Challenges and Opportunities in Achieving Health Equity

Racial disparities in CRC screening among Black and White individuals, and equitable approaches to reach those aged 45-49

📅 Tuesday, May 4th  🕑 12:00 PM Eastern

ANN ZAUBER, PhD
Attending Biostatistician
Memorial Sloan Kettering

DARRELL M. GRAY II, MD, MPH, FACG
Associate Professor of Medicine
The Ohio State University
Wexner Medical Center

FOLA MAY, MD, PHD
Assistant Professor of Medicine
University of California
Los Angeles
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 - 12:25p ET Dr. Ann Zauber: Current rates and/or trends in incidence, mortality, stage at presentation, survival, and differences between Black & White individuals; Reasons for disparities

12:25-12:40p ET Dr. Darrell Gray: intended and unintended consequences of lowering the screening age from 50 to 45

12:40-12:55p ET Dr. Fola May: What we know about evidence-based interventions and application to the 45-49 year old populations. Needs for future research and where we go from here

12:55-1:55p ET Discussion

1:55-2:00p ET Close out and next steps: Andi Dwyer
June 24th, 11-3:30pm EST: The Patient Voice

June 25th, 11-3:30pm EST: Research Efforts & Outcomes

- Registration is FREE, we need your voice at the table
- Call for Abstracts open through May 7, scientific and advocacy submissions accepted.

FightCRC.org/rallyonresearch
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Challenges and Opportunities in Achieving Health Equity: Epidemiology and Demographics

Fight Colorectal Cancer Learning Series
Ann G. Zauber, PhD
May 4, 2021
Outline:

• Background
• Trends over time:
  • Incidence
  • Mortality
  • Stage at diagnosis/survival
• Microsimulation modeling and race
• Adherence and race
Burden of CRC Cases Among Blacks vs General Population in the US (2021)

Burden of CRC Cases Among Blacks vs General Population in the US (2021)

Preventable
Burden of CRC Deaths Among Blacks in the US vs. General Population (2021)

Burden of CRC Deaths Among Blacks in the US vs. General Population (2021)

<table>
<thead>
<tr>
<th></th>
<th>Male</th>
<th>Female</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lung &amp; bronchus</td>
<td>9,280</td>
<td>7,270</td>
</tr>
<tr>
<td>Prostate</td>
<td>5,350</td>
<td>6,540</td>
</tr>
<tr>
<td>Colon &amp; rectum</td>
<td>3,810</td>
<td>3,300</td>
</tr>
<tr>
<td>Pancreas</td>
<td>2,690</td>
<td>2,940</td>
</tr>
<tr>
<td>Liver &amp; intrahepatic bile duct</td>
<td>2,670</td>
<td>1,350</td>
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<tr>
<td>Stomach</td>
<td>1,230</td>
<td>1,400</td>
</tr>
<tr>
<td>Myeloma</td>
<td>1,160</td>
<td>1,200</td>
</tr>
<tr>
<td>Leukemia</td>
<td>1,140</td>
<td>980</td>
</tr>
<tr>
<td>Kidney &amp; renal pelvis</td>
<td>940</td>
<td>770</td>
</tr>
<tr>
<td>Esophagus</td>
<td>240</td>
<td>220</td>
</tr>
<tr>
<td>All sites</td>
<td>36,410</td>
<td>36,190</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>Male</th>
<th>Female</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lung &amp; bronchus</td>
<td>69,410</td>
<td>62,470</td>
</tr>
<tr>
<td>Prostate</td>
<td>34,130</td>
<td>43,600</td>
</tr>
<tr>
<td>Colon &amp; rectum</td>
<td>28,520</td>
<td>24,460</td>
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<tr>
<td>Pancreas</td>
<td>25,270</td>
<td>22,950</td>
</tr>
<tr>
<td>Liver &amp; intrahepatic bile duct</td>
<td>20,300</td>
<td>13,770</td>
</tr>
<tr>
<td>Leukemia</td>
<td>13,900</td>
<td>12,940</td>
</tr>
<tr>
<td>Esophagus</td>
<td>12,410</td>
<td>9,930</td>
</tr>
<tr>
<td>Urinary bladder</td>
<td>12,260</td>
<td>8,760</td>
</tr>
<tr>
<td>Non-Hodgkin lymphoma</td>
<td>12,170</td>
<td>8,550</td>
</tr>
<tr>
<td>Brain &amp; other nervous system</td>
<td>10,500</td>
<td>8,100</td>
</tr>
<tr>
<td>All sites</td>
<td>319,420</td>
<td>289,150</td>
</tr>
</tbody>
</table>

