Colorectal Cancer Screening in Primary Care: Update on STOP CRC

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Outline

- Colorectal cancer (CRC) screening background
- STOP CRC pilot study findings and lessons learned
- STOP CRC pragmatic study
- Successes and current challenges – you can help!
Why colon cancer screening matters…

- Colon cancer is a leading cause of cancer death;
- Nearly 1/3 of age-eligible adults in the US are not up-to-date;
- Colon cancer can be prevented; survival is
  - 93% for Stage 1
  - 8% for Stage IV;
- Screening is effective, inexpensive, easy to do;
- Unscreened generally receive care at community clinics.

Percentage up-to-date with CRC screening:

- Non-Hisp white: 59.8%
- Hispanic: 46.5%
- In US < 10 yrs: 21.3%
- Uninsured: 20.7%
Colorectal Cancer statistics for Oregon

Stage of CRC detection*

- Colorectal cancer, stage at diagnosis, OR 2010

CRC screening disparity*

- Colorectal cancer screening, OR 2010-11

*Source: Oregon State Cancer Registry

*Source: Behavioral Risk Factor Surveillance Survey
Stage of diagnosis disparity

Proportion of CRC that are detected at late stages*

<table>
<thead>
<tr>
<th></th>
<th>White</th>
<th>Latino</th>
</tr>
</thead>
<tbody>
<tr>
<td>Men</td>
<td>58</td>
<td>63.3</td>
</tr>
<tr>
<td>Women</td>
<td>54.6</td>
<td>68.3</td>
</tr>
</tbody>
</table>

*Source: Oregon state cancer registry
Colorectal cancer screening options

- Average-risk individuals aged 50 -75*
  - High-sensitivity fecal occult blood test (FOBT), including fecal immunochemical tests (FIT);
  - Colonoscopy every 10 years;
  - Sigmoidoscopy every 5 years plus interval FOBT/FIT.

- The Affordable Care Act (ACA) mandates that screening tests recommended by the USPSTF be covered with no out-of-pocket costs;

*based on US Preventive Services Task Force Recommendations
FIT as a viable option

- Patients prefer fecal testing over colonoscopy, in studies using data from a given year;
- Some geographic regions have limited colonoscopy capacity, fecal testing allows for ‘risk stratification’;
- “I will not get a colonoscopy unless I believe something is wrong”; fecal testing can motivate patients to get colonoscopy

- Rates of first-line colonoscopy screening:
  - ~ 40% (without reminders)
- Rates of follow-up diagnostic colonoscopy:
  - 60 - 90%
Comparison between FOBT and FIT

- **FOBT**
  - 3-sample test
  - Dietary and medication restrictions
  - Tests for any type of blood in the stool
  - Requires colonoscopy follow-up

- **FIT**
  - 1-sample, 2-sample, or 3-sample test
  - No dietary or medication restrictions
  - Tests for human blood in the stool
  - Requires colonoscopy follow-up
CRC screening rates higher with FIT vs. FOBT

- A recent systematic review of randomized trials comparing adherence of FIT and gFOBT found 6 of 7 studies reported increased adherence with FIT versus gFOBT:
  - Adherence was **11.4-16.3 percentage points higher** in 6 studies
  - Adherence was **15.4-16.3 percentage points higher** in studies (n = 3) that compared a 1-sample FIT to 3-sample gFOBT

* Studies that compared 1-sample FIT to 3-sample gFOBT

CRC screening rates are highest if patients offered fecal testing or choice

Inadomi et al. 2012
Free FIT vs. Free colonoscopy program

- Study included uninsured patients aged 54-64 at the John Peter Smith Health Network, a safety net health system.
- Randomized patients into 3 groups:
  - Free FIT (n = 1593)
  - Free colonoscopy (n = 479)
  - Usual care (n = 3898)

Gupta et al. JAMA IM 2013
Multi-level Framework

Adapted from the Consolidated Framework for Implementation Research

Outcomes: Adoption, Reach, Effectiveness, Implementation, Maintenance

- External environment
- Internal setting
- Intervention characteristics
- Implementation process
External environment

- Medicaid expansion
- Incentives and rewards for CRC screening
- CRC screening coverage
- Colonoscopy capacity
Oregon Medicaid Enrollment, before and after Medicaid Expansion

