Screening for Type 2 Diabetes Mellitus in Adults: U.S. Preventive Services Task Force Recommendation Statement

U.S. Preventive Services Task Force*

Description: Updated U.S. Preventive Services Task Force (USPSTF) recommendation about screening for type 2 diabetes mellitus in adults.

Methods: To estimate the balance of benefits and harms of screening, the USPSTF updated its 2003 evidence review, adding evidence from new trials as well as updates on earlier studies. The review for this current recommendation focused on evidence that early treatment prevented long-term adverse outcomes of diabetes, including cardiovascular events, visual impairment, renal failure, and amputation.

Recommendations: Screen for type 2 diabetes in asymptomatic adults with sustained blood pressure (either treated or untreated) greater than 135/80 mm Hg. (B recommendation)

Current evidence is insufficient to assess the balance of benefits and harms of routine screening in asymptomatic adults with blood pressure of 135/80 mm Hg or lower. (I statement)

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* For a list of members of the U.S. Preventive Services Task Force, see the **Appendix** (available at www.annals.org).

The U.S. Preventive Services Task Force (USPSTF) makes recommendations about preventive care services for patients without recognized signs or symptoms of the target condition.

It bases its recommendations on a systematic review of the evidence of the benefits and harms and an assessment of the net benefit of the service.

The USPSTF recognizes that clinical or policy decisions involve more considerations than this body of evidence alone. Clinicians and policymakers should understand the evidence but individualize decision making to the specific patient or situation.

Summary of Recommendations and Evidence

The USPSTF recommends screening for type 2 diabetes in asymptomatic adults with sustained blood pressure (either treated or untreated) greater than 135/80 mm Hg. This is a grade B recommendation.

The USPSTF concludes that the current evidence is insufficient to assess the balance of benefits and harms of routine screening for type 2 diabetes in asymptomatic adults with blood pressure of 135/80 mm Hg or lower. This is an I statement.

See the **Figure** for a summary of the recommendations and suggestions for clinical practice.

Table 1 describes the USPSTF grades, and **Table 2** describes the USPSTF classification of levels of certainty about net benefit. Both are also available online at www.annals.org.

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Rationale

Importance

The prevalence of type 2 diabetes mellitus is increasing—about 9% of the adult U.S. population currently has this disorder. Diabetes is a leading cause of blindness, renal disease, and amputation and leads to increased mortality, primarily from cardiovascular events.

Detection

The USPSTF found convincing evidence that available screening tests accurately detect type 2 diabetes during an early, asymptomatic phase.

Benefits of Detection and Early Treatment

Adults with sustained blood pressure greater than 135/80 mm Hg: The USPSTF found adequate evidence that, in adults who have hypertension and diabetes, lowering blood pressure below conventional target values reduces the incidence of cardiovascular events and cardiovascular mortality.

Adults with blood pressure 135/80 mm Hg or lower: The USPSTF found convincing evidence that intensive glycemic control in persons with clinically detected (as opposed to screening-detected) diabetes can reduce progression of microvascular disease. However, the benefits of tight gly-

cemic control on microvascular clinical outcomes, such as severe visual impairment or end-stage renal disease, take years to become apparent. There is inadequate evidence that early diabetes control as a result of screening provides an incremental benefit for microvascular clinical outcomes compared with initiating treatment after clinical diagnosis.

There is inadequate evidence that tight glycemic control significantly reduces macrovascular complications, such as myocardial infarction and stroke.

Harms of Detection and Early Treatment

The USPSTF found adequate evidence that the short-term harms of screening for diabetes, such as anxiety, are small. However, the longer-term effects of labeling a large proportion of the adult U.S. population as abnormal are unknown.

USPSTF Assessment

The USPSTF concludes that for adults with sustained blood pressure greater than 135/80 mm Hg, there is moderate certainty that the net benefit of screening for diabetes is substantial.

The USPSTF concludes that for adults with blood pressure of 135/80 mm Hg or less, evidence of the value of screening for diabetes is lacking, and the balance of benefits and harms cannot be determined.

