How to improve your performance of colonoscopy

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GI doctors do colonoscopy!

- Primary role of gastroenterologists in CRC prevention is to provide high quality colonoscopy
- The incidence of CRC is dropping in the U.S.
- 5 studies have addressed the incidence of CRC after colonoscopy by GI vs non-GI (3 in U.S.): all 5 show lower risk with GI
- Extreme variability within GI doctors
### Variable detection of adenomas among GI docs during colonoscopy

<table>
<thead>
<tr>
<th>Number of doctors</th>
<th>Lowest ADR</th>
<th>Highest ADR</th>
<th>Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>Barclay Illinois 2006</td>
<td>9.4%</td>
<td>32.7%</td>
<td>3.5</td>
</tr>
<tr>
<td>Chen Indiana 2007</td>
<td>15.5%</td>
<td>41.1%</td>
<td>2.7</td>
</tr>
<tr>
<td>Imperiale Indiana 2009</td>
<td>7%</td>
<td>44%</td>
<td>6.3</td>
</tr>
<tr>
<td>Shaukat Minnesota 2009</td>
<td>10%</td>
<td>39%</td>
<td>3.9</td>
</tr>
</tbody>
</table>

### Variable detection of proximal serrated lesions (GI docs) during colonoscopy

<table>
<thead>
<tr>
<th>Number of doctors</th>
<th>Lowest proximal colon serrated lesion detection rate</th>
<th>Highest proximal colon serrated lesion detection rate</th>
<th>Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hetzel Boston</td>
<td>1.1%</td>
<td>7.6%</td>
<td>6.9</td>
</tr>
<tr>
<td>Kahi Indiana</td>
<td>1%</td>
<td>18%</td>
<td>18</td>
</tr>
</tbody>
</table>
Operator dependence – cancer prevention
Kaminski et al NEJM 2010;362:1795-803

<table>
<thead>
<tr>
<th>Adenoma detection rate (ADR)</th>
<th>Hazard ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt; 11%</td>
<td>10.94</td>
</tr>
<tr>
<td>11.0 – 14.9%</td>
<td>10.75</td>
</tr>
<tr>
<td>15.0 – 19.9%</td>
<td>12.50</td>
</tr>
</tbody>
</table>

Residual risk after colonoscopy: right vs left colon

- Brenner 2011
- Singh, G 2007
- Singh, H 2010
- Baxter, 2009

Legend: Left-sided, Right-sided
Are you a good colonoscopist?

- Requires measurement:
  - Adenoma detection rate
  - Cecal intubation rate
  - Use of recommended intervals for screening and surveillance

- Features of these targets:
  - Clinically relevant
  - Feasible to measure
  - Evidence of variable performance

Should the target be adjusted?

- Change from ADR?
  - Adenomas per colonoscopy
  - Polyp Detection Rate (PDR)

- Change the ADR target?
  - Current targets:
    - ≥ 25% in men
    - ≥ 15% in women
  - True prevalence of adenomas is > 50%
Essentials of detection

- Know endoscopic spectrum of pre-cancerous lesions
- Use effective preparations
- Work at detection

Spectrum of pre-cancerous lesions in the colorectum

<table>
<thead>
<tr>
<th>Lesion</th>
<th>Paris shape</th>
<th>Distribution</th>
<th>Prevalence</th>
<th>Pathology</th>
</tr>
</thead>
<tbody>
<tr>
<td>Traditional adenomatous polyps</td>
<td>1p</td>
<td>Left</td>
<td>Low</td>
<td>Mostly LGD</td>
</tr>
<tr>
<td></td>
<td>1s</td>
<td>Throughout</td>
<td>Common</td>
<td>Mostly LGD</td>
</tr>
<tr>
<td>Flat adenomas (lesions)</td>
<td>2a</td>
<td>Greater to right</td>
<td>Common</td>
<td>Mostly LGD</td>
</tr>
<tr>
<td>Depressed adenomas (lesions)</td>
<td>2c</td>
<td>Greater to right</td>
<td>rare</td>
<td>↑↑ HGD and invasive cancer</td>
</tr>
<tr>
<td></td>
<td>2a + 2c</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>2c + 2a</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sessile serrated adenoma (polyp)</td>
<td>1s or 2a</td>
<td>Right colon</td>
<td>Common</td>
<td>Distinction from HP may not be reliable</td>
</tr>
<tr>
<td>TSA</td>
<td>1s or 1p</td>
<td>Left colon</td>
<td>rare</td>
<td>Uncertain</td>
</tr>
</tbody>
</table>
Conventional adenomatous polyp

White light  NBI

Flat 2a adenoma
Depressed adenoma

Serrated lesion with mucus cap
Serrated lesions

Fixing low level detectors

- Successful programs incorporate education on lesion spectrum
  - Rockford: education plus timer
  - Mayo Jacksonville: EQUIP
Split-Dosing Provides More Satisfactory Results Than Traditional Dosing (cont)

Group A = 4 L of PEG on the night before the procedure; Group B = 2 L of PEG on the evening before and 2 L on the morning of the procedure.


The impact of split dosing

Not split

Split
Arguments Against Split-Dosing Regimens

- Inconvenient to the patient
  - Unlikely to be a factor once the process is explained to the patient
- Anesthesiologists will not allow split-dosing
  - Clear liquids allowed up until 2 hours prior to sedation

Withdrawal technique
Right colon retroflexion

Technical Updates

- CO2 insufflation
  - Multiple RCTs find less post procedure pain
  - Safer during: EMR, decompression, stent placement, tight sigmoid colon
- Water immersion
  - Unsedated and lightly sedated exams
  - Redundant colons
Immediate complications

- Perforation
  - Diagnostic
  - Therapeutic
- Bleeding
- Cardiovascular and pulmonary (apnea)
- Splenic injury
- Aspiration

Avoiding complications in insertion

- Attitude? (never rush, etc.)
- Pediatric scope for selected cases
- Don’t push against fixed resistance (perforation prevention)
- Beware severe diverticular disease
- Use CO2: easy on the air (switch to water)
- Careful with torque on complex loops in the proximal colon (prevent splenic injury)
- Recognize reflux and aspiration risk early
Conclusions

- Measure to know your effectiveness
  - ADR, CIR, use of correct intervals
- Detection basics
  - Know disease spectrum, prep effectively, work at detection
- Update your tools and technique
  - CO2, water immersion
- Expand complication awareness
  - Splenic injury, aspiration pneumonia