JAMA | US Preventive Services Task Force | RECOMMENDATION STATEMENT

Screening for Skin Cancer
US Preventive Services Task Force Recommendation Statement

US Preventive Services Task Force

IMPORTANCE Skin cancer is the most commonly diagnosed cancer in the US. There are different types of skin cancer varying in disease incidence and severity. Basal and squamous cell carcinomas are the most common types of skin cancer but infrequently lead to death or substantial morbidity. Melanomas represent about 1% of skin cancer and cause the most skin cancer deaths. Melanoma is about 30 times more common in White persons than in Black persons. However, persons with darker skin color are often diagnosed at later stages, when skin cancer is more difficult to treat.

OBJECTIVE To update its 2016 recommendation, the US Preventive Services Task Force (USPSTF) commissioned a systematic review on the benefits and harms of screening for skin cancer in asymptomatic adolescents and adults.

POPULATION Asymptomatic adolescents and adults who do not have a history of premalignant or malignant skin lesions.

EVIDENCE ASSESSMENT The USPSTF concludes that the evidence is insufficient to determine the balance of benefits and harms of visual skin examination by a clinician to screen for skin cancer in asymptomatic adolescents and adults.

RECOMMENDATION The USPSTF concludes that the current evidence is insufficient to assess the balance of benefits and harms of visual skin examination by a clinician to screen for skin cancer in adolescents and adults. (I statement)

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Summary of Recommendation

Population	Recommendation	Grade
Asymptomatic adolescents and adults	The USPSTF concludes that the current evidence is insufficient to assess the balance of benefits and harms of visual skin examination by a clinician to screen for skin cancer in adolescents and adults. See the Practice Considerations section for additional information regarding the I statement.	I

USPSTF indicates US Preventive Services Task Force.

See the Summary of Recommendation figure.

Preamble

The US Preventive Services Task Force (USPSTF) makes recommendations about the effectiveness of specific preventive care services for patients without obvious related signs or symptoms to improve the health of people nationwide.

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.

The USPSTF is committed to mitigating the health inequities that prevent many people from fully benefiting from preventive services. Systemic or structural racism results in policies and practices, including health care delivery, that can lead to inequities in health. The USPSTF recognizes that race, ethnicity, and gender are all social rather

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Table. Summary of USPSTF Rationale

Rationale	Assessment
Detection	The USPSTF found adequate foundational evidence that visual skin examination by a clinician has modest sensitivity and specificity for detecting melanoma. However, skin cancer has primarily been studied in persons with fair skin, so the evidence may not be applicable to all skin colors. Evidence is limited regarding the accuracy of the clinical visual skin examination for detecting keratinocyte carcinoma.
Benefits of early detection and intervention and treatment	The USPSTF found inadequate evidence that screening for skin cancer through visual skin examination by a clinician reduces morbidity or mortality.
Harms of early detection and intervention and treatment	The USPSTF found inadequate evidence of the harms of skin cancer screening and diagnostic follow-up.
USPSTF assessment	Due to a lack of available data applicable to a US population, the USPSTF found that the evidence is insufficient to determine the balance of benefits and harms for visual skin examination by a clinician to screen for skin cancer in asymptomatic adolescents and adults.

Abbreviation: USPSTF, US Preventive Services Task Force.

than biological constructs. However, they are also often important predictors of health risk. The USPSTF is committed to helping reverse the negative impacts of systemic and structural racism, gender-based discrimination, bias, and other sources of health inequities, and their effects on health, throughout its work.

Importance

Skin cancer is the most commonly diagnosed cancer in the US.[1] There are different types of skin cancer varying in disease incidence and severity. Basal and squamous cell carcinomas are the most common types of skin cancer but infrequently lead to death or substantial morbidity.[2] Melanomas represent about 1% of skin cancer and cause the most skin cancer deaths. An estimated 8000 individuals in the US will die of melanoma in 2023.[3]

Melanoma is about 30 times more common in White persons than in Black persons.[4] However, persons with darker skin color are often diagnosed at later stages, when skin cancer is more difficult to treat.[5-7] Several factors may contribute to these disparities, including differences in risk factors, access to care, and clinical presentation.[8,9]

USPSTF Assessment of Magnitude of Net Benefit

The US Preventive Services Task Force (USPSTF) concludes that the **evidence is insufficient**, and the balance of benefits and harms for visual skin examination by a clinician to screen for skin cancer in asymptomatic adolescents and adults cannot be determined.