Clinical Considerations

Patient Population under Consideration

This recommendation concerns adults without symptoms of diabetes or evidence of possible diabetes complications. Symptoms of diabetes include polyuria, polydipsia, and polyphagia. Possible diabetes complications include nonhealing ulcers or infections and established vascular disease (for example, coronary artery disease, stroke, and peripheral artery disease). Persons with these symptoms or conditions should be tested for diabetes.

Suggestions for Practice Regarding the I Statement

In persons with blood pressure of 135/80 mm Hg or lower, screening may be considered on an individual basis if knowledge of diabetes status would help inform decisions about coronary heart disease (CHD) prevention strategies, including assessment of CHD risk and subsequent consideration of lipid-lowering agents or aspirin.

For example, consider a patient for whom lipid-lowering treatment would be recommended if his or her 10-year CHD risk was 20% or greater (see Risk Assessment). If the patient's calculated risk was 17% without diabetes and greater than 20% with diabetes, then screening for diabetes would be useful in determining lipid treatment. However, if the calculated risk was 10% without diabetes and 15% with diabetes, then the screening test result would have no effect on the decision whether to use lipid-lowering treatment.

Risk Assessment

Blood pressure is an important predictor of complications of cardiovascular disease (CVD) (including CHD and stroke) in persons with type 2 diabetes mellitus and should be measured as the first step in applying this recommendation. The examination of global CHD and stroke risk allows the clinician to determine how aggressive treatment for CVD risk factors needs to be. In making this assessment, clinicians should use any of several validated CHD risk assessment calculators, such as the calculator based on Framingham Heart Study data (available at www.intmed.mcw.edu/clincalc/heartrisk.html).

Screening Tests

Three tests have been used to screen for diabetes: fasting plasma glucose, 2-hour postload plasma glucose, and hemoglobin A_{1c}. Each has advantages and disadvantages. The American Diabetes Association has recommended the fasting plasma glucose test for screening because it is easier and faster to perform, more convenient and acceptable to patients, and less expensive than other screening tests. The fasting plasma glucose test has more reproducible results than does the 2-hour postload plasma glucose test, has less intraindividual variation, and has similar predictive value for development of microvascular complications of diabetes. The American Diabetes Association defines diabetes as a fasting plasma glucose level of 126 mg/dL or greater and recommends confirmation with a repeated screening test on a separate day, especially for people with borderline results.

Treatment of Persons with Sustained Blood Pressure of 135/80 mm Hg or Greater

Blood pressure targets should be lower for persons who have type 2 diabetes mellitus than for those who do not. Lower blood pressure targets for persons with diabetes and high blood pressure reduce CVD events compared with higher targets. Attention to other risk factors for CVD, such as physical inactivity, lipid levels, diet, and obesity, is also important, both to decrease risk for CHD and to improve glucose control.

Screening Intervals

The optimal screening interval is not known. The American Diabetes Association, on the basis of expert opinion, recommends a 3-year interval.

Other Approaches to Prevention

There is no evidence of benefit in health outcomes from screening for impaired glucose tolerance (IGT) or impaired fasting glucose (IFG). However, intensive programs of lifestyle modification (diet, exercise, and behavior) do reduce the incidence of diabetes. Regardless of whether the clinician and patient decide to screen for diabetes, people should eat a healthful diet, be active, and maintain a healthy weight—these behaviors have other benefits in addition to preventing or forestalling type 2 diabetes. The USPSTF recommends intensive interven-

tions for obese persons who desire to lose weight. Population-based approaches to increasing physical activity and reducing obesity, as recommended by the Task Force on Community Preventive Services, should be supported.

Useful Resources

Evidence and USPSTF recommendations on blood pressure, diet, physical activity, and obesity are available at www.preventiveservices.ahrq.gov. The reviews and recommendations for the Task Force on Community Preventive Services may be found at www.thecommunityguide.org.

Other Considerations

Research Needs

The types of studies that would help fill gaps in the evidence include a randomized (or nonrandomized), controlled trial of screening for type 2 diabetes mellitus; extended follow-up of the UKPDS (United Kingdom Prospective Diabetes Study) and other cohort studies; studies of glycemic control, with CHD outcomes, in screening-detected populations; studies of optimal lipid and blood pressure targets for people with screening-detected diabetes; and studies examining the impact of a diagnosis of prediabetes on the effectiveness of lifestyle interventions.

