COLORECTAL CANCER PREVENTION MYTH BUSTERS: SCREENING, STOOL AND SCOPES

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MERCY ONE

1

Disclosures

I have no disclosures

2

Outline

- What is screening?
- Who and why do we screen?
- Colon cancer epidemiology
- Guidelines
- Screening modalities & What's the data?
- How is Iowa doing?
- Sociodemographic disparities
- Screening during the COVID pandemic

3

What is screening?

"The application of tests, examinations or other procedures… to sort out apparently well persons who probably have a disease from those who probably do not." (Wilson and Jungner, 1968)

- Major health problem
- Natural history understood
- Suitable screening test
- Effective treatment exists
- Reduces disease incidence and disease-related mortality
- Cost-effective
- Ongoing process

4

Why do we screen?

- Lifetime incidence 5%
- Majority of cases occur after 50 years-old
- One-third of patients with colorectal cancer die from the disease
- Colon screening is cost effective
- **Colorectal cancer is a PREVENTABLE disease!**
- Goals:
  - To reduce colorectal cancer incidence and mortality
  - Detect early stage and curable cancers
  - Detect pre-cancerous lesions

5

Myth

- We are screening for colorectal cancer

6

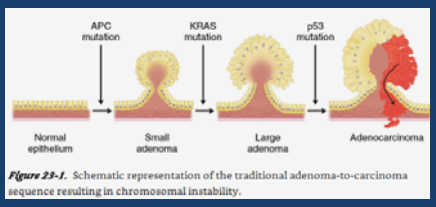


Figure 23-1. Schematic representation of the traditional adenoma-to-carcinoma sequence resulting in chromosomal instability.

7

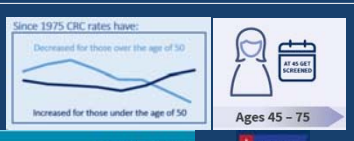
Who do we screen?

- Who is an average-risk individual?
  - No family or personal history of colon cancer
  - No personal history of colon adenoma
  - No inflammatory bowel disease
  - No symptoms

8

Who do we screen?

- 50 years-old ?



*In 2018, secondary to new data on the increased risks of colon cancer in those under 50, the American Society of Colon and Rectal Surgery changed recommendations to consider starting screening at age 45.

9

Myth

- Colorectal cancer only happens in older people

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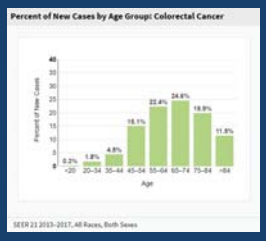
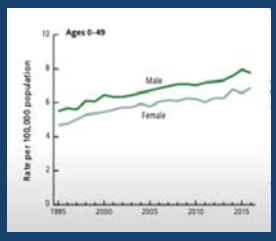




11

Screening modalities

- Fecal occult blood test or fecal immunochemical test
  - Yearly
- Sigmoidoscopy
  - Every 5 years
- Colonoscopy
  - Every 10 years
- Virtual colonoscopy
  - Every 5 years
- Fecal DNA
  - Every 1 or 3 years

12

Myth

- All screening modalities are created equal

13

Fecal occult blood test (FOBT)

- Aimed at detecting subtle blood loss in GI tract
- Requires at least 2 mL of blood loss a day to become positive
- Strict dietary adjustments prior to collecting sample
- Poor sensitivity
- Repeat annual testing
  - Compliance?
- Costs:
  - If positive, will need colonoscopy within 1 year of abnormal result
    - Studies report only 25-59% of patients with a positive FOBT receive diagnostic evaluation [1]

[1] Miglioretti DL, et al. Improvement in the diagnostic evaluation of a positive fecal occult blood test in an integrated health care organization. Med Care. 2008;46(9 Suppl 1): S91– 6.

14

Fecal occult blood test (FOBT)

- Several randomized controlled trials demonstrating a benefit of FOBT in reducing mortality from colorectal cancer [1,2]
  - Approximately 15% reduction
    - Likely due to FOBT with subsequent follow-up colonoscopy
- Much of the data on FOBT was published in the 1990s
  - Data collected in the 1970-80s

[1] Kronborg O, et al. Randomised study of screening for colorectal cancer with faecal-occult-blood test. Lancet. 1996;348(9040): 1467–71.
[2] Hardcastle JD, et al. Randomised controlled trial of faecal-occult-blood screening for colorectal cancer. Lancet. 1996;348(9040): 1472–7.

