



American Medical Women's Association

Position Paper on Medical Risk Factor Screening for Cardiovascular Disease in Adults October 7, 2014

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AMWA Position

The American Medical Women's Association (AMWA) supports screening for cardiovascular disease (CVD) risk factors in adults in order to assess CVD risk and identify those individuals who require treatment. This paper discusses the magnitude of CVD in the United States, and the recommendations in various guidelines for screening for major CVD risk factors: high blood pressure, hypercholesterolemia, diabetes mellitus and obesity. AMWA believes that proper screening for these risk factors, followed by lifestyle and pharmacological treatment, as appropriate, will reduce the magnitude of CVD in the United States.

The Burden of Cardiovascular Disease

Chronic diseases are the leading cause of morbidity and mortality in the United States and are the most common, costly, and preventable of all health conditions. About 50% of all adults are diagnosed with at least one chronic illness, with 70% of nationwide deaths resulting from chronic diseases (1). As of 2012, the most common chronic and preventable diseases include heart disease, stroke, type 2 diabetes mellitus (Type 2 DM), and obesity (2). Screening by history, physical examination, and laboratory tests may help detect these diseases early, and may allow assessment of the risk of developing heart disease, stroke, and diabetes. Prevention and treatment involves modification of physical activity, diet and nutrition, tobacco use, and alcohol consumption, and when indicated adjunctive pharmacological therapy (2).

Heart disease is the leading cause of death for both men and women, accounting for 600,000 deaths each year (3). As the most common type of heart disease, coronary artery disease (CAD) kills nearly 380,000 people annually (3). CAD can lead to a myocardial infarction (MI), worsening heart health. Furthermore, CAD costs the United States \$108.9 billion each year, yet no treatment is curative, but merely supportive and aimed at reducing symptoms (4). Fortunately, prevention and early detection of heart disease offer

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the ability to reduce the morbidity and mortality associated with this chronic illness and provide the added benefit of reducing healthcare expenditure (5).

Prevention and treatment of heart disease is primarily aimed at combating risk factors such as high blood pressure, high cholesterol, diabetes mellitus, overweight and obesity, and lifestyle habits such as smoking (5). Table 1 shows the prevalence of CHD and stroke, and risk factors for cardiovascular disease in the U.S. population. With the exception of smoking, most of the data are from 2010 in adults age 18 years and older.

Table 1: Prevalence of CHD, Stroke, and CVD risk factors in adults \geq 18 years old (2010)

Diseases and Risk Factors	Both sexes	Females	Males
Coronary heart disease	15.4 M (6.4%)	6.6 M (5.1%)	8.8 M (7.9%)
Myocardial infarction	7.6 M (2.9%)	2.6 M (1.7%)	5.0 M (4.2%)
Angina Pectoris	7.8 M (3.2%)	4.1 M (3.2%)	3.7 M (3.3%)
Stroke	6.8 M (2.8%)	3.8 M (3.0%)	3.0 M (2.6%)
Smoking*	42.1 M (18.1%)	19.1 M (15.9%)	23.0 M (20.5%)
Overweight & obesity, BMI >25 kg/m ²	154.7 M (68.2%)	74.8 M (63.7%)	79.9 M (72.9%)
Obesity, BMI >30 kg/m ²	78.4 M (34.6%)	41.6 M (35.6%)	36.8 M (33.6%)
Blood cholesterol			
Total cholesterol > 200 mg/dL	98.9 M (43.4%)	53.6 M (44.9%)	45.3 M (41.3%)
Total cholesterol > 240 mg/dL	31.9 M (13.8%)	17.9 M (14.7%)	14.0 M (12.7%)
LDL cholesterol > 130 mg/dL	71.0 M (31.1%)	35. M (30.0%)	35.2 M (31.9%)
HDL cholesterol < 40 mg/dL	48.7 M (21.8%)	14.1 M (12.3%)	34.6 M (31.8%)
High BP*	77.9 M (33.0%)	40.7M (32.2%)	37.2 M (33.6%)
Diabetes mellitus			
Diabetes mellitus, diagnosed	19.7 M (8.3%)	10.1 M (7.9%)	9.6 M (8.7%)
Diabetes mellitus, undiagnosed	8.2 M (3.5%)	2.9 M (2.3%)	5.3 M (4.7%)
Pre-diabetes	87.3 M (38.2%)	33.6 M (30.5%)	50.7 M (46.0%)

CHD, coronary heart disease; CVD, cardiovascular disease; BMI, body mass index; LDL, low density lipoprotein; HDL, high density lipoprotein; BP, blood pressure; M, millions

* Data for smoking are from 2012 and in adults age 20 years and older (National Health Interview Survey). **High blood pressure is defined as systolic BP \geq 140 mm Hg or diastolic BP \geq 90 mm Hg or taking anti-hypertensive medication, or having been told at least twice by a physician or other health professional that one has high blood pressure.

