Diagnostic Testing of Fecal Incontinence
Fecal Incontinence - History

- Establish rapport & Overcome social stigma
- Onset & Precipitating events
- Duration, Severity & Timing
- Coexisting problems/Surgery/ Urinary Incontinence
- Obstetric Hx-Forceps, Tears, Presentation, Repair
- Drugs, Caffeine, Diet
- Clinical Subtypes & Grading

Fecal Incontinence – Clinical Subtypes

• Passive Incontinence
  – Involuntary discharge of feces or flatus without awareness

• Urge Incontinence
  – Discharge of rectal contents in spite of active attempts to retain

• Fecal Seepage
  – Involuntary seepage with otherwise normal evacuation

Rao, ACG Guidelines, Am J Gastro 2004
Pathophysiology – Fecal Incontinence

- 80% of patients have more than one abnormality

# Mechanisms vs Clinical Subtypes

<table>
<thead>
<tr>
<th></th>
<th>Passive</th>
<th>Urge</th>
<th>Seepage</th>
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</thead>
<tbody>
<tr>
<td>Anal sphincter weakness</td>
<td>+</td>
<td>+ or -</td>
<td>+ or -</td>
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<tr>
<td>Impaired Sensation</td>
<td>+</td>
<td>-</td>
<td>+</td>
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<tr>
<td>Impaired accommodation</td>
<td>-</td>
<td>+</td>
<td>-</td>
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<tr>
<td>Pudendal neuropathy</td>
<td>+</td>
<td>+ or -</td>
<td>-</td>
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<tr>
<td>Incomplete Evacuation</td>
<td>+ or -</td>
<td>-</td>
<td>+</td>
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</tbody>
</table>

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Rao, Gastroenterology 2004
Record your stool habit for one week

<table>
<thead>
<tr>
<th>Date</th>
<th>Time of Bowel Movement</th>
<th>Stool leakage Yes/No</th>
<th>Seepage/Staining Yes/No</th>
<th>Consistency (1-7)</th>
<th>Urgency Yes/No</th>
<th>Pads Yes/No</th>
<th>Drug</th>
<th>Comments</th>
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<td>Liquid</td>
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</tr>
</tbody>
</table>
DRE-PROTOCOL

- Pt in left lateral position, hips flexed to 90°
- 3 steps
  - (1) Inspection
  - (2) Perianal sensation & anocutaneous reflex
    - normal, impaired, absent
  - (3) Digital palpation and maneuvers
    - Mass, tenderness, stool
    - Bearing down x 2
      - push effort
      - sphincter relaxation
      - perineal descent
    - Squeeze x 2
      - normal, weak, increased
## DRE: Expert vs Trainee, n=110

<table>
<thead>
<tr>
<th>Condition</th>
<th>Kappa</th>
<th>Confidence</th>
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</thead>
<tbody>
<tr>
<td>Resting Tone</td>
<td>0.37</td>
<td>0.3-0.5</td>
</tr>
<tr>
<td>Puborectalis</td>
<td>0.46</td>
<td>0.3-0.6</td>
</tr>
<tr>
<td>Squeeze Tone</td>
<td>0.36</td>
<td>0.2-0.5</td>
</tr>
<tr>
<td>Normal ARM</td>
<td>0.3</td>
<td>0.1-0.5</td>
</tr>
<tr>
<td>Incontinence</td>
<td>0.5</td>
<td>0.4-0.7</td>
</tr>
</tbody>
</table>

Tantiphlachiva, Rao et al *Neurogastro Mot* 2009
Tests of Anorectal Function

- Anorectal manometry
- Anal Endosonography
- Rectal Compliance Test
- Pudendal Nerve Terminal Latency
- Balloon expulsion test
- Defecography
- Anal High Definition Manometry
- Saline Continence Test
- Electromyography
- Translumbar/transsacral MEP

