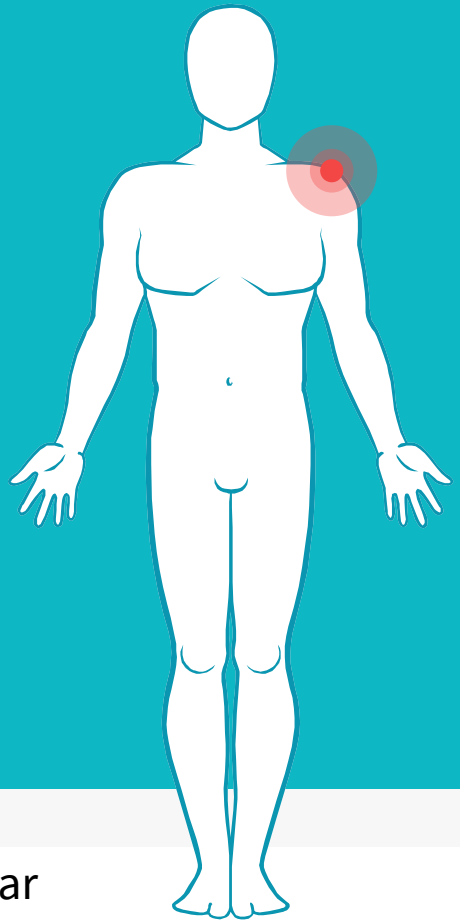
Screening and prevention



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MCQs

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3

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B. Detectable at early age

C. Acceptable to the population

D. Test has to be highly specific

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B. Breastfeeding

C. Have a first-degree relative with a BRCA1 or BRCA2 gene mutation

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C. Transrectal ultrasound (TRUS)

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30 Years old male. On screening his BP was 135\85. Which one of the following statements is correct

A. Screen him again after 3 years

B. Lifestyle modification and screen him every year

C. Start treatment with ACE Inhibitor.

..D. Do Nothing.

At which age we have to stop cervical cancer testing for women who had regular cervical cancer testing in the past 10 years with normal results ?

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C. < 21 years old

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WHICH ONE OF THE FOLLOWING IS CONSIDERED AS TERTIARY PREVENTION:

A. educational programs.

B. palliative therapy.

C. lifestyle modification.

D. fecal occult blood test.

Screening and diagnostic tests are the same thing?

A. True

B. False

What is best method of screening for prostate cancer?

a. Prostate specific antigen

b. Digital rectal exam

c. Pap smear

d. Biopsy

1.To define screening/prevention and its uses in family practice

The Definition Screening

WHO definition

Screening is defined as the presumptive identification of unrecognized disease in an apparently healthy, asymptomatic population by means of tests, examinations or other procedures that can be applied rapidly and easily to the target population.

The objective of screening

To be able to diagnose and treat a potentially serious condition **at an early stage** when it is still treatable.

To prevent or delay the development of advanced disease in the subset with preclinical disease.

Uses Of Screening In Family Practice

- One of the fundamental goals of primary care medicine is **the prevention or early detection of disease through screening**. Screening can lead to interventions that may decrease morbidity and mortality, but it can also lead to increased morbidity and mortality if performed inappropriately.

- Screening tests are available for many common diseases and encompass biochemical (e.g., cholesterol, glucose), physiologic (e.g., blood pressure, growth curves), radiologic (e.g., mammogram, bone densitometry), and cytologic (e.g., Pap smear) approaches.

