

Getting to the Bottom of it: Conquering Benign Anorectal Disorders



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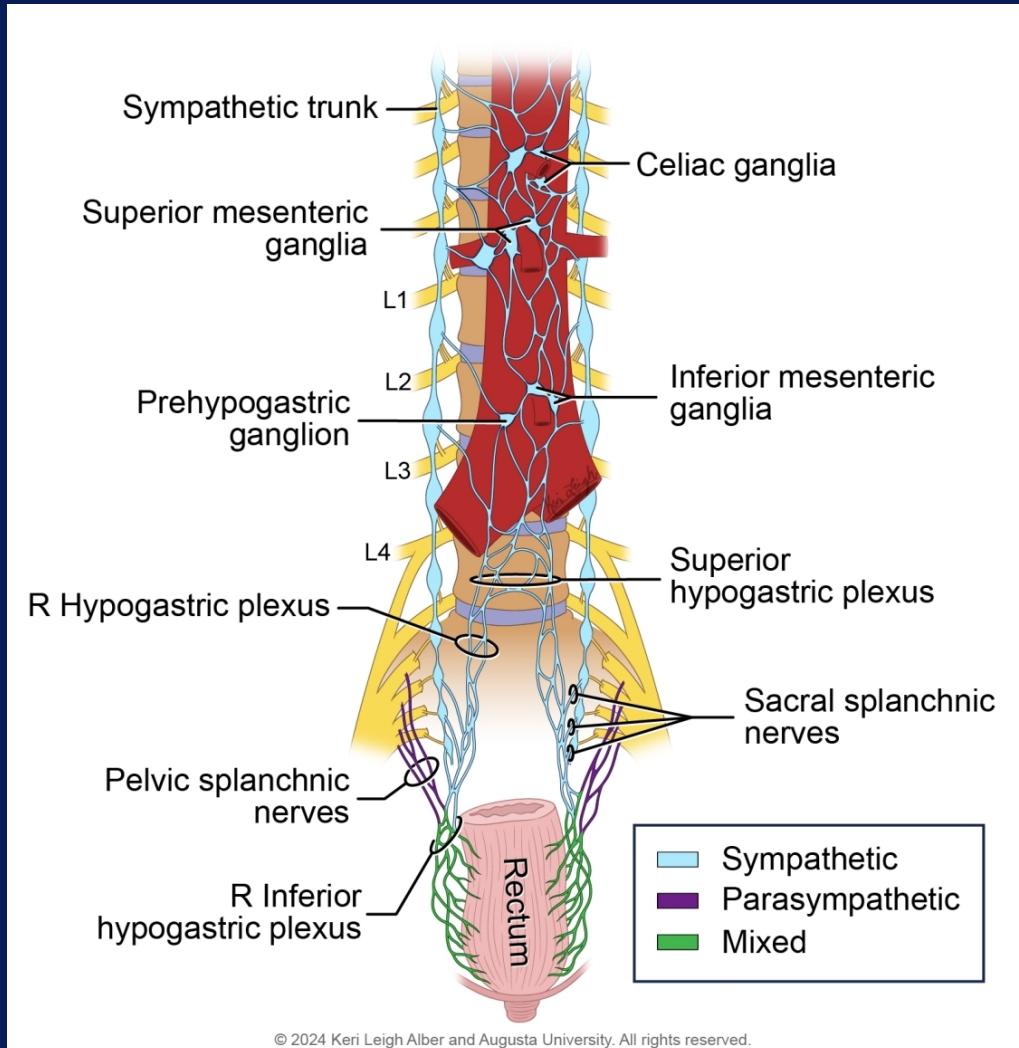


AUGUSTA
UNIVERSITY

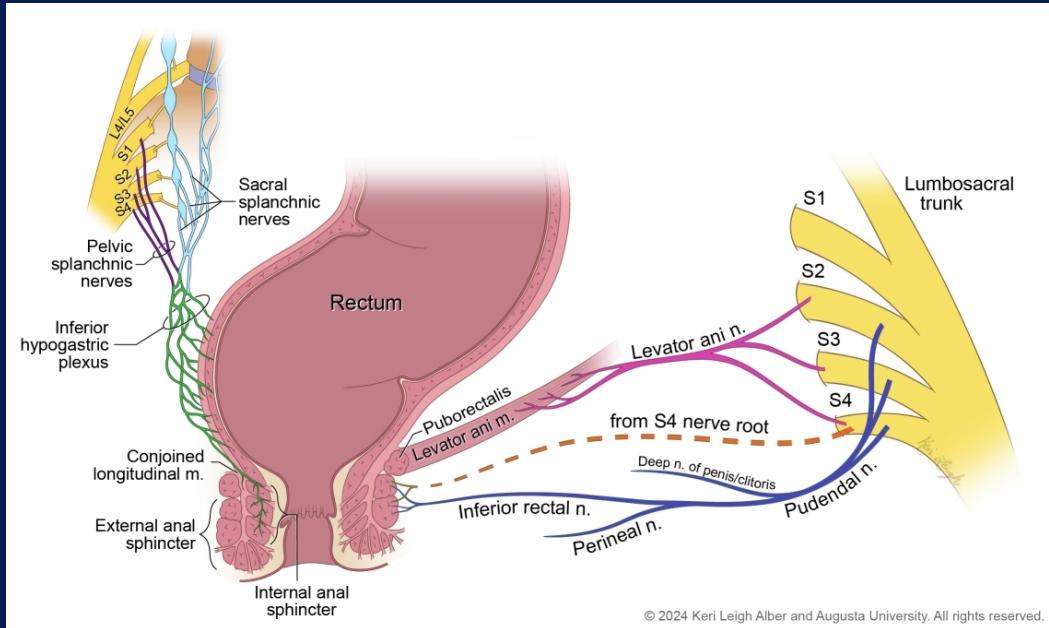
OBJECTIVES

- **Pathophysiology of Anorectal disorders**
- **Evaluation of Anorectal disorders**
 - **Digital Rectal Exam**
 - **Anorectal Manometry + BET+ Others**
 - **Translumbbosacral anorectal magnetic stimulation (TAMS)**
- **Discuss Treatment**
 - **Dyssynergic Defecation**
 - **Fecal Incontinence**
 - **Anal Fissure**
 - **Hemorrhoids**

Neuroanatomy of the Anorectum



Y. Yan, Rao S, et al Am J Gastro 2025



- Sympathetic innervation arises from the superior hypogastric plexus, hypogastric plexus and splanchnic nerves (T1-L2).
- Parasympathetic from pelvic splanchnic nerves (S1-S4).
- Mixed autonomic from inferior hypogastric plexus.
- Somatic from pudendal nerves.
- Intercommunicating nerves.

Case Study

41-yr-old school teacher

■ Increasing constipation- 3 years

- Now, B.M once every 1-2 weeks, hard, pellet-like stool only after phosphosoda enema + suppository and laxatives
- Uses digital maneuvers, and describes excessive straining, incomplete evacuation and occasional bleeding
- Tried OTC laxatives, linaclotide, PEG-no relief

■ O/E: lower abdominal fullness

■ What next?

Evaluation of Anorectal Function

- History
- DRE
- Stool diary



Constipation APP

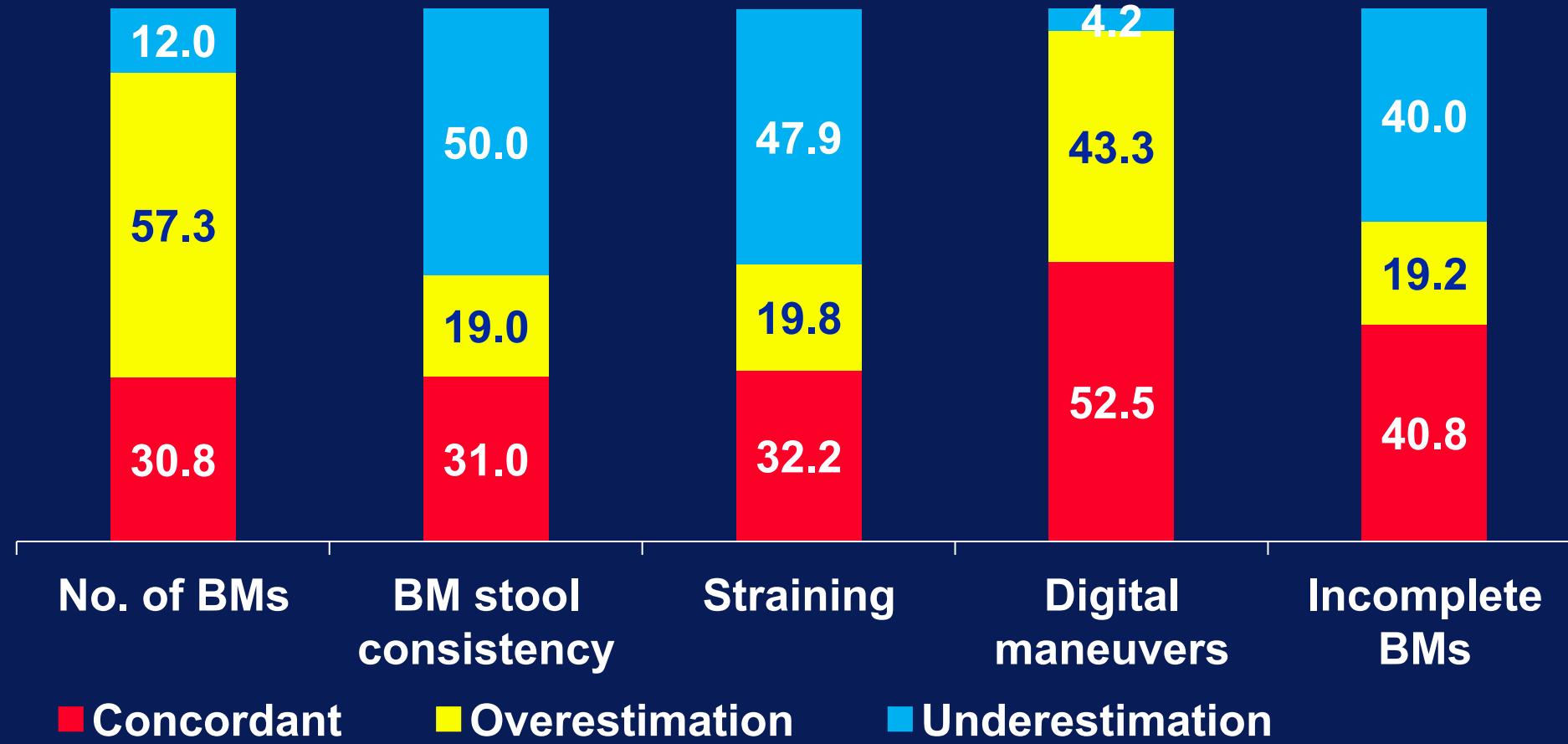


Fecal Incont. APP

- Anorectal high resolution manometry
- Anal Endosonography
- Rectal Compliance Test
- Pudendal Nerve Terminal Latency
- Balloon expulsion test
- Defecography

