Colorectal Cancer Screening

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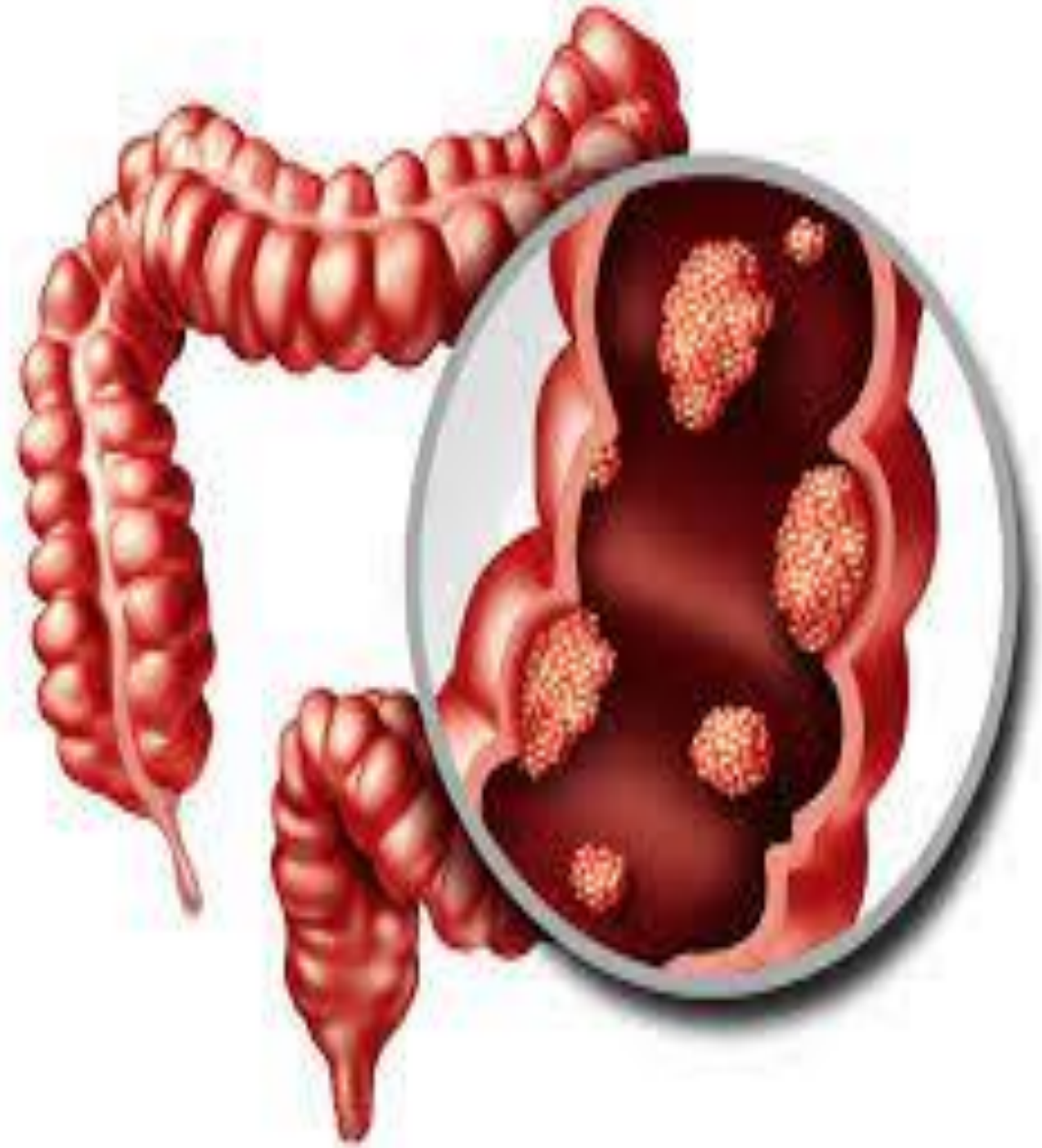
Colorectal Cancer
Screening Options



