How to start a screening Program?

WEO Colorectal Cancer Screening Committee Meeting
Brasilia Nov 11 2017
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Wheel has been discovered already.
Policy Planning Thanks to GBD
Big Data
CRC Screening programs implemented if...

- CRC incidence > 30/100,000 (Burden of Disease)
- **Resources** available and related cost
- Cost effectiveness of population screening
- Development of **infrastructure, cancer & death registry system**
- **Central laboratory** (FOBT/FIT)
- **Colonoscopy referral system** (Timely), Surgery, oncology...
- Prior **Pilot studies**
Challenges

• All Guidelines recommend routine screening for CRC and Adenomas in asymptomatics at 50

• Differences on frequency of screening, age to discontinue and preferred screening method

• HR patients... age to start screening, frequency and method
Overview

• 3rd more common cause of Cancer
• 4th most common cause of Cancer Deaths
• **PREVENTABLE**
• Regional Variability in changes in incidence and mortality
• 2030 increase by 60% 2.2 million new cases and 1.1 million deaths globally

Overview

• Numerous Guidelines Available
• Regional variations
• Incidence & Mortality indexes and resources availability driven

• They tend to converge

Task Forces Multi-institutional Efforts
Overview

• Few programs out of the USA utilize Colonoscopy for first line screening in average risk populations
• Most do use FOBT (FIT) and F-Sig
• Resources drive the programs
• Endoscopists enough, Surgeons enough...?
 Plans for limited resources areas

• FOBT/FIT. **Low initial costs**
  (FIT only one sample required)
• Non invasive
• Easy to perform
• Permits triaging for colonoscopy risk stratification
• Cutoff values could adjust colonoscopy resource
Colorectal Cancer Screening in the Americas
Situation and Challenges

• Fourth most common cancer in men and women
  246,000 newly diagnosed. 112,000 people dying yearly

  Second cause of cancer death among “latinos” in the USA

• Incidence and mortality rates in Latin America and the Caribbean lower than USA and Canada

• Except Uruguay, Argentina, Barbados, and Trinidad & Tobago

• CRC incidence rates in LAC increasing!

Expert consultation on colorectal cancer screening
Pan American Health Organization & CDC 2016, PAHO headquarters
Incidence and Mortality Rates

Colorectum
ASR (W) per 100,000, all ages

Male
- Canada: 41.6
- Uruguay: 35.9
- Barbados: 31.7
- United States of America: 26.5
- Puerto Rico: 29.6
- Trinidad and Tobago: 33.4
- Argentina: 29.8
- France, Martinique: 25.3
- Bahamas: 21.1
- Cuba: 17.8
- Suriname: 23.9
- Costa Rica: 14.6
- Chile: 16.9
- Jamaica: 15.2
- France, Guadeloupe: 16.9
- Colombia: 13.4
- Panama: 14.1
- Paraguay: 12.9
- Peru: 10.2

Female
- Canada: 28.5
- Uruguay: 25.4
- Barbados: 28.1
- United States of America: 22.2
- Puerto Rico: 20.6
- Trinidad and Tobago: 16.8
- Argentina: 19.1
- France, Martinique: 23.1
- Bahamas: 19.9
- Cuba: 21.6
- Suriname: 12.7
- Costa Rica: 15.9
- Chile: 14.4
- Jamaica: 13.7
- France, Guadeloupe: 11.6
- Colombia: 12.5
- Panama: 11.1
- Paraguay: 11.3
- Peru: 11.9
GBD Technical Training Workshop
What is screening for colorectal cancer?