- Anal High Definition Manometry
- Translumbbosacral Anorectal Magnetic Stimulation (TAMS)

How accurate is constipation history? Recall vs Prospective Stool diary



Constipation APP vs Paper Diary



Constipation APP

	Test-retest/Reliability (n=16)				Validity (n=16), APP vs Paper			
	First week	Second week	ICC	P	APP	Paper	ICC	P
No. of BMs	6.9 ± 1.0	5.2 ± 0.8	0.8	<0.0001	12.1 ± 1.7	12.8 ± 1.9	0.9	<0.0001
No. of SBMs	4.4 ± 1.3	3.4 ± 0.9	0.9	<0.0001	7.8 ± 2.1	10.3 ± 2.0	0.9	<0.0001
No. of CSBMs	1.9 ± 0.9	1.6 ± 0.7	0.9	<0.0001	3.5 ± 1.5	4.3 ± 1.6	0.9	<0.0001
Time on toilet (min)	9.4 ± 1.9	9.0 ± 2.0	0.9	<0.0001	9.1 ± 1.9	7.8 ± 1.8	0.9	<0.0001
No. of Type 1-2 stools	1.4 ± 0.8	0.9 ± 0.3	0.07	0.445	2.3 ± 0.8	2.6 ± 1.0	0.9	<0.0001
No. of Type 3-5 stools	3.2 ± 0.8	2.4 ± 0.7	0.2	0.345	5.6 ± 1.1	7.8 ± 2.1	0.8	0.0001
Digital Use (n)	2	2	0.6	0.043	3	3	1.0	1.000
No. of Gas	3.4 ± 0.8	2.4 ± 0.5	0.7	0.011	5.8 ± 1.2	8.4 ± 1.9	0.7	0.003
No of Bloating	5.1 ± 0.6	3.9 ± 0.6	0.8	0.003	9.1 ± 1.1	9.4 ± 1.8	0.8	0.004

Who wants a Rectal exam?



*Essential components
of performing DRE*



3-step DRE-PROTOCOL

1) Inspection

2) Perianal sensation & anocutaneous reflex:

- normal, impaired, absent

3) Digital maneuvers: mass, tenderness, stool

- Squeeze x 2: normal, weak, increased

- Bearing down x 2

- push effort, sphincter relaxation, perineal descent

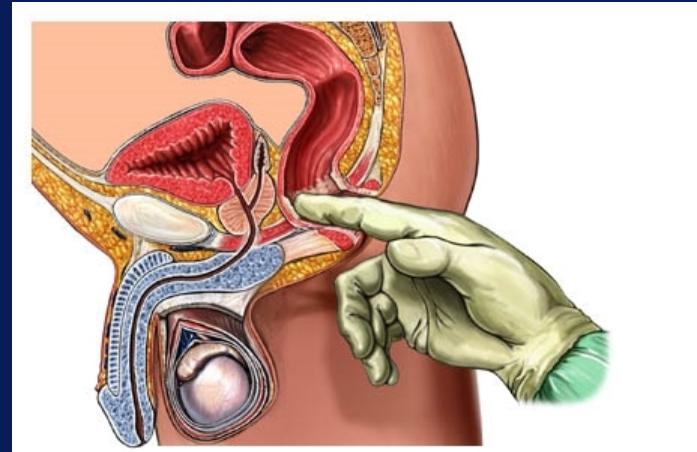


Clinically dyssynergia if ... any 2;

- inability to
 - contract abdominal muscles
 - relax anal sphincter
- paradoxical contraction of anal sphincter
- absence of perineal descent

Yield of rectal exam in dyssynergia, n=209

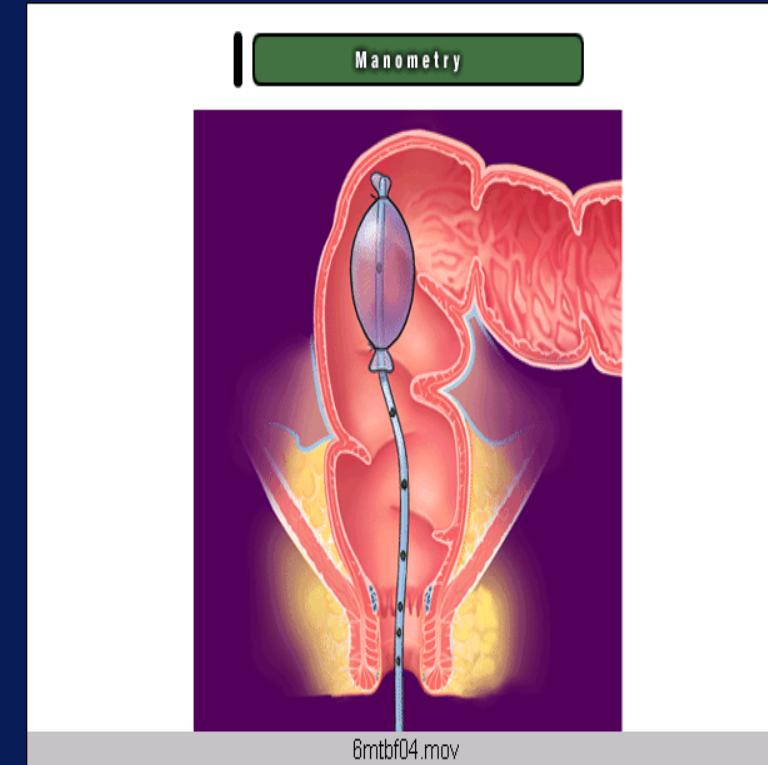
- All patients had
 - DRE
 - Anorectal manometry
 - Balloon Expulsion Test
- Data Analyzed independently



Parameter	Sensitivity (%)	Specificity (%)
Dyssynergia from DRE	75%	87%
Balloon expulsion test	49%	90%

ANORECTAL MANOMETRY

- **Assessment of:**
 - **Pressure, Sensory and Reflex activity of the anus and rectum**
 - **Dynamics of defecation and continence.**



