



Provincial Health Services Authority

Colon Screening

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Program



Faculty Disclosure

- No relationship with financial sponsors.
- No potential conflict of interest

Objectives

At the end of this presentation, learners will:

1. Perform colorectal cancer risk assessment on their patients.
2. Recommend that eligible patients participate in colon screening.
3. Refer appropriate patients for colonoscopy surveillance at recommended intervals.

Colorectal Cancer

- 3rd most common cancer diagnosed
- 2nd leading cause of cancer death
- 1/14 men and 1/16 women

Why Screen for CRC

- Decreased diagnoses of CRC
 - Detection and removal of precancerous lesions
- Decreased deaths due to CRC
 - Decreased diagnoses
 - Detection at an earlier stage of disease
- Decreased morbidity
 - Surgery, stoma, adjuvant therapy
- Cost-effective

Colon Screening Recommendations

Colon Screening Recommendations

- Several guidelines available
- Provincial guidelines
 - Guidelines and Protocol Advisory Committee (2022)
- National guidelines
 - Canadian Task Force on Preventative Health (2016)
- International guidelines
 - US Task Force on Preventative Health
 - US Multi-Society Task Force

BC Guidelines

- Guidelines and Protocol Advisory Committee (GPAC)
- Joint committee of the Doctors of BC and Ministry of Health
- Involved stakeholders from family medicine, surgery, radiology and GI
- Updated in 2022:
 - Screening for colorectal neoplasia (Part 1)
 - Average risk individuals
 - Individuals with a family history of colorectal cancer
 - Colonoscopy surveillance (Part 2)
 - Individuals with a personal history of precancerous lesions removed from the colon

Risk Assessment

- Age
- Family history
 - Familial CRC
 - Hereditary CRC
- Personal history
 - Pre-cancerous lesions (PCL) removed
 - Ulcerative or Crohn's colitis
 - Other: Acromegaly, childhood abdominal XRT

Family History of Colorectal Cancer

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Family History

- Hereditary colorectal cancer
 - Germline pathogenic variant (Lynch syndrome)
 - 5-10% colorectal cancer
- Familial colorectal cancer
 - Multifactorial genetic and shared environmental risk factors

Familial Colorectal Cancer

- Risk increases based on:
 - Older age of patient
 - Increased number of relatives affected
 - Closeness of the affected relative
 - Younger age at diagnosis of affected relative

Familial Colorectal Cancer

- Meta-analysis cumulative risk of CRC by 85 years of age

Family History	RR (95%CI)
No family history	1.00
One FDR	1.37 (0.76-2.46)
One FDR < 50 years	3.26 (2.82-3.77)
One FDR < 60 years	2.02 (1.59-2.57)

TABLE 1. BC guidelines for screening individuals with a family history of colorectal cancer.

Family history	Test	Start age	Interval
≥ 2 FDRs* diagnosed with colorectal cancer	Colonoscopy	40 years [†]	5 years
1 FDR diagnosed with colorectal cancer at < 60 years of age	Colonoscopy	40 years [§]	5 years
1 FDR diagnosed with colorectal cancer at ≥ 60 years of age	FIT [‡]	50 years	2 years
≥ 1 SDR(s) [§] diagnosed with colorectal cancer	FIT	50 years	2 years
≥ 1 FDR(s) diagnosed with a precancerous lesion	FIT	50 years	2 years

* FDR = first-degree relative.

[†] Or 10 years younger than the earliest age of diagnosis of the FDRs, whichever is earlier.

[‡] FIT = fecal immunochemical test.

[§] SDR = second-degree relative.

Hereditary Colorectal Cancer

- When to suspect:
 - Multiple CRCs in family
 - CRC diagnosed at age ≤ 40 years
 - ≥ 2 precancerous lesions at age ≤ 40 years
 - Synchronous/metachronous CRCs
 - Multiple precancerous colorectal lesions
 - 10 or more cumulatively

