

Understanding Cancer

**A SERIES OF SIMPLE EDUCATIONAL VIDEOS
FOR THE GENERAL PUBLIC**



By Dr Hafsa Waseela Abbas

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Part 16: Diagnosis - Screening

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What is screening?



What is screening?

It is a way of detecting cancer early in people who have no symptoms (asymptomatic) before they get the symptoms.

It is estimated that 63% of cancers have been detected at Stage 1 (early stage) via screening!



***This helps provide more treatments that cure
(curative).***



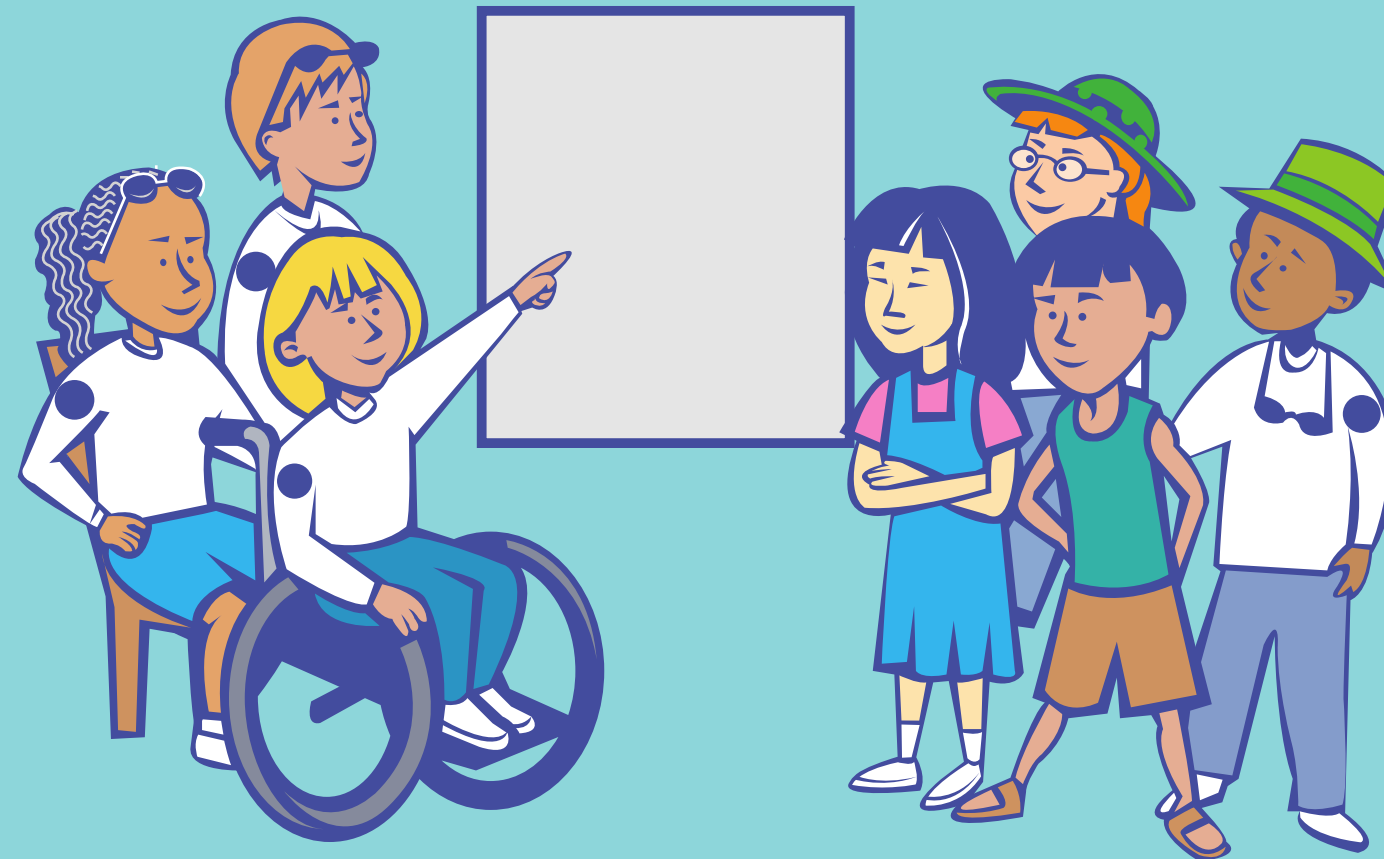
**IT ALSO HELPS PREVENT
CANCER!**



***The screening programme targets or aims for
people of a particular age!***



Many public awareness campaigns provide advice on symptoms and the role of screening.



People who do have symptoms should go to their G.P and not wait to be screened!





Deciding to be screened is up to the person.



Screening tests are:



- **SAFE**
- **CHEAP**
- **SENSITIVE**
- **ACCEPTABLE**

SENSITIVITY

**THIS IS PART OF THE POPULATION THAT HAVE A
POSITIVE TEST.**

SPECIFICITY

**THIS IS PART OF THE POPULATION WITH THE
DISEASE BUT HAS A NEGATIVE OUTCOME.**

FAMILY HISTORY OF CANCER



This increases risk.

Changes in the genes (mutations) in the blood and therefore it is best to screen close relatives.

FAMILY HISTORY OF CANCER



Mutations in the APC gene increases the number of clump of cells called polyps that cause familial adenomatous polyposis causing bowel cancer.

FAMILY HISTORY OF CANCER



Mutations in the BRCA 1 and 2 gene increases risk for breast and ovarian cancer.

There are 11 NHS national population screening programmes available in England.



**The three main UK cancer screening
programmes are:**

BOWEL CANCER

- Men and women aged between 60 and 74 years every 2 years
- Age changed to 50 by NHS since April 2021.
- Over 74 need to ask for kit.
- Bowel scope is done if positive.

CERVICAL CANCER

- Women aged between 25 and 64 years
- Every 3 years for those aged between 25 and 49.
- Every 5 years for those aged between 50 and 64.
- Cervical Smear test.

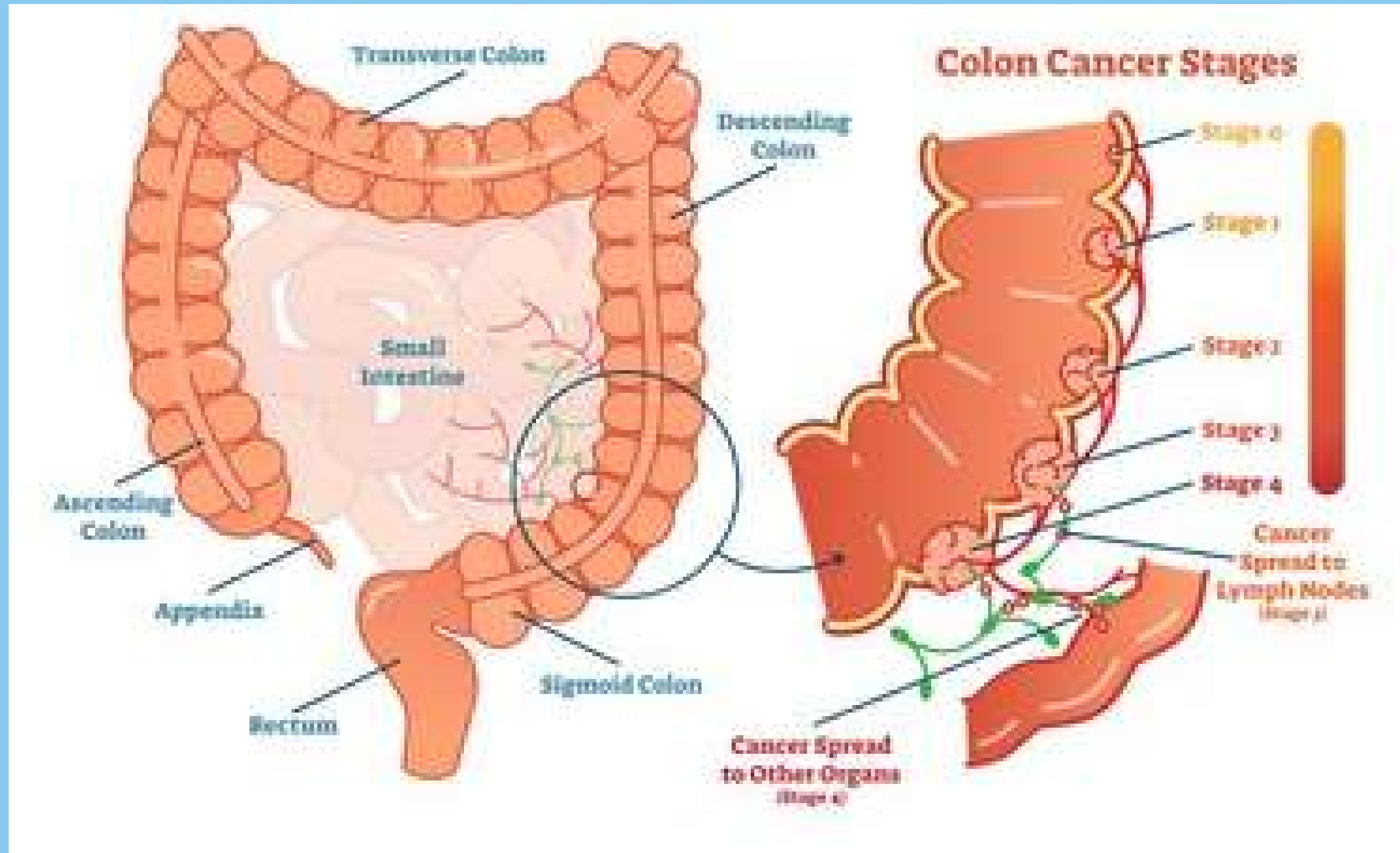
BREAST CANCER

- Women ages 50 to 70 every 3 years.
- Women over 70 screened on request.
- Mammography (X-ray scan).

Bowel cancer



Bowel cancer is the cancer of the large intestine.



Cancer Research UK statistics

- 4th most common cancer in the UK
- 2nd most common cause of death.
- Lower survival rates in females than males.