Anorectal Manometry Probes

Air-Charged
disposable probe



High resolution probe



3D High-definition probe



Unisensor probe



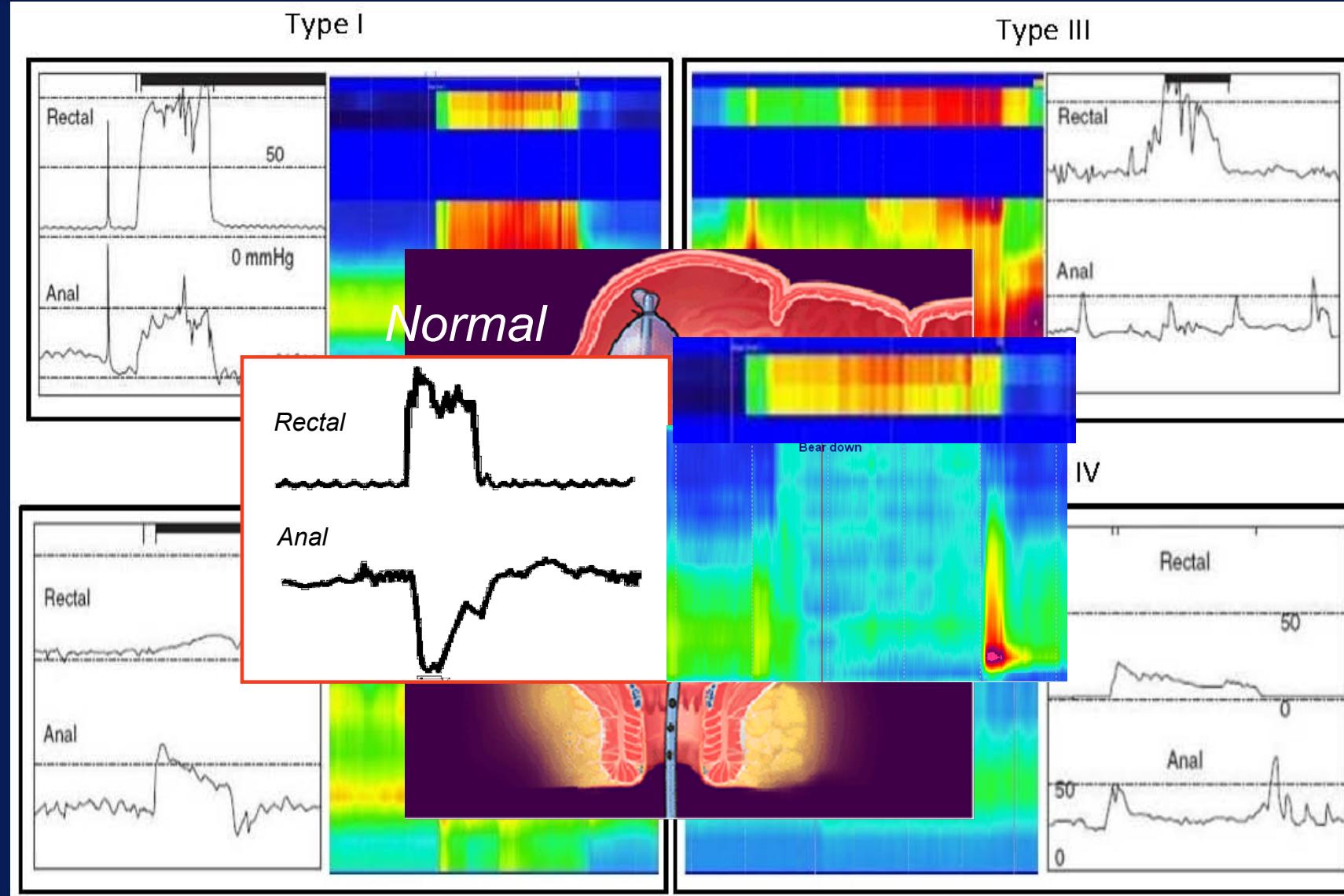
Rao ARM Protocol

- Resting Pressure (5 min)
- Squeeze (30 s)
- 1 minute rest
- Squeeze (30 s)
- 1 minute rest
- Push/bear down (30 s)
- 1 minute rest
- Push/bear down (30 s)
- 1 minute rest
- Cough
- 30 s rest
- Cough
- 15 s rest
- Rectal sensation/Compliance/RAIR using intermittent rectal balloon distension technique
- Push on commode with 60 cc balloon (30 s)
- Balloon expulsion test (5 min)

IAPWG Protocol

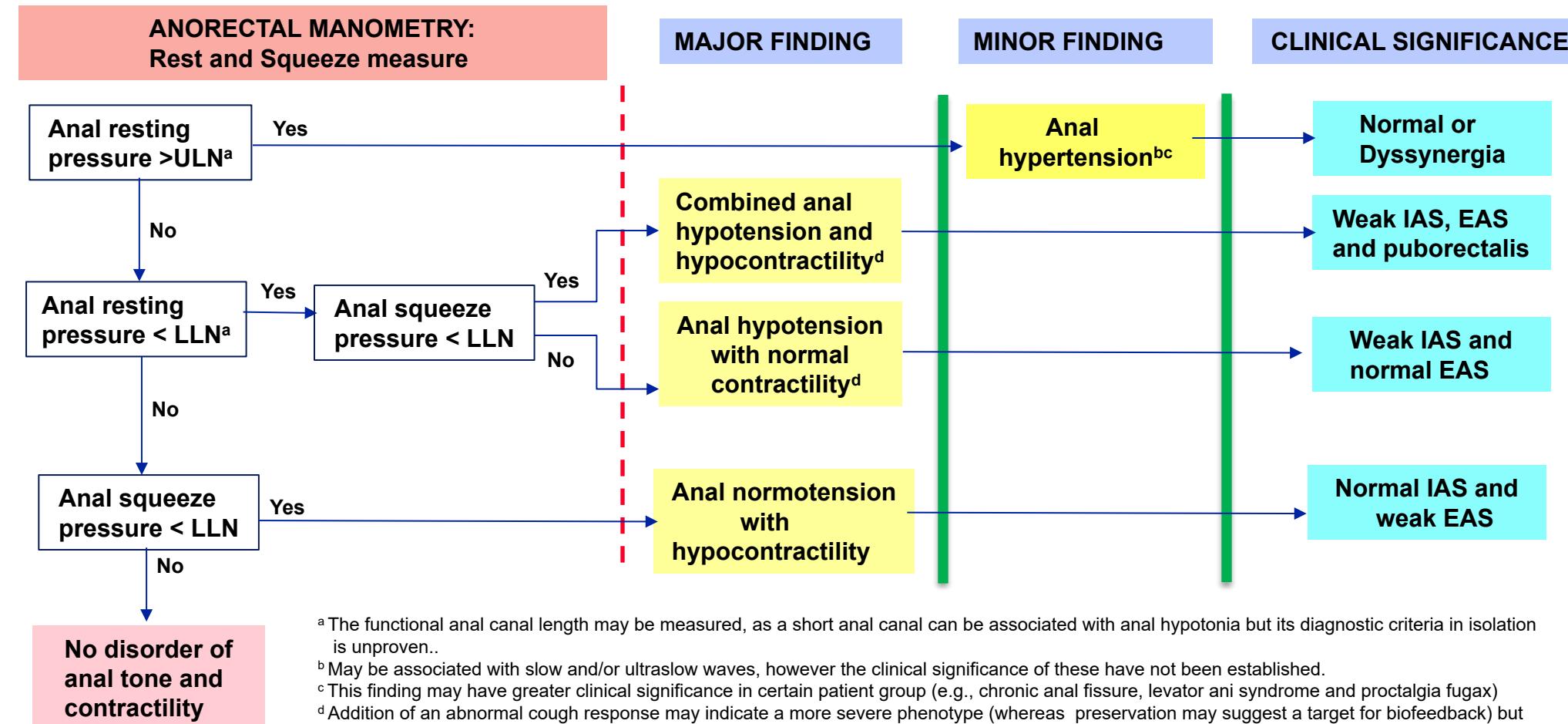
- Stabilization period(3 min)
- Rest (60 s)
- Short squeeze (5 s) x 3
- Recovery interval (30 s) after each squeeze (x 3)
- Long squeeze (30 s)
- Recovery Interval (60 s)
- Cough x 3 (5 s)
- Recovery Interval (30 sec after each cough x 3)
- Push (15 s) x 3
- Recovery Interval (30 s) after each push x 3
- Rectal sensory testing (2 min)
- RAIR (60 s)

Types of Dyssynergic Defecation



London Classification

LONDON CLASSIFICATION PART II: DISORDERS OF ANAL TONE AND CONTRACTILITY



modified

Carrington E, Heinrich H, Knowles C, Rao SS et al. *Neurogastroenterol Motil.* 2019.

LLN: Lower limit of normal
ULN: Upper limit of normal

Diagnostic Criteria-Dyssynergic Defecation

1. The patient must satisfy diagnostic criteria for **functional constipation-Rome III**
2. During repeated attempts to defecate must demonstrate **Dyssynergic pattern** of defecation
 - Manometry
 - EMG
3. Patient must demonstrate **one other abnormal** test:
 - a. Abnormal balloon expulsion Test (> 1 minute)
 - b. Prolonged Colonic Transit Time (radioopaque markers or wireless motility capsule or Scintigraphy)
 - c. Abnormal Defecogaphy ($\geq 50\%$ barium retention)

Bharucha et al, Gastroenterology 2006; 130: 1514

Rao SSC. Gastroenterol Clin N Am 36 (2007) 687-711

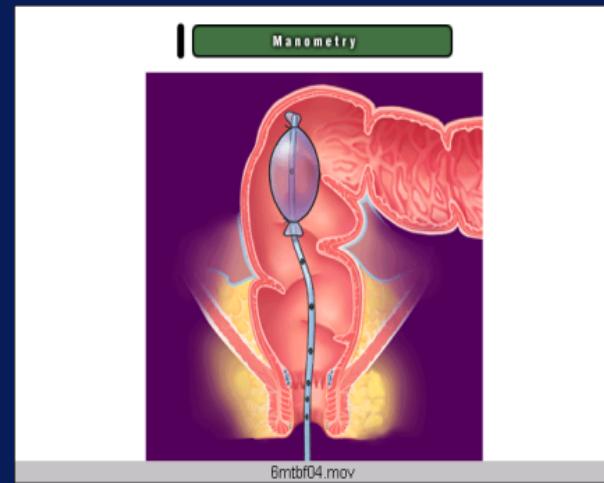
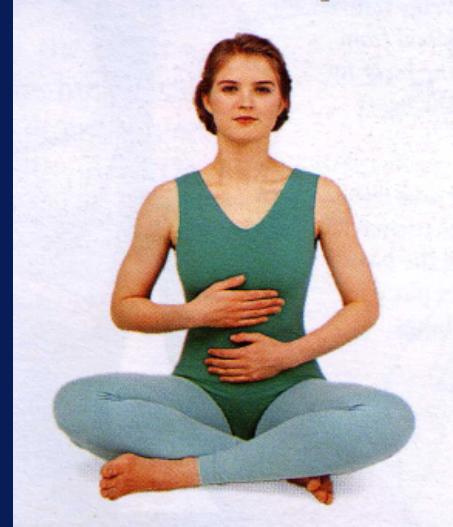
How to Treat Dyssynergic Defecation ?

