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Type your questions here so that the moderator can see them. Not all questions will be answered but we will get to as many as possible.
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ABIM Board Certified physicians need to complete their MOC activities by December 31, 2022 in order for the MOC points to count toward any MOC requirements that are due by the end of the year. No MOC credit may be awarded after March 1, 2023 for this activity.

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If you plan to claim MOC Points for this activity, you will be asked to: Please list specific changes you will make in your practice as a result of the information you received from this activity.

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Week 50 – Thursday, December 15, 2022
Optimal Positioning of Small Molecule Treatment Options in IBD
Faculty: David T. Rubin, MD, FACG
Moderator: Samir A. Shah, MD, FACG
At Noon Eastern and NEW! 8pm Eastern!

There will be NO Virtual Grand Rounds until January 5, 2023.
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Week 1 – Thursday, January 5, 2023
AI in GI
Faculty: Seth A. Gross, MD, FACG
Moderator: Nasim Parsa, MD
At Noon Eastern and NEW! 8pm Eastern!

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Disclosures

Aasma Shaukat, MD, MPH, FACG
Freenome, Inc: Consultant; Medtronic, Italy: Consultant; Motus GI: Consultant

Asmeen Bhatt, MD
Boston Scientific- Stocks
Medtronics- Stocks

*All of the relevant financial relationships listed for these individuals have been mitigated

ADR, PDR, or IRR: What Are My Quality Metrics for Colonoscopy?

Aasma Shaukat MD MPH FACG
Director GI Outcomes Research, Robert M and Mary H. Glickman Professor of Medicine
Professor of Population health
NYU Grossman School of Medicine
Quality Metric and Benchmarks

<table>
<thead>
<tr>
<th>Pre-Procedural Target</th>
<th>Target</th>
</tr>
</thead>
<tbody>
<tr>
<td>Appropriate indication documented</td>
<td>&gt;80%</td>
</tr>
<tr>
<td>Informed Consent</td>
<td>&gt;98%</td>
</tr>
<tr>
<td>Appropriate Surveillance Interval</td>
<td>&gt;=90%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Intraprocedure Target</th>
<th>Target</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bowel Prep Quality (Adequate)</td>
<td>&gt;=85%</td>
</tr>
<tr>
<td>Cecal Intubation</td>
<td>&gt;=90% all, &gt;=95% screening</td>
</tr>
<tr>
<td>Adenoma Detection Rate</td>
<td>&gt;=25% All, &gt;=30% (M), &gt;=20% (F)</td>
</tr>
<tr>
<td>Withdrawal Time (&gt;=6min)</td>
<td>&gt;98%</td>
</tr>
<tr>
<td>Attempted endoscopic removal of polyps before surgery referral</td>
<td>&gt;98%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Post-Procedural Target</th>
<th>Target</th>
</tr>
</thead>
<tbody>
<tr>
<td>Perforation rate</td>
<td>&lt;1:500 all, &lt;1:1000 screening</td>
</tr>
<tr>
<td>Post-Polypectomy Bleeding incidence</td>
<td>&lt;1%</td>
</tr>
<tr>
<td>Surveillance interval recommendation</td>
<td>&gt;= 90%</td>
</tr>
</tbody>
</table>

ACG/ASGE practice guideline: Measuring the Quality of Endoscopy. Gastrointest Endosc 2006;58:S1-S38;
Rex et al. GIE 2015; 81: 31-53;

Adenoma detection rate

- ADR during screening colonoscopies in average risk men and women over age 50 (now 45)
  - # of COL where at least 1 adenoma is found
  - Total # of COL performed
  - In a given time period per endoscopist
- Higher ADR = higher quality exam = fewer missed cancers
- Goal is 25%
  - >= 30% for men >=50 yrs
  - >= 20% for women >=50 yrs
- Does NOT include SSA/SSL

ASGE practice guideline: Measuring the Quality of Endoscopy. Gastrointest Endosc 2006;58:S1-S38 Gastrointest Endosc 2006;58:S1-S38
Rex DK et al. GIE 2015; 81: 31-53
ADR and interval CRC