<table>
<thead>
<tr>
<th>Age Group</th>
<th>Before Medicaid Expansion</th>
<th>After Medicaid Expansion</th>
<th>Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>All ages</td>
<td>Dec-13: 659,114&lt;br&gt;Jun-14: 971,095</td>
<td>% 47.3%</td>
<td></td>
</tr>
<tr>
<td>&lt; 19</td>
<td>Dec-13: 372,639&lt;br&gt;Jun-14: 426,130</td>
<td>% 14.4%</td>
<td></td>
</tr>
<tr>
<td>19 – 21</td>
<td>Dec-13: 20,996&lt;br&gt;Jun-14: 41,625</td>
<td>% 98.3%</td>
<td></td>
</tr>
<tr>
<td>22 – 35</td>
<td>Dec-13: 90,356&lt;br&gt;Jun-14: 193,078</td>
<td>% 113.7%</td>
<td></td>
</tr>
<tr>
<td>36 – 50</td>
<td>Dec-13: 70,203&lt;br&gt;Jun-14: 147,184</td>
<td>% 109.7%</td>
<td></td>
</tr>
<tr>
<td>51 – 64</td>
<td>Dec-13: 57,295&lt;br&gt;Jun-14: 124,418</td>
<td>% 117.2%</td>
<td></td>
</tr>
<tr>
<td>65 +</td>
<td>Dec-13: 47,625&lt;br&gt;Jun-14: 38,660</td>
<td>% -18.8%</td>
<td></td>
</tr>
</tbody>
</table>
CRC screening become incentivized in Oregon

“The state [OR] has also developed 33 performance measures to aim to show to the public and the federal government how the project is working, with financial incentives to local Coordinated Care Organizations for meeting goals like rates of adolescent well-care visits and colorectal cancer screening.”

ACA prevention mandates are meant to increase screening, current policies could increase disparities; 

ACA mandate only applies to the initial screening test. **FOBT** screening is a 2-part test, positive tests need a follow-up diagnostic colonoscopy; 

Follow-up diagnostic colonoscopy may be unaffordable for some (e.g. Medicare basic, high deductible plans).
An invited commentary in response to a trial by Baker et al., a mailed FIT program achieved repeat screening rates >82% in a low-income Hispanic population.

Only 60% of those with a positive test had a follow-up colonoscopy.

More work is needed to assure equity and to increase diagnostic follow-up after a positive FIT screening test (e.g. Medicare basic, high deductible commercial plans).
Internal setting

- Types of tests that are recommended and used
- Provider attitudes and beliefs about CRC screening and tests
- In-clinic systems to promote CRC screening
- Use of EMR
- Prioritization of CRC screening
- Readiness and adaptability to change
STOP CRC Pilot
STOP CRC Update: Pilot Clinic partnership

- Founded in 1975
- Provides over 132,000 office visits to 34,000+ patients per year in Washington and Yamhill Counties
- Operates 4 primary care clinics, 3 dental offices, and 2 school-based health centers.

Virginia Garcia Memorial Health Center

<table>
<thead>
<tr>
<th>Clinic</th>
<th>N Patients aged 50-74</th>
<th>% Hispanic aged 50-74</th>
<th>% aged 50-74 who obtained FIT or FOBT</th>
</tr>
</thead>
<tbody>
<tr>
<td>#1</td>
<td>898</td>
<td>73</td>
<td>3.7</td>
</tr>
<tr>
<td>#2</td>
<td>1562</td>
<td>52</td>
<td>3.9</td>
</tr>
<tr>
<td>#3</td>
<td>1495</td>
<td>31</td>
<td>5.2</td>
</tr>
<tr>
<td>#4</td>
<td>1235</td>
<td>38</td>
<td>7.6</td>
</tr>
</tbody>
</table>
### Strategies and Opportunities to STOP Colon Cancer in Priority Populations: STOP CRC Pragmatic Pilot Study Design and Outcomes


#### STOP CRC Intervention Activities and Outcomes

<table>
<thead>
<tr>
<th>Activity</th>
<th>Auto Intervention</th>
<th>Auto Plus Intervention</th>
</tr>
</thead>
<tbody>
<tr>
<td>Letters mailed</td>
<td>112</td>
<td>101</td>
</tr>
<tr>
<td>FIT kits mailed</td>
<td>109</td>
<td>97</td>
</tr>
<tr>
<td>Reminder postcards mailed</td>
<td>95</td>
<td>84</td>
</tr>
<tr>
<td>Reminder call delivered</td>
<td>NA</td>
<td>30*</td>
</tr>
</tbody>
</table>

- **FIT kits complete**
  - Auto: 44 (39.3%)
  - Auto Plus: 37 (36.6%)

- **Positive FIT result**
  - Auto: 5 (12.5%)
  - Auto Plus: 2 (5.7%)