- **General Measures**
 - Diet, exercise, fluids & habit training
 - Laxatives/Prokinetics
- **Specific Treatment**
 - Botox injection
 - Biofeedback therapy
 - Cognitive Behavioral Therapy
 - Surgery
 - Myectomy- 30% improvement
 - Colostomy

Biofeedback-Dyssynergia

» *Goals of Therapy:*

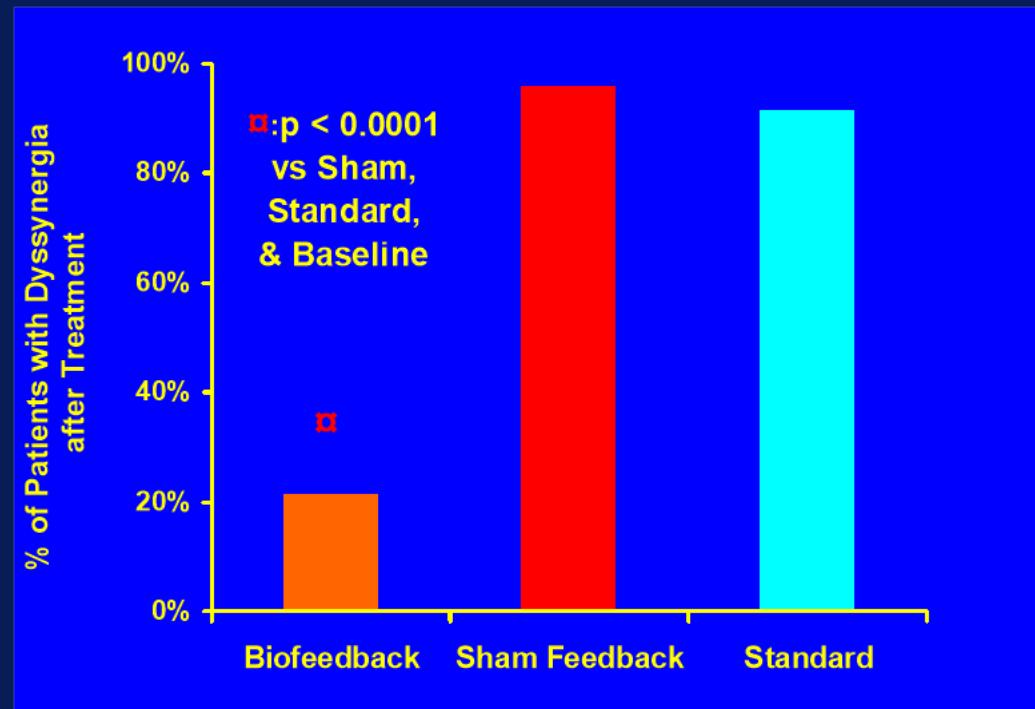
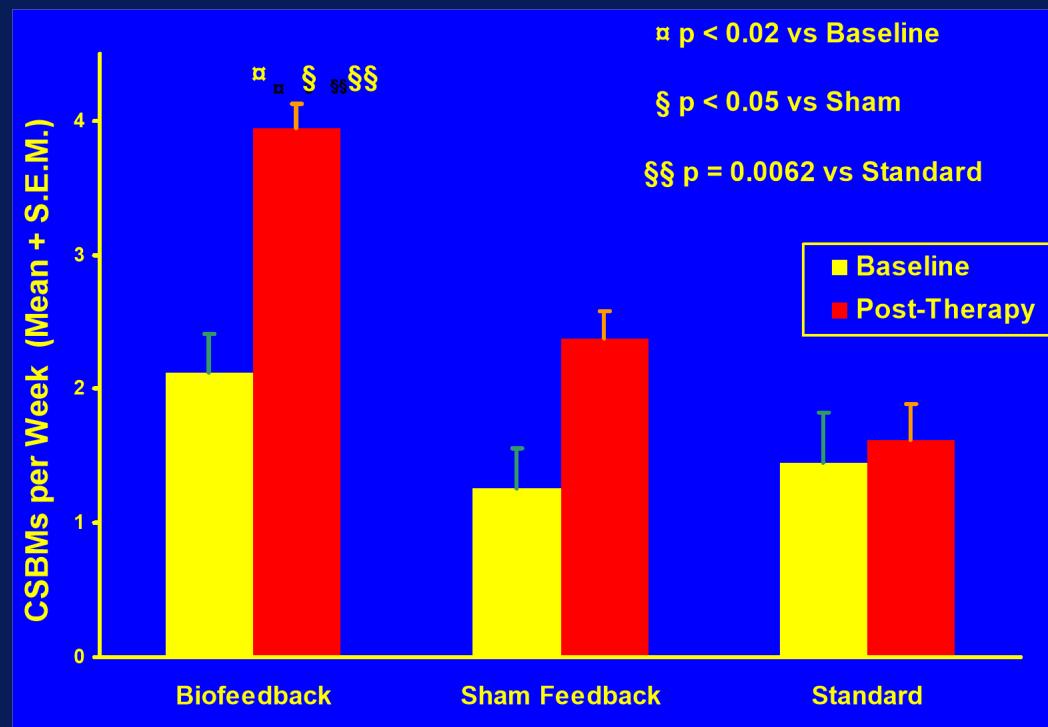
- A) Teach *Diaphragmatic breathing exercise*
- B) Teach *anal sphincter & pelvic floor relaxation*
- C) Improve *Rectal Sensation*
- D) Eliminate *Sensory Delay*
- E) Improve *Recto-anal Coordination*



Biofeedback Therapy-RCTs

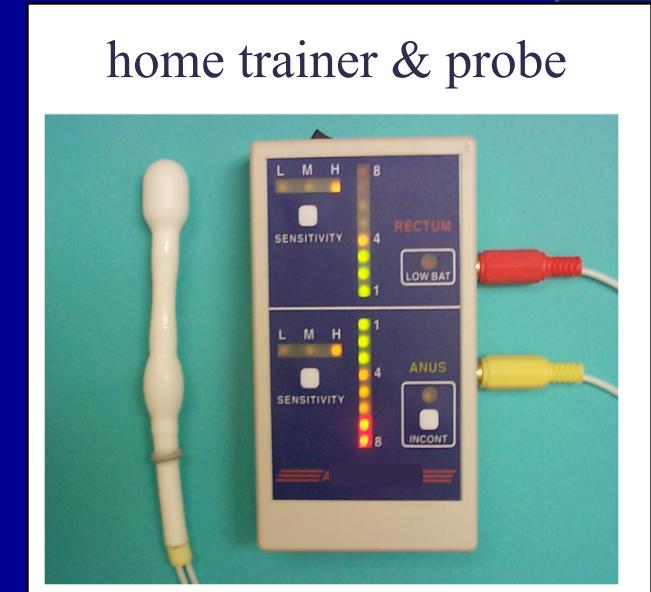
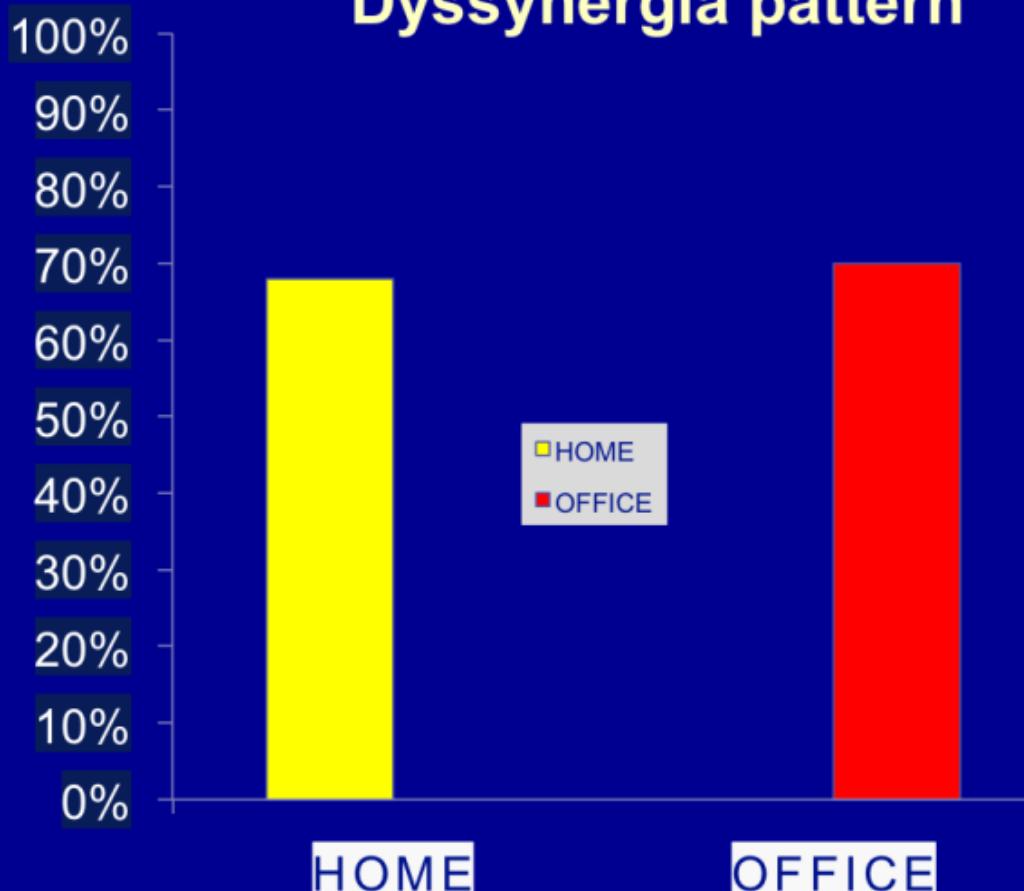
- Biofeedback Vs PEG 14.6 g for Dyssynergia
 - *Chiarioni et al, Gastroenterology 2006; 130: 657-64*
- Biofeedback vs Diazepam for Dyssynergia
 - *Heymen et al, Dis Col Rectum 2007*
- Biofeedback vs Sham Therapy vs Standard Therapy
 - *Rao et al CGH 2007*
- Biofeedback vs Standard Therapy-One Year outcome
 - *Rao et al Am J Gastroenterol 2010*
- *Home vs Office Biofeedback Therapy-Efficacy & Cost Effectiveness*
 - *Rao et al, Go et al, DDW 2011*

Effects of Biofeedback Therapy on CSBM & Dyssynergia- ITT Analysis



Home vs Office Biofeedback- Responder Analysis, How Effective?

