INTERVAL CANCER

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CRC Incidence and mortality rates in the Americas

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

South America

- Canada: Male 42.6, Female 28.5
- Uruguay: Male 35, Female 25.4
- Barbados: Male 31.7, Female 28.1
- United States of America: Male 26.5, Female 22
- Puerto Rico: Male 29.6, Female 20.6
- Trinidad and Tobago: Male 33.4, Female 16.8
- Argentina: Male 29.8, Female 19.1
- France, Martinique: Male 25.9, Female 23.1
- Bahamas: Male 21.1, Female 19.9
- Cuba: Male 17.8, Female 21.6
- Suriname: Male 23, Female 12.7
- Costa Rica: Male 14.6, Female 12.1
- Brazil: Male 17, Female 7.2
- Chile: Male 16.9, Female 7.5
- Jamaica: Male 16.9, Female 6.9
- France, Guadeloupe: Male 15.2, Female 5.9
- Colombia: Male 13.4, Female 7.6
- Panama: Male 14.1, Female 7.5
- Paraguay: Male 12.9, Female 7.7
- Peru: Male 10.2, Female 6.7
# Incidence of Interval cancer

## Prevalence, Risk Factors, and Outcomes of Interval Colorectal Cancers: A Systematic Review and Meta-Analysis*

<table>
<thead>
<tr>
<th>Reference</th>
<th>Country</th>
<th>Years studied</th>
<th>Number of iPCCRC/number of CRC cancers examined</th>
<th>Relative prevalence of interval CRC (%)</th>
<th>Percentage of interval cancers that were right sided (N)</th>
<th>Percentage of interval cancers that were left sided (N)</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bressler (12)</td>
<td>Canada</td>
<td>1997–2002</td>
<td>430/12,487</td>
<td>3.4</td>
<td>55 (238)</td>
<td>45 (192)</td>
<td>6–36 Months</td>
</tr>
<tr>
<td>Baxter (5)</td>
<td>Canada</td>
<td>2000–2005</td>
<td>1,260/14,064</td>
<td>9.0</td>
<td>54 (676)</td>
<td>46 (584)</td>
<td>7–36 Months</td>
</tr>
<tr>
<td>Ie Clercq (14)</td>
<td>Netherlands</td>
<td>2001–2010</td>
<td>147/5,107</td>
<td>2.9</td>
<td>60 (87)</td>
<td>40 (60)</td>
<td>&lt;60 Months</td>
</tr>
<tr>
<td>Erichsen (9)</td>
<td>Denmark</td>
<td>2000–2009</td>
<td>982/38,064</td>
<td>2.6</td>
<td>45 (441)</td>
<td>44 (433)</td>
<td>12–60 Months</td>
</tr>
<tr>
<td>Cooper (6)</td>
<td>USA</td>
<td>1994–2005</td>
<td>4,192/57,839</td>
<td>7.2</td>
<td>68 (2,851)</td>
<td>30 (1,253)</td>
<td>6–36 Months</td>
</tr>
</tbody>
</table>

**Samadder (15)** | **USA** | **1995–2009** | **159/2,659** | **6.0** | **55 (88)** | **40 (63)** | **6–60 Months** |

| Arain (10)  | USA           | 1989–2004     | 63/1,323                                      | 4.8                                    | 63 (40)                                                 | 37 (23)b                                              | <60 Months |
| Corley (8)  | USA           | 1998–2010     | 712/8,730                                    | 8.2                                    | 60 (427)                                                | 38 (267)                                              | 6–120 Months |
| Brenner (11)| Germany       | 2003–2007     | 78/1,945                                     | 4.0                                    | 56 (44)                                                 | 41 (32)                                               | 12–120 Months |
| Ferrandez (13)| Spain       | 2003–2005     | 27/386                                       | 6.7                                    | 22 (6)                                                  | 78 (21)                                               | <36 Months |

*Singh S. Am J Gastroenterol 2014; 109:1375–1389

approximately 1 in 27 CRCs are interval CRCs (3.7%)
"INTERVAL CANCER IS THE PROOF OF OUR FAILURE"
Why You Should Fail Like a Pilot, Not a Doctor

Matthew Syed | Nov. 5, 2015

Only when we face our failures can we learn from them

An estimated 400,000 people die due to avoidable mistakes every year in American hospitals. These medical errors can’t all be pinned on careless or inexperienced doctors, either. The most experienced medical professionals are less than infallible, beset by distractions, exhaustion, and anxiety. Mainly, though, medical error stems from an innate human flaw: our pathological resistance to noticing, and correcting, our own habitual mistakes.
The definition of interval CRC is varied and complex.