Discussion

Burden of Disease

Diabetes is a tremendous clinical and public health burden for the U.S. population (1). Data from the NHANES (National Health and Nutrition Examination Survey) indicated that 19.3 million U.S. adults 20 years of age or older (9.3% of the adult population) had diabetes in 2002. Diabetes was undiagnosed in one third of these individuals (2). An additional 26% of the population had IFG. The prevalence of diagnosed diabetes increased from 5.1% from 1988 to 1994 to 6.5% from 1999 to 2002. Prevalence is increasing most rapidly among individuals with a body mass index of 35 kg/m^2 or greater (2, 3).

The prevalence of diabetes (diagnosed and undiagnosed) increases with age, reaching 21.6% for those 65 years of age or older. African Americans, Hispanic or Latino Americans, American Indians, and some Asian Americans and Native Hawaiians or other Pacific Islanders are at particularly high risk for type 2 diabetes mellitus (4). The prevalence of diagnosed diabetes is twice as high in non-Hispanic black and Mexican-American persons as in non-Hispanic white persons (2). Modifiable factors, including reductions in physical activity, dietary changes, and increased frequency of testing, may play a role in the increasing prevalence of diabetes (3).

Diabetes was the sixth leading cause of death in 2000 (4). Overall, risk for premature death among individuals with diabetes is about twice that for those without. Adults with diabetes have rates of stroke and death from heart disease that are about 2 to 4 times higher than adults without diabetes. Diabetes is the leading cause of new cases of blindness among adults age 20 to 74 years and the leading cause of end-stage renal disease, accounting for 44% of new cases of end-stage renal disease. More than 60% of lower-limb amputations not due to trauma occur among individuals with diabetes (4).

Scope of Review

The USPSTF reviewed the evidence on screening for type 2 diabetes mellitus in 2003. For the current recommendation, the USPSTF reviewed the evidence from new trials as well as updates of previously included studies. The current review focused on screening for IGT and IFG in asymptomatic adults and screening for type 2 diabetes mellitus in asymptomatic adults at increased and average risk for diabetes complications. Interventions were reviewed for effects on health outcomes, including cardiovascular morbidity, symptomatic neuropathy, nonhealing ulcers, lower-limb amputation, chronic kidney disease, severe visual impairment, mortality, and quality of life. The USPSTF review focused on the risk for complications from type 2 diabetes mellitus, especially CVD, because the goal of screening—improvement of health and well-being—is contingent on decreasing the complications of type 2 diabetes mellitus and not primarily on decreasing the prevalence of the disease. The risk factors identified as important predictors of cardiovascular complications among persons with type 2 diabetes mellitus included older age, smoking, hypertension, hyperlipidemia, higher glycemic burden, and membership in certain high-risk ethnic groups.

Accuracy of Screening Tests

The assessment of screening tests for type 2 diabetes mellitus is complicated by uncertainty regarding the most appropriate gold standard for comparison. Definitions of diabetes were originally developed by using results of 2-hour postload plasma glucose testing to identify a population at substantially increased risk for retinopathy. The criterion for an abnormal fasting plasma glucose level was developed on the basis of 2-hour postload plasma glucose testing and revised downward (from 140 mg/dL to 126 mg/dL) to make the sensitivity of fasting plasma glucose testing comparable with that of 2-hour postload plasma glucose testing. However, a study using NHANES III data has demonstrated that, compared with fasting plasma glucose testing, the 2-hour postload plasma glucose screening test leads to diagnosis of diabetes in more individuals (5).

Large population-based studies have examined the test characteristics of 2-hour postload plasma glucose, fasting plasma glucose, and hemoglobin A_{1c} for identifying individuals with retinopathy. Sensitivity and specificity for detecting retinopathy were in the range of 75% to 80% for all 3 tests when using the following thresholds: fasting plasma glucose test, 126 mg/dL or greater; 2-hour postload plasma glucose test, 200 mg/dL or greater; or hemoglobin A_{1c} test, 6.4% or greater (6–8). Other studies have examined whether these tests predict future CVD events.

