

# Pelvic Floor Physical Therapy in the GI Population

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# What is a pelvic floor physical therapist?

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Education/training: we complete 4 years of undergrad followed by 3 years of graduate work, resulting in our Doctorate of Physical Therapy (DPT)

Certifications: PRPC (Pelvic Rehabilitation Practitioner Certification) through Herman and Wallace Pelvic Rehabilitation Institute, WCS (Women's Health Clinical Specialist) through the APTA (American Academy of Physical Therapy)

Conditions commonly treated: urinary incontinence, urinary retention, urinary urgency/frequency, prolapse, pelvic pain, dyspareunia, pregnancy/postpartum, constipation, fecal incontinence, dyssynergic defecation, post-prostatectomy

# Pelvic PT in “the past”

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Limited internal treatment

Limited use of modalities

Kegels were the answer to everything

\*Today we will focus on best practice pelvic PT in “**the present**”\*

# Colorectal Anatomy

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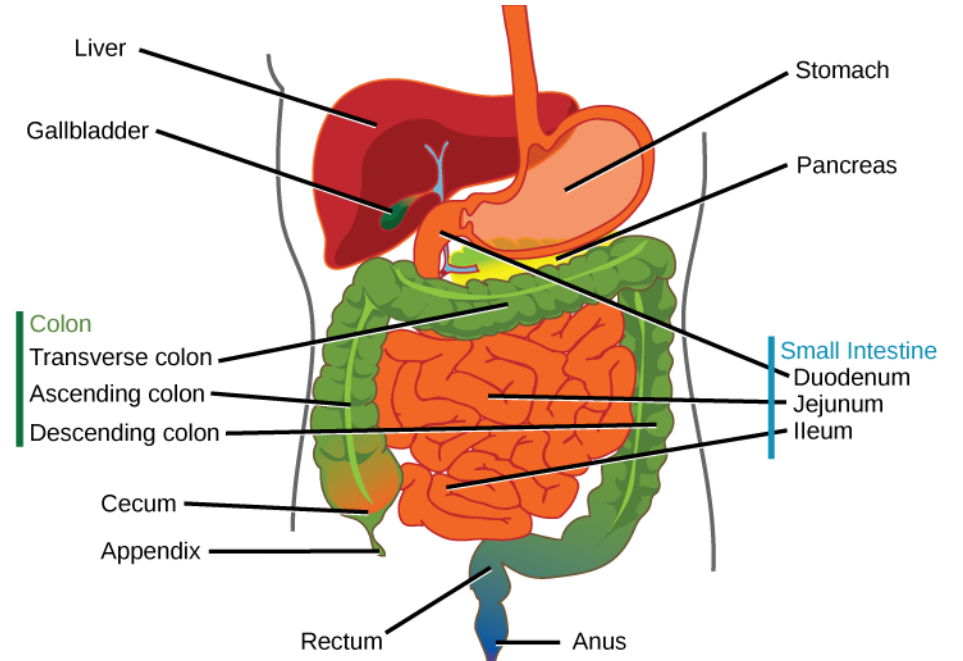
Ascending, transverse, descending, sigmoid colon

Rectum

Anal Canal

**Anal Sphincters**

**Muscles, fascia, ligaments, nerves**



# Layers of Pelvic Floor

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## Layer 1: Superficial pouch

- Muscles of urogenital triangle and external anal sphincter

## Layer 2: Urogenital diaphragm

- Muscles of deep perineal pouch
- Perineal membrane

## Layer 3: Pelvic Diaphragm

- Levator Ani-pubococcygeus, **puborectalis (muscle of continence)**, illiococcygeus
- Coccygeus