Adapted from Heart Disease and Stroke Statistics -- 2014 Update: A Report from the American Heart Association (6).

High Blood Pressure

High blood pressure is present in about one-third of adult women and men (6). There is a consistent positive correlation between blood pressure and cardiovascular disease (CVD). Elevated blood pressures are associated with greater risk for heart attack, heart failure, and stroke (7). The U.S. Preventive Services Task Force (USPSTF) recommends screening for hypertension (HTN) in all adults starting at age 18 (8). Hypertension is classified as systolic blood pressure ≥ 140 or diastolic blood pressure ≥ 90 (7). While sufficient data to recommend a screening interval is lacking, the Joint National Committee on Prevention, Detection, Evaluation, and Treatment of High Blood Pressure (JNC 7) recommends screening every 2 years in individuals with blood pressures less than 120/80 mmHg and every year in individuals with either systolic blood pressure of 120-139 mmHg or diastolic blood pressure of 80-89 mmHg (7). Recommendations from other health organizations vary only slightly. The American Heart Association suggests that screening begin at age 20, while the American Academy of Family Physicians (AAFP) recommends age 18 (9). Variations in recommendations may generate concern as to the age at which screening should start and the best interval for screening in order for the most patients to benefit. USPSTF's recommendation is Grade A, indicating that the net benefit is substantial and the evidence that provides this conclusion is consistent and is generated from well-designed and well-conducted studies.

Lipids and Lipoproteins

High cholesterol, is another risk factor for CAD and CVD. The USPSTF recommends different screening timelines for males and females and stratifies frequency based on age and risk factors. It recommends that all men aged 35 and older be screened for lipid disorders and men aged 20-35 be screened only if they are at increased risk for CAD (10). Women over the age of 20 should be screened only if they are at increased risk for CAD (10). The USPSTF makes no recommendation for or against routine screening for lipid disorders in men aged 20 to 35, or in women aged 20 and older who are not at increased risk for coronary heart disease (10). A major change in these recommendations compared to the recommendations released in 2001 is that adult women at any age should be screened only if they have other risk factors for CVD. This change is not congruent with guidelines published by several other organizations. For example, the National Cholesterol Education Program's Adult Treatment Panel III (ATP III) recommends that all adults over the age of 20 receive a fasting lipoprotein profile every 5 years to screen for hyperlipidemia (11). A fasting lipoprotein profile includes total cholesterol, low-density lipoprotein (LDL) cholesterol, high-density lipoprotein (HDL) cholesterol, and triglycerides. The AAFP strongly recommends periodic fasting lipoprotein screening in men aged 35-65 and in women aged 45-65 (10).

The 2013 American College of Cardiology/American Heart Association Guideline on the Assessment of Cardiovascular Risk recommends assessment of traditional CVD risk factors every 4 to 6 years in adults 20 to 79 years of age who are free from CVD (12). These guidelines also recommend estimation of the 10 year risk of CVD in those 40-79 years of age using Pooled Cohort Equations and assessment of 30 year or lifetime risk in those 20 to 59 years of age (12). These variations create misunderstandings for practicing physicians, patients, and insurance companies. Furthermore, they develop uncertainty

regarding the best age at which screening should begin, the screening interval, and the consequences of choosing one start age and interval versus another. Lastly, as heart disease is the major culprit of female deaths across the country, not screening this population appropriately can lead to severe consequences.

Diabetes Mellitus

In addition to HTN and hyperlipidemia, Type 2 DM completes the trio of chronic illnesses most often responsible for CAD and CVD. As of 2012, diabetes affects 29.1 million Americans, of which 8 million were undiagnosed and therefore not being treated (13). Even more staggering are the number of individuals with prediabetes. Between 2009–2012, 37% of U.S. adults aged 20 years or older had prediabetes based on fasting glucose or hemoglobin A1C levels (13). Applying this percentage to the entire U.S. population in 2010 yields an estimated 86 million American adults aged 20 years or older with prediabetes (13). Diabetes is a major cause of heart disease and stroke, and as the population of diabetic patients grows, complications of this illness - including death - will abound.