Stage Distribution of CRC by Race

<table>
<thead>
<tr>
<th>Stage</th>
<th>Blacks</th>
<th>Whites</th>
</tr>
</thead>
<tbody>
<tr>
<td>Localized</td>
<td>37</td>
<td>39</td>
</tr>
<tr>
<td>Regional</td>
<td>31</td>
<td>34</td>
</tr>
<tr>
<td>Distant</td>
<td>24</td>
<td>20</td>
</tr>
<tr>
<td>Unstaged</td>
<td>8</td>
<td>7</td>
</tr>
</tbody>
</table>

Five-Year CRC Relative Survival Rates By Race and Stage in the US

![Bar Chart](chart.png)

- Localized: Blacks 86%, Whites 90%
- Regional: Blacks 65%, Whites 72%
- Distant: Blacks 10%, Whites 14%
- All Stages: Blacks 58%, Whites 65%

Colorectal Cancer Trends Over Time
Age-Adjusted CRC Incidence Among Blacks and Whites (1975 to 2017)

Rutter et al. (2021) Cancer Epidemiol Biomarkers Prev.
Age-Adjusted CRC Mortality Rates by Race/Ethnicity (1975-2013)

Age-Adjusted Trends in CRC Mortality Rates Among Blacks and Whites in the US (1975-2016)

Age-Specific CRC Incidence By Race and Time Period

Rutter et al. (2021) Cancer Epidemiol Biomarkers Prev.
Reasons for Disparity
CRC Disparities

Treatment Differences
- Access to Care
- SES
- Barriers to Screening

Lifestyle Factors
- Genetic Predisposition
- Cultural Norms

Biological Factors
- Knowledge/Awareness

Quality of Care

Daniel et al. (2017) Frontiers in Bioscience
Risk Factors of CRC

Non-Modifiable
- Age
- Ethnicity
- Family history of CRC or colorectal polyps
- History of IBD
- Genetic syndromes
- Type-two diabetes

Modifiable
- Smoking
- Excessive alcohol consumption
- High consumption of red meats
- High consumption of processed foods
- Low intake of fruit and vegetables
- Body fat and obesity
- Sedentary lifestyle

Carethers and Doubeni
Gastroenterology 2020
Microsimulation Modeling of CRC Incidence and Contribution of Screening (1975-2000)

Microsimulation Modeling of CRC Mortality and Contribution of Screening and Treatment

Microsimulation Modeling If Blacks Had Similar Screening and Treatment As Whites

**CRC Incidence** By Race/Screening

**CRC Mortality** by Race/Screening

Disparities in CRC Incidence and Mortality Between Blacks and Whites

Explained by Screening

Explained by Survival

Explained by Screening & Survival

Microsimulation Modeling of CRC Mortality and Intervention 1975-2020

Microsimulation Modeling of CRC Mortality and Further Opportunities for Screening and Treatment (1975-2020)

Adherence to Colonoscopy and Colonoscopy Findings by Race with Facilitated Access