- Kaiser Permanente Northern California health plan members
- COL for any indication 1998-2010
- Follow-up: 10 yrs, another COL, CRC diagnosis, Jan 2011, termination of membership
- 139 Gastroenterologists (min>300 COL, >75 screening COL)

Corley D et al. NEJM 2014;370:2539-41

ADR and Risk of Interval Cancer

Each 1% increase in ADR is associated with 3% decrease in risk of CRC
ADR and Risk of Interval Cancer

Kaiser Permanente Northern California, Kaiser Permanente Southern California, and Kaiser Permanente Washington

43 endoscopy centers, 383 eligible physicians, and 735,396 patients 50-75 w negative COL between January 2011 and June 2017, follow-up through December 2017

ADR above median of 28% associated with lower risk of PCCRC (1.79 vs 3.10 cases per 10,000 person-years)

Lower risk of PCCRC death (0.05 vs 0.22 cases per 10,000 person-years)


ADR limitations: “One and done” phenomenon

Adenomas per colonoscopy (APC): Total number of adenomas
Total number of colonoscopies

Endoscopists with similar ADR rates have shown significant differences in APC rates

<table>
<thead>
<tr>
<th>ADR</th>
<th>&lt;25%</th>
<th>≥25%</th>
</tr>
</thead>
<tbody>
<tr>
<td>APC</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Q1, N (%)</td>
<td>11,372 (52.4%)</td>
<td>10,332 (47.6%)</td>
</tr>
<tr>
<td>Q4, N (%)</td>
<td>0 (0.0%)</td>
<td>19,792 (100.0%)</td>
</tr>
</tbody>
</table>

APC associated with Adenoma Miss Rate

APC associated with post-colonoscopy CRC rates

Polyp Detection Rate is associated with PCCRC

- Polish Screening Colonoscopy Program 2000-2011
- N=173,287; 262 Endoscopists; 395 CRC over 10 years follow-up
- ADR, PDR and APC associated with PCCRC and CRC death
- ADR 25%=PDR 43%

[Sessile serrated polyp detection rate and PCCRC]

- Sessile serrated polyp, traditional serrated adenoma, large [≥1 cm] or proximal hyperplastic polyp >5 mm
- Average SSDR from GiQuiC: 5 million COL, 4000 endoscopists: 6%
- Associated with PCCRC:
  - NH Colonoscopy Registry: Compared to endoscopists with SSDR<3%:
    - Lower risk of PCCRC SSDR 3% to <9% (HR 0.57; 95% CI .39-.83)
    - 9% or higher (HR .39; 95% CI .20-.78)

Wieszczy P. et al. CGH 2022;24:S1542-3565(22)00298-1

Incomplete Resection Rate

- 346 neoplastic polyps removed by 11 gastroenterologists: IRR 10.1% (6% to 22%)
- IRR significantly higher for large (10–20 mm) than small (5–9 mm) neoplastic polyps: 17.3% vs 6.8%; RR = 2.1
- Higher for SSLs than TA: 31.0% vs 7.2%; RR = 3.7
- Follow up surveillance:
  - Risk for metachronous neoplasia was greater in segments with incomplete versus complete resection 52% vs. 23%; RD 28% [95% CI 9% to 47%]
  - greater risk for advanced neoplasia 18% vs. 3%; RD 15% [95% CI 1% to 29%]
  - IRR was the strongest independent factor for metachronous neoplasia: OR 3.0 [CI, 1.12 to 8.17]


ADR, WT and Interval CRC

- Community based practice in Minneapolis/St. Paul
- 51 GI
- 76,810 Screening colonoscopies over 6 years
- Linked records with State cancer registry for incident cancers within 5 years of colonoscopy
- Average annual ADRs: 26% ± 9%; WT: 8.6±1.7 min
- 56 interval cancers over 249,261 person-years of follow-up

WT and Interval cancer
Physicians’ average annual withdrawal times were inversely associated with interval cancers (p < 0.0001)

Adenoma detection rates by age groups:

- Multiple endoscopy centers in MN
- 223,572 average risk screening colonoscopies
- 99 Endoscopists
- 2014-2019

