

# Cancer Screening Guidelines and Risk Factors for Cancer

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# What is the USPSTF?

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- United States Preventive Services Task Force
- Created in 1984
- Independent, volunteer panel of national experts in prevention and evidence-based medicine
- Makes evidence-based recommendations about clinical preventive services such as screenings, counseling services, and preventive medications
- Each recommendation is given a letter grade based on the strength of the evidence and the balance of benefits and harms of a preventive service
- The recommendations apply only to people with no signs or symptoms of the specific disease or condition under evaluation
- The recommendations address only services offered in the primary care setting or services referred by a primary care clinician

Grade	Definition	Suggestions for Practice
<b>A</b>	The USPSTF recommends the service. There is high certainty that the net benefit is substantial.	Offer or provide this service.
<b>B</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 or provide this service.
<b>C</b>	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 or provide this service for selected patients depending on individual circumstances.
<b>D</b>	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.
<b>I</b> 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. If the service is offered, patients should understand the uncertainty about the balance of benefits and harms.

# Three major strategies for preventing cancer or finding it early

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1. Address modifiable risk factors (make healthy choices):
  - maintaining a healthy weight
  - avoiding tobacco
  - limiting alcohol use
  - protecting your skin
2. Vaccines – HPV, Hepatitis B
3. Screening

# Prostate Cancer: Risks

- Age
- Family history: first degree relative with prostate cancer increases risk by 2-3X
- Race: more common in African-American men. Starts earlier, grows faster
- Geography – more common in North America, northwestern Europe, Australia, the Caribbean. Less common in Asia, Africa, Central America, and South America.
- Under investigation:
  - Diet
  - Obesity
  - Smoking
  - Chemical exposures
  - Inflammation of the prostate
  - STDs
  - Vasectomy

# Prostate Cancer: USPSTF Screening Recommendations

## May, 2018

Recommendation Summary		
Population	Recommendation	Grade (What's This?)
Men aged 55 to 69 years	<p>For men aged 55 to 69 years, the decision to undergo periodic prostate-specific antigen (PSA)-based screening for prostate cancer should be an individual one. Before deciding whether to be screened, men should have an opportunity to discuss the potential benefits and harms of screening with their clinician and to incorporate their values and preferences in the decision. Screening offers a small potential benefit of reducing the chance of death from prostate cancer in some men. However, many men will experience potential harms of screening, including false-positive results that require additional testing and possible prostate biopsy; overdiagnosis and overtreatment; and treatment complications, such as incontinence and erectile dysfunction. In determining whether this service is appropriate in individual cases, patients and clinicians should consider the balance of benefits and harms on the basis of family history, race/ethnicity, comorbid medical conditions, patient values about the benefits and harms of screening and treatment-specific outcomes, and other health needs. Clinicians should not screen men who do not express a preference for screening.</p>	<b>C</b>
Men 70 years and older	<p>The USPSTF recommends against PSA-based screening for prostate cancer in men 70 years and older.</p>	<b>D</b>

# Breast Cancer: Risks

- Age
- Genetic mutations
- Early menarche
- Late or no pregnancy
- Starting menopause after age 55
- Physical inactivity
- Overweight or obese after menopause
- Dense breasts
- Combination hormone therapy
- Oral contraceptives
- Personal history of breast cancer
- Personal history of non-cancerous breast diseases
- Previous treatment using radiation therapy
- Women who took the drug diethylstilbestrol (DES) and women whose mothers took DES while pregnant
- Drinking alcohol

# Breast Cancer: USPSTF Screening Recommendations

## January, 2016

Recommendation Summary		
Population	Recommendation	Grade (What's This?)
Women aged 50 to 74 years	The USPSTF recommends biennial screening mammography for women aged 50 to 74 years.	<b>B</b>



# Breast Cancer: USPSTF Screening Recommendations

## January, 2016

### Women aged 40-49 years (Grade C)

- The decision to start screening mammography in women prior to age 50 years should be an individual one based on value placed on potential harms versus potential benefits
- While screening in this age group may reduce the risk for breast cancer death, the number of deaths averted is smaller than that in older women and the number of false-positive results and necessary biopsies is larger
- In addition to false-positive results and unnecessary biopsies, all women undergoing regular screening mammography are at risk for the diagnosis and treatment of noninvasive and invasive breast cancer that would otherwise not have become a threat to their health, or even apparent, during their lifetime (overdiagnosis)
- Women with a parent, sibling, or child with breast cancer are at higher risk for breast cancer and may benefit more than average-risk women from beginning screening in their 40s