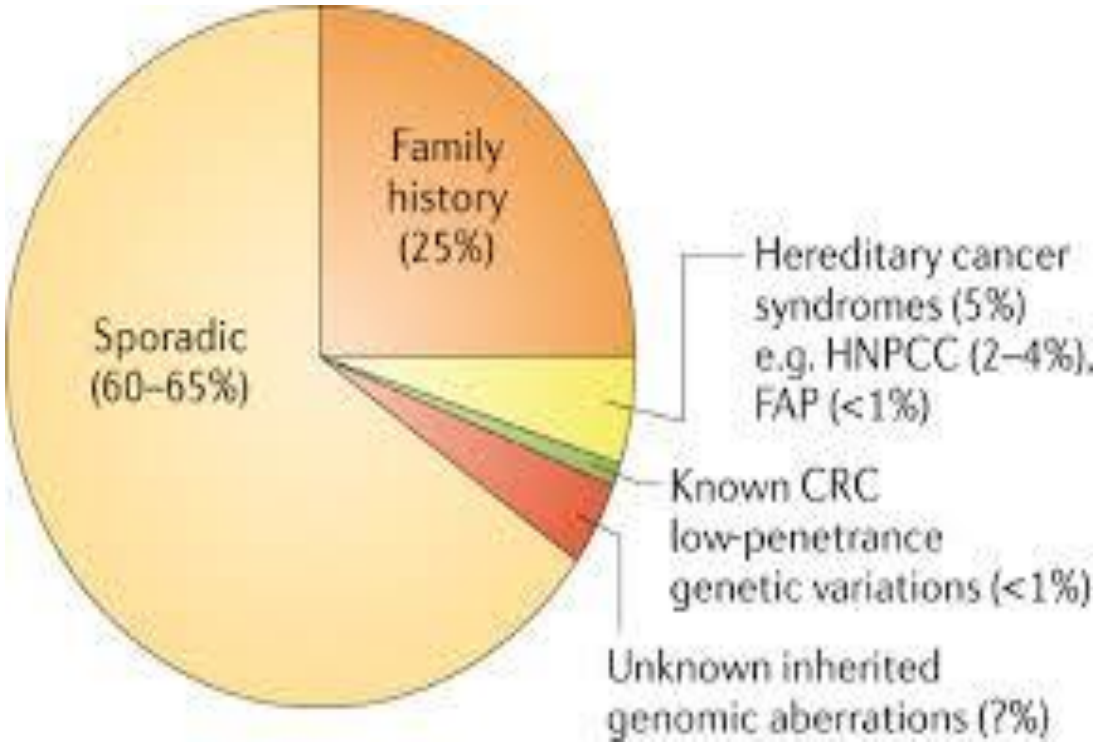
Colorectal cancer (CRC) is the third most common cancer in men and women.

CRC screening efforts are directed toward removal of adenomas and sessile serrated lesions and detection of early-stage CRC.

In the United States, colorectal cancer (CRC) ranks **second** to lung cancer as a cause of cancer **mortality** and is the third most commonly occurring cancer in both men and women.

A study estimated that in 2020 approximately 147,950 new CRC cases would have been diagnosed and 53,200 individuals would have died of the disease .

Global burden of colorectal canser nature



- Between 2011 and 2015, the average annual incidence rates per 100,000 population were 45.9 and 34.6 for men and women respectively .
- CRC incidence and mortality rates have shown a steady decline of approximately 1.7% and 3.2%, respectively per year.
- The decline began in the mid 1980s and has accelerated since the early 2000s.
- It is believed to be driven by changes in risk factors, early detection of cancer through CRC screening, and removal of precancerous polyps with colonoscopy, in addition to advances in surgical and treatment approaches.

Most CRCs develop through the adenoma-carcinoma sequence, presenting opportunities to prevent cancer by removing its precursor lesions, in addition to identifying CRC in its earliest, curable stages.