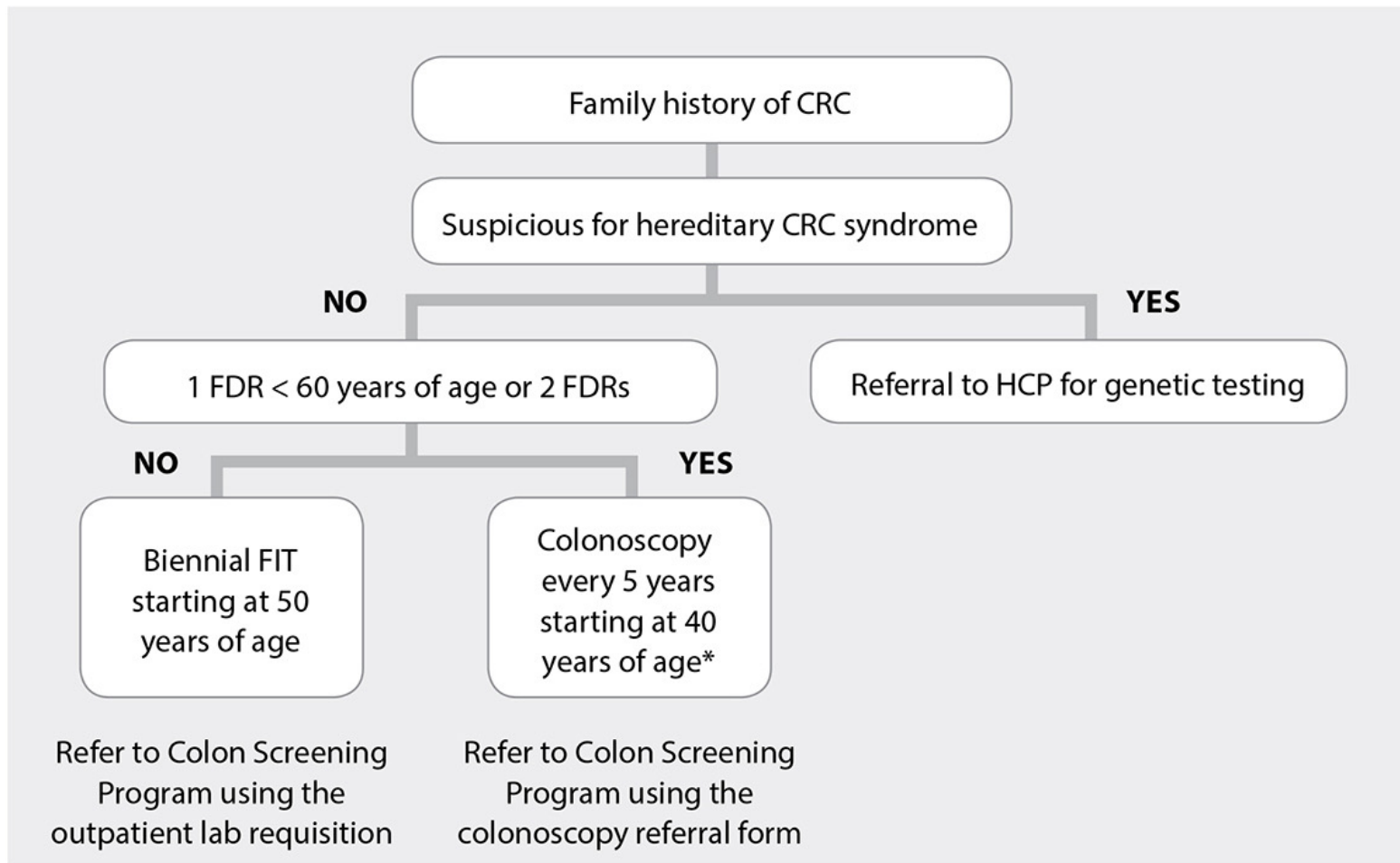
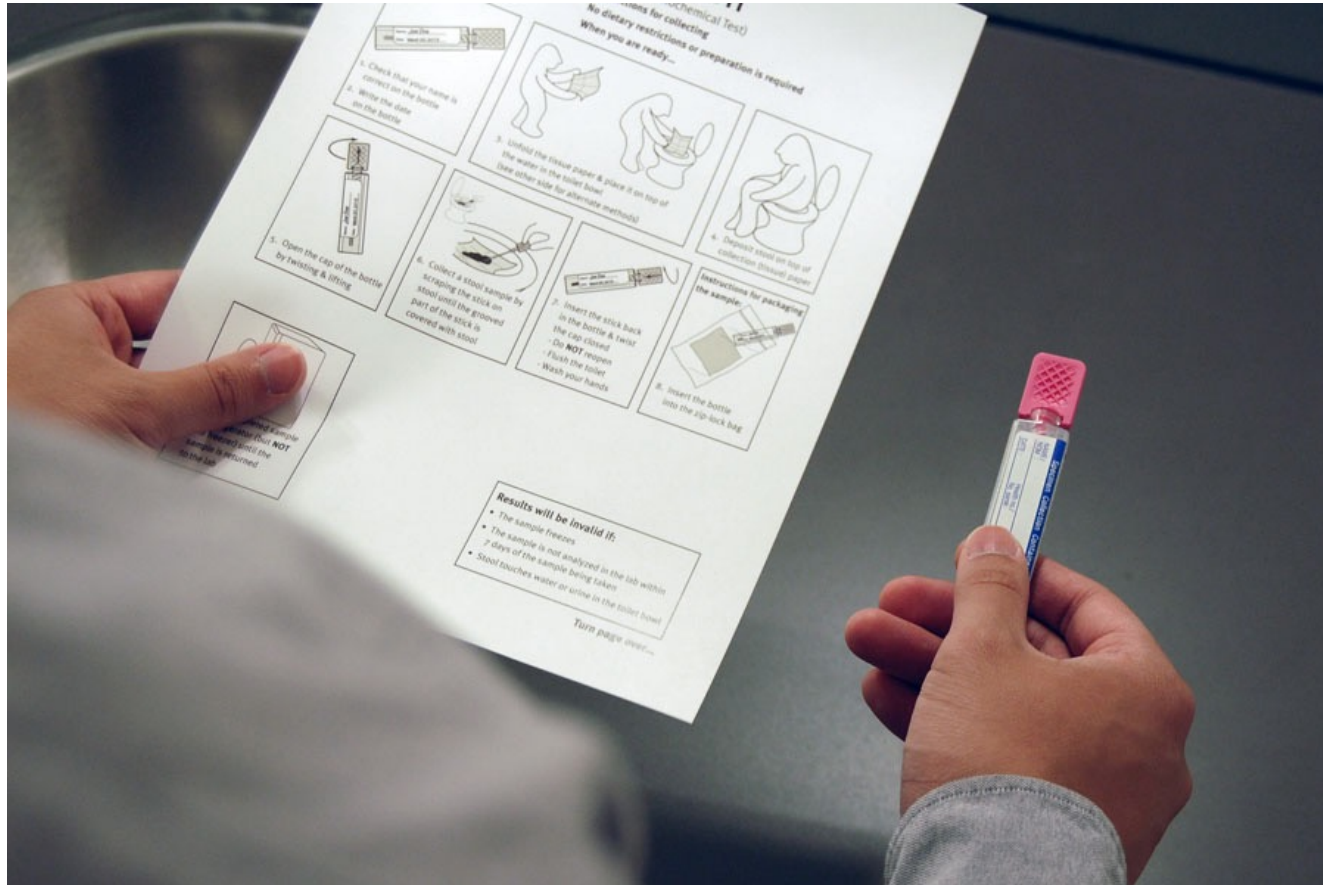


