Agency for Healthcare Research and Quality
Advancing Excellence in Health Care

NATIONAL GUIDELINE CLEARINGHOUSE

General

Guideline Title

Screening for abnormal blood glucose and type 2 diabetes mellitus: U.S. Preventive Services Task Force recommendation statement.

Bibliographic Source(s)

U.S. Preventive Services Task Force. Screening for abnormal blood glucose and type 2 diabetes mellitus: U.S. Preventive Services Task Force recommendation statement. Ann Intern Med. 2015 Dec 1;163(11):861-8. [51 references] PubMed

Guideline Status

This is the current release of the guideline.

This guideline updates a previous version: Screening for type 2 diabetes mellitus in adults: U.S. Preventive Services Task Force recommendation statement. Ann Intern Med. 2008 Jun 3;148(11):846-854. [52 references]

This guideline meets NGC's 2013 (revised) inclusion criteria.

Recommendations

Major Recommendations

The US Preventive Services Task Force (USPSTF) grades its recommendations (A, B, C, D, or I) and identifies the Levels of Certainty regarding Net Benefit (High, Moderate, and Low). The definitions of these grades can be found at the end of the "Major Recommendations" field.

Summary of Recommendation and Evidence

The USPSTF recommends screening for abnormal blood glucose as part of cardiovascular risk assessment in adults aged 40 to 70 years who are overweight or obese. Clinicians should offer or refer patients with abnormal blood glucose to intensive behavioral counseling interventions to promote a healthful diet and physical activity. (B recommendation)

Clinical Considerations

Patient Population under Consideration

This recommendation applies to adults aged 40 to 70 years seen in primary care settings who do not have symptoms of diabetes and are overweight or obese. The target population includes persons who are most likely to have glucose abnormalities that are associated with increased cardiovascular disease (CVD) risk and can be expected to benefit from primary prevention of CVD through risk factor modification.

Persons who have a family history of diabetes, have a history of gestational diabetes or polycystic ovarian syndrome, or are members of certain racial/ethnic groups (that is, African Americans, American Indians or Alaskan Natives, Asian Americans, Hispanics or Latinos, or Native

Hawaiians or Pacific Islanders) may be at increased risk for diabetes at a younger age or at a lower body mass index. Clinicians should consider screening earlier in persons with 1 or more of these characteristics.

Screening Tests

Glucose abnormalities can be detected by measuring HbA_{1c} or fasting plasma glucose or with an oral glucose tolerance test. The table in the original guideline document shows test values for normal glucose metabolism, impaired fasting glucose (IFG), impaired glucose tolerance (IGT), and type 2 diabetes. Hemoglobin A_{1c} is a measure of long-term blood glucose concentration and is not affected by acute changes in glucose levels due to stress or illness. Because HbA_{1c} measurements do not require fasting, they are more convenient than using a fasting plasma glucose or oral glucose tolerance test. The oral glucose tolerance test is done in the morning in a fasting state; blood glucose concentration is measured 2 hours after ingestion of a 75-g oral glucose load.

The diagnosis of IFG, IGT or type 2 diabetes should be confirmed; repeated testing with the same test on a different day is the preferred method of confirmation.

Threshold for Behavioral Interventions

Many studies assessed intensive behavioral interventions for persons at increased CVD risk, but none report a consistent threshold for intervention among persons with abnormal blood glucose. Many studies include persons with multiple risk factors, and CVD risk increases with the number of risk factors and glucose level. Perceived readiness for change and access to appropriate interventions will probably influence treatment recommendations. Although direct evidence that preventing a diagnosis of type 2 diabetes results in improved health outcomes is limited, primary prevention that reduces the chances of a diagnosis may reduce the adverse consequences of disease management. Because the average reduction in glucose levels resulting from intensive behavioral interventions is modest, persons with higher glucose levels may be more likely to benefit and avoid a diabetes diagnosis than those whose glucose levels are closer to normal.

Type of Intervention

Behavioral interventions that have an effect on CVD risk and delay or avoid progression of glucose abnormalities to type 2 diabetes combine counseling on a healthful diet and physical activity and are intensive, with multiple contacts over extended periods. The evidence is insufficient to conclude that pharmacologic interventions have the same multifactorial benefits (for example, weight loss or reductions in glucose levels, blood pressure, and lipid levels) as behavioral interventions.

