

Screening and prevention

Done by: nawaf Aldarwish,
mohammed Almania, Fahad
Alotaibi, Faisal Alabbad, Saud
Alhothaly.





Objectives:

Define screening / prevention and its use in family medicine.

Identify levels of prevention in primary care practice.

Recognize the criteria of screening test.

Identify screening types and illustrate examples of targeted people.

Explain appropriate approach for prevention and screening of common problems in primary care.

Indicate the pros and cons of screening.

Summarize the recommendations for screening programs in adults e.g. Breast cancer, Colorectal ca, cervical ca, Prostate ca, osteoporosis...etc.

Review the local vaccination schedule from Saudi M.O.H.



MCQs



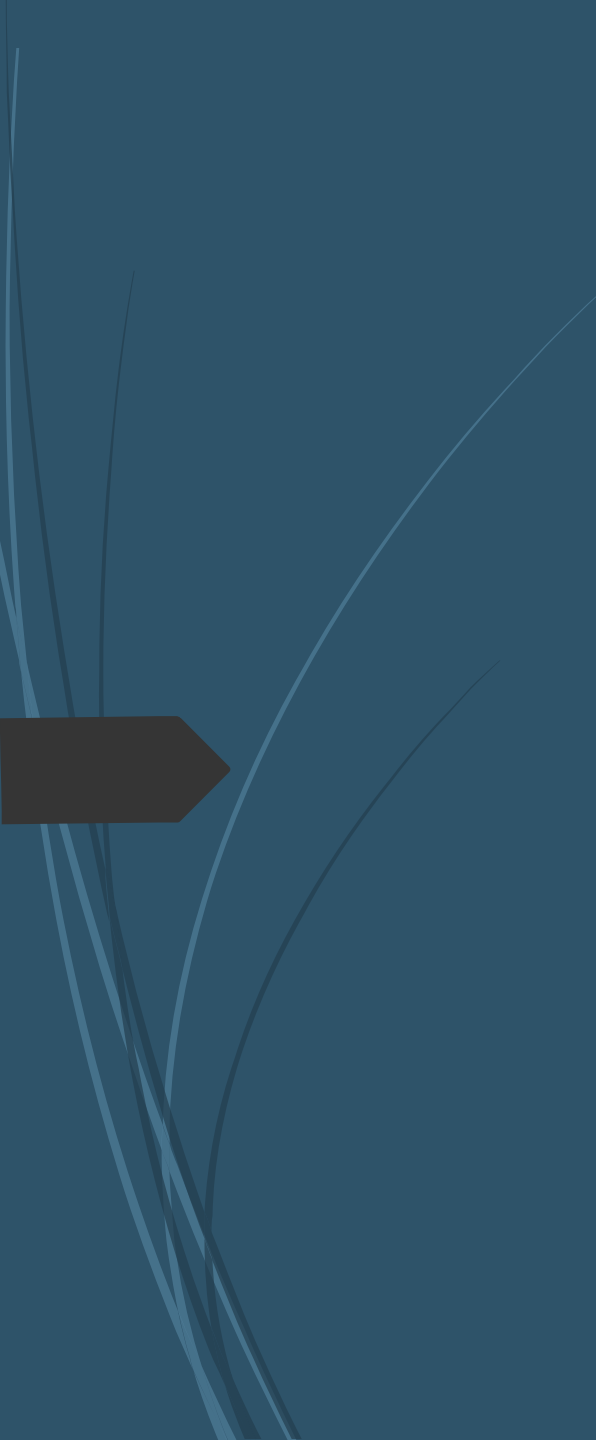
A/Which one of the following is multipurpose screening:

1-Screening in pregnant woman for VDRL, HIV and HBV by serology.

2-CBC and Hb electrophoresis in sickle cell anemia.

3-Screening for familial cancers.

4-Screen school children for visual defect.



B/which of the following is screening test for lung cancer?

1-low dose ct chest

2-tumor markers

3-chest x-ray

4-spirometry



C/which one of the following is a primary prevention of colorectal cancer?

1-High intake of fibers

2-High intake of red meats

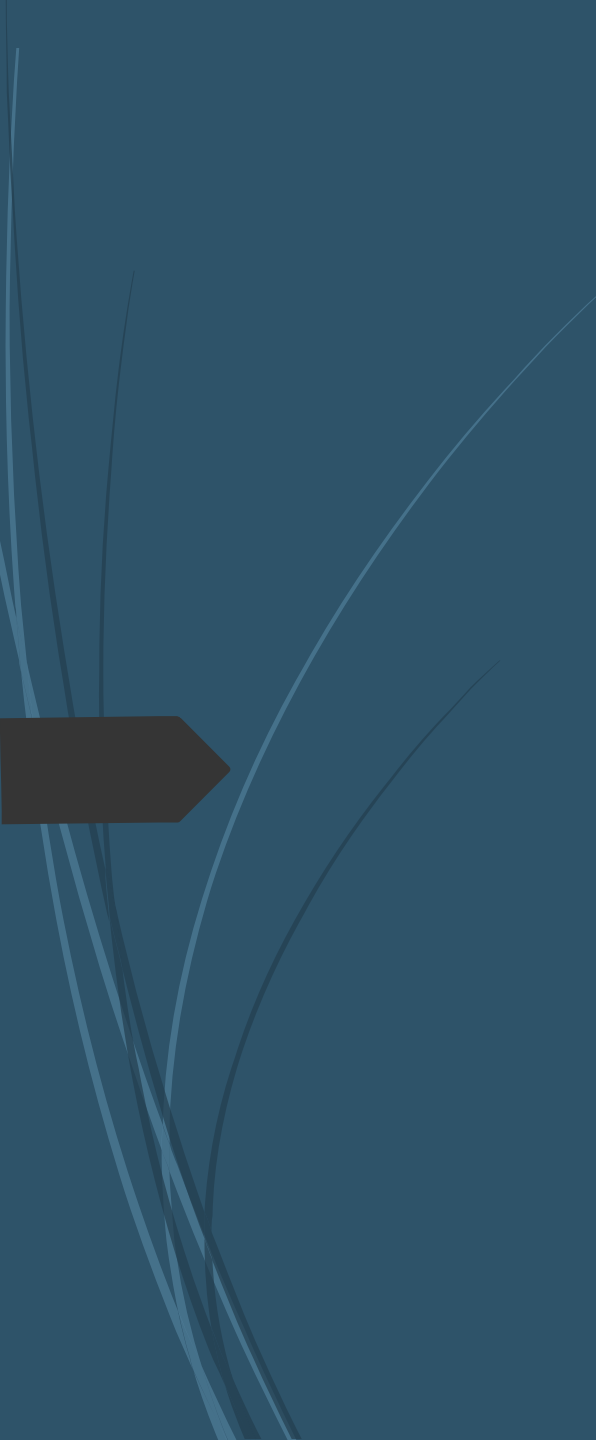
3-Sitting regularly for prolonged periods