Luckily, Type 2 DM is preventable and when detected early and treated, complications are minimized. Currently the USPSTF recommends screening for Type 2 DM in asymptomatic adults with sustained blood pressure, both treated or untreated, greater than 135/80 mmHg (14). This is a grade B recommendation, meaning that while the available evidence is sufficient to encourage screening in this patient population, confidence in the estimate of net benefit is constrained. More information and data may be substantial enough to alter this recommendation. Furthermore, the USPSTF says there is insufficient evidence to determine whether or not screening for Type 2 DM in asymptomatic adults with blood pressures less than 135/80 mmHg has substantial benefits (14). Again, recommendations vary between institutions, with the largest discrepancy between the USPSTF and the American Diabetic Association (ADA), which has more stringent and more structured screening guidelines.

The ADA recommends that testing to detect Type 2 DM and assess risk for future diabetes in asymptomatic people should be considered in adults of any age who are overweight or obese and who have one or more additional risk factors for diabetes (15). Risk factors include physical inactivity, first-degree relative with diabetes, members of a high-risk ethnic population (e.g., African American, Latino, Native American, Asian American, and Pacific Islander), women who delivered a baby weighing 9 lb or were diagnosed with gestational diabetes mellitus, hypertension or on therapy for hypertension, HDL cholesterol level ≤ 35 mg/dl and/or a triglyceride level ≥ 250 mg/dl, women with polycystic ovarian syndrome, impaired glucose tolerance or impaired fasting glucose on previous testing, other clinical conditions associated with insulin resistance, and a history of CVD (15). In those without these risk factors, testing should begin at age 45 years (15). If tests are normal, repeat testing should be carried out at least at 3-year intervals (15). The ADA criteria for diagnosing Type 2 DM include a hemoglobin A1C greater than or equal to 6.5%, fasting plasma glucose greater than or equal to 126 mg/dL, two hour plasma glucose greater than or equal to 200 mg/dL during an oral glucose tolerance test, or in a patient with classic symptoms of hyperglycemia or hyperglycemic crisis, a

random plasma glucose greater than or equal to 200 mg/dL (16). In those identified with increased risk for future diabetes, other CVD risk factors should be identified and, if appropriate, treated (15).

Overweight and Obesity

Obesity was recently declared a disease and physicians are encouraged to treat patients with this condition. In 2010, 154.7 million adults ages 18 and older were considered overweight or obese in the United States (6). Of that population, 78.4 million were obese (6). Overweight and obese patients are identified based on their body mass index (BMI). BMI is an index of weight-for-height and is calculated by dividing a person's weight in kilograms by his/her height in meters squared. If the result is between 25-29.9 kg/m², the person is overweight. If the number is over 30 kg/m², then the individual is obese. Overweight patients are at increased risk of becoming obese. Obesity is particularly concerning because it is an independent risk factor for CAD and it exacerbates the effects of HTN, hyperlipidemia, and Type 2 DM on CAD (6, 17). The incidence of diabetes and HTN increases in obese patients (17). Fortunately, the overweight and obesity state, along with their sequelae can be managed with weight loss and at least annual BMI calculation (18). Additionally, weight loss of at least 5% decreases in systolic and diastolic BP, improves lipid profile, and improves glycemic control in patients with type 2 diabetes (17, 18).

Summary and Conclusions

HTN, hyperlipidemia, Type 2 DM, and obesity remain the leading causes of chronic disease and continuously increasing morbidity and mortality in the United States. When occurring together, they exponentially worsen patient outcomes. Yet, published guidelines for screening each of these conditions continue to vary and the inability to establish congruent recommendations has consequences. Concerns regarding variations generate several key questions. For some conditions or for some patients, earlier screening or more frequent screening intervals may improve outcomes, yet in other circumstances this may not be the case and may simply lead to increased healthcare costs. On a related note, earlier and more frequent screening intervals may appear to increase costs initially, but ultimately actually reduce healthcare spending by deterring the long-term sequelae of HTN, hyperlipidemia, Type 2 DM, and obesity and their associated costs. Remembering that guidelines exist as a means of direction for the clinician, a personalized medical assessment, guided by the clinical suspicion of the provider, allows for a more comprehensive assessment of risk factors. The medical necessity of screening that does not fit into prescribed algorithms is ultimately in the hands of an astute clinician. The benefits of preventing CVD are undeniable and are achievable through the proper detection and treatment of HTN, hyperlipidemia, Type 2 DM, and obesity.

