Stool-Based Colorectal Cancer Screening
State of the science and implications for screening management among the 45-49 year old population

📅 Tuesday, March 9th  🕒 1:00 PM Eastern

ANN ZAUBER  PHD
Attending Biostatistician
Memorial Sloan Kettering

THEODORE R. LEVIN  MD
Research Scientist
Kaiser Permanente
Northern California
Fight Colorectal Cancer (Fight CRC) is a leading patient-empowerment and advocacy organization in the United States, providing balanced and objective information on colon and rectal cancer research, treatment, and policy.

We are relentless champions of hope, focused on funding promising, high impact research endeavors while equipping advocates to influence legislation and policy for the collective good.

Learn more at FightColorectalCancer.org
Early-Age Onset Workgroup Research Learning Session #5

Agenda

12:00-12:10p ET  Welcome and Introductions: Elsa Weltzien and Andrea (Andi) Dwyer

12:10 - 12:40p ET  Dr. Ann Zauber: State of the science of stool-based testing

12:40-1:10p ET  Discussion with Dr. Theordore R. Levin: implementation of stool-based testing

1:10-1:55p ET  Discussion

1:55-2:00p ET  Close out and next steps: Andi Dwyer
EAO Workgroup: Upcoming Opportunities

01 Research Learning Series – Session #5

May 4, 2021 – 12-2 pm EST
Pt. 2: Equitable access to screening among 45-49
Registration coming soon!

02 2021 EAO CRC International Symposium

June 24 & 25, 2021. 11:30-3:30 EST
The 2021 symposium will include action-based dialogue between patients, advocates, clinicians, and researchers, and collaborative discussion of the successes and gaps in EAO CRC research and clinical care.

Registration and abstract submissions opening March 31, 2021
CALL ON CONGRESS
FIGHT COLORECTAL CANCER

KICKOFF EVENT
MARCH 15

CALLONCONGRESS.ORG
Stool-Based Colorectal Cancer Screening

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“Strategies to Screen Ages 45-49 for Colorectal Cancer: The Case for Implementing Stool-Based Screening at a Younger Age”

Fight CRC Early Age Onset Workgroup
March 9, 2021

Ann G. Zauber, PhD
Memorial Sloan Kettering Cancer Center
CISNET-Colon Coordinating Chair
Outline

• Background
• Characteristics of Stool Based Screening
• Diagnostic Accuracy of Stool Based Screening
• Adherence to Stool Based Screening
• USPSTF 2020 Draft Recommendations
Background
CRC Screening from 2000 - 2018

Source: National Health Interview Survey (2018) Stacey Fedewa
In the United States, 90% of CRC Screening is Colonoscopy

**PROS:**
- Done every 10 years
- Removes adenomas and detects CRC

**CONS:**
- Bowel prep
- Sedation
- Potential perforation
- Companion is needed after exam
Getting Vetted As a Running Mate? Like a Colonoscopy, Only Worse…

**Life on the Vice-Presidential Short List**

It’s exciting. It can also feel like a colonoscopy.

Evan Bayh, a former Democratic senator from Indiana and a repeat vice-presidential contestant, somewhat famously compared the vetting process to a colonoscopy — “except they use the Hubble telescope on you.”

-New York Times
July 4, 2020
"Many of my own patients are surprised to learn that there’s another way," said Dr. Alex Krist, also a family physician at Virginia Commonwealth University. “As they age, they want less invasive methods” and may be happy to switch.

-New York Times
January 11, 2021
Adenoma-Carcinoma Sequence

The National Polyp Study at 40: Challenges Then and Now

PUBLIC HEALTH
- Polypectomy rationale
- Adv. Adn. surrogate
- NPS model
- Guidelines
  - Adv. Adn. screening goal
  - Surveillance intervals
  - Adv. family hx
  - Surveillance by colonoscopy
  - Risk stratification

FUTURE STUDIES
- NPS model use
- Screening colonoscopy RCTs
- Surveillance intervals RCT
- Adv. Adn. family hx
- Adv. Adn./CRC risk

Surveillance intervals ↑ NEJM 1993
Incidence ↓ NEJM 1993
Mortality ↓ NEJM 2012
National Polyp Study: Colonoscopy Polypectomy Reduces CRC Incidence and CRC Mortality

Colonoscopic polypectomy reduces burden of disease
• The opportunity to intervene in the natural history through screening is noted in red. Screening can either remove an adenoma, thus moving a person to the “no lesion” state, or diagnose a preclinical cancer, which, if detected at an earlier stage, may be more amenable to treatment (Knudsen, JAMA 2016)
Suggested screening

- SEER Data of 1988-1992 SEER
Familial Risk is Associated with CRC

• Evidence to begin CRC screening earlier for familial risk.

