Proctectomy

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Colorectal Surgery Residency Program Director
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Great! I was invited to speak at ACS-NSQIP about Proctectomy. But what will I talk about?
...Our vision for your talk was to discuss what things a surgeon or service or hospital might implement or do to improve the care for proctectomy patients...technique things, complication issues, functional issues, pre/intra/post op etc.

...This will likely be for an "mixed" audience of surgeons and non surgeons - which can make it a little tougher, but more fun!
Proctectomy: Let’s Have Some Fun!!

• Operating room communication & culture
• Surgical Care Improvement Project
• Surgical Site Infection
• Surgical planning, timing, and technique
• The operation
• Functional outcomes
• Complications of surgery
• Avoidance of readmission
• Opportunities for ACS-NSQIP
Surgical Safety Checklist

Before induction of anaesthesia (with at least nurse and anaesthetist)

- Has the patient confirmed his/her identity, site, procedure, and consent?
  - Yes
  - Not applicable

- Is the site marked?
  - Yes
  - Not applicable

- Is the anaesthesia machine and medication check complete?
  - Yes

- Is the pulse oximeter on the patient and functioning?
  - Yes

- Does the patient have a:
  - Known allergy?
    - No
    - Yes
  - Difficult airway or aspiration risk?
    - No
    - Yes, and equipment/assistance available
  - Risk of >500ml blood loss (7ml/kg in children)?
    - No
    - Yes, and two IVs/central access and fluids planned

Before skin incision (with nurse, anaesthetist and surgeon)

- Confirm all team members have introduced themselves by name and role.
- Confirm the patient’s name, procedure, and where the incision will be made.
- Has antibiotic prophylaxis been given within the last 60 minutes?
  - Yes
  - Not applicable

Anticipated Critical Events

To Surgeon:
- What are the critical or non-routine steps?
- How long will the case take?
- What is the anticipated blood loss?

To Anaesthetist:
- Are there any patient-specific concerns?

To Nursing Team:
- Has sterility (including indicator results) been confirmed?
- Are there equipment issues or any concerns?

Is essential imaging displayed?
- Yes
- Not applicable

Before patient leaves operating room (with nurse, anaesthetist and surgeon)

Nurse Verbally Confirms:
- The name of the procedure
- Completion of instrument, sponge and needle counts
- Specimen labelling (read specimen labels aloud, including patient name)
- Whether there are any equipment problems to be addressed

To Surgeon, Anaesthetist and Nurse:
- What are the key concerns for recovery and management of this patient?

This checklist is not intended to be comprehensive. Additions and modifications to fit local practice are encouraged.

Revised 1/2009 © WHO, 2009
### Table: Impact of a Surgical Safety Checklist

<table>
<thead>
<tr>
<th></th>
<th>Before</th>
<th>After</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Morbidity</td>
<td>11%</td>
<td>7%</td>
<td>P=0.003</td>
</tr>
<tr>
<td>Death</td>
<td>1.5%</td>
<td>0.8%</td>
<td>P&lt;0.001</td>
</tr>
</tbody>
</table>

AB Haynes, 2009
## Safety Checklist: Operating Room, ASC, and Procedure Room

Checklist to be used for all procedures performed in the Operating Room, Ambulatory Surgery Center, and Procedure Room.

<table>
<thead>
<tr>
<th>Sign In: Surgery Interactive Team Discussion</th>
<th>Sign In: Procedure Interactive team discussion</th>
<th>Time Out Involves interactive verbal communication</th>
<th>Sign Out Verbal confirmation prior to team leaving the room</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Introduction of team</strong></td>
<td><strong>Introduction of team</strong></td>
<td><strong>Team agrees:</strong></td>
<td><strong>Name of procedure recorded</strong></td>
</tr>
<tr>
<td><strong>Pre-Procedure Checklist:</strong></td>
<td><strong>Pre-Procedure Checklist:</strong></td>
<td>Correct Patient</td>
<td>Disposition of unused blood products discussed</td>
</tr>
<tr>
<td><strong>Nursing</strong></td>
<td><strong>Nursing</strong></td>
<td>Correct Side and Site</td>
<td>Counts Completed and Reconciled</td>
</tr>
<tr>
<td>- Allergies</td>
<td>- Allergies</td>
<td>Correct Procedure</td>
<td>Specimen(s) labeled</td>
</tr>
<tr>
<td>- H&amp;P</td>
<td>- Antibiotic (Pre-Op)</td>
<td>Correct Position (if applicable)</td>
<td>Equipment issues addressed</td>
</tr>
<tr>
<td>- Informed Consent</td>
<td>- H&amp;P</td>
<td><strong>Affirmation of Time Out</strong></td>
<td>Team reviews: Key concerns for recovery and management of the patients</td>
</tr>
<tr>
<td>- Nursing Assessment</td>
<td>- Informed Consent</td>
<td>(if applicable)</td>
<td></td>
</tr>
<tr>
<td>- VTE Prophylaxis</td>
<td>- Nursing Assessment</td>
<td><strong>Surgeon:</strong></td>
<td></td>
</tr>
<tr>
<td>- Critical Information</td>
<td>- VTE Prophylaxis</td>
<td>- All elements/issues resolved? Are we ready to start?</td>
<td></td>
</tr>
<tr>
<td><strong>Anesthesia</strong></td>
<td><strong>Anesthesia/Proceduralist</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Antibiotic (Pre-Op)</td>
<td>- Blood products</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Blood products</td>
<td>- Pre-anesthesia assessment</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Pre-anesthesia assessment</td>
<td>- Critical Information</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Surgeon</strong></td>
<td><strong>Proceduralist</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Diagnostic test results available</td>
<td>- Diagnostic test results available</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Imaging available and properly labeled</td>
<td>- Imaging available and properly labeled</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Implants, devices, and/or special equipment</td>
<td>- Implants, devices, and/or special equipment Site Marked (when applicable)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Site Marked (when applicable)</td>
<td>- Critical Information</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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**“Stop Light Time Out”**