# Breast Cancer: USPSTF Screening Recommendations

## January, 2016

Women aged 75 years or older	The USPSTF concludes that the current evidence is insufficient to assess the balance of benefits and harms of screening mammography in women aged 75 years or older.	<b>I</b>
All women	The USPSTF concludes that the current evidence is insufficient to assess the benefits and harms of digital breast tomosynthesis (DBT) as a primary screening method for breast cancer.	<b>I</b>
Women with dense breasts	The USPSTF concludes that the current evidence is insufficient to assess the balance of benefits and harms of adjunctive screening for breast cancer using breast ultrasonography, magnetic resonance imaging, DBT, or other methods in women identified to have dense breasts on an otherwise negative screening mammogram.	<b>I</b>

# Lung Cancer: Risks

## • SMOKING

- Tobacco smoke contains 7,000 chemicals, at least 70 are known carcinogens
- Linked to 80-90% of lung cancers in the U.S.
- Smokers are 15-30x more likely to get lung cancer or die from lung cancer
- Risk correlated with number of years and number of cigarettes a person smoked
- Secondhand smoke
  - 2/5 adults in U.S. who don't smoke are exposed to second hand smoke
  - ~7,300 people who never smoked die from lung cancer due to secondhand smoke every year
- Radon
  - High levels in 1 out of 15 U.S. homes
  - Causes 20,000 cases each year
- Other substances/chemicals
  - Asbestos, arsenic, diesel exhaust, silica, chromium
- Personal or family history of lung cancer
- Radiation therapy to the chest
- Diet?
  - Beta-carotene may increase risk in smokers

# Lung Cancer: USPSTF Screening Recommendations

## December, 2013

### Recommendation Summary

#### *Summary of Recommendation and Evidence*

Population	Recommendation	Grade (What's This?)
Adults Aged 55-80, with a History of Smoking	The USPSTF recommends annual screening for lung cancer with low-dose computed tomography (LDCT) in adults aged 55 to 80 years who have a 30 pack-year smoking history and currently smoke or have quit within the past 15 years. Screening should be discontinued once a person has not smoked for 15 years or develops a health problem that substantially limits life expectancy or the ability or willingness to have curative lung surgery.	<b>B</b>

# Colorectal Cancer: Risks

- Age ( $\geq 50$ )
- Inflammatory bowel disease (Crohn's, ulcerative colitis)
- Personal history of colorectal cancer or colorectal polyps
- Family history of colorectal cancer or colorectal polyps
- Certain genetic syndromes
  - familial adenomatous polyposis (FAP)
  - hereditary non-polyposis colorectal cancer (Lynch syndrome)
- Physical inactivity
- Overweight or obesity
- A diet low in fruit and vegetables
- A low-fiber and high-fat diet
- Alcohol consumption
- Tobacco use

# Colorectal Cancer: USPSTF Screening Recommendations

## June, 2016

Recommendation Summary		
Population	Recommendation	Grade (What's This?)
Adults aged 50 to 75 years	<p>The USPSTF recommends screening for colorectal cancer starting at age 50 years and continuing until age 75 years.</p> <p>The risks and benefits of different screening methods vary. See the <a href="#">Clinical Considerations section</a> and the <a href="#">Table</a> for details about screening strategies.</p>	<b>A</b>
Adults aged 76 to 85 years	<p>The decision to screen for colorectal cancer in adults aged 76 to 85 years should be an individual one, taking into account the patient's overall health and prior screening history.</p> <ul style="list-style-type: none"><li>• Adults in this age group who have never been screened for colorectal cancer are more likely to benefit.</li><li>• Screening would be most appropriate among adults who 1) are healthy enough to undergo treatment if colorectal cancer is detected and 2) do not have comorbid conditions that would significantly limit their life expectancy.</li></ul>	<b>C</b>

