PHC

432 Team

7

SCREENING CANCERS IN FAMILY PRACTICE

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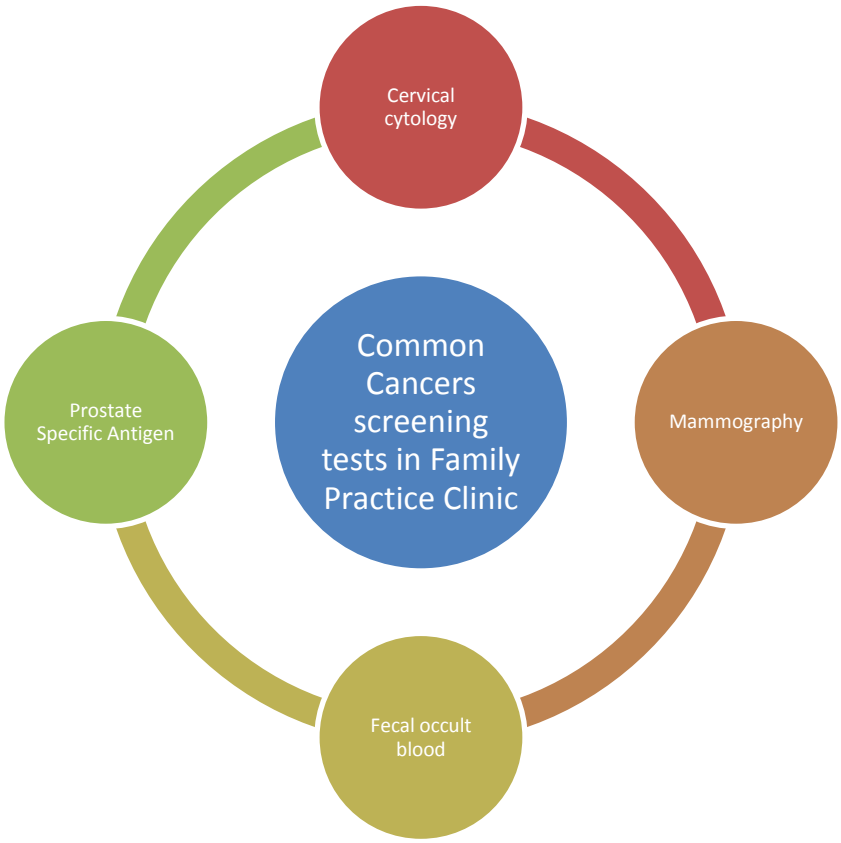
COLOR GUID: Doctor's Notes Team Notes **slides** Not important **Important** **431 team work**

Objectives

1. What does it mean by screening?
2. Criteria for screening.
3. Target people.
4. Common cancers to be screened e.g. Breast, Cervix, Colon and Prostate Cancers.
5. How these common cancers are screened (Examination, Markers, …..).
6. Cost effectiveness.



Screening for common cancers

Screening Definition:

Is a strategy used in a population to identify an unrecognized disease in individuals without signs or symptoms.

OR

Application of certain procedures to populations by doctor initiative, **with the aim of identifying asymptomatic disease** or **people at risk from it.**

- **Screening is a form of secondary prevention.**

Criteria for screening: (Wilson criteria):

1. **Knowledge of disease:**
    a. The condition should be important.
    b. There must be a recognizable latent or early symptomatic stage.
    c. The natural course of the condition, including development from latent to declared disease, should be adequately understood.
2. **Knowledge of test:**
    a. Suitable test or examination.
    b. Test acceptable to population.
    c. Case finding should be continuous.
3. **Treatment for disease:**
    a. Accepted treatment for patients with recognized disease.
    b. Facilities for diagnosis and treatment available.
    c. Agreed policy concerning whom to treat as patients.
4. **Cost considerations:**
    a. Costs of case finding (including diagnosis and treatment of patients diagnosed) economically balanced in relation to possible expenditures on medical care as a whole.