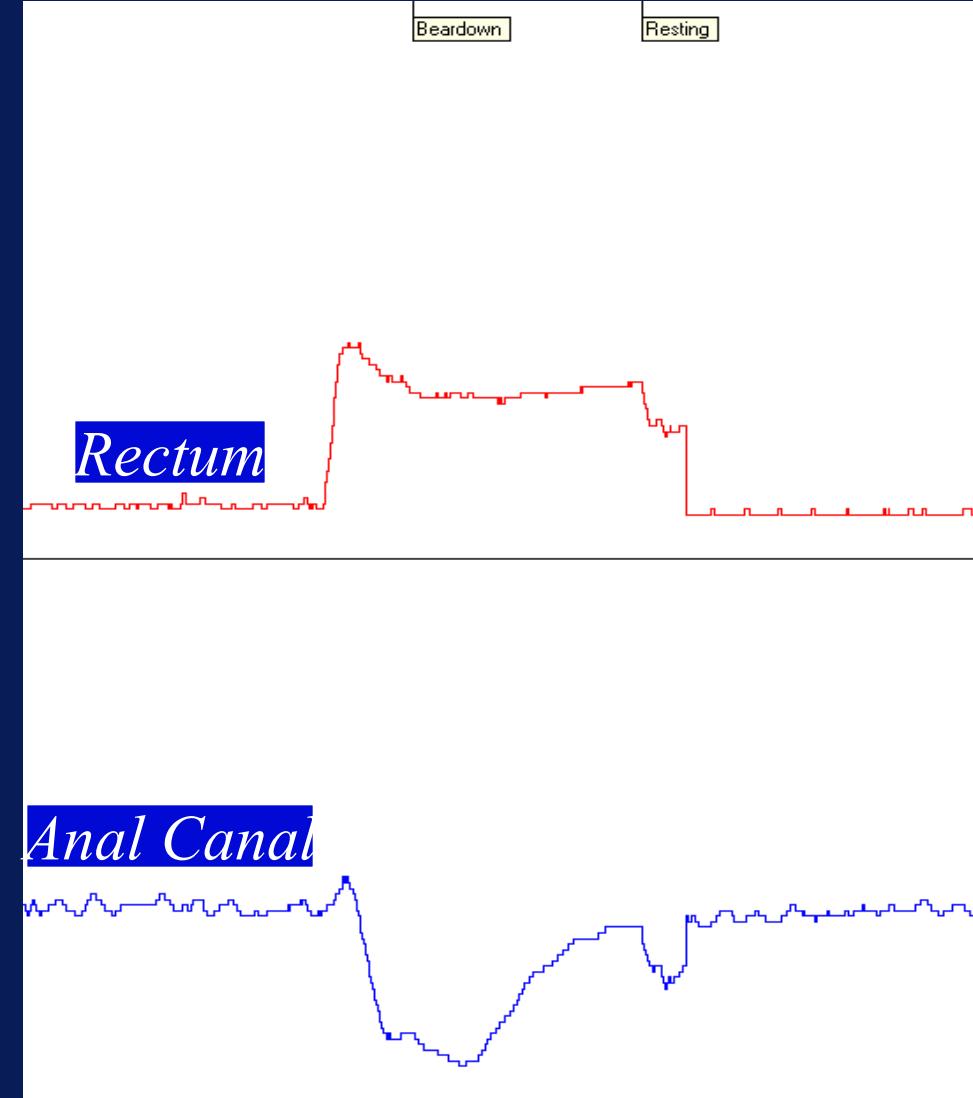
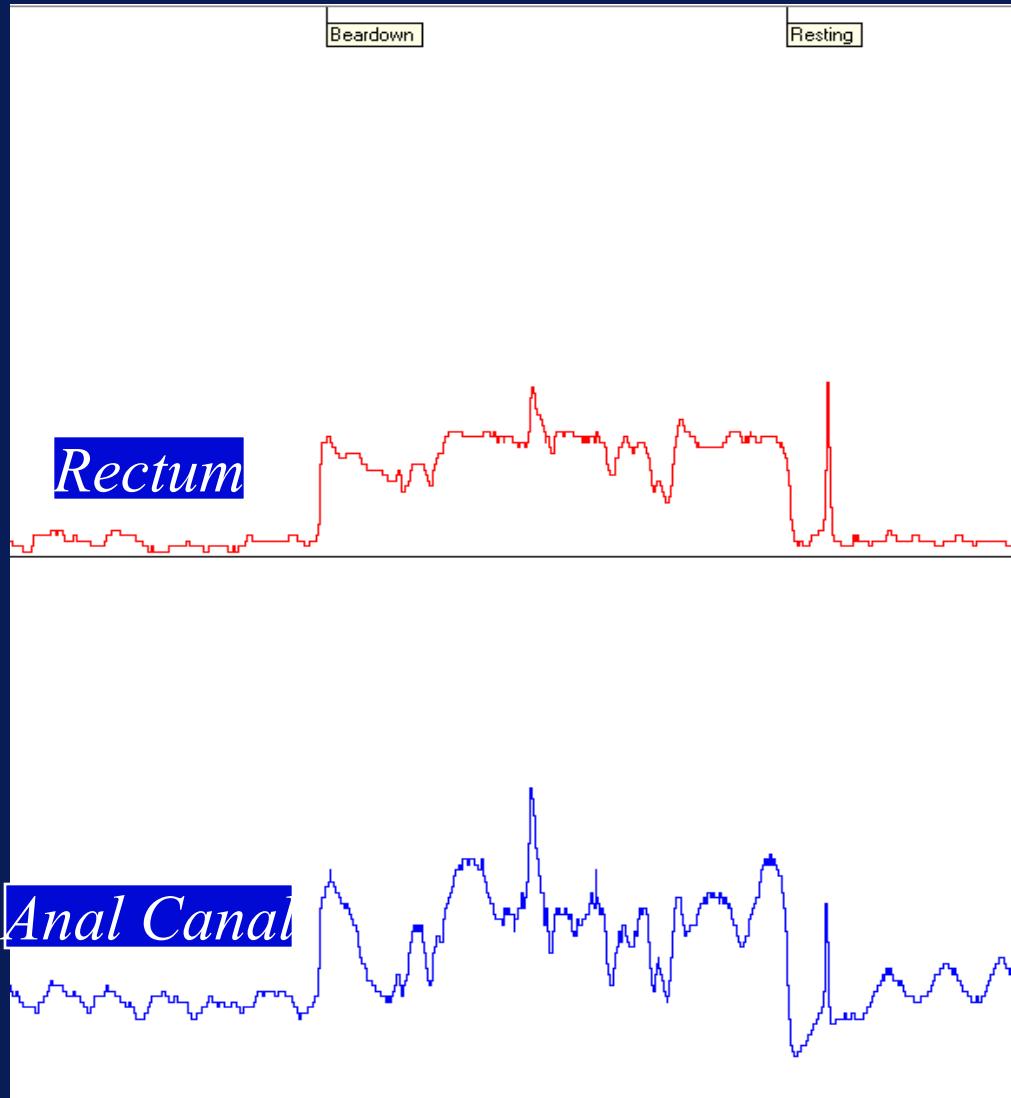
RESPONDER= ≥ 1 CSBM/wk + Normalization of Dyssynergia pattern



Dyssynergia-Effects of Biofeedback

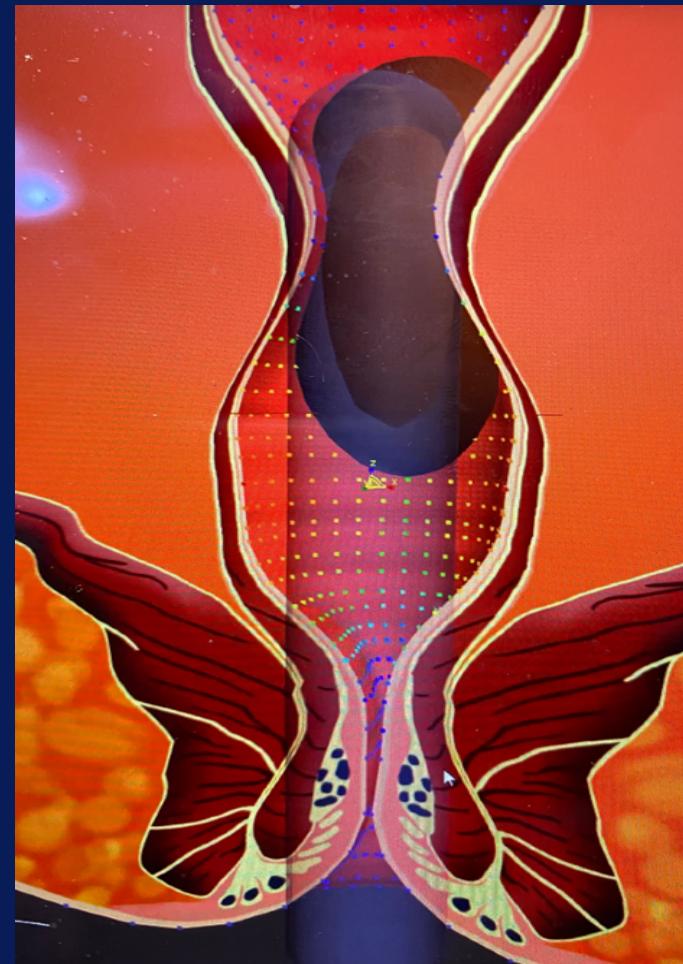
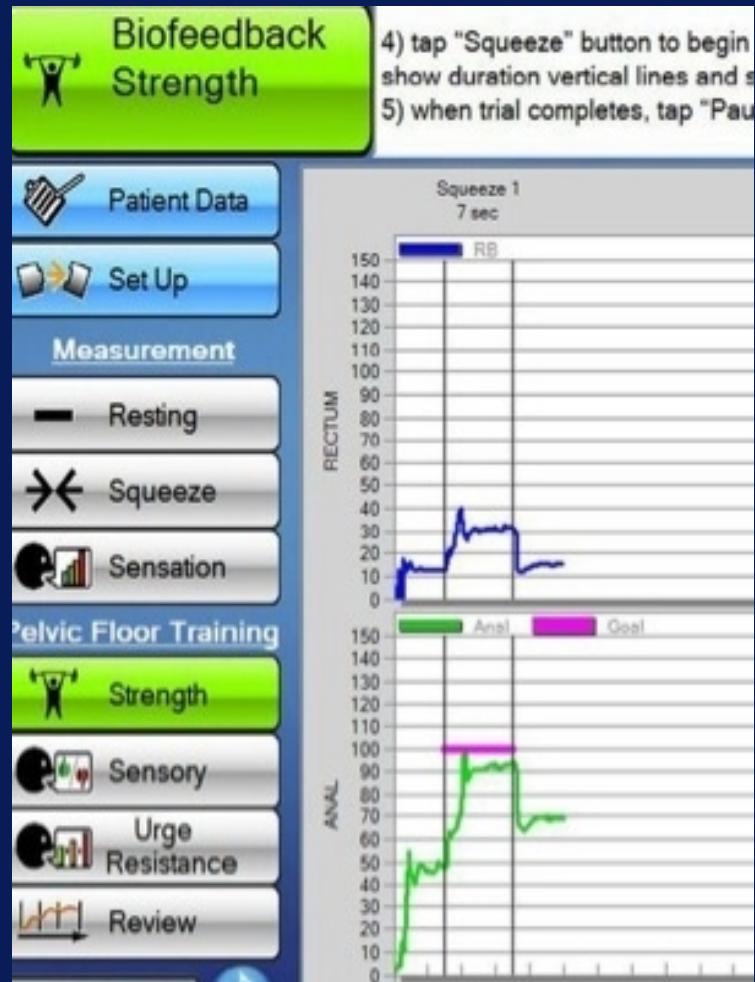
BEFORE