## Pelvic Wall Muscles:

- Piriformis
- Obturator Internus

# Anal Sphincters

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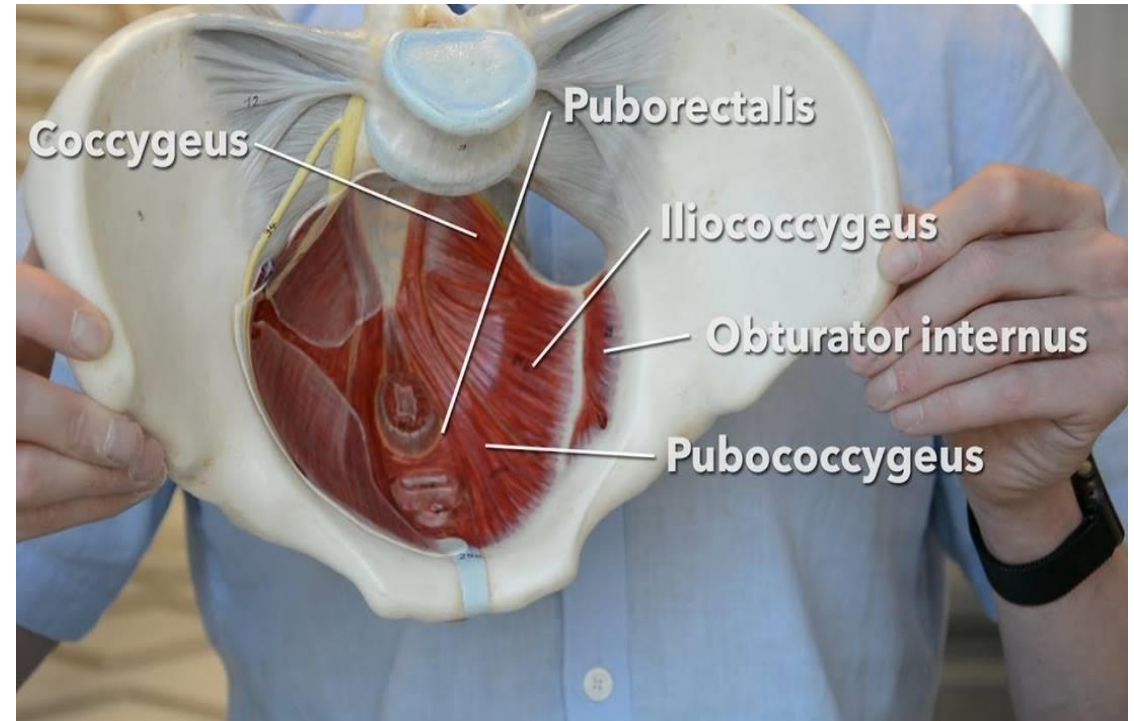
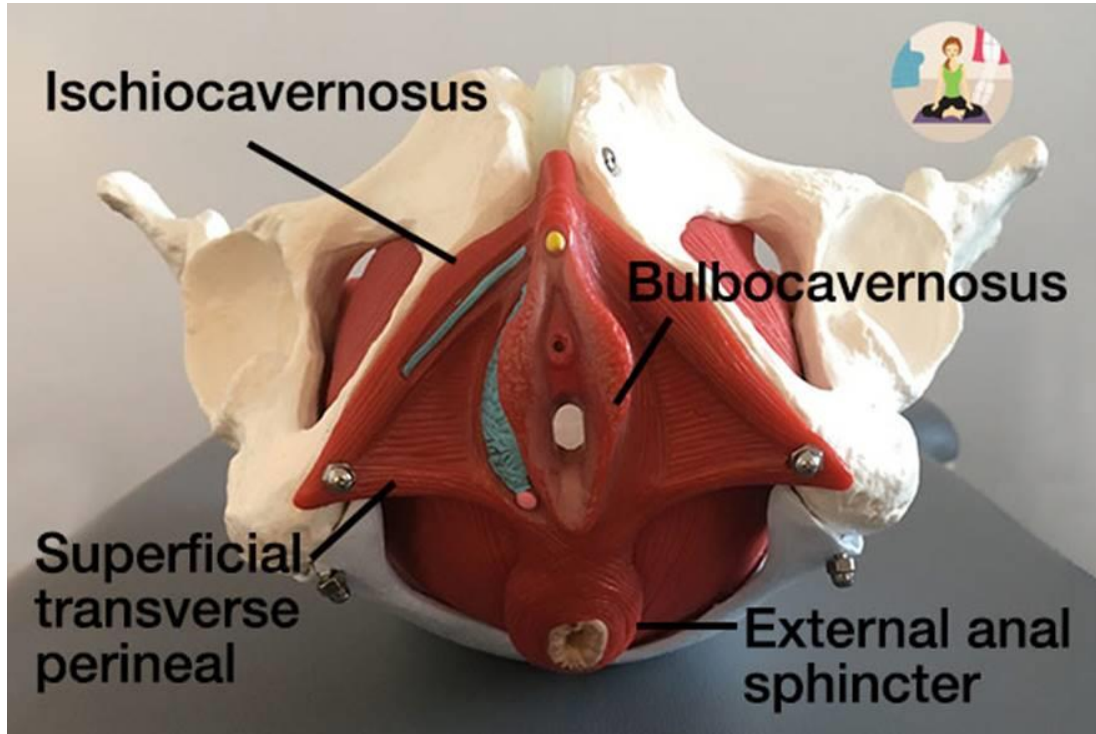
## Internal Anal Sphincter (IAS)

- Involuntary sphincter
- Relaxes when stimulated by parasympathetic nerves supplying it

## External Anal Sphincter (EAS)

- Under voluntary control
- Relies on stretch receptors
- Attaches to perineal body and to anococcygeal ligament
- Closes anus and draws canal anteriorly
- A decrease in anorectal angle maintains fecal continence