**Activity:** Everyone Stop

- Time-out begins  and Confirms
- Stopped by
- Confirms Diagnosis

**All Agree:** Proceed
COUNT PROCESS

For every surgical patient, we will follow these steps:

COUNT IN
1. SCAN sponge material master tag
2. BREAK second band, then manually COUNT sponges, instruments, sharps, other applicable items

PACKED/TUCKED ITEMS
1. Verbalize, Acknowledge & Document

DURING THE CASE
1. Manual COUNT of sponges
2. SCAN sponge material individual tags in groups of 5 laps & 10 raytecs
3. BAG sponge material in groups of 5 towels, 5 laps & 10 raytecs
4. BAG other counted materials as packaged by the manufacturer

PAUSE BEFORE FIRST CLOSURE OR CAVITY CLOSURE
1. PAUSE. Everyone STOPS.
2. SURGEON performs methodical wound exploration before cavity closure and verbalizes results of search.
3. VERIFY sponge, sharps (needles), and other applicable items with a manual count and confirm with white board (ASC) or count sheet.
4. SCAN out sponge materials that are off the sterile field.
5. AUDIBLY CONFIRM that: "Sponge, Needle and Other Counts are Correct".
6. "Team Agrees".

FINAL COUNT
1. PAUSE. Everyone STOPS.
2. SURGEON performs methodical wound exploration before final closure and verbalizes results of search
3. CONFIRM sponge, sharps, and other applicable items with a manual count and confirm with white board (ASC) or count sheet.
4. One pack of five sponges may be kept on the field for the closing process.
5. Prior to completion of skin closure, the manual count is reconciled with the current surgicount screen.
6. If any component of the sponge/instrument/needle or other counts are incorrect at this stage, then an x-ray is ordered and the Code Blast Radiology Policy is initiated, culminating in Staff Radiologist to Staff Surgeon verbal communication.
7. AUDIBLY CONFIRM that: "Sponge, Instrument, Needle & Other Counts are Correct".
8. "Team Agrees"
9. After skin closure is complete, and before patient is removed from OR table, the remaining 5 sponges are scanned off the field and the surgicount is closed.
SCIP Compliance & SSI

MT Hawn Ann Surg 2011

Surgical Care Outcomes & Assessment Program, Washington

Improved SCIP compliance, no change in SSI
Improved SCIP compliance, ↓ VTE, death, CAE
## Venous Thromboembolism in CORS & SCIP

<table>
<thead>
<tr>
<th>Variables</th>
<th>Total N=674</th>
<th>Pharmacologic prophylaxis Yes N=613</th>
<th>Pharmacologic prophylaxis No N=61</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Deep Venous Thrombosis</td>
<td>22(3)</td>
<td>17(3)</td>
<td>5(8)</td>
<td>0.04</td>
</tr>
<tr>
<td>Pulmonary Embolus</td>
<td>9(1)</td>
<td>7(1)</td>
<td>2(3)</td>
<td>0.19</td>
</tr>
<tr>
<td>Porto-Mesenteric DVT</td>
<td>19(3)</td>
<td>16(3)</td>
<td>3(5)</td>
<td>0.38</td>
</tr>
<tr>
<td>DVT, PE, or Porto-Mesenteric DVT</td>
<td>41(6)</td>
<td>33(5)</td>
<td>8(13)</td>
<td>0.02</td>
</tr>
</tbody>
</table>
Colorectal Surgery Risk Adjusted Surgical Site Infection

O/E or OR Trends

1.43
1.11
1.16
1.24
1.1
0.97
1.07
1.03
0.92
1.07
1.11
1.16
1.11
1.43

Semiannual Report Time Periods

Denotes Odds Ratio (OR)
Source: ACS NSQIP Database
COLORECTAL WOUND OCCURRENCES
Raw Data: July 1, 2010 through June 30, 2011

Superficial Incisional SSI: 12.7%
Deep Incisional SSI: 7.8%
Organ/Space SSI: 5.4%
Wound Disruption: 1.8%

Comparison: Academic teaching hospitals greater than 500 beds
Source: ACS NSQIP Database
CORS SSI Bundle #1

