

Gastrointestinal Review¹

- Fecal continence is maintained by:
 - Anatomic factors
 - Anorectal sensation
 - Rectal compliance
- Thus, problems can arise from:
 - Extrinsic disorder of CNS/PNS
 - Intrinsic disorder of the colon, rectum, anal sphincters, PFM, or combination



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Gastrointestinal Reflex Review^{1,2}

- Intact IAS ensures continence during sampling
Rectoanal Inhibitory Reflex (RAIR)
 - IAS relaxes
 - EAS contracts to help maintain continence (and during increases in IAP)
- Parasympathetic Defecation Reflex
 - Chronic suppression can lead to constipation problems
- Intrinsic Defecation Reflex
 - Can be easily suppressed by conscious control (including conscious PFM contraction)



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Musculoskeletal Component of GI System Review^{3,4}

- Puborectalis maintains anorectal angle to support continence
- During defecation, the pelvic floor muscles (including IAS and puborectalis) should either:
 1. Relax – when over toilet to allow normal, complete evacuation
 - Ensure proper positioning on the toilet to promote opening (increasing) of the anorectal angle, relaxation of puborectalis, contraction of rectum and stool evacuates
 2. Contract – to store feces if defecation is inappropriate (via Accommodation Reflex)



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Puborectalis

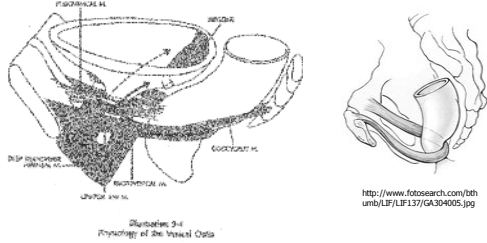


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Pelvic Floor Musculature

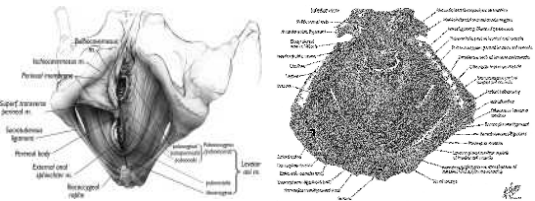


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Pelvic Floor Disorders that Affect Defecation that are Amenable to PT

- PT can address these problems:^{4,5}
 - Functional Disorders:
 - Pelvic floor dyssynergia (obstructed defecation, constipation, dyschezia, tenesmus)
 - Underactive pelvic floor muscles (inadequate defecatory propulsion, incontinence)
 - Structural Disorders:
 - Rectocele
 - Rectal prolapse
 - Neoplasm
 - Hirschsprung's disease



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Dyssynergic Defecation⁴

- Dyssynergic defecation
 - aka: anismus, pelvic floor dyssynergia, obstructive defecation, paradoxical puborectalis, pelvic outlet obstruction, spastic pelvic floor syndrome
 - Results from non-relaxing pelvic floor muscles (PFM) or from lack of ano-rectal coordination
 - Involuntary anal spasm, impaired coordination, and/or inadequate relaxation during defecation is the main cause
 - Manifests as: paradoxical contraction, limited perineal descent, or impaired push effort
- Management: PT and biofeedback to promote increased sensory perception in the rectum and correct the underlying dyssynergia



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Constipation/Obstructed Defecation⁴

- Presence of rectal prolapse or rectocele
- Presence of pelvic pain
 - When constipated, patients can resort to significant straining in order to evacuate
 - further increases the tension on the PFM, contributing to weakness and pudendal nerve damage/overstretch
 - With the muscular weakness/relaxation that results, there is no counteracting force to facilitate support to the rectum during bearing down and thus the rectum can prolapse through the anus or the vaginal vault



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Anal Incontinence

- Gas and fecal incontinence
 - With insufficient, untimely, or absence of proper PFM muscle contraction (including IAS and EAS), anal contents can escape and result in incontinence⁶
 - Incomplete evacuation can result in passive soiling⁷
 - Up to 50% of people with FI exhibit abnormal defecation dynamics⁷



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Physical Therapy Intervention³

- Full evaluation (rectal, vaginal in some cases) internally and externally to assess the musculoskeletal system to determine the cause(s) of the dysfunction after MD referral
- Treatment Options
 - Manual Techniques
 - Bowel/Bladder Retraining
 - Neuromuscular Re-education/Biofeedback
 - Therapeutic Exercise
 - (Modalities PRN, including electrical stimulation)