Wilson criteria (using the mnemonic IATROGENIC)

- Important – the condition should be an important one
- Acceptable treatment for the disease
- Treatment and diagnostic facilities should be available
- Recognizable at an early stage of symptoms
- Opinions on who to treat as patients must be agreed
- Guaranteed safety e.g. low radiation exposure
- Examination must be acceptable by the patient
- Natural history of the disease must be known
- Inexpensive test
- Continuous screening i.e. not a one-off

THE COMMON CANCERS SHOULD BE SCREENED IN FAMILY PRACTICE CLINIC:

Cervical Cancer	Colon Cancer
Breast Cancer	Prostate Cancer

A) Cervical Cancer:

➢ Incidence of cervical cancer:

- Cervical cancer is the 12th most common cancer among women females in the UK (2010), according for 2% of all new cases of cancer in females.
- In 2010 there were 2,851 new cases of cervical cancer in the UK.
- The crude incidence rate shows that there are around 9 new cervical cases for every 100,000 females in the UK
- **Cervical screening is not a test for cancer.**
- **It is a method of preventing cancer** by detecting and treating early abnormalities which, if left untreated, could lead to cancer in a woman's cervix.
- Early detection and treatment can prevent 75 per cent of cancers developing but like other screening tests, it is not perfect. It may not always detect early cell changes that could lead to cancer.

➢ What is Screening Tool for Cervix:

- It is **Pap smear** (A microscopic technique to examine vaginal debris - first developed by zoologist George N.Papanicolaou.)
- **The Pap smear has been the model for cancer screening.**
- Pap tests aims to**identify abnormal cells sampled from the transformation zone**, the junction of ecto- and endocervix, where cervical dysplasia and cancers arise.

Pap-Test dilemma:

a. It is a Screening test to be administered to asymptomatic patients.
b. Not a diagnostic test to confirm or refute the suspicion of disease.
c. More than 50% of women who has cervical cancer had never been Pap smeared

➢ Effectiveness of Pap smear Test:

- **More sensitive of detecting**Cervical Squamous cell malignancy.
- Squamous cell carcinoma of cervix is more prevalent than adenocarcinoma of cervix. .
- C***ure rates were higher for women with cervical cancer detected by screening*** *as compared to those diagnosed by symptoms.*
- This screening tool can detect **very early changes**, if untreated, could lead to invasive cervical cancers over the course of years.

➢ Who are the high Risk group:

1. Low socioeconomic class.
2. Early age of first sexual intercourse.
3. Early age of first pregnancy.
4. Multiple sexual partners.
5. Frequent pregnancies.
6. Human pappiloma virus- type 16,18 and 33.
7. Smoking doubles the risk of cervical cancer.

➢ Potential Errors in sampling & evaluating Pap-smear:

1) Clinician may not sample the area of cervical abnormality.
2) Abnormal cells may not be plated on the slide.
3) Cells may not be adequately preserved with fixative.
4) Cytopathologist may not identify the abnormal cells.
5) The cytologist may inaccurately report the findings.

➢ Cervical Screening Intervals:

All women should receive their first invitation for routine screening at age of 25.

In younger age range cervical screening interval have been reduced from 5 to 3 years

Age group (years)	Frequency of Screening
25	First invitation
25-49	3 yearly
50-64	5 yearly
65 +	Only those who are not screened till age of 50 or had recent abnormal test

➢ Role of Family Physician in Cervical Screening:

- Should have an **effective call –and –recall system** for inviting women registered with them for screening.
- Patient should **ensure to keep their correct contact** details with Family physician.
- During family planning clinics, any women with overdue smears and had no recent cervical smears done, should be offered smears.

➢ Limitation of Cervical Screening Tests

- A false -negative rate of about 10% for carcinoma in situ.(even necrotic tumors can give a negative results)
- A false –positive rate of about 5 %(smears showing mild dysplasia).
- **Sampling problems**: the squamocolumnar junction not always accessible.
- Possible causes which may upset interpretation like;
  (Menstruation, Pregnancy, Contraceptive pills, Intrauterine device and Polyps).