Figure 1. Cumulative Incidence of Colorectal Cancer According to Age and the Presence or Absence of a Family History of the Disease.

Fuchs CS et al, NEJM 1994
Among adults younger than 55 years, there was a 51% increase in the incidence of CRC from 1994 to 2014 and an 11% increase in mortality from 2005 to 2015.

CISNET Modeling and Past Recommendations
Population Simulation Model

Input
- Demography assumptions
- Natural history assumptions (incl. risk level)
- Screening assumptions

MISCAN program
- Demography part
- Natural history part
- Screening part

Output
- Cancer incidence and mortality without screening
- Cancer incidence and mortality with screening

Results
- Effects of screening
USPSTF CISNET Decision Analysis 2008

- Age to begin of 40, 50, 60
- Comparative modeling with MISCAN and SimCRC
- SimCRC found a higher benefit by beginning at age 40 than MISCAN
- No empiric data to start at 40
USPSTF Decision Analysis 2008
Adherence Affects Life Years saved

- Considered 100%, 80% and 50% adherence to screening program

- As expected lower adherence has lower life years gained than full adherence for both MISCAN and SimCRC models
USPSTF Recommendations 2016

• In 2016, the CISNET models performed analyses for the United States Preventive Services Task Force

  • Two out of three CISNET models recommended screening from age 45 to 75 years with a 15 year colonoscopy interval.
  • MISCAN recommended screening from age 50 to 75 years with a 10 year colonoscopy interval.
  • Lacking empiric data on age to begin
ACS 2018: Impact of Rising CRC in Young Adults (MISCAN Model)

![Graph showing the impact of rising colorectal cancer (CRC) in young adults using the MISCAN model. The graph illustrates the efficiency of different colorectal cancer screening strategies based on age intervals and the number of colonoscopies performed per 1000 40-year-olds. The x-axis represents colonoscopies per 1000 40-year-olds, while the y-axis shows life-years gained (LYG) per 1000 40-year-olds. The graph includes intervals for age to begin and age to end screening, with efficient frontier strategies marked by symbols.](image-url)
ACS 2018 Recommendations:

<table>
<thead>
<tr>
<th>Recommendation</th>
</tr>
</thead>
<tbody>
<tr>
<td>The ACS recommends that adults aged 45 y and older with an average risk of CRC</td>
</tr>
<tr>
<td>structural (visual) examination, depending on patient preference and test</td>
</tr>
<tr>
<td>availability. As a part of the screening process, all positive results on non-</td>
</tr>
<tr>
<td>colonoscopy screening tests should be followed up with timely colonoscopy.</td>
</tr>
<tr>
<td>The recommendation to begin screening at age 45 y is a qualified recommendation.</td>
</tr>
<tr>
<td>The recommendation for regular screening in adults aged 50 y and older is a strong recommendation.</td>
</tr>
<tr>
<td>The ACS recommends that average-risk adults in good health with a life expectancy of greater than 10 y continue CRC screening through the age of 75 y (qualified recommendation).</td>
</tr>
<tr>
<td>The ACS recommends that clinicians individualize CRC screening decisions for individuals aged 76 through 85 y based on patient preferences, life expectancy, health status, and prior screening history (qualified recommendation).</td>
</tr>
<tr>
<td>The ACS recommends that clinicians discourage individuals over age 85 y from continuing CRC screening (qualified recommendation).</td>
</tr>
<tr>
<td>Options for CRC Screening</td>
</tr>
<tr>
<td>---------------------------</td>
</tr>
<tr>
<td><strong>Stool-based tests</strong></td>
</tr>
<tr>
<td>• Fecal immunochemical test every year</td>
</tr>
<tr>
<td>• High-sensitivity, guaiac-based fecal occult blood test every years</td>
</tr>
<tr>
<td>• Multitarget stool DNA test every 3 years</td>
</tr>
<tr>
<td><strong>Structural examinations</strong></td>
</tr>
<tr>
<td>• Colonoscopy every 10 years</td>
</tr>
<tr>
<td>• CT colonography every 5 years</td>
</tr>
<tr>
<td>• Flexible sigmoidoscopy every 5 years</td>
</tr>
</tbody>
</table>
Informing the Young Onset CRC Debate: Unintended and Intended Consequences

Potential Intended Consequences
- CRC prevention in 45-49 year age group
- CRC prevention in high-risk minority groups
- Increase in screening rates in ≥50 year age group

Potential Unintended Consequences
- Diversion of resources to lower-risk population
- Increase in screening disparities
- Substantial cost
- Lost opportunity to study screening effectiveness in younger adults
- Actual benefits may fall short of predictions

Figure 1. Potential consequences of recommending colorectal cancer (CRC) screening initiation at age 45 instead of age 50 years.