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Manual Therapy Techniques³

- Techniques for pain relief directed at specific musculature
- Manual facilitation of correct PFM contraction or relaxation
 - Neuromuscular re-education
- Scar tissue techniques
- Research shows a reduction in anal canal resting pressures with use of manual techniques⁸



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Bowel/Bladder Retraining³

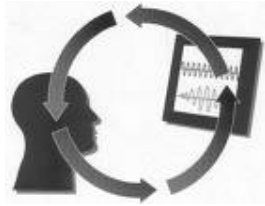
- Bowel/Bladder 3 day analysis
- Appropriate timing of elimination
 - Avoidance of chronic urge suppression/attempting without an urge
- Proper defecation positioning
- Proper avoidance of straining
- Proper PFM elongation/relaxation with defecation



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Biofeedback ⁹

- Typically unknown information about a physiological process is converted into simple visual or auditory cues
- Biofeedback has been shown in the literature to be the MOST effective treatment option in ADULT patients with dyssynergic defecation ⁸



http://www.effective-time-management-strategies.com/images/biofeedback_techniques.jpg

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Biofeedback/Neuromuscular Re-education

- Purpose: Re-training the PFM to correct dyssynergia, improve coordination, and improve pelvic floor strength/support^{3,4}
 - Easy to detect paradoxical activity in the PFM⁵
- Types:
 - Manual cues
 - Mirror
 - sEMG (internal or external)
 - Pressure EMG
 - Balloon catheter
 - Rehabilitative Ultrasound
 - **no single technique appears more effective than others, based on researchers training and experience



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Specialized Pelvic Floor Biofeedback Equipment

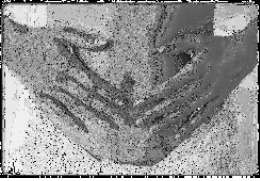


Photos available at: http://www.currenttechnologyinc.com/pages/pages.asp?page_name=comp_pathway



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Biofeedback Takes Many Forms



<http://img.timeinc.net/health/200704/PelvicPain225.jpg>

- Verbal instruction and reinforcement can be effective feedback⁹
 - More practical
 - More affordable
 - Encouragement, praise, and good rapport between therapist and patient, as well as proper training of the therapist is KEY



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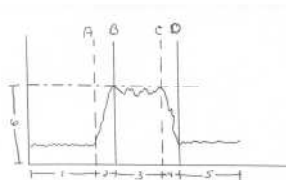
Successful Patient Education³

- Good explanation of: pathophysiology of condition, normal physiology/desired response, equipment (i.e.: device and screen)
- Easy to see visual/auditory cues
- Proper therapist feedback
 - Knowledge of performance, Knowledge of results
 - Encourage independent problem solving
- Achievable goals
- Adequate rest



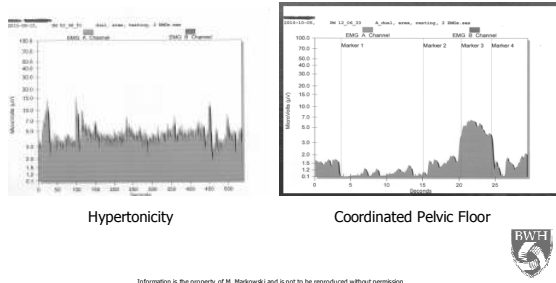
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Biofeedback³



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Biofeedback Examples



Physical Therapy and Patient Education³

- Dependent on the type of presenting dysfunction
- Educate and demonstrate proper techniques/behaviors
 - Eating, water consumption, positioning, proper defecation position/elimination techniques, proper cueing for PFM relaxation or contraction as appropriate
 - Education on the physiology of elimination process and the voluntary influences that we can change
 - Role of the PFM in elimination and/or continence
 - “When to turn it on, when to turn it off”
- NO ADVERSE SIDE EFFECTS



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“Typical Treatment Course”

- No cookbooks or typical patients
- Evaluation and given bowel/bladder diary to complete
- Visit 2 onward, depending on neuromuscular dysfunction:
 - If straining = teach proper defecation mechanics for full and proper elimination
 - If weak = proper pelvic floor muscle strengthening (START with identifying PROPER pelvic floor muscles)
 - If pain or muscular tightness component = manual techniques and self stretching and relaxation techniques
 - If problem with stool quality (too soft/too firm) = education on diet and water intake
 - Review “behavioral habits” with bowel/bladder diary, correct as needed (doesn’t sit to defecate, chronic suppression)



