Colorectal Cancer Screening: GI Specialty Issues

Institute of Medicine
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Portland VAMC
Projected Colorectal Cancer Mortality Rates
Both Races, Both Sexes, All Ages, By Model
Description of Selected Goal

MISCAN Model
Age-adjusted Rates

SimCRC Model
Age-adjusted Rates

Rates are age-adjusted to the 2000 standard population using age groups <1y, 1-4y, 5-14y, 15-24y, 25-34y, 35-44y,
45-54y, 55-64y, 65-74y, 75-84y, 85+y.
Treatment-related objectives were not included in Healthy People 2010. We included treatment goals to evaluate
the potential impact on colorectal cancer mortality.
Colorectal Cancer

Genetic
Environmental
Lifestyle

Normal Colon

Advanced
Adenoma

10-20% Lifetime Risk

Cancer

5-6% Lifetime Risk
Raising the bar

Colon Cancer Detection

Colon Cancer Prevention
% Change in Procedure Volume
1999-2002 Medicare Data

Colonoscopy
Colonoscopy Utilization for Screening over time

% of all colonoscopies
n = 600,000

Average-Risk Screening

CORI: Lieberman et al; CGH 2005; 3: 798-805
GI Specialty Issues

• Quality
• Risk
• Resources
• Disruptive technologies
Colonoscopy Screening Studies
(n > 1000)

• Studies: 2000-2004
  – VA Cooperative Study; NEJM: 2000; 343: 162-8 (n = 3121)
  – Indiana Study; NEJM 2000; 343: 169-74 (n = 1994)
  – CT Colonography studies (n = 2447) (Pickhardt, Rockey, Cotton)
  – Fecal DNA Study; NEJM 2004; 351: 2704-14 (n = 4404)
  – Spain, Am J Gastroenterol 2003; 98: 2648-54 (n = 2210)

• Studies: 2005-2006
  – Women: (Schoenfeld) NEJM 2005; 352: 2061-8 (n = 1463)
  – Taiwan; Gastrointest Endosc 2005; 61: 547-53 (n = 1708)
  – Japan, Gastroenterology 2005; 129: 422-8
    (n = 21,805 with iFOBT)
  – Seattle, JAMA 2006; 295: 2357-65 (N = 1244)
  – Poland, NEJM 2006; 355: 1863-72 (n = 50,148)
  – Germany (n = 1.14M)
**Interval Neoplasia after Colonoscopy**

<table>
<thead>
<tr>
<th>Study</th>
<th>n</th>
<th>F/u CSP</th>
<th>Cancer per 1000 person yrs of f/u</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pabby, 2005</td>
<td>1905</td>
<td>0,1,4 yrs</td>
<td>0.7</td>
</tr>
<tr>
<td>Alberts, 2000</td>
<td>1303</td>
<td>0,1,3 yrs</td>
<td>0.7</td>
</tr>
<tr>
<td>Robertson, 2005</td>
<td>2915</td>
<td>0,3.7 yrs</td>
<td>0.9</td>
</tr>
<tr>
<td>Bertanolli, 2006</td>
<td>2035</td>
<td>0,1,3 yrs</td>
<td>0.3</td>
</tr>
<tr>
<td>Arber, 2006</td>
<td>1561</td>
<td>0,1,3 yrs</td>
<td>0.4</td>
</tr>
<tr>
<td>Baron, 2006</td>
<td>2587</td>
<td>0,1,3 yrs</td>
<td>0.7</td>
</tr>
<tr>
<td>VA, 2006</td>
<td>872</td>
<td>0, 2,5 yrs</td>
<td>0.9</td>
</tr>
</tbody>
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Pabby; Gastrointest Endosc 2005; 61:385-91
Alberts; NEJM 2000; 342: 1156-62
Robertson; Gastroenterol 2005; 129: 34-41
Bertagnolli; NEJM 2006; 355: 873-84
Arber; NEJM 2006; 355: 885-95
Baron, Gastroenterol 2006, 131:1674-82
Lieberman, Gastroenterol 2007; 133:1077-85
Interval Cancer after Colonoscopy

0.3-0.9%

• New, fast growing lesions
  – Sawhney et al; Gastroenterology 2006; 131: 1700-5