Mendelson et al (2017) Clinical Gastro and Hepatology

Equivalent Access to Screening and Patient Navigation

<table>
<thead>
<tr>
<th></th>
<th>Blacks</th>
<th>Whites</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adherent</td>
<td>78%</td>
<td>83%</td>
</tr>
<tr>
<td>Not Adherent</td>
<td>22%</td>
<td>17%</td>
</tr>
<tr>
<td>Any adenomas</td>
<td>25%</td>
<td>26%</td>
</tr>
<tr>
<td>Adv. Adenomas</td>
<td>7%</td>
<td>6%</td>
</tr>
<tr>
<td>No Polyps</td>
<td>58%</td>
<td>53%</td>
</tr>
</tbody>
</table>

Mendelson et al (2017) Clinical Gastro and Hepatology
Thank You!
Any Questions?
The Double-Edged Sword of Guideline Recommendations
Lowering the Age of Screening Initiation to 45
Guidelines for CRC screening have been evolving

1960s-70s
Early large studies of Endoscopy and stool-based screening programs

1990s
Winawer SJ, Zauber AG et al, 1993
Winawer SJ et al., 1997

2008
1st guideline to recommend earlier screening (45yo) among African Americans

2018
ACS recommends earlier Screening (45yo) among all average-risk

Oct 2020
USPSTF draft recommendation
Screening rates among those 50-75 have increased over time, but are below goal

Based on 2018 Behavioral Risk Factor Surveillance System, among those 50-75 years of age:

<table>
<thead>
<tr>
<th>Race or ethnicity</th>
<th>Non-Hispanic White</th>
<th>Non-Hispanic Black</th>
<th>Asian/Pacific Islander</th>
<th>Hispanic</th>
</tr>
</thead>
<tbody>
<tr>
<td>Screening rate</td>
<td>71.0%</td>
<td>70.0%</td>
<td>64.8%</td>
<td>56.1%</td>
</tr>
</tbody>
</table>

Screening rates among those 45-49 are increasing

2018 National Health Interview Survey
Self-reported screening within the past year
Screening rates computed by interview quarter


Screening rates
↑ 4.8% (Q1) → 11.7% (Q4)

Estimated 226,656 individuals (Q1)
vs
592,351 (Q4)
Potential intended consequences of lowering the age of screening initiation to 45
Prevent colorectal cancers and colorectal cancer deaths

Burden of CRC in high-risk minority groups – e.g. African Americans

African Americans present earlier

Relative risk of polyps > 9mm & proximal adenomas as compared to Whites

Improvement in CRC screening rates among those ≥ 50

% Federally Qualified Health Center Patients ages 50-75 years Up-to-Date with CRC Screening

Source: Uniform Data System

Earlier and more frequent messaging
Potential *unintended* consequences of lowering the age of screening initiation to 45
Diversion of resources from where it may be needed most – e.g. follow-up after abnormal FIT test

Diversion of resources from where it may be needed most – e.g. follow-up after abnormal FIT/FOBT test

Worsen existing disparities in CRC screening and outcomes

Fundamental cause hypothesis
(Link and Phelan, 2005)

Benefits of health-enhancing resources (e.g. CRC screening) “realized to a greater extent by those who are less likely to face, discrimination, and stigma and more likely to have access to socioeconomic resources”

Substantial societal and individual costs

<table>
<thead>
<tr>
<th>Scenario</th>
<th>Description</th>
<th>Colorectal cancer cases (baseline)</th>
<th>Colorectal cancer deaths (baseline)</th>
<th>Total costs (discounted) (baseline)</th>
<th>Total number of colonoscopies (baseline)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Scenario A:</strong></td>
<td>Current age-specific screening participation patterns in the U.S. **</td>
<td>696,700</td>
<td>244,600</td>
<td>$114.7 billion</td>
<td>70.3 million</td>
</tr>
<tr>
<td><strong>Scenario B:</strong></td>
<td>Begin screening at age 45 (shift current age-band-specific participation patterns by 5 years to younger ages)</td>
<td>667,300 (↓ 29,400)</td>
<td>233,500 (↓ 11,100)</td>
<td>$125.1 billion (↑ $10.4 billion)</td>
<td>80.9 million (↑ 10.7 million)</td>
</tr>
<tr>
<td><strong>Scenario C:</strong></td>
<td>Begin screening at age 45 (extrapolate participation rate at age 45 based on current participation patterns, without change in participation at older ages)</td>
<td>691,100 (↓ 5,600)</td>
<td>242,600 (↓ 2,000)</td>
<td>$119.1 billion (↑ $4.4 billion)</td>
<td>73.8 million (↑ 3.5 million)</td>
</tr>
</tbody>
</table>