# Pelvic floor anatomy



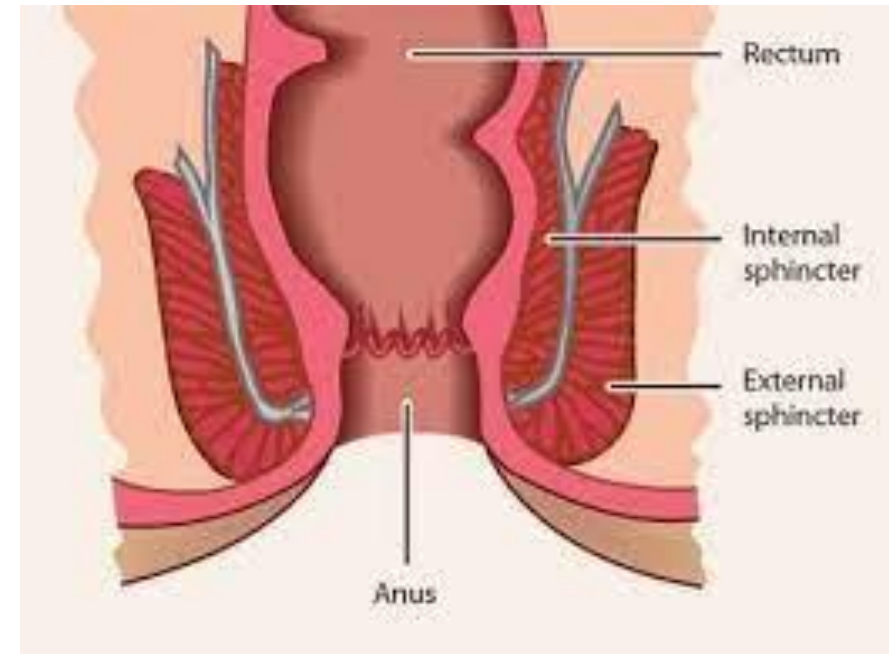
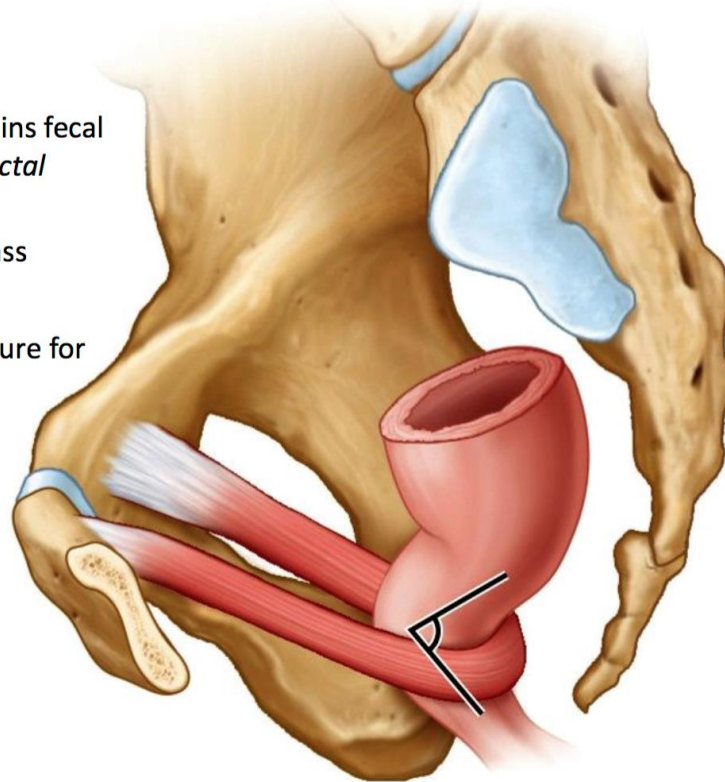
## Muscles of the pelvic wall & floor

See table 3.2 in MDA text

### **Puborectalis**

- Forms the puborectal sling
- Tonus (tonic contraction) maintains fecal continence by creating the *anorectal angle* (~80°)
- Relaxes to allow fecal mass to pass

(see also visceral innervation lecture for this unit)