# Colorectal Cancer: USPSTF Screening Recommendations

## June, 2016

**Table. Characteristics of Colorectal Cancer Screening Strategies<sup>a</sup>**

Screening Method	Frequency <sup>b</sup>	Evidence of Efficacy	Other Considerations
<b>Stool-Based Tests</b>			
gFOBT	Every year	RCTs with mortality end points: High-sensitivity versions (eg, Hemoccult SENZA) have superior test performance characteristics than older tests (eg, Hemoccult II)	Does not require bowel preparation, anesthesia, or transportation to and from the screening examination (test is performed at home)
FIT <sup>c</sup>	Every year	Test characteristic studies: Improved accuracy compared with gFOBT  Can be done with a single specimen	Does not require bowel preparation, anesthesia, or transportation to and from the screening examination (test is performed at home)
FIT-DNA	Every 1 or 3 y <sup>d</sup>	Test characteristic studies: Specificity is lower than for FIT, resulting in more false-positive results, more diagnostic colonoscopies, and more associated adverse events per screening test  Improved sensitivity compared with FIT per single screening test	There is insufficient evidence about appropriate longitudinal follow-up of abnormal findings after a negative diagnostic colonoscopy; may potentially lead to overly intensive surveillance due to provider and patient concerns over the genetic component of the test

# Colorectal Cancer: USPSTF Screening Recommendations

## June, 2016

**Table. Characteristics of Colorectal Cancer Screening Strategies<sup>a</sup>**

Screening Method	Frequency <sup>b</sup>	Evidence of Efficacy	Other Considerations
<b>Direct Visualization Tests</b>			
Colonoscopy <sup>c</sup>	Every 10 y	Prospective cohort study with mortality end point	Requires less frequent screening. Screening and diagnostic followup of positive results can be performed during the same examination.
CT colonography <sup>e</sup>	Every 5 y	Test characteristic studies	There is insufficient evidence about the potential harms of associated extracolonic findings, which are common
Flexible sigmoidoscopy	Every 5 y	RCTs with mortality end points: Modeling suggests it provides less benefit than when combined with FIT or compared with other strategies	Test availability has declined in the United States
Flexible sigmoidoscopy with FIT <sup>c</sup>	Flexible sigmoidoscopy every 10 y plus FIT every year	RCT with mortality end point (subgroup analysis)	Test availability has declined in the United States Potentially attractive option for patients who want endoscopic screening but want to limit exposure to colonoscopy



# Melanoma and Other Skin Cancer: Risks

- A lighter natural skin color
- Family history of skin cancer
- Personal history of skin cancer
- Exposure to the sun
- A history of sunburns, especially early in life
- A history of indoor tanning
- Skin that burns, freckles, reddens easily, or becomes painful in the sun
- Blue or green eyes
- Blond or red hair
- Certain types and a large number of moles

## Skin types

- I. Always burns, never tans
- II. Burns easily, tans minimally
- III. Burns moderately, tans gradually to light brown
- IV. Burns minimally, always tans well to moderately brown
- V. Rarely burns, tans profusely to dark
- VI. Never burns deeply pigmented, least sensitive

Though skin types I and II are at the highest risk for skin damage, EVERYONE's skin can be damaged by UV exposure

# Skin Cancer: USPSTF Screening Recommendations

## July, 2016

### Recommendation Summary

Population	Recommendation	Grade (What's This?)
Asymptomatic 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 adults.	<b>I</b>

# Cervical Cancer: Risks

- Human papillomavirus (HPV)
  - Group of >150 related viruses
  - Transmitted through intimate skin-to-skin contact
  - Most sexually active people get HPV at some point in their lives
  - About 1 in 4 people have HPV at any given time in the U.S.
  - 90% of HPV infections are cleared
  - HPV causes ~32,500 cancers annually in the U.S.
  - A vaccine is available against the 9 types of HPV that are most associated with cancer (6,11,16,18,31,33,45,52,58)
- Smoking
- HIV or other immunocompromising condition
- Using birth control pills for  $\geq 5$  years
- Having given birth to three or more children
- Having several sexual partners

# Cervical Cancer: USPSTF Screening Recommendations

## March, 2012 (Update is in progress)

Population	Recommendation	Grade (What's This?)
Women 21 to 65 (Pap Smear) or 30-65 (in combo with HPV testing)	The USPSTF recommends screening for cervical cancer in women age 21 to 65 years with cytology (Pap smear) every 3 years or, for women age 30 to 65 years who want to lengthen the screening interval, screening with a combination of cytology and human papillomavirus (HPV) testing every 5 years. See the <a href="#">Clinical Considerations</a> for discussion of cytology method, HPV testing, and screening interval.	<b>A</b>