- Pre-operative antibacterial bath/shower w/ Hibiclens soap
- Standard, sterile skin prep by OR scrub nurse
- Glove change & sterile sleeve application after intraop DRE
- Glove and instrument change for skin closure
- Saline irrigation of SQ before skin closure
- Standard application of wound dressing
- Continuation of OR wound dressing for 48 hours
- Clean, standard dressing change (if necessary)
SSI Bundle Checklist Results

Average Bundle Compliance: 87.6%

- Standard, Sterile Dressing Application: 95%
- Wound Irrigation: 90%
- Glove/Instrument Change @ Skin Closure: 88%
- Glove/Sleeve Change w/ DRE: 92%
- Intra-op Prep: 89%
- Skin Cleansing: 58%
p Chart – Superficial and Deep SSI

P Chart of Incisional by Stage

Tests performed with unequal sample sizes
# Surgical Site Infection in Colorectal Surgery is Not Decreased with an Infection Prevention Bundle

JD Vogel, D. Larochelle, G. Bergomi, RP Kiran, FH Remzi

<table>
<thead>
<tr>
<th>Procedure Type</th>
<th>Pre Intervention (1/1/10 - 3/31/11)</th>
<th>Post Intervention (4/1/11 - 10/31/11)</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Numerator #SSI</td>
<td>Denominator #Cases</td>
<td>SSI</td>
</tr>
<tr>
<td>Lap Colectomy</td>
<td>13</td>
<td>122</td>
<td>10.7%</td>
</tr>
<tr>
<td>Lap Proctectomy</td>
<td>5</td>
<td>38</td>
<td>13.2%</td>
</tr>
<tr>
<td>Open Colectomy</td>
<td>17</td>
<td>120</td>
<td>14.2%</td>
</tr>
<tr>
<td>Open Proctectomy</td>
<td>15</td>
<td>84</td>
<td>17.9%</td>
</tr>
</tbody>
</table>

ACS 2012 Podium Presentation
Parenteral vs parenteral + oral antibiotics

Lewis, Canadian J Surg, 2002
Also, Cochrane Review and MSQC
Wound Edge Protection in Abdominal Surgery

<table>
<thead>
<tr>
<th>Study or Subgroup</th>
<th>Intervention</th>
<th>Control</th>
<th>Risk Ratio M-H, Random, 95% CI</th>
<th>Year</th>
</tr>
</thead>
<tbody>
<tr>
<td>Events</td>
<td>Total</td>
<td>Events</td>
<td>Total</td>
<td>Weight</td>
</tr>
<tr>
<td>Maxwell et al</td>
<td>16</td>
<td>88</td>
<td>12</td>
<td>82</td>
</tr>
<tr>
<td>Williams et al</td>
<td>10</td>
<td>84</td>
<td>10</td>
<td>83</td>
</tr>
<tr>
<td>Psaila et al</td>
<td>8</td>
<td>46</td>
<td>10</td>
<td>47</td>
</tr>
<tr>
<td>Nystrom et al</td>
<td>7</td>
<td>70</td>
<td>6</td>
<td>70</td>
</tr>
<tr>
<td>Gamble and Hopton et al</td>
<td>10</td>
<td>27</td>
<td>8</td>
<td>29</td>
</tr>
<tr>
<td>Batz et al</td>
<td>1</td>
<td>25</td>
<td>7</td>
<td>25</td>
</tr>
<tr>
<td>Redmond et al</td>
<td>11</td>
<td>102</td>
<td>27</td>
<td>111</td>
</tr>
<tr>
<td>Brunet et al</td>
<td>6</td>
<td>73</td>
<td>18</td>
<td>76</td>
</tr>
<tr>
<td>Sookhai et al</td>
<td>23</td>
<td>170</td>
<td>54</td>
<td>182</td>
</tr>
<tr>
<td>Horiuchi et al</td>
<td>8</td>
<td>111</td>
<td>16</td>
<td>110</td>
</tr>
<tr>
<td>Lee et al</td>
<td>1</td>
<td>61</td>
<td>7</td>
<td>48</td>
</tr>
<tr>
<td>Reid et al</td>
<td>3</td>
<td>64</td>
<td>15</td>
<td>66</td>
</tr>
</tbody>
</table>

Total (95% CI) | 921 | 929 | 100.0% | 0.60 [0.41, 0.86] |

Total events | 104 | 190 |

Heterogeneity: Tau² = 0.20; Chi² = 24.08, df = 11 (P = 0.01); I² = 54%
Test for overall effect: Z = 2.78 (P = 0.005)

Note: 1850 patients were included in this meta-analysis, as opposed to 1933 patients for whom the 12 studies reported primary data. The difference is explained by the fact that two studies had three arms (two intervention arms and one control arm) and only the relevant arms were included in this analysis.

A. Gheorghe, Ann Surg 2012
CORS SSI Prevention: The Next Steps

- Oral non-absorbable antibiotics combined with mechanical bowel prep
  - Neomycin and Metronidazole
  - Practical matters

- Wound edge protection for all intestinal surgeries.

