SCREENING AND PREVENTION

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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.
- Summaries 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

Which of the following is a multiphasic screening?

a. CBC and Hb electrophoresis in sickle cell anemia.

b. Screening for familial cancers.

c. Newborn screening.

d. Screen school children for visual defect.

Which of the following is a criterion for screening test?

a. The natural history of the disease is not well understood.

b. Its risk outweighs the benefit.

c. Treatment of the early disease should benefit the patient more than later in the disease.

d. The disease that is being screened is detected at late stages.

All of the following are considered primary prevention methods for breast cancer EXCEPT:

a. Early pregnancy

b. Breastfeeding

c. Oral contraceptives

d. Exercise

Which of the following stages of prevention is considered screening?

a. Primary Prevention.

b. Secondary Prevention.

c. Tertiary Prevention.

A 60 year-old patient had a major stroke. He is unable to stand without assistance, can’t walk and his speech is affected. He is referred by his physician to stroke rehabilitation center. What is the level of prevention ?

a. Primary prevention.
b. Secondary prevention.
c. Tertiary prevention.

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

a. Natural history of illness is well understood
b. Detectable at early age
c. Acceptable to the population
d. Test has to be highly specific

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:

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

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

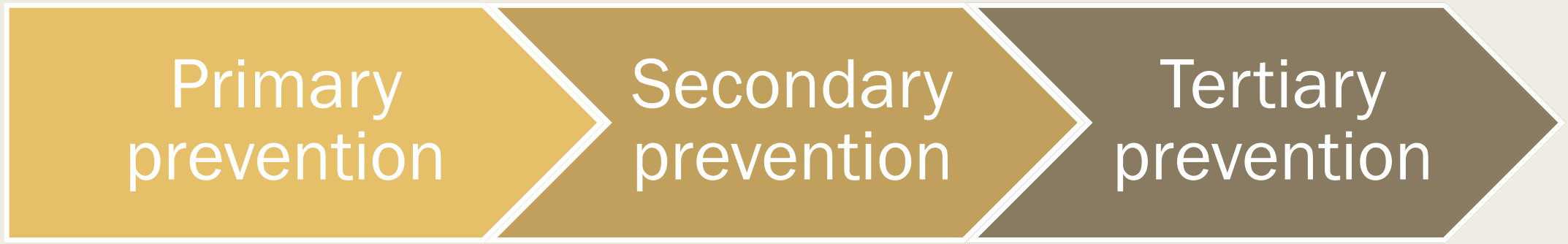
Prevention:

- 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:

- 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.

SUMMARIES 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.*

Con.

- National osteoporosis foundation:
  - *All women aged 65 years and older.*
  - *All men aged 70 years and older.*
  - *Younger postmexnopausal 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?

1. To protect children in the Kingdom and all target groups in the the community against diseases targeted by immunization.
2. To maintain the Kingdom polio-free and to get rid of measles, rubella and mumps.
3. To reducing the infection rates of other diseases targeted by immunization.

THE VACCINATION SCHEDULE:

Vaccine	التطعيم	Visit الزيارة
• BCG • Hepatitis B	• درن • التهاب كبدي (ب)	عند الولادة At Birth
• IPV • DTaP • Hepatitis B • Hib • Pneumococcal Conjugate (PCV)* • Rota**	• شلل أطفال معطل • الثلاثي البكتيري • الالتهاب الكبدي (ب) • المستدمية النزلية • البكتيريا العقدية الرئوية* • فيروس الروتا**	عمر شهرين 2 Months
• IPV • DTaP • Hepatitis B • Hib • Pneumococcal Conjugate (PCV)* • Rota**	• شلل أطفال معطل • الثلاثي البكتيري • الالتهاب الكبدي (ب) • المستدمية النزلية • البكتيريا العقدية الرئوية* • فيروس الروتا**	عمر ٤ شهور 4 Months
• OPV • IPV • DTaP • Hepatitis B • Hib • Pneumococcal Conjugate (PCV)*	• شلل الأطفال الفموي • شلل أطفال معطل • الثلاثي البكتيري • الالتهاب الكبدي (ب) • المستدمية النزلية • البكتيريا العقدية الرئوية*	عمر ٦ اشهر 6 Months
• Measles • Meningococcal Conjugate quadrivalent (MCV4)	• الحصبة المفرد • الحمى الشوكية الرباعي المقترن	عمر ٩ أشهر 9 Months
• OPV • MMR • Pneumococcal Conjugate (PCV)* • Meningococcal Conjugate quadrivalent (MCV4)	• شلل الأطفال الفموي • الثلاثي الفيروسي • البكتيريا العقدية الرئوية* • الحمى الشوكية الرباعي المقترن	عمر ١٢ شهر 12 Months
• OPV • DTaP • Hib • MMR • Vericella • Hepatitis A	• شلل الأطفال الفموي • الثلاثي البكتيري • المستدمية النزلية • الثلاثي الفيروسي • الجديري المائي • الالتهاب الكبدي (أ)	عمر ١٨ شهر 18 Months
• Hepatitis A	• الالتهاب الكبدي (أ)	عمر ٢٤ شهر 24 Months
• OPV • DTaP(Td)*** • MMR • Varecilla	• شلل الأطفال الفموي • الثلاثي البكتيري (الثنائي البكتيري)*** • الثلاثي الفيروسي • الجديري المائي	عند دخول الصف الأول الإبتدائي School Entry

https://www.moh.gov.sa/en/HealthAwareness/EducationalContent/vaccination/Pages/vaccination1.aspx

BACK TO OUR MCQS

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All of the following are considered primary prevention methods for breast cancer EXCEPT:

a. Early pregnancy.

b. Breastfeeding.

c. Hormonal therapy.

d. Exercise

Which of the following stages of prevention is considered screening?

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b. *Secondary Prevention.*

c. Tertiary Prevention.

A 60 year-old patient had a major stroke. He is unable to stand without assistance, can't walk and his speech is affected. He is referred by his physician to stroke rehabilitation center. What is the level of prevention ?

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c. Acceptable to the population.

d. *Test has to be highly specific.*

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