FIGURE 2. Approach to an individual with a family history of colorectal cancer (CRC).

FDR = first-degree relative; HCP = Hereditary Cancer Program; FIT = fecal immunochemical test.

*Or 10 years earlier than the age of diagnosis of the youngest affected relative.

Average Risk Screening



Colon Screening Strategies

- RCT evidence
 - gFOBT annual and biennial
 - Flexible sigmoidoscopy every 10 years
 - Colonoscopy every 10 years
- Guideline recommendations
 - FIT (Canada, Europe, UK, Asia) annual or biennial
 - Fecal DNA (USA) every 3 years
 - CT colonography (USA) every 5 years
- Several serum and urine based tests under investigation

Results from CRC Screening RCTs (ITT)

Test	Trial	CRC Incidence RR (95%CI)	CRC Mortality RR (95%CI)	Follow-Up (years)
gFOBT	Pooled results	1.02 (0.93-1.12)	0.91 (0.84-0.98)	19.5
	5 trials	0.90 (0.77-1.04)	0.78 (0.65-0.93)	30
Flexible Sigmoidoscopy	Pooled results	0.78 (0.74-0.83)	0.74 (0.68-0.80)	11-17
	4 trials			
Colonoscopy	NordICC Trial	0.82 (0.70-0.93)	0.90 (0.64-1.16)	10

Lin et al JAMA 2021
Bretthauer et al NEJM 2022

FIT Performance

- No randomized studies assessing CRC mortality or incidence
- Compared to guaiac FOBT
 - Improved participation
 - Improved detection of advanced neoplasia
- Results from guaiac FOBT randomized controlled trials have been extrapolated to FIT
- Several large cohort studies demonstrating that FIT screening decreases CRC incidence and mortality

FIT vs. Colonoscopy

- Randomized trials underway comparing FIT to colonoscopy
- COLONPREV – Spain
 - Colonoscopy vs. biennial FIT
- CONFIRM – USA Department of Veteran's Affairs
 - Colonoscopy vs. annual FIT
- SCREESCO – Sweden
 - Colonoscopy vs. biennial FIT vs. control
- Akita pop-colon trial – Japan
 - Annual FIT + colonoscopy vs. annual FIT

FIT vs. Colonoscopy

- Randomized trial of 53,302 asymptomatic adults 50-69 years
 - Biennial FIT vs one-time colonoscopy
 - Results of first round of screening