Screening Intervals

Evidence on the optimal rescreening interval for adults with an initial normal glucose test result is limited. Cohort and modeling studies suggest that rescreening every 3 years may be a reasonable approach for adults with normal blood glucose levels.

Other Approaches to Prevention

Because overweight and obesity, physical inactivity, abnormal lipid levels, high blood pressure, and smoking are all modifiable risk factors for cardiovascular events, the USPSTF recommends screening and appropriate interventions for these conditions (available at www.uspreventiveservicestaskforce.org).

The USPSTF recommends screening for obesity in adults and offering or referring those with a body mass index of 30 kg/m^2 or greater to intensive, multicomponent behavioral interventions. Although intensive interventions may not be practical in many primary care settings, patients can be referred from primary care to community-based programs for these interventions.

The USPSTF recommends offering or referring adults who are overweight (body mass index >25 kg/m^2) and have additional cardiovascular risk factors to intensive behavioral counseling interventions to promote a healthful diet and physical activity for CVD prevention.

The USPSTF recommends screening for lipid disorders in men aged 35 years or older and women aged 45 years or older who are at increased risk for coronary heart disease. The USPSTF also recommends screening for hypertension in adults aged 18 years or older and that clinicians ask all adults about tobacco use and provide tobacco cessation interventions to those who use tobacco products.

Useful Resources

The Community Preventive Services Task Force recommends combined diet and physical activity promotion programs for persons who are at increased risk for type 2 diabetes. It found that these programs are effective across a range of counseling intensities, settings, and facilitators. Effective programs commonly include setting a weight loss goal, individual or group sessions about diet and exercise, meetings with a trained diet

or exercise counselor, or individually tailored diet or exercise plans. More information is available at www.thecommunityguide.org/diabetes/combineddietandpa.html.

Definitions

What the U.S. Preventive Services Task Force (USPSTF) Grades Mean and Suggestions for Practice

Grade	Grade Definitions	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 selectively offering or providing this service to individual patients based on professional judgment and patient preferences. There is at least moderate certainty that the net benefit is small.	Offer/provide this service for selected patients depending on individual circumstances.
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 the "Clinical Considerations" section of USPSTF Recommendation Statement (see the "Major Recommendations" field). If offered, patients should understand the uncertainty about the balance of benefits and harms.

USPSTF Levels of Certainty Regarding Net Benefit

Definition: The 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.

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 factors such 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 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.

Clinical Algorithm(s)

None available

Scope

Disease/Condition(s)

Type 2 diabetes mellitus

Guideline Category

Prevention

Risk Assessment

Screening

Clinical Specialty

Endocrinology

Family Practice

Internal Medicine

Preventive Medicine

Intended Users

Advanced Practice Nurses

Allied Health Personnel

Health Care Providers

Nurses

Physician Assistants

Physicians

Guideline Objective(s)

To summarize the U.S. Preventive Services Task Force (USPSTF) recommendations on screening for abnormal blood glucose and type 2 diabetes mellitus in adults

Target Population

Adults aged 40 to 70 years seen in primary care settings who do not have symptoms of diabetes and are overweight or obese

Interventions and Practices Considered

1. Screening for abnormal blood glucose as part of cardiovascular risk assessment (40 to 70 year olds that are overweight or obese)
2. Behavioral counseling to promote a healthful diet and physical activity

Major Outcomes Considered

- Key Question 1: Is there direct evidence that screening for type 2 diabetes, impaired fasting glucose (IFG), or impaired glucose tolerance (IGT) among asymptomatic adults improves health outcomes?
- Key Question 2: What are the harms of screening for type 2 diabetes, IFG, or IGT?
- Key Question 3: Do interventions for screen-detected or early type 2 diabetes, IFG, or IGT provide an incremental benefit in health outcomes compared with no interventions or initiating interventions after clinical diagnosis?
- Key Question 4: What are the harms of interventions for screen-detected or early type 2 diabetes, IFG, or IGT?
- Key Question 5: Is there evidence that more intensive glucose, blood pressure (BP), or lipid control interventions improve health outcomes in adults with type 2 diabetes, IFG, or IGT compared with traditional control? Is there evidence that aspirin use improves health outcomes in these populations compared with nonuse?
- Key Question 6: What are the harms of more-intensive interventions compared with traditional control in adults with type 2 diabetes, IFG, or IGT?
- Key Question 7: Do interventions for IFG or IGT delay or prevent the progression to type 2 diabetes?