- Monitor results with ACS-NSQIP data
Ileal Pouch Surgery: Timing

• Delay proctectomy with j-pouch IPAA:
  – Severe acute or toxic colitis
  – High dose steroids
  – Debilitated patients
  – Recent anti-TNF alpha therapy

• Avoid / prevent
  – Bleeding
  – Nerve injury
  – Septic complications
  – Poor functional outcomes

# Infliximab in Ulcerative Colitis is Associated with an Increased Risk of Postoperative Complications After Restorative Proctocolectomy

I. J. Mor, M.D., F.R.A.C.S. • J. D. Vogel, M.D. • A. da Luz Moreira, M.D. • B. Shen, M.D. • J. Hammel, M.S. • F. H. Remzi, M.D.

Digestive Diseases Institute, Cleveland Clinic, Cleveland, Ohio

<table>
<thead>
<tr>
<th></th>
<th>Odds Ratio</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sepsis</td>
<td>13.8</td>
<td>0.011</td>
</tr>
<tr>
<td>Anastomotic Leak</td>
<td>7.8</td>
<td>0.013</td>
</tr>
<tr>
<td>Early post-op complication</td>
<td>3.5</td>
<td>0.004</td>
</tr>
<tr>
<td>Late post-op complication</td>
<td>2.2</td>
<td>0.08</td>
</tr>
</tbody>
</table>

**Patients on Infliximab were 2X more likely to undergo 3-stage IPAA**

I.J. Mor, 2008
Ulcerative Colitis & Infliximab
TPC and IPAA
Subtotal Colectomy with End Ileostomy
Subtotal Colectomy with End Ileostomy
Subtotal Colectomy with End Ileostomy instead of IPAA

Indications (in general)

- Severe Acute or “Toxic” Colitis
- Significant co-morbidity
- Morbid Obesity
- Current or recent use of anti-TNFα medications
- High-dose steroid use
- Severe malnutrition or hypoalbuminemia
- Severe anemia

Laparoscopic Proctectomy

- Decreased SSI
- Decreased VTE
- Decreased Pain
- Decreased Length of Stay
- Faster return to work
- Short-term cancer outcomes no different than open surgery
- >80% done with open technique at NSQIP hospitals!

DY Greenblatt 2011, SB Lang, 2010; S. Breakink Cochrane Database 2006
### Table 2. Frequency of 30-Day Adverse Outcomes in 5,420 Patients Who Underwent Open Resection or Laparoscopic-Assisted Proctectomy for Cancer

<table>
<thead>
<tr>
<th>Adverse outcomes</th>
<th>Open (%)</th>
<th>LAP (%)</th>
<th>p Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Any complication*</td>
<td>28.8</td>
<td>20.5</td>
<td>&lt;0.001†</td>
</tr>
<tr>
<td>Superficial SSI</td>
<td>11.8</td>
<td>6.0</td>
<td>&lt;0.001†</td>
</tr>
<tr>
<td>Abscess</td>
<td>7.4</td>
<td>7.6</td>
<td>0.81</td>
</tr>
<tr>
<td>Sepsis and septic shock</td>
<td>7.2</td>
<td>4.7</td>
<td>0.004†</td>
</tr>
<tr>
<td>Urinary tract infection</td>
<td>5.5</td>
<td>4.4</td>
<td>0.16</td>
</tr>
<tr>
<td>Respiratory complication</td>
<td>4.5</td>
<td>2.8</td>
<td>0.011†</td>
</tr>
<tr>
<td>Renal failure</td>
<td>2.0</td>
<td>0.8</td>
<td>0.007†</td>
</tr>
<tr>
<td>Dehiscence</td>
<td>1.9</td>
<td>1.4</td>
<td>0.37</td>
</tr>
<tr>
<td>VTE</td>
<td>1.7</td>
<td>0.7</td>
<td>0.012†</td>
</tr>
<tr>
<td>Cardiac complication</td>
<td>0.8</td>
<td>0.7</td>
<td>0.58</td>
</tr>
<tr>
<td>Hemorrhage</td>
<td>0.7</td>
<td>0.5</td>
<td>0.38</td>
</tr>
<tr>
<td>Neurologic complication</td>
<td>0.4</td>
<td>0.3</td>
<td>0.63</td>
</tr>
<tr>
<td>Peripheral nerve injury</td>
<td>0.3</td>
<td>0.1</td>
<td>0.34</td>
</tr>
<tr>
<td>Prolonged LOS (&gt;10 d)</td>
<td>20.1</td>
<td>11.8</td>
<td>&lt;0.001†</td>
</tr>
<tr>
<td>Reoperation</td>
<td>6.9</td>
<td>6.5</td>
<td>0.70</td>
</tr>
<tr>
<td>Mortality</td>
<td>1.1</td>
<td>0.6</td>
<td>0.14</td>
</tr>
</tbody>
</table>

*Includes all listed outcomes other than prolonged length of stay, reoperation, and mortality.
†Statistical significance at the p < 0.05 level.

