mm Hg and diastolic blood pressure < 80 mm Hg.

^{††} The group with above goal blood pressure according to the ACC/AHA guideline but not the ADA position statement had systolic blood pressure of 130 to 139 mm Hg with diastolic blood pressure < 90 mm Hg or diastolic blood pressure of 80 to 89 mm Hg with systolic blood pressure < 140 mm Hg and did not have high cardiovascular disease risk.

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^{†††} The group with above goal blood pressure according to the ACC/AHA guideline and the ADA position statement had systolic blood pressure ≥ 140 mm Hg or diastolic blood pressure ≥ 90 mm Hg or had high cardiovascular disease risk and systolic blood pressure ≥ 130 mm Hg or diastolic blood pressure ≥ 80 mm Hg.

[‡] Mean 10-year atherosclerotic cardiovascular disease risk was calculated among participants without a history of cardiovascular disease.

* High CVD risk was defined as a history of cardiovascular disease or a 10-year predicted atherosclerotic cardiovascular disease risk $\geq 10\%$.

^{‡‡} Mean 30-year atherosclerotic cardiovascular disease risk was calculated among participants 20 to 59 years of age without a history of cardiovascular disease

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Supplementary Figure 1. Antihypertensive medication initiation and intensification recommendations according to the 2017 American College of Cardiology/American Heart Association blood pressure guideline and the American Diabetes Association diabetes and hypertension position statement.