	FIT	Colonoscopy	p-value
Participation	34.2%	24.6%	<0.0001
CRC DR	0.1%	0.1%	0.99
Advanced adenoma DR	0.9%	1.9%	<0.001

BC Guidelines for Colon Screening

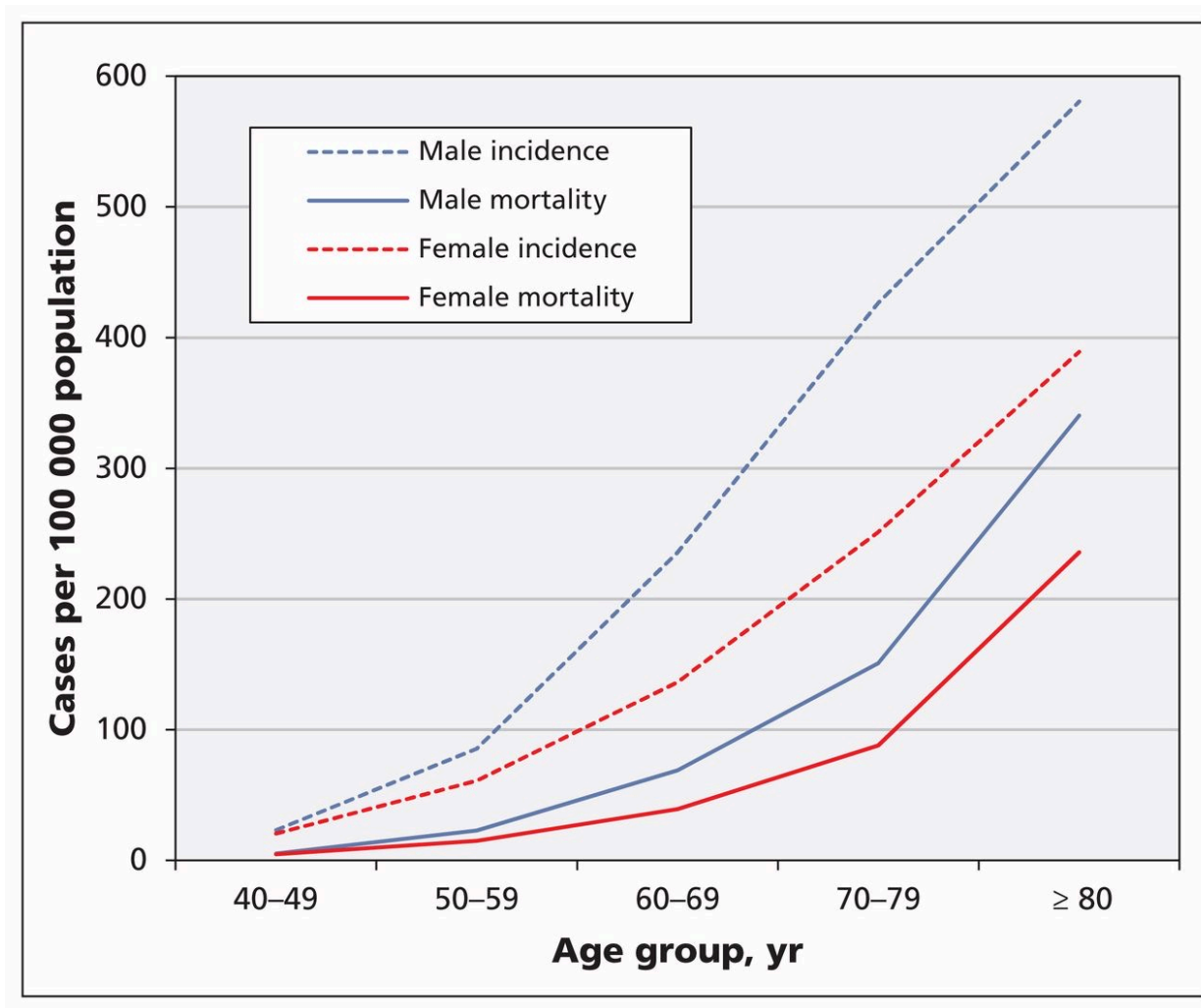
- No change from previous guidelines
- Average risk individuals 50 to 74 years of age
 - Biennial FIT
 - Within the Colon Screening Program, where available
- Aligns with the Canadian Task Force on Preventative Health Care recommendations
- Recognizes the benefits of organized programmatic screening

Canadian Guidelines for Colon Screening

- Colorectal cancer screening is recommended by the Canadian Task Force on Preventative Health Care
- Average risk individuals 50 to 74 years of age
 - FOBT (or FIT) every 2 years *or*
 - Flexible sigmoidoscopy every 10 years
- All provinces and one territory have commenced or announced screening programs using FOBT/FIT as the primary screening test

Age to Start Screening

Estimated incidence and mortality from colorectal cancer in Canada in 2015, by sex.