**EVERY
YEAR!**



42,317 cases

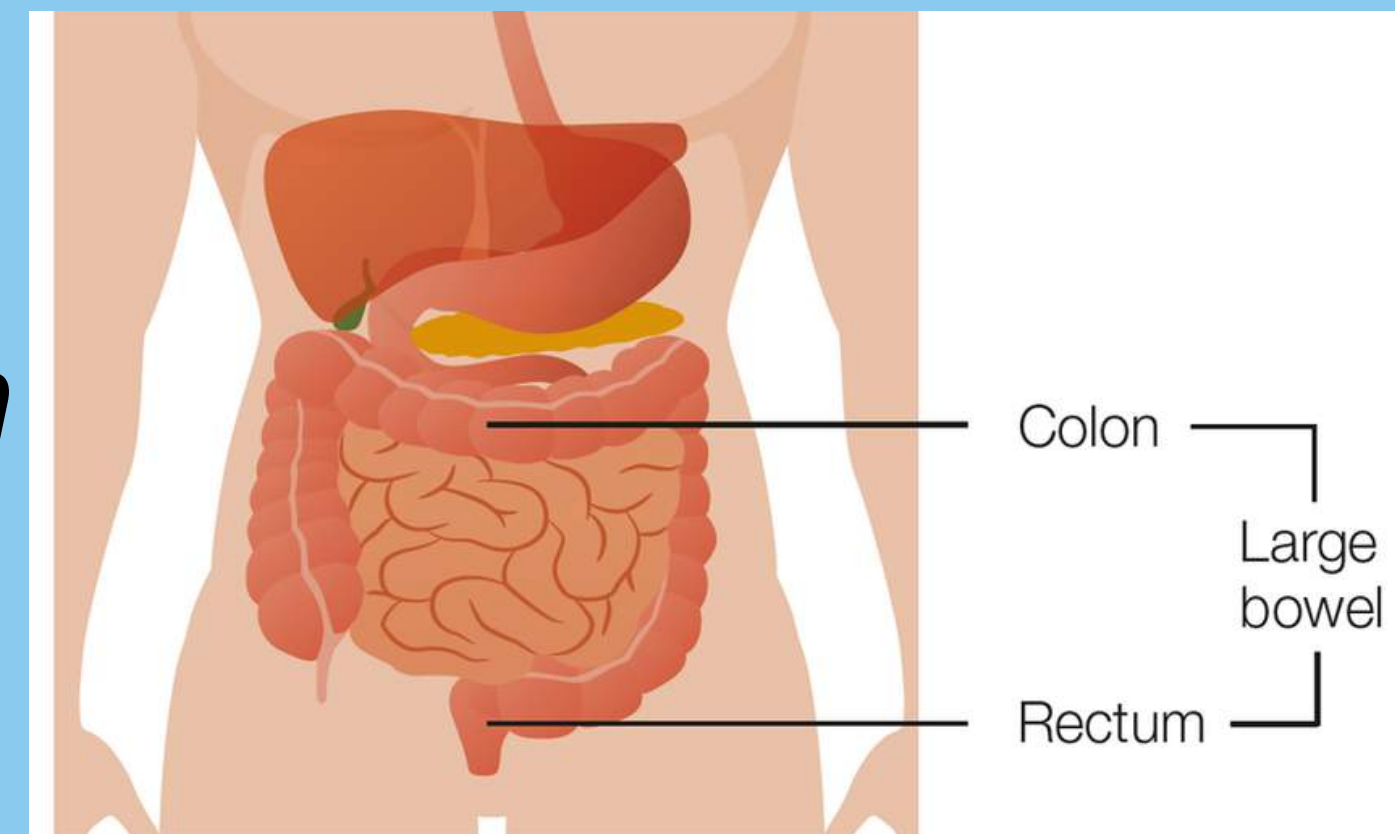
16,571 deaths

53% survival

10+ years

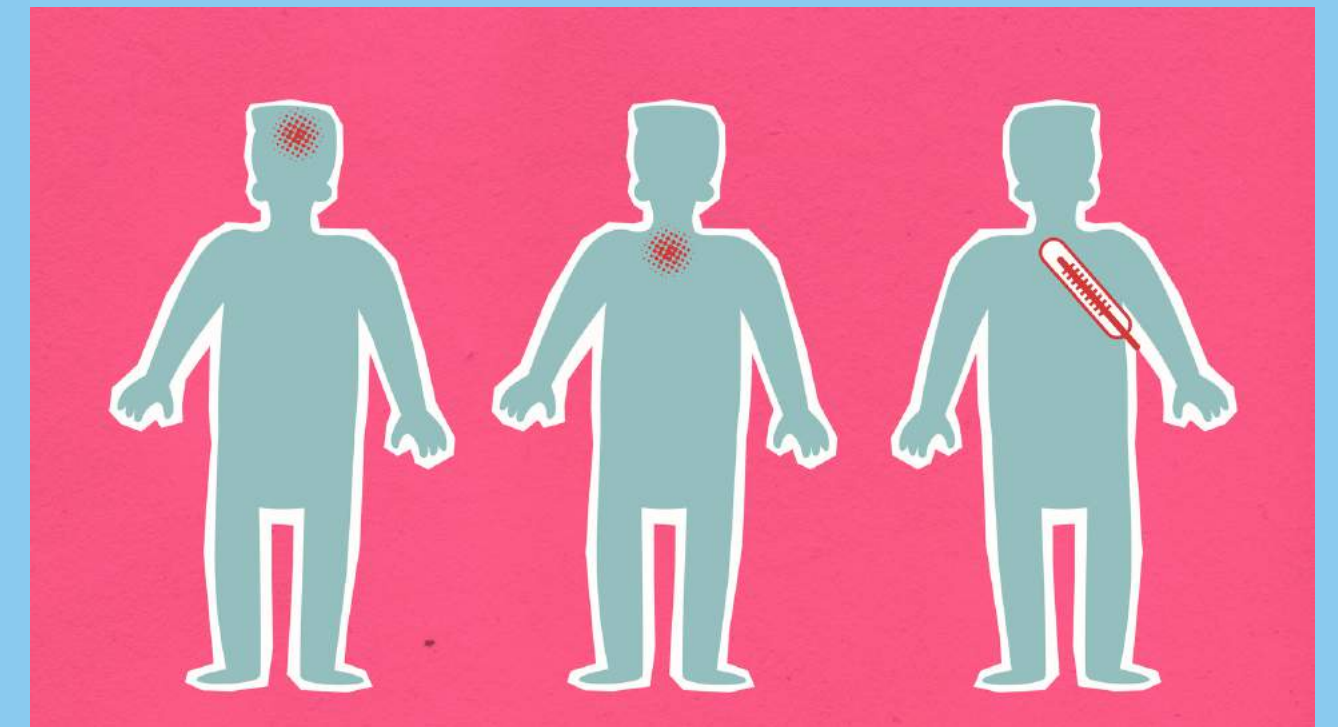
Risk factors

- Age
- Genetics.
- Lifestyle factors that are ***PREVENTABLE*** (54% of cases.)
 - 1) ***Diet (eating red and processed meat and less fibre).***
 - 2) ***Overweight***
 - 3) ***Smoking***
 - 4) ***Alcohol***
 - 5) ***Sun exposure and ionising radiation***
 - 6) ***Lack of exercise.***



Symptoms

- ***Red or black blood in poo/faeces or at the bottom.***
- ***Lump in back passage.***
- ***Stomach or bottom pain.***
- ***Unexplained weight loss***
- ***Tired***
- ***Lack of breath***
- ***Toilet changes: Going to the toilet often, soft or loose poo, hard poo (constipation)***

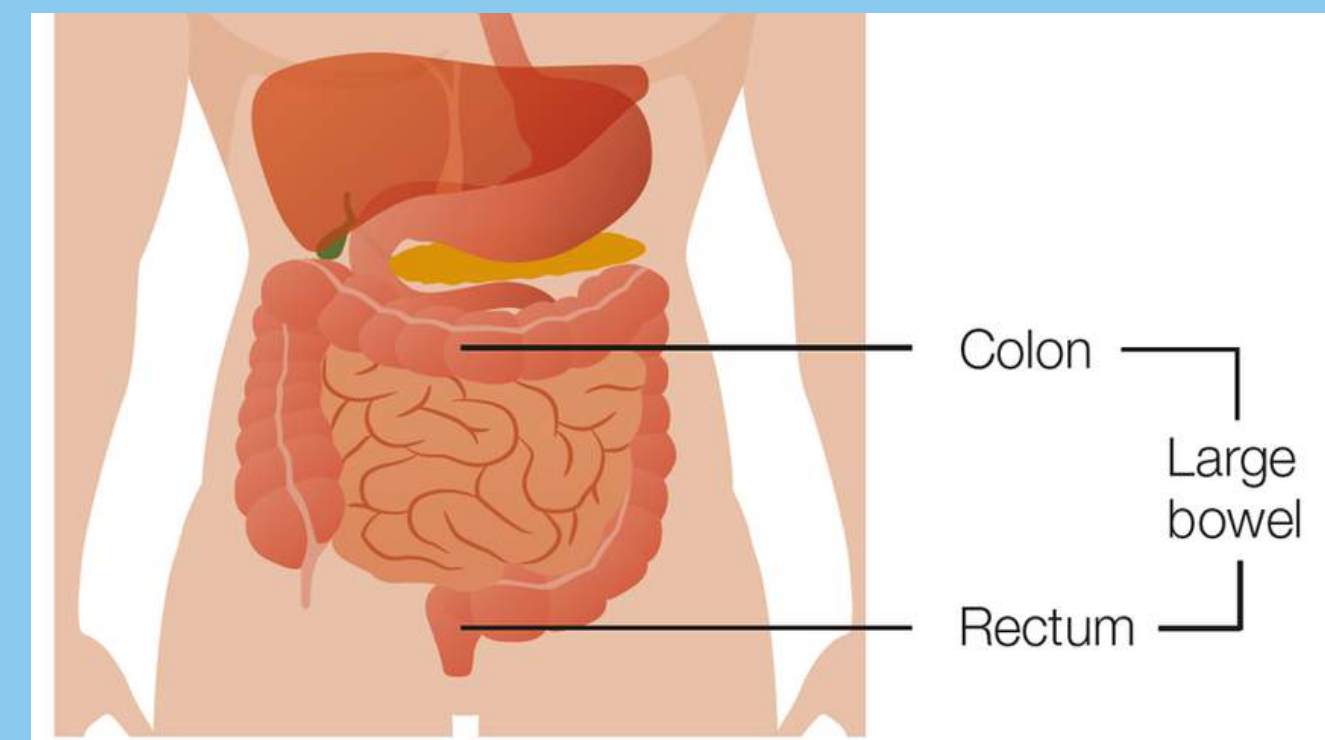


Who is the bowel screening programme aimed at?