4- alcohol use



D/ Which one of the following is not part of Wilson-Junger criteria?

1. Natural history of illness is well understood
2. Detectable at early age
3. Acceptable to the population
4. Test has to be highly specific



E/2 years old boy came with Accommodative esotropia, the physician told the parent that he should wear glasses to prevent amblyopia, what type of prevention is it?

1-primary prevention

2-secondary prevention

3- tertiary prevention



Define screening / prevention
and its use in family medicine.

Screening:



according to WHO:

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**.



According to Oxford handbook of general practice:

The ability to diagnose and treat a potentially **serious condition** at an early stage when it is still **treatable**.

An early disease detection or **Secondary Prevention**.

Aim 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**.



Prevention:

Merriam-Webster's dictionary defines prevention as “the act of preventing or hindering” and “the act or practice of keeping something from happening.”

Physicians efforts are aimed at preventing the untimely occurrences of the 5 Ds: death, disease, disability, discomfort, and dissatisfaction.



Identify levels of prevention
in primary care practice.

Levels of prevention:



Primary prevention



Secondary prevention



Tertiary prevention

Primary prevention:

- ▶ Intervening before health effects occur. (so we intervene before the disease occur.)
 - Examples:
 - **Vaccination** and post exposure **prophylaxis**.
 - Nutrition intervention and food supplementation.
 - **Health education**.
 - 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).

Secondary prevention:

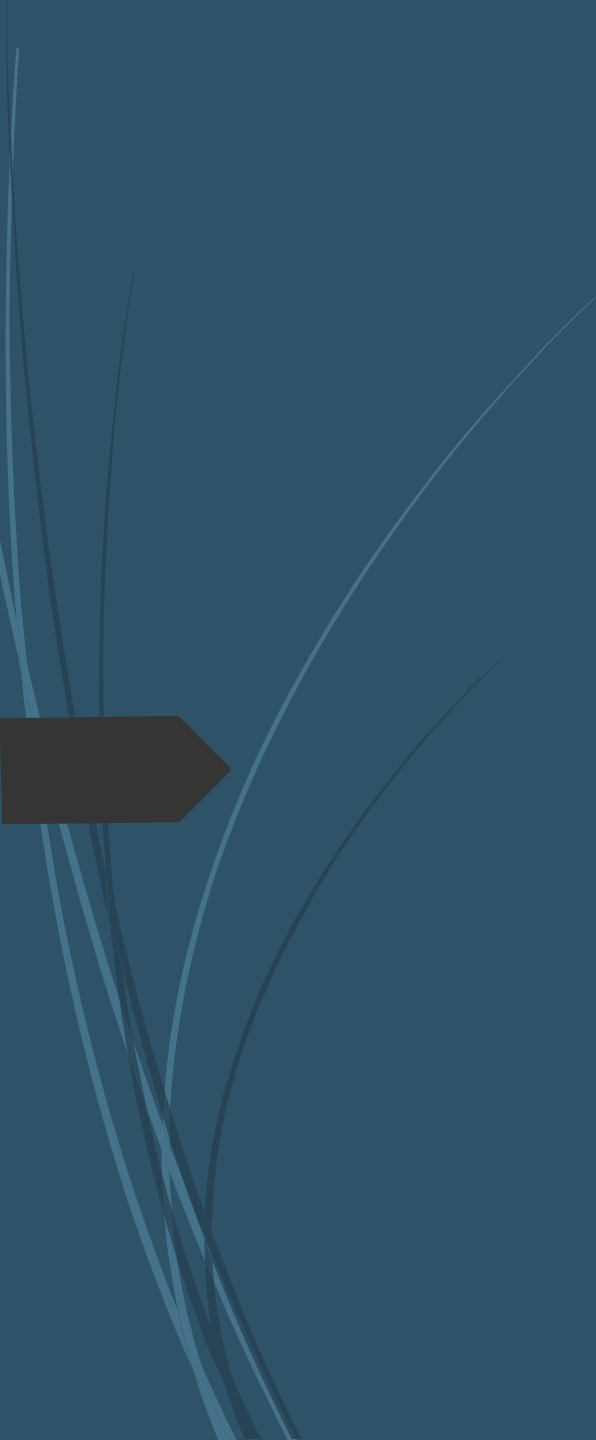
- ▶ Screening to identify diseases in the **earliest stages**, before the onset of **signs** and **symptoms**.
 - Examples:
 - Population-based **screening** programmes for **early detection** of diseases.
 - Provision of **maternal** and **child health** programmes, including **screening** and **prevention** of congenital malformations.
 - Provision of **chemoprophylactic** agents to control **risk factors**.

Tertiary prevention:

- Managing disease **post diagnosis** to **slow** or **stop** disease progression. (Prevention of **complications** once the disease is present).
 - Examples:
 - **Rehabilitation** programs. (post stroke patients).
 - **Palliative** therapy.
 - **Limiting complications** and **disability** in patients with established disease. (uncontrolled DM led to amputation).