The Definition of Prevention

"Actions aiming at eradicating, eliminating, or minimizing the impact of disease and disability, or if none of these is feasible, retarding the progress of disease and disability"

- The concept of prevention is best defined in the context of levels of prevention:

{**primary**, **secondary**, and **tertiary prevention.**}

Levels of prevention:

- **Primary prevention** is Prevention of disease occurrence.
  - Vaccination and post-exposure prophylaxis of children, adults and the elderly
  - Health education
  - Nutrition intervention and food supplementation
  - Sanitation of the environment
  - Lifestyle modification
  - Inclusion of disease prevention programmes at primary and specialized health care levels, such as access to preventive services (ex. counselling)

Levels of prevention:

- **Secondary prevention** is Controlling disease in early form
  - Population-based **screening programmes** for early detection of diseases
  - Provision of maternal and child health programmes, including screening and prevention of congenital malformations
  - Provision of chemoprophylactic agents to control risk factors (e.g. hypertension)

Levels of prevention:

- **Tertiary prevention** is Prevention of complications once the disease is present
  - Rehabilitation program e.g. cardiac or stroke rehabilitation programs.
  - Palliative therapy
  - Limiting complications /disability in patients with established disease by regular surveillance, e.g.: trying to prevent Diabetic complications by good control, regular fundoscopic exam, foot care

2. To understand the criteria for screening tests

What do you think?

1

Disease Has Serious Consequences

Screening should target diseases with serious consequences such as mortality or severe or prolonged morbidity.

Well Understood Natural History

It has a long-enough preclinical phase

Screening Population Has High Prevalence of Detectable Preclinical Phase

To justify the cost of screening, the detectable preclinical phase of the disease should have a high prevalence among people who are screened

Screening Test Has High Accuracy for Detecting the Detectable Preclinical Phase

The screening test must have good sensitivity and specificity. To detect more true-positive cases than false-positive cases.

Screening Test Detects Disease Before Critical Point

If the critical point occurs before the detectable preclinical phase, then screening cannot be effective. If the critical point occurs soon after the start of the detectable preclinical phase, then screening will often be too late.

Screening Test Causes Little Morbidity

At the time of screening, a person's risk of death or serious morbidity from the target disease is relatively small. Thus, even a small adverse effect to many of the screened persons is likely to offset any substantial benefit of screening afforded to a few

Screening Test Is Affordable and Available

The diagnostic test must be affordable and available to the target population. If the test is available only at large urban medical facilities, or is not affordable for patients, or both, then screening cannot be effective.

Treatment Exists

An effective treatment for the disease must exist for screening to improve patient outcomes.

Detection of disease alone is not cost effective.

Treatment Is More Effective When Applied Before Symptoms Begin

Screening cannot be cost-effective if the disease can be treated successfully after symptoms appear.

Treatment Is Not Too Risky or Toxic

This is particularly important when many false-positive cases or many cases of pseudodisease undergo treatment; these patients derive no benefit from treatment, only its side effects.

WJ

Wilson and Jungner Criteria

Box 1. **Wilson and Jungner classic screening criteria**[1]

1. The condition sought should be an important health problem.
2. There should be an accepted treatment for patients with recognized disease.
3. Facilities for diagnosis and treatment should be available.
4. There should be a recognizable latent or early symptomatic stage.
5. There should be a suitable test or examination.
6. The test should be acceptable to the population.
7. The natural history of the condition, including development from latent to declared disease, should be adequately understood.
8. There should be an agreed policy on whom to treat as patients.
9. The cost of case-finding (including diagnosis and treatment of patients diagnosed) should be economically balanced in relation to possible expenditure on medical care as a whole.
10. Case-finding should be a continuing process and not a "once and for all" project.

3.To identify screening types and examples of targeted people for each type

Types of screening

1) Mass screening
2) High risk / selective / targeted screening
3) Multiphasic screening
4) Multipurpose screening
5) Opportunistic / case finding screening

1) Mass screening

Application of screening test to large, **unselected** population.

Everyone in the group is screened **regardless** of the probability of having the disease or condition.

Examples **??**

1) Mass screening

Examples:

- Visual defects in school children.
- Mammography in women aged 40 years and above.
- Newborn screening program
- Scoliosis

2) High risk / selective / targeted screening

It is applied **selectively** to **high risk groups**, the groups defined on the basis of epidemiological research.

Examples **??**

2) High risk / selective / targeted screening

Examples:

- Screening foetus for Down's syndrome in a mother who already has a baby with Down's syndrome.
- Screening for familial cancers, HTN and DM.
- Screening for cancer cervix in low social groups.
- Screening for HIV in risk groups.