LAP, laparoscopic-assisted proctectomy; LOS, length of stay; SSI, surgical site infection; VTE, venous thromboembolism.
Laparoscopic Approach Significantly Reduces Surgical Site Infections after Colorectal Surgery: Data from National Surgical Quality Improvement Program

Table 5. Operative and Postoperative Factors

<table>
<thead>
<tr>
<th>Variables</th>
<th>Laparoscopic</th>
<th>Open</th>
<th>p Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operative time (min), mean (IQR)</td>
<td>159 (119–214)</td>
<td>139 (98–196)</td>
<td>0.001</td>
</tr>
<tr>
<td>Operative time (&gt;180 min), n (%)</td>
<td>1,335 (39.1)</td>
<td>2,331 (30.8)</td>
<td>0.001</td>
</tr>
<tr>
<td>Postoperative complications, n (%)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Superficial infection</td>
<td>225 (6.6)</td>
<td>779 (10.3)</td>
<td>0.001</td>
</tr>
<tr>
<td>Deep infection</td>
<td>35 (1.0)</td>
<td>185 (2.4)</td>
<td>0.001</td>
</tr>
<tr>
<td>Organ space infection</td>
<td>81 (2.4)</td>
<td>322 (4.3)</td>
<td>0.001</td>
</tr>
<tr>
<td>Wound dehiscence</td>
<td>29 (0.85)</td>
<td>202 (2.7)</td>
<td>0.001</td>
</tr>
</tbody>
</table>

IQR, interquartile range.

- 2006-7 ACS NSQIP colorectal surgery (select CPT)
- Proctectomy in 25%, LAP in 31%
- Open: ↑ Morbidity Probability ↓ Op Time
- OR for SSI in open cases: 1.6 (1.4-1.9)

RP Kiran, 2010
Risk of Postoperative Venous Thromboembolism After Laparoscopic and Open Colorectal Surgery: An Additional Benefit of the Minimally Invasive Approach?

Ron Shapiro, M.D. • Jon D. Vogel, M.D. • Ravi P. Kiran, M.D.
Department of Colorectal Surgery, Digestive Disease Institute, Cleveland Clinic, Cleveland, Ohio

• 2005-8 ACS NSQIP Public Use File
• Venous Thromboembolism (VTE): 2.4%
  • Lap 1.2%
  • Open 2.4% (p<.001)
• VTE: Age, Male, ↓Functional status, Comorbidities
• VTE related to sepsis, SSI, steroid use, reoperation
• Multivariate Analysis: Open CRS is a risk factor for VTE

R. Shapiro, 2011
How about the Robot?

In the da Vinci system, the surgeon sits at a viewfinder (left) and remotely manipulates probes and instruments on actuator arms over the operating table.
Robotic Proctectomy

- Counted as LAP by SCR?
- Meta-analysis, LAP vs. Robot, Rectal Cancer
  - Decreased conversion with robot
  - No difference in complications, CRM, LN, etc.
- Learning curve and training
- Cost considerations
- An alternative to LAP or open

SD. Wexner 2009; S. Memom 2012
Proctectomy Pitfalls

- Pelvic Hemorrhage (PSI 9)
- Colon or Ileal Pouch Reach Problems
- Anastomotic Leak
- Accidental Puncture or Laceration (PSI 15)
  - Intestinal or other organ (ureter, spleen, etc)
Presacral Hemorrhage
Mesenteric Hemorrhage
Control of Pelvic Hemorrhage

- Is it venous or arterial?
- Finger pressure
- Alert Anesthesia team
- Need help?
- Repair: suture, thumb tack, muscle graft, get the rectum out
- Pack, SICU, return to OR as needed
### APL in 269 of 2897 CORS Cases

<table>
<thead>
<tr>
<th>Injury Type</th>
<th>N(% of all APL)</th>
<th>Delayed Dx</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total</td>
<td>269</td>
<td>6 (2%)</td>
</tr>
<tr>
<td>Serosal Tear</td>
<td>127 (47%)</td>
<td>0</td>
</tr>
<tr>
<td>Enterotomy</td>
<td>102 (38%)</td>
<td>2 (2%)</td>
</tr>
<tr>
<td>Splenic injury</td>
<td>13 (4.8%)</td>
<td>0</td>
</tr>
<tr>
<td>Bladder injury</td>
<td>12 (4.5%)</td>
<td>2 (17%)</td>
</tr>
<tr>
<td>Ureter injury</td>
<td>9 (3.3%)</td>
<td>2 (22%)</td>
</tr>
<tr>
<td>Blood vessel</td>
<td>5 (1.9%)</td>
<td>0</td>
</tr>
<tr>
<td>Vaginal injury</td>
<td>1 (0.4%)</td>
<td>0</td>
</tr>
</tbody>
</table>

C. Kin, J.D. Vogel ASCRS 2012
Enterotomy and extra-intestinal APL groups fared worse in reoperation, sepsis, abscess.
Length of stay was longer in patients with enterotomy or extra-intestinal APL.
Anastomotic Reach Problems
Ileal S-Pouch Construction
Configuration of the Ileal Pouch

J versus W:
- No difference in prospective randomized studies
- J is the preferred method due to simplicity

J versus S, versus W:
- 18 studies, 1519 patients (689 J, 306 W, 524 S)
- Frequency favored S and W compared to J
- J had higher need for anti-diarrheal usage
- S was associated with pouch intubation

Keighley M 1998 Br J Surg
Johnston D 1996 Gut
Lovegrove Colorectal Dis 2007
IPAA: Stapled or Hand-Sewn?

