Utilization of an electronic patient survey to determine up-to-date colorectal cancer screening status and identify high-risk individuals

Christopher Soriano, M.D.
Resident Physician, PGY-3
Penn State Health
Milton S. Hershey Medical Center
THANK YOU NCCRT!!
Who we are

**Research Team:**

Christopher Soriano, M.D.
Thomas McGarrity, M.D.
Brian McAllister, M.D.
Jennifer Cooper, M.D.
Justin Loloi, B.S.
Junjia Zhu, Ph.D.
Laurie Peiffer, B.S.
Gregory Caputo, M.D.

• Primary clinical affiliate of Penn State College of Medicine
• 548-bed tertiary care hospital
• Level I Trauma Center
• GI Department ranked in the top 50 nationally by US News
• 10,000+ employees
How we got here

• In 2014, the NCCRT initiated the “80% by 2018” campaign

• Recognizing the importance of developing tools to help achieve this goal, we developed and investigated the utility of a colorectal cancer (CRC) screening uptake and risk assessment tool for use by large entities such as employers and medical practices

• A specific aim was to identify high-risk populations and evaluate their CRC screening up-to-date status
Our Survey Instrument

Development and Design

• Consists of three sections:

1. Demographic Data

2. Previous CRC screening

CRC screening up-to-date status determined

Based on USPSTF 2016 Guidelines
The Colorectal Cancer Risk Assessment Tool

The Colorectal Cancer Risk Assessment Tool is designed to help health care providers estimate the lifetime risk for men and women with colorectal cancer. It is intended to be used with other colorectal cancer risk assessment tools and other health care providers to provide information on the risk of colorectal cancer over the next 5 years, 10 years, and lifetime.

This tool cannot accurately estimate risk of colorectal cancer for people who have the following health conditions:

- Ulcerative colitis
- Crohn disease
- Familial adenomatous polyposis (FAP)
- Hereditary Nonpolyposis Colorectal Cancer (HNPCC), also known as Lynch Syndrome
- Personal history of colorectal cancer

This tool takes about 5 minutes to complete.
Our Survey Instrument

What makes our survey unique
(and useful!)

• Consists of three sections:
  1. Demographic Data
  2. Previous CRC screening
  3. Identification of high-risk groups

Development and Validation of a Colon Cancer Risk Assessment Tool for Patients Undergoing Colonoscopy

Fay Kastrinos, M.D., M.P.H.¹,⁵, John I. Allen, MD, MBA⁶, David H. Stockwell, M.D., M.P.H.¹,⁵, Elena M. Stoffel, M.D., M.P.H.¹,³,⁵, Earl F. Cook, ScD⁴,⁵, Muthoka L. Mutinga, M.D.²,⁵, Judith Balmaña, M.D.⁷, and Sapna Syngal, M.D., M.P.H.¹,³,⁵
Our Survey Instrument
Development and Design: Section 1

What is your current age?

What is your gender?

○ Male
○ Female

What is your primary race?

○ American Indian or Alaskan Native
○ Asian
○ Black or African American
○ White
○ Native Hawaiian or other Pacific Islander
○ Decline to answer

What is your ethnicity?

○ Hispanic or Latino
○ Not Hispanic or Latino
○ Decline to answer
Our Survey Instrument

Development and Design: Section 2

Have you had the following Colorectal Cancer Screening tests?

<table>
<thead>
<tr>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>Colonoscopy in past 10 years?</td>
<td>○</td>
</tr>
<tr>
<td>Stool blood test in past year?</td>
<td>○</td>
</tr>
<tr>
<td>Stool DNA test in past 3 years?</td>
<td>○</td>
</tr>
<tr>
<td>CT Colonography in past 5 years?</td>
<td>○</td>
</tr>
<tr>
<td>Sigmoidoscopy in past 5 years?</td>
<td>○</td>
</tr>
<tr>
<td>Sigmoidoscopy in past 10 years plus stool blood test in past year?</td>
<td>○</td>
</tr>
</tbody>
</table>

Questions adapted from USPSTF JAMA 2016; 315:2564
### Our Survey Instrument

**Development and Design: Section 3**

#### 1. Do you have a first-degree relative (mother, father, brother, sister, child) with any of the following conditions diagnosed before age 50?

<table>
<thead>
<tr>
<th>Condition</th>
<th>Yes</th>
<th>No</th>
<th>Unknown</th>
</tr>
</thead>
<tbody>
<tr>
<td>Colon or rectal cancer</td>
<td>O</td>
<td>O</td>
<td>O</td>
</tr>
<tr>
<td>Cancer of the uterus, ovary, stomach, small intestine, urinary tract</td>
<td>O</td>
<td>O</td>
<td>O</td>
</tr>
<tr>
<td>(kidney, ureter, bladder), bile ducts, pancreas or brain</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

#### 2. Have you had any of the following conditions diagnosed before age 50?

<table>
<thead>
<tr>
<th>Condition</th>
<th>Yes</th>
<th>No</th>
<th>Unknown</th>
</tr>
</thead>
<tbody>
<tr>
<td>Colon or rectal cancer</td>
<td>O</td>
<td>O</td>
<td></td>
</tr>
<tr>
<td>Colon or rectal polyps</td>
<td>O</td>
<td>O</td>
<td></td>
</tr>
</tbody>
</table>

#### 3. Do you have three or more relatives with a family history of colon or rectal cancer?

- Yes  
- No  
- Unknown

(This includes parents, brothers, sisters, children, grandparents, aunts, uncles and cousins.)

#### 4. Do you have any first-degree relatives (mother, father, brother, sister or child) with cancer of the colon or rectum diagnosed under age 60?