A meta-regression analysis of 20 observational studies found that the results of both fasting plasma glucose and 2-hour postload plasma glucose tests were statistically significantly associated with future CVD events in a continuously graded fashion, beginning at levels consistent with IGT and IFG and increasing more steeply at the highest glucose levels (9).

In the past, the utility of hemoglobin A_{1c} testing was limited in part by relatively poor reproducibility and lack of standardization across laboratories. More recently, widespread adoption of standardized hemoglobin A_{1c} measurements has occurred, and newer techniques for measurement are generally highly reproducible (10). A systematic review in 1996 found that a hemoglobin A_{1c} cutoff value of 6.4% was 66% sensitive and 98% specific and was associated with a positive predictive value of 63% in a population with a diabetes prevalence of 6% (11). Increasing the cutoff value to 7.0% increased the positive predictive value to 90%. Hemoglobin A_{1c} values in the high-normal range (5.6% to 6.0%) seem to predict a higher incidence of future diabetes (12, 13).

Effectiveness of Early Detection and Treatment

No trial has been done to establish whether systematic screening for diabetes and early treatment improves health outcomes compared with clinical diagnosis. The ADDITION (Anglo-Danish-Dutch Study of Intensive Treatment in People with Screen Detected Diabetes in Primary Care), currently in progress, may shed light on differences in baseline characteristics and long-term health outcomes between persons with screening-detected type 2 diabetes mellitus and those who present with symptoms (14). The USPSTF attempted to compare the expected health outcomes from a strategy of systematic screening with those from usual care. In the absence of direct evidence from a trial of screening, the USPSTF examined indirect evidence to estimate whether screening, early diagnosis, and treatment of screening-detected or early type 2 diabetes mellitus were associated with improved health outcomes.

The USPSTF reviewed the evidence on early treatment of type 2 diabetes mellitus in preventing long-term adverse outcomes, including cardiovascular events, visual impairment, renal failure, and amputations. Four treatments to reduce the incidence of CVD events among persons with diabetes have been studied in high-quality, randomized, controlled trials: tight glycemic control, tight blood pressure control, treatment of dyslipidemia, and aspirin therapy. No randomized, controlled trial has demonstrated a statistically significant reduction in total CVD events from tight glycemic control. The UKPDS (after 10 years of follow-up) showed a trend toward reduced CVD events in participants randomly assigned to tight glycemic control (15). These participants had lower rates of myocardial infarction (14.7 vs. 17.4 events per 1000 patient-years) and sudden death (0.9 vs. 1.6 events per 1000 patient-years) than those receiving conventional management. There were no reductions in stroke (relative risk [RR], 1.11), heart failure (RR, 0.91), angina (RR, 1.02), or all-cause mortality (RR, 0.94) associated with tighter glycemic control.

A number of recent randomized, controlled trials have examined various aspects of treatment for hypertension among persons with type 2 diabetes. Principal findings indicate that an aggressive approach to blood pressure control among persons with type 2 diabetes mellitus reduces CVD events by 50% (16, 17); treatment of isolated systolic hypertension among persons older than 60 years of age with type 2 diabetes mellitus reduces CVD events by 34% to 69% (18, 19); treatment of persons with type 2 diabetes mellitus and at least 1 other CVD risk factor with ramipril (regardless of whether they have hypertension) reduces CVD events by 22% and all-cause mortality by 16% (20); and angiotensin-converting enzyme inhibitors and angiotensin-receptor blockers are useful antihypertensive agents for type 2 diabetes mellitus (16, 21). Although there is evidence that lowering blood pressure in individuals with diabetes improves outcomes, no clear evidence has shown that persons with type 2 diabetes detected by screening would respond differently to specific antihypertensive regimens than would those without diabetes.

Results from studies of intensive lipid-lowering treatment in persons with and without type 2 diabetes mellitus are mixed about whether those with type 2 diabetes mellitus benefit more than those without. Several secondary prevention trials of treatments for people with lipid abnormalities reported that lipid treatment reduced the incidence of CHD events by about the same relative percentage among those with type 2 diabetes mellitus and those without (RR reduction, 19% to 42%) (22–24). The HPS (Heart Protection Study) found that including simvastatin in the treatment regimen of persons with diabetes reduces major vascular events (myocardial infarction, stroke, and revascularization) from 25% to 20%; that is, using simvastatin prevents 1 major vascular event in 20 persons over a 5-year period (25). This benefit was seen regardless of initial low-density lipoprotein cholesterol level (26).