# Anorectal Angle

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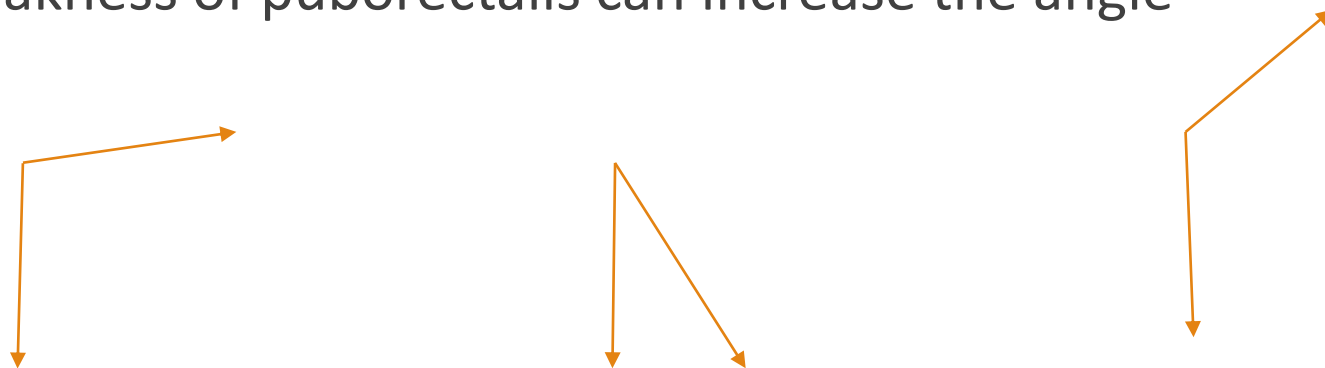
Formed between the axis of the rectum and anal canal

Normal: 80-100 degrees

Varies depending on strength of puborectalis, relaxation of the muscle or position of the pelvis

Pelvic floor muscle relaxation increases angle

Weakness of puborectalis can increase the angle



# Physiology of Defecation

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## **Normal defecation:**

- Anal sphincter and puborectalis muscle relax
- Anorectal angle widens
- Perineum descends
- Voluntary bearing down increases intra-abdominal pressure
- Stool moves from rectum to be evacuated through anus

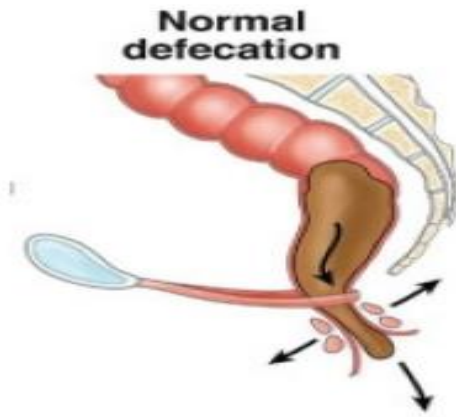
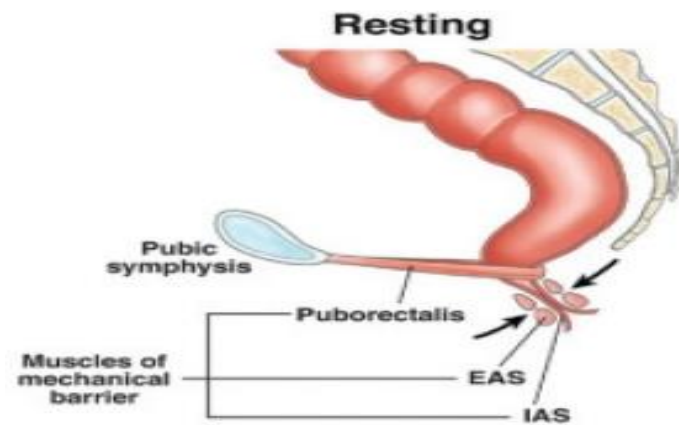
# Physiology of Defecation

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## **Abnormal defecation:**

- A result of dyssynergia, an uncoordinated effort from abdominal and pelvic floor muscles
- Causes:
  - Since childhood
  - After an event (pregnancy, trauma, back injury)
  - Chronic straining and constipation
  - Unknown

(Satish 2016)



- Sensory perception of stool
- Rectal distension
- Contract diaphragm, abdomen, and rectal muscles
- Relax EAS (decreased sphincter pressure)
- Relax puborectalis muscle



- Prolonged colonic transit time
- Discoordination of abdominal, rectoanal, and pelvic floor muscles
- Rectal hyposensitivity
- Paradoxical increase in sphincter pressure
- < 20% relaxation of resting anal sphincter pressure
- Inadequate abdomino-rectal propulsive forces

# Pathophysiology of GI conditions

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## **Dyssynergic defecation:**

- Is often related to incoordination of the abdominal and pelvic floor muscles
  - This failed coordination can result in the following: suboptimal propulsive force, paradoxical contraction, or inadequate anal relaxation.
- Can also be influenced by impaired rectal sensation
- A study found that abnormal balloon expulsion times during ARM (suggestive of dyssynergic defecation) was primarily due to the following causes: elevated anal sphincter pressure at rest, elevated anal sphincter pressure during defecation, and inadequate propulsive force.

(Satish 2016)

# Diagnostic Criteria for Dyssynergic Defecation

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Patients must satisfy diagnostic criteria for functional constipation and/or constipation-predominant IBS.

Patients must demonstrate **dyssynergic pattern during defecation**

- paradoxical increase in anal sphincter pressure (anal contraction), or less than 20% relaxation of the resting anal sphincter pressure, or inadequate propulsive forces observed with manometry, imaging or electromyographic recordings

Patients must satisfy one or more of the following criteria\*

- - Inability to expel an artificial stool (50 mL water-filled balloon) within 1–2 minutes.
- - Inability to evacuate or  $\geq 50\%$  retention of barium during defecography.