Methodology

Methods Used to Collect/Select the Evidence

Hand-searches of Published Literature (Primary Sources)

Hand-searches of Published Literature (Secondary Sources)

Searches of Electronic Databases

Description of Methods Used to Collect/Select the Evidence

Note from the National Guideline Clearinghouse (NGC): A systematic evidence review and full report were prepared by the Oregon Evidence-based Practice Center (EPC) for the U.S. Preventive Services Task Force (USPSTF) (see the "Availability of Companion Documents" field).

Data Sources and Searches

A research librarian searched the Cochrane Central Register of Controlled Trials and the Cochrane Database of Systematic Reviews and MEDLINE (2007 to October 2014). The reviewers supplemented electronic searches by reviewing previous USPSTF reports and reference lists of relevant articles.

Study Selection

At least 2 reviewers independently evaluated each study to determine inclusion eligibility using predefined inclusion and exclusion criteria (see Appendix Figure 2 in the systematic review). Because of the limited evidence on treatment of screen-detected diabetes (key question 5), they also included studies of treatment of early diabetes (defined as a pharmacologically untreated hemoglobin A_{1c} level <8.5% or diabetes diagnosis in the past year) that was not specifically screen-detected. Appendix Figure 3 in the systematic review summarizes the selection of literature.

Number of Source Documents

See the flow diagram (Appendix Figure 3) in the systematic review (see the "Availability of Companion Documents" field) for a summary of evidence search and selection.

Articles included for Key Questions:

- Key Question 1: 2 studies
- Key Question 2: 3 studies
- Key Question 3: 13 studies (in 16 publications)
- Key Question 4: 9 studies (in 11 publications)
- Key Question 5: 3 studies (in 6 publications) and 9 systematic reviews
- Key Question 6: 6 studies and 4 systematic reviews
- Key Question 7: 16 studies (in 17 publications)

Methods Used to Assess the Quality and Strength of the Evidence

Weighting According to a Rating Scheme (Scheme Given)

Rating Scheme for the Strength of the Evidence

Two investigators independently applied criteria developed by the U.S. Preventive Services Task Force (USPSTF) to rate the quality of each study as good, fair, or poor. See the "Description of the Methods Used to Analyze the Evidence" field for further information.

Methods Used to Analyze the Evidence

Meta-Analysis

Review of Published Meta-Analyses

Systematic Review with Evidence Tables

Description of the Methods Used to Analyze the Evidence

Note from the National Guideline Clearinghouse (NGC): A systematic evidence review and full report were prepared by the Oregon Evidence-based Practice Center (EPC) for the U.S. Preventive Services Task Force (USPSTF) (see the "Availability of Companion Documents" field).

Data Abstraction and Quality Rating

One investigator abstracted details about the study design, patient population, setting, screening method, interventions, analysis, follow-up, and results. A second investigator reviewed data abstraction for accuracy. Two investigators independently applied criteria developed by the USPSTF to rate the quality of each study as good, fair, or poor. Discrepancies were resolved through a consensus process.

Data Synthesis and Analysis

The investigators conducted meta-analyses to calculate risk ratios (RRs) on effects of interventions with the DerSimonian–Laird random-effects model using Stata, version 12 (StataCorp). Statistical heterogeneity was assessed using the I^2 statistic. When statistical heterogeneity was present, they performed sensitivity analyses using the profile likelihood method because the DerSimonian–Laird model results in overly narrow 95% confidence intervals (CIs). Two studies that used a 2×2 factorial design reported no interaction between treatments and were analyzed as a 2-group parallel group trial for the comparison of interest. When studies evaluated several lifestyle strategies, the investigators combined the lifestyle groups. They included all studies in meta-analyses, regardless of event rates. For rare events (incidence <1%), they staff calculated the Peto odds ratio. The investigators stratified results by drug class or lifestyle intervention and performed additional sensitivity analyses based on study quality and presence of outlier trials. They assessed the aggregate internal validity (quality) of the body of evidence for each key question (good, fair, or poor) using methods developed by the USPSTF, based on the quality of studies, precision of estimates, consistency of results, and directness of evidence.