*34 patients were not reached after 2 attempts
**FIT completion of 24% was expected

#### Fecal test completion rates*

*Auto and Auto Plus as percentage of patients mailed a FIT kit.
Follow-up to abnormal FITs

Uninsured patient (n = 2) were offered free f/u colonoscopy through a community-based organization, Project Access Now

<table>
<thead>
<tr>
<th>Patient</th>
<th>Colonoscopy receipt</th>
<th>Colonoscopy result/comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>N</td>
<td>Patient declined</td>
</tr>
<tr>
<td>2</td>
<td>Y</td>
<td>Hyperplastic polyps; not precancerous</td>
</tr>
<tr>
<td>3</td>
<td>Y</td>
<td>Polyp -- 5mm</td>
</tr>
<tr>
<td>4</td>
<td>Y</td>
<td>Abnormal appearing rectal tissue; no masses</td>
</tr>
<tr>
<td>5</td>
<td>Y</td>
<td>36 polyps; some tubular adenomas; up to 3 cm</td>
</tr>
<tr>
<td>6</td>
<td>Y</td>
<td>Polyp --5mm</td>
</tr>
<tr>
<td>7</td>
<td>Y</td>
<td>Hemorrhoids</td>
</tr>
</tbody>
</table>

Patient-centered approaches

Developed with input from:
- Patient advisory council members
- Clinic staff
- STOP CRC advisory board
Instructions for Insure

Developed by graphic artists at Multnomah County Health Department, with input from patients and clinic staff.
Table 4: Patient-reported Reasons for FIT Kit Non-completion (n=20)

<table>
<thead>
<tr>
<th>English Language Speakers</th>
<th>Spanish Language Speakers</th>
</tr>
</thead>
<tbody>
<tr>
<td>2 Fear of results, cost, or follow-up</td>
<td>7</td>
</tr>
<tr>
<td>1 Did not receive FIT kit</td>
<td>6</td>
</tr>
<tr>
<td>6 Concern about mailing fecal matter</td>
<td>0</td>
</tr>
<tr>
<td>4 Busy / forgetful</td>
<td>0</td>
</tr>
<tr>
<td>2 Other health conditions</td>
<td>2</td>
</tr>
<tr>
<td>3 Provider encouraged colonoscopy</td>
<td>0</td>
</tr>
<tr>
<td>2 Prefer conversation with provider</td>
<td>1</td>
</tr>
<tr>
<td>0 Living out of country / traveling</td>
<td>2</td>
</tr>
<tr>
<td>2 Not as good as colonoscopy</td>
<td>0</td>
</tr>
<tr>
<td>2 Unemployed / financial</td>
<td>0</td>
</tr>
<tr>
<td>1 Unnecessary / waste of resources</td>
<td>0</td>
</tr>
<tr>
<td>0 Confusion about why receiving FIT kit</td>
<td>1</td>
</tr>
<tr>
<td>0 Unsure if FIT kit is free</td>
<td>1</td>
</tr>
</tbody>
</table>
STOP CRC Pragmatic Study
STOP CRC intervention

EMR tools in Reporting Workbench, driven by Health Maintenance;
Step-wise exclusions for:
• Invalid address
• Self-reported prior screening
• Completion of CRC screening
Improvement cycle (e.g. Plan-Do-Study-Act)
Using an automated data-driven, EHR-embedded program for mailing FIT kits: Lessons from the STOP CRC pilot study
Coronado GD, Burdick T, Petrik AF, Kapka T, Retecki S, Green BB.
J Gen Pract 2014
### Clinic Workflows

**Understanding variations in fecal testing by clinic**

<table>
<thead>
<tr>
<th>Identify patient</th>
<th>Provide test</th>
<th>Encounter type</th>
<th>Order type</th>
<th>Order class</th>
<th>Where processed</th>
<th>How documented</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre-visit chart review</td>
<td>In-person during visit</td>
<td>Visit encounter</td>
<td>Future</td>
<td>External interface, outside collection</td>
<td>Clinic lab</td>
<td>Result note</td>
</tr>
<tr>
<td>Office visit</td>
<td>Lab encounter</td>
<td>Interim note</td>
<td>Regular</td>
<td>External interface</td>
<td>Outside lab</td>
<td>Problem list, coded terms</td>
</tr>
<tr>
<td>Gaps in care report</td>
<td>Mail</td>
<td></td>
<td></td>
<td>Back office</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Mapping Clinic Workflows: A Novel Method for Multi-site Research in Learning Health Systems**

Coronado GD, Retecki S, Petrik AF, Coury J, Aguirre J, Taplin SH, Burdick T, Green BB. JAMIA 2014 (submitted)
Value of workflows