<table>
<thead>
<tr>
<th>Age Group</th>
<th>ADR Rate</th>
<th>p-value (compared to 45-49)</th>
<th>Overall ADR</th>
<th>p-value (compared to 45-49)</th>
</tr>
</thead>
<tbody>
<tr>
<td>45-49 year old</td>
<td>28.4% (27.1%, 29.6%)</td>
<td>&lt;0.001</td>
<td>28.4% (27.1%, 29.6%)</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>50-54 year old</td>
<td>31.1% (30.7%, 31.4%)</td>
<td>&lt;0.001</td>
<td>31.1% (30.7%, 31.4%)</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>50-75 year old</td>
<td>35.6% (35.4%, 35.8%)</td>
<td>&lt;0.001</td>
<td>35.6% (35.4%, 35.8%)</td>
<td>&lt;0.001</td>
</tr>
</tbody>
</table>

ADRs by age groups:

Modelled the effect of proportion of 45-49 yr olds that constitute the total screening colonoscopy population

<table>
<thead>
<tr>
<th>45-49 year old as proportion of total (%)</th>
<th>Overall ADR (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>5%</td>
<td>35.2%</td>
</tr>
<tr>
<td>10%</td>
<td>34.9%</td>
</tr>
<tr>
<td>25%</td>
<td>33.8%</td>
</tr>
<tr>
<td>50%</td>
<td>32.0%</td>
</tr>
<tr>
<td>75%</td>
<td>30.1%</td>
</tr>
</tbody>
</table>


• GIQuIC registry US
• 45-75 yr olds Screening Colonoscopy
• 2014-2020
• >2 million exams
• 814 Endoscopists

<table>
<thead>
<tr>
<th>Overall Mean (SD) ADR</th>
<th>45-49 years</th>
<th>50-54 years</th>
<th>50-75 years</th>
</tr>
</thead>
<tbody>
<tr>
<td>Endoscopist n</td>
<td>814</td>
<td>814</td>
<td>814</td>
</tr>
<tr>
<td>Total procedures</td>
<td>47,213</td>
<td>1,014,193</td>
<td>2,759,326</td>
</tr>
<tr>
<td>Mean (SD) ADR in men</td>
<td>32.91 (10.74)</td>
<td>36.98 (9.96)</td>
<td>41.50 (9.89)</td>
</tr>
<tr>
<td>Endoscopist n</td>
<td>219</td>
<td>219</td>
<td>219</td>
</tr>
<tr>
<td>Total procedures</td>
<td>9,928</td>
<td>470,146</td>
<td>1,270,382</td>
</tr>
<tr>
<td>Mean (SD) ADR in women</td>
<td>22.84 (9.87)</td>
<td>25.57 (8.48)</td>
<td>30.10 (9.18)</td>
</tr>
<tr>
<td>Endoscopist n</td>
<td>321</td>
<td>321</td>
<td>321</td>
</tr>
<tr>
<td>Total procedures</td>
<td>16,372</td>
<td>529,084</td>
<td>1,477,418</td>
</tr>
</tbody>
</table>

What interventions improve Quality Indicators?

Step 1

- Measure Quality indicators
- Provide Report cards
  - Individual physicians
  - Group average
  - Individuals deidentified
  - Individuals identified
  - Post them on the ASC wall
  - Publish online

Sample Report card

<table>
<thead>
<tr>
<th>Endoscopist ID: 21314566</th>
<th>Time period: Q1 2021</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total number of colonoscopies performed</td>
<td>300</td>
</tr>
<tr>
<td>Total number of screening colonoscopies performed</td>
<td>100</td>
</tr>
<tr>
<td>Complete Colonoscopies (excluding cases due to poor prep)</td>
<td>295 (98%)</td>
</tr>
<tr>
<td>ADR (for screening colonoscopy)</td>
<td>31%</td>
</tr>
<tr>
<td>Withdrawal time (procedures where no polypectomy or biopsies performed)</td>
<td>8.2 min ± 1.15 min</td>
</tr>
<tr>
<td>Number of Colonoscopies with inadequate bowel prep</td>
<td>5 (2%)</td>
</tr>
</tbody>
</table>
Measure and report

- Patients are encouraged to ask the endoscopist their ADR

Endoscopist report card

- 6 Endoscopists
- Quarterly report card on quality measures starting 2009
- Compared ADR and cecal intubation rate before and after intervention