Methods Used to Formulate the Recommendations

Balance Sheets

Expert Consensus

Description of Methods Used to Formulate the Recommendations

The U.S. Preventive Services Task Force (USPSTF) systematically reviews the evidence concerning both the benefits and harms of widespread implementation of a preventive service. It then assesses the certainty of the evidence and the magnitude of the benefits and harms. On the basis of this assessment, the USPSTF assigns a letter grade to each preventive service signifying its recommendation about provision of the service (see Table below). An important, but often challenging, step is determining the balance between benefits and harms to estimate "net benefit" (that is, benefits minus harms).

U.S. Preventive Services Task Force Recommendation Grid*

Certainty of Net Benefit	Magnitude of Net Benefit			
	Substantial	**Moderate**	**Small**	**Zero/Negative**
High	A	B	C	D
Moderate	B	B	C	D
Low	Insufficient			

**A*, *B*, *C*, *D*, and *I (Insufficient)* represent the letter grades of recommendation or statement of insufficient evidence assigned by the USPSTF after assessing certainty and magnitude of net benefit of the service (see the "Rating Scheme for the Strength of the Recommendations" field).

The overarching question that the USPSTF seeks to answer for every preventive service is whether evidence suggests that provision of the service would improve health outcomes if implemented in a general primary care population. For screening topics, this standard could be met by a large randomized controlled trial (RCT) in a representative asymptomatic population with follow-up of all members of both the group "invited for screening" and the group "not invited for screening."

Direct RCT evidence about screening is often unavailable, so the USPSTF considers indirect evidence. To guide its selection of indirect evidence, the Task Force constructs a "chain of evidence" within an analytic framework. For each key question, the body of pertinent literature is critically appraised, focusing on the following 6 questions:

1. Do the studies have the appropriate research design to answer the key question(s)?
2. To what extent are the existing studies of high quality? (i.e., what is the internal validity?)
3. To what extent are the results of the studies generalizable to the general U.S. primary care population and situation? (i.e., what is the external validity?)
4. How many studies have been conducted that address the key question(s)? How large are the studies? (i.e., what is the precision of the evidence?)
5. How consistent are the results of the studies?
6. Are there additional factors that assist the USPSTF in drawing conclusions (e.g., presence or absence of dose–response effects, fit within a biologic model)?

The next step in the USPSTF process is to use the evidence from the key questions to assess whether there would be net benefit if the service were implemented. In 2001, the USPSTF published an article that documented its systematic processes of evidence evaluation and recommendation development. At that time, the USPSTF's overall assessment of evidence was described as good, fair, or poor. The USPSTF realized that this rating seemed to apply only to how well studies were conducted and did not fully capture all of the issues that go into an overall assessment of the evidence about net benefit. To avoid confusion, the USPSTF has changed its terminology. Whereas individual study quality will continue to be characterized as good, fair, or poor, the term *certainty* will now be used to describe the USPSTF's assessment of the overall body of evidence about net benefit of a preventive service and the likelihood that the assessment is correct. Certainty will be determined by considering all 6 questions listed above; the judgment about certainty will be described as high, moderate, or low.

In making its assessment of certainty about net benefit, the evaluation of the evidence from each key question plays a primary role. It is important to note that the USPSTF makes recommendations for real-world medical practice in the United States and must determine to what extent the evidence for each key question—even evidence from screening RCTs or treatment RCTs—can be applied to the general primary care population. Frequently, studies are conducted in highly selected populations under special conditions. The USPSTF must consider differences between the general primary care population and the populations studied in RCTs and make judgments about the likelihood of observing the same effect in actual practice.

It is also important to note that one of the key questions in the analytic framework refers to the potential harms of the preventive service. The USPSTF considers the evidence about the benefits and harms of preventive services separately and equally. Data about harms are often obtained

from observational studies because harms observed in RCTs may not be representative of those found in usual practice and because some harms are not completely measured and reported in RCTs.