Liang et al, Gastro 2018
Who is *Actually* Getting Screened >50?

FIGURE. Percentage of respondents aged 50–75 years who reported being up to date* with colorectal cancer screening, by age — Behavioral Risk Factor Surveillance System (BRFSS), United States, 2018†‡

* Blood stool test within the past 1 year, sigmoidoscopy within the past 5 years, and/or colonoscopy within the past 10 years.
† Data were weighted to the age, sex, and racial/ethnic distribution of each state’s adult population using intercensal estimates and age-standardized to the 2018 BRFSS population.
‡ Test for trend is significantly different (p<0.005).

CDC, 2018
Who is Getting Screened After the ACS 2018 Recommendations?

**Figure 1.** Colorectal cancer (CRC) and breast cancer (BC) screening and primary care provider (PCP) visits within the past year among adults aged 45 to 49 years in the National Health Interview Survey for 2015 and 2018. Colorectal cancer screening included colonoscopy, sigmoidoscopy, computed tomography colonography, and stool testing within the past year. Breast cancer screening included mammogram within the past year among females only. Q indicates interview quarter.

Fedewa et al, 2019 *Cancer*
Just in Time:
American College of Gastroenterology
Clinical Guideline
Begin Screening Ages 45-49 Conditional

References

1. We recommend CRC screening in average-risk individuals
   between ages 50 and 75 years to reduce incidence of advanced
   adenoma, CRC, and mortality from CRC.
   Strong recommendation; moderate-quality evidence
2. We suggest CRC screening in average-risk individuals between
   ages 45 and 49 years to reduce incidence of advanced adenoma,
   CRC, and mortality from CRC.
   Conditional recommendation; very low-quality evidence

Shaukat et al, March 1, 2021 Am J Gastro
Characteristics of Stool Based Screening
“The best test is the one that gets done, and done well.”
-Dr. Sidney Winawer
FIT Screening Programs Worldwide
RCTs for FIT vs Colonoscopy:

• CONFIRM (VA)
• COLONPREV (Quintero)
• TARGET-C (China)
Colorectal Cancer Screening: Stool Tests
FOBT, FIT, and Cologuard
Steps of Stool-Based Testing

Stool Based Test:
(gFOBT, FIT or mt-sDNA)

- Negative Finding → Repeat screening at next interval
- Positive Finding → Colonoscopy
Negative Consequences of Increasing Colonoscopy Time After Positive FIT

Figure 2. Stages of newly diagnosed CRC cases in FIT-positive patients according to time to diagnostic colonoscopy.

Meester et al, 2016 Clinical Gastroenterology and Hepatology
What Will it Cost?

$~800-1,000^*$

$595 - 695^+$

$25 - 35^+$

Costs with Medicare*

Cost as Imperiale et al, 2021+
Funded by Exact Sciences
Screening Intervals and the Intensity of Screening – Ages 45-75

![Bar chart showing screening intervals for different tests: FIT (Annual), FIT (Biennial), mt-sDNA (3 yrs), and Colonoscopy (10 yrs).]
Hemoccult II:

- Qualitative test
- Evidence Source: RCTS
- Reduction in CRC Incidence: 17-20%
- Reduction in CRC Mortality: 9-22%
  - 33% for hydrated slides

Ladabaum et al., 2020 Gastro
How Do Stool-Based Test Detect Hemoglobin?

- **gFOBT** uses the *pseudoperoxidase activity* of heme to detect the presence of blood in stool
  - Dietary modification, avoidance of nonsteroidal anti-inflammatory drugs and vitamin C are recommended to avoid false-positives and false-negatives, respectively
  - Three stool samples per each screening round

Ladabaum et al., 2020 *Gastro*
FIT Screening:

• Evidence Sources: observational studies and test characteristic studies

• Reduction in CRC Incidence: 10%

• Reduction in CRC Mortality: 22-62%

Ladabaum et al., 2020 Gastro
How Do Stool-Based Test Detect Hemoglobin?

• **FIT** uses an antibody to detect *hemoglobin* and is *not affected by diet*. It has largely replaced gFOBT
  • Only one stool sample is needed; greater adherence compared to gFOBT

Ladabaum et al., 2020 *Gastro*
Dear Mr. Smith,

Thank you for taking the time to do your bowel screening test.

**Your result:** We are pleased to tell you that your bowel screening test shows that no further investigation is required at this time.