Aspirin reduces CHD in persons with and without diabetes, with a similar RR reduction (about 30%) in both groups (27–29). Aspirin lowers the risk for ischemic stroke in women, but the benefits do not seem to be greater in women with diabetes than in those without (30).

Although there is evidence that retinal photocoagulation is effective in reducing the incidence of visual impairment among people with diabetes who have severe retinopathy or macular edema, most people with type 2 diabetes mellitus detected by routine screening will not require this intervention. Furthermore, although tight glycemic control reduces the development and progression of retinopathy, its effects on serious visual impairment are less clear and probably occur 10 years or more after the diagnosis of diabetes. There is less certainty about the degree to which tight glycemic control during the preclinical period (be-

tween screening and clinical detection), when glucose levels are lower than at later stages of the disease, reduces retinopathy and later visual impairment (31).

In reviewing the evidence on screening and its possible impact on chronic renal failure, the USPSTF concluded that, although tight glycemic and blood pressure control and use of angiotensin-converting enzyme inhibitors and angiotensin-receptor blockers reduce development and progression of albuminuria, it could not determine whether initiating these treatments earlier as a result of screening would have an important impact on chronic renal failure (31). Lower-limb amputation in persons with diabetes occurs primarily as late complications related to development of distal sensory neuropathy and peripheral vascular disease, both of which take years to develop. Although foot care programs, and perhaps tight glycemic and blood pressure control, may reduce lower-limb amputation over the long term, the USPSTF found no evidence that early implementation of these interventions during the time between screening and clinical detection would affect this outcome (31).

Modeling diabetes interventions is a relatively young field; models vary in their perspectives, methods, and results. Some models suggest that aggressive blood pressure, lipid level, and glycemic control in persons with diabetes may be effective and relatively cost-effective, and that older persons benefit more than younger persons. However, the assumptions in the models are based on data from trials that included both clinically and screening-detected persons with diabetes; therefore, the models do not directly address the question of screening or whether persons with type 2 diabetes mellitus should be treated differently from those without (1).

A number of studies suggest that intensive lifestyle and various pharmacotherapeutic interventions in persons with IGT or IFG decrease the incidence of type 2 diabetes mellitus over follow-up periods of up to 7 years (1, 32). However, there are few data on prevention or delay of cardiovascular and other long-term health outcomes, including CVD events or death. There are also few data on treatments for cardiovascular risk factors among persons with IGT or IFG compared with normoglycemic populations.

Potential Harms of Screening and Treatment

Observational studies report no serious long-term adverse psychological effects from receiving a new diagnosis of type 2 diabetes mellitus from screening. Data are limited, however, and studies vary in outcome measures, characteristics of the screened and comparison populations, and methodological quality. One cohort study compared persons with type 2 diabetes mellitus diagnosed in a general practitioner's office (most of whom had diabetes-related symptoms) with those diagnosed via screening. The researchers found that the former group had worse psychological measures, although the negative effects diminished over time. No studies reported adverse effects of receiving a diagnosis of IFG or IGT, and no studies examined the psychological effects of the actual screening test or of labeling a large proportion of the population with IFG or IGT.

Treatments for diabetes are relatively safe. However, tight glycemic control at a time when glucose levels are relatively low (that is, the time between screening and clinical diagnosis) can induce hypoglycemia. In the UKPDS, 2.3% of people receiving insulin had a major hypoglycemic episode each year, as did 0.4% to 0.6% of those receiving oral hypoglycemic agents (15). Angiotensin-converting enzyme inhibitors and statins have reasonably low levels of serious adverse effects (33–35). New information has recently been published linking rosiglitazone use to increased risk for myocardial infarction (36).