(Satish 2016)

# PT treatment for Dyssynergic Defecation

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*Bowel health education: adequate water and fiber intake, proper toilet positioning, regular exercise, bowel routines*

***Biofeedback therapy (\*gold standard\*)***

*Rectal balloon catheter training*

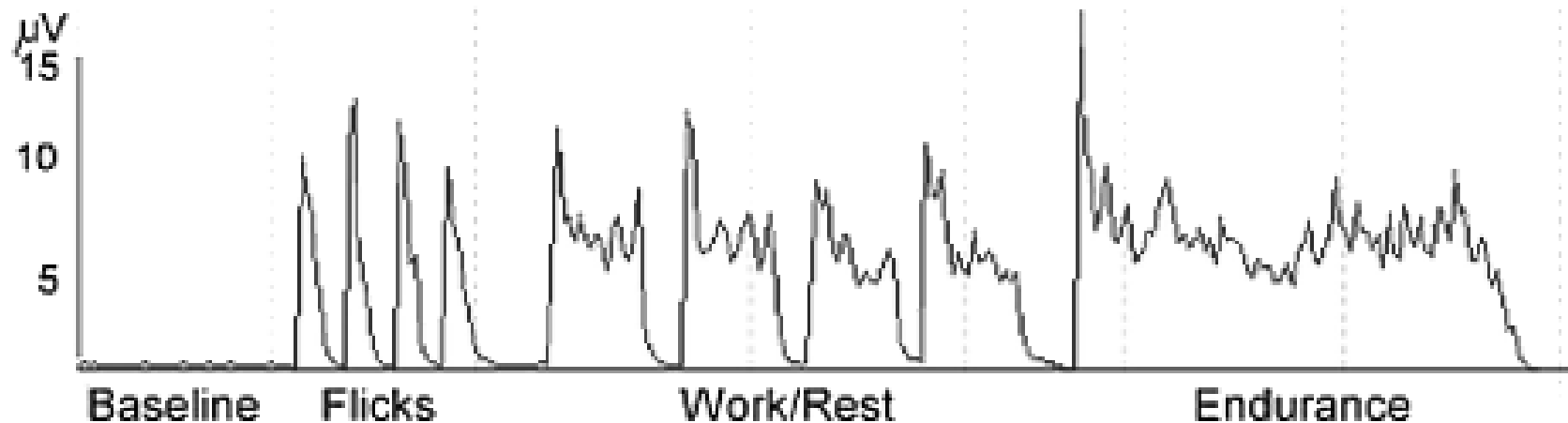
*Manual therapy/internal release techniques*