AFTER



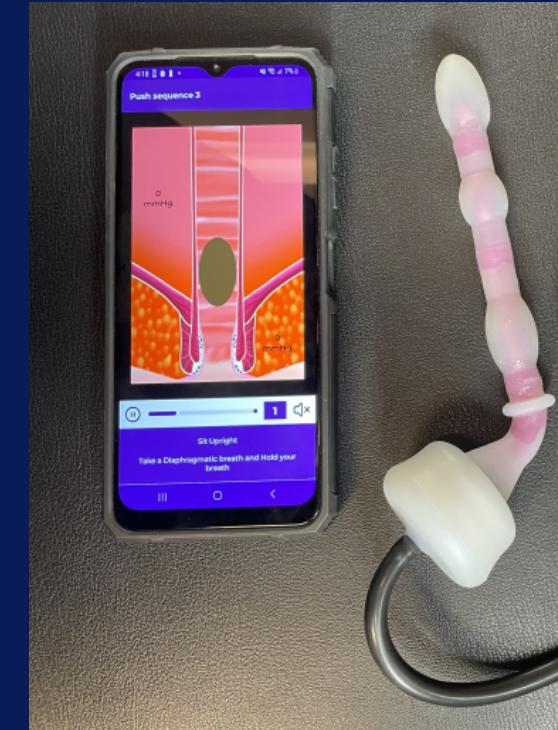
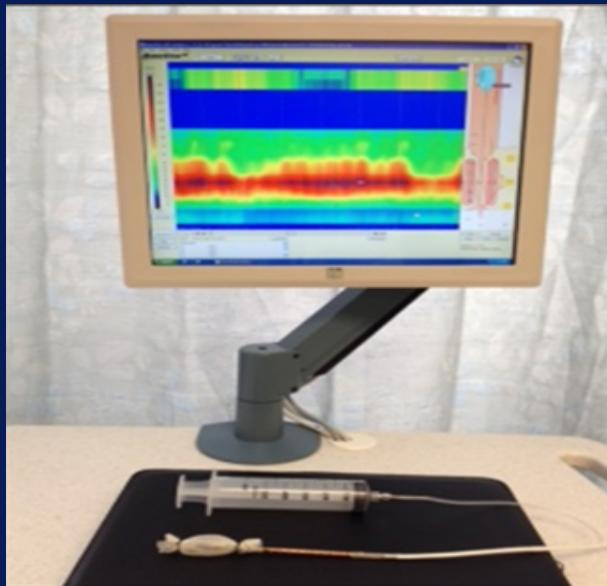
Courtesy of Rao SS

Biofeedback System: Visual Display Challenges



Home vs Standard Office BT

- **Dyssynergic defecation (Rome IV)**
 - Constipation symptoms (2/6 symptoms) for >6 months
 - Dyssynergic pattern (Rao Types I- IV)
 - Abnormal Balloon (50 ml) Expulsion time = > 1minute
- DD patients (Rome IV) were randomized to home using home or office BT.



Results

RESPONDER= >1 CSBM/wk vs Baseline + Normalization of Dyssynergia Pattern

Fig 4. Responder Rates

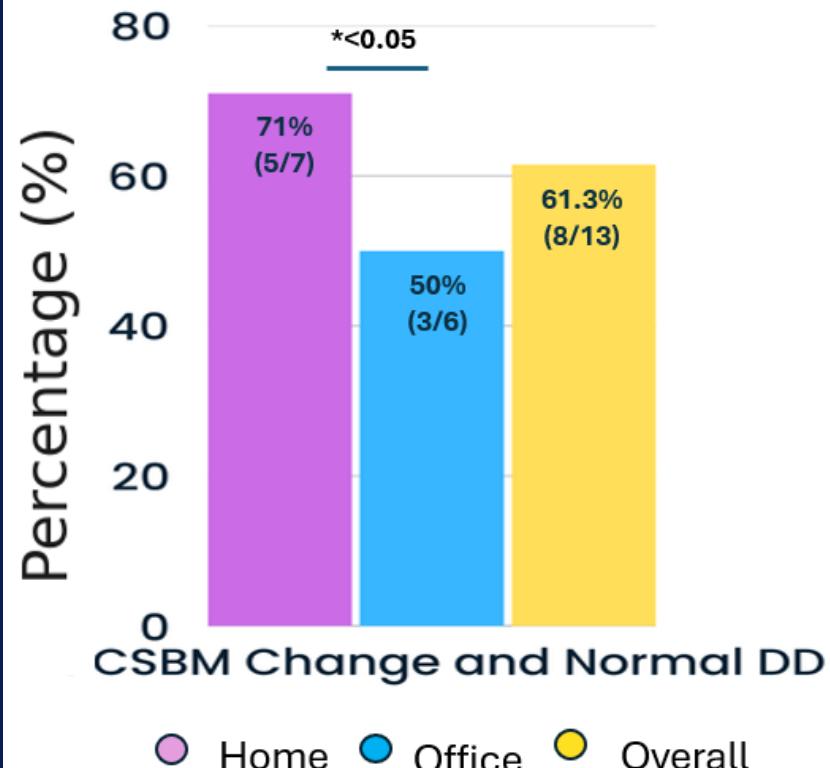
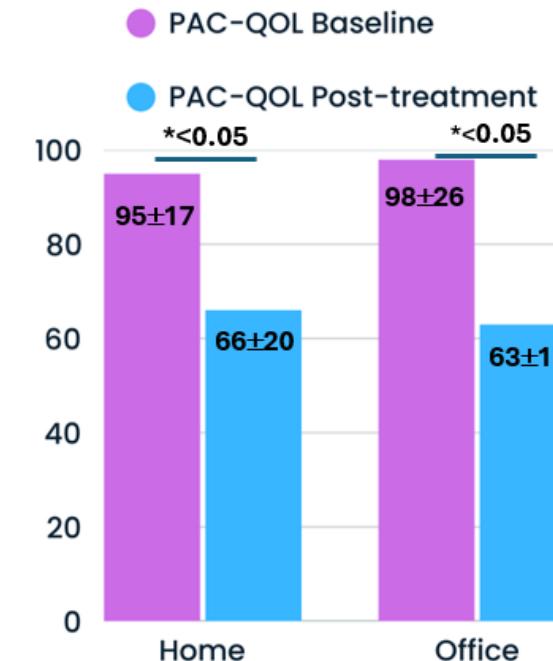


Fig 5. Effects on QOL



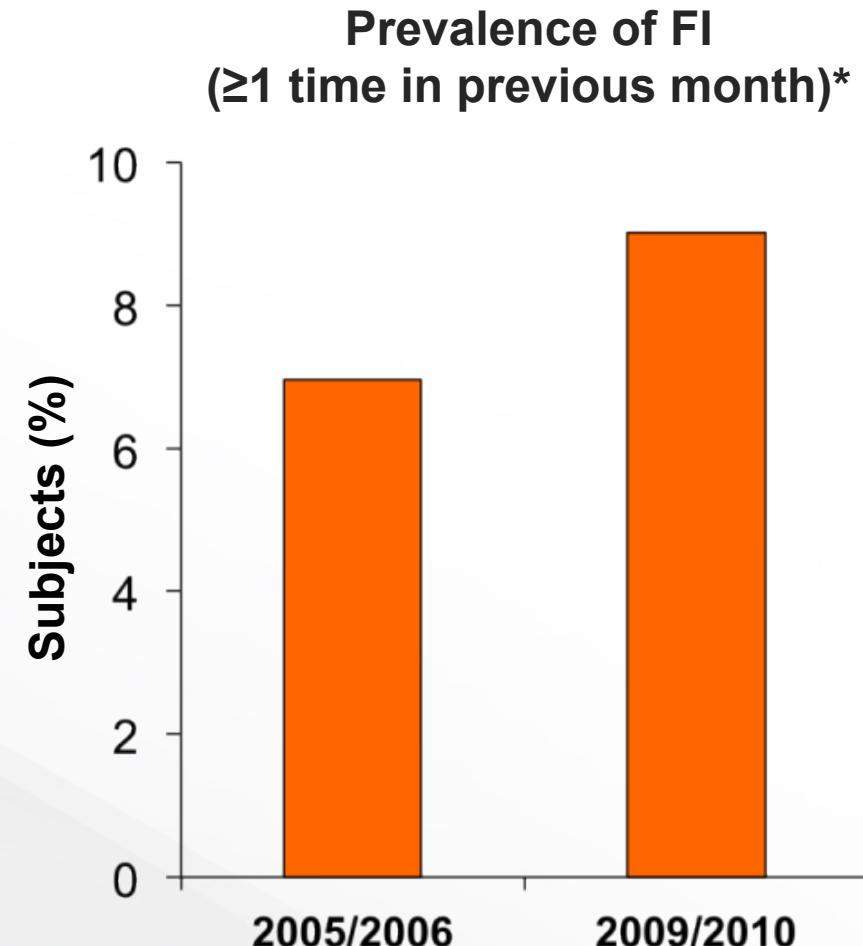
CASE STUDY

AH: 47 yrs, Gravida 3, Para 2

- 2005 - Fecal Incontinence - 2 months after delivery.
- 2012 - 2nd Delivery, symptoms have worsened.
- B.M. - 2/day; 4-8 incontinence episodes/wk-10yrs
- Senses stool coming out but cannot stop it.
- Flatus incontinence
- No urinary incontinence, back injury or diabetes.
- Hypothyroid
- Tried Psyllium, loperamide 4mg/tid-No relief

Prevalence of Fecal Incontinence: Fast Facts

Overall prevalence of fecal incontinence:	9.0%
Prevalence of fecal incontinence occurring at least once weekly:	1.1%
Prevalence in men:	7.4%
Prevalence in women:	9.1%
Prevalence in individuals aged ≥ 70 years:	17.5%



*Data from NHANES 2005/2006 and 2009/2010 surveys. N=52,195.
Ditah I et al. *Am J Gastroenterol.* 2012;107:S717. Abstract 1762.