• Incomplete removal
  – Pabby et al; Gastrointest Endosc 2005; 61: 385-91

• Missed lesions

<table>
<thead>
<tr>
<th>Author</th>
<th>n</th>
<th>for adenoma &gt;1cm</th>
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<tr>
<td>Pickhardt (2003)</td>
<td>1233</td>
<td>87.5%</td>
</tr>
<tr>
<td>Cotton (2004)</td>
<td>600</td>
<td>96%</td>
</tr>
<tr>
<td>Rocky (2005)</td>
<td>614</td>
<td>98%</td>
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2-12% of polyps >1cm are missed!!
Interval Cancer after Colonoscopy
0.3-0.9%

• New, fast growing lesions
  – Sawhney et al; Gastroenterology 2006; 131: 1700-5

• Incomplete removal
  – Pabby et al; Gastrointest Endosc 2005; 61: 385-91

• Missed lesions
  per patient sensitivity of colonoscopy

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2-12% of polyps >1cm are missed !!
## Colonoscopy: Adverse Events

<table>
<thead>
<tr>
<th>Study</th>
<th>Year</th>
<th>Setting</th>
<th>Rates</th>
</tr>
</thead>
<tbody>
<tr>
<td>VACSP 380;</td>
<td>2002</td>
<td>Screening 30d f/u</td>
<td>0.3% Serious</td>
</tr>
<tr>
<td>Korman</td>
<td>2003</td>
<td>Amb Surg Centers</td>
<td>0.03% perforation</td>
</tr>
<tr>
<td>Bowles</td>
<td>2004</td>
<td>UK</td>
<td>0.13% perforation</td>
</tr>
<tr>
<td>Rathgaber</td>
<td>2006</td>
<td>Community</td>
<td>0.2% bleed</td>
</tr>
<tr>
<td>Ko</td>
<td>2007</td>
<td>Community</td>
<td>Minor/ED visits</td>
</tr>
<tr>
<td>Sharma</td>
<td>2007</td>
<td>Community</td>
<td>1.1% cardio-pulm</td>
</tr>
<tr>
<td>Levin</td>
<td>2006</td>
<td>HMO</td>
<td>0.5% serious</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>0.09% perforation</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>0.5% bleed</td>
</tr>
</tbody>
</table>
Colonoscopy

Depends on:

• Appropriate utilization
• High-quality exam to cecum
• Low rate of incompletely removed lesions
• Low rate of adverse events
Quality Indicators for Colonoscopy which should be monitored:

- Appropriate indication
- Bowel Prep quality
- Cecal Intubation rate
- Withdrawal time from cecum
- Polyp descriptors and retrieval
- Adenoma detection rate
- Appropriate surveillance intervals
- Adverse events/Unplanned events
CORI

- **CONCEPT:**
  - Collect endoscopic practice data from diverse clinical practice settings throughout the United States

- **GOAL:**
  - Measure outcomes related to endoscopy

- **FUNDING:**
  - NIDDK since 1999
CORI: Paper To Computer

Dictation

Hand-written

Computerized endoscopy report generator
Data Collection/Transmission

Central Databank

Patient Privacy
Central Data Bank
Current Active Sites (n = 72)
Community 68%
Academic 17%
VA 11%
Military = 3%
HMO 1%
Colonoscopy Quality

How are doing?

n = 438,521
2004-2006
Adequate Prep Rates by Site Volume

Bowel Prep not reported: 13.9%
Co-Morbidity: ASA Entry

% entered vs Site Volume
Cecal intubation rates by site volume

- 100%
- 90%
- 96.3%
- Cecal Landmarks not reported: 14%
Quality Indicators:
Polyp Descriptors
258,601 polyps

• Polyp size reported
  – NO: 11.9%

• Morphology reported (flat, sessile, pedunculated):
  – NO: 14.7%

• Retrieval Reported
  – NO: 4.5%
Scatterplot - Site Volume vs Polyp > 9mm detection on screening exams

Mean: 6.3%
Immediate Complication Rates

Site Volume vs. % any comp
Brave New World

- Pay for performance
- Health savings account
- Payers who demand quality data
Resources: Supply and Demand