15

Fecal immunochemical test (FIT)

- Utilizes specific antibodies to detect globin
- Has replaced most FOBT tests
  - Improved detection of hemoglobin compared to gFOBT
    - Increased sensitivity and specificity
    - Can pick up as little as 0.3 mL of blood in stool
  - No requirements for dietary restrictions
- Overall accuracy 95% [1]
  - 79% sensitivity and 94% specificity
- Adenoma detection only 28% [2]
- No good data suggesting that FIT lowers colon cancer mortality

[1] Lee JK, et al. Accuracy of fecal immunochemical tests for colorectal cancer: systematic review and meta-analysis. Ann Intern Med. 2014;160(3): 171.
[2] Rennert G. Fecal occult blood screening--trial evidence, practice and beyond. Recent Results Cancer Res. 2003;163: 248--53. discussion 64-6.

16

Sigmoidoscopy

- Examines only 1/3 of the colon
- Benefits:
  - More tolerable to perform without sedation
  - Can be performed by variety of operators
  - Minimal bowel preparation
- If adenoma detected, requires formal colonoscopy
- Does not evaluate the more proximal colon

17

Sigmoidoscopy

- Large RCT demonstrated 21% reduction in colorectal cancer incidence and 26% reduction in mortality [1]
  - Mortality from proximal colorectal cancer was not affected
  - Morality reduction of 50% for only distal colorectal cancer
- Recent RCT compared flexible sigmoidoscopy +/- FOBT [2]
  - 63% adherence
  - 28% reduction in colorectal cancer
  - 12% reduction in mortality
- No difference between flexible sigmoidoscopy alone or in combination with FOBT

[1] Schoen RE, et al. Colorectal-cancer incidence and mortality with screening flexible sigmoidoscopy. N Engl J Med. 2012;366(25): 2345--57.
[2] Holme Ø, et al. Effect of flexible sigmoidoscopy screening on colorectal cancer incidence and mortality: a randomized clinical trial. JAMA. 2014;312(6): 606--15.

18

Stool DNA testing

- Most recent advancement
- Use DNA testing of stool samples
  - Tests for DNA mutations and methylations of common genes associated with colorectal cancer
- Requires large stool sample (mailed)
- No dietary restrictions
- **False positives** (more than FIT)
  - 16% of all tests are positive, 66-75% of which are false positives [1]
- Polyps >1 cm can be detected [2,3]
  - Sensitivity 57%

[1] Imperiale TF, et al. Multitarget stool DNA testing for colorectal-cancer screening. N Engl J Med. 2014 Apr 3;370(14):1287-97.
[2] Heigh RI, et al. Detection of colorectal serrated polyps by stool DNA testing: comparison with fecal immunochemical testing for occult blood (FIT). PLoS One. 2014;9(1): e85659.
[3] Lidgard GP, et al. Clinical performance of an automated stool DNA assay for detection of colorectal neoplasia. Clin Gastroenterol Hepatol. 2013;11(10): 1313– 8.

19

Myth

- If I have a positive stool DNA test that means I have cancer

20

Stool DNA testing

- "Multitarget Stool DNA Testing for Colorectal-Cancer Screening" (Imperiale et. al., NEJM 2014)
  - RCT of FIT vs stool DNA
  - All patients received colonoscopy as gold standard

Table 1. Sensitivity and Specificity of the Multitarget Stool DNA Test and the Fecal Immunochemical Test (FIT) for the Most Advanced Findings on Colonoscopy.

Most Advanced Finding	Colonoscopy (N = 9989)	Multitarget DNA Test (N = 9989)		FIT (N = 9989)	
		Positive Results	Sensitivity (95% CI)	Positive Results	Sensitivity (95% CI)
	no.	no.	%	no.	%
Colorectal cancer					
Any	65	60	92.3 (83.0–97.5)	48	73.8 (61.5–84.0)
Stage I to III*	60	56	93.3 (83.8–98.2)	44	73.3 (60.3–83.9)
Colorectal cancer and high-grade dysplasia	104	87	83.7 (75.1–90.2)	66	63.5 (53.5–72.7)
Advanced precancerous lesions†	757	321	42.4 (38.9–46.0)	180	23.8 (20.8–27.0)
Nonadvanced adenoma	2893	498	17.2 (15.9–18.6)	220	7.6 (6.7–8.6)
		Specificity (95% CI)			Specificity (95% CI)
All nonadvanced adenomas, non-neoplastic findings, and negative results on colonoscopy	9167	1231	86.6 (85.9–87.2)	472	94.9 (94.4–95.3)
Negative results on colonoscopy	4457	455	89.8 (88.9–90.7)	162	96.4 (95.8–96.9)

Imperiale TF, et al. Multitarget stool DNA testing for colorectal-cancer screening. N Engl J Med. 2014 Apr 3;370(14):1287-97.