Uses in family medicine:

- ❖ 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 many approaches including:
 - **Biochemical** (e.g., cholesterol, glucose),
 - **Physiologic** (e.g., blood pressure, growth curves),
 - **Radiologic** (e.g., mammogram, bone densitometry),
 - **Cytologic** (e.g., Pap smear).



Recognize the criteria of screening test.

Screening criteria:

- ▶ We have two screening criteria:
 - ▶ **WHO criteria** for good screening tests.
 - ▶ **Wilson-Jungner** Criteria for screening.

WHO criteria for a good screening test:

- The condition screened for should be an **important one**.
- There should be an **acceptable treatment** for patients with the disease.
- The facilities for **diagnosis** and **treatment** should be available.
- There should be a recognized **latent** or **early symptomatic stage**.

Cont.

- There should be a **suitable test** or **examination** which has few false positives (**specificity**) and few false negatives (**sensitivity**).
- The test or examination should be **acceptable to the population**.
- The **cost**, including diagnosis and subsequent treatment, should be **economically balanced** in relation to expenditure on medical care as a whole.

Wilson- Jungner Criteria for screening:



The condition being screened for ***should be an important health problem.***



The natural history of the condition should be ***well understood.***



There should be a ***detectable early stage.***



Treatment at an early stage should be of ***more benefit than at a later stage.***



A ***suitable test*** should be devised for the early stage.

Cont.



The test should be **acceptable**.



Intervals for repeating the test should be determined.



Adequate health service provision should be made for the extra clinical workload resulting from screening.



The risks, both physical and psychological, should be less than the benefits.

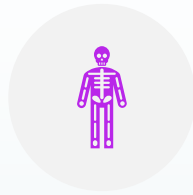


The **costs should be balanced** against the benefits.



Identify screening types and illustrate examples of targeted people.

Types of screening:



Mass screening.



Selective or high risk targeted screening.



Multiphasic screening.




Multipurpose screening.



Case finding or opportunistic screening.

Mass screening:

- ▶ Application of **screening** test to **large, unselected** population. Everyone is screened regardless of the probability of having the **disease or condition**.
- ▶ Examples:
 - **Visual defect** in school children.
 - **Mammography** for women above **40** years of age.
 - **Newborn screening** program.



Selective or high risk targeted screening:

➤ It is applied ***selectively to high risk groups.***

➤ Examples:

- **Screening** fetus for **Down's syndrome** in a mother who already has a baby with **Down's syndrome.**
- Screening for **familial cancers.**
- Screening for **cancer cervix** in **low** socioeconomical groups.
- Screening for **HIV in risk groups.**

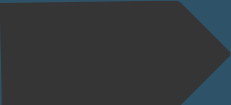
Multiphasic screening:

- ▶ The **screening** in which various **diagnostic procedures** are done during the same screening program, to carry out screening tests for a **single diseases**. The procedure may include **questionnaire**, **clinical examination** and a **range of measurements** and **investigations**.
- ▶ Examples:
 - **CBC** and **Hb** electrophoresis for Sickle cell anemia.
 - **PSA** and **PR** for prostate cancer.
 - **FBS** and **GTT** for DM.



Multipurpose screening:

- The screening of a population by ***more than one test*** done ***simultaneously*** to detect ***more than one disease***.
- Examples:
 - Screening in **pregnant woman** for **VDRL, HIV** and **HBV** by serology.



Case finding
or
opportunistic
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.

The U.S.
Preventive
Services Task
Force grades :

What are Preventive Services?

Preventive services consist of healthcare services that include check-ups, patient counseling, and screenings to prevent illness, disease and other health-related problems.

Grade	Definition	Suggestions for Practice
A	The USPSTF recommends the service. There is high certainty that the net benefit is substantial.	Offer or 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 or 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 or 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. If the service is offered, patients should understand the uncertainty about the balance of benefits and harms.

The U.S. Preventive Services Task Force levels of evidence :

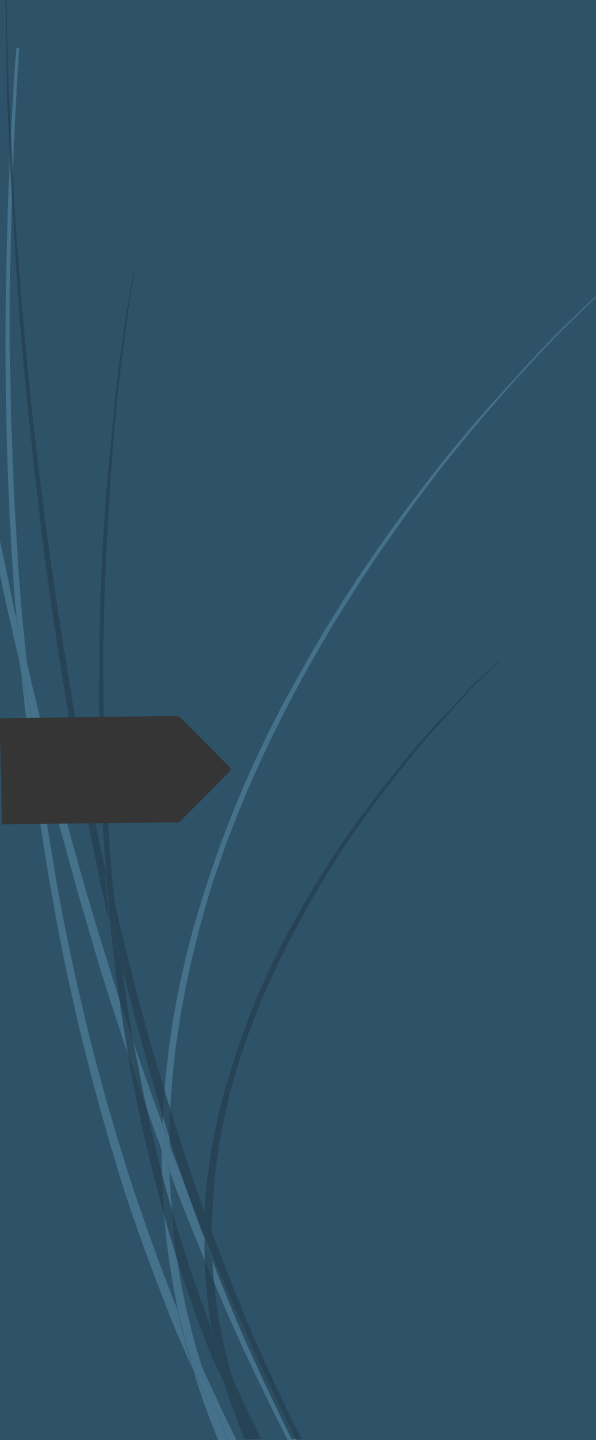
The USPSTF defines certainty as:

"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.