See the **Table** for more information on the USPSTF recommendation rationale and assessment and the eFigure in the Supplement for information on the recommendation grade. See the **Figure** for a summary of the recommendation for clinicians. For more details on the methods the USPSTF uses to determine the net benefit, see the USPSTF Procedure Manual.[10]

Practice Considerations

Patient Population Under Consideration

This recommendation applies to asymptomatic adolescents and adults who do not have a history of premalignant or malignant skin lesions. It does not apply to symptomatic patients, including those who present with a suspicious skin lesion, or those already under surveillance because of a high risk of skin cancer, such as persons with a familial syndrome (eg, familial atypical mole and melanoma syndrome).

Definitions

Keratinocyte carcinoma, previously referred to as nonmelanoma skin cancer, consists of basal and squamous cell carcinomas.[2]

Screening Tests

A visual skin examination is the most commonly proposed method for skin cancer screening and includes a survey of the body for skin lesions. A common technique used by clinicians to assess a potential melanoma is the "ABCDE" rule, which looks for lesions with the following characteristics: asymmetry, border irregularity, nonuniform color, diameter greater than 6 mm, and evolution over time. Another approach for visual skin examination is the "ugly duckling" sign, in which the clinician identifies pigmented lesions that look different than other moles on the patient. Visual skin examination can be performed with either the naked eye or a magnifying device called a dermatoscope. Biopsy of a suspicious lesion is needed to definitively diagnose skin cancer.[8]

Treatment

Melanoma is generally treated by surgically removing the primary tumor and surrounding normal tissue and possibly taking a biopsy of the sentinel lymph node to determine stage. Immunotherapy and targeted therapy are also used to treat advanced melanoma. There are several treatments for keratinocyte carcinoma, including surgical excision, Mohs micrographic surgery, radiation therapy, electrodessication and curettage, and photodynamic therapy, among others.[8]

Suggestions for Practice Regarding the I Statement

Potential Preventable Burden

Skin cancer is the most commonly diagnosed cancer in the US.[1] Melanoma, which constitutes 1% of skin cancer, causes more skin cancer deaths than keratinocyte carcinoma. An estimated 98 000 new cases of melanoma will be diagnosed in the US in 2023, with 8000 associated deaths.[3] Estimated 5-year survival for melanoma ranges from 99.5% for localized-stage disease to 31.9% for distant-stage disease.[11] Because keratinocyte carcinoma is common and usually curable, it is not monitored by cancer registries and reliable epidemiologic data are not available. However,

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Figure. Clinician Summary: Screening for Skin Cancer