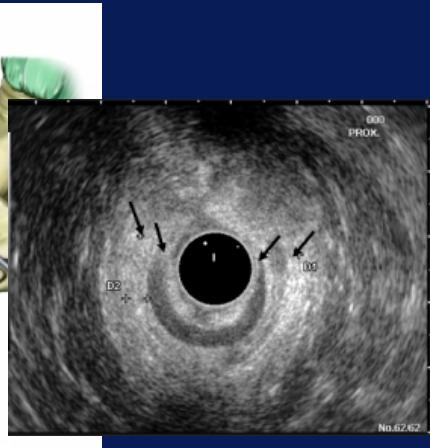
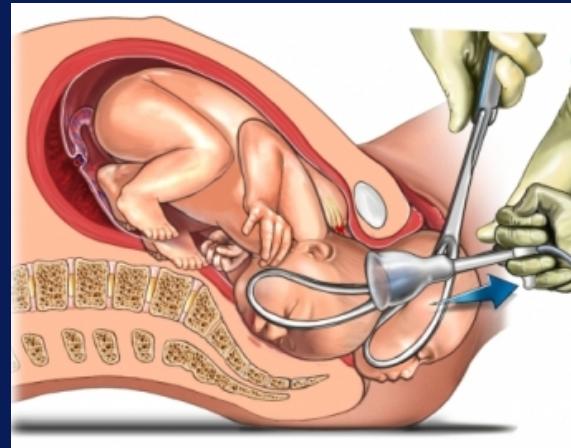
Fecal incontinence- A Multifactorial Problem



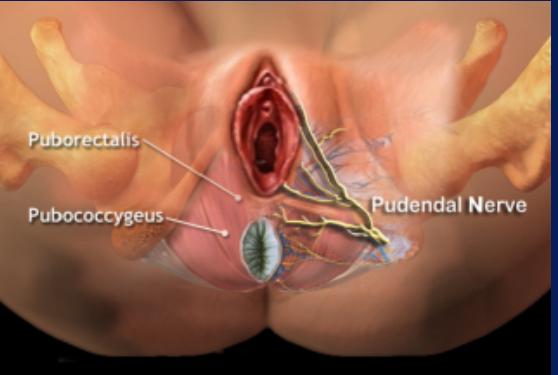
Diarrhea/Urgency
Bharucha et al Gastro 2010