**What happens next?**
We will send you another test in two years’ time if you are still aged between 50 and 74. It’s important that you do your bowel screening test every time you’re invited. After that age you can still request a test by contacting the Bowel Screening Centre (details above).

**Never ignore symptoms**
It’s important to remember that this test picks up most but not all bowel cancers. This is because the test looks for blood but not all cancers bleed all of the time. Remember that changes can happen in between your bowel screening tests so please tell your GP if you notice any of these symptoms:
Dear Mr. Smith,

Thank you for taking the time to do the bowel screening test.

**Your result: The test you provided shows that further investigation is required.**

This result doesn’t mean you have cancer but it does mean that we need to check on the cause of the bleeding (the bowel screening test measures the amount of blood in your poo sample).

*A colonoscopy is the best way of looking for the cause of bleeding.* It can find bowel cancer at the earliest stage of the disease, when it’s more treatable. It can also prevent cancer by removing polyps (small growths of cells on the bowel wall) during the test.
Cologuard (mt-sDNA)

- Qualitative test, multiple targets—FIT and DNA mutation:
  - BMP3
  - NDRG4
  - KRAS
  - β-actin
- Adherence support program for patient compliance
- Includes large serrated lesions
- No long-term mortality studies

Threshold: 183

\[
\text{\((e^{\text{Sum of Scores}}) / (1 + e^{\text{Sum of Scores}}) \times 1000 = \text{multi-target stool DNA Composite Score}\)}
\]

(Imperiale et al, 2021, Cancer Prevention Research)
Cologuard:
Cologuard:

1. SIT
   - Cologuard® is ready to use when you are ready to use it.

2. SCRAPE
   - Use the kit components to collect your sample.

3. SOAK
   - Fill the sample container with the liquid preservative.

4. SHIP
   - Ship your sample to complete the process.
Cologuard:

45 or older?
Start screening for colon cancer with Cologuard®

An effective and noninvasive screening option for adults 45 and older at average risk for colon cancer. Rx only.

Why start at 45?

Specificity 95% Among Age 45-49
(Imperiale et al, 2021, Cancer Prevention Research)
Diagnostic Accuracy of Stool Based Tests
### Sensitivity and Specificity

<table>
<thead>
<tr>
<th>Test</th>
<th>Disease</th>
<th>Cancer</th>
<th>No Cancer</th>
</tr>
</thead>
<tbody>
<tr>
<td>Positive</td>
<td>Sensitivity (TP) ↓</td>
<td>False Positive →</td>
<td></td>
</tr>
<tr>
<td>Negative</td>
<td>False Negative →</td>
<td>Specificity (TN) ↓</td>
<td></td>
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</table>
Sensitivity and Specificity (for one time test)

Lin et al, 2020 Draft Evidence Report
Quantitative FIT Performance

Selby et al, 2019 *Gastro*
Quantitative FIT Performance

Compared to positivity thresholds > 10 and ≤20 µg/g, positivity thresholds ≤10 µg/g:

- 11% sensitivity for CRC
- 3% specificity

+ 10% sensitivity for AA

Per 100,000 average risk people undergoing one-time fecal immunochemical testing:

- 43 additional CRCs
- 341 additional AAs
- 3,031 additional positive tests

>10 and ≤20 µg/g  ≤10 µg/g

Gastroenterology

Selby et al, 2019 Gastro
FIT Cut-Off By Screening Program Country

Kaminski et al, 2020 Gastro
Adherence to Stool-Based Tests
Scottish Bowel Screening Program

Dutch National Screening Program

Figure 1. Overall participation per screening round with percentage distribution of type of response to participation (initial response vs response after reminder letter).

Figure 2. Participation rates per round of FIT-based screening subdivided by sex.

van der Vlugt et al., 2017 BJC
CRC-AIM: 100% Adherence vs. Imperfect Adherence (70% mt-sDNA & 40% FIT)

Piscitello et al., 2020 *PLOS*
CRC-AIM Incidence and Mortality

Piscitello et al., 2020 *PLOS*
2020 United States Preventive Services Task Force DRAFT Recommendations
# USPSTF Draft Age to Begin Screening Recommendations 2020

## Recommendation Summary

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### USPSTF Draft Screening Tests Recommendations 2020

#### Stool Based Exam

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<td>Annual</td>
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<tr>
<td>FIT</td>
<td>Annual</td>
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<tr>
<td>mt-sDNA</td>
<td>1 or 3 years*</td>
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#### Direct Visualization Exam