Modified from Rao, ACG Guidelines, Am J Gastro 2004
Anal Manometry

- Resting Sphincter Pr. 50-70 mmHg
- Squeeze Sphincter Pr. 100-200 mmHg
- Squeeze Duration > 20 Seconds
- Sensory Delay < 5 Seconds
- First Sensation 15 cc
- Threshold Desire to Defecate 50-100 cc

Anal Endosonography
Incontinence

Healthy Subject

Rectum

Anal Canal

Courtesy of Rao SS
Anal-High Definition Manometry

Symmetrical squeeze pressure
Maximal & Sustained Squeeze

Asymmetrical squeeze pressure
Maximal Squeeze

Sustained Squeeze

low pressure area

3D: Sagittal View
2D: Unfolded View
3D: Oblique View
Impaired Rectal Compliance

Rectum

Anal Canal

Courtesy of Rao SS
Anal Ultrasound
Anal Sphincter Integrity- 3-D HDM

AUS

HDM

Normal

Incontinent

Squeeze

Squeeze
Defecogram: Normal

Squeeze

Push
Prolapse / Intussusception

- Telescoping of bowel or bowel mucosa
- May produce prolapse & obstructed defecation
- Solitary rectal ulcer syndrome
- Small degrees may be incidental
MR Defecography

- **Advantages**
  - No radiation
  - Shows bowel lumen & surrounding soft tissues

- **Disadvantages**
  - Expensive
  - Operator dependent
  - Most equipment must image supine

Pudendal Nerve Terminal Motor Latency
AGA Position Statement - PNTML

“The PNTML cannot be recommended for evaluation of patients with fecal incontinence”

BECAUSE

- Low specificity & sensitivity
- Operator dependent technique
- Poor Correlation with manometry
- Test does not predict surgical outcome

Diamant et al Gastroenterology ;March, 1999
Translumbar/Transsacral MEP in F. Incontinence, n=48, controls = 20

Translumbar/Transsacral MEP in F. Incontinence, n=48, controls = 20

Trans-lumbar MEPs: Incontinence vs Controls

Tantiphlachiva K, Rao SS et al DDW 2008
# Clinical Utility of ARM in Fecal Incontinence

<table>
<thead>
<tr>
<th>Incontinence Pts</th>
</tr>
</thead>
<tbody>
<tr>
<td>Diagnosis Confirmed</td>
</tr>
<tr>
<td>New Information</td>
</tr>
<tr>
<td>Influenced Treatment</td>
</tr>
<tr>
<td>Normal Study</td>
</tr>
<tr>
<td>Not Helpful</td>
</tr>
</tbody>
</table>

Fecal Incontinence

History, Examination, Clinical Grading

Diarrhea + Incontinence
- Flexible Sigmoidoscopy/Colonoscopy/Barium Enema + Metabolic Profile
  - VE
  - Fiber, Loperamide/Lomotil Cholestyramine & Others
    - Improved
    - Not Improved

Obstetric/Surgical/Neurological Injury + Others

Prolapse
- Confirmed
- Doubtful

Surgery + VE
- Defecography

Anorectal Manometry + PNTML + Anal Ultrasound

Fecal Incontinence-2014

Symptoms + Failed Supportive®

Anorectal Manometry + PNTML + Anal Ultrasound

Weak Sphincter/Defect + Normal PNTML
- Surgery
- Biofeedback

Weak Sphincter/Defect + Abnormal PNTML
- Biofeedback or Colostomy

Impaired Sensation
- Biofeedback

Urgency Hypersensitivity
- Biofeedback

Seepage + Dyssynergia
- Biofeedback

Sensory Adaptation Training Rectal Augmentation

Modified from Rao, ACG Guidelines, Am J Gastro 2004
Conclusions - Diagnostic Testing in Fecal Incontinence

- Fecal incontinence is multifactorial
- Detailed History, Physical & DRE important
- Diarrhea evaluation may facilitate optimal therapy
- ARM, Anal Ultrasound, MRI provide structural and functional information
- Neuro-physiological Tests (Lumbo-sacral MEPs) provide etiology/pathophysiological information
- These tests are complementary