- Assure that EMR tools function as intended across health centers;
- Customize training;
- Predict unintended consequences;
- Promote standardized practices to improve data quality.
Participating clinics*

Open Door Community Health Centers (4)
Multnomah County Health Department (6)
La Clinica del Valle (3)
Mosaic Medical (4)
Virginia Garcia Memorial Health Center (2)
Community Health Center (CHC) Medford (3)
Benton County Health Department (2)
Oregon Health & Science University (OHSU) (2)

*Overall: colonoscopy screening in past 10 years: 5%;
fecal testing in past year: 7.5%
# Types of FIT kits used

<table>
<thead>
<tr>
<th>Health Center</th>
<th>FIT kit brand</th>
<th>N samples</th>
<th>Where processed?</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Consult Diagnostics</td>
<td>1-sample</td>
<td>Local hospital</td>
</tr>
<tr>
<td>2</td>
<td>Hemosure</td>
<td>1-sample</td>
<td>Local hospital</td>
</tr>
<tr>
<td>3</td>
<td>OC-Micro</td>
<td>1-sample</td>
<td>Outside lab</td>
</tr>
<tr>
<td>4</td>
<td>Insure</td>
<td>2-samples</td>
<td>Outside lab</td>
</tr>
<tr>
<td>5</td>
<td>Insure</td>
<td>2-samples</td>
<td>On-site</td>
</tr>
<tr>
<td>6</td>
<td>Insure</td>
<td>2-samples</td>
<td>Outside lab</td>
</tr>
<tr>
<td>7</td>
<td>OC-Micro</td>
<td>1-sample</td>
<td>Outside lab</td>
</tr>
<tr>
<td>8</td>
<td>OC-Micro</td>
<td>1-sample</td>
<td>Outside lab</td>
</tr>
</tbody>
</table>
Organizational assessment

- Organizational survey (1 per health center)
- Leadership interviews (qualitative; 4 – 7 per health center)
- Provider interviews (quantitative; all family and internal medicine providers who serve adults)
  - Short survey addressed: Provider attitudes; clinic practices related to CRC screening; Use of EMR for CRC reporting and patient identification
  - On-line platform (Survey Monkey)
  - Web link distributed to qualifying providers at all sites
- To-date 112 provider surveys have been completed (60% response rate); finding based on first 78.
Provider perceptions of colonoscopy access*

*based on 78 completed surveys
Biggest challenges
EMR tools use real-time data

- New patients;
- Patients with a recent clinic visit;
- Patients newly eligible for CRC screening (because of age or screening hx)
- Patients with no recent clinic visit;
- Patients newly ineligible for CRC screening (because of age, screening hx, or co-morbidities)
Analytic plan

- **Primary outcomes**
  - Rate of fecal testing 12 months after identified as eligible

- **Secondary outcomes**
  - Any CRC screening 12 months after intervention
  - CRC HEDIS score
  - Reach
  - Adoption (in YR01 among intervention sites, and in YR02 among usual care sites)
  - Implementation (by intervention component)
  - Maintenance (patient-level and clinic-level)
  - Rate of diagnostic follow-up
Impact of changes in clinic volumes

Maintenance of clinic volumes

Drop in clinic volumes

- N newly elig (clinic visit, age-in)
- N newly ineligible (HM updated)
- N newly ineligible (clinic visit)
- N continued eligible
Other challenges

- Gastroenterology capacity
  - Anecdotally, in some geographic regions, wait-time for colonoscopy can be as long as 8 months;
  - We plan to assess this at the end of the study using EMR data;
- Updating EMR with historical colonoscopy
  - Receive procedure report without pathology report;
  - No interval to next screening.
Unintended (positive) consequences

- All health centers are using FIT, only 1 was using FIT before the study;
- EMR capture of CRC screening has improved;
- Clinic staff are now using Health Maintenance for CRC screening and other preventive health screenings.
Summary

- Rates of colorectal cancer screening are low and particularly low for Latinos;
- Screening (home-based fecal testing) is highly effective, inexpensive, and easy to deliver, and patients prefer fecal testing;
- How rates of colorectal cancer screening are raised is transformative
  - Home-based testing can allow for risk stratification without clinic visit;
- Successful, cost-saving programs can be implemented;
- STOP CRC can provide evidence to support
  - broad adoption of direct-mail program;
  - long-term sustainability;
  - improvements in program efficiency (i.e. PDSA cycles);
  - information about cost; and
  - data to drive policy changes.
Acknowledgments

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