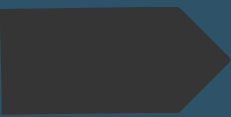
Level of Certainty*	Description
High	The available evidence usually includes consistent results from well-designed, well-conducted studies in representative primary care populations. These studies assess the effects of the preventive service on health outcomes. This conclusion is therefore unlikely to be strongly affected by the results of future studies.
Moderate	<p>The available evidence is sufficient to determine the effects of the preventive service on health outcomes, but confidence in the estimate is constrained by such factors as:</p> <ul style="list-style-type: none"> • 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. <p>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.</p>
Low	<p>The available evidence is insufficient to assess effects on health outcomes. Evidence is insufficient because of:</p> <ul style="list-style-type: none"> • 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. • Lack of information on important health outcomes. <p>More information may allow estimation of effects on health outcomes.</p>



Summarizes the
recommendations for
screening programs in adults.

Cholesterol measurements:

- ▶ **Cholesterol** screening is performed by a **blood test**.
- ▶ People with **high cholesterol** measurements from a **blood sample** have a **higher risk** for **cardiovascular disease** (CVD) than those with **cholesterol** in the **normal range**.



Pap test (also called Pap smears):

- **Pap smears** are samples of **cells** taken from the **cervix** in women to look for **cellular changes** indicative of **cervical cancer**.



Prostate specific antigen (PSA):

- This blood test measures the **prostate specific antigen (PSA)** levels in the blood.
- **Antigens** are any substances that evoke responses from a **person's immune system**.
- The prostate specific antigen levels can be **elevated** in the presence of **prostate cancer**. However, it is **important** to understand that other **benign prostate conditions** may also **elevate PSA**, such as **benign prostatic hyperplasia (BPH)**, which is noncancerous **swelling** of the prostate.



Mammography:

- **Mammography** is the process of using **low-energy X-rays** to examine the human **breast**. The goal of mammography is the **early detection** of **breast cancer**, typically through detection of characteristic **masses or microcalcifications**.

Colonoscopy:

- ▶ **Colonoscopy** or **coloscopy** is the **endoscopic** examination of the **large bowel** and the **distal part** of the **small bowel** with a CCD camera or a fiber optic camera on a flexible tube passed through the **anus**.
- ▶ It can provide a **visual diagnosis** and grants the opportunity for **biopsy** or **removal** of **suspected colorectal cancer lesions**.
- ▶ Colonoscopy can **remove polyps** as small as one millimeter or less. Once polyps are removed, they can be studied with the aid of a **microscope** to **determine** if they are **precancerous** or **not**.



Diabetes or prediabetes:

- ▶ There are two simple tests used in diabetes screening, **The fasting plasma glucose test** involves checking the **level of glucose** in your blood while you are **fasting**, **The oral glucose tolerance test (OGTT)** involves **drinking a sugary solution two hours** before you have your blood drawn.



Osteoporosis:

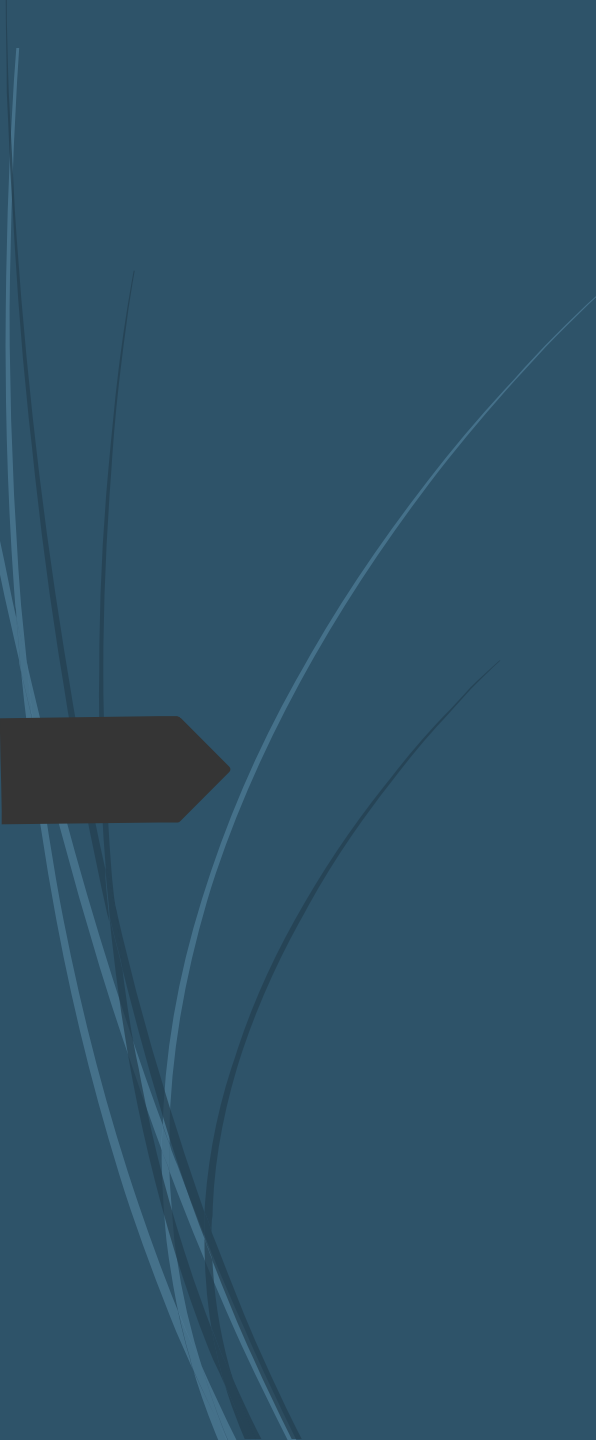
- ▶ **American academy** of family physicians:
 - ▶ Women aged **65** years and **older**.
 - ▶ Women aged **60** years and **older** at increased risk for **osteoporotic fractures**.