Human Pappiloma Virus Immunization & Future of Cervical Screening:

- HPV Type 16 and 18 – the most carcinogenic of the pappiloma viruses.
- They causes 70 % of cervical cancers worldwide.
- **Two vaccines types** has been licensed for protection.

Advantages of Vaccines:

- Offer high level of protection.
- 98% seropositivity at 4.5 years follow-up.
- A significant reduction in the number of pre-cancerous changes in immunized individuals.
- Vaccine also protects genital warts.

➢ Issues of HPV-Vaccines:

- In spite of the Vaccine the Cervical Screening program will continue b/c clinical trial data has shown that it will not protect all HPV types that cause cervical cancer.
- Parental concerns over sexual implications of HPV immunization may also reduce uptake of this Vaccine, thereby reducing the efficacy of the HPV-immunization program.

B) Screening For Bowel Cancer:

➢ Introduction:

- **Colorectal Cancer(CRC) is a common & lethal disease.**
- **2nd leading cause of Cancer deaths.**
- **Worldwide, it is 2nd most commonly diagnosed cancer in women & third most common in Men.**
- Approximately 1 in3 people who develop CRC die of this disease.

➢ Screening Rationale:

- Removal of premalignant adenomas can prevent the cancer and removal of localized cancer can prevent CRC-related deaths.
- Progression from adenoma to carcinoma take at least 10-years on average.

➢ Risk Factors affecting Screening recommendations:

over age of 60 year	Lack of exercise
A previous Colon polyp	Obesity
Personal history of IBS	Family history
Diet: high fat & red meat, low vegetables, folate and fiber	Smoking and alcohol
Personal history of colon cancer	

Twice a year screening for colorectal cancer using **Fecal Occult Blood (FOB) tests** reduces mortality by 16%.

➢ Screening: (by fecal occult blood FOB)

1. Every two years if still within the eligible age range for routine screening.
2. If the result is abnormal, they will be referred for a colonoscopy.
3. If the result is unclear, FOB test will need to be repeated.

➢ Fecal occult blood test:

1) Fecal occult blood (FOB) test works by detecting tiny amounts of blood which cannot normally be seen in colon motions.
2) The FOB test does not diagnose Colon cancer, but the results will indicate whether further investigation (colonoscopy) is needed.
3) **Fecal occult blood = screening test for colon cancer.**
4) **Colonoscopy = diagnostic test for colon cancer.**

Advantages of FOB-Tests Screening :	Disadvantages of FOB-Tests Screening:
1. Non-invasive. 2. More cost effective with few colonoscopies needed for follow-up. 3. Simple to administer.	1. Inconvenience. 2. Relative insensitivity – occult blood is not uniformly distributed in feaces and some lesions bleed intermittently. 3. Relative non-specificity-lesions other than cancer can generate positive tests. 4. Compliance (wide variation).

➢ **How good is the TEST in practice:**

1. **2% of those screened** will have a positive FOB and should be offered colonoscopy.
2. Of those undergoing Colonoscopy :
   - 10 % will have bowel Cancer.
   - 30% will have polyps.
   - 40% will have no abnormality.
3. **Bleeding** tends to occurs **relatively late in the tumors** natural history.
4. If the test is negative there is still a 1 in 200 chance of a cancer and 1 in 50 chance of an adenoma in the next 4 years.

- All men and women aged 60-69 should be checked every 2 –yearly with FOB.
- Any one Over-70s can also be included(optional)

➢ **Other Screening Tools:**

- **Colon Imaging.**
  - ntrast barium enema. ---- every 5 –years
  - Computed Tomographic Colonography ---- every 5 years.

- **Endoscopies.**
  - Flexible Sigmoidoscopy --- every 5-years.
  - Colonoscopy --- every 10- years.

C) Screening For Prostate Cancer:

➢ **Incidence & prevalence:**

- 2nd most common cause of Cancer and Cancer deaths, in men both in UK & USA.
- About 10,000 men die annually of prostate cancer.