Estimate of Magnitude of Net Benefit

When there is no direct evidence on the effectiveness of screening, the USPSTF looks to indirect evidence of benefit. The USPSTF found that available screening tests accurately identify asymptomatic diabetes and that in adults with hypertension and diabetes, more intensive blood pressure treatment leads to a substantial reduction—approximately 50%—in CVD events over 5 years. The USPSTF did not find evidence in other populations that screening and treatment of early diabetes or screening for IGT or IFG would lead to improved health outcomes compared with waiting to treat diabetes once it becomes symptomatic. Therefore, the USPSTF concluded that there was moderate certainty that screening for diabetes in adults with hypertension would lead to substantial benefit but that there is insufficient evidence to determine the benefit of screening in other populations.

How Does Evidence Fit with Biological Understanding?

Type 2 diabetes mellitus may remain undiagnosed for several years because hyperglycemia develops gradually and may not cause symptoms (3, 37). However, at some unknown level of hyperglycemia, risk for macrovascular complications increases in persons with undiagnosed diabetes. The prevalence of advanced microvascular complications, such as proliferative retinopathy, is low at clinical diagnosis, and duration of diabetes and degree of hyperglycemia are associated with increasing risk for these complications over time (38–41). The epidemiology of macrovascular complications differs from that of microvascular complications: Cardiovascular morbidity and mortality are substantially elevated well before diagnosis of diabetes and are also elevated in persons with IFG or IGT (9, 43–49).

Update of Previous USPSTF Recommendation

This recommendation updates the one released in 2003. The major change in the current recommendation is that routine screening for type 2 diabetes mellitus in adults with hyperlipidemia is no longer part of the grade B recommendation. As discussed in the Clinical Considerations section, clinicians should perform an assessment of global CVD risk, including the risk in those with hyperlipidemia, and if the patient's risk is near a threshold for treatment

with lipid-lowering medications, they should screen for diabetes to adequately assess the patient's CVD risk.

RECOMMENDATIONS OF OTHERS

The American Academy of Family Physicians recommends screening for type 2 diabetes in adults with hypertension and hyperlipidemia; it found insufficient evidence to recommend for or against screening adults who are at low risk for coronary vascular disease (50). The American College of Obstetricians and Gynecologists recommends fasting glucose testing for women beginning at age 45 years, with an interval of 3 years. The Canadian Task Force on Preventive Health Care found fair evidence to recommend screening adults with hypertension and hyperlipidemia for type 2 diabetes mellitus to prevent cardiovascular events and death (a grade B recommendation) (51). On the basis of expert opinion, the American Diabetes Association recommends consideration of screening to detect prediabetes (IFG or IGT) or diabetes in persons 45 years of age and older, particularly in those with a body mass index of 25 kg/m^2 or greater. Such testing should also be considered in people who are younger than 45 years of age and overweight if they have another risk factor for diabetes, including inactivity, family history of type 2 diabetes mellitus, membership in a high-risk ethnic group, gestational diabetes, hypertension, dyslipidemia, IGT or IFG, or a history of vascular disease (52).

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Requests for Single Reprints: Reprints are available from the USPSTF Web site (www.preventiveservices.ahrq.gov).

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Figure. **Screening for type 2 diabetes mellitus in adults: clinical summary of a U.S. Preventive Services Task Force (*USPSTF*) recommendation statement.**

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Screening for Type 2 Diabetes Mellitus in Adults
Clinical Summary of U.S. Preventive Services Task Force Recommendation

Population	Asymptomatic Adults with Sustained Blood Pressure *greater than* 135/80 mm Hg	Asymptomatic Adults with Sustained Blood Pressure 135/80 mm Hg *or lower*
Recommendation	Screen for Type 2 Diabetes Mellitus Grade: B	No Recommendation Grade: I (Insufficient Evidence)