ONE-STEP SCREENING

Colonoscopy

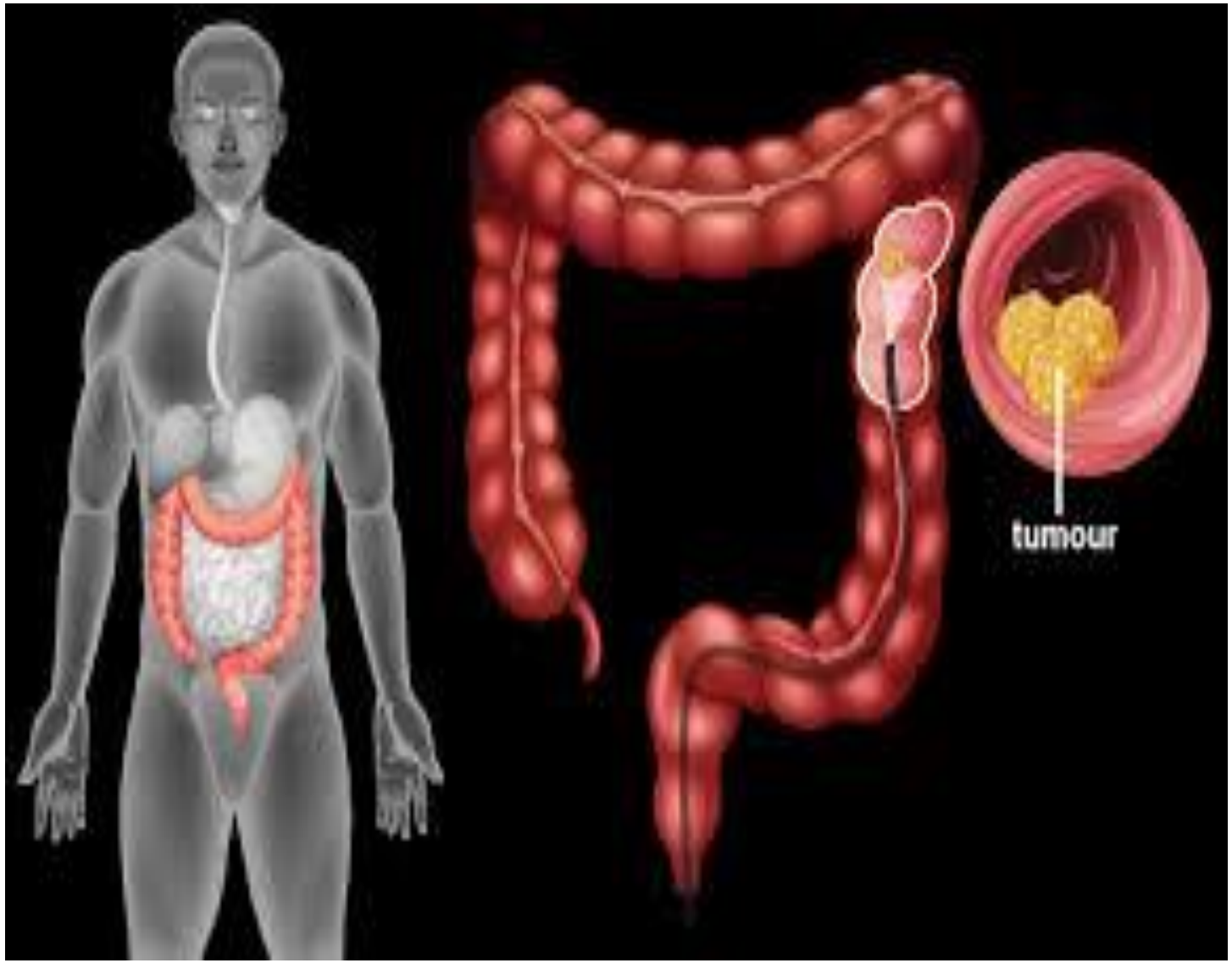
Colonoscopy is the most commonly performed gastrointestinal procedure in the United States.

It allows for not only the detection of early-stage cancers but also the detection and removal of polyps and confers a long-term protection from CRC incidence and mortality.

A systematic review of 6 observational studies reported a pooled reduction of 69% in overall CRC incidence and reduction of 68% (95% CI 57%–77%) in CRC mortality associated with screening colonoscopy .

TWO-STEP APPROACH SCREENING TESTS

Stool- and blood-based tests


tumour

Stool-based tests

Three large RCTs with 11–30 years of follow-up were conducted in Europe and the United States .

These trials randomized average-risk individuals between ages 45 and 80 years to annual

or biennial screening using **guaiac fecal occult blood testing(gFOBT)** compared with usual care.

With biennial screening, after 13, 20, and 30 years of follow-up, there was a corresponding

18% reduction in CRC mortality .

With annual FOBT screening, there was a sustained 33% reduction in CRC mortality over 30 years .

The Minnesota FOBT trial also reported a reduction in CRC incidence of 20% after 18 years of follow up.

FIT(fecal immunochemical test)

- **ADVANTAGES:**
- A 79% sensitivity and 94% specificity for CRC
- Noninvasive
- No risk of complications
- Can be done at home
- Programmatic screening possible

- **DISADVANTAGES:**
- Positive results require colonoscopy
- Needs to be repeated annually
- Low sensitivity for advanced adenomas
- Does not detect serrated lesions

mtsDNA stool test

ADVANTAGES:

- **92% sensitivity and 87% specificity for CRC**
- **Long-term reduction in CRC incidence and mortality is unknown**
- **Noninvasive**
- **No risk of complications**
- **Can be done at home**
- **Better sensitivity for advanced adenomas and large serrated lesions than FIT alone**

DISADVANTAGES:

- **Positive results require colonoscopy**
- **Repeat interval unknown but 3 years proposed**
- **More expensive than FIT alone**
- **Concern for over testing and harms from a positive test and negative colonoscopy**

Septin 9

ADVANTAGES:

48% sensitivity and 91% specificity for CRC

Long-term reduction in CRC incidence and mortality is unknown

Minimally invasive

No risk of complications

Can be added to routine blood draw

DISADVANTAGES:

Low sensitivity for CRC

Repeat interval unknown

Positive results require colonoscopy

Direct visualization tests

Colonoscopy

ADVANTAGES:

100% detection rate for CRC

Long-term reduction in CRC incidence 31%–71% and CRC mortality 65%–88% from observational studies