Every 2 years, men and women aged 60 to 74 are given a screening kit.

However, NHS has changed the age to 50 starting from April 2021.

Anyone over 74 can request a kit by calling 0800 707 6060.



What does the screening programme involve?

FOBT VS FIT

(FAECAL OCCULT BLOOD TEST) VS (FAECAL IMMUNOCHEMICAL TEST)

The aim is to see if there is any blood in the poo.

FOBT test

***3 different poo samples
on different days.***

FIT test

***One poo sample for
haemoglobin to increase
screening type.***

***The FIT was introduced in June
2019 and is sent for invitations.***

FIT test



FOBT test

Fecal Occult Blood Test (FOBT)

Procedure to determine occult blood in stool for diagnose Colon cancer



Occult blood in the stool may indicate colon cancer or polyps in the colon or rectum though not all cancers or polyps bleed



Blood is detected through a fecal occult blood test



What does the screening programme involve?

1) The screening kit is completed at home and sent to the screening hub.



What does the screening programme involve?

2) The screening hub examines the kit to see if there is any blood in the poo sample.



What does the screening programme involve?

3) The results are sent out 2 weeks later.



The results!

There are three potential outcomes:

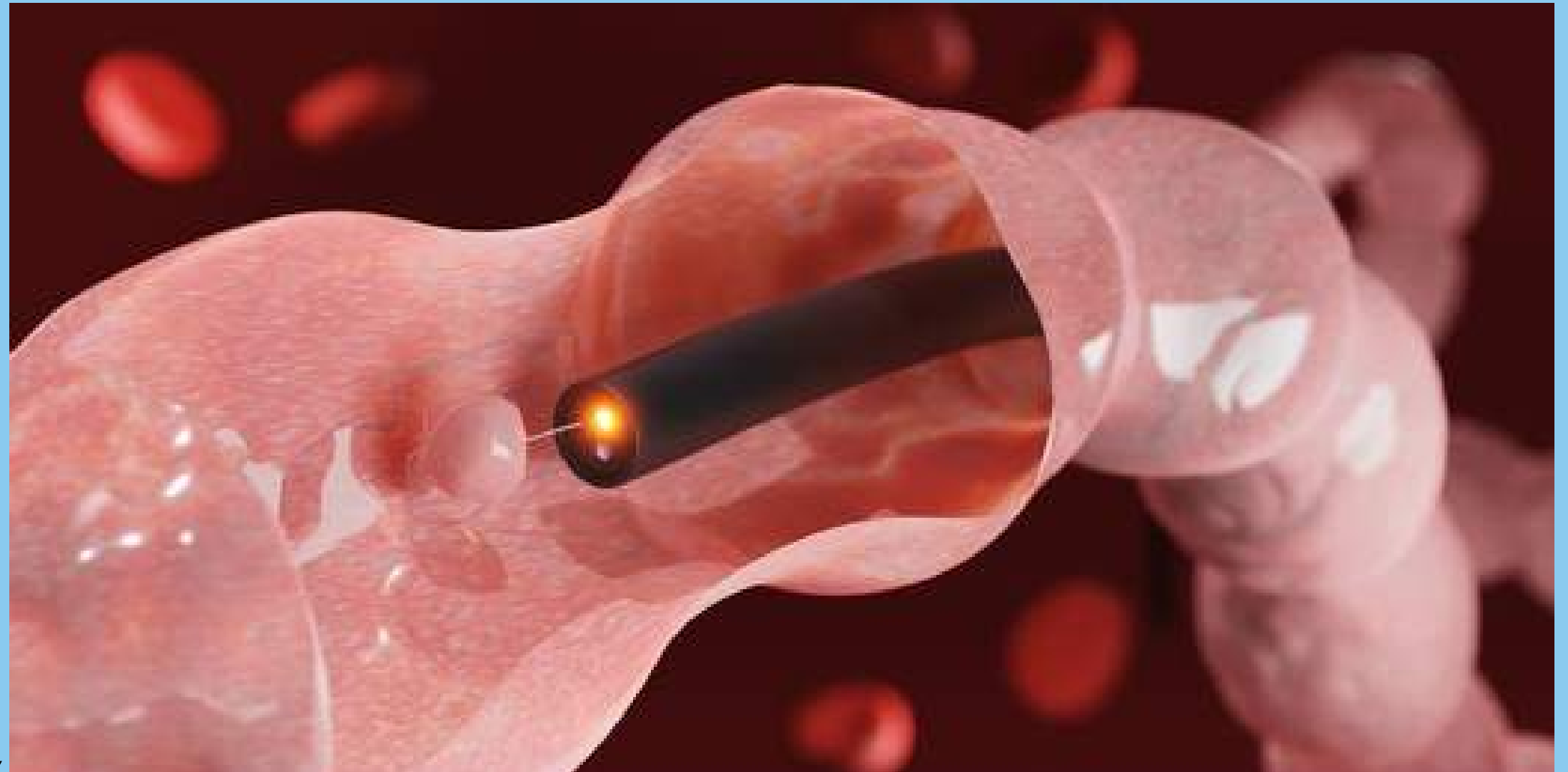
- 1) **No blood detected (normal result)** – No further action.
- 2) **Result is unclear** – the screening test needs to be repeated and a second kit is given.
- 3) **Blood is detected (abnormal result)** – The doctor will discuss the result with the patient and arrange for a bowel scope (colonoscopy or sigmoidoscopy).

Colonoscopy

A home enema kit is sent to complete on the day of the scan.

The procedure takes around 20 minutes.

If polyps are found, they are removed.



Colonoscopy

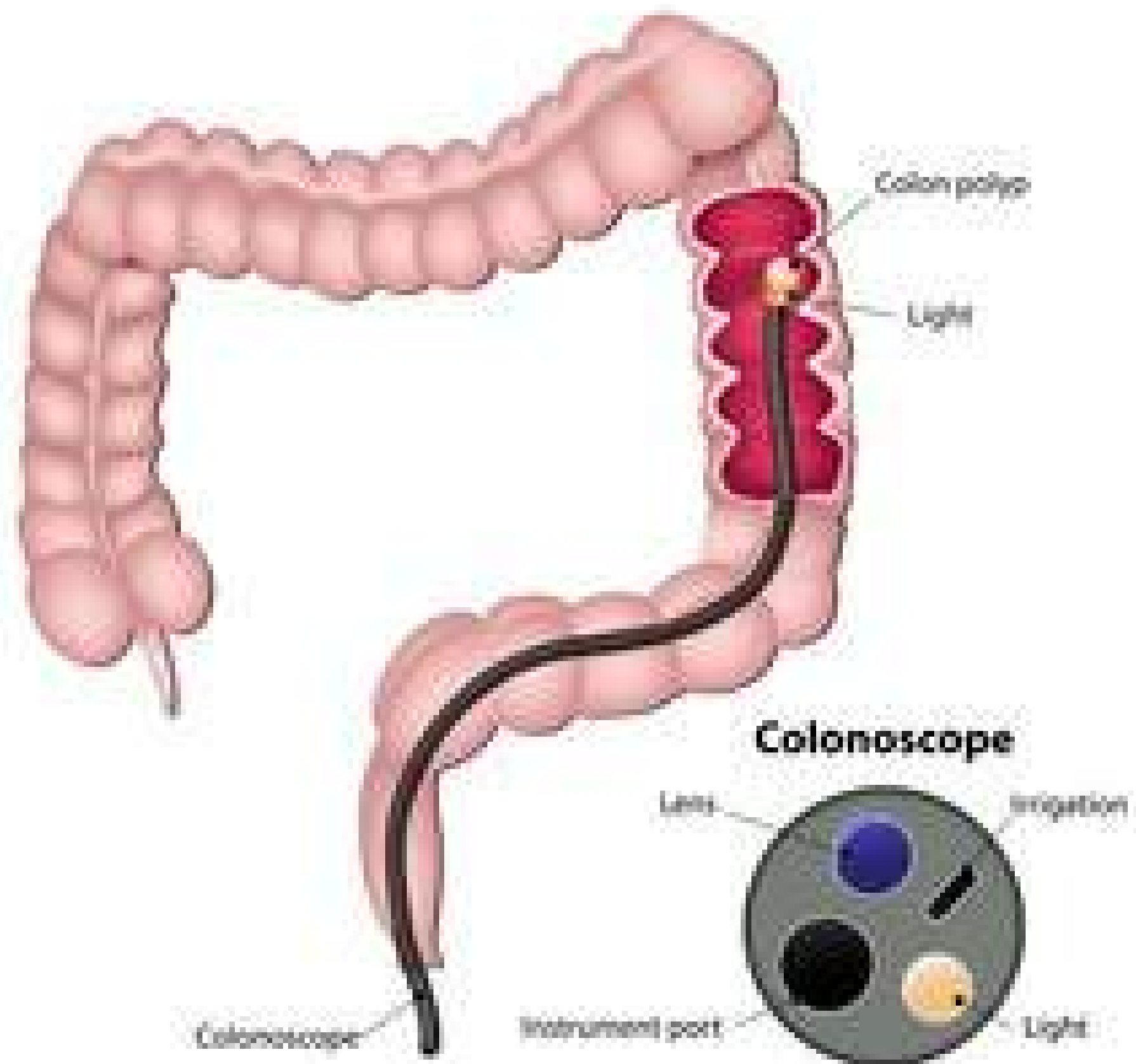
To examine the large bowel.