- ▶ **United States Preventive Services Task Force:**
 - ▶ All women aged **65** and **older**.
 - ▶ In addition, they recommend screening in **younger women** whose **fracture risk** is **equal** to or **greater** than that of **65** years old.



Continue

- ▶ **National osteoporosis foundation:**
 - ▶ All women aged **65** years and **older**.
 - ▶ All men aged **70** years and **older**.
 - ▶ Younger **postmenopausal** women, women in **menopausal transition** and men aged **50** to **69** years of age with clinical **risk factor** for **fracture**.
 - ▶ Adults who have **fracture after** the **age of 50 years**.
 - ▶ Adults with a **condition** (e.g. Rheumatoid arthritis) or taking **medications** (e.g. Steroids) associated with **low bone mass or bone loss**.



Explain appropriate approach for prevention and screening of common problems in primary care.

Breast cancer:

Screening and Prevention method:

- **Conventional Digital Mammography.**

Population:

- **Women above 40 years of age.**

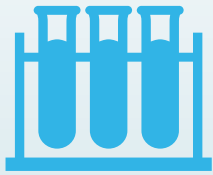
Screening intervals:

- **Annual** screening **mammography** should be **offered** to women 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 **annually**.
- Women should continue screening **mammography** as long as their overall health is **good** and they have a **life expectancy of 10 years or more**.

Cervical cancer:

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

Endometrial cancer:



No Screening test or procedure.



Targeted 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.

Lung cancer:



Screening test or procedure:

Low dose CT chest.



Targeted 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.

Colorectal cancer:



Screening test or procedure:

See Next slide.



Targeted population:

Men and women, 45 to 85 years.



From **76 to 85** screening should be based on Patient's preference, Life expectancy, Health and Screening history.



Screening is discouraged after the age of **85** due to risk of **increased mortality & screening complication.**

Screening methods for 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.



Targeted population:

Men from 55 to 69 years of age.



Men who have at least a 10-year life expectancy, screening should not occur without an informed decision-making process due to the potential benefits, risks and uncertainties associated with the screening.



Indicate the pros and
cons of screening.

Pros of screening:



Improved prognosis for some cases detected by screening.



Less radical treatment for some early cases.



Reassurance for those with negative test results.



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



Economical saving on future treatment.

Cons of screening:



Longer morbidity in cases where prognosis is unaltered.



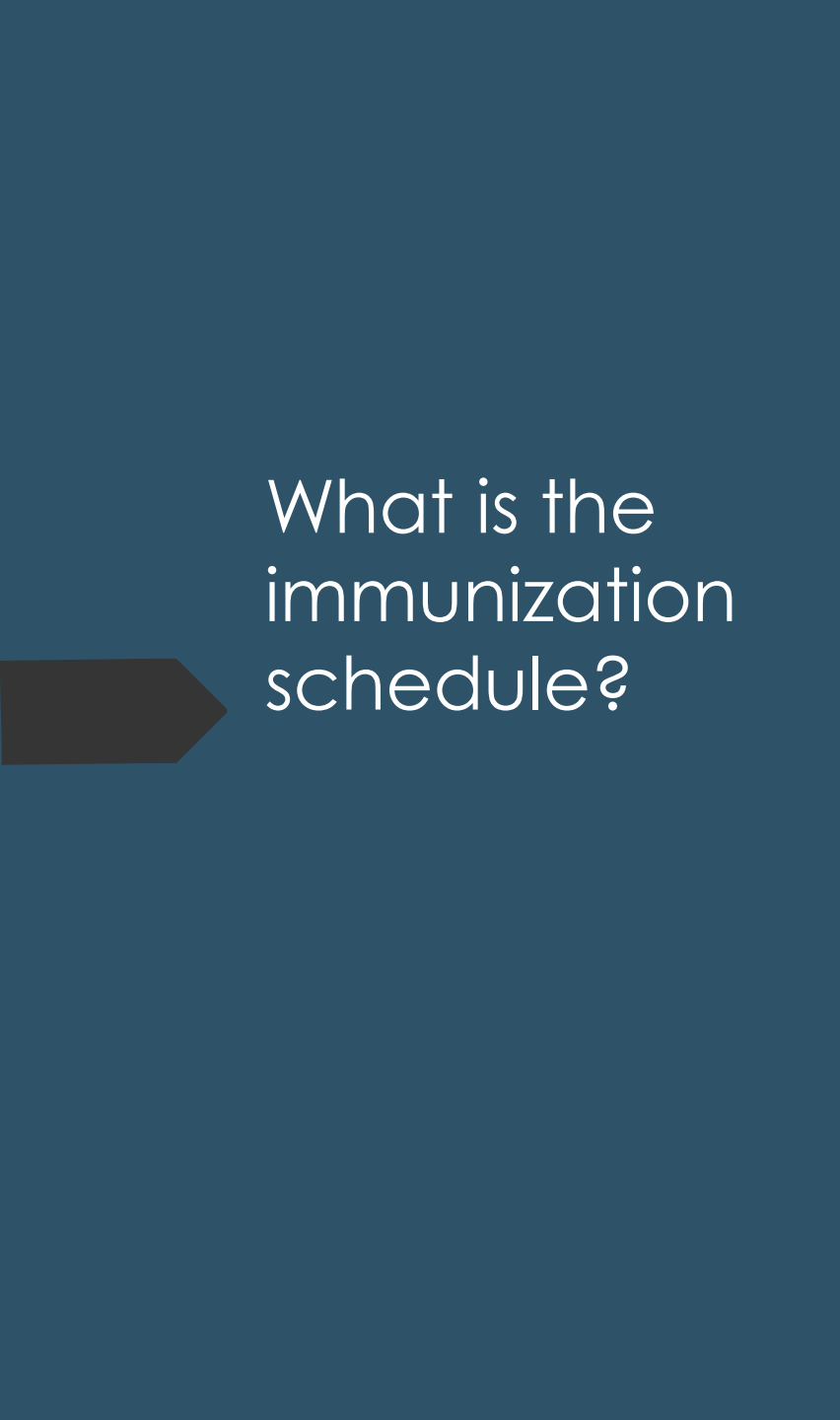
False reassurance for those with false-negative results.