Diagnostic and therapeutic

Can detect cancers and precursor polyps

Infrequent repeat interval (q10 years) possible

DISADVANTAGES:

Operator dependent

Requires bowel preparation and sedation

Risk of complications 4–8 in 10,000

Flexible sigmoidoscopy

ADVANTAGES:

90%–100% sensitivity for distal colon CRC

Long-term reduction in CRC incidence 21%

reduction in CRC mortality 26%

Less invasive than colonoscopy

Low risk of complications

DISADVANTAGES:

Positive results require colonoscopy

Needs to be repeated every 5–10 years

Requires enema preparation

CT colonography

ADVANTAGES:

Sensetivity :90%–100% for CRC

Variable sensitivity for polyps, poor sensitivity for flat lesions and sessile serrated lesions

Less invasive than colonoscopy

Does not require sedation

Lower risk of complications than Colonoscopy

DISADVANTAGES:

Positive results require colonoscopy

Requires bowel preparation

Follow up may be required for extracolonic findings

Limited availability of trained radiologists across the United States

colon capsule

Advantages:

81% sensitivity and 93% specificity for polyps >= 6 mm

Minimally invasive

Does not require sedation

Newer generation tests can be done at home

disadvantages:

Requires bowel preparation

Positive examinations require colonoscopy

Repeat interval unknown

CRC screening in average-risk individuals starting at age 45 years

Recent studies have highlighted a rising incidence of CRC in individuals younger than 50 years in the United States.

Although CRC incidence has continued to decline in those age 50 years and older, the incidence rates have doubled in 20- to 49-year-olds.

In 2018, the American Cancer Society published guidelines with a qualified recommendation to lower the starting age for CRC screening from **50 to 45 years of age** in the average-risk adult population ,even though current recommendations of the US Preventive Services Task Force (USPSTF) and the Multi-Specialty Task Force (MSTF) are to begin screening at age 50 years.

American Cancer Society guidelines

It is recommended CRC screening in average-risk individuals between ages 50 and 75 years to reduce incidence of advanced adenoma, CRC, and mortality from CRC.

It is suggested CRC screening in average-risk individuals between ages 45 and 49 years to reduce incidence of advanced adenoma, CRC, and mortality from CRC.

It is suggested that a decision to continue screening beyond age 75 years be individualized.

It is recommended colonoscopy and FIT as the primary screening modalities for CRC screening.

It is suggested consideration of the following screening tests for individuals unable or unwilling to undergo colonoscopy or FIT:

flexible sigmoidoscopy, multitarget stool DNA test, CT colonography or colon capsule.

- It is suggested against Septin 9 for CRC screening.

Conditional recommendation, very low-quality of evidence.

It is recommended that the following intervals should be followed for screening modalities:

FIT every 1 year

Colonoscopy every 10 years

Strong recommendation; low-quality evidence

It is suggested that the following intervals should be followed for screening modalities:

Multitarget stool DNA test every 3 years

Flexible sigmoidoscopy every 5–10 years

CTC every 5 years

CC every 5 years

Conditional recommendation; very low-quality evidence

It is suggested initiating CRC screening with a colonoscopy at age 40 or 10 years before the youngest affected relative, whichever is earlier, for individuals with CRC or advanced polyp in 1 first degree

relative (FDR) at age,60 years or CRC or advanced polyp in >=2 FDR at any age.

It is suggested interval colonoscopy every 5 years.

Conditional recommendation; very low-quality evidence

It is suggested consideration of genetic evaluation with higher familial CRC burden (higher number and/or younger age of affected relatives).

It is suggest initiating CRC screening at age 40 or 10 years before the youngest affected relative and then resuming average-risk screening recommendations for individuals with CRC or advanced polyp in **1 FDR at age >=60 years.**

In individuals with **1 second-degree relative (SDR)** with CRC or advanced polyp, we suggest following average-risk CRC screening recommendations.

It is recommended that colonoscopists achieve CIRs of at least 95% in screening subjects.

Strong recommendation, low-quality evidence

It is suggested low-dose aspirin in individuals between the ages of 50–69 years with a cardiovascular disease risk of >10% over the next 10 years, who are not an increased risk for bleeding and willing to take aspirin for at least 10 years to reduce the risk of CRC.

Conditional recommendation; low-quality evidence

It is recommended against the use of aspirin as a substitute for CRC screening.

Strong recommendation, low-quality evidence

It is recommended organized screening programs to improve adherence to CRC screening compared with opportunistic screening.

Strong recommendation; low-quality evidence

It is suggested the following strategies to improve adherence to screening: patient navigation,patient reminders,clinician interventions, provider recommendations, and clinical decision support tools.

Conditional recommendation; very low-quality evidence

Thank you