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<tr>
<td>CTC</td>
<td>Every 5 years</td>
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<tr>
<td>Flex-sig</td>
<td>Every 5 years</td>
</tr>
<tr>
<td>Flex-sig with FIT</td>
<td>Flex-sig every 10 years and yearly FIT</td>
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*suggested by manufacturer
**USPSTF Draft Screening Tests Recommendations 2020**

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*suggested by manufacturer*
US Preventive Service Task Force
LYG and Number of Colonoscopies

Colonoscopy Strategies
**2020**: Base Case IRR=1.19

Knudsen et al, 2020 Draft Report
Life Years Gained and Lifetime Number of Colonoscopies:

Knudsen et al, 2020 Draft Report
Lifetime Number of Colonoscopies and LYG for Stool-Based Screening Strategies

Knudsen et al, 2020 Draft Report
FIT and sDNA FIT Screening Modalities:

Knudsen et al, 2020 Draft Report
Life Years Gained By Age to Begin Screening, Model Averages

Knudsen et al, 2020 Draft Report
Life Years Gained By Age to Begin Screening, Model Averages

Knudsen et al, 2020 Draft Report
Summary

• The increase of early-onset CRC appears to be a birth cohort effect
• Current guidelines are in favor of an earlier age to screen, although with debate
• Stool based exams may offer a less invasive method to screen for CRC
• Adherence, along with the diagnostic accuracy of all screening exams are crucial to detect CRC
The Need for Health Equity

<table>
<thead>
<tr>
<th>Major Stratifications of Disparities in Colorectal Cancer Screening Outcomes</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Race/ethnicity</td>
</tr>
<tr>
<td>2. English proficiency/language</td>
</tr>
<tr>
<td>3. Immigrant status</td>
</tr>
<tr>
<td>4. Educational level</td>
</tr>
<tr>
<td>5. Income</td>
</tr>
<tr>
<td>6. Insurance coverage</td>
</tr>
<tr>
<td>7. Occupation</td>
</tr>
<tr>
<td>8. Age</td>
</tr>
<tr>
<td>9. Sex/gender</td>
</tr>
<tr>
<td>10. Geography (neighborhoods, county, state, rural versus urban, etc.)</td>
</tr>
<tr>
<td>11. Behavioral risk factors (e.g., obesity)</td>
</tr>
</tbody>
</table>
The Need for Health Equity

Doubeni et al, Annual Reviews 2021
Summary

“The best test is the one that gets done, and done well.”

- Dr. Sidney Winawer

- Willingness to do testing
- Ease of testing
- Reliable diagnostic accuracy
- Burden of intervals
- Follow-up of colonoscopy with positive stool test
- Adherence to a program with repeat testing
- CRC Screening can reduce colorectal incidence and colorectal cancer mortality
Thank You!
The Kaiser Permanente Northern California Colorectal Cancer Screening Program: Lessons for the Pandemic and Beyond

• T. R. Levin, MD
• TPMG Clinical Lead for CRC Screening
• TPMG Assistant Chair of Gastroenterology
• Research Scientist, DOR
KPNC CRC Screening Program
Overview: KPNC CRC screening program

• All members 51-75
• Approximately 1,000,000 eligible members
  ➢ 800,000 receiving annual FIT outreach

Regional FIT Outreach Program:
- PCP Pre-letter Mailed
- FIT Kit Mailed
- Robo-call reminder
- Reminder Postcard
- Secure Message
- MA Calls

Colonoscopy by referral: high risk, or by referral, particularly 65-75 year olds
Regional FIT Kit Outreach

• All average risk members, due for CRC screening, ages 50-75 receive annual FIT kit outreach. Average risk African American members age 45-49 also receive outreach.

Pre-eLetter or print letter mailed → FIT Kit mailed → Robo-call reminder → Reminder eLetter or print letter
FIT Kit (Touch 2)

- Mailed to member, labeled with MRN, PCP
- Includes instructions on how to complete test
- Includes postage-paid return envelope
- Member must write in collection date and mail within 2 days of taking sample
Targeted Outreach to Address Screening Disparities

• Lower screening rates among Latinx and African American population
• Created targeted outreach
  • Use of existing outreach system (from standard outreach)
  • Focus groups co-designed content
  • Piloted new materials before regionalizing
Subtle Changes Across Cultural Groups

Latinx Outreach

1. What
   We need a sample of your poop to screen for colon cancer.

2. When
   In 1-2 weeks, we’ll send you a FIT kit, a simple test that you do in the privacy of your own home.

3. Why
   Protect yourself. Do this test. Be there for your family.

Colon Cancer Screening
We need a sample of your poop to screen for colon cancer.
In 1-2 weeks, we’ll send you a FIT kit in the mail.
You’ll do it at home.