Anxiety, Unnecessary intervention and sometimes morbidity for those with false -positive results.



Review the local vaccination schedule from Saudi M.O.H.



What is the
immunization
schedule?

- The basic **vaccinations** identified in the **Vaccination Certificate**, from **birth** until the **first grade**.

What is the aim of this vaccination schedule?



To protect **children** in the Kingdom and **all target groups** in the the community against diseases targeted by **immunization**.



To maintain the Kingdom **polio-free** and to get rid of **measles, rubella** and **mumps**.



To **reducing** the **infection** rates of other diseases targeted by immunization.

THE VACCINATION SCHEDULE:

Vaccine	التطعيم	الزيارة Visit
<ul style="list-style-type: none"> • BCG • Hepatitis B 	<ul style="list-style-type: none"> • درن • التهاب كبدي (ب) 	عند الولادة At Birth
<ul style="list-style-type: none"> • IPV • DTaP • Hepatitis B • Hib • Pneumococcal Conjugate (PCV)* • Rota** 	<ul style="list-style-type: none"> • شلل أطفال معطل • الثلاثي البكتيري • التهاب الكبد (ب) • المستدمية النزلية • البكتيريا العقدية الرئوية* • فيروس الروتا** 	عمر شهرين 2 Months
<ul style="list-style-type: none"> • IPV • DTaP • Hepatitis B • Hib • Pneumococcal Conjugate (PCV)* • Rota** 	<ul style="list-style-type: none"> • شلل أطفال معطل • الثلاثي البكتيري • التهاب الكبد (ب) • المستدمية النزلية • البكتيريا العقدية الرئوية* • فيروس الروتا** 	عمر ٤ شهور 4 Months
<ul style="list-style-type: none"> • OPV • IPV • DTaP • Hepatitis B • Hib • Pneumococcal Conjugate (PCV)* 	<ul style="list-style-type: none"> • شلل الأطفال الفموي • شلل أطفال معطل • الثلاثي البكتيري • التهاب الكبد (ب) • المستدمية النزلية • البكتيريا العقدية الرئوية* 	عمر ٦ اشهر 6 Months
<ul style="list-style-type: none"> • Measles • Meningococcal Conjugate quadrivalent (MCV4) 	<ul style="list-style-type: none"> • الحصبة المفرد • الحمى الشوكية الرباعي المقترن 	عمر ٩ أشهر 9 Months
<ul style="list-style-type: none"> • OPV • MMR • Pneumococcal Conjugate (PCV)* • Meningococcal Conjugate quadrivalent (MCV4) 	<ul style="list-style-type: none"> • شلل الأطفال الفموي • الثلاثي الفيروسي • البكتيريا العقدية الرئوية* • الحمى الشوكية الرباعي المقترن 	عمر ١٢ شهر 12 Months
<ul style="list-style-type: none"> • OPV • DTaP • Hib • MMR • Vericella • Hepatitis A 	<ul style="list-style-type: none"> • شلل الأطفال الفموي • الثلاثي البكتيري • المستدمية النزلية • الثلاثي الفيروسي • الجدري المائي • التهاب الكبد (أ) 	عمر ١٨ شهر 18 Months
<ul style="list-style-type: none"> • Hepatitis A 	<ul style="list-style-type: none"> • التهاب الكبد (أ) 	عمر ٢٤ شهر 24 Months
<ul style="list-style-type: none"> • OPV • DTaP(Td)*** • MMR • Varicella 	<ul style="list-style-type: none"> • شلل الأطفال الفموي • الثلاثي البكتيري (الثنائي البكتيري)*** • الثلاثي الفيروسي • الجدري المائي 	عند دخول الصف الأول الإبتدائي School Entry



Back to our MCQs



A/ Which one of the following is multipurpose screening :

- 1-CBC and Hb electrophoresis in sickle cell anemia.
- 2-Screening in pregnant woman for VDRL, HIV and HBV by serology.
- 3-Screening for familial cancers.
- 4-Screen school children for visual defect.