“colorectal cancer diagnosed after a screening or surveillance exam in which no cancer is detected, and before the date of the next recommended exam”*

* Gut. 2015 Aug;64(8):1257-67
Gastroenterology

World Endoscopy Organization Consensus Statements on Post-Colonoscopy and Post-Imaging Colorectal Cancer

Monograph Draft

Photo courtesy of Dr. Linda Rabeneck
Interval cancer
– A screening term – measure of success of screening.
– A colorectal cancer diagnosed after a colorectal screening examination or test in which no cancer is detected, and before the date of the next recommended exam.

Post-colonoscopy CRC (PCCRC)
– A colonoscopy QA term - measure of accuracy of the colonoscopy.
– A CRC detected after any colonoscopy – not screening-specific.
– Within screening, it includes CRC detected at next screening exam.
We recommend that **Post-Colonoscopy Colorectal Cancer (PCCRC)** is the preferred term for cancers appearing **after a colonoscopy** in which no cancer is diagnosed.
PCCRCs can be sub-categorized into:

• **Interval cancers:**
  → Where the cancer is identified before the next recommended screening or surveillance examination.

• **Non-interval cancers:**
  → **Type A:** the cancer is identified at a recommended screening or surveillance interval.
  → **Type B:** the cancer is identified after a recommended screening or surveillance interval.
  → **Type C:** no subsequent screening or surveillance interval for repeat examination was recommended.
<table>
<thead>
<tr>
<th>Interval type</th>
<th>Non-interval type</th>
<th>Examples</th>
</tr>
</thead>
<tbody>
<tr>
<td>Detected prior to recommended surveillance timepoint</td>
<td>Detected at recommended surveillance timepoint</td>
<td>Patient with 2 adenomas (2mm, 4mm) is advised to return in 5 years. Four years later develops anaemia; colonoscopy reveals CRC</td>
</tr>
<tr>
<td></td>
<td>Detected after recommended surveillance timepoint</td>
<td>Patient with a 15mm adenoma is advised to return for surveillance in 3 years. On surveillance, a CRC is found</td>
</tr>
<tr>
<td></td>
<td>Where no surveillance timepoint had been recommended</td>
<td>Patient with 3 small adenomas is advised to return for surveillance in 3 years. Patient misses this, returns 4 years later with CRC</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Patient with change in bowel habit – colonoscopy normal. No further investigation advised. 5 years later patient develops symptoms and a colonoscopy reveals CRC</td>
</tr>
</tbody>
</table>
Most plausible explanations (Statement 6)

a) Possible missed lesion, prior examination adequate.

b) Possible missed lesion, prior examination negative but inadequate.

c) Detected lesion, not resected.

d) Likely incomplete resection of previously identified lesion.

e) Likely new CRC.
Most plausible explanations

Patient related / Biological
1. New lesions
2. Hereditary colorectal cancer (Lynch)
3. Non-polypoid colorectal tumors (NPT)
4. SSA

Endoscopists related / Technique
1. ADR
2. Adherence to the follow-up protocols
3. Cecal intubation rate (CIR)
4. Missed lesions
5. Incomplete polyp resection

Additional studies are needed to determine whether interval cancers arise as a result of missed lesions or accelerated neoplastic progression.
The rates and patterns of growth of 375 tumors of the large intestine and rectum observed serially by double-contrast enema study


“Most polyps grow so slowly that they will not reach a significant size during the longest human life”
<table>
<thead>
<tr>
<th>Type</th>
<th>Displasia</th>
<th>Molecular features</th>
<th>Location</th>
<th>PreC.?</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Adenoma-carcinoma pathway</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Adenoma</td>
<td>Yes</td>
<td>APC</td>
<td></td>
<td>Yes</td>
</tr>
<tr>
<td><strong>Serrated pathway of carcinogenesis</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hyperplastic polyp</td>
<td>No</td>
<td>KRAS mutations</td>
<td>Rectosigmoid/Proximal</td>
<td>unknown</td>
</tr>
<tr>
<td>GCSP goblet cell serrated polyps</td>
<td>No</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MVSP microvesicular serrated polyps</td>
<td>No</td>
<td>BRAF mutations – CIMP</td>
<td>Rectosigmoid/Proximal</td>
<td>probably evolving to SSA/Ps</td>
</tr>
<tr>
<td>Sessile Serrated adenoma (Polyp-SSA/P)</td>
<td>No</td>
<td>Mutations of BRAF gene and high levels of CIMP (CIMP-H)</td>
<td>Proximal (covered by a mucous layer)</td>
<td>Yes (can evolve to SSA with dysplasia (SSADs))</td>
</tr>
<tr>
<td>Sessile Serrated adenoma with dysplasia (SSADs)</td>
<td>Yes</td>
<td>BRAF mutations and CIMP-H state</td>
<td>Proximal (covered by a mucous layer)</td>
<td>Yes</td>
</tr>
<tr>
<td>Traditional Serrated Adenoma (TSA)</td>
<td>Yes</td>
<td>KRAS mutations</td>
<td>Distal</td>
<td>Yes</td>
</tr>
</tbody>
</table>
Unifying theory for interval cancers