Outcomes may not match model-predicted outcomes

- Assumes higher adherence to screening and follow-up than seen in current practice
- Does not factor in:
  - Exacerbation of disparities
  - Costs
  - Impact of mixed messages
  - Potential genetic/molecular differences that may impact efficacy of screening

Summary

• Colorectal cancer screening recommendations are evolving with the available data.

• Screening rates are increasing including among 45-49 year olds.

• Guideline recommendations must be tempered against potential intended and unintended consequences.

Thank you!

darrell.gray@osumc.edu

The James
Evidence-Based Interventions to Increase Screening in Racially and Ethnically Diverse Populations

Folasade P. May MD PhD MPhil
UCLA Health
UCLA Kaiser Permanente Center for Health Equity
Veterans Affairs
EO-CRC incidence highest in Black individuals

Age 20-49
White and Black individuals

Significant impact of EO-CRC among Latinos

SEER 18: 2000 – 2010
EOCRC: Age<50
White and Latino individuals

Kobliniski et al. J Gastrointest Oncol. 2019.
Overview

• Screening test use among the medically underserved
• Barriers to screening among the underserved
• Evidence-based screening interventions
• Completion of non-colonoscopic screening
• Priority research areas
Screening test use by race and ethnicity

U.S. screening rate by race and ethnicity, 2018

- Non-Hispanic White: 71.0%
- Non-Hispanic Black: 70.0%
- Multicultural: 65.1%
- Non-Hispanic Asian/Pacific Islander: 64.8%
- Non-Hispanic American Indian/Alaska Native: 62.1%
- Latino/Hispanic: 56.1%
Screening test use by insurance and income

**Health insurance status**
- Insured: 71.2%
- Uninsured: 40.1%

**Annual household income ($)**
- $\geq 75,000$: 76.1%
- $50,000-74,999$: 72.6%
- $35,000-49,999$: 67.5%
- $15,000-34,999$: 62.2%
- $<15,000$: 58.0%

(Reflects 2018 U.S rates)
Screening test options

**Stool-based strategies**
- gFOBT
- Fecal Immunochemical FIT-DNA Test (FIT)

**Direct-visualization techniques**
- CT Colonography
- Flexible Sigmoidoscopy
- Colonoscopy

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**Screening test type by race/ethnicity**

<table>
<thead>
<tr>
<th>Race/Ethnicity</th>
<th>Stool-based</th>
<th>Colonoscopy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Non-Hispanic White</td>
<td>10</td>
<td>63</td>
</tr>
<tr>
<td>Non-Hispanic Black</td>
<td>12</td>
<td>60</td>
</tr>
<tr>
<td>Hispanic/Latino</td>
<td>15</td>
<td>52</td>
</tr>
<tr>
<td>American Indian/Alaska Native</td>
<td>12</td>
<td>53</td>
</tr>
<tr>
<td>Asian</td>
<td>15</td>
<td>47</td>
</tr>
</tbody>
</table>

National Health Interview Survey, 2018.
Barriers to screening in the underserved

**Patient-Level Factors**
- Lack of Knowledge
- Beliefs/Cultural factors
- Education
- Health Literacy
- Language
- Fear of procedure/prep
- Fear of cancer diagnosis
- Cost/Lack of Insurance
- Distrust
- Comorbidities
- Competing demands
- Logistical challenges

**Provider-Level Factors**
- Knowledge
- Beliefs
- Practice setting
- Counseling practices
- Lack of recommendation
- Discrimination
- Time constraints
- Perceived need
- Support/Resources