What does the USPSTF recommend?	**For adolescents and adults who do not have signs or symptoms of skin cancer:** The USPSTF found the current evidence is insufficient to assess the balance of benefits and harms of visual skin examination by a clinician to screen for skin cancer. Grade: I statement
To whom does this recommendation apply?	• This recommendation applies to adolescents and adults who do not have signs or symptoms of skin cancer. • It does not apply to persons with a personal or family history of skin cancer. • It does not apply to persons with symptoms, such as changes in size, shape, or color of skin growths or irregular moles.
What's new?	This recommendation is consistent with the 2016 USPSTF recommendation.
How to implement this recommendation?	• There is insufficient evidence to recommend for or against screening for skin cancer in adolescents and adults. The USPSTF is calling for more research on the effectiveness of screening for skin cancer in populations with a diversity of skin tones and for studies assessing the accuracy of risk assessment tools and the impact of social determinants of health. • Clinicians should use their judgment when deciding whether to screen for skin cancer.
What additional information should clinicians know about this recommendation?	• There are 2 main types of skin cancer: melanoma and keratinocyte carcinoma (KC), which consists of basal and squamous cell carcinomas. KC is more common, but melanoma causes more deaths. • Exposure to UV radiation from sun exposure, indoor tanning beds, and other UV radiation–emitting devices is the major environmental risk factor for skin cancer. • A history of frequent sunburns, older age, and male sex are associated with increased risk for skin cancer. • Melanoma is about 30 times more common in White persons than in Black persons. However, persons with darker skin color are ofter diagnosed at later stages, when skin cancer is more difficult to treat. Several factors may contribute to these disparities, including differences in risk factors, access to care, and clinical presentation. • The most common type of melanoma among Black persons occurs mostly on skin not frequently exposed to direct sunlight, such as palms of hands, soles of feet, or under fingernails or toenails.
Why is this recommendation and topic important?	• Skin cancer is the most common type of cancer in the US; however, most skin cancers do not cause serious health problems or death. • Melanoma constitutes about 1% of skin cancers. An estimated 98 000 new cases of melanoma will be diagnosed in the US in 2023, with 8000 associated deaths. • There are many preventive behaviors persons can take to reduce skin cancer risk, such as minimizing sun exposure, protecting their skin when in the sun, and avoiding tanning beds.
What are other relevant USPSTF recommendations?	The USPSTF has a recommendation on behavioral counseling for skin cancer prevention. This recommendation is available at https://www.uspreventiveservicestaskforce.org/uspstf/
What are additional tools and resources?	• The Community Preventive Services Task Force recommends interventions for skin cancer prevention in childcare centers; primary and middle schools; outdoor occupational, recreational, and tourism settings; and communities (https://www.thecommunityguide.org/). • The Centers for Disease Control and Prevention's Melanoma Dashboard provides state and local data for melanoma incidence and mortality, UV radiation levels, and other risk factors. These geographic-specific data can help communities better meet their unique melanoma prevention needs (https://ephtracking.cdc.gov/Applications/melanomadashboard/).
Where to read the full recommendation statement?	Visit the USPSTF website (https://www.uspreventiveservicestaskforce.org/uspstf/) or the *JAMA* website (https://jamanetwork.com/collections/44068/united-states-preventive-services-task-force) to read the full recommendation statement. This includes more details on the rationale of the recommendation, including benefits and harms; supporting evidence; and recommendations of others.

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.

emerging evidence indicates that mortality data for squamous cell carcinoma may be underestimated.[2,8]

Exposure to UV radiation from sun exposure, indoor tanning beds, and other UV radiation–emitting devices is the major environmental risk factor for skin cancer. History of frequent sunburns, older age, and male sex are associated with increased risk for skin cancer. Exposure to UV radiation from the use of indoor tanning beds is an important risk factor in adolescents. Incidence of melanoma is higher among White persons compared with persons of other races and ethnicities. This difference likely reflects traits associated with increased melanoma risk, such as fair skin (which is more susceptible to sunburning), light-colored eyes, and red or blond hair being more common among White persons compared with persons of other races and ethnicities.[8] Acral lentiginous melanoma, which occurs mostly on skin not frequently exposed to direct sunlight (eg, palms of hands, soles of feet, or under fingernails or toenails), is the most common type of melanoma among Black populations.[8,12] Other melanoma risk factors include higher numbers of moles on the skin, atypical moles, as well as a personal and family history of skin cancer.[8]

Potential Harms

Trial evidence on the harms of skin cancer screening is limited. Potential harms include cosmetic harms (eg, scarring) from diagnostic workup, psychosocial harms (eg, worry) from the screening process, and overdiagnosis leading to overtreatment.[8,13] Treatment harms vary in frequency and severity depending on treatment type. Harms tend to be infrequent and less severe for local

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excisional treatments, whereas systemic treatments like chemotherapy or immunotherapy have the potential for more common and severe harms.[8]

Current Practice

Contemporary data on clinician practice patterns related to skin cancer screening are limited. Available studies show that the majority of melanomas are detected either by the patient discovering the lesion and reporting it to their clinician or by the clinician finding it incidentally.[14] In 1 study, survey data showed that dermatologists perform more skin cancer screening examinations than family practice clinicians or internists (552 [81.3%] dermatologists vs 333 [59.6%] family practice clinicians vs 243 [56.4%] internists).[15]

Additional Tools and Resources

The Community Preventive Services Task Force recommends interventions for skin cancer prevention in child care centers; primary and middle schools; outdoor occupational, recreational, and tourism settings; and communities (https://www.thecommunityguide.org/).[16]

The Centers for Disease Control and Prevention's Melanoma Dashboard provides state and local data for melanoma incidence and mortality, UV radiation levels, and other risk factors. These geography-specific data can help communities better meet their unique melanoma prevention needs (http://ephtracking.cdc.gov/Applications/melanomadashboard/).[17]