Putting the body of evidence for all key questions together as a chain, the USPSTF assesses the certainty of net benefit of a preventive service by asking the 6 major questions listed above. The USPSTF would rate a body of convincing evidence about the benefits of a service that, for example, derives from several RCTs of screening in which the estimate of benefits can be generalized to the general primary care population as "high" certainty (see the "Rating Scheme for the Strength of Recommendations" field). The USPSTF would rate a body of evidence that was not clearly applicable to general practice or has other defects in quality, research design, or consistency of studies as "moderate" certainty. Certainty is "low" when, for example, there are gaps in the evidence linking parts of the analytic framework, when evidence to determine the harms of treatment is unavailable, or when evidence about the benefits of treatment is insufficient. Table 4 in the methodology document listed below (see the "Availability of Companion Documents" field) summarizes the current terminology used by the USPSTF to describe the critical assessment of evidence at all 3 levels: individual studies, key questions, and overall certainty of net benefit of the preventive service.

Sawaya GF, Guirguis-Blake J, LeFevre M, Harris R, Petitti D; U.S. Preventive Services Task Force. Update on the methods of the U.S. Preventive Services Task Force: estimating certainty and magnitude of net benefit. Ann Intern Med. 2007;147:871-875. [5 references].

Rating Scheme for the Strength of the Recommendations

What the U.S. Preventive Services Task Force (USPSTF) Grades Mean and Suggestions for Practice

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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 the "Clinical Considerations" section of USPSTF Recommendation Statement (see the "Major Recommendations" field). If offered, patients should understand the uncertainty about the balance of benefits and harms.

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Definition: The 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.

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 factors such as: • The number, size, or quality of individual studies • Inconsistency of findings across individual studies

Level of Certainty	Description
	• 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 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.

Cost Analysis

The U.S. Preventive Services Task Force (USPSTF) does not consider the costs of providing a service in this assessment.

Method of Guideline Validation

Comparison with Guidelines from Other Groups

External Peer Review

Internal Peer Review

Description of Method of Guideline Validation

Peer Review

Before the U.S. Preventive Services Task Force (USPSTF) makes its final determinations about recommendations on a given preventive service, the Evidence-based Practice Center (EPC) and the Agency for Healthcare Research and Quality (AHRQ) send the draft evidence review to 4 to 6 external experts and to Federal agencies and professional and disease-based health organizations with interests in the topic. The experts are asked to examine the review critically for accuracy and completeness and to respond to a series of specific questions about the document. The draft evidence review is also posted on the USPSTF Web site for public comment. After assembling these external review comments and documenting the proposed response to key comments, the topic team presents this information to the USPSTF in memo form. In this way, the USPSTF can consider these external comments before it votes on its recommendations about the service. Draft recommendation statements are then circulated for comment among reviewers representing professional societies, voluntary organizations, and Federal agencies, as well as posted on the USPSTF Web site for public comment. These comments are discussed before the final recommendations are confirmed.

Response to Public Comment

A draft version of this recommendation statement was posted for public comment on the USPSTF Web site from 7 October 2014 to 5 November 2014. The USPSTF reviewed all public comments received. In response, the USPSTF revised the final recommendation to clarify the populations considered to be at increased risk and provided more details about lifestyle interventions found to be most effective for prevention. The USPSTF also reexamined the potential harms of labeling associated with screening and found limited harms.

Comparison with Guidelines from Other Groups

Recommendations for screening from the following groups were discussed: the American Diabetes Association, the American Association of Clinical Endocrinologists, the American Academy of Family Physicians, Diabetes Australia, Diabetes UK, and the Canadian Task Force on Preventive Health Care.

Evidence Supporting the Recommendations

Type of Evidence Supporting the Recommendations

The type of evidence supporting the recommendations is not specifically stated.

Benefits/Harms of Implementing the Guideline Recommendations

Potential Benefits

Benefits of Early Detection and Treatment

The U.S. Preventive Services Task Force (USPSTF) found inadequate direct evidence that measuring blood glucose leads to improvements in mortality or cardiovascular morbidity.