It involves a long tube with a camera entered through the back passage.

For every 100 people having a colonoscopy following an abnormal kit result:

- *50 have nothing abnormal detected*
- *40 have polyps*
- *10 have cancer*

COLONOSCOPY



Flexible sigmoidoscopy

To examine the back passage.

It involves a thin flexible tube with a camera.

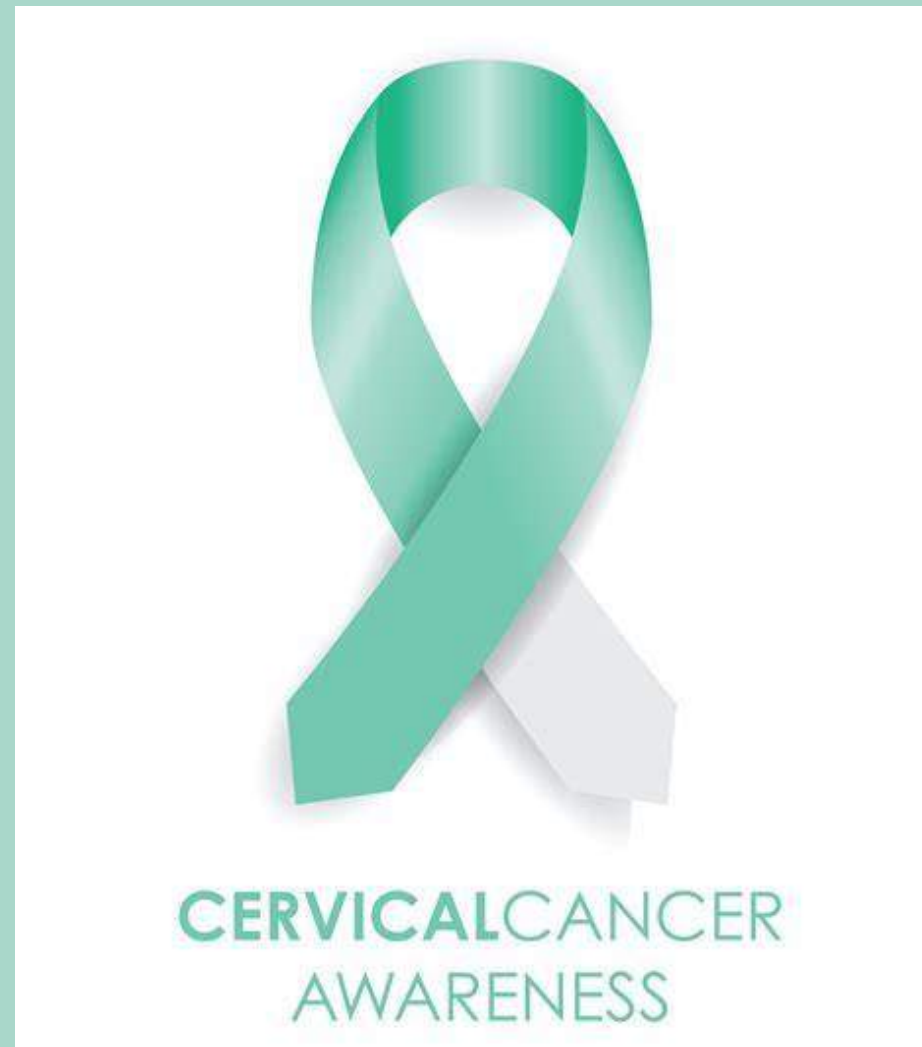
It can take images and biopsies.



CT Colonography

Urgent referrals for bowel obstruction – 3D scan.

Cervical cancer



Cervical cancer is the cancer of the cervix.



Cancer Research UK statistics

**EVERY
YEAR!**



- Most common cancer in women aged 35 and under.
- 14th most common cancer in the UK **3152 cases**
- 2nd most common cause of death. **854 deaths**
- Survival rates in females high under 40 years old **51% survival
10+ years.**

Risk factors

- Age
- Genetics.
- Lifestyle factors that are ***PREVENTABLE*** (54% of cases.)

1) Deprivation – cancer risks are 65% higher in deprived areas.

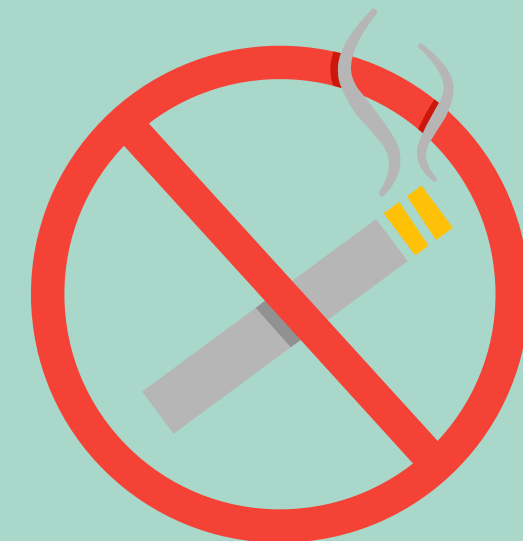
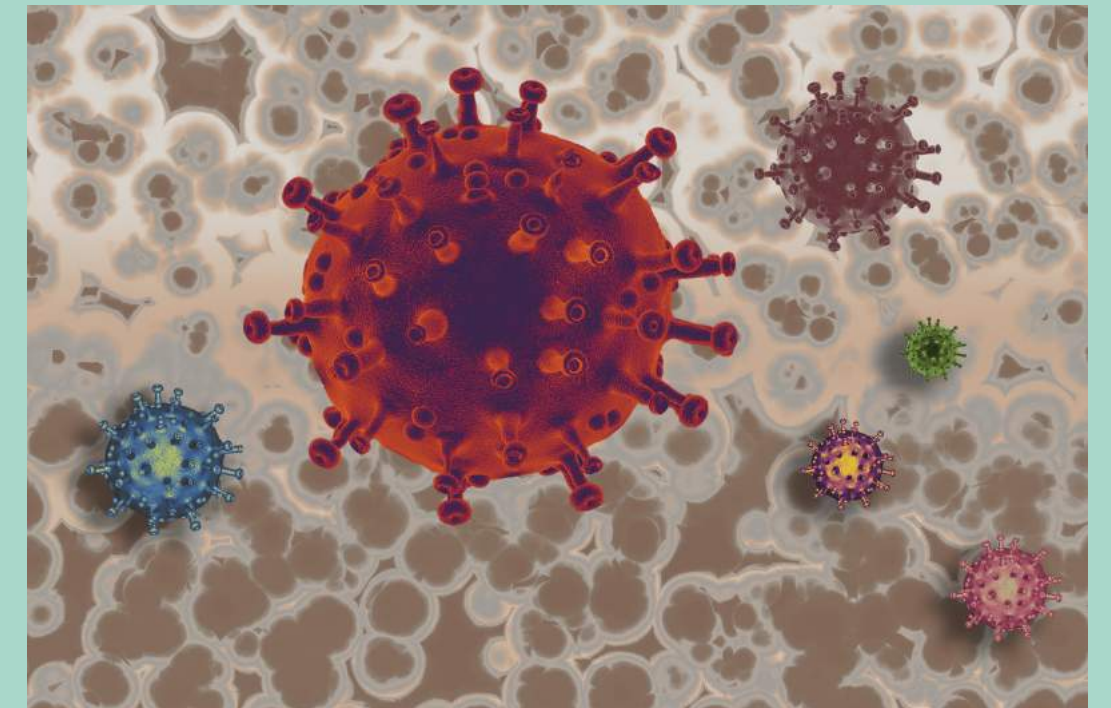
- ***520 cases each year are linked to this.***

Risk factors

2) Infections 99.8% are caused by HPV (Human papillomavirus).

Vaccination is available for 12-13 years which can prevent cancer.

3) 21% cases caused by smoking.



Symptoms

- *Bleeding during or after sexual intercourse*
- *Bleeding during menstruation (period) or after menopause.*
- *Vaginal discharge*
- *Pain during sex.*

Who is the cervical cancer screening programme aimed at?

The cervical screening programme started in the late 1980s.

Since 1990, the rate of cervical cancer has decreased by 25% in the UK.



Who is the cervical cancer screening programme aimed at?

Women aged between 25 and 64 years are invited for the screening test.

- Every 3 years for people aged 25 to 49.
- Every 5 years for people aged 50 to 64.



What does the screening programme involve?

This is done to help see changes in the cells of the cervix that increases cancer risk.



What does the screening programme involve?