**System-Level Factors**
- Access to screening
- Colonoscopy capacity
- Quality of Care
- Reminder systems
- Provider assessment
- Provider feedback
- Care coordination
- Coverage policy

**Policy-Level Factors**
- Screening guidelines
- Insurance access
- Insurance mandate policy
- Coverage policy
- Cost/Co-pay policy
- Access to follow-up

May FP et al. Med Care, 2019.
Barriers to screening colonoscopy in the underserved

- Worry about equity treatment
- Invasiveness of procedure
- Concerns about provider competence/quality
- Skepticism about provider motives
- Sexual connotation of procedure
- (Rightful) distrust of doctors and healthcare system
- Access to endoscopist
- Out of pocket costs
- Need for escort
- Fear of Sedation
- Time off Work
- Concerns about Prep
- Fear of discomfort
- Embarrassment
- Fear of experimentation

Tammana VS et al. WJG. 2014. 
# Evidence-based screening interventions

**Patient-Directed**
- Education *(printed, video, telephone, mailed, electronic)*
- Direct outreach *(clinic, telephone, mailed)*
- Reminders *(printed, telephone, mailed, electronic)*
- Barrier-directed efforts
- Incentives/financial assistance
- Navigation
- Decision aid

**Provider-Directed**
- Direct outreach *(clinic, telephone, mailed)*
- Printed media
- Assessment and feedback
- Incentives

**System-Directed**
- Reminder systems
- Clinical workflow changes
- Population health management
- Navigation
- EHR prompts/nudges

**Policy-Directed**
- Insurance mandate
- Federally qualified health center support
- Preventive services coverage
- Eliminate cost barriers

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Mailed FIT outreach in Black individuals age 45-50

**Patients, setting:** Black individuals age 45-50 (N= 10,232); Kaiser Northern CA health plan.

**Design:** Prospective.

**Exposure:** Mailed FIT outreach.

**Outcome:** Screening utilization compared to unscreened Black, White, Hispanic, and Asian/Pacific Islander health plan members age 51-56.

![Graph showing percent that completed test]

- **Black (age 45-50):** 33.1%
- **Black (age 51-56):** 22.3%
- **White (age 51-56):** 29.7%
- **Hispanic (age 51-56):** 26.6%
- **Asian/Pacific Islander (age 51-56):** 33.3%

**OR 1.18 (1.12-1.24)**
**OR 1.71 (1.57-1.67)**
# Stool-based screening in Black individuals (RCTs)

<table>
<thead>
<tr>
<th>Author</th>
<th>Intervention</th>
<th>Setting</th>
<th>Effect (OR)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Arnold et al</td>
<td>Health literacy pamphlet and video</td>
<td>Rural clinic</td>
<td>1.1 (0.6-1.8)</td>
</tr>
<tr>
<td>Campbell et al</td>
<td>Lay health advisor, tailored newsletters, videos</td>
<td>Rural Churches (NC)</td>
<td>2.1 (1.0-4.4)</td>
</tr>
<tr>
<td>Christy et al</td>
<td>Video+FIT or brochure+FIT</td>
<td>Community clinic (FL)</td>
<td>0.3 (0.2-0.5) (87% return)</td>
</tr>
<tr>
<td>Friedman et al</td>
<td>Educational videos in clinic</td>
<td>Community clinic (TX)</td>
<td>1.4 (0.7-2.7)</td>
</tr>
<tr>
<td>Powe et al</td>
<td>Multimedia education</td>
<td>Senior citizen centers (SC)</td>
<td>3.9 (1.9-8.1)</td>
</tr>
<tr>
<td>Holt et al</td>
<td>Lay health advisors</td>
<td>Churches (AL)</td>
<td>0.5 (0.2 – 1.0) (87% return)</td>
</tr>
<tr>
<td>Horne et al</td>
<td>Education vs. patient navigation</td>
<td>Medicare database (MD)</td>
<td>1.1 (0.7 – 1.6)</td>
</tr>
<tr>
<td>Myers et al</td>
<td>Mailed outreach (SI) vs. tailored mail outreach+navigation(TNI)</td>
<td>Urban clinics (PA)</td>
<td>1.5 (1.0-2.2) (TNI)</td>
</tr>
<tr>
<td>Basch et al</td>
<td>Tailored telephone outreach</td>
<td>Urban (NYC)</td>
<td>39.3 (5.3-291.0)</td>
</tr>
<tr>
<td>Goldberg et al</td>
<td>Mailed FOBT cards and reminders</td>
<td>Urban hospital (IL)</td>
<td>13.0 (3.7-46.5)</td>
</tr>
<tr>
<td>Schroy et al</td>
<td>Decision aid +/- personalized risk assessment tool</td>
<td>Safety-net (MA)</td>
<td>1.4 (1.0-2.0)* (all modalities)</td>
</tr>
</tbody>
</table>
Culturally tailored intervention