21

Stool DNA testing

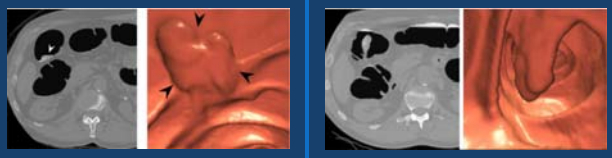
PROS

- Non-invasive
- Does not require bowel preparation
- Can be done at home
- Better than FIT
- More patient willingness

CONS

- Not preventative
- Advanced adenoma detection 42%
- Adenoma detection 17%
- Subsequent diagnostic colonoscopy required
- Not therapeutic

22



CT colonography/Virtual colonoscopy

23

CT colonography/Virtual colonoscopy

- "Minimally invasive"
- Uses CT to generate 2D images with 3D reconstruction
- Still requires bowel preparation
- Requires distention of colon
  - Rectal catheter insertion to allow for manual/automatic continuous inflation carbon dioxide
- If polyps are detected, therapeutic colonoscopy is required

24

CT colonography/Virtual colonoscopy

- American College of Radiology Imaging Network national multicenter CTC trial assessed over 2500 patients [1]
  - Sensitivity of 90% for polyp or cancer detection ≥1 cm and 78% for ≥6 mm
- Another study looked at outcomes in 1000 cases where screening CTC exams were negative [2]
  - 1 internal cancer and 11 large adenomas were noted after a mean follow-up of 4.7 years
- CTC has a current 5-year screening interval

[1] Johnson CD, et al. Accuracy of CT colonography for detection of large adenomas and cancers. N Engl J Med. 2008;359(12): 1207–17.
[2] Kim DH, et al. Five-year colorectal cancer outcomes in a large negative CT colonography screening cohort. Eur Radiol. 2012;22(7): 1488–94.

25

CT colonography/Virtual colonoscopy

- Extracolonic findings
  - Approximately 66% of scans will find something incidental
  - Additional workup in about 25%
  - Clinically relevant in 2-3%
  - Screening other organs?
    - AAA
    - Liver disease

26

CT colonography/Virtual colonoscopy

PROS	CONS
▪ Has the ability to detect polyps	▪ Not therapeutic
▪ "Minimally invasive"	▪ Needs bowel preparation
▪ No sedation needed	▪ Has not been widely accepted/utilized
▪ Extracolonic findings	▪ Extracolonic findings

27

Colonoscopy

PROS

- Highest sensitivity for cancer and all pre-cancerous lesions
  - Multiple studies
- Both diagnostic and therapeutic at the same time
- Up to 10 years between evaluations

CONS

- Requires full bowel preparation
- Complications
  - Perforation
  - Bleeding
- Discomfort

28

Myth

- The prep is horrible

29

Myth

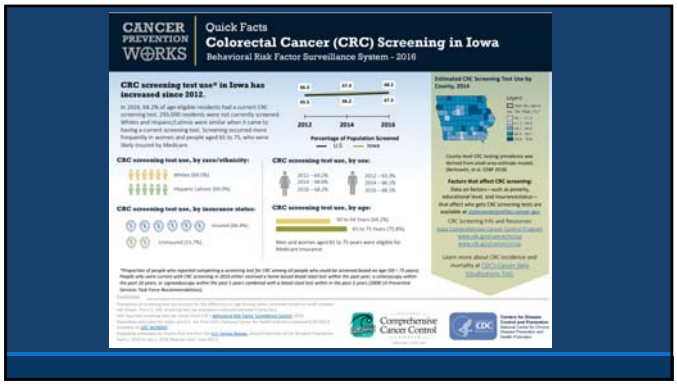
- A colonoscopy has to be painful

30

Myth

- Colonoscopies are dangerous

31



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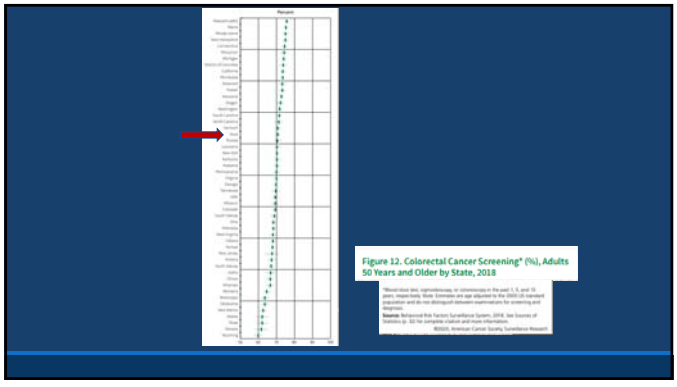
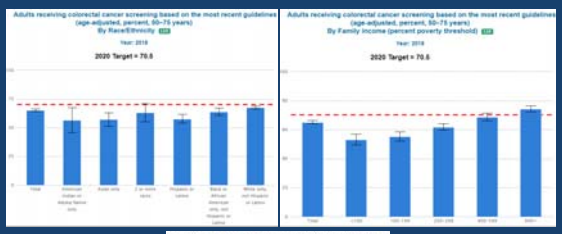