➢ **Screening:**

- **Prostate –Specific Antigen (PSA)** – the common name for all. PSA is a blood test to check the level of PSA in blood. Most healthy men have levels under 4 nano-gram per milliliter of blood.

Age group	PSA cut-off
50-59	≥3
60-69	≥4
70 or over	>5

Dilemmas in Measuring PSA:

- **Digital Rectal Examination (DRE) has <u>minimal effects on PSA levels</u>** – causes transient elevation of only 0.26-0.4d ng/ml, PSA can be measured immediately after DRE.
- Ejaculation can increase PSA levels by up to 0.8 ng/ml, levels returns to normal within 48 hrs.
- After treating Bacterial Prostatitis, PSA returns to normal six to eight weeks after symptoms resolve.
- **Acute Urinary retention** may elevate PSA levels, l*evels decrease by 50% within one to two days following resolution*.

➢ Some FACTS about PSA:

- The PSA test is currently the best method of identifying localized prostate cancer.
- 75% of men with <u>raised **PSA** had No prostate Cancer on Biopsy</u>.
- More than 50% of patients with raised **PSA**will become Normal when repeated 6 weeks later.
- **PSAis raised by UTI, BPH, recent ejaculation, vigorous exercise, and prostatitis**.
- **PSA** cannot differentiate *aggressive* from *indolent* cancer.
- **PSA** raises with age& Age related Reference Values should be used.
- A borderline PSA in an asymptomatic man should be repeated in 1-3 months .Any rising trend should be referred urgently.
- **Screening is not recommended in men 75 –years of age with less than 10-years life expectancy** , as treating at this age group is unlikely to improve the survival.

➢ Digital Rectal Examination(DRE):

Doctor inserts a gloved, lubricated finger into the rectum to feel for any bumps or hard areas on the prostate that may need to be tested for cancer.

- Can detect Cancers only in the Posterior & lateral aspects of prostate gland.
- Only 85% of the prostate cancers arise peripherally which can be detected by DRE.
- DRE has a sensitivity of 59%& specificity of 94%.
- Majority of cancers detected by DRE has already been clinically and pathologically advanced.

➢ DRE v/s PSA:

- Studies have reported, **more than 45% cancers are detected only by PSA**; while **only 18% are detected solely by DRE**.
- Both PSA & DRE are somewhat complementary , and their combined use can increase the overall rate of detection

If the results of the PSA ± DRE suggest that having a prostate cancer, do a prostate biopsy to find out.

➢ Biopsy Risks:

Prostate Biopsies may also **miss findings cancers** and can rarely cause serious infections.

Biopsy can lead to **serious anxiety**&**physical discomfort.**

➢ To Screen Or Not To Screen:

The Current evidence does not support "National Screening Program "because over-diagnosis and over-treatment are significant problem.

1. There is controversy about which screen-detected lesions will become clinically significant. Current methods of screening involve measurement of PSA, followed by Transrectal ultrasound scanning and biopsy, but these lack adequate specificity and sensitivity. There are three major treatment options for localized disease: radical prostatectomy, radical radiotherapy, and monitoring with treatment if required.
2. There is no randomized controlled trial evidence to suggest a survival advantage of any of these treatments, and each has risks.

D) Screening For Breast Cancer:

➢ The size of the Problem :

- The major form of Cancer among women.
- Among 20% of female cancer deaths, **it is the most common cause of death in women aged 35-54**.
- In UK, highest breast cancer mortality rate.