Other Related USPSTF Recommendations

In a separate recommendation, the USPSTF recommends counseling all young adults, adolescents, children, and parents of young children about minimizing exposure to UV radiation for persons aged 6 months to 24 years with a fair skin type to reduce their risk of skin cancer (B recommendation) and selectively offering counseling (based on risk factors) to adults older than 24 years with a fair skin type (C recommendation). The USPSTF concludes that the current evidence is insufficient to assess the balance of benefits and harms of counseling adults about skin self-examination for skin cancer prevention (I statement).[18]

Update of Previous USPSTF Recommendation

In 2016, the USPSTF found insufficient evidence to assess the balance of benefits and harms of visual skin examination by a clinician to screen for skin cancer in adults (I statement).[19] This recommendation concurs with the previous I statement.

Supporting Evidence

Scope of Review

The USPSTF commissioned a systematic review to evaluate the benefits and harms of screening for skin cancer in asymptomatic adolescents and adults.[8,20] The review included evidence for both keratinocyte carcinoma and cutaneous melanoma. The USPSTF used foundational evidence from previous reviews to assess the diagnostic accuracy of visual skin examination by a clinician to detect skin cancer.

Accuracy of Screening Tests and Risk Assessment

Based on foundational evidence, the sensitivity of visual skin examination by a clinician (eg, primary care clinician, dermatologist, or plastic surgeon) to detect melanoma ranged from 40% to 70% and specificity ranged from 86% to 98%. Evidence evaluating the diagnostic accuracy of visual skin examination to detect keratinocyte carcinoma was limited and inconsistent.[19] No new studies from the current review reported diagnostic accuracy for an asymptomatic screening population.[8,20]

Benefits of Early Detection and Treatment

The USPSTF reviewed 3 nonrandomized studies evaluating 2 skin cancer screening programs in Germany. One fair-quality study (SCREEN; n = 360 288 screened) included in the previous review measured melanoma mortality in 1 region of Germany before and after implementing a population-based skin cancer screening program. The screening program consisted of clinician education and training, a public awareness campaign, and clinical skin examinations for 1 year. At the 5-year follow-up, melanoma mortality declined 49% in the screening region compared with surrounding areas without a screening program. However, this mortality benefit attenuated at the 10-year follow-up, with melanoma mortality returning to similar rates as at program initiation.[8,20,21]

Following the initial positive outcomes from the SCREEN trial, Germany implemented a nationwide routine skin cancer screening program covered by statutory health insurance. This program included clinician education and free total skin examinations every 2 years by either a participating primary care clinician or dermatologist. One fair-quality study (N not reported) compared melanoma mortality between Germany and 22 other European countries and found that the annual melanoma mortality rate increased, not decreased, prior to and after implementation of the German national screening program. The mean unadjusted melanoma mortality rate per 100 000 population in Germany increased from 2.7 deaths to 3.4 deaths after initiation of the national screening program. Melanoma mortality rates increased in other European countries throughout the same period but not as much as in Germany. These data suggested that there is no observable melanoma mortality benefit from a national skin cancer screening program.[8,20,22]

Another nonrandomized but good-quality study (n = 1 431 327) from the German national skin cancer screening program found a higher proportion of melanoma deaths in the unscreened group compared with the screened group during a 4-year observation period (171 deaths [9.5% of the screened group] vs 154 deaths [22.8% of the unscreened group]; unadjusted hazard ratio, 0.37 [95% CI, 0.30-0.46]; $P < .05$). However, this difference was attenuated on multivariate analysis and after adjustment for lead time bias.[8,20,23]

The ecological and nonrandomized design of the German screening studies limits the conclusions that can be drawn about the effectiveness of clinical skin cancer screening on melanoma mortality. No included studies reported outcomes for keratinocyte carcinoma mortality or all-cause mortality. The applicability to US settings is also difficult to assess because the population diversity and

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health care delivery in the US differ from the characteristics in available studies.[8,20]

Given the limitations in studies evaluating the direct effect of skin cancer screening on mortality, the USPSTF reviewed evidence for an indirect pathway that evaluated whether screening is associated with earlier detection of skin cancer or precancerous lesions and whether earlier detection reduces melanoma and all-cause mortality. The USPSTF reviewed 6 nonrandomized observational studies (n = 2 947 595) assessing the effectiveness of skin cancer screening on earlier detection (measured by cancer stage or lesion thickness). Results were either inconsistent or showed no association between routine clinician skin examination and increased detection of keratinocyte carcinoma, melanoma, or skin cancer precursor lesions compared with usual care or lesion-directed examination.[8,20]