33

Sociodemographic Disparities in CRC Screening



34

Social Determinants of Health

- Social policies
- Structural racism
- Discrimination
- Health literacy
- Employment status
- Poverty
- Living environment
- Access to high-quality healthcare
- Medical mistrust

35

Myth

- Colorectal cancer screening is equally obtainable and widely available to everyone

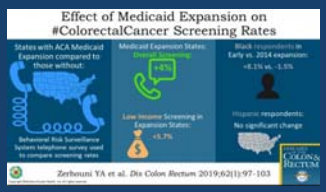
36

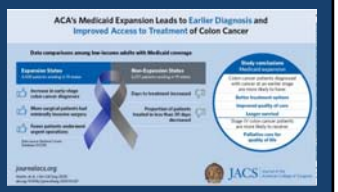
Barriers to Screening

Patient-level factors	Systemic and Policy-level factors	Provider-level factors
❖ Lack of knowledge ❖ Beliefs and cultural factors ❖ Education ❖ Health literacy ❖ Language ❖ Cost and lack of insurance	❖ Access to screening tests ❖ Colonoscopy capacity ❖ Cost and insurance policy	❖ Knowledge ❖ Beliefs ❖ Practice setting ❖ Counseling practices ❖ Lack of recommendation ❖ Discrimination ❖ Time constraints ❖ Perceived need ❖ Referral practices ❖ Lack of support

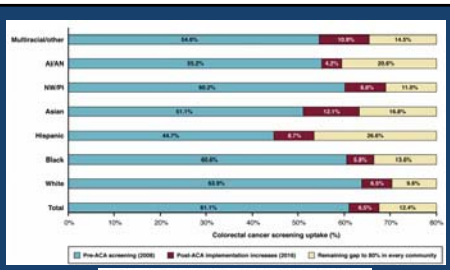
May, FP, et al. Disparities in Colorectal Cancer Screening in the United States Before and After Implementation of the Affordable Care Act. CGH. 2020;18(8): P1796-1804.

37





38



Demb J, Gupta S. Racial and Ethnic Disparities in Colorectal Cancer Screening Pose Persistent Challenges to Health Equity. CGH. 2020;18(8): P1691-93.

39

Screening in the times of COVID

"Delayed cancer screenings." Epic Health Research Network. (May 2020). Retrieved from: https://ehrn.org/articles/delays-in-preventive-cancer-screenings-during-covid-19-pandemic.

40

Screening in the times of COVID

"Delayed cancer screenings." Epic Health Research Network. (May 2020). Retrieved from: https://ehrn.org/articles/delays-in-preventive-cancer-screenings-during-covid-19-pandemic.

41

Myth

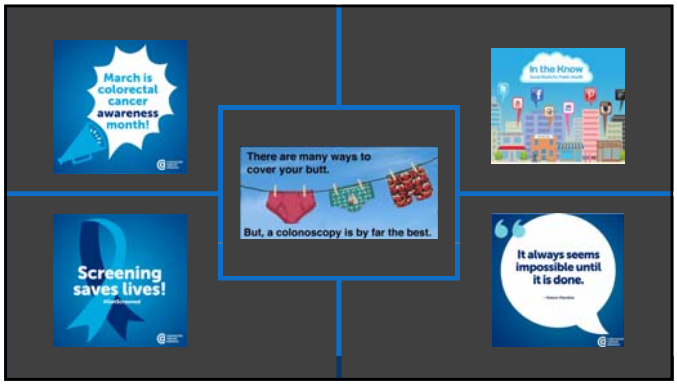
- It's safer to just wait until the pandemic is over

42

Summary

- Colon screening reduces colorectal cancer incidence and mortality
- Colon screening is cost-effective
- Screening modalities
  - Colonoscopy is the gold standard
  - Ordering providers should know the data when ordering different screening tests
- 45 is the new 50
- Health equity is important for improving healthcare outcomes
- Thank you to the primary care providers!

43



44