1) *A speculum is a duck-bill-shaped device that is used by the doctor to see the hollow area of the body.*



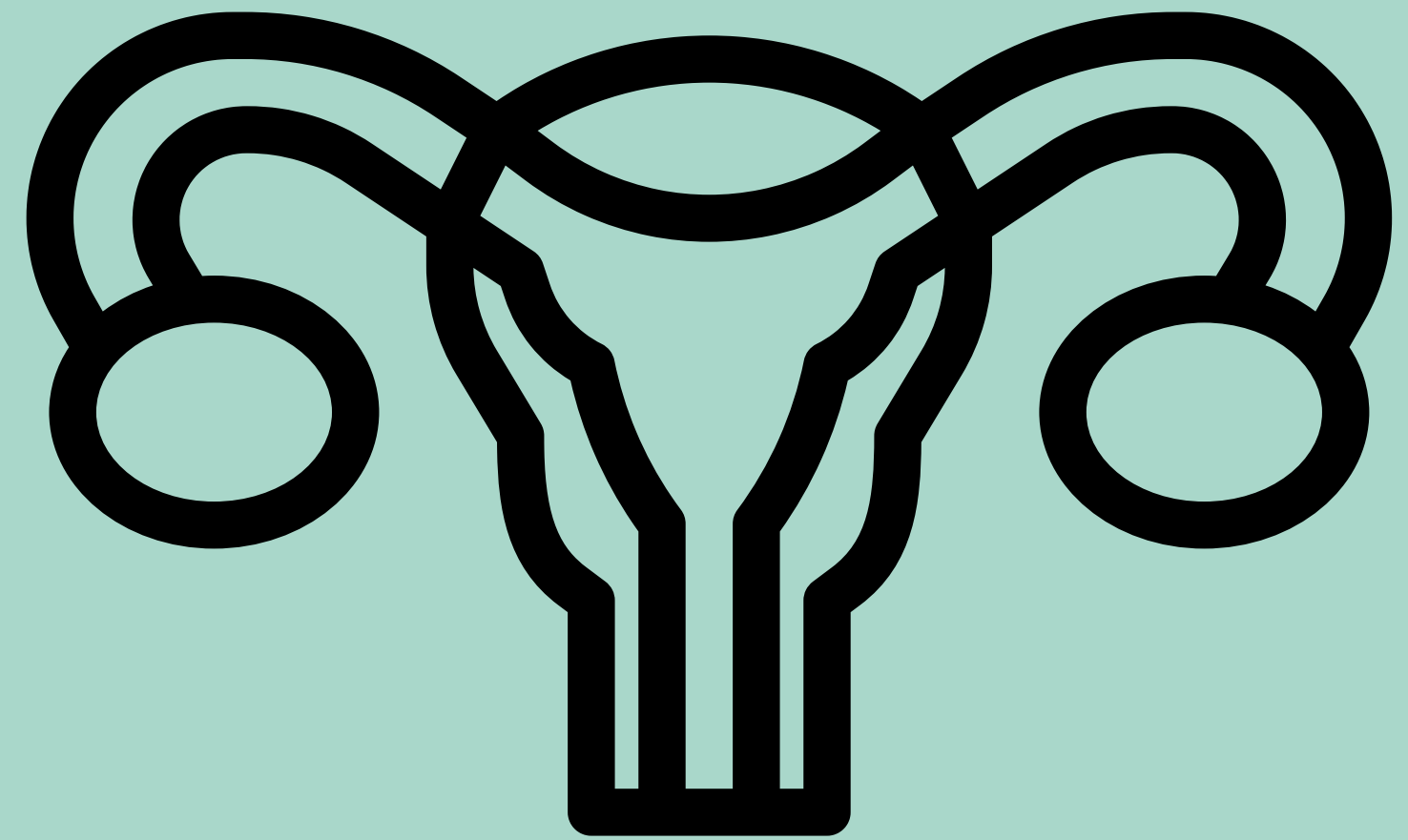
What does the screening programme involve?

2) For the smear, a special wooden spatula (Aper) with cytology brush take cells from the surface of the vagina of the cervix (ectocervix).



What does the screening programme involve?

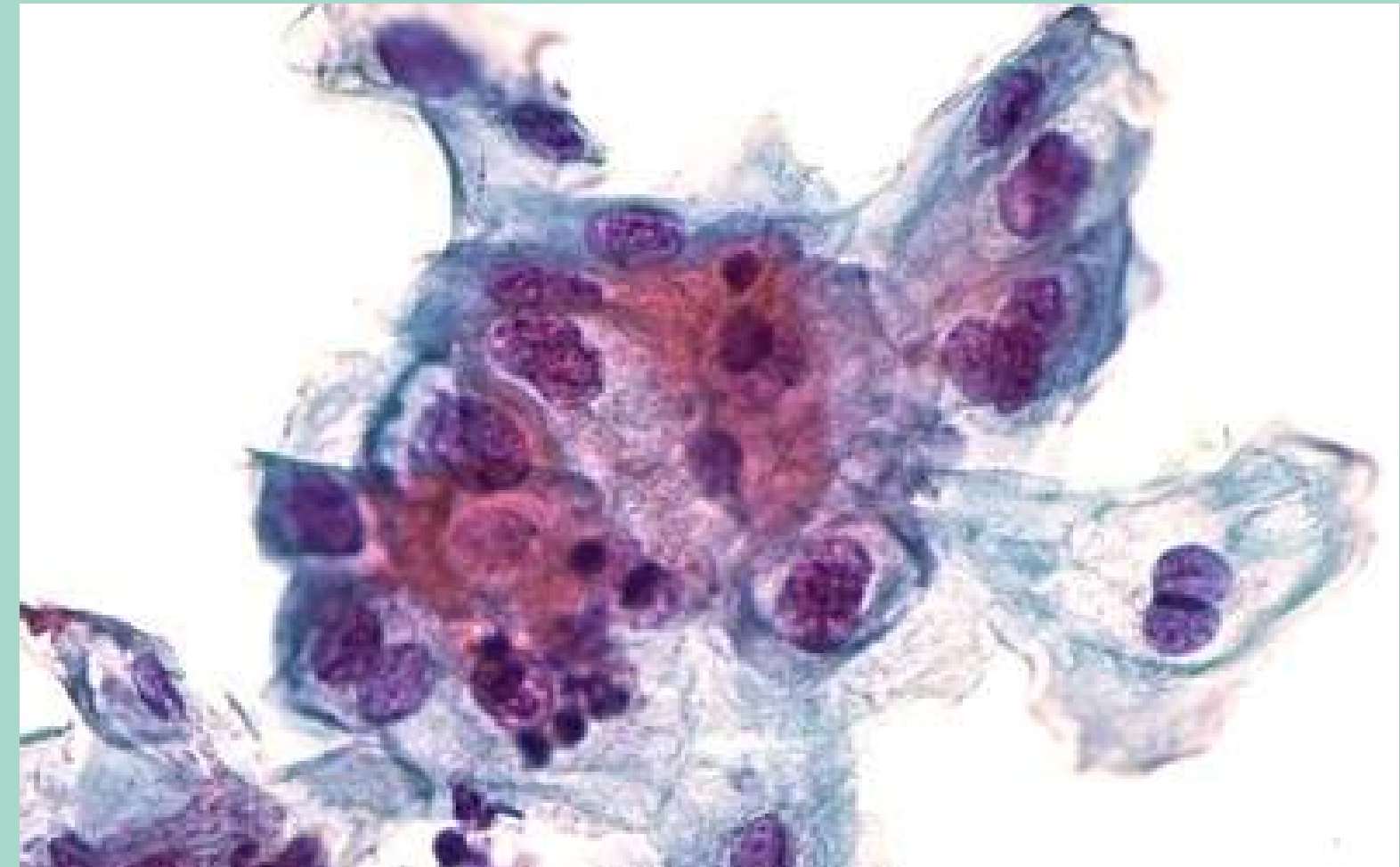
3) *Sometimes it is taken from the endometrium or endocervix.*



What does the screening programme involve?

4) *The Pap (Papanicolaou) test is used to stain the cells.*

If positive, a further test called a colposcopy is used.



Colposcopy

The aim of the test is to see the cervix epithelium by binocular microscopy.

1) A speculum is inserted just like during a smear.



Colposcopy

2) A magnifying lens is used to look at your cervix in more detail – does not go into the vagina.

3) A small sample might be taken – local anaesthetic if needed.



Breast cancer



Cancer Research UK statistics

- 8,100 cases each year are benign breast carcinoma in situ.
- Breast cancer is common in females with 54,700 and in males 390 new cases.

Breast cancer survival in England is highest for women aged between 60 and 69. This may be due to SCREENING and less tumour characteristics in the target group.

EVERY YEAR!



55100 cases
11547 deaths
51% survival
86+ years.

Risk factors

- Age
- Genetics.
- Lifestyle factors that are ***PREVENTABLE*** (23% of cases)

1) obesity

2) alcohol

3) not breastfeeding

4) oral contraceptives

5) hormone levels



Symptoms

- ***Pain in the breast***
- ***Nipple position changed***
- ***A lump present in the breast or armpit***
- ***Leak or discharge of fluid from the breast.***
- ***Changes to the breast's size, shape, feel.***
- ***Changes to the skin: red, rash, dimpling***



Who is the breast screening programme aimed at?

Since 1986, every 3 years mammogram was done for people age 50 and 64.

The ages has now increased to 50 to 70 years old every 3 years.



Who is the breast screening programme aimed at?

For those who are over 70 they can make a referral.

Under 50 are not invited unless invited by UK centre for cancer care and research (CCCR) significant benefit for people aged 40 to 49.



What does the screening programme involve?

It is carried out at special clinics or mobile breast screening unit vans.

1) The mammogram is sensitive to detect breast cancer.

- It involves taking 2 X-RAY images per breast.*
- People with dense breasts are less sensitive.*



What does the screening programme involve?

2) Breast is compressed to flatten breast tissue.



What does the screening programme involve?

3) This creates a high contrast image where it is recorded on x-ray film or detail.



What happens after the breast screen?

1) Mammograms are examined by a radiologist and the results are sent to the patient and G.P in two weeks.



What happens after the breast screen?