• Meta-analysis, 21 studies, 4183 patients
• = surgical complications
• Stapled
  – Decreased nocturnal seepage
  – Decreased pad usage
  – Nonsignificant increase in cuff dysplasia
• (Stapled is a lot easier to do)

RE Lovegrove, 2006
Colon Reach Problems: Retroileal CRA
Straight Coloanal Anastomosis
J-Pouch Coloanal Anastomosis
Side-End Coloanal Anastomosis
Coloanal Anastomosis

• Straight, j-pouch, coloplasty, side-end
• Improved function with a reservoir
  – Decreased bowel frequency
  – Decreased urgency
  – Decreased fecal incontinence
  – Decreased use of antidiarrheals
  – No increase in complication

VF Fazio 2005, Cochrane 2008
Proctectomy: Complications

- Colorectal / coloanal anastomotic leak
- Ileal Pouch Anal Anastomosis (IPAA) leak
- Tip of the J-pouch leak
- Pouch-vaginal & colo-vaginal fistula
- Surgical Site Infection
- Venous Thromboembolism
- Ileus / SBO
- Everything else
Ileal Pouch Anal Anastomotic Leak

The Management of Anastomotic Pouch Sinus After IPAA.
Ali, Usama; Shen, Bo; Remzi, Feza; Kiran, Ravi

DOI: 10.1097/DCR.0b013e318244087c
Tip of the J-Pouch Leak

27 cases, most UC
- 23 repaired
- 2 redo j-pouch
- 1 pouch excision
- 1 percutaneous drain only

Management of Leak From the Tip of the "J" in Ileal Pouch-Anal Anastomosis.
Kirat, Hasan; Kiran, Ravi; Oncel, Mustafa; Shen, Bo; Fazio, Victor; Remzi, Feza

DOI: 10.1007/DCR.0b013e31820481be
Management of Leak From the Tip of the "J" in Ileal Pouch-Anal Anastomosis. Kirat, Hasan; Kiran, Ravi; Oncel, Mustafa; Shen, Bo; Fazio, Victor; Remzi, Feza
Management of Leak From the Tip of the "J" in Ileal Pouch-Anal Anastomosis. Kirat, Hasan; Kiran, Ravi; Oncel, Mustafa; Shen, Bo; Fazio, Victor; Remzi, Feza
Prevention of Anastomotic Leak?

- Timing of surgery for Ulcerative Colitis
- Malnutrition
- Immunosuppression
- Anemia
- Sepsis
- Radiation
- **Defunctioning loop ileostomy**

CORS Readmissions Reviews

- Unplanned – 91%; Planned – 9%
- Readmission Source:
  - Physician Referral – 37%
  - Clinic Referral – 31%
  - Transfer from Another Hospital – 30%
- Readmission Department:
  - Colorectal Surgery – 82%
  - Hospital Medicine – 6%
Cleveland Clinic

Department of Colorectal Surgery
Readmission Review

Patient Name:

MRN:

Date of discharge:

Date of readmission:

Planned readmission?
[ ] Yes
[ ] No

If Unplanned, please check all reasons that apply:

[ ] Dehydration or acute renal insufficiency
[ ] Ileus/SBO
[ ] Wound infection (superficial or deep SSI)
[ ] Wound care or Ostomy-related problems (except dehydration)
[ ] Abdominal or pelvic abscess (organ space SSI)
[ ] Anastomotic complications
[ ] Early post-operative complication of j/s/k-pouch (abscess, fistula, leak, etc)
[ ] Fistula [new or problematic existing fistula],
[ ] Venous Thromboembolism (DVT or PE)
[ ] Bleeding or anemia
[ ] Cardiopulmonary problems (CHF, arrhythmia, angina, pneumonia, etc)
[ ] Problems related to underlying medical conditions
[ ] Pain management
[ ] Failure to thrive/nausea
[ ] Other non-infectious problems (pancreatitis,
[ ] Other infectious problems ("sepsis", central line infections, C. difficile colitis, etc)

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privileges as outlined in Ohio Revised Code, sections 2317 (a), 2305.24, 2305.25 - 2305.253, and 2305.28
<table>
<thead>
<tr>
<th>Condition</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dehydration or acute renal insufficiency</td>
<td>17%</td>
</tr>
<tr>
<td>Ileus/SBO</td>
<td>16%</td>
</tr>
<tr>
<td>Abdominal or pelvic abscess (organ space SSI)</td>
<td>13%</td>
</tr>
<tr>
<td>Pain management</td>
<td>9%</td>
</tr>
<tr>
<td>Failure to thrive/nausea</td>
<td>9%</td>
</tr>
<tr>
<td>Wound infection (superficial or deep SSI)</td>
<td>9%</td>
</tr>
<tr>
<td>Problems related to underlying medical conditions</td>
<td>8%</td>
</tr>
<tr>
<td>Psycho-social reasons</td>
<td>8%</td>
</tr>
<tr>
<td>Anastomotic complications</td>
<td>7%</td>
</tr>
<tr>
<td>Other non-infectious problems (pancreatitis, etc.)</td>
<td>6%</td>
</tr>
<tr>
<td>Wound care or Ostomy-related problems (except dehydration)</td>
<td>6%</td>
</tr>
<tr>
<td>Bleeding or anemia</td>
<td>4%</td>
</tr>
<tr>
<td>Fistula (new or problematic existing fistula),</td>
<td>4%</td>
</tr>
</tbody>
</table>
Eating Right and Avoiding Dehydration for Patients after Bowel Surgery

Your doctor has prescribed a GI soft diet to help you during your surgical recovery. This diet is soft in texture, low in fiber, and easier to digest.