African American Outreach

1. What
   We need a sample of your poop to screen for colon cancer.

2. When
   In 1-2 weeks, we’ll send you a FIT kit, a simple test that you do in the privacy of your own home.

3. Why
   Be there for your family. It’s never been easier to protect yourself from colon cancer.

Colon Cancer Screening
We need a sample of your poop to screen for colon cancer.
In 1-2 weeks, we’ll send you a FIT kit in the mail.
You’ll do it at home.
Provider facing information about where patients are in the CRC screening program.

The PROMPT drawer tells you the latest outreach the member received.
Outcomes of the CRC Screening Program
Impact on Test Use and CRC Screening Rates

Levin TR, Corley DA. Gastroenterology 2018;155:1383–1391

https://doi.org/10.1053/j.gastro.2018.07.017
Impact on Colorectal Cancer Incidence

Levin TR, Corley DA. Gastroenterology 2018;155:1383–1391
Impact on Colorectal Cancer Mortality

Levin TR, Corley DA. Gastroenterology 2018;155:1383–1391
Early Screening of African Americans (45–50 Years Old) in a Fecal Immunochemical Test–Based Colorectal Cancer Screening Program

Levin, Jensen, et al.
Gastroenterology 2020;159:1695–1704

Funded by TPMG Delivery Science Research Program
## Multi-Society Task Force: 2017 Guideline

<table>
<thead>
<tr>
<th>Tier 1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Colonoscopy every 10 years</td>
</tr>
<tr>
<td>Annual fecal immunochemical test</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Tier 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>CT colonography every 5 years</td>
</tr>
<tr>
<td>FIT-fecal DNA every 3 years</td>
</tr>
<tr>
<td>Flexible sigmoidoscopy every 10 years (or every 5 years)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Tier 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Capsule colonoscopy every 5 years</td>
</tr>
</tbody>
</table>

### Available tests not currently recommended
- Septin 9

Start at age 50, except African Americans start at 45

---

Regional African American tailored outreach, age 45-49

1 week before kit

1 week after pre-postcard

FIT Kit

“Get ahead of colon cancer. It can be as easy as 1-2-3.”

1 week after

Robocall

4 weeks after kit

Reminder Postcard

Regional African American tailored outreach, age 45-49

Local Outreach
## Comparisons to 51-56 with no prior screening

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>African American 51-56</th>
<th>African American 51-56</th>
<th>White 51-56</th>
<th>Hispanic 51-56</th>
<th>Asian Pacific Islander 51-56</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total, n</td>
<td>10,232</td>
<td>3603</td>
<td>22,832</td>
<td>10,930</td>
<td>8893</td>
</tr>
<tr>
<td>Complete FIT, n (%)</td>
<td>3390 (33.1)</td>
<td>805 (22.3)</td>
<td>6772 (29.7)</td>
<td>2905 (26.6)</td>
<td>2960 (33.3)</td>
</tr>
<tr>
<td>FIT+, n (%)</td>
<td>136 (4.0)</td>
<td>37 (4.6)</td>
<td>309 (4.6)</td>
<td>116 (4.0)</td>
<td>113 (3.8)</td>
</tr>
<tr>
<td>FIT+ colo, n (%)</td>
<td>116 (85.3)</td>
<td>30 (81.1)</td>
<td>245 (79.3)</td>
<td>92 (79.3)</td>
<td>84 (74.3)</td>
</tr>
<tr>
<td>Adv Adnoma n (%)</td>
<td>39 (33.6)</td>
<td>6 (20.0)</td>
<td>70 (28.6)</td>
<td>24 (26.1)</td>
<td>19 (22.6)</td>
</tr>
<tr>
<td>CRC, n (%)</td>
<td>3 (2.6)</td>
<td>1 (3.3)</td>
<td>10 (4.1)</td>
<td>0 (0.0)</td>
<td>6 (7.1)</td>
</tr>
<tr>
<td>Symptoms 1 year prior</td>
<td>336 (3.3)</td>
<td>77 (2.1)</td>
<td>202 (0.9)</td>
<td>128 (1.2)</td>
<td>118 (1.3)</td>
</tr>
</tbody>
</table>