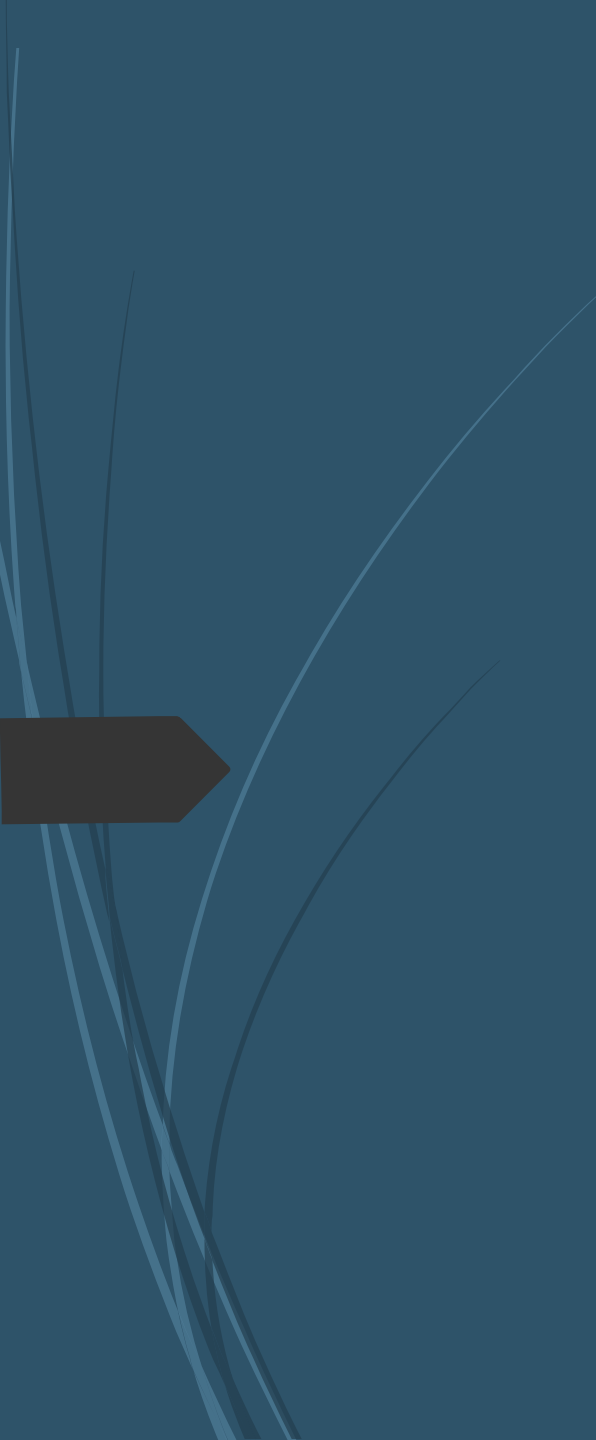
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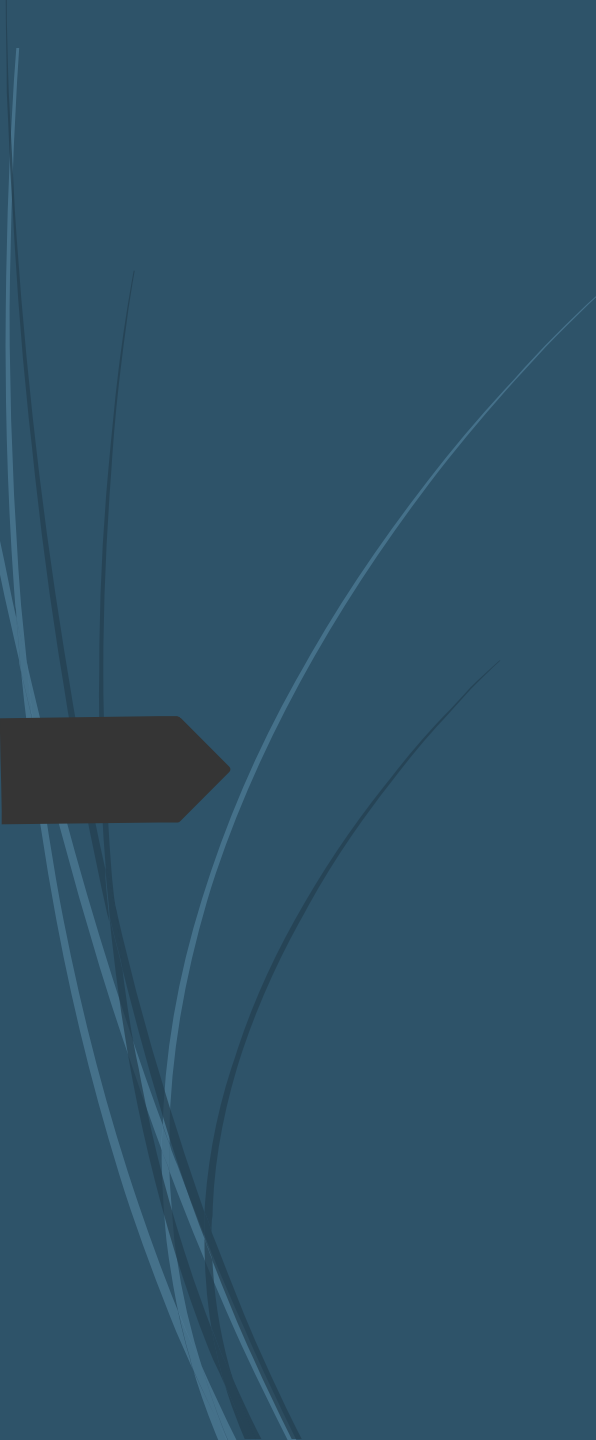
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3-low dose ct chest

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C/which one of the following is a primary prevention of colorectal cancer?

