New Targets for Adequate Preparation

• What is an adequate prep?
  – Excellent or good (fair?)
  – Able to see polyps ≥ 6 mm in size
  – Should be able to follow the recommendations for screening and surveillance based on the findings of the exam
How to reach the targets?

- Split or same day dosing
- Triage at time of scheduling
  - Prep risk: CHF, liver disease with ascites, CRF
  - Risk of inadequate prep
  - Risk for poor compliance with instructions
- On day of procedure

Risk of inadequate preparation

- Chronic constipation
- Constipating meds, especially opioids
- Diabetes
- Obesity
- Prior colon resection
- Prior inadequate preparation
Risk of poor compliance

• Medicaid insurance
• Lower educational level
• English not first language
• “Low health literacy”
• “Low patient activation”

Prep efficacy

**Higher**
- 4 liter PEG-ELS
- Lower effectiveness plus homemade additions

**Lower**
- 2 liter PEG-ELS
- Miralax plus bisacodyl
- Oral sulfate solution
- Sodium picosulfate plus magnesium citrate
High risk for poor compliance

- Intensify education
- Motivation
- Reminders

- Ultimate: navigation

How to reach the targets?

- Split or same day dosing
- Triage at time of scheduling
  - Prep risk: CHF, liver disease with ascites, CRF
  - Risk of inadequate prep
  - Risk for poor compliance with instructions
- On day of procedure
  - Brown effluent: consider more prep or enemas
  - Clean up: judge the prep after cleaning
Measures of performance

• Adenoma detection rate
  – Serrated lesion detection rate
  – Adenomas per colonoscopy
  – Screening and surveillance intervals
• Bowel preparation adequacy
• Cecal intubation rate

Methods of correcting poor detection

• Barclay: education plus 8 minute timer
• Wallace: EQUIP

• Discontinuation of privileges
What are the components of an education program?

- Lesion recognition
- Examination technique

### Colorectal Cancer - Molecular Basis

<table>
<thead>
<tr>
<th>Pathway</th>
<th>Frequency</th>
<th>Genes</th>
<th>MSI</th>
<th>Precursor</th>
<th>Speed</th>
</tr>
</thead>
<tbody>
<tr>
<td>CIN</td>
<td>65-70%</td>
<td>APC K-ras p53</td>
<td>No</td>
<td>Adenoma</td>
<td>Slow</td>
</tr>
<tr>
<td>Lynch</td>
<td>3%</td>
<td>MLH1 MLH2 MLH6 PMS2</td>
<td>Yes</td>
<td>Adenoma</td>
<td>Fast</td>
</tr>
<tr>
<td>CIMP</td>
<td>30-35%</td>
<td>BRAF</td>
<td>Sometimes</td>
<td>Serrated</td>
<td>Can be fast</td>
</tr>
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</table>
### 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>
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<tbody>
<tr>
<td>Traditional adenomatous polyps</td>
<td>1p</td>
<td>Left</td>
<td>Low</td>
<td>Mostly LGD</td>
</tr>
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<td></td>
<td>1s</td>
<td>Throughout</td>
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<td>↑↑ HGD and invasive cancer</td>
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<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>
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<td>TSA</td>
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<td>rare</td>
<td>Uncertain</td>
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</table>

### Clues to the detection of serrated lesions (SSA/P and HP)

- Pale color
- Shape flat (2a or even 2b) or sessile (1s)
- Mucus cap on surface (can wash this off – is water immersion ok?)
- Debris on the rim or on the surface (can wash this off also)
- No blood vessels or just lacy vessels that course past pits
- Edges indistinct
- Normal mucosal blood vessel pattern obscured
- Pits dark, sometimes large round darks pits (Type “O”)
- Texture change on the surface
Colonoscopic Polypectomy

• Most commonly performed therapeutic procedure in gastroenterology
• Most important GI procedure from public health perspective

How often is polypectomy incomplete?