3) Multiphasic screening

The screening in which various diagnostic procedures are employed during the **same screening program**, to carry out screening tests for **single diseases**.

The procedure may include health questionnaire, clinical examination and a range of measurements and investigations.

3) Multiphasic screening

Examples:

- DM - FBS & Glucose tolerance test
- Sickle cell anemia - CBC & Hb electrophoresis

4) Multipurpose screening

The screening of a population by **more than one test** done **simultaneously** to detect **more than one disease**.

Examples:

- Screening of a pregnant women for VDRL, HIV & HBV by serological tests.

5) Opportunistic / case finding screening

Screening of persons who come to health practitioner **for some other purpose.**

Examples:

- Screening for high blood pressure when a patient comes in for a flu shot.

4. To explain pros and cons of screening

advantages of screening

1)Improved prognosis for some cases detected by screening.

2)Less radical treatment for some early cases.

3)Reassurance for those with negative test results.

4)Increased information on natural history of disease and benefits of treatment at early stage.

5)economic saving on future treatment.

disadvantages of screening

1)Longer morbidity in cases where prognosis is unaltered.
2)False reassurance for those with false-negative results.
3)Anxiety, Unnecessary intervention and sometimes morbidity for those with false-positive results.

5. To identify appropriate approaches for prevention and screening of the common problems in primary care

Breast Cancer

- Screening test or procedure: **Mammography**
- Population: women above **40 years of age**
- Screening intervals:
  - **Annual** screening mammography should be **offered** to patients between 40 and 44 years of age.
  - **Annual** screening with mammography should be **initiated** at 45 years of age in women at average risk.
  - For women 55 years and older, **biennial** screening is the preferred approach, with the option to screen each year.
  - Women should continue screening mammography as long as their overall health is good and they have a life expectancy of 10 years or more

Dr. Norah AlShehri: memorize these numbers

Cervical Cancer

- Population: women above **21** years of age

Population	Screening test or procedure	Screening Intervals
21 to 29 years of age	Pap test	Every three years
30 to 65 years of age	Pap test and HPV DNA test	Every five years with both the HPV test and the Pap test (preferred) or every three years with the Pap test alone (acceptable)
66 years or older	Pap test and HPV DNA test	Women 66 years or older who have had three or more consecutive negative Pap tests or two or more consecutive negative HPV and Pap tests within the past 10 years, with the most recent test occurring in the previous five years, should stop cervical cancer screening

- What about Women who have had a total hysterectomy?

Endometrial Cancer

- **No** Screening test or procedure
- Population: women, **at menopause**
- At the time of menopause, women should be informed about risks and symptoms of endometrial cancer and strongly encouraged to report any unexpected bleeding or spotting to their physicians

Colorectal Cancer

- Population: Men and women, **45 to 85 years**, for all tests listed
- The decision whether to perform screening in patients 76 to 85 years of age should be based on patient preference, life expectancy, health, and screening history.
- Screening should be discouraged in patients older than 85 years because the risks of mortality and screening complications are increased.

Colorectal Cancer

Screening test or procedure	Screening Intervals
Guaiac-based FOBT with at least 50% sensitivity for cancer, or fecal immunochemical test with at least 50% sensitivity for cancer	Annually
OR Multitarget stool DNA test	Every three years
OR Flexible sigmoidoscopy	Every five years, flexible sigmoidoscopy can be performed alone, or consideration can be given to combining flexible sigmoidoscopy performed every five years with a highly sensitive FOBT or fecal immunochemical test performed annually
OR Double-contrast barium enema	Every five years
OR Colonoscopy	Every 10 years
OR CT colonography	Every five years

Prostate Cancer

- Screening test or procedure: **Prostate specific antigen test** with or without digital rectal examination
- Population: Men, **55 to 69 years**
- Men who have at least a 10-year life expectancy should have an opportunity to make an informed decision with their clinician about whether to be screened for prostate cancer after receiving information about the potential benefits, risks, and uncertainties associated with prostate cancer screening; prostate cancer screening should not occur without an informed decision-making process

Lung Cancer

- Screening test or procedure: Low-dose **CT**
- Population: Current or former **smokers** 55 to 74 years of age in good health with at least a 30 pack-year history
- Clinicians should initiate a discussion about **annual** lung cancer screening with apparently healthy patients 55 to 74 years of age who have at least a 30 pack-year smoking history and who currently smoke or have quit within the past 15 years; a process of informed and shared decision making with a clinician related

6. To justify the rationale for selection of a screening test with practical case /condition. Examples include Ca. breast, Ca. colon, Ca. prostate cancer,.....