1-High intake of fibers

2-High intake of red meats

3-Sitting regularly for prolonged periods

4- alcohol use



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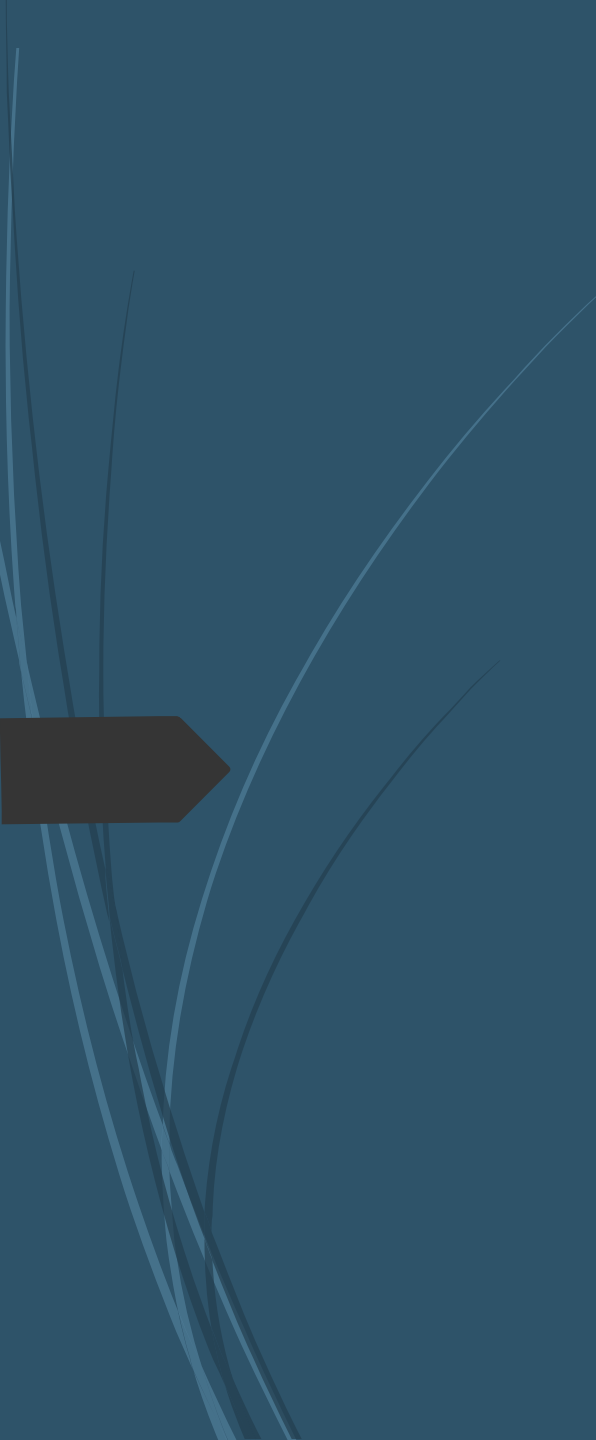
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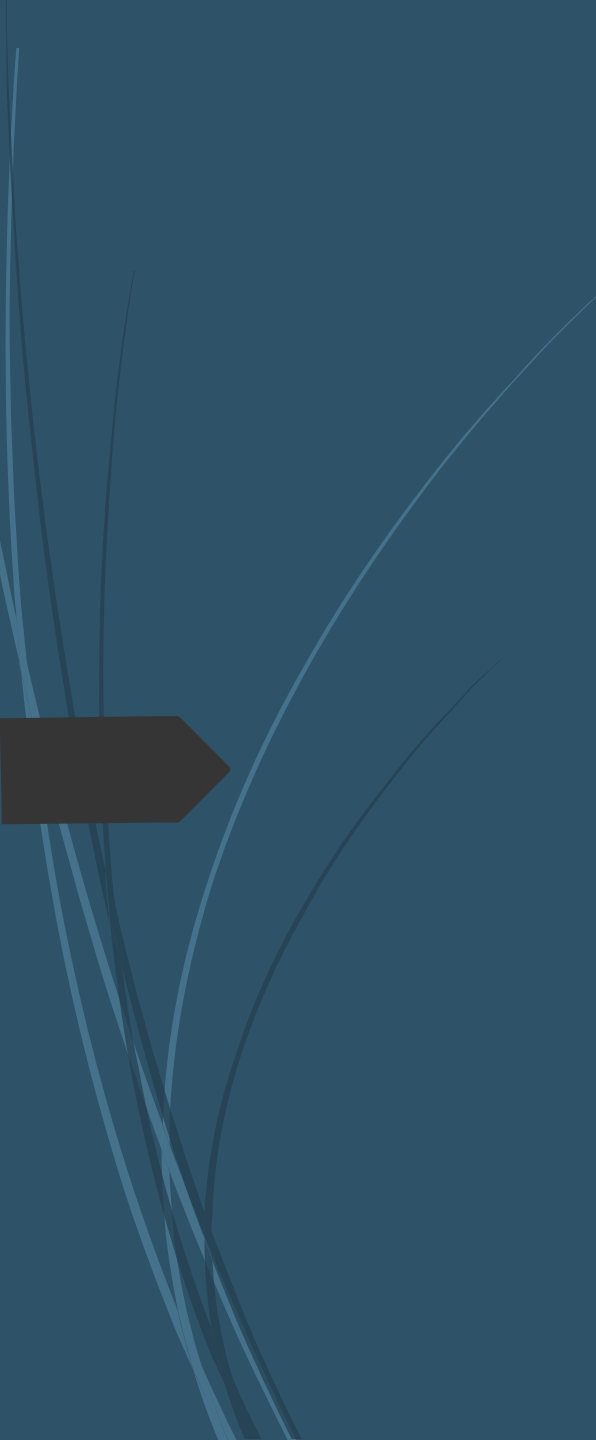


E/2 years old boy came with Accommodative esotropia, the physician told the parent that he should wear glasses to prevent amblyopia, what type of prevention is it?

1-primary prevention

2-secondary prevention

3- tertiary prevention



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Case

A 51-year-old man, comes to your office because one of his friends was recently diagnosed with colorectal cancer. He is wondering whether he should be screened too.

- Do you need more information for this case?

He has no family history of cancer and no gastrointestinal symptoms .

- what is the available methods for screening this case?

1-Flexible sigmoidoscopy every five years.

2- Multitarget stool DNA test every 3 years.

3-Colonoscopy every 10 years.



Case

-If the patient asks for help choosing a screening method. What is the most appropriate response?

Explain the risks and benefits of various screening methods and elicit his preference.

Provide information on the local availability and quality of each testing method.

References:

- ▶ - Oxford Handbook of General practice
- ▶ - U.S. Preventive Services Task Force recommendations “USPSTF”
(<https://www.uspreventiveservicestaskforce.org/Page/Name/recommendations>)
- ▶ - Saudi Ministry of Health vaccination schedule
(<https://www.moh.gov.sa/en/HealthAwareness/EducationalContent/vaccination/Pages/vaccination1.aspx>)



Questions

Thanks