*Downtraining strategies*

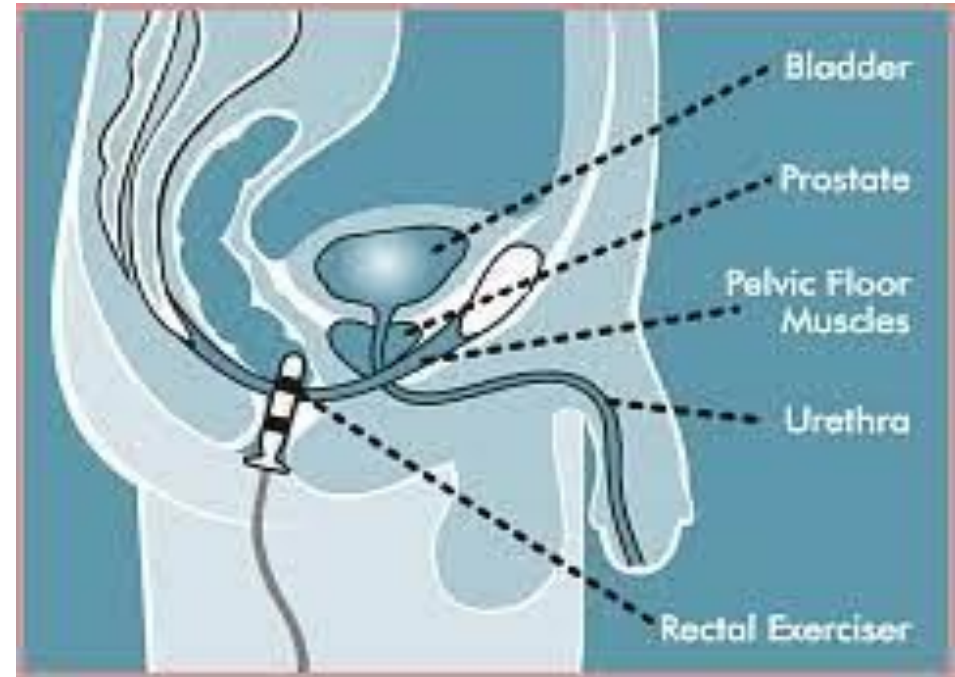
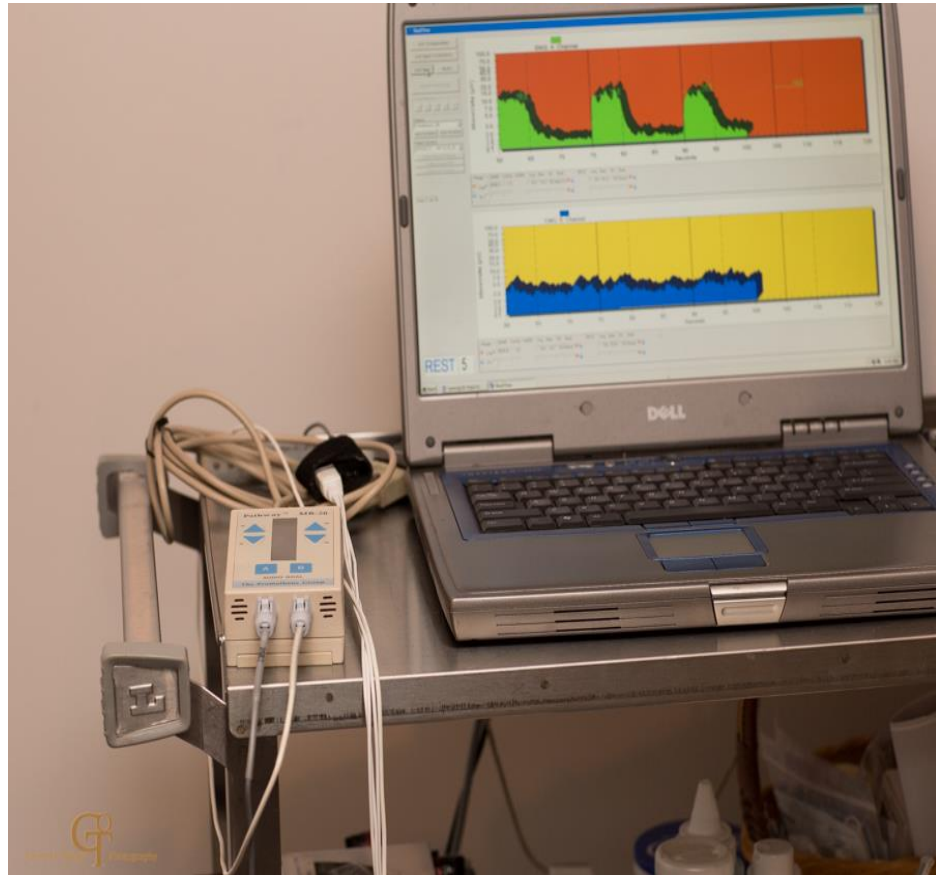
# Biofeedback

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Monitoring or recording of muscle action potential; goal: uptraining (increase muscle activity), downtraining (to decrease muscle activity), coordination (improve timing and sequence of contractions); does NOT measure strength or power, measures increased electrical activity







# Evidence to support biofeedback

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Battaglia, E., Serra, A., et al. (2004). "Long Term Study on Effects of Visual Biofeedback and Muscle Training as a Therapeutic Modality in Pelvic Floor Dyssynergia and Slow Transit Constipation." *Dis Colon Rectum* 91 (3): 297-306

Coffey, S., Wilder, E., et al. (2002) "The Effects of a Progressive Exercise Program with Surface Electromyographic Biofeedback on Adult with Fecal Incontinence." *Physical Therapy* 82 (8): 798-809

Emmanuel, A.V. and Kamm, M.A. (2001) "Response to a behavioral treatment, biofeedback, in constipated patients is associated with improved gut transit and autonomic innervation" *Gut* 49" 214-219

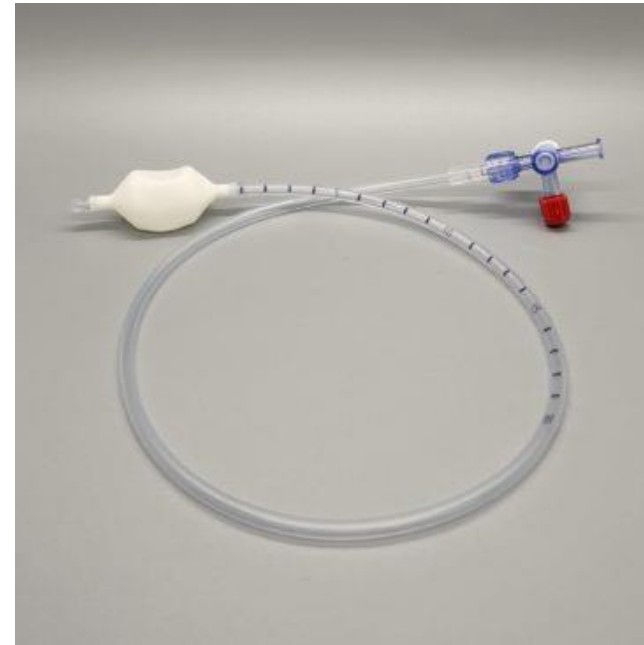
Heymen, S., Jones, K.R., et al. (2003) "Biofeedback treatment of constipation" a critical review." *Dis Colon Rectum* 46: 1208-1217