Comparison to 51-56 with and without prior screening

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>African American 51-56</th>
<th>African American 51-56</th>
<th>White 51-56</th>
<th>Hispanic 51-56</th>
<th>Asian Pacific Islander 51-56</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total, n</td>
<td>10,232</td>
<td>12,621</td>
<td>80,753</td>
<td>34,915</td>
<td>36,947</td>
</tr>
<tr>
<td>Complete FIT, n (%)</td>
<td>3390 (33.1)</td>
<td>7447 (59.0)</td>
<td>52,996 (65.6)</td>
<td>20,860 (26.6)</td>
<td>26,095 (70.6)</td>
</tr>
<tr>
<td>FIT+, n (%)</td>
<td>136 (4.0)</td>
<td>201 (2.7)</td>
<td>1610 (3.0)</td>
<td>584 (2.8)</td>
<td>744 (2.9)</td>
</tr>
<tr>
<td>FIT+ colo, n (%)</td>
<td>116 (85.3)</td>
<td>170 (84.6)</td>
<td>1371 (85.2)</td>
<td>507 (86.8)</td>
<td>632 (84.9)</td>
</tr>
<tr>
<td>Adv Adnoma, n (%)</td>
<td>39 (33.6)</td>
<td>35 (20.6)</td>
<td>256 (18.76)</td>
<td>75 (14.8)</td>
<td>82 (13.0)</td>
</tr>
<tr>
<td>CRC, n (%)</td>
<td>3 (2.6)</td>
<td>3 (1.8)</td>
<td>20 (1.5)</td>
<td>4 (0.8)</td>
<td>12 (1.9)</td>
</tr>
</tbody>
</table>

The ACS recommends that people at average risk of colorectal cancer start regular screening at age 45 (qualified recommendation). This can be done either with a sensitive test that looks for signs of cancer in a person’s stool (a stool-based test), or with an exam that looks at the colon and rectum (a visual exam).

Wolff CA CANCER J CLIN 2018;68:250–281
CONCLUSIONS: In a Markov model analysis, we found that starting CRC screening at age 45 years is likely to be cost effective. However, greater benefit, at lower cost, could be achieved by increasing participation rates for unscreened older and higher-risk persons.
## USPSTF Guideline (Draft)

### Recommendation Summary

<table>
<thead>
<tr>
<th>Population</th>
<th>Recommendation</th>
<th>Grade</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adults ages 50 to 75 years</td>
<td>The USPSTF recommends screening for colorectal cancer in all adults ages 50 to 75 years. See the &quot;Practice Considerations&quot; section and Table 1 for details about screening strategies.</td>
<td>A</td>
</tr>
<tr>
<td>Adults ages 45 to 49 years</td>
<td>The USPSTF recommends screening for colorectal cancer in adults ages 45 to 49 years. See the &quot;Practice Considerations&quot; section and Table 1 for details about screening strategies.</td>
<td>B</td>
</tr>
<tr>
<td>Adults ages 76 to 85 years</td>
<td>The USPSTF recommends that clinicians selectively offer screening for colorectal cancer in adults ages 76 to 85 years. Evidence indicates that the net benefit of screening all persons in this age group is small. In determining whether this service is appropriate in individual cases, patients and clinicians should consider the patient's overall health and prior screening history.</td>
<td>C</td>
</tr>
</tbody>
</table>

A = high certainty, substantial benefit; B = moderate certainty, moderate benefit; C = moderate certainty, small net benefit

www.uspreventiveservicestaskforce.org/uspstf/recommendation/colorectal-cancer-screening
### ACG Clinical Guidelines: Colorectal Cancer Screening 2021

Shaukat, A; Kahi, CJ; Burke, CA; Rabeneck, L; Sauer, BG.; Rex, DK.


<table>
<thead>
<tr>
<th>Summary</th>
<th>Recommendation strength</th>
<th>GRADE quality of evidence</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 We recommend colorectal cancer (CRC) screening in average-risk</td>
<td>Strong</td>
<td>Moderate</td>
</tr>
<tr>
<td>individuals between ages 50 and 75 yr to reduce incidence of advanced</td>
<td></td>
<td></td>
</tr>
<tr>
<td>adenoma, CRC, and mortality from CRC</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2 We suggest CRC screening in average-risk individuals between ages 45</td>
<td>Conditional</td>
<td>Very low</td>
</tr>
<tr>
<td>and 49 yr to reduce incidence of advanced adenoma, CRC, and mortality</td>
<td></td>
<td></td>
</tr>
<tr>
<td>from CRC</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4 We recommend colonoscopy and fecal immunochemical testing (FIT) as</td>
<td>Strong</td>
<td>Low</td>
</tr>
<tr>
<td>the primary screening modalities for CRC screening</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Conclusions

• It may be reasonable to start screening at 45 for African Americans or for people of all races, but the overall incidence remains very low.