The USPSTF previously found adequate evidence that intensive behavioral counseling interventions for persons at increased risk for cardiovascular disease (CVD) have moderate benefits in lowering CVD risk. Populations in which these benefits have been shown include persons who are obese or overweight and have hypertension, hyperlipidemia or dyslipidemia, and/or impaired fasting glucose (IFG) or impaired glucose tolerance (IGT). Benefits of behavioral interventions include reductions in blood pressure, glucose and lipid levels, and obesity and an increase in physical activity. Studies that specifically treat persons who have IFG or IGT with intensive lifestyle interventions to prevent the development of diabetes consistently show a moderate benefit in reducing progression to diabetes. Lifestyle interventions have greater effects on reducing progression to diabetes than metformin or other medications.

Potential Harms

Harms of Early Detection and Treatment

The U.S. Preventive Services Task Force (USPSTF) found that measuring blood glucose is associated with short-term anxiety but not long-term psychological harms. The USPSTF found adequate evidence that the harms of lifestyle interventions to reduce the incidence of diabetes are small to none. The harms of drug therapy for the prevention of diabetes are small to moderate, depending on the drug and dosage used.

Qualifying Statements

Qualifying Statements

- The U.S. Preventive Services Task Force (USPSTF) makes recommendations about the effectiveness of specific clinical preventive services for patients without related signs or symptoms.
- It bases its recommendations on the evidence of both the benefits and harms of the service and an assessment of the balance. The USPSTF does not consider the costs of providing a service in this assessment.
- The USPSTF recognizes that clinical decisions involve more considerations than evidence alone. Clinicians should understand the evidence but individualize decision making to the specific patient or situation. Similarly, the USPSTF notes that policy and coverage decisions involve considerations in addition to the evidence of clinical benefits and harms.
- Recommendations made by the USPSTF are independent of the U.S. government. They should not be construed as an official position of the Agency for Healthcare Research and Quality (AHRQ) or the U.S. Department of Health and Human Services.

Implementation of the Guideline

Description of Implementation Strategy

The experiences of the first and second U.S. Preventive Services Task Force (USPSTF), as well as that of other evidence-based guideline efforts, have highlighted the importance of identifying effective ways to implement clinical recommendations. Practice guidelines are relatively weak tools for changing clinical practice when used in isolation. To effect change, guidelines must be coupled with strategies to improve their acceptance and

feasibility. Such strategies include enlisting the support of local opinion leaders, using reminder systems for clinicians and patients, adopting standing orders, and audit and feedback of information to clinicians about their compliance with recommended practice.

In the case of preventive services guidelines, implementation needs to go beyond traditional dissemination and promotion efforts to recognize the added patient and clinician barriers that affect preventive care. These include clinicians' ambivalence about whether preventive medicine is part of their job, the psychological and practical challenges that patients face in changing behaviors, lack of access to health care or of insurance coverage for preventive services for some patients, competing pressures within the context of shorter office visits, and the lack of organized systems in most practices to ensure the delivery of recommended preventive care.

Dissemination strategies have changed dramatically in this age of electronic information. While recognizing the continuing value of journals and other print formats for dissemination, the USPSTF will make all its products available through its Web site . The combination of electronic access and extensive material in the public domain should make it easier for a broad audience of users to access USPSTF materials and adapt them for their local needs. Online access to USPSTF products also opens up new possibilities for the appearance of the annual, pocket-size *Guide to Clinical Preventive Services*.

To be successful, approaches for implementing prevention have to be tailored to the local level and deal with the specific barriers at a given site, typically requiring the redesign of systems of care. Such a systems approach to prevention has had notable success in established staff-model health maintenance organizations, by addressing organization of care, emphasizing a philosophy of prevention, and altering the training and incentives for clinicians. Staff-model plans also benefit from integrated information systems that can track the use of needed services and generate automatic reminders aimed at patients and clinicians, some of the most consistently successful interventions. Information systems remain a major challenge for individual clinicians' offices, however, as well as for looser affiliations of practices in network-model managed care and independent practice associations, where data on patient visits, referrals, and test results are not always centralized.

Implementation Tools

Foreign Language Translations

Mobile Device Resources

Patient Resources

Pocket Guide/Reference Cards

Staff Training/Competency Material

For information about availability, see the *Availability of Companion Documents* and *Patient Resources* fields below.