The USPSTF reviewed 9 nonrandomized studies (n = 1 326 051) assessing the association between stage at diagnosis and melanoma or all-cause mortality. Results showed that there is a strong, consistent positive association between more advanced stage at melanoma detection and increasing melanoma and all-cause mortality risk.[8,20] For example, 1 good-quality US-based study (n = 185 219) showed that compared with in situ disease at detection, the adjusted hazard ratios for melanoma mortality were 5.8 (95% CI, 5.3-6.3) for localized stage, 31.5 (95% CI, 28.9-34.2) for regional stage, and 169.6 (95% CI, 154.2-186.6) for distant stage. Regarding all-cause mortality, the same pattern was observed; the adjusted hazard ratios for all-cause mortality were 1.5 (95% CI, 1.5-1.5) for localized stage, 3.9 (95% CI, 3.8-4.1) for regional stage, and 15.8 (95% CI, 14.9-16.7) for distant stage, compared with in situ melanoma at detection.[24] US-based studies also showed higher melanoma mortality risk at all stages among men compared with women, and at stage 1 among Asian American, Black, Hispanic, Native American, and Pacific Islander adults compared with White adults. No evidence was available assessing the association between stage at keratinocyte carcinoma detection and skin cancer or all-cause mortality.[8,20]

Harms of Screening and Treatment

The USPSTF reviewed 2 small fair-quality nonrandomized studies evaluating the harms of skin cancer screening. A fair-quality study (n = 45) in Germany described patient ratings of cosmetic acceptance of deep shave excisions after 6 months. Patients judged 7% of shave sites as having poor cosmetic outcomes.[25] A fair-quality US-based study (n = 187) used various scales to estimate patient-reported psychological harms (eg, anxiety, depression, and physical and social consequences) and health-related quality of life at 5 and 8 months after screening with visual examination and subsequent diagnostic biopsy as indicated. Scores in both the screened and unscreened groups were within the normal range on all measures, indicating there were no significant psychological effects.[8,20,26,27]

Response to Public Comment

A draft version of this recommendation statement was posted for public comment on the USPSTF website from October 25, 2022, to November 21, 2022. In response to comments, the USPSTF provided more information on the risk of melanoma in individuals with darker skin color in the Practice Considerations section. The USPSTF also clarified the difference between asymptomatic and symptomatic patient populations in the Practice Considerations section. Comments inquired about screening in higher-risk populations. Due to the lack of available data applicable to a diverse US population, the USPSTF is recommending neither for nor against screening for skin cancer in an asymptomatic population. As such, health care professionals are encouraged to use their clinical judgment when deciding whether to perform a visual skin examination. Comments suggested alternate terms to describe differences in skin color. The USPSTF is committed to using inclusive language in its recommendations and acknowledges that inclusive language and terminology continues to evolve. Terminology used in this recommendation statement reflects current medical terms, clear language principles, and how skin color was reported in included studies.

Research Needs and Gaps

Studies are needed that provide the following information.

- Consistent data showing the effects of screening on morbidity and mortality or early detection of skin cancer, particularly melanoma.
- Clearer descriptions of skin color and inclusion of a full spectrum of skin colors in study participants.
- Morbidity and mortality outcomes in participants reflective of a US population with a diversity of skin tones.
- The effectiveness of screening in a range of primary care settings that reflect the variation in access to care in the US.
- The effectiveness of screening for reducing morbidity and mortality of acral lentiginous melanoma, which is the most frequently diagnosed melanoma in persons with darker skin color.
- Validated risk assessment tools to identify persons at highest risk for skin cancer and who might benefit from screening.
- The impact of social determinants of health (eg, outdoor occupational exposure, geographic exposure differences, and access to quality care) on skin cancer risk, prevention, screening, and treatment.

Recommendations of Others

Currently, no professional organizations in the US recommend clinical visual examination for skin cancer screening. Although the American Academy of Dermatology does not have formal guidelines on clinician-performed skin cancer screening, it does encourage and provide resources for its clinician members to hold free skin cancer screening events for the public.[8,28]

ARTICLE INFORMATION

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