the serrated pathway of tumorigenesis

combine issues related to **quality of endoscopic** examination and **biological differences** in tumor biology

- **sessile serrated lesions** develop from a pathway characterized by **defects in methylation** (CpG island methylator phenotype high) and phenotypically occur in the right colon and are **sessile** (nonpolypoid) in appearance, **making their detection and removal more difficult.**

- **family history of colorectal cancer** is more common among patients with an interval CRC.

Samadder N et al. Gastroenterology 2014;146:950–960
What can we do?

“Only when we face our failures we can learn from them”
Pioneering institutions grasp a precious truth: **failure is unavoidable.**

“The key is to harness the lessons of failure as part of a dynamic process of change. ”
Quality!!

Dr. Roque Sáenz, 2009
**INTRODUCTION**

The quality within colonoscopies is the degree in which the test increases the likelihood of good health outcomes. It may be affected before, during or after the procedure. If the endoscopist meets the criteria of quality and performance, he/she can continuously improve performance and safety.

Colonoscopy practice should be improved and get it homogeneous in quality. Probably we need an up-skilling to get the objectives and the results equal in any endoscopy unit.

**AIM** to develop a tool for assessing the performance of endoscopists and endoscopy units in terms of colonoscopy quality. Results can discriminate between an excellent, regular and bad performance of the endoscopists.

**MATERIALS AND METHODS**

A MEDLINE search was done, and the results were used by a group of six experts to generate items. A modified Delphi methodology was used to achieve consensus (Likert scale 1-5). The rounds were applied electronically and all the data was used anonymously.

**RESULTS**

Forty three out of sixty five endoscopists from 9 Latin American countries (response rate of 66.2%), assessed the degree of importance in the 1st and 2nd round. In the 3rd round (35 items), 23 endoscopists assessed the degree of agreement and critical importance. A final 8-item instrument was obtained to evaluate the quality in colonoscopies.

**Table 1.** The Colonoscopy Quality Score (CoQS).

<table>
<thead>
<tr>
<th>Item</th>
<th>Good: 8-9</th>
<th>Regular: 5-7</th>
<th>Bad: 3 or less</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>The endoscopist evaluates cleansing with the Boston Bowel Preparation Scale and more than 85% of patients reach a good score:</td>
<td>Good: more than 95%</td>
<td>Regular: 90-95%</td>
</tr>
<tr>
<td>2.</td>
<td>The enema introduction rate in CRC screening programs (&gt; 50 years old):</td>
<td>Good: &gt; 9 minutes, spending more time in the ascending colon as well as the descending colon, including a double check of ascending colon.</td>
<td>Regular: 6-9 minutes</td>
</tr>
<tr>
<td>3.</td>
<td>The colonoscopy withdrawal time:</td>
<td>Good: &gt; 30% in men and &gt; 20% in women</td>
<td>Regular: 25-30% in men and 15-20% in women</td>
</tr>
<tr>
<td>4.</td>
<td>The colonoscopy report:</td>
<td>Good: photo documentation of all sites mentioned as evaluated, with emphasis on all relevant lesions</td>
<td>Regular: photo documentation of almost all sites mentioned as evaluated, including all relevant lesions</td>
</tr>
<tr>
<td>5.</td>
<td>The adenoma detection rate in colonoscopies for CRC screening (&gt; 50 years old):</td>
<td>Good: plans a colorectal cancer surveillance program</td>
<td>Regular: only performs surveillance programs in patients with previously rectaled colon cancer</td>
</tr>
<tr>
<td>6.</td>
<td>After an adenoma, serrated polyp or cancer resection, the endoscopist:</td>
<td>Good: &lt; 0.1% (1/1000)</td>
<td>Regular: 0.1-0.2%</td>
</tr>
<tr>
<td>7.</td>
<td>Perforation rate in diagnostic colonoscopies:</td>
<td>Good:</td>
<td>Regular: 0.1-0.2%</td>
</tr>
<tr>
<td>8.</td>
<td>Regarding continuous improvement, the endoscopic unit:</td>
<td>Good: continuous quality improvement programs, &gt; 50% of endoscopists involved in</td>
<td>Regular: has continuous quality improvement programs, &lt; 50% of endoscopists participating</td>
</tr>
</tbody>
</table>