Unless directed differently by your dietitian or physician, follow these guidelines for the next 4-6 weeks. If you continue to have difficulty eating once you are at home, contact your dietitian or physician.

<table>
<thead>
<tr>
<th>Food Group</th>
<th>Foods to Avoid for 4-6 Weeks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Meat and meat substitutes</td>
<td>Meat with casings (hot dogs, sausage, kielbasa), luncheon meats with whole spices or casings, shellfish, chunky peanut butter, nuts</td>
</tr>
<tr>
<td>Fruits</td>
<td>Fresh fruit (except bananas), juices with pulp, dried fruit (raisins, prunes, etc.), canned fruit cocktail, canned pineapple, frozen/thawed berries, coconut</td>
</tr>
<tr>
<td>Vegetables</td>
<td>Raw vegetables, cooked or raw corn and mushrooms, stewed tomatoes, popcorn, potato skins, stir-fry vegetables, sauerkraut, beans, legumes and peas</td>
</tr>
<tr>
<td>Dairy</td>
<td>Dairy product mixed with fresh fruit (except bananas), berries, whole spices, nuts or seeds</td>
</tr>
<tr>
<td>Grains</td>
<td>Bread rolls with nuts, whole spices, poppy, bran, sesame seeds, coarse whole grains, dried fruits or berries, cereals with nuts, whole spices, bran or berries</td>
</tr>
<tr>
<td>Herbs and spices</td>
<td>Whole spices like peppercorns, whole cloves, anise seeds, celery seeds, rosemary, caraway seeds, and fresh herbs</td>
</tr>
<tr>
<td>Miscellaneous</td>
<td>Jams, jellies with seeds, carbonated beverages</td>
</tr>
</tbody>
</table>

After 4-6 weeks, slowly start to reintroduce the **Foods to Avoid** back into your diet unless your doctor has told you otherwise. Try a small portion of one of these foods each day. If it does not bother you within 24 hours, it can be added to your diet. Continue to add new foods in this way.

Some people may continue to experience food sensitivities and may need to continue to avoid certain foods. If you cannot tolerate a food, avoid that food for a few weeks before you try it again.
Frequently Asked Questions

1. What is normal stool or ostomy output?
   - Stool output after bowel surgery is often increased, and diarrhea is common.
   - If you have an ostomy, the output varies based on the location of the stoma in your bowel, your height and weight, and your food and beverage intake.
   - Ileostomy output averages between 800 and 1200 cc per day (~1 quart = 1,000 cc). The output should be an oatmeal or applesauce consistency. It is normal to empty your ileostomy bag 6-8 times per day when it is half full.
   - Jejunostomy output is often much higher volume and more watery. Patients with a jejunostomy may require intravenous (IV) nutrition support.
   - Colostomy output is more like regular bowel movements and typically does not require dietary or fluid adjustments.
   - There are special situations with all types of ostomies that may require dietary and/or medical interventions.
   - Measure and record your ostomy output for the first two weeks at home.

2. What can I do to improve my hydration and absorption?
   - Chewing is the first step in digestion, and if done well can help improve absorption. You may also have fewer problems with blockage when the food is passing through your bowel. Chew foods to a mashed potato consistency.
   - Small amounts of food may be better digested and absorbed than large meals. Eat 5 to 6 small meals per day and eat slowly.
   - Solid foods may not be absorbed as well if liquids are pushing them through the bowel. Separate beverages from meal times.
   - Drinking fluids rapidly may worsen stool output. Sip liquids throughout the day.

3. Will certain foods and beverages increase my stool output?
   - Yes, simple carbohydrates like table sugar, corn syrup, honey, soda, and juice increase the amount of water in the bowel, resulting in increased stool output. Omit high sugar foods and fluids.
   - Water is not always well-absorbed and can increase stool output. If your stool output is increased, you should drink an oral rehydration solution instead. (See FAQ #6)
   - Sugar alcohols often found in diet products, sugarless gum, and some medications are not well-absorbed and can worsen diarrhea. Avoid sugar-free items containing sorbitol, mannitol, or xylitol.
   - Alcohol and caffeine are stimulants and may increase your stool output. Caffeine is also a diuretic that may increase fluid loss in your urine and stool. Limit or avoid alcohol and caffeine.

4. What foods will help decrease my stool output?
   - Complex carbohydrates such as pasta, grains, rice, potatoes, fruits, and vegetables provide bulk to stool and slow the movement of stool through the intestine, helping to decrease stool output. Replace simple sugars with complex carbohydrates.
   - You lose sodium and other electrolytes in your stool. Eating salty meals and snacks and seasoning your foods with salt will replace some of the losses. Increase sodium in diet if stool output is increased.
   - Foods such as bananas, tapioca, boiled white rice, baked potatoes without skin, applesauce, smooth peanut butter, and oatmeal may help thicken stool output. Include a “thickening” food to each meal and snack.
5. I’ve lost weight. Can I use nutrition supplements to add calories and protein to my diet?