<table>
<thead>
<tr>
<th></th>
<th>Before (95%CI)</th>
<th>After (95% CI)</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>ADR</td>
<td>44.7% (39.1%-50.4%)</td>
<td>53.9% (49.7%-58.1%)</td>
<td>0.013</td>
</tr>
<tr>
<td>Cecal intubation rate</td>
<td>95.6% (92.5%-97.5%)</td>
<td>98.1% (96.7%-99.0%)</td>
<td>0.027</td>
</tr>
</tbody>
</table>


Step 2. Improve Prep

- Use split dose or same day prep
- Begin second dose 4-6 hours prior to colonoscopy
  - Finish prep at least 2 hours prior to colonoscopy
- Judge prep after all washing has been done
- Adequate prep should be achieved in at least 85% of cases
- If inadequate prep, repeat within 1 year
Split prep = Higher ADR

% w/ Adenoma % w/ Adenoma<9mm

Split prep non-split prep


Step 3. Know what to look for and resect completely!
Polyp Recognition is important!

- Endoscopic Features of easily missed polyps:
  - Right sided
  - Flat/sessile
  - Irregular borders
  - Covered by mucus

Huang CS. et al. AJG 2011;106:229-40
Step 4. Think of interventions in the following categories:

- Technique
- Technology
- Education
**Technique: Withdrawal time**

- **Withdrawal time:**
  - Should be at least 6 minutes in colonoscopies without biopsy or polypectomy

- **Withdrawal technique:**
  - Adequate distention
  - Washing and clean up
  - Looking behind folds
  - Segmental inspection and subjective timing

ASGE practice guideline: Measuring the Quality of Endoscopy. Gastrointest Endosc 2006;58:S1-S38
Rex DK. Colonoscopic Withdrawal technique is associated with adenoma miss rate. Gastrointest Endosc 2000;51:33-6

---

**Time alone isn’t enough: Technique matters**

Lowest vs Highest ADR Endoscopist

![Chart showing comparison between Lowest and Highest ADR Endoscopist](chart.png)

Lee GIE 2011;74:128-34
Other Techniques

- Retroflexion in the cecum versus re-examining right colon during withdrawal
- Left versus right lateral decubitus position during withdrawal
- Changing patient position during withdrawal
- 2nd observer looking at the screen (Tech or Nurse)
- Water immersion and water exchange

Mixed Results
- Seem to benefit low performers

Ball AJ et al. Gastrointest Endosc. 2015;82(3):488-94

Systemic interventions
Education interventions

“Endoscopic Quality Improvement Project” (EQUIP)

- 15 Endoscopist; half received training
- 2 Educational sessions (1-1.5 hrs each)
  - Techniques to improve detection
  - Techniques to distinguish adenoma vs hyperplastic
  - Videos of highest ADR doctors’ pullback methods
- Monthly feedback on ADR and WD time
- Results posted on ASC wall (de-identified)

<table>
<thead>
<tr>
<th></th>
<th>Phase I ADR (baseline)</th>
<th>Phase II ADR</th>
<th>Phase III ADR (5 mo later)</th>
</tr>
</thead>
<tbody>
<tr>
<td>EQUIP</td>
<td>36%</td>
<td>47%</td>
<td>46%</td>
</tr>
<tr>
<td>Control</td>
<td>36%</td>
<td>35%</td>
<td>39%</td>
</tr>
</tbody>
</table>


Intervention: Train the Leader

- 40 Polish endoscopy centers with ADR <25% for the leader
- Randomized to
  - Feedback only (individual report cards)
  - Training: assessment, hands on training, post training feedback
- 24,582 colonoscopies by 38 leaders

<table>
<thead>
<tr>
<th>ADRs</th>
<th>Pre-intervention</th>
<th>Early post-intervention (6 mo)</th>
<th>Later post intervention (12 mo)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Feedback only</td>
<td>18.5%</td>
<td>19.6%</td>
<td>20.8%</td>
</tr>
<tr>
<td>Train the leader</td>
<td>17.4%</td>
<td>25.6%</td>
<td>23.9%</td>
</tr>
</tbody>
</table>

Accessory Devices

ASGE. Endoscopes and devices to improve colon polyp detection. GIE 2015;81:1122-29