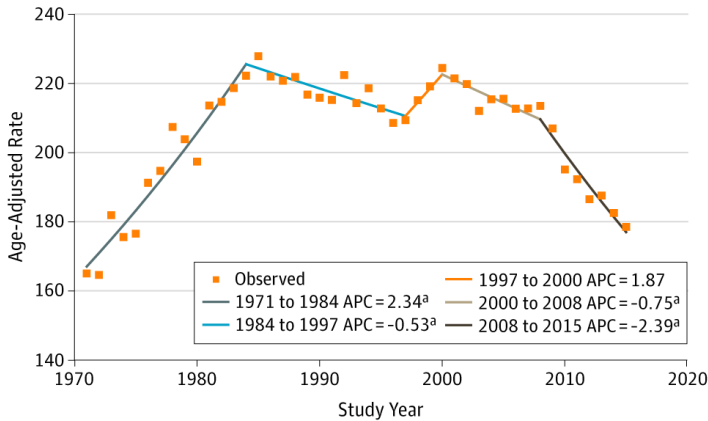


Canadian Task Force on Preventive Health Care CMAJ
2016;188:340-348

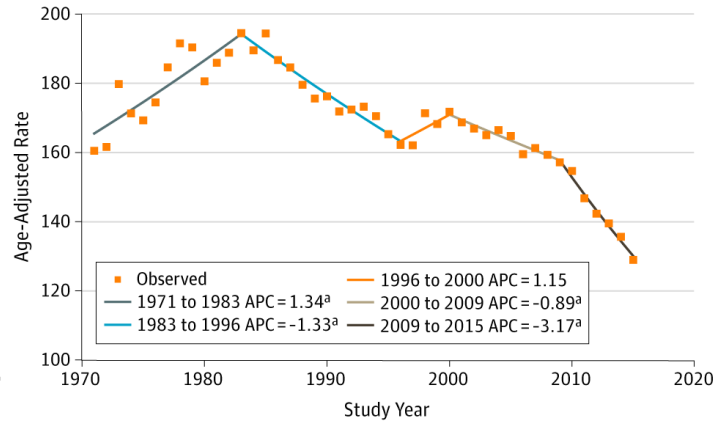
CMAJ·JAMC

Observed Incidence Trends by Sex and Age in Canada

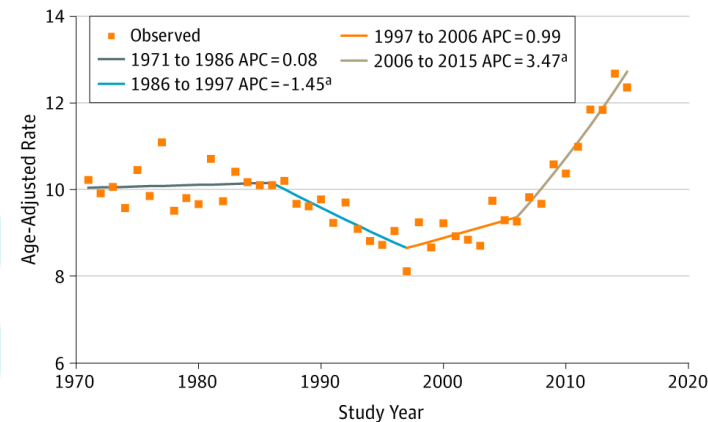
A Men 50 years and older



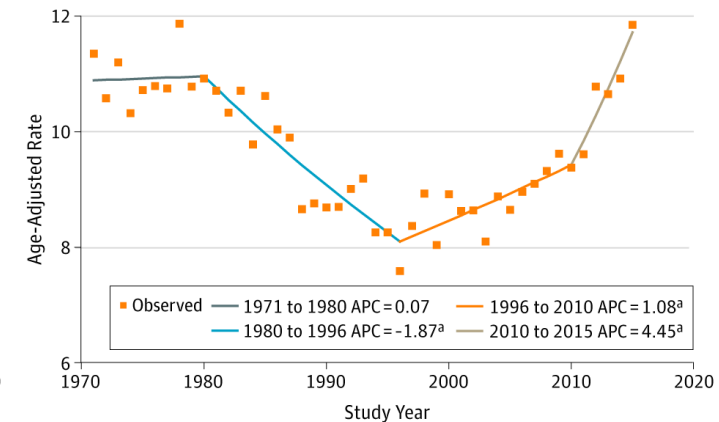
B Women 50 years and older



C Men younger than 50 years



D Women younger than 50 years



Early Onset Colorectal Cancer

- Increased incidence rates of CRC in younger adults (< 50 years)
- Compared to CRC diagnosed in those > 50 years:
 - Diagnosed at a later stage
 - Higher proportion of left sided colon and rectal cancer
 - More aggressive histologic subtypes
 - More often symptomatic
- US guidelines: start screening at 45 years