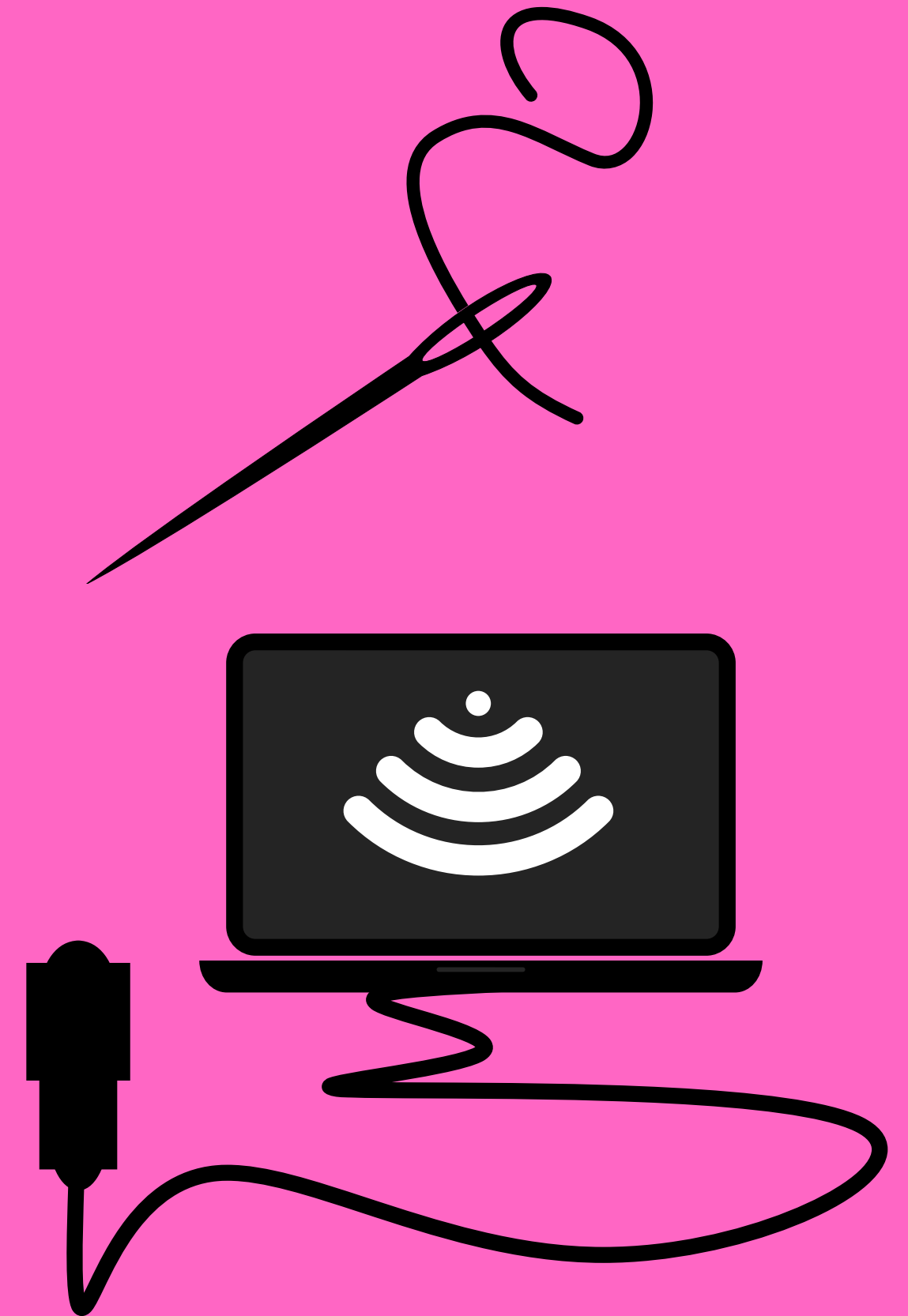
2) Efficiency of screening depends on the quality of imaging and reporting.



What happens after the breast screen?

3) If any abnormalities, further tests may be required and may also repeat x-ray if not clear enough.

This includes ultrasound, fine needle biopsy or core needle biopsy.



Benefits of screening

IT SAVES LIVES!



Benefits of screening

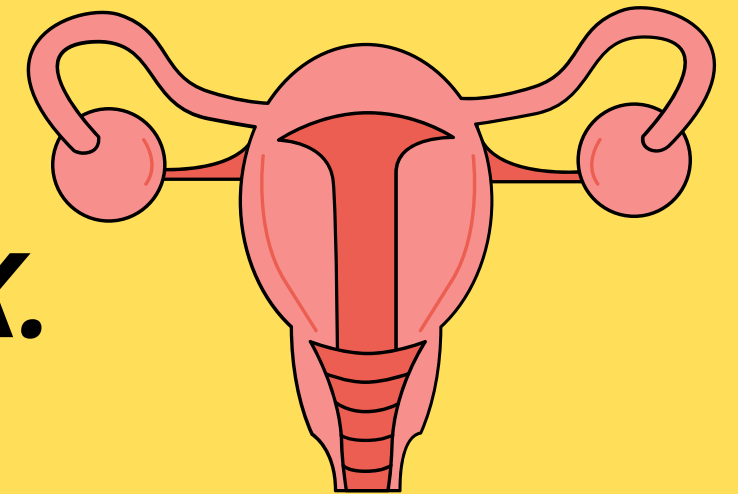


BOWEL CANCER

Screening decreases death by 25% and the Bowel scope by 40%.

CERVICAL CANCER

Screening prevents 70% of deaths in UK.



BREAST CANCER

Screening prevents 1,300 deaths.

(38% according to Cochrane review)

Most found at early stage and less treatment.



Risks of screening

OVERDIAGNOSIS

A bowel cancer or polyp that would not have caused any harm is diagnosed and treated.

Risks of screening

OVER-INTERPRETATION

People over-interpret a normal result and do not report symptoms they do experience in the future.

Risks of screening

Bowel cancer screening can give:

FALSE POSITIVE RESULTS

They can give an abnormal result even though the person does not have cancer.

FALSE NEGATIVE RESULTS

Miss the cancer.

A small percentage of cases.



Risks of screening

Bowel scope have small risks of:

- *bleeding*
- *damage (perforation) to the bowel wall*
- *very rarely - death.*

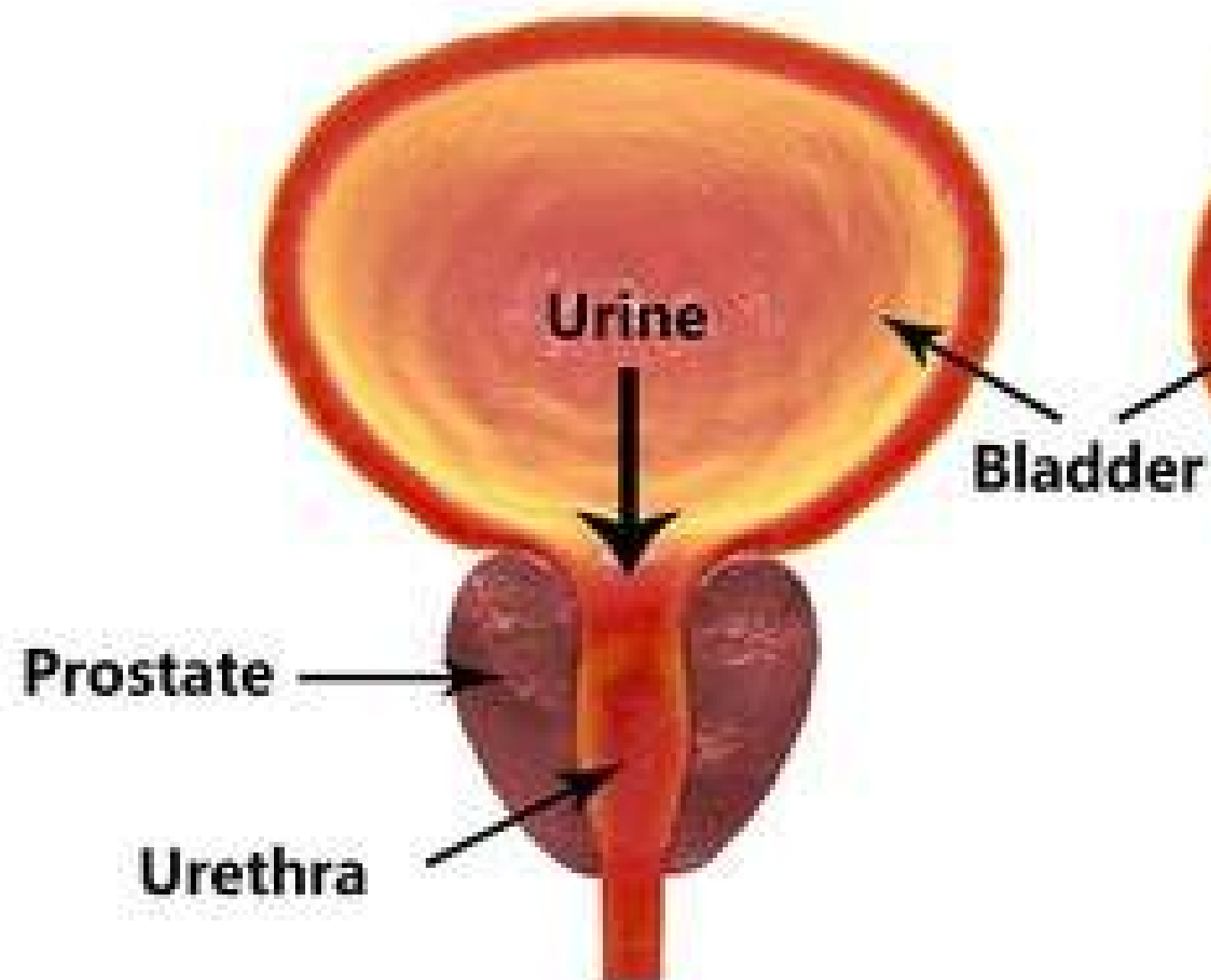


Other types of cancers

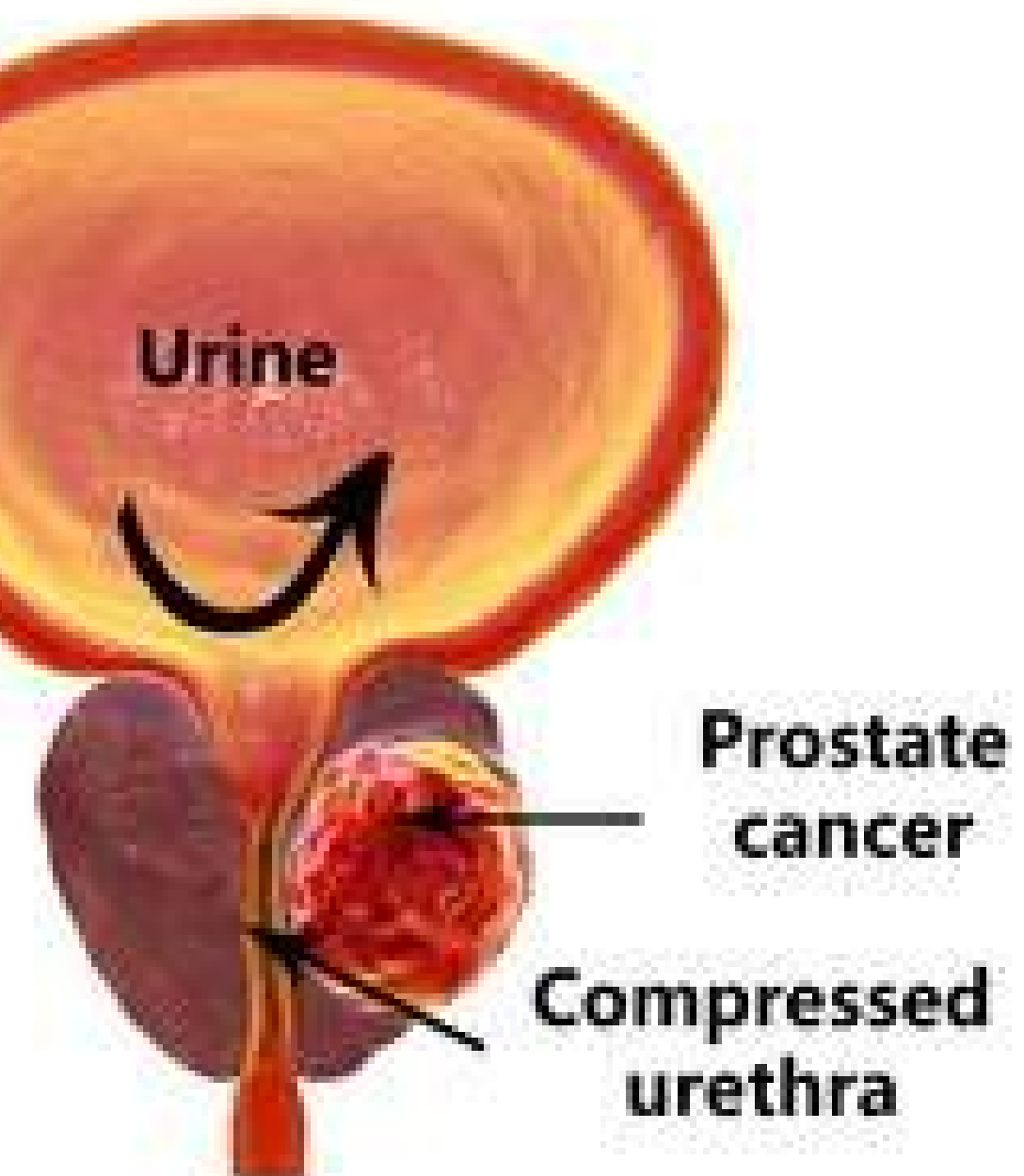
- No cancer screening programme despite its incidence.
- Cancer researchers are looking for a reliable test that will DECREASE death by 50% by 2026.

PROSTATE CANCER

NORMAL PROSTATE

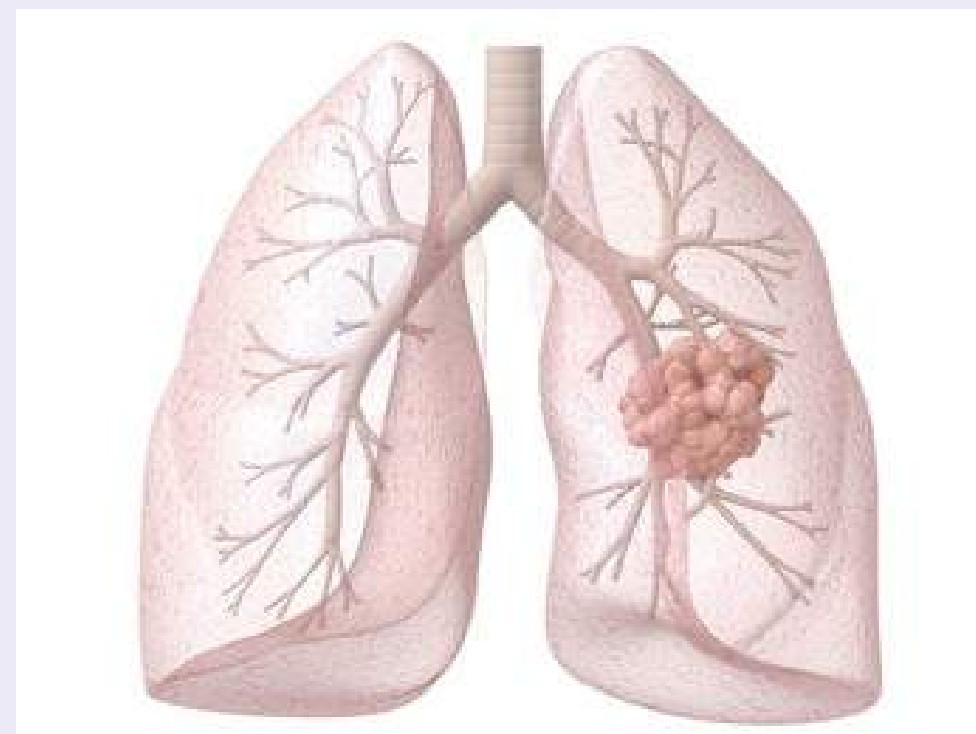


PROSTATE CANCER



Other types of cancers

- No cancer screening programme despite its incidence.
- There are Lung checks in England from Autumn 2019. Still in process in other parts of the UK.



**LUNG
CANCER**

Targeted Lung Health Check Programme (TLHC)

- It is given to patients aged 55 to 74 who are former or current smokers to help diagnose lung cancer early.
- It is estimated 6,000 people are diagnosed early.



**LUNG
CANCER**

Targeted Lung Health Check Programme (TLHC)

1) A nurse conducts a medical history and asks questions about breathing and lifestyle. Height and weight are measured.



**LUNG
CANCER**

Targeted Lung Health Check Programme (TLHC)

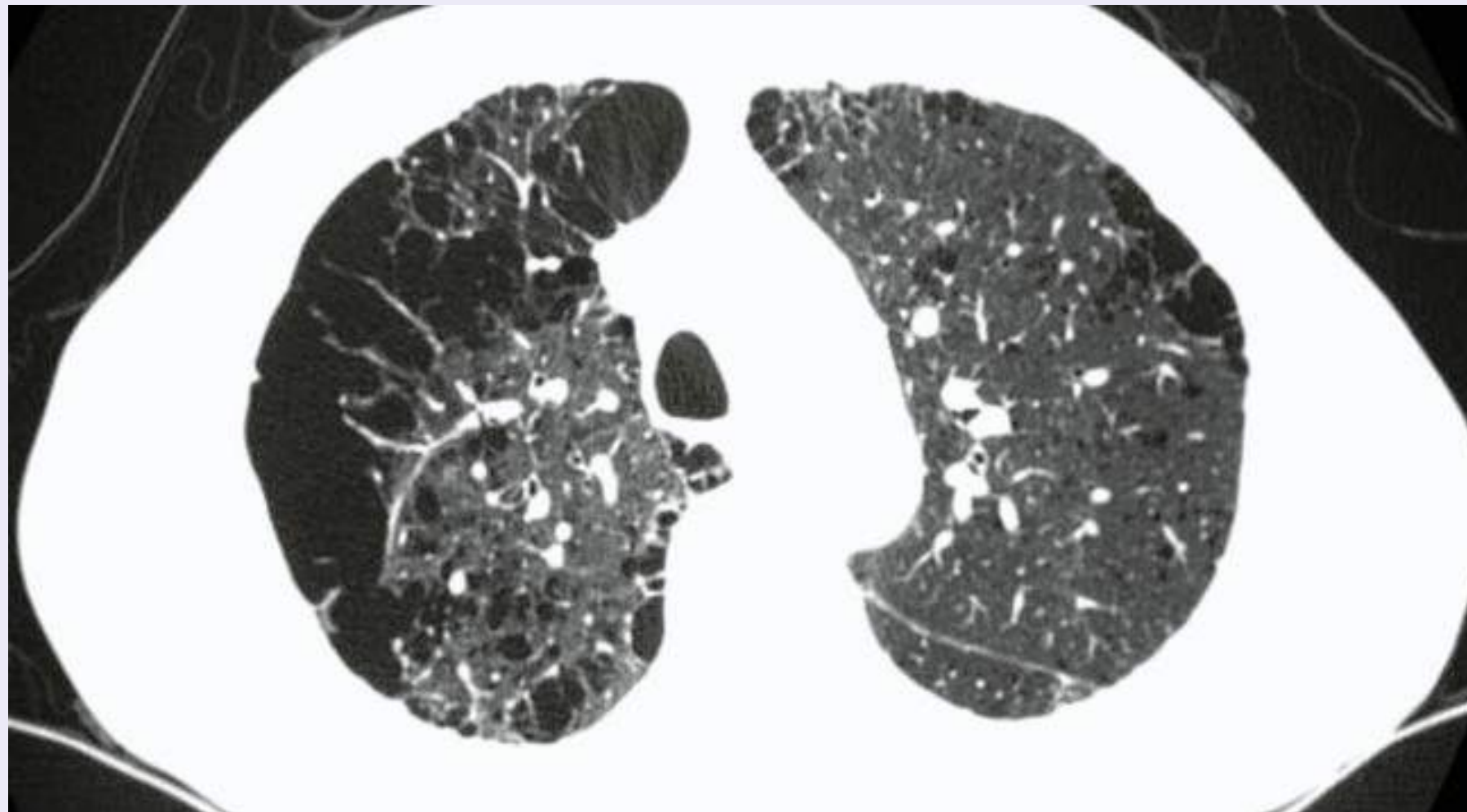
**2) During COVID-19, this is currently done
virtually.**



**LUNG
CANCER**

Targeted Lung Health Check Programme (TLHC)