Risk assessment	These recommendations apply to adults with no symptoms of type 2 diabetes mellitus or evidence of possible complications of diabetes. Blood pressure measurement is an important predictor of cardiovascular complications in people with type 2 diabetes mellitus. The first step in applying this recommendation should be measurement of blood pressure (BP). Adults with treated or untreated BP >135/80 mm Hg should be screened for diabetes.
Screening tests	Three tests have been used to screen for diabetes: • Fasting plasma glucose (FPG) • 2-hour postload plasma • Hemoglobin A_{1c} The American Diabetes Association (ADA) recommends screening with FPG, defines diabetes as FPG ≥126 mg/dL, and recommends confirmation with a repeated screening test on a separate day.
Screening intervals	The optimal screening interval is not known. The ADA, on the basis of expert opinion, recommends an interval of every 3 years.
Suggestions for practice regarding insufficient evidence	When BP is ≤135/80 mm Hg, screening may be considered on an individual basis when knowledge of diabetes status would help inform decisions about coronary heart disease (CHD) preventive strategies, including consideration of lipid-lowering agents or aspirin. To determine whether screening would be helpful on an individual basis, information about 10-year CHD risk must be considered. For example, if CHD risk without diabetes was 17% and risk with diabetes was >20%, screening for diabetes would be helpful because diabetes status would determine lipid treatment. In contrast, if risk without diabetes was 10% and risk with diabetes was 15%, screening would not affect the decision to use lipid-lowering treatment.
Other relevant information from the USPSTF and the Task Force on Community Preventive Services	Evidence and USPSTF recommendations regarding blood pressure, diet, physical activity, and obesity are available at www.preventiveservices.ahrq.gov. The reviews and recommendations of the Task Force on Community Preventive Services may be found at www.thecommunityguide.org.

For a summary of the evidence systematically reviewed in making these recommendations, the full recommendation statement, and supporting documents, go to www.preventiveservices.ahrq.gov.

Table 1. **What the U.S. Preventive Services Task Force Grades Mean and Suggestions for Practice***

Grade	Definition	Suggestions for Practice
A	The USPSTF recommends the service. There is high certainty that the net benefit is substantial.	Offer/provide this service.
B	The USPSTF recommends the service. There is high certainty that the net benefit is moderate or there is moderate certainty that the net benefit is moderate to substantial.	Offer/provide this service.
C	The USPSTF recommends against routinely providing the service. There may be considerations that support providing the service in an individual patient. There is moderate or high certainty that the net benefit is small.	Offer/provide this service only if other considerations support offering or providing the service in an individual patient.
D	The USPSTF recommends against the service. There is moderate or high certainty that the service has no net benefit or that the harms outweigh the benefits.	Discourage the use of this service.
I statement	The USPSTF concludes that the current evidence is insufficient to assess the balance of benefits and harms of the service. Evidence is lacking, of poor quality, or conflicting, and the balance of benefits and harms cannot be determined.	Read clinical considerations section of USPSTF Recommendation Statement. If the service is offered, patients should understand the uncertainty about the balance of benefits and harms.

* USPSTF = U.S. Preventive Services Task Force.

Table 2. **U.S. Preventive Services Task Force Levels of Certainty Regarding Net Benefit**

Level of Certainty*	Description
High	The available evidence usually includes consistent results from well-designed, well-conducted studies in representative primary care populations. These studies assess the effects of the preventive service on health outcomes. This conclusion is therefore unlikely to be strongly affected by the results of future studies.
Moderate	The available evidence is sufficient to determine the effects of the preventive service on health outcomes, but confidence in the estimate is constrained by such factors as: the number, size, or quality of individual studies inconsistency of findings across individual studies limited generalizability of findings to routine primary care practice lack of coherence in the chain of evidence. As more information becomes available, the magnitude or direction of the observed effect could change, and this change may be large enough to alter the conclusion.
Low	The available evidence is insufficient to assess effects on health outcomes. Evidence is insufficient because of: the limited number or size of studies important flaws in study design or methods inconsistency of findings across individual studies gaps in the chain of evidence findings that are not generalizable to routine primary care practice a lack of information on important health outcomes. More information may allow an estimation of effects on health outcomes.

* The U.S. Preventive Services Task Force (USPSTF) defines ***certainty*** as "likelihood that the USPSTF assessment of the net benefit of a preventive service is correct." The net benefit is defined as benefit minus harm of the preventive service as implemented in a general primary care population. The USPSTF assigns a certainty level based on the nature of the overall evidence available to assess the net benefit of a preventive service.

U.S. Preventive Services Task Force

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