- If you are malabsorbing, avoid high sugar supplements such as Ensure® or Boost®. You will not absorb these well and they may increase your output.
- Try low sugar supplements with less than 10 grams of sugar per serving, such as Carnation® Instant Breakfast Essentials™ (No Sugar Added) and Boost Glucose Control®. Protein powders such as Resource® Beneprotein® can provide additional calories and protein.
- If you do not like nutrition supplements, try snacks. For example: 5 saltine crackers with 2 ounces of cheddar cheese provide approximately 290 calories and 15 grams of protein; 4 graham cracker squares with 2 tablespoons of peanut butter provide approximately 250 calories and 9 grams of protein. Avoid high-sugar nutrition supplements.

6. What is the best thing to drink if I am having high stool output?

- Fluids that have the same amount of sodium, potassium, and glucose as your blood are best absorbed. These fluids are often called oral rehydration solutions (ORS) because they help replace what is lost in the stool.
- You can make ORS at home using the following recipe: Mix 1 liter (4 cups) of water + 2/3 tsp of table salt + 2 tbsp of sugar + sugar-free Kool Aid or Crystal Light (to taste) in a pitcher. Sip between meals.
- You may choose to purchase commercial ORS products such as Pedialyte®, Rehydrate®, or Ceralyte®.
- Gatorade G2® is a low-sugar beverage that needs additional salt added for optimal absorption (1/8 tsp salt added per 8 ounce serving).
- Do not add ice or dilute your ORS, as this may affect the absorption.
- Water is not absorbed as well as ORS and may increase your stool output, so drink plenty of ORS, but limit the quantity of water.

- Avoid high-sugar drinks, alcohol, and caffeine-containing beverages. Drink oral rehydration solution instead of other beverages.

7. How much fluid should I drink each day?

- Fluid needs are individualized and vary depending on the type of ostomy you have. You must drink enough fluid to prevent dehydration.

8. How will I know if I am dehydrated?

- Increased thirst or muscle cramps
- Weight loss of more than 3 pounds in 24 hours
- Dry mouth or cracked lips
- Low urine output or dark urine with a strong odor
- Low blood pressure
- Dizziness or weakness

Recognize the signs and symptoms associated with dehydration. If you are experiencing any of these symptoms, call your physician’s office during business hours or the Nurse on Call (216.444.1234) after hours. (See FAQ # 10)

9. Are there fiber supplements or medications that can help to decrease my stool output?

- The addition of soluble fiber such as Benefiber®, Metamucil®, Konsyl®, Fibercon®, or Citrucel® may help thicken your output and slow down the passage of food from the stomach into your intestine.
- Introduce fiber slowly with one serving per day and increase as tolerated to 2-3 servings per day.
- The anti-diarrheal medication Imodium® may be purchased over the counter or prescribed by your physician. Imodium® and Lomotil® (prescription only for Lomotil®) are usually the first-line medical treatment for a high output ostomy. In most cases, these medications are effective in reducing ostomy output.
- Additional medications such as codeine and
opium tincture may be prescribed if stool output remains increased after starting Imodium® and Lomotil®.

- It is important to take these medications 30 minutes before your meals because they work to slow the movement of food through your digestive system. They are not as effective when taken after meals. These medications may also be taken before bedtime.
- The typical dose of Imodium® and Lomotil® is 1-2 tablets 30 minutes before meals and at bedtime, up to 8 tablets per day of each medication.
- A liquid form of Imodium® and Lomotil® is also available and may be prescribed.
- If you have cramping, abdominal pain, nausea, or vomiting, stop taking the medications and notify your physician. This may indicate an obstruction or ileus.

10. Who should I contact if I am having a problem with my stoma output or a medication?

- Contact your physician’s office if your problem occurs during business hours Monday-Friday (9:00 a.m.-5:00 p.m.).
- Contact the Nurse on Call (216.444.1234) if the problem occurs on the weekend or after 5:00 p.m.

These guidelines were developed by a panel of multidisciplinary Digestive Disease Institute clinicians, including intestinal rehabilitation physicians and dietitians, Nutrition Therapy dietitians, colorectal surgeons, enterostomal therapists, physician assistants, and nurses with expertise in caring for patients with intestinal disorders.

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Center for Human Nutrition, M17/
Digestive Disease Institute
9500 Euclid Avenue, Cleveland, OH 44195
Appointments: 216.444.3046 (Main Campus)
1.800.233.2273, ext. 43046
Hearing-impaired (TTY) assistance: 216.444.6261
www.clevelandclinic.org/health/

This information is not intended to replace the medical advice of your doctor or health care provider. Please consult your health care provider for advice about a specific medical condition.

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Our Fun Proctectomy Talk Comes to an End

• Improving ACS-NSQIP for colorectal surgery (just my thoughts)…
  – Include anastomotic leak in post-op results
  – LAP, HAL, Robotic, Conversions
  – Anastomosis details
  – Defunctioning ostomy
  – Decrease variables, increase capture
Cleveland Clinic

Every life deserves world class care.