Norton, C. and Kamm, M.A. (2001) "Anal sphincter biofeedback and pelvic floor exercises for fecal incontinence in adults- a systematic review." *Alimentary Pharmacology and Therapeutics* 15: 1147-1154

# Rectal Balloon Catheter Training

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Process: patient lies on their side and a deflated lubricated balloon is inserted into the rectum. The balloon is slowly inflated and sensory thresholds are determined based off of patient's feedback about first sensation, first urge, and need to "defecate". The patient can then practice either holding the balloon in (in the case of FI) or passing the balloon (in the case of constipation or dyssynergia).



# Pathophysiology of GI conditions

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## **Fecal incontinence:**

- Can be caused by muscle dysfunction/weakness in the following:
  - The puborectalis muscle forms a lasso around the rectal canal, creating the anorectal angle. This feature of the pelvic floor is responsible for continence of solid stool.
  - The internal anal sphincter (IAS) is an involuntary muscle that produces over 50% of anal resting pressure, maintaining continence of gas and liquid stool at rest.
  - The external anal sphincter (EAS) is a voluntary muscle that can double the pressure in the anal canal for short periods of time to assist with overall continence.

# Pathophysiology of GI conditions (Cont.)

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## **Fecal Incontinence:**

- Can be caused by impaired reflexes
  - The rectoanal inhibitory reflex (RAIR) is an involuntary relaxation of the IAS in response to rectal distention, which allows the contents to descend into the anal canal for further assessment of consistency prior to expulsion.
  - The rectoanal excitatory reflex (RAER) is a semi-voluntary contraction of EAS and PR to prevent incontinence following RAIR.
- Other factors include: rectal sensation, stool consistency/quality (diarrhea), and defecation dynamics

# Pathophysiology of GI conditions

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*PFM retraining*

*Biofeedback*

*Rectal balloon catheter training*

*Functional electrical stimulation*

*Lifestyle changes*

*Perianal skin care recommendations*

*Core/hip/back strengthening*

*Relaxation exercises (as needed)*

*Manual Therapy*

# Electrical Stimulation

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- Use for facilitation or inhibition (urge incontinence), improve proprioception through sensory feedback
- Goal of treatment is “to elicit a strong muscle contraction through stimulation of the motor nerve. Can be used to slow disuse atrophy in innervated muscle, to gain muscle ‘strength’ and bulk...”
  - Current concepts in electrical stimulation, 2010
- Contraindications: active UTI’s, currently pregnant, use of pacemaker, metastatic cancer, poor cognition, pelvic pain





# Manual Therapy

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Manual work for scar tissue, myofascial or radiation adhesions

- gentle techniques
- stretching

Nerve glides

Advanced myofascial techniques, advanced fascial release (visceral)

# Pathophysiology of GI conditions

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## **Constipation:**

- Primary
  - Related to issues with colonic or anorectal function (slow transit, inertia)
    - Test: colonic transit test
  - Related to defecatory disorders (dyssynergia)
    - Test: anorectal manometry and balloon expulsion
- Secondary
  - Related to disease or medication
    - Antihypertensives, antidepressants, iron, analgesics, anti-Parkinson, antiepileptic, and antipsychotic drugs

# Diagnostic Criteria for Constipation

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Rome III Diagnostic Criteria [11]

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Diagnostic criteria<sup>a</sup>

1. Must include *two or more* of the following:
  - a. Straining during at least 25% of defaecations
  - b. Lumpy or hard stools in at least 25% of defaecations
  - c. Sensation of incomplete evacuation for at least 25% of defaecations
  - d. Sensation of anorectal obstruction/blockage for at least 25% of defaecations
  - e. Manual manoeuvres to facilitate at least 25% of defaecations (e.g. digital evacuation, support of the pelvic floor)
  - f. Fewer than 3 defaecations per week.
2. Loose stools are rarely present without the use of laxatives
3. Insufficient criteria for irritable bowel syndrome

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<sup>a</sup>Criteria fulfilled for the last 3 months with symptom onset at least 6 months prior to diagnosis