• “Looking for cancer or polyps when patients have no symptoms”

• Finding colorectal cancer before symptoms develop dramatically improves survival

• Identifying and removing polyps before they become cancerous prevents development of CRC”

• Doug Rex, Indiana
The mission

- Diminishing CRC’s incidence and mortality
- Precursors and early lesions diagnosis
- Endoscopy and surgical treatment
- Avoid interval CCR
Screening Programs

• **Adherence** to yearly or biennial FOBTs/FIT
• If Stool tests, CTC or FS show abnormalities ...
• **High Quality Diagnosis colonoscopy** guaranted with complete removal of polyps and accurate pathological Diagnosis of CRC
• **Timely** referral for Surgery
• If Adenomatous polyps removed or CRC resected **Surveillance colonoscopies**
• Rescreening if indicated
Population based screening

- Discover latent disease in the population
- Detect it at its early stages
- Treat adequately
- **Programmatic instead of opportunistic**
- Administrative structure for service delivery, quality assurance and evaluation
- High coverage, equity...
Range of Screening Options

- Colorectal screening is **underused**
- Strategy to **increase screening rates**
- **Stool-based screening tests**
  - g-FOBT every year / FIT yearly
  - FIT-DNA 1-3 years
- **Direct visualization screening tests**
  - Colonoscopy, every 10 years
  - CT colonography, every 5 years
  - F-sig, every 5 years
  - F-sig every 10 years + FIT yearly
Alternatives
Low resources scenarios

- Winawer S,
- Cascades Concept
- WGO Practical Guidelines Task Force
- Stepwise according to resources

6 Cascades — tooling up for screening

World Gastroenterology
Organisation/International Digestive Cancer Alliance
Practice Guidelines
Colorectal cancer screening
Statement

• “The more candidates to screening recruited, the more favorable effect with any screening modality”

• Key issue
Colonoscopy televised, March 2000

The "Couric Effect"

Cram et al. The Impact of a Celebrity Promotional Campaign on the Use of Colon Cancer Screening: The Katie Couric Effect

Monthly colonoscopy rates in the CORI database from July 1998 to December 2000. Ms Couric's colonoscopy was televised on the Today Show in March 2000 (Month 0)

USPSTF (2016)
US Preventive Services Task Force

Validates any of 5 different technologies at different intervals

• Colonoscopy
• F-Sig
• FIT
• Colonography
• Combined stool DNA/testing
• Not convinced evidence of one test’s superior
Older patients

- Colonoscopy screening discontinued in patients aged 75 or older with prior negative screening tests
- Life expectancy less than 10 years, or 85 years or older without prior screening
EMR- Flat Polyps
Guidelines

• Different Throughout the world
• Multiple options
• Best screening test is the one that gets done...
  Well
• National or Regional Programs (Nat. Health Services) vs Oportunistic
Screening options
Our Weapons

Structural exam of colon

Colonoscopy, sigmoidoscopy or CT colonography
Capsule
All Require adequate bowel Prep
Colonoscopy & F-sig Permits Polypectomy

Non-invasive stool-based test

Options include FIT, stool DNA
Sample obtained at home
No bowel prep. required

Genetic Markers & serum based
LST- Granular Type
AGA Institute Guidelines for Colorectal Cancer Surveillance

- More than 10 adenomas: Less than 3 years
- 1-2 Tubular ad. less 10 mm: 5-10 years
- More than 10 mm, With dysplasia or Traditional serrated adenoma: 3 years
- 3-10 adenomas: 3 years
- Less 10 mm, proximal colon Without Dysplasia: 5 years
- Villous adenoma or TA more 10 mm: 3 years
Asia Pacific Working Group

• High Risk factors. (Score) Triage for earlier Colonoscopy
  Male
  Advanced age
  Family History of CRC
  Smoking /Obesity
• Reduces Endoscopy Workload
• Minimizes risk of Missing asymptomatic CRC and advanced adenomas

Yeah KG Gut 2011 Chiu HM GE 2016
OBESITY & AGING
Inequities

- Different screening rates (Compliance)
- Different results, according to resources
- USA (Colonoscopy)
- Developing World’s CRC incidence rapidly increasing ...
  
  handicapped Health Systems Budgets besides

- Educational level related
- No Health insurance 19% vs 62% in covered
- Double III and IV CCR in uncovered
- Racial: Caucasics > African Americans > Latins
Colorectal Cancer Screening: Recommendations for Physicians and Patients From the U.S. Multi-Society Task Force on Colorectal Cancer