Patients, setting: Black individuals age 50-75 years (N = 330); community setting (FL).

Design: Efficacy study of 2 intervention conditions promoting CRC screening.

Intervention
- Arm 1: Culturally tailored CDC informational booklet + FIT kit
- Arm 2: Standard CRC screening brochure plus an FIT kit

Outcome: FIT kit screening uptake.

Overall 87% return

Christy et al, Cancer. 2016.
Patients, setting: Majority Black population (N=153/266) in NYC urban setting.

Design: RCT

Intervention:
Arm 1 (intervention): Tailored telephone outreach
Arm 2 (control): mailed printed materials

Outcome: completion of 3 FOBT, sigmoidoscopy, colonoscopy, or a barium enema in 6 months.
Patient navigation intervention

Patients, setting: Low-income Blacks and Latinos age 50-75 years (N=843); One large medical center.

Design: RCT.

Intervention
Arm 1: Telephone-delivered individualized education by two bilingual navigators.
Arm 2: Usual care

Outcome: Colonoscopy completion within 6 months

Patients, setting: Safety-net system (8 clinics); Majority Black and Latino patients age 50-75 years. N=10,820.

Design: Cluster randomized trial

Intervention
- **Arm 1:** Mailed postcard + telephone call + mailed FIT kit + Reminder call
- **Arm 2:** Usual care

Outcome: Screening participation at 1 year
**Patient Navigation in non-clinical settings (Barbershop studies)**

**Patients, setting:** Black males (N=731) age > 50 recruited in barbershops between 2010 and 2013.

**Design:** 3-arm randomized trial.

**Intervention arms:**
1) Patient navigation for CRC,
2) motivational interviewing for HTN,
3) both.

**Outcome:** CRC screening completion at 6 months.

Features of optimal interventions

- Multi-level, multicomponent interventions (patient, provider, system, policy)
- Dissemination in community settings
- Culturally tailored navigation approaches by telephone or in-person
- Patient and stakeholder engagement
Emphasis on “Two-Step” Process

Positive non-colonoscopic screening test result → Diagnostic colonoscopy to detect polyps and CRC
Priority research areas

• Role and effectiveness of tailored messaging to encourage screening among individuals from underserved groups age 45-49

• Evidence-based strategies to assure completion of stool-based tests annually

• Strategies to maximize follow-up after abnormal non-colonoscopic screening (policy, insurance coverage)
Summary

• Colorectal cancer (CRC) screening remains underutilized among medically underserved populations.

• Barriers to screening among medically underserved individuals include patient, provider, system, and policy-level factors.

• Implementing evidence-based interventions to encourage uptake of CRC screening will be essential to achieve 80% of the population screened age 45-75.
Thank You!

Funding Sources:
NIH/NCI
UCLA JCCC
Broad Institute
TRDRP

drfolamay

https://www.uclahealth.org/gastro/may-lab
Discussion
RALLY ON RESEARCH
EARLY-AGE ONSET CRC
JUNE 24-25, 2021 | fightcrc.org/rallyonresearch
FIGHT COLORECTAL CANCER