# PT treatment for constipation

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## *Bowel health education*

- *recommendations regarding fiber and water intake*

## *Toilet positioning*

- *squatty potty*

## *Helping promote a regular physical activity routine*

## *Yoga poses*

## *Manual therapy- internal release and colon massage*

## *Biofeedback*

## *Rectal balloon catheter training*

# Colon Massage

Lying on your back with your knees bent up, massage your abdomen in the following sequence:

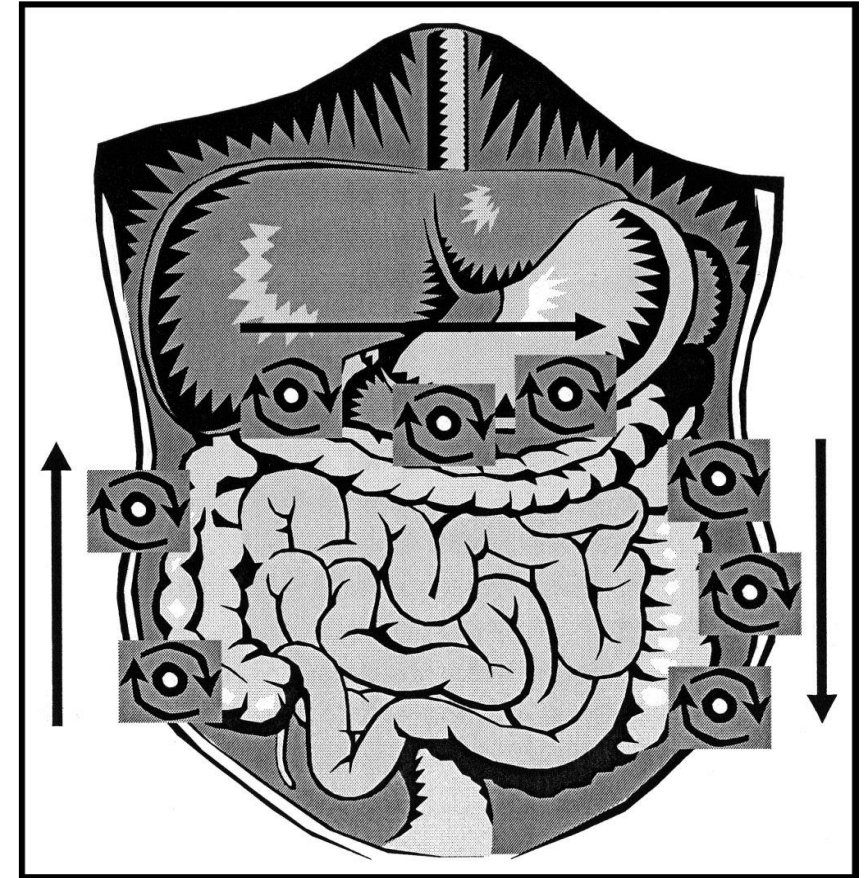
Starting at the right lower quadrant (right inside your pelvic bone) massage in circles up to your ribs on the right side.

Massage in circles from the RIGHT ribcage to your LEFT ribcage

Massage in circles from the LEFT ribcage, down toward your LEFT pelvic bone

Push from the L pelvic bone toward your pubic symphysis (to get stool “out”)

Repeat this sequence 10x, once daily. This massage should take you ~10 minutes.



# Considerations for pelvic PT in “the future”

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Schedule PT visits prior to anorectal manometry to coach patients on proper use of their pelvic floor muscles first

Arrange shadowing opportunities between GI providers and pelvic PTs to gain further understanding of each other’s areas of expertise

Research topic: determine the effects of PFPT on EAS vs levator ani strength and function. Does a difference exist?

# Referral to a pelvic PT

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If your patient is experiencing any of the conditions/symptoms previously discussed, it would benefit them to consult with a pelvic PT

Most private insurances do not require a physician referral

Medicare does require a physician referral

UNC offers pelvic PT services in a variety of locations/geographical areas- Durham, Hillsborough, Cary, Chapel Hill, Pittsboro

# References

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Current Concepts in Electrical Stimulation (2010) Retrieved 8/2/22 from <http://www.electrotherapy.org/assets/Downloads/Current%20Concepts%20in%20Electrical%20Stimulation%20may%202010.pdf>.

(J Neurogastroenterol Motil 2016; 22(3): 423-435 <https://doi.org/10.5056/jnm16060>. Diagnosis and Treatment of Dyssynergic Defecation. Satish S C Rao<sup>1,\*</sup>, and Tanisa Patcharatrakul<sup>1,2</sup>)

NIH National Library of Medicine. StatPearls Diarrhea. Nemeth V and Pflieger N. Nov 29 2021.

Battaglia, E., Serra, A., et al. (2004). "Long Term Study on Effects of Visual Biofeedback and Muscle Training as a Therapeutic Modality in Pelvic Floor Dyssynergia and Slow Transit Constipation." Dis Colon Rectum 91 (3): 297-306

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# PT contact info

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# Questions?

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