• Polyps 5-20 mm in size
  – Overall rate of incomplete polypectomy 10.1%
  – Predictors of incomplete polypectomy
    • Endoscopist range: 6.5% to 22.7%
    • Size: (10-20 mm vs 5-9 mm: 17.3% vs 6.8%)
    • Serrated: (31.0% vs 7.2%)
      – Pohl; Gastroenterology;2013;144:74-80

• Diminutive polyps
  – Cold forceps resection produced complete resection in 62% of conventional adenomas and 24% of hyperplastic polyps
    – Efthymiou Endoscopy 2011;43:312-6
Known from RCTs – older studies

- Detachable snares reduce bleeding risk from large pedunculated polyps (immediate and delayed)
- Epinephrine reduces risk of immediate hemorrhage from sessile and pedunculated polyps

Known from RCTs – recent studies

- Cold snaring effective and quicker than hot snaring for 3-8 mm polyps, no complications
  - Paspatis; Colorectal Disease; 2011:e345-8
  - Ichise; Digestion; 2011:84:78-81
- Jumbo forceps more efficient and effective than large capacity forceps for resection of diminutive polyps
  - Dragonov; GIE; 2012:75:118-26
Known from RCTs – recent studies

- Hydroxyethyl starch was more effective than saline as a submucosal injection fluid
  - Fewer injections, resections and cut time in half
  - Product Gelfusin not available in U.S. but similar products are (e.g. Voluven)
    - Moss A; AJG; 2010;105:2375-82
- D50 was associated with an increased risk of post-polypectomy syndrome
  - Katsinelos; GIE; 2008;68:692-8

Cold snaring: DDW 2013

- Abstract 7 (Lee et al):
  - RCT of cold snaring vs cold forceps for 1-5 mm polyps
  - Time shorter with CS: 14.3 vs 22 sec (p<0.001)
  - Complete eradication CS 93.2% vs 75.9% (p=0.009)
  - Method of polypectomy (forceps) and size 4-5 mm predicted incomplete eradication
- Abstract Tu1496 (Aslan et al):
  - RCT of cold vs hot snaring for 5-10 mm polyps
  - CS faster (26 vs 70 sec) and equal eradication rates
Cold snaring technique is different

**Cold snaring**
- Capture 1 to several mm rim of normal tissue around the polyp
- Suction only if needed to capture polyp
- Push hard to anchor the snare
- Don’t tent and don’t deflate

**Hot snaring**
- Capture only the polyp and at most a small rim of normal tissue
- Tent and deflate before cautery
Flat Lesions – Paris Classification

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Lateral spreading tumors (2a lesion > 1 cm in size)

- Granular (85% of LSTs)
  - Very low risk of invasive cancer (1-2%)
- Non-granular (15% of LSTs)
  - Risk of invasive cancer (15%)

Is this relevant for polypectomy?

- When is en bloc resection desirable?
  - When the risk of invasive cancer is high
    - Depressed adenomas
    - Non-granular LSTs
What’s new in large polyp resection? Many papers on ESD

**ESD**
- **Good:**
  - Better pathology specimen
  - Lower recurrence rate
- **Bad**
  - High perforation rate
  - More expensive (hospitalization)
  - Takes longer (money loser)

**EMR**
- **Good**
  - Efficient (less of a money loser)
  - Low risk of perforation
  - Long term outcome may equal ESD for most lesions
- **Bad**
  - Recurrence rate at least 15%

Things not to do with LSTs

- **False positive non-lifting sign:**
  - Don’t use a hot technique to biopsy a polyp
  - Don’t take off part of an LST and then stop (finish the job!!)
  - Don’t biopsy a Paris 2a (flat) LST that is very flat
  - Don’t tattoo under an LST to mark it for later endoscopic resection
3 things that make resection of LSTs hard:

• Large size
  – Inject a portion and resect – then inject another portion and repeat - stay in the submucosal plane

• Difficult to access
  – Retroflex
  – Cap on end of scope

• Too flat
  – Specialty snare (spiral)
  – Cap on the end of the scope

The large LST – piecemeal injection and stay in submucosal plane
Use of cap to snare resect flat lesions
Serrated lesions

**Keys to detection**
- Mucus cap
- Debris
- Pale color
- Flat or sessile shape
- Indiscrete edges
- Absence of blood vessels on surface
- Texture alteration

Serrated resection: contrast agent, stiff snare and resect normal margin
Take Home Points for Practice

- Snares preferred over forceps
- Cold forceps – jumbo or large capacity better: use only if you can engulf in one bite
- Avoid hot forceps entirely
- Resect depressed lesions and non-granular LSTs en bloc if possible
- Know solutions for difficult LSTs: piecemeal injection, retroflexion, cap, specialty snares
- Serrated lesions: inject with contrast agent, stiff snare, resect a margin of normal tissue