Comparing technique, devices and endoscopes

<table>
<thead>
<tr>
<th>Technique (WE, 2nd observer, position changes)</th>
<th>OR for I ADR (vs. High def colonoscopy)</th>
<th>95% CI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Enhanced imaging techniques (chromoendoscopy, narrow-band imaging, flexible spectral imaging color enhancement, blue laser imaging)</td>
<td>1.29</td>
<td>1.09-1.35</td>
</tr>
<tr>
<td>New scopes (full-spectrum endoscopy, extra-wide-angle-view colonoscopy, dual focus)</td>
<td>0.98</td>
<td>0.79-1.21</td>
</tr>
</tbody>
</table>

- No specific technology for increasing ADR was superior to others
- No difference in detection of advanced ADR, polyp detection rate, or mean number of adenomas/patient

Emerging Technologies: AI for GI

- Polyp detection
- Histology prediction
- Prep quality
- Mucosa exposed/seen
- Adequate retroflexion


AI-enabled program for CADe FDA approved

- 685 patients, 3 centers in Italy
- All indications
- Randomized to CADe vs standard COL
- ADR: 40.4% standard COL vs. 54.8% CADe
- Adenoma per Colonoscopy higher e CADe: 1.07 vs. 0.71
- No difference in WT, non-neoplastic rates

Pooled two trials:

- 660 patients, 10 endoscopists
- Italy, all indications
- ADR 44.5% vs. 53.3%
- CADe, indication associated with ADR improvement, but not endoscopist experience


Multifaceted interventions are needed


Interventions to improve adenoma detection rates for colonoscopy

TABLE 1. Summary of interventions to improve ADR

<table>
<thead>
<tr>
<th>Intervention</th>
<th>Compared with</th>
<th>Absolute increase in adenoma detection</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Technique</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Water assistance</td>
<td>CO₂/air insufflation</td>
<td>6% water immersion 10% for water exchange</td>
<td>Evidence supports emphasizing training in withdrawal technique rather than time</td>
</tr>
<tr>
<td>Lengthening withdrawal time</td>
<td>&lt;6 min</td>
<td>9% for 9 min WT compared with 6 min</td>
<td>Water exchange increases insertion time but withdrawal time same as other techniques</td>
</tr>
<tr>
<td>Retroflexion in cecum</td>
<td>No retroflexion</td>
<td>17% for right-sided adenomas</td>
<td>Overall success rate 91%, adverse vents 0.3%</td>
</tr>
<tr>
<td>Second look, either retroflexion in the cecum or second forward look in the proximal colon</td>
<td>Single forward look</td>
<td>10% for all adenomas, 5% for right-sided adenomas</td>
<td>Second forward look improves adenoma detection; no difference in retroflexed or straightforward second look</td>
</tr>
<tr>
<td>Dynamic change in patient position</td>
<td>No change in position</td>
<td>7%</td>
<td>Adequate distention during position changes is key, particularly with excellent preparation</td>
</tr>
<tr>
<td>Technology</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Distal attachment devices</td>
<td>Standard colonoscopy</td>
<td>5%-11%</td>
<td>May reduce procedure time</td>
</tr>
<tr>
<td>Enhanced imaging technology</td>
<td>Standard or high definition white-light colonoscopy</td>
<td>5% to 18% absolute improvement in adenoma detection</td>
<td>Narrow-band imaging with 190 colonoscopes is superior to white-light colonoscopy</td>
</tr>
<tr>
<td>Computer aided detection technologies</td>
<td>Standard colonoscopy</td>
<td>10%-12% in adenoma, .2 in adenoma per colonoscopy</td>
<td>Added benefit of polyp histology recognition</td>
</tr>
</tbody>
</table>
# Summary

- ADR, PDR, SSDR and IRR are important quality indicators
- Measure and track ADR
- ADRs for 45-49 lower than that for 50-55 and 50-75-year-olds (AR 3%-7%)
- Many available tools to improve Quality indicators

Shaukat A et al. Interventions to improve adenoma detection rates GIE 2022
Thank you!

Aasma.Shaukat@nyulangone.org
@aasmashaukatmd

Questions?

Aasma Shaukat, MD, MPH, FACP

Asmeen Bhatt, MD
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