➢ Risk Factors:

Female sex	**Previous breast cancer**	**Previous endometrial or ovarian cancer.**
Family History	**Age(peak incidence after age45)**	**Social Class: one of the few cancers to have higher risk in more affluent class.**

Risk Group:

1. *Healthy women aged 50–70 years are eligible for routine breast screening.*
2. *Women at increased risk of breast cancer (such as with a strong family history of breast cancer) may be eligible for breast screening before 47 years of age.*
3. *Hormone Replacement Therapy (HRT):*
Long-term use of combined estrogen and progesterone increases the risk of breast cancer. This risk seems to return to that of the general population after discontinuing them for five years or longer.
4. *Increase Menstrual periods: either by early menarche or late menopause:*
Women who have had more menstrual cycles because they started menstruating early (before age 12) and/or went through menopause later (after age 55) have a slightly higher risk of breast cancer. The increase in risk may be due to a longer lifetime exposure to the hormones estrogen and progesterone.

Prolonged Estrogen exposure and increased Risk	What will decrease the Risk
➢ Early menarche & late menopause. ➢ Estrogen used in HRT and OCP. ➢ Obesity – increase endogenous estrogen.	Breaks in estrogen exposure due to **childbirth** **and** **breast feeding** reduces breast cancer risk.

➢ **Prognosis:**

- On average, 2/3 of all women are alive 5-years after diagnosis.
- Females diagnosed with early local disease do far better than metastatic spread.

➢ **Role of mammography (*screening test for breast cancer*):**

Breast screening uses mammography (radiography) to find small changes in the breast before there are any other signs or symptoms of breast cancer.

Some Histological facts:

➢ The tissues of young women's breast is dense, resulting in practical difficulties in interpretation.

"MRI OR Ultrasound is recommended in younger women".

➢ Premenopausal thinning makes mammography easier in older (50+) women.

Some psychological facts:

- All women undergoing screening **experience anxiety** about undergoing tests, awaiting results, experiencing indignity.
- Some may become even **phobic**.

➢ What are the benefits and harms of mammography:

The benefits include	The harms include
• It detects breast lumps too small to be palpated, and 5-years survival is better for early disease. • The sensitivity of modern mammography is about 80% and specificity of 95%. • Still clinical examination can pick-up 50-60% of the abnormal cases. • This procedure gives very low –level X-ray exposure of about 1 rad. • UK-Breast Cancer Screening Program screening decreases deaths by 48%. • Women chose to attend Screening v/s not to choose, there found 35% reduction in Breast cancer cases.	• Over-diagnosis leading to unnecessary treatment. (Over-diagnosis refers to the detection of breast cancers through screening that would not have been diagnosed without screening and would not have threatened the lives of the women concerned.) • False-positive mammograms leading to unnecessary further investigations. • False reassurance due to missed cancer and incorrect diagnosis. • Pain and discomfort due to mammography. • Psychological distress. • Radiation exposure, which may increase the risk of breast cancer.

➢ Breast Self-examination:

- Worthwhile preventive exercise, should be taught at every available opportunity.
- But evidence is shaky like; showed no reduction in overall mortality but increases number of invasive investigations & benign results.
- At the same time a sense of Guilt engendered in patients who fail to self-examine before it's too late.

➢ Alternative Concept of Breast awareness:

- Females should be encouraged to get familiar with the feeling of normal breast through-out their monthly cycles.
- Regularly reporting any changes from abnormality rather than regular systemic self-examination.

Summary

1- ScreeningIs a strategy used in a population to identify an unrecognized disease in individuals without signs or symptoms.

2- The criteria for screening: Knowledge of disease, Knowledge of test, Treatment for disease and Cost considerations.

3- Common cancers :

a. **Cervical Cancer: The Pap smear has been the model for cancer screening**
b. **Screening for Bowel Cancer: Screening for colorectal cancer using Fecal Occult Blood (FOB) tests**
c. **Screening for Prostate Cancer: Prostate –Specific Antigen (PSA)**
d. **Screening for Breast Cancer: Breast screening uses mammography.**

Questions

1) What is best method of screening for prostate cancer?

a. Prostate specificantigen
b. Digital rectal exam
c. Pap smear
d. Biopsy

2) What is the diagnostic test for colon cancer?

a. CT
b. Colonoscopy
c. Fecal occult blood
d. ultrasound

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Answers:

1st Questions: A

2nd Questions: B