Institute of Medicine (IOM) National Healthcare Quality Report Categories

IOM Care Need

Staying Healthy

IOM Domain

Effectiveness

Patient-centeredness

Identifying Information and Availability

Bibliographic Source(s)

U.S. Preventive Services Task Force. Screening for abnormal blood glucose and type 2 diabetes mellitus: U.S. Preventive Services Task Force recommendation statement. Ann Intern Med. 2015 Dec 1;163(11):861-8. [51 references] PubMed

Adaptation

Not applicable: The guideline was not adapted from another source.

Date Released

2015 Dec 1

Guideline Developer(s)

U.S. Preventive Services Task Force - Independent Expert Panel

Guideline Developer Comment

The U.S. Preventive Services Task Force (USPSTF) is a federally-appointed panel of independent experts. Conclusions of the USPSTF do not necessarily reflect policy of the U.S. Department of Health and Human Services (DHHS) or its agencies.

Source(s) of Funding

The U.S. Preventive Services Task Force (USPSTF) is an independent, voluntary body. The U.S. Congress mandates that the Agency for Healthcare Research and Quality (AHRQ) support the operations of the USPSTF.

Guideline Committee

U.S. Preventive Services Task Force (USPSTF)

Composition of Group That Authored the Guideline

*Task Force Members**: Albert L. Siu, MD, MSPH (*Chair*) (Mount Sinai School of Medicine, New York, and James J. Peters Veterans Affairs Medical Center, Bronx, New York); Kirsten Bibbins-Domingo, PhD, MD, MAS (*Co-vice Chair*) (University of California, San Francisco, San Francisco, California); David Grossman, MD, MPH (*Co-vice Chair*) (Group Health Research Institute, Seattle, Washington); Linda Ciofu Baumann, PhD, RN, APRN (University of Wisconsin, Madison, Wisconsin); Karina W. Davidson, PhD, MASc (Columbia University, New York, New York); Mark Ebell, MD, MS (University of Georgia, Athens, Georgia); Francisco A.R. GarcÄ±ía, MD, MPH (Pima County Department of Health, Tucson, Arizona); Matthew Gillman, MD, SM (Harvard Medical School, Harvard Pilgrim Health Care Institute, Boston, Massachusetts); Jessica Herzstein, MD, MPH (Independent Consultant, Washington, DC); Alex R. Kemper, MD, MPH, MS (Duke University, Durham, North Carolina); Alex H. Krist, MD, MPH (Fairfax Family Practice, Fairfax, Virginia Commonwealth University, Richmond, Virginia); Ann E. Kurth, PhD, RN, MSN, MPH (New York University, New York, New York); Douglas K. Owens, MD, MS (Veterans Affairs Palo Alto Health Care System, Palo Alto, Stanford University, Stanford, California); William R. Phillips, MD, MPH (University of Washington, Seattle, Washington); Maureen G. Phipps, MD, MPH (Brown University, Providence, Rhode Island); Michael P. Pignone, MD, MPH (University of North Carolina, Chapel Hill, North Carolina).

Former U.S. Preventive Services Task Force (USPSTF) member Michael LeFevre, MD, MSPH (University of Missouri, Columbia, Missouri) also contributed to the development of this recommendation.

*Members of the Task Force at the time this recommendation was finalized. For a list of current Task Force members, go to http://www.uspreventiveservicestaskforce.org/Page/Name/our-members.

Financial Disclosures/Conflicts of Interest

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Authors followed the policy regarding conflicts of interest described at www.uspreventiveservicestaskforce.org/Page/Name/methods-and-processes. Disclosures can also be viewed at www.acponline.org/authors/icmje/ConflictOfInterestForms.do?msNum=M15-2345.

Guideline Status

This is the current release of the guideline.

This guideline updates a previous version: Screening for type 2 diabetes mellitus in adults: U.S. Preventive Services Task Force recommendation statement. Ann Intern Med. 2008 Jun 3;148(11):846-854. [52 references]

This guideline meets NGC's 2013 (revised) inclusion criteria.

Guideline Availability

Available from the Annals of Internal Medicine Web site.