CRC Standardized Incidence Rates (per 100,000)

Age Group	Incidence Rate 1984-1988	Incidence Rate 2009-2013	Relative Change %	Absolute Difference
20-29	0.8	1.8	+125.0	+1.0 per 100,000
30-39	4.5	7.1	+57.8	+2.6 per 100,000
40-49	19.4	23.6	+21.6	+4.2 per 100,000
50-59	73.5	61.2	-16.7	-12.3 per 100,000
60-69	188.9	104.1	-44.9	-84.8 per 100,000
70-79	356.3	190.2	-46.6	-166.1 per 100,000



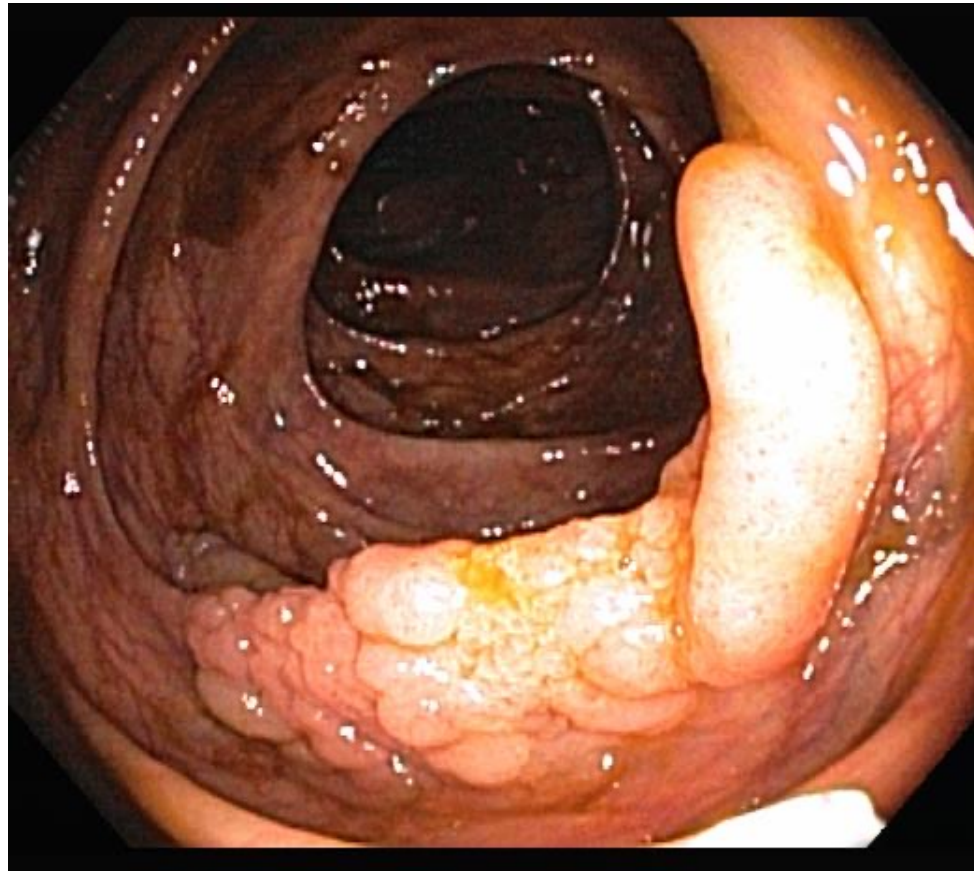
Early Onset Colorectal Cancer

- Consider the possibility of CRC in young patients presenting with rectal bleeding
- CPAC conducting a systematic review and modelling screening strategies involving younger age groups

When to stop?