# Cervical Cancer: USPSTF Screening Recommendations

## March, 2012 (Update is in progress)

Women younger than 30 years, HPV testing	The USPSTF recommends against screening for cervical cancer with HPV testing, alone or in combination with cytology, in women younger than age 30 years.	<b>D</b>
Women younger than 21	The USPSTF recommends against screening for cervical cancer in women younger than age 21 years.	<b>D</b>
Women Older than 65, who have had adequate prior screening	The USPSTF recommends against screening for cervical cancer in women older than age 65 years who have had adequate prior screening and are not otherwise at high risk for cervical cancer. See the <a href="#">Clinical Considerations</a> for discussion of adequacy of prior screening and risk factors.	<b>D</b>
Women who have had a hysterectomy	The USPSTF recommends against screening for cervical cancer in women who have had a hysterectomy with removal of the cervix and who do not have a history of a high-grade precancerous lesion (cervical intraepithelial neoplasia [CIN] grade 2 or 3) or cervical cancer.	<b>D</b>

# Pancreatic Cancer: Risks

- Smoking (2x increase risk)
- Male sex (30% more common)
- African-American
- Age
- Still under investigation:
  - Obesity
  - Diabetes
  - Chronic pancreatitis
  - Certain hereditary conditions
  - Family history of pancreatic cancer

# Pancreatic Cancer: USPSTF Screening Recommendations

## February, 2018

### *Summary of Recommendation*

Population	Recommendation	Grade (What's This?)
Asymptomatic Adults	The USPSTF recommends against routine screening for pancreatic cancer in asymptomatic adults using abdominal palpation, ultrasonography, or serologic markers.	<b>D</b>

# Other Cancers...

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# Bladder Cancer: Risks

- Smoking
- Family history of bladder cancer
- Genetic mutations
- Workplace chemicals
- Chemotherapy
- Arsenic
- Chinese herb *Aristolochia fangchi*
- Chronic urinary tract infections

# Bladder Cancer: USPSTF Screening Recommendations

## August, 2011

### Recommendation Summary

#### *Summary of Recommendations*

Population	Recommendation	Grade (What's This?)
Asymptomatic Adults	The USPSTF concludes the current evidence is insufficient to assess the balance of benefits and harms of screening for bladder cancer in asymptomatic adults.	<b>I</b>

# Oral Cancer: Risks

- Smoking
- Smokeless tobacco use
- Excessive alcohol use
- HPV

# Oral Cancer: USPSTF Screening Recommendations

## November, 2013

### Recommendation Summary

#### *Summary of Recommendation and Evidence*

Population	Recommendation	Grade (What's This?)
Asymptomatic Adults	The USPSTF concludes that the current evidence is insufficient to assess the balance of benefits and harms of screening for oral cancer in asymptomatic adults.	<b>I</b>

# Ovarian Cancer: Risks

- Age
- Family history
- Genetic mutations (BRCA1, BRCA2, Lynch syndrome)
- Personal history of breast, uterine, or colorectal cancer
- Eastern European or Ashkenazi Jewish background
- Endometriosis
- Have never given birth or have had trouble getting pregnant

# Ovarian Cancer: USPSTF Screening Recommendations

## February, 2018

### Recommendation Summary

Population	Recommendation	Grade (What's This?)
Asymptomatic women	The USPSTF recommends against screening for ovarian cancer in asymptomatic women. This recommendation applies to asymptomatic women who are not known to have a high-risk hereditary cancer syndrome.	<b>D</b>

# Testicular Cancer: Risks

- Undescended testicle
- Family history
- HIV infection
- Carcinoma in situ of the testicle
- Personal history of testicular cancer
- White, American Indian
- Age (20-34)

# Testicular Cancer: USPSTF Screening Recommendations

## April, 2011

### *Summary of Recommendation and Evidence*

Population	Recommendation	Grade (What's This?)
Adolescent and Adult Men	The USPSTF recommends against screening for testicular cancer in adolescent or adult men.	<b>D</b>



# Thyroid Cancer: Risks

- Radiation to the neck area
- Genetic conditions

# Thyroid Cancer: USPSTF Screening Recommendations

## May, 2017

### Recommendation Summary

Population	Recommendation	Grade (What's This?)
Adults	The USPSTF recommends against screening for thyroid cancer in asymptomatic adults.	<b>D</b>

# Resources

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*Published Recommendations.* U.S. Preventive Services Task Force.  
<https://www.uspreventiveservicestaskforce.org/BrowseRec/Index>

Centers for Disease Control and Prevention [www.cdc.gov](http://www.cdc.gov)

American Cancer Society [www.cancer.org](http://www.cancer.org)