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Research

- Biofeedback for dyssynergic defecation shown to be superior to laxatives, sham feedback, standard therapy, placebo, and diazepam (Rao 2009)⁴
- Biofeedback for fecal incontinence is still lacking in efficacy, although it is effective in patients with chronic anal pain (Enck 2009)⁸
- Biofeedback + pelvic floor muscle exercise (PFME) was superior to PFME alone in treatment of FI at 3 months and 12 months follow-up (Heymen 2009)¹⁰
- Level B evidence, based on good, consistent scientific evidence, to support the use of PT in the treatment of chronic pelvic pain¹¹ (Abraham 2008)



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Research Update: Heymen et al, 2009 RCT ¹¹

- 108 patients (45 biofeedback + PFME and 63 PFME only)
 - Both groups received educational intervention, behavioral strategies, PFME, fiber supplements and anti-diarrheal agents as needed to modify stool consistency
 - 6 visits, once every 2 weeks for one hour with PT
 - Results:
 - Bio + PFME group = greater reduction in Fecal Incontinence Severity Index (FISI); fewer days per week with FI, complete continence in 44% (20/45) compared to 21% (13/63) in PFME group; 76% of biofeedback patients reported adequate relief from FI compared with 41% of PFME
 - Biofeedback group continued to report greater reductions in FISI at one year and continued to report adequate relief 53% (24/45) versus 35% (22/63) in PFME group

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Selecting Patients for Physical Therapy

- Positive Prognostic Indicators:¹²
 1. Patients with good sphincter function before treatment
 2. Patients with mild to moderate FI
- Motivated patient
 - Active participant
- Cognitive processing skills and attention⁵

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Referring to Pelvic Physical Therapy

- Physician referral after formal GI workup to rule out non-musculoskeletal causes of symptoms
- Prescription for PT "Physical Therapy Evaluate and Treat for _____(diagnosis)"
- Patient calls to schedule appointments



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Case Studies

- M.R. (Anal incontinence)
 - 2 year history of fecal and gas incontinence, particularly of looser stool, unchanging symptoms in time. Feels like "I am never done defecating and I could wipe forever."
 - Anal manometry revealed decrease in anorectal resting and squeeze pressure, mild decrease in sensation to balloon distension, incomplete relaxation of anal sphincters with balloon distension
 - No previous treatments to date
 - Goals: To eliminate/reduce leakage
 - Inconsistent ability to voluntary relax/elongate PFM for defecation, 2+/5 PFM MMT, involuntary contraction absent, abdominal muscle substitution with attempts at PFM contraction
 - In 3 visits, 60% improvement in completeness/ease of defecation and reduced leakage
 - In 6 visits, 100% improvement in completeness/ease of defecation and no further episodes of anal leakage secondary to gains in PFM strength, coordination, awareness, proper defecation habits

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Case Studies

- S.K. (constipation/dyschezia/chronic enema, laxative use)
 - 5 year history of enema 3x/day and/or glycerin suppository secondary to "inability to have a BM without them" use with worsening symptoms in time
 - Daily abdominal pain/cramping, thinks she "has to go 3 times a day" to be "normal"
 - No change with Zelnorm, colace, or Miralax
 - Goals: BM without enema use and no belly pain/cramps
 - Incomplete relaxation of PFM with attempts at defecation, PFM hypertonicity, tenderness to palpation of puborectalis and EAS
 - In 7 visits, no more enema use, 1-2 suppositories a month, no further belly pain/bloating, restored PFM coordination,
 - In 12 visits, no more enema or suppository use, (3 months later) with 1 independent BM daily, no tenderness to palpation
 - "This has changed my life" 100% improvement



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Conclusion

- Many GI conditions can have musculoskeletal components that are amenable to pelvic physical therapy intervention
- Correction of the underlying pathophysiological dysfunction lends patients better control of symptoms when compared to surgical correction of anatomic deficits⁴
- PT, including biofeedback, is a non-invasive option with evidence based results with no side-effects
- Neuromuscular re-education is key- biofeedback is a part of this
- Questions?
- Thank you!



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