- Modeling studies
- Continuing screening
 - Continuing screening beyond 75 years resulted in loss of QALYs (=net harm) due to colonoscopy complications
- Never screened = First time screening
 - Unscreened individuals 75-90 years
 - No comorbidity – up to 86 years with FIT
 - Moderate comorbidity – up to 83 years with FIT
 - Severe comorbidity – up to 80 years with FIT

Follow-Up Care



Previous Colonoscopy Surveillance

- Due to low numbers of post-colonoscopy CRC (PCCRC), studies may use a surrogate outcome of Advanced Neoplasia (high risk PCL or CRC)
 - Over-estimates the risk of CRC
- Comparator group may be general population, screening status unknown rather than individuals with a normal colonoscopy

Colonoscopy Surveillance

- More recently, studies evaluating large cohorts undergoing colonoscopy surveillance with PCCRC as the outcome have been published
- Coincided with colonoscopy surveillance guideline updates
 - US, Europe, Asia-Pacific

Precancerous Lesions

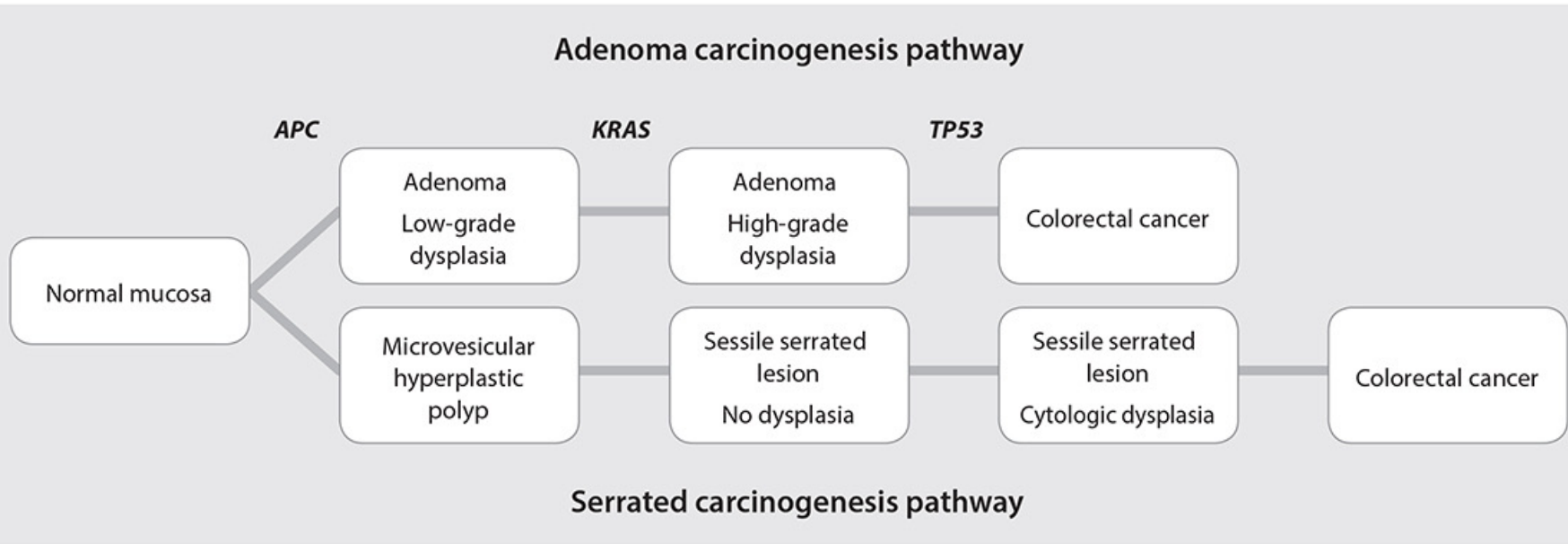


FIGURE 1. Adenoma and serrated colorectal cancer pathways.

High Risk Findings

Feature	Low Risk	High Risk
Size	< 10 mm	≥ 10 mm
Number	0 to 4	≥ 5
Histology	<ul style="list-style-type: none"> ◆ Adenoma with low grade dysplasia ◆ Sessile serrated lesion with no dysplasia 	<ul style="list-style-type: none"> ◆ Adenoma with high grade dysplasia ◆ Adenoma with villous features ◆ Sessile serrated lesion with dysplasia ◆ Traditional serrated adenoma

Includes hyperplastic polyps

Summary of Evidence

- Recent publications have higher validity
 - Longer-term follow-up
 - CRC is the outcome studied
 - Data collected during a period when colonoscopy quality was improving
 - Track and account for surveillance colonoscopy