- Yes  
- No  
- Unknown

#### 5. Do you have more than 1 first-degree relative with colon or rectal cancer?

- Yes  
- No  
- Unknown

Questions adapted from:  
Am J. Gastro 2014; 109:1159-1179
Why is this important?

What is the utility in identifying high-risk individuals?

Increase in Incidence of Colorectal Cancer Among Young Men and Women in the United States

Rebecca L. Siegel, Ahmedin Jemal, and Elizabeth M. Ward
Department of Surveillance and Health Policy Research, American Cancer Society, Atlanta, Georgia

• We view this population as an underserved group with a healthcare disparity
Our Survey Instrument

Distribution and Administration

• Administered to Physicians’ Alliance Limited and their 10 primary care sites in central Pennsylvania
• Goal: to compare patient reported data to established CRC screening quality improvement data
Our Survey Instrument

Distribution and Administration

• Paper survey converted to short, electronic survey

• Administered via Research Electronic Data Capture (REDCap) platform
  • Secure web application for building and managing online surveys and databases

• Distributed anonymously to all employees of Penn State Health aged 40 and above via the Department of Human Resources
  • Employees received emails directing them to online survey
  • Participation was voluntary and not compensated
Results

• 2638 respondents met inclusion criteria

• Average-risk patients aged ≥50: 81.2% UTD

• 878 respondents identified as high-risk individuals
  • High-risk individuals: 77.7% UTD
Does this tell the whole story?

What about the younger adults at high-risk?

- High-risk respondents aged 40-49 years: 45.8% UTD
  - Number of high-risk respondents aged 40-49: 110
  - No statistically significant differences in gender, race or ethnicity in those UTD vs. not UTD
Biases and Barriers

• Selection bias
  • Those responding more likely to be up-to-date with CRC screening?
  • Have access to healthcare
  • More likely to be exposed to benefits of screening as employees of healthcare entity

• Recall bias
  • Survey fully dependent on respondent recall of previous screening
  • Pertinent family history not readily available/accessable

• HR Department received several complaints that employees were uncomfortable divulging medical information to their employer
  • Despite assurances that survey was secure and anonymous
Next Steps

How can we utilize our survey

• Our tool is effective in:
  1. Assessing a patient’s CRC screening status
  2. Identifying high-risk individuals

• We have been successful in:
  1. Developing a “report card” for Penn State Health on their CRC screening practices among employees
  2. Engaging with HR to accomplish our goals
  3. Identifying a vulnerable population with a healthcare disparity
Avenues to improve screening

Using our survey instrument as a “report card”

1. Patient/population education
   • Make available survey to other employers, companies, practices, etc. as a “report card”
     • Informs individuals of:
       • Importance of screening
       • Screening modalities
       • Screening practices of colleagues/peers
       • Existence and characteristics of high-risk populations
   • Use Penn State Health as a model for how to use HR Department as an advocate and champion of such a practice
     • Is it appropriate to use HR for such a purpose?
The response from our HR Department

“...participating in screening saves lives.”

• Goal is to partner with areas within organization doing wellness activities
• Have developed a “Wellness Toolkit” for employees
  • Includes a benefits guide with access to wellness resources as an employee
  • Shares benefits coverage and recommendations on preventative screening
• Three “Mammogram Nights” have been scheduled
• Plan to build and implement a rewards system to encourage employees to engage in wellness
Avenues to improve screening

Using our survey instrument as a “report card”

1. Patient/population education
   • Make survey to other employers, companies, practices, etc.
     • Informs individuals of:
       • importance of screening
       • Screening modalities
       • screening practices of colleagues/peers
       • Existence of high-risk populations
   • Use Penn State Health as a model for how to use HR Department as an advocate and champion of such a practice
     • Is it appropriate to use HR for such a purpose? YES
   • Disseminate our work and findings via local outlets
     • Central Pennsylvania Business Journal
Avenues to improve screening

Helping providers improve their practice

2. Provider assistance and education
   • Our work may further burden busy providers
     • Personal CRC cancer screening history hard to obtain
     • Pertinent family history is even harder to obtain
   • Could we make our survey available to providers?
     • Anonymity would need to be suspended
     • Could be included as part of intake paperwork
     • Could be emailed or taken home for completion after discussion with family or review of records
   • Could it be used for practice quality improvement?
     • Further education on identification of high-risk individuals
Avenues to improve screening

Can we accomplish both?

• Distribute through employer
  1. Suspend anonymity (with permission)
     • Notify patient of “positive screen”
     • Link respondent with PCP who could be notified of “positive screen”
  2. Retain anonymity
     • Survey could alert patients afterward of “positive screen” and encourage discussion with provider on next steps
All the tools you need are all in one place.
Summary

• Our short, electronic survey was a novel and efficient way to evaluate a large number of patients to determine CRC screening rates and identify high-risk individuals.

• Our survey instrument can be easily administered by any large entity, including employers, agencies, or medical practices.

• Such entities can utilize the survey to generate a “report card” on the effectiveness of their CRC screening strategies.

• Though administered anonymously, simple modifications could be made to help identify high-risk individuals in need of more extensive CRC screening.

• Human Resources departments represent appropriate and effective resources to help encourage screening.

• Penn State Health met the CRC screening goal of “80% by 2018” set out by the National Colorectal Cancer Roundtable and was added to the “80% by 2018 Hall of Fame.”
Thank You!

• Thomas McGarrity, M.D.
• Brian McAllister, M.D.
• Jennifer Cooper, M.D.
• Justin Loloi, B.S.
• Junjia Zhu, Ph.D.
• Laurie Peiffer, B.S.
• Gregory Caputo, M.D
• Ms. Patricia Siegrist

• Penn State Health Department of Human Resources
• The National Colorectal Cancer Roundtable
References