Availability of Companion Documents

The following are available:

Evidence Reviews:

- Selph S, Dana T, Bougatsos C, Blazina I, Patel H, Chou R. Screening for abnormal glucose and type 2 diabetes mellitus: a systematic review to update the 2008 U.S. Preventive Services Task Force recommendation. Full report. Evidence Synthesis No. 117. AHRQ Publication No. 13-05190-EF-1. Rockville (MD): Agency for Healthcare Research and Quality; 2015 Apr. 233 p.
- Selph S, Dana T, Blazina I, Bougatsos C, Patel H, Chou R. Screening for type 2 diabetes mellitus: a systematic review for the U.S. Preventive Services Task Force. Ann Intern Med. 2015 Jun 2;162(11):765-776.

Available from the U.S. Preventive Services Task Force (USPSTF) Web site.

Background Articles:

- Barton MB et al. How to read the new recommendation statement: methods update from the U.S. Preventive Services Task Force. Ann Intern Med. 2007;147:123-127.
- Guirguis-Blake J et al. Current processes of the U.S. Preventive Services Task Force: refining evidence-based recommendation development. Ann Intern Med. 2007;147:117-122.
- Sawaya GF et al. Update on the methods of the U.S. Preventive Services Task Force: estimating certainty and magnitude of net benefit. Ann Intern Med. 2007;147:871-875.

Available from the USPSTF Web site.

The following are also available:

- Screening for abnormal blood glucose and type 2 diabetes mellitus: clinical summary. Rockville (MD): U.S. Preventive Services Task Force. 2015 Oct. 1 p. Available from the USPSTF Web site.
- A continuing medical education (CME) activity is available from the Annals of Internal Medicine Web site.
- The guide to clinical preventive services, 2014. Recommendations of the U.S. Preventive Services Task Force. Rockville (MD): Agency for

Healthcare Research and Quality (AHRQ), 2014. 144 p. Electronic copies available from the AHRQ Web site .

The Electronic Preventive Services Selector (ePSS) is an application designed to provide primary care clinicians and health care teams timely decision support regarding appropriate screening, counseling, and preventive services for their patients. It is based on the current, evidence-based recommendations of the USPSTF and can be searched by specific patient characteristics, such as age, sex, and selected behavioral risk factors.

Patient Resources

The following are available:

- Screening for abnormal blood glucose and type 2 diabetes mellitus. Understanding task force recommendations. Rockville (MD): U.S. Preventive Services Task Force; 2015 Oct. 4 p. Available from the U.S. Preventive Services Task Force (USPSTF) Web site .
- Screening for abnormal blood glucose and type 2 diabetes: U.S. Preventive Services Task Force recommendation. Summaries for patients. Ann Intern Med. 2015 Dec;163(11):I-34. Available from the Annals of Internal Medicine Web site .
- Women: stay healthy at any age. 2014 update. Rockville (MD): Agency for Healthcare Research and Quality. AHRQ Pub. No. 14-IP007-A. 2014 Mar. 5 p. Available in English and Spanish from the AHRQ Web site.
- Men: stay healthy at any age. 2014 update. Rockville (MD): Agency for Healthcare Research and Quality. AHRQ Pub. No. 14-IP006-A. 2014 Mar. 5 p. Available in English and Spanish from the AHRQ Web site.
- Women: stay healthy at 50+. 2014 update. Rockville (MD): Agency for Healthcare Research and Quality. AHRQ Pub. No. 14-IP002-A. 2014 Mar. 5 p. Available in English and Spanish from the AHRQ Web site.
- Men: stay healthy at 50+. 2014 update. Rockville (MD): Agency for Healthcare Research and Quality. AHRQ Pub. No. 14-IP009-A. 2014 Mar. 5 p. Available in English and Spanish from the AHRQ Web site.

Myhealthfinder is a tool that provides personalized recommendations for clinical preventive services specific to the user's age, gender, and pregnancy status. It features evidence-based recommendations from the USPSTF and is available at www.healthfinder.gov .

Please note: This patient information is intended to provide health professionals with information to share with their patients to help them better understand their health and their diagnosed disorders. By providing access to this patient information, it is not the intention of NGC to provide specific medical advice for particular patients. Rather we urge patients and their representatives to review this material and then to consult with a licensed health professional for evaluation of treatment options suitable for them as well as for diagnosis and answers to their personal medical questions. This patient information has been derived and prepared from a guideline for health care professionals included on NGC by the authors or publishers of that original guideline. The patient information is not reviewed by NGC to establish whether or not it accurately reflects the original guideline's content.

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