Lee et al Gastro 2020;158:884-894

Wieszchy et al. Gastro 2020. 158(4):875-882

Cross et al. Gut 2021;70:2307-2320

Lieberman et al. Gastro 2020;158:862-874

Summary of Evidence

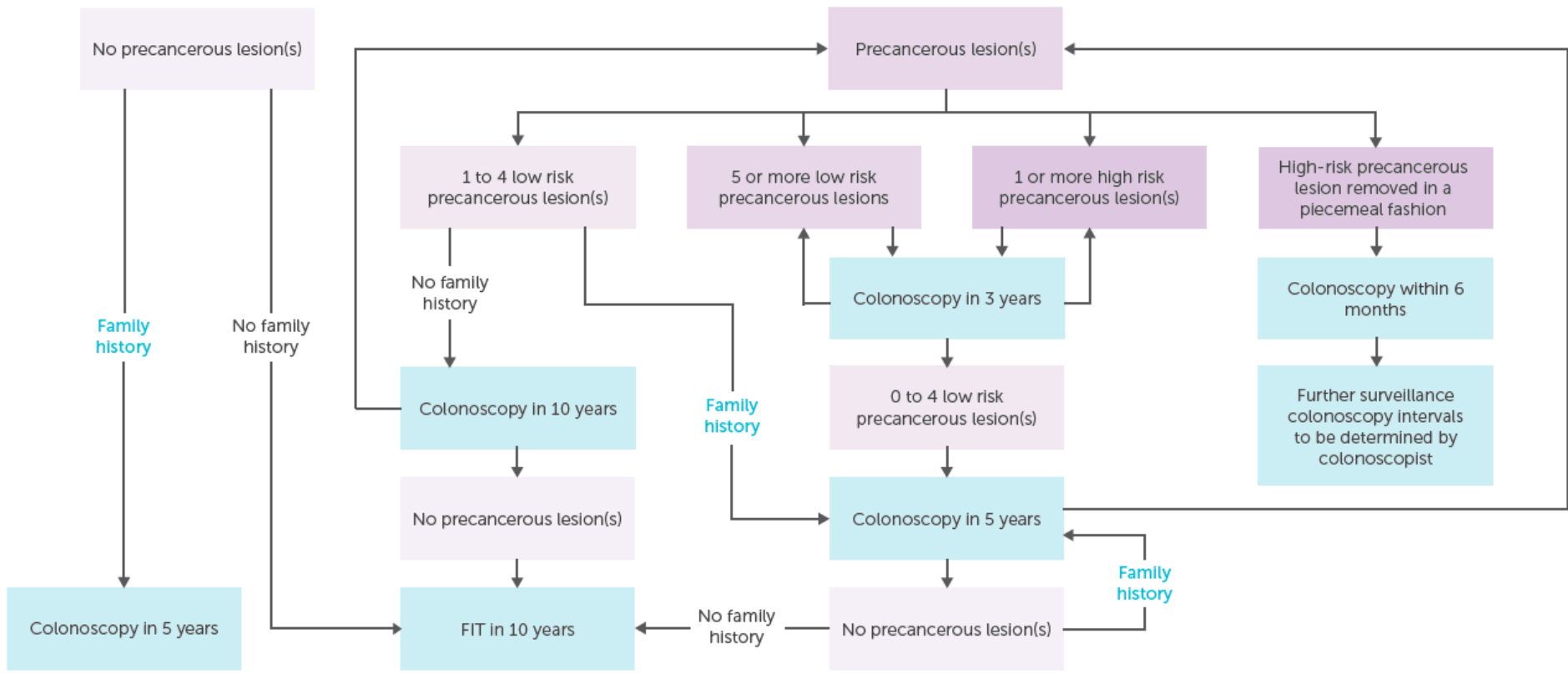
- Personal history of high risk PCLs may increase an individual's risk of future CRC
 - After 3 year colonoscopy, risk = general population
 - After 5 year colonoscopy, risk < general population
 - Risk may be due to PCLs ≥ 20 mm or with HGD

Summary of Evidence

- Personal history of low-risk PCLs
 - Similar risk to individuals with no PCLs
 - Lower risk than the general population
 - Controlling for surveillance colonoscopies

BC Surveillance Guidelines

- GPAC updated colonoscopy surveillance guidelines in 2022
- < 4 low risk precancerous lesions – colonoscopy @ 10 years
- ≥ 5 low risk PCLs – colonoscopy @ 3 then 5 years
- 1 or more high risk PCL – colonoscopy @ 3 then 5 years
- Return to FIT following normal colonoscopy



High Quality Colonoscopy

- Complete to cecum
- Adequate bowel preparation
- Adequate colonoscopist ADR
- Complete lesion resection

Take-Home Points

- CRC screening decreases CRC mortality and incidence
- RCT data for benefits of guaiac FOBT and flexible sigmoidoscopy
- Await results from 4 randomized trials of FIT vs. colonoscopy
- Start screening in average risk at 50 years
- Stop screening at 75 years
- Consider one-time screening test in a previously unscreened patient over 75 years

Take-Home Points

- New evidence supports less intense colonoscopy surveillance and eventual return to FIT for individuals with low risk precancerous lesions
- Close follow-up of patients following resection of colorectal cancer is recommended for early detection of local recurrence or metastatic disease

Thank you!



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