References

1. Kung HC, Hoyert DL, Xu JQ, Murphy SL. Deaths: final data for 2005. *National Vital Statistics Reports* 2008;56(10). Available at: http://www.cdc.gov/nchs/data/nvsr/nvsr56/nvsr56_10.pdf
2. Centers for Disease Control and Prevention. Chronic Disease Prevention and Health Promotion. 2014. Available at <http://www.cdc.gov/chronicdisease/overview/index.htm#2>
3. Murphy SL, Xu JQ, Kochanek KD. Deaths: Final data for 2010. *Natl Vital Stat Rep.* 2013;61(4). http://www.cdc.gov/nchs/data/nvsr/nvsr61/nvsr61_04.pdf
4. Heidenreich PA, Trogon JG, Khavjou OA, et al. Forecasting the future of cardiovascular disease in the United States: a policy statement from the American Heart Association. *Circulation.* 2011;123:933-44. Epub 2011 Jan 24.
5. Centers for Disease Control and Prevention. Racial/ethnic and socioeconomic disparities in multiple risk factors for heart disease and stroke—United States, 2003. *MMWR* 2005;54:113–117. Available at: <http://www.cdc.gov/mmwr/preview/mmwrhtml/mm5405a1.htm>
6. Go AS, Mozaffarian D, Roger VL, et al. Heart disease and stroke statistics—2014 update: a report from the American Heart Association. *Circulation.* 2013;261-262. Epub 2013 Dec 18. Available at: <https://circ.ahajournals.org/content/early/2013/12/18/01.cir.0000441139.02102.80.full.pdf>
7. Joint National Committee on Prevention, Detection, Evaluation, and Treatment of High Blood Pressure. National Heart, Lung, and Blood Institute. Seventh report of the Joint National Committee on Prevention, Detection, Evaluation, and Treatment of High Blood Pressure. *Hypertension* 2003;42:1206-52. [PMID: 14656957]
8. U.S. Preventive Services Task Force. *Screening for High Blood Pressure: U.S. Preventive Services Task Force Reaffirmation Recommendation Statement.* AHRQ Publication No. 08-05105-EF-2, December 2007. First published in *Ann Intern Med* 2007;147-783-786. <http://www.uspreventiveservicestaskforce.org/uspstf07/hbp/hbprs.htm>
9. American Academy of Family Physicians. Summary of recommendations for clinical preventive services. Revision 6.0; August 2005.
10. U.S. Preventive Services Task Force. *Screening for Lipid Disorders in Adults: U.S. Preventive Services Task Force Recommendation Statement.* June 2008. <http://www.uspreventiveservicestaskforce.org/uspstf08/lipid/lipidrs.htm>
11. Expert Panel on Detection, Evaluation, and Treatment of High Blood Cholesterol in Adults. Executive summary of the third report of the National Cholesterol Education

Program Expert Panel on Detection, Evaluation, and Treatment of High Blood Cholesterol in Adults (ATP III). *JAMA* 2001;285:2486-2497.

12. Goff DC Jr, Lloyd-Jones DM, Bennett G, Coady S, D'Agostino RB Sr, Gibbons R, Greenland P, Lackland DT, Levy D, O'Donnell CJ, Robinson J, Schwartz JS, Shero ST, Smith SC Jr, Sorlie P, Ston NJ, and Wilson PWF. 2013 ACC/AHA guideline on the assessment of cardiovascular risk: a report of the American College of Cardiology/American Heart Association Task Force on Practice Guidelines. *Circulation* Nov 2013.

13. Centers for Disease Control and Prevention. *National diabetes statistics report: estimates of diabetes and its burden in the United States, 2014*. Atlanta, GA: US Department of Health and Human Services; 2014.

14. *Screening for Type 2 Diabetes Mellitus in Adults*, Topic Page. U.S. Preventive Services Task Force. <http://www.uspreventiveservicestaskforce.org/uspstf/uspstiab.htm>

15. American Diabetes Association. Executive summary: standards of medical care in diabetes - 2010. *Diabetes Care* Jan 2010;33(1):S4-S10.

16. American Diabetes Association. Standards of medical care in diabetes - 2014. *Diabetes Care* Jan 2014;37(1):S15.

17. Bray GA. Medical consequences of obesity. *J Clin Endocrinol Metab* 2014. 89(6):2583-2589.

18. Jensen MD et al 2013 AHA/ACC/TOS Guideline for the Management of Overweight and Obesity in Adults. *Journal of the American College of Cardiology* 2014; 63: 2985-3023.