Breast Cancer

What is the screening recommendation for breast cancer?

Biennial screening mammography should be offered to average-risk women 50 to 74 years of age. Screening mammography has been shown to **reduce rates of breast cancer mortality** and it has also been found to be **cost-effective** in women 50 to 74 years of age.

What about women between 40 - 49?

For average-risk women 40 to 49 years of age, the risks and benefits of mammography are closely balanced. The decision to perform screening mammography should take into consideration the individual patient risk, values, and comfort level of the patient and physician.

When shall we stop screening?

The optimal age at which to stop routine breast cancer screening is uncertain. The ACS and the NCCN recommend that as long as an older woman is in good health and remains a candidate for breast cancer treatment if necessary, she should continue to be screened.

Is breast self examination is used as a screening method?

Although it is a common practice, teaching breast self-examination does not reduce breast cancer mortality. So, it is not used as a screening method. The goal of breast self-awareness is for women to promptly report any changes in their breasts to their primary care physician.

What about Clinical breast examination?

The USPSTF states that there is insufficient evidence to support clinical breast examination as a screening method. So it is an option for women in all risk categories, but should not replace screening mammography.

Can we use Ultrasonography for screening?

A study comparing mammography alone with mammography plus ultrasonography in high-risk women with dense breasts found that the addition of ultrasonography increased the rate of cancer detection, but at the cost of increased false-positive results. That's why it is not used as a screening method. The most important use of breast ultrasonography is in the evaluation of suspicious lesions found during screening mammography and of those found by physical examination but not detected by mammography.

Can we use Magnetic resonance imaging for screening?

MRI has higher sensitivity and can provide additional information compared with mammography. The ACS and the NCCN recommend the addition of magnetic resonance imaging to mammography for women with a **known BRCA mutation**, those with a **first-degree relative who has a BRCA mutation**, and those with a **lifetime risk of 20 percent or more**.

They recommend that screening begin at 25 to 30 years of age, and continue for as long as a woman is in good health, although the exact timing and screening interval remain unclear.

Cervical Cancer

Benefits and harms

Benefits	Harms
Screening aims to identify high-grade precancerous cervical lesions. Treatment of precancerous lesion is less invasive than treatment of cancer and results in fewer adverse effects. High-grade lesions precancerous may be treated with ablative and excisional therapies. Early-stage cervical cancer may be treated with surgery (hysterectomy) or chemoradiation.	Abnormal test results can lead to more frequent testing and invasive diagnostic procedures, such as colposcopy and cervical biopsy. Harms from these diagnostic procedures include vaginal bleeding, pain, infection, and failure to diagnose (due to inadequate sampling) Some treatments for precancerous lesions (such as cold-knife conization and loop excision) are associated with adverse pregnancy outcomes

Benefits Vs. Harm

cytology every three years

The USPSTF concludes that for women 21 to 65 years of age, there is **high** certainty that the benefits of screening with cytology every three years substantially outweigh the harms.

Cytology and HBV testing (co-testing) every five years

- For women 30 to 65 years of age, there is **high** certainty that the benefits of screening with a combination of cytology and HPV testing (co-testing) every five years outweigh the harms.
- For women younger than 30 years, there is **moderate** certainty that the potential harms of screening with HPV testing (alone or in combination with cytology) outweigh the potential benefits.

Screening itself

- For women younger than 21 years, regardless of sexual history, there is **moderate** certainty that the harms of screening outweigh the benefits.
- For women older than 65 years who have had adequate prior screening and are not otherwise at high risk of cervical cancer, there is **moderate** certainty that the benefits of screening do not outweigh the potential harms.