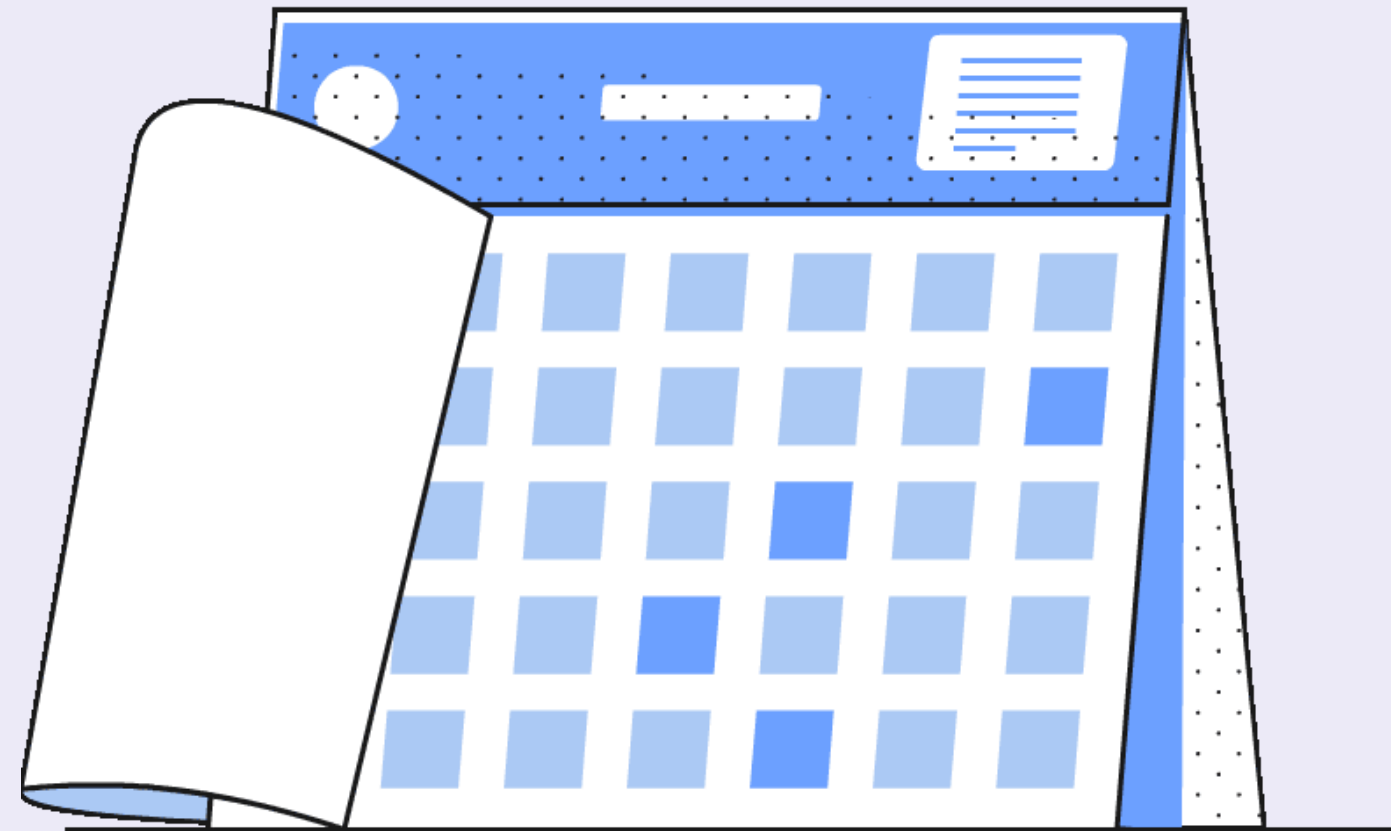
3) They are then invited for a low dose CT scan to take an image of the lungs.



**LUNG
CANCER**

Targeted Lung Health Check Programme (TLHC)

**4) If anything abnormal, further low dose
CT scans are done and treatment is done.**



**LUNG
CANCER**

Research



NHS England are looking at using CT scans as a screening test for patients who smoke.

Low dose CT scans is a possible screening test.

However, lots of scans can cause high radiation which can cause lung damage.

LUNG CANCER

NELSON clinical trial

This is a large clinical trial in Europe.

They are studying CT scan for targeted screening - smokers and former smokers rather than age.



LUNG CANCER

NELSON clinical trial



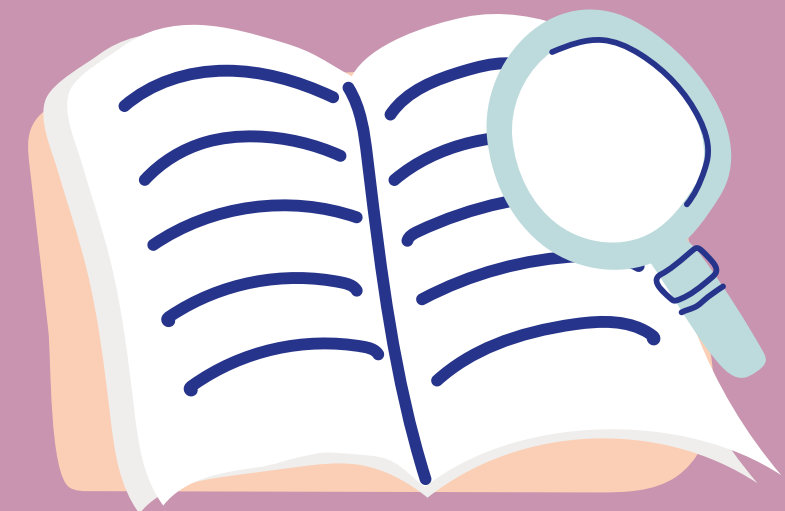
LUNG CANCER

**This decreases death and is looked at the
UK National Screening Committee (UK NSC)
who look at results, cost and whether
benefits outweigh the risk.**

Other research

Several tests have been developed but they are expensive, unclear and sensitive.

It can also cause overdiagnosis where lung cancers found through screening are not life-threatening and may cause unnecessary treatment.



LUNG CANCER

The effect of COVID-19 on screening

Since the World Health Organisation announced COVID-19 as a pandemic on 11th March 2020.

This had an impact on health services particularly:

- **CANCER SCREENING**
- **DIAGNOSIS**
- **TREATMENT PLANS**

Source: Institute of Genetics and Cancer (Cancer Research UK - Edinburgh)

The effect of COVID-19 on screening

RESEARCH PAPER 1

The health service prioritised the high death rates linked with the COVID-19 pandemic.

Source: Institute of Genetics and Cancer (Cancer Research UK - Edinburgh)

The effect of COVID-19 on screening

APPOINTMENTS.

They were missed or cancelled.

RESEARCH PAPER 1

Source: Institute of Genetics and Cancer (Cancer Research UK - Edinburgh)

The effect of COVID-19 on screening

INTERRUPTIONS

*Laboratory tests, imaging and diagnostic services
and even surgeries!*

Urgent symptomatic cases were put forward.

The effect of COVID-19 on screening

**COVID-19 pandemic INCREASED DEATH RATES in
cancer patients aged between 15 and 84.
5 years after diagnosis.**

RESEARCH PAPER 2

Source: Maringe, C., Spicer, J., Morris, M., Purushotham, A., Nolte, E., Sullivan, R., Rachet, B. and Aggarwal, A., 2020. The impact of the COVID-19 pandemic on cancer deaths due to delays in diagnosis in England, UK: a national, population-based, modelling study. The Lancet Oncology, 21(8), pp.1023-1034.

The effect of COVID-19 on screening

Breast cancer: 7.9 - 9.6% increase.

Bowel cancer: 15.3 - 16.6% increase.

Lung cancer: 4.8 - 5.3% increase.

Throat/oesophageal cancer: 5.8 - 6.0%

RESEARCH PAPER 2

Source: Maringe, C., Spicer, J., Morris, M., Purushotham, A., Nolte, E., Sullivan, R., Rachet, B. and Aggarwal, A., 2020. The impact of the COVID-19 pandemic on cancer deaths due to delays in diagnosis in England, UK: a national, population-based, modelling study. The Lancet Oncology, 21(8), pp.1023-1034.

The effect of COVID-19 on screening

The COVID-19 pandemic affected the number of surgeries which impacted on survival rates.

A 3-month delay to surgery across all stage 1–3 cancers is estimated to cause more than 4700 deaths each year in England.

Sud, A., Jones, M., Broggio, J., Loveday, C., Torr, B., Garrett, A., Nicol, D., Jhanji, S., Boyce, S., Gronthoud, F., Ward, P., Handy, J., Yousaf, N., Larkin, J., Suh, Y., Scott, S., Pharoah, P., Swanton, C., Abbosh, C., Williams, M., Lyratzopoulos, G., Houlston, R. and Turnbull, C., 2020. Collateral damage: the impact on outcomes from cancer surgery of the COVID-19 pandemic. *Annals of Oncology*, 31(8), pp.1065-1074.

The effect of COVID-19 on screening

Advanced cancers - 30% decrease in survival at 6 months.

17% decrease in survival at 3 months for patients with stage 2/3 cancers of the bladder, lung, oesophagus, ovary, liver, pancreas and stomach.

Sud, A., Jones, M., Broggio, J., Loveday, C., Torr, B., Garrett, A., Nicol, D., Jhanji, S., Boyce, S., Gronthoud, F., Ward, P., Handy, J., Yousaf, N., Larkin, J., Suh, Y., Scott, S., Pharoah, P., Swanton, C., Abbosh, C., Williams, M., Lyratzopoulos, G., Houlston, R. and Turnbull, C., 2020. Collateral damage: the impact on outcomes from cancer surgery of the COVID-19 pandemic. *Annals of Oncology*, 31(8), pp.1065-1074.



Overall, the screening programmes are really effective in diagnosing cancer early and even prevent it.

More screening programmes are in process of research and clinical trials for other cancers.

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***Part 17: Cancer Waiting Time and
programmes to diagnose early***

UPCOMING VIDEO RELEASING SOON!

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Acknowledgements

Oxford Handbook of Oncology

Canva

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Maringe, C., Spicer, J., Morris, M., Purushotham, A., Nolte, E., Sullivan, R., Rachet, B. and Aggarwal, A., (2020) The impact of the COVID-19 pandemic on cancer deaths due to delays in diagnosis in England, UK: a national, population-based, modelling study. The Lancet Oncology, 21(8), pp.1023-1034.

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you!*

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