**Figure 1.** Development of Colonoscopy Quality Score (CoQS).

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**CONCLUSION**

Colonoscopy Quality Score (CoQS) is a useful questionnaire to evaluate the performance of the endoscopists and endoscopy units. Additionally, the results could be helpful to identify the need for re-training of endoscopists.

**References:**

1. School of Medicine, Pontificia Universidad Católica de Chile, Santiago, Chile; 2. Managing director GECYT, Universidad de Buenos Aires, Buenos Aires, Argentina; 3. Pastoral Hospital, President of the Uruguayan Society of Gastroenterology, Coordinator of the Communications Committee of SIGE, Montevideo, Uruguay; 4. Hospitales, Servicio Nacional de Salud, Universidad Central de Ecuador, Quito, Ecuador; 5. Department of Gastroenterology, Clínica Alemana Santiago, Faculty of Medicine Clínica Alemana de Santiago, Universidad del Desarrollo, Santiago, Chile. This is a collaborative work between 65 endoscopists from 9 countries (Argentina, Brazil, Chile, Colombia, United States of America, Mexico, Peru, Uruguay and Venezuela).

**Disclosure:** None of the authors have any COI to disclose.
What can we do?

Quality of colonoscopy

- Adenoma Detection (ADR) (M 30%, W 20%)
- Adenoma Resection (?)
- Bowel prep ≥85% adequate
- Cecal intubation (CIR) ≥ 95%
- Withdrawal time ≥ 6 min
- Surveillance Interval ≥90%
ADR and Risk of Interval Cancer

![Graph showing the risk of interval cancer across different quintiles of ADR.](graph.png)

- **Quintile 1** - ADR < 20%
  - HR = 1.00 (95% CI, 0.70–1.23)
  - No. of CRCs: 186

- **Quintile 2** - ADR < 20%
  - HR = 0.93 (95% CI, 0.68–1.06)
  - No. of CRCs: 144

- **Quintile 3** - ADR < 20%
  - HR = 0.85 (95% CI, 0.54–0.91)
  - No. of CRCs: 139

- **Quintile 4** - ADR < 20%
  - HR = 0.70 (95% CI, 0.39–0.69)
  - No. of CRCs: 167

- **Quintile 5** - ADR > 33%
  - HR = 0.52 (95% CI, 0.39–0.69)
  - No. of CRCs: 76

Corley et al. NEJM 2014: 370: 1298-1306
Withdrawal time and Interval Cancer

Shaukat, Gastro 2015

Cleansing quality critically determines quality, difficulty, speed, and completeness of colonoscopy.

<table>
<thead>
<tr>
<th></th>
<th>Adequate</th>
<th>Inadequate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Completition (%)</td>
<td>90.4</td>
<td>71.1*</td>
</tr>
<tr>
<td>Time to cecum (min)</td>
<td>11.9</td>
<td>16.1*</td>
</tr>
<tr>
<td>Withdrawal time (min)</td>
<td>9.8</td>
<td>11.3*</td>
</tr>
<tr>
<td>Polyp of any size</td>
<td>29.4</td>
<td>23.9*</td>
</tr>
<tr>
<td>Polyp &gt;10 mm</td>
<td>6.4</td>
<td>4.3*</td>
</tr>
</tbody>
</table>

*p<0.05
Let's follow Sully...

- If we find more polyps, we will leave less behind...
- Keep adequate bowel prep
- Use high resolution technology
- Look carefully! Everywhere, anywhere...
- See further → “japanese vision”!
- Take your time
- New technology?! AI? Coming soon...
- KEEP QUALITY!!

And...
We can always fail, but an harmonious, coordinated and highly trained team reduces these chances to a minimum.

That’s our goal!
2do Congreso Mundial de Endoscopia GI

en conjunto con

24º Congreso Pan Americano de Endoscopia Digestiva

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MUCHAS GRACIAS .........