Colorectal Cancer

Screening tests

Stool-based screening methods

They are quick, noninvasive, and can be done in the home.

Screening test	Interval	Sample collection	Sensitivity & specificity
Guaiac-based fecal occult blood test (gFOBT)	Annually	3 stool samples collected at home, and avoid hemecontaining foods before the test	Fair sensitivity (62% - 79%) Good specificity (87% - 96%)
Fecal immunochemical test (FIT)	Annually	At home single stool sample and not requiring any dietary restrictions	More sensitive (74%) and specific (96%) than gFOBT
Multitargeted stool DNA test (FIT-DNA)	Every 3 year		More sensitive (92%) but less specific (90%) than FIT

Of these, FIT-DNA is significantly more expensive than the other two
Both FIT and FIT-DNA have poor sensitivity (24% and 42%, respectively) for detecting adenomatous polyps and serrated polyps measuring 1 cm or greater.
Positive test result requires a colonoscopy.

Screening tests

Direct Visualization Screening

They allow for the identification of adenomatous polyps and serrated polyps
All of them require bowel preparation

Screening test	Interval	If polyp was found	Visualization	Sedation	Duration
Colonoscopy	Every 10 year	Polyps found during colonoscopy can be removed during the procedure	The entire colon	Required	20 - 30 min + recovery time
Computed tomographic colonography (CTC) Radiation + IV contrast media	Every 5 year	Polyps found require follow-up colonoscopy	The entire colon May miss small or flat polyps	Not required	10 - 15 min
Flexible sigmoidoscopy	Every 5 year		Visualize only distal third of colon	Not typically done	Around 10 min

What to choose?

Family physicians can help their patients choose a test for CRC screening by reviewing test characteristics, benefits, harms, and costs. In addition to the advantages and disadvantages of each test, physicians must consider patient preference, comorbidities, test availability, likelihood that the test will be completed, and availability of resources for follow-up of abnormal test results..

All approaches are thought to significantly decrease deaths caused by CRC.

Prostate Cancer

Prostate Cancer

Most prostate cancers have a good prognosis even without treatment.

Prostate specific antigen (PSA)

Although PSA testing has been used to screen for prostate cancer since 1987, there is no consensus on which threshold should warrant a prostate biopsy. The most commonly used threshold of more than 4.0 ng per mL (4.0 µg per L) and this has an approximately 70% false-positive rate. As many as 15% of men with a PSA level less than 4.0 ng per mL will have prostate cancer on biopsy, and 15% of those cancers are high grade.

Digital Rectal Examination

Even in patients with elevated PSA levels, DRE did not influence the chance of detecting prostate cancer

Prostate Cancer

Table 2. Key Discussion Points Regarding Prostate Cancer Screening

Prostate cancer screening with the PSA test is optional because the chance of harm from screening is greater than the chance of benefit for most men.
The potential benefit of prostate cancer screening corresponds to preventing, at most, one death caused by prostate cancer per 1,000 men screened, although 37 men would be diagnosed with prostate cancer unnecessarily, after 11 years of follow-up.[6]
Harms of screening include anxiety related to abnormal PSA test results or a cancer diagnosis. Prostate biopsy can cause pain and bleeding, and there is a small risk of hospitalization. Treatment of prostate cancer is associated with a small risk of surgery-related death, erectile dysfunction, urinary incontinence, and other complications.
Men who choose to have a PSA test increase their chances of a prostate cancer diagnosis, and most prostate cancers are slow growing and do not cause death.
The PSA test does not distinguish between aggressive cancer and slow-growing cancer. PSA levels can be elevated because of benign conditions, such as prostate enlargement and infection. Also, 15% of patients with prostate cancer have a normal PSA level.[10]

PSA = prostate-specific antigen.

Information from references 6 and 10.

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A)True

B)False

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Role Play

References:

- WHO
- Oxford HandBook of General Practice 4TH Edition.
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THANKS!

Any questions?