Appropriate Utilization:
- Screening interval
- Surveillance intervals
- Evaluation of symptoms
*Among adults who have colonoscopy, 20% are < 50 years old

Lieberman et al; Gastrointest Endosc 2005; 62: 875-83
### Colonoscopy Utilization: < 50 years

Lieberman et al; Gastrointest Endosc 2005; 62: 875-83

<table>
<thead>
<tr>
<th>Procedure</th>
<th>Women</th>
<th>Men</th>
</tr>
</thead>
<tbody>
<tr>
<td>Indication</td>
<td>N = 16,257</td>
<td>n = 13,510</td>
</tr>
<tr>
<td>Ave Risk Screen</td>
<td>1%</td>
<td>2%</td>
</tr>
<tr>
<td>(+) FOBT</td>
<td>8%</td>
<td>10%</td>
</tr>
<tr>
<td>IBS</td>
<td>29%</td>
<td>18%</td>
</tr>
</tbody>
</table>
Resources for Surveillance

- Colon surveillance represents 25% of all colonoscopies in patients > 55 yrs
- Evidence for over-utilization from surveys
  - > 50% of endoscopists recommend surveillance at 3 years or less for small adenomas despite guidelines
  - Many physicians in US perform surveillance colonoscopy for hyperplastic polyps

Lieberman et al; CGH 2005; 3: 798-805
Mysliwiec et al; Ann Intern Med 2004; 141:264-71
## Surveillance Guideline

<table>
<thead>
<tr>
<th>Baseline Finding</th>
<th>Interval*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hyperplastic polyps (rectum/sigmoid)</td>
<td>10 yrs</td>
</tr>
<tr>
<td>1-2 Tubular adenomas &lt;1cm</td>
<td>5-10 yrs</td>
</tr>
<tr>
<td>≥ 3 adenomas</td>
<td>3 yrs</td>
</tr>
<tr>
<td>Tubular ad &gt; 1cm</td>
<td></td>
</tr>
<tr>
<td>Villous adenoma</td>
<td></td>
</tr>
<tr>
<td>High-grade dysplasia</td>
<td></td>
</tr>
<tr>
<td>&gt;10 adenomas</td>
<td>&lt; 3 yrs</td>
</tr>
<tr>
<td>Piecemeal resection</td>
<td>2-6 mos</td>
</tr>
<tr>
<td>Cancer</td>
<td>1 year</td>
</tr>
</tbody>
</table>

*Assumes complete exam with adequate prep

Winawer et al; Gastroenterol 2006; 130: 1872-85
Rex et al; Gastroenterol 2006; 130: 1865-71
Surveillance: Report of Prior Endoscopy

Site Volume vs. % entered
Resources

• Utilization
• Changes in practice may change demand
  – CT Colonography
  – Genetic screening

% with Colonoscopy
Resources

• Utilization

• Changes in Practice

• New endoscopists
  – Increase training
  – Physician extenders under supervision
Resources

Colonoscopy

Demand

Capacity

Colonoscopy
Future – Disruptive Technologies
GI Specialty Issues

- Quality
- Risk
- Resources
- **Disruptive technologies**
CT Colonography

GI ISSUES
1) Impact on GI practice
2) Should GI physicians perform CT?
3) If so, training, credentialing issues

Pickhardt; NEJM 2003; 349: 2191; Cotton; JAMA 2004; 291:1713-9;
Rockey: Lancet 2005;365: 305-11
CT Colonography: Issues

- Management of findings
- Inter-observer variability
- Bowel Prep
- Radiation
- Extracolonic findings

Low Resolution CTC
Chromoendoscopy

Submucosal adenocarcinoma of colon

Indigo carmine

Soetikno et al; JAMA 2008; Lieberman; JAMA 2008
Raising the bar

Colon Cancer Detection

Colon Cancer Prevention

Colon Screening Quality

1970’s

1990’s

2008
Challenges for GI Specialists

- Document and monitor quality
- Document appropriate utilization
Screening can prevent Colon Cancer.....

...but only if it is done well
Resources: Supply and Demand

Utilization issues
Changes in practice
- CT Colonography
- Genetic
- Screening interval
- Surveillance intervals
- Evaluation of symptoms
Resources

- Utilization
- Changes in practice may change demand
  - CT Colonography
  - Genetic screening