• FIT represents an excellent way to efficiently select patients for colonoscopy only to those most likely to benefit from it.
Impact of the COVID-19 Pandemic on Colorectal Cancer Screening and Surveillance Outcomes (PICASO)
COVID 19 Disruption in CRC screening

- March 2020: elective colonoscopies were halted nearly everywhere
- Pause in care delivery has affected millions across the US
- Patients continue to delay needed diagnostic and follow-up colonoscopies due to fear of infection
- Scheduling is more complex now due to need to also schedule Sars-CoV-2 testing
- Disruptions worldwide
  - NCI estimates approximately 10,000 excess deaths in the US alone from breast cancer and CRC (based on CISNET models)
  - IQVIA modeling study: 18,800 Americans may experience delays in CRC diagnosis this year.

Aitken M, Kleinrock M. Shifts in healthcare demand, delivery, and care during the COVID-19 era: Tracking the impact in the United States. IQVIA Institute for Human Data Science 2020
Dekker E, Gastroenterology 2020 ePub [https://doi.org/10.1053/j.gastro.2020.09.018](https://doi.org/10.1053/j.gastro.2020.09.018)
Strategies for Shaping a COVID-19–Adapted Future for CRC Screening and Prevention

Remind patients and providers that CRC screening saves lives.
Ensure participation by offering patients multiple options for screening.
Expand the pool of patients participating in screening.
For individuals with greater than average CRC risk base on an abnormal screening test, family history of CRC, or prior history of adenoma or CRC, prioritize and emphasize importance of colonoscopy follow-up.
Make endoscopy as safe as possible.
Prepare for a future in which the role of colonoscopy in screening will shift increasingly toward diagnosis, therapy, and surveillance, and away from asymptomatic screening.

COVID, coronavirus disease-19; CRC, colorectal cancer.

Gupta and Lieberman. Gastroenterology 2020;159:1205–1208
https://doi.org/10.1053/j.gastro.2020.06.091
Pandemic Impact on CRC Screening

AIM:
Evaluate the impact of the pandemic on CRC screening at KPNC.

METHODS:
Compare January-December 2019 and January-October 2020

Evaluating:
- KPNC screening-eligible population aged 50-75;
- Those up to date with screening due to colonoscopy;
- Eligible for a FIT;
- Mailed a FIT kit;
- Completed a FIT;
- Completed a follow-up colonoscopy after a positive FIT;
- Completed a colonoscopy unrelated to a positive FIT;
- Up to date with screening by end of follow-up (i.e., 2019 and end of October 2020, respectively).
<table>
<thead>
<tr>
<th>Parameter</th>
<th>2019</th>
<th>2020 (up to end of October)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Eligible For CRC Screening</td>
<td>913,873</td>
<td>941,763</td>
</tr>
<tr>
<td>Up To Date from Prior Colo</td>
<td>151,252</td>
<td>150,407</td>
</tr>
<tr>
<td>Eligible for FIT</td>
<td>762,621</td>
<td>791,356</td>
</tr>
<tr>
<td>FIT returned completed, n (%)</td>
<td>504,152 (66.1)</td>
<td>365,972 (46.2)</td>
</tr>
<tr>
<td>Positive FIT, n (%)</td>
<td>15,402 (3.1)</td>
<td>10,922 (2.9)</td>
</tr>
<tr>
<td>Colonoscopy follow-up of positive FIT by year-end, n (%)</td>
<td>11,119 (72.2)</td>
<td>6,856 (62.8)</td>
</tr>
<tr>
<td>Colonoscopy Unrelated to FIT</td>
<td>14,420</td>
<td>9,902</td>
</tr>
<tr>
<td>Up To Date with CRC Screening, n (%)</td>
<td>665,541 (72.8)</td>
<td>522,215 (55.5)</td>
</tr>
</tbody>
</table>
Fig 1b. FIT Returned by Eligible Members, by Month, KPNC
Conclusions

• The COVID-19 pandemic resulted in temporary delays in the mailing and return of FITs, but the organized program allowed rapid resumption of screening as soon as it was feasible.

• There was a reduction in colonoscopies performed, due, in part, to patient reluctance to complete follow-up colonoscopy during the pandemic.
• Thank you!
Discussion
EAO Workgroup: Upcoming Opportunities

01 Research Learning Series – Session #5
May 4, 2021 – 12-2 pm EST
Pt. 2: Equitable access to screening among 45-49
Registration coming soon!

02 2021 EAO CRC International Symposium
June 24 & 25, 2021. 11:30-3:30 EST
The 2021 symposium will include action-based dialogue between patients, advocates, clinicians, and researchers, and collaborative discussion of the successes and gaps in EAO CRC research and clinical care.

Registration and abstract submissions opening March 31, 2021
CALL ON CONGRESS

FIGHT COLORECTAL CANCER

KICKOFF EVENT
MARCH 15

CALLONCONGRESS.ORG