• Rex et al AJG 2017, Gastroenterology 2017
Take home message

• Incidence and mortality for CRC declining
• Increasing in LAC
• CRC third most common cause of Cancer worldwide
• Preventable if Adenomas detected and removed
• Curable if CRC detected early
• Best test is the one that gets done,..well and with appropriate follow up
CRC Prevention

“The best method for CRC prevention...
is the one that gets done...
Well”

S. Winawer
The National Colorectal Cancer Roundtable Campaign to screen 80% for CRC by 2018: Mapping Progress by State to Focus Screening Efforts. Ann Zauber et al. Memorial Sloan Kettering Cancer Center, Erasmus Medical Center...

• National Campaign to increase screening rates to 80% by 2018 (50 yrs)
• Avoids 277.000 CRC & 203.000 Deaths By 2030
• Means 24,4 millions extra screened persons
• Each institution establishes TNNS. (Total Number of Newly Screened)
• 900 organizations
  • Gastroenterology Societies, Gobernors, Majors, Local and State Health Departments, Patients centered Groups Hospitals, Medical Centers, Insurance Companies, Etnic Groups etc.
Stool-Based

- FIT better results and compliance
- In Population studies filters patients for Colonoscopy
- Adherence to annual or biennial controls
- Poor adherence out of research setting. 18% at 3rd year (US Veterans Health Affairs)
- More than 1,000,000 cases
- Low Adenoma detection

Gellad ZF (AJG 2011)
FIT

- 80% sensitivity for cancer
- 25-30% for **advanced adenomas**
  - Intramucosal CRC, >1 cm, Villous >25%, and HGD
- Better for distal than proximal adenomas (?)
- Similar results with one day test vs 2 or 3
- Better compliance with electronic reminders

Lee JK, Ann Intern Med 2014
Multitarget Stool DNA Testing

- CRC shed detectable DNA into the stool
- ColoGuard® (DNA/FIT)
- 92.3% sensibility for CRC (73.8% FIT)
- 42.4 for advanced adenoma (23.8% FIT)
- Interval for testing 1 or 3 years

Imperiale TF NEJM 2014
Image based testing

• Double-contrast Barium Enema
• Misses more than 22.4% of CRC
• Not included in USPSTF screening Guidelines
• Low resources areas could consider its use
Image based testing

- **Computerized Tomography Colonoscopy**
- CO$_2$ insuflation of the colon and thin TC multyslice
- Full bowel prep
- Computer software constructs 3D images
- No sedation or complications
- Extracolonic findings
CT-Colonography

• CT-C versus Colonoscopy same day, multicenter study, 2600 patients
• CTC identified 90% of adenomas >10mm and cancers
• Didn’t detect 13 adenomas > 10 mm
  1 10 mm malignant lesion
• Lower detection of SS polyps

Johnson CD NEJM 2008 IJspeert JE  AJG 2016
F-Sig

- 60 cm sigmoidoscope (Splenic flexure)
- No sedation, No full Prep
- Non Gastroenterologists, Trained nurses...
- Decrease in CRC incidence (18-27%) and mortality (20-31%)
- Only distal cancers
- Advanced missed neoplasia 33% were men and 65% women
- Distal lesion found. Total Co warranted
• F-Sig once at 55 years old, added in UK NHS Bowel Cancer Screening Programme
• Biennial gFOBT for 60-74 years old
• Fully Implemented 2018
• Potential to prevent additional 10,000 CRC cases and 2000 deaths by 2030
Colonoscopy

- “Gold Standard” in detection of polyps, tumors, inflammation
- Direct visualization of the entire colon, remotion of polyps and CRC identification
- Full & Quality prep
- Sedation required frequently
- Most expensive modality of screening
- Cost effective
- Highest risk of complications

Kahi CJ Clin Gastroenterol Hepatol 2009
Colonoscopy

- Not perfect, not all equal (Quality control)
- Miss rate of lesions (2-22%)
- Interval Colon cancer 1%
- High ADR colonoscopists, lower ICC rate
- Colon capsule 69% sensitivity for significant polyps
- FDA approval for incomplete colonoscopies

Van Rijn JC AJG 2006 Kaminski MF NEJM 2010
Expert in colonoscopy referral

• **Negative**  Repeat in 10 years

• **Positive** (Adenoma or Sessile Serrated Polyp)  
  Endoscopy removal & Polyp Surveillance

  CT Colonography (Negative: Repeat 5 years)  
  Sigmoidoscopy   (Negative: Repeat 5 years)

• **CRC** Referral for surgery/oncology
Divergent Global CRC Screening Guidelines

- Vary around the world
- USA Colonoscopies For Screening in average risk population
- Vs less expensive and less invasive technologies for average risk population
- Different rationale due to philosophical and resources utilization approaches
AGA Institute Guidelines for Colorectal Cancer Surveillance

- No polyps or hyperplastic polyps in rectum/sigmoid  
  10 years

- Serrated polyps/lesions
- High & Low-risk adenomas  
  3 years

- Serrated Polyposis  
  1 year
  More than 10
Conventional adenomas surveillance

- 1-2 small (<10 mm) tubular adenomas  5-10 y
- 3-10 tubular adenomas        3 y
- >10 adenomas                < 3 y

These recommended intervals assume a complete exam to cecum, adequate bowel prep and complete removal of polyps at the baseline exam.

Lieberman DA, Gastroenterology. 2012; 143: 844–857
2008

- Test to detect cancer or adenomas & cancer
- Cancer: gFOBT/FIT every year
  MTsDNA (interval uncertain)
- Adenomas & cancer:
  Colonoscopy every 10 years
  F-sig/DCBE/CT-C every 5 years

Levin B, Gastroenterology 2008
2008 USPSTF
Recently Updated Options

• gFOBT/FIT every year
• MTsDNA every 1-3 years
• Colonoscopy every 10 years
• CTC/F-sig every 5 years
• F-sig every 10 years + FIT annually

ACG Guidelines

• Prioritized the ACS/MSTF/ACR Guidelines
• **Colonoscopy** is the preferred screening and prevention test. At 50...45 in African Americans
• **FIT** preferred if Colonoscopy declined

Rex DK AJG 2009
National Comprehensive Cancer Network NCCN

- Colonoscopy preferred method
- Annual gFOBT
- FIT and F-Sig every 5 years

Burt RW, J Nat Compr Canc Netw 2013
ACP 2015

- Average-risk adults, 50 to 75 years screened for CRC by one of the following strategies
  - Annual high-sensitivity FOBT or FIT
  - F-sig every 5 years
  - High-sensitivity FOBT or FIT every 3 years + F-sig every 5 years
  - Colonoscopy every 10 years
Multi Society Task Force

• Average risk, testing 1 begins at 45 years for African Americans and at 50 for others

• Family history of CRC or advanced adenoma before 60 in one FDR or at any age in two FDR, Colonoscopy 10 years younger than the youngest age at diagnosis of a FDR, or 40. Repeat every 5 years

• One FDR with CRC, advanced adenoma, or advanced serrated lesion diagnosed at 60 or older, screening should begin with 1 test at age 40 and continue as average-risk patients
ACP 2015

• Average-risk adults younger than 50
• Older than 75
• Estimated life expectancy less than 10 years

...should not be screened
ACG guidelines distinction between screening tests for cancer prevention and for cancer detection

- Preventing Tests preferred over those detecting cancer
- Preferred prevention test is colonoscopy every 10 years, beginning at 50 (45 years African Americans)
- Annual FIT, for patients declining colonoscopy or other cancer prevention test
ACG alternative tests

• F-sig every 5-10 years
• CT colonography every 5 years, replaces DC/BE patients who decline colonoscopy
• Alternative cancer detection tests
• Annual Hemoccult Sensa
• Fecal DNA every 3 years