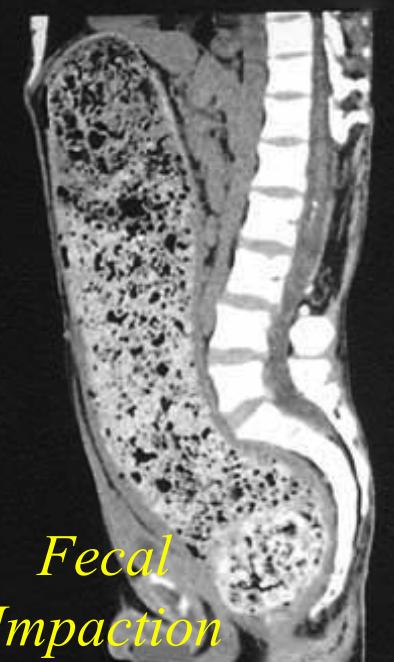
Ageing



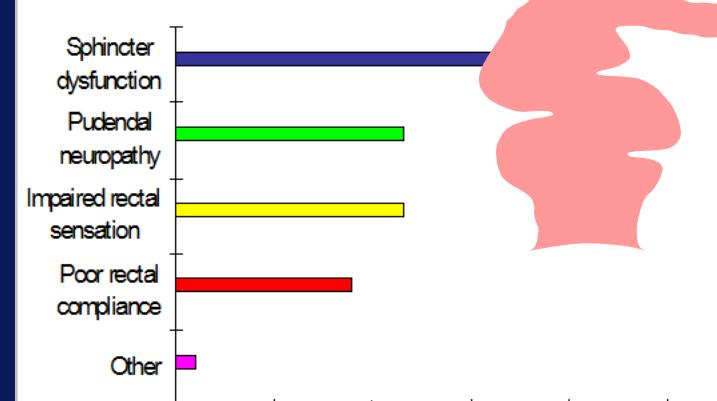
S.C. Injury



Pudendal
Neuropathy



Fecal
Impaction



80% > one abnormality-
Rao et al Am J Gastro 1997;92:469-75

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*

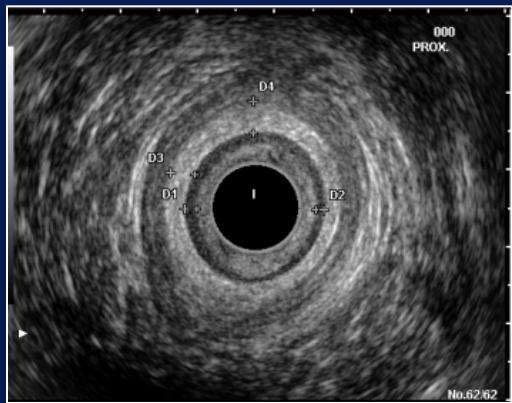
■ *Fecal Seepage*

- *Involuntary seepage with otherwise normal evacuation*

Anal Sphincter Changes in Health & FI

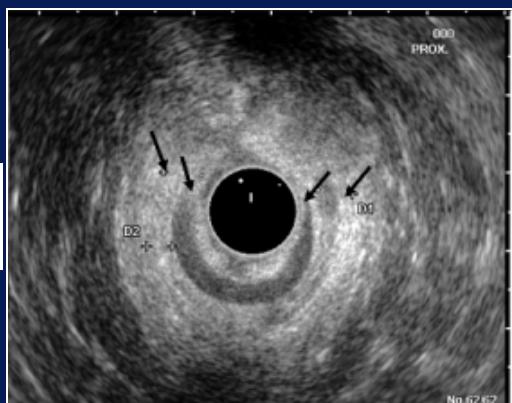
AUS

Normal



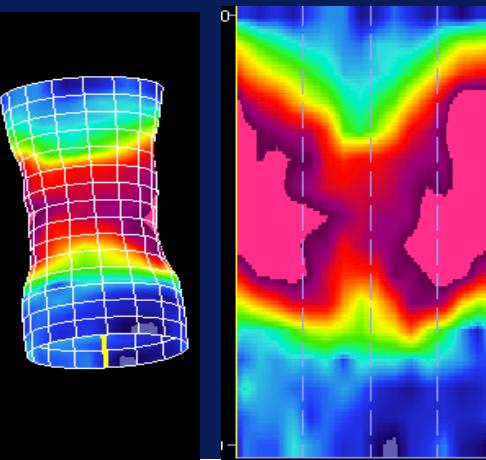
HDM

Incontinent

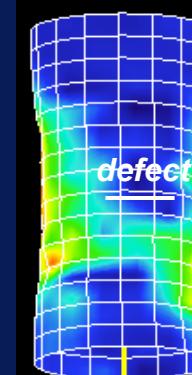


HDM

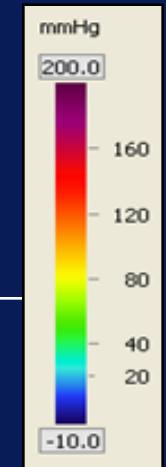
Squeeze



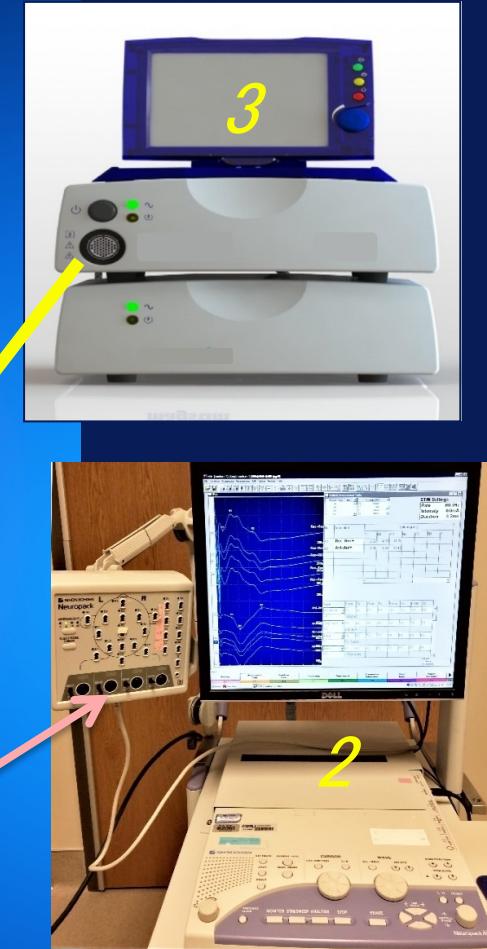
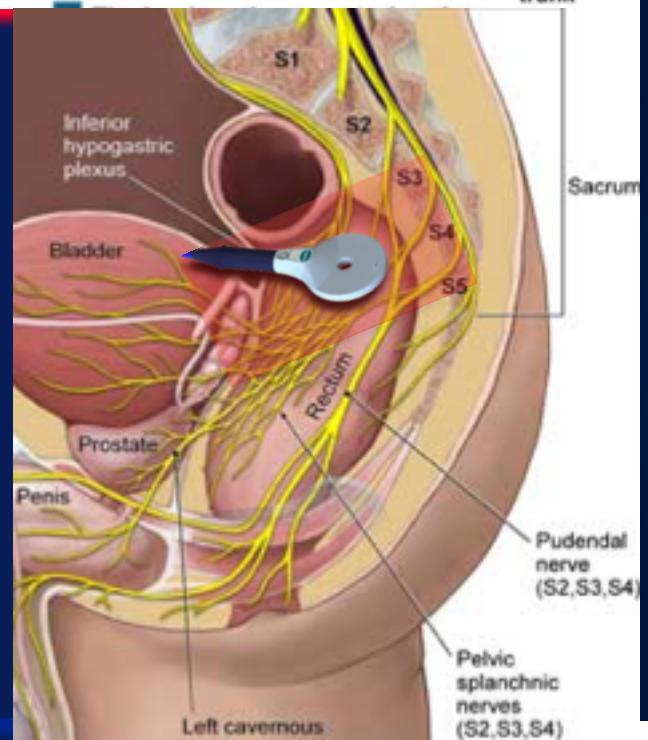
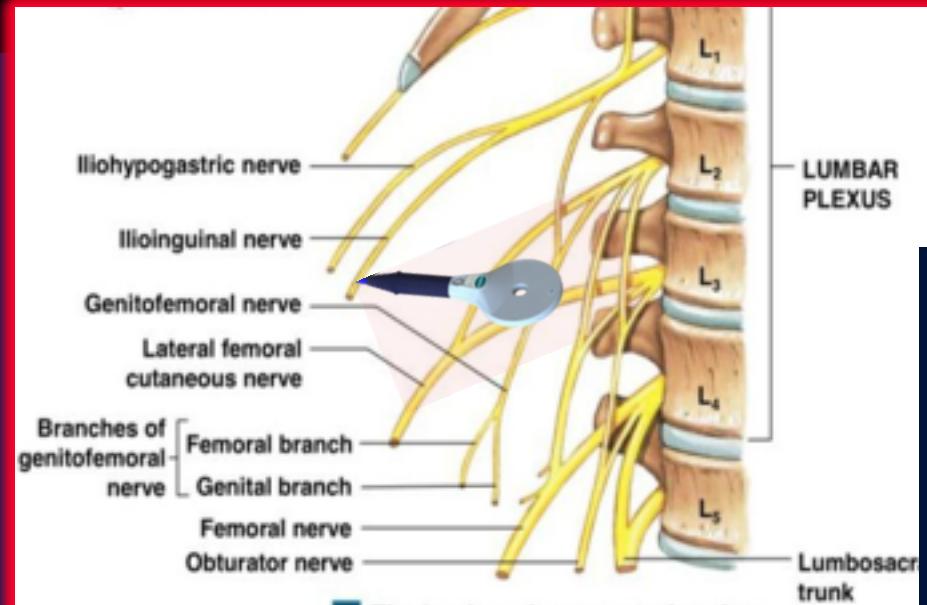
Squeeze



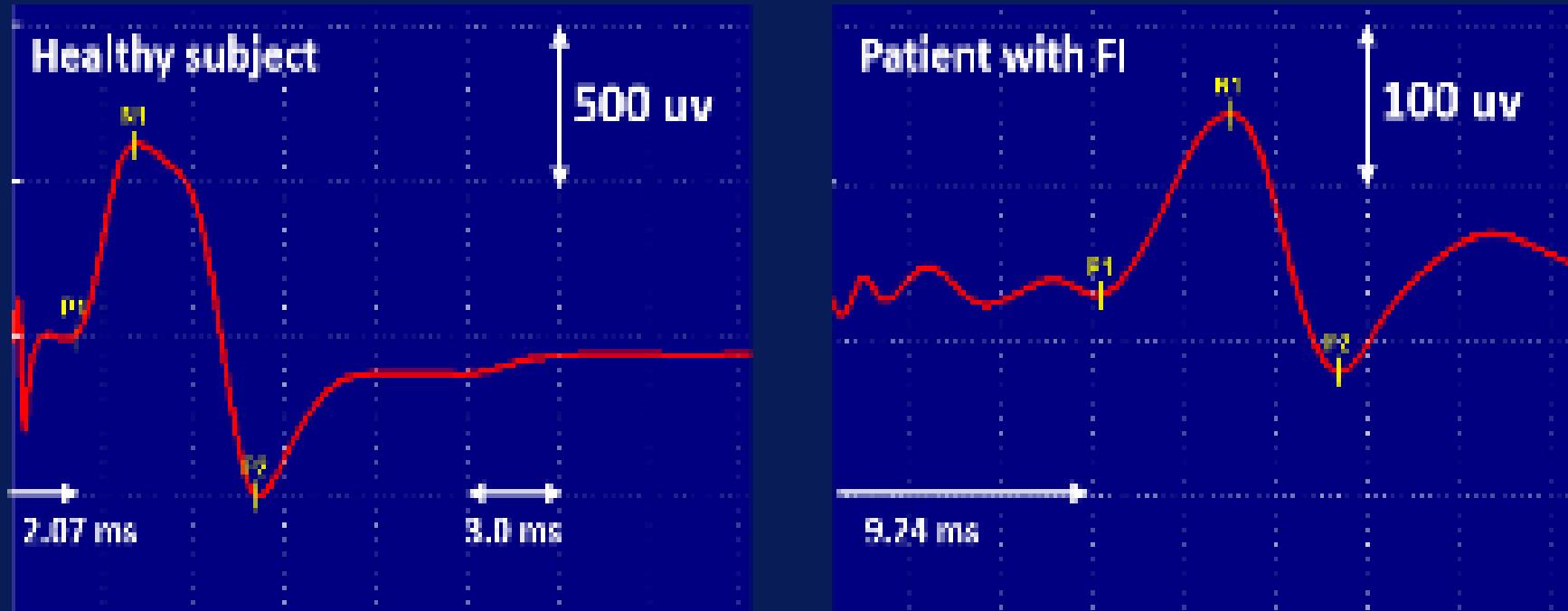
Squeeze



Translumbbosacral Anorectal Magnetic Stimulation (TAMS) Test



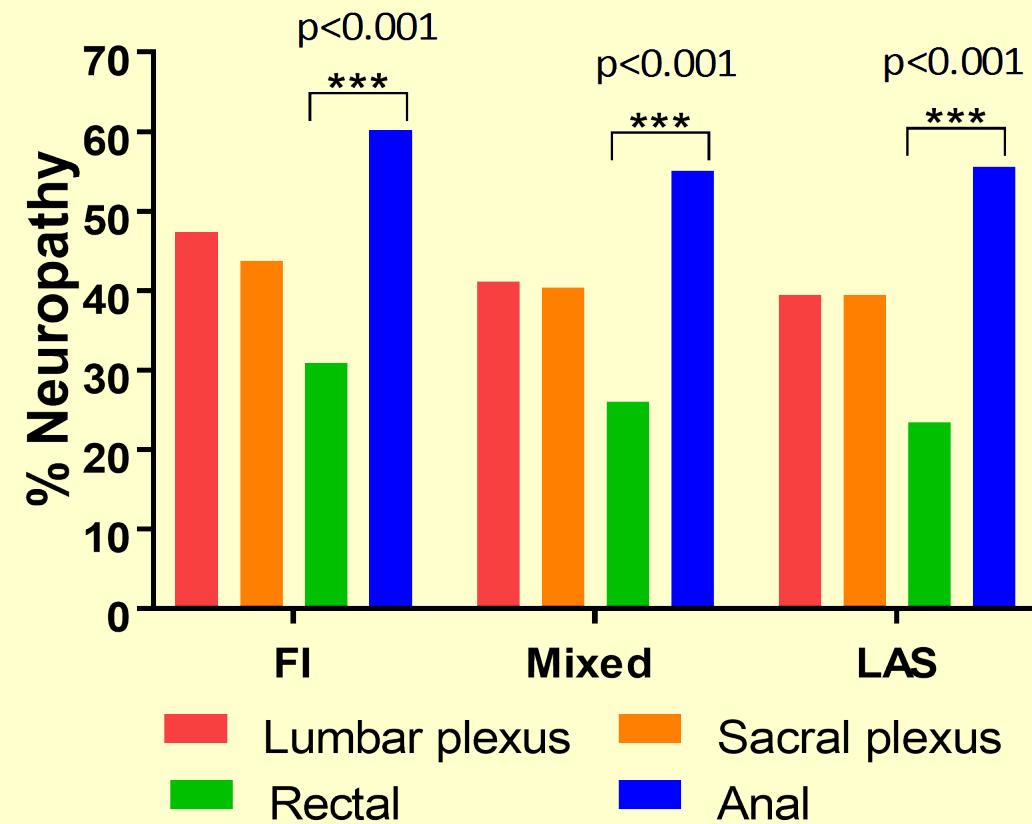
TAMS Test



*Sacro-anal Motor Evoked
Potentials (MEPs)*

Clinical Utility of TAMS

FI=152, Mixed=68, LAS= 31



- FI= Fecal Incontinence
- Mixed= FI and Constipation
- LAS= Levator Ani Syndrome

Case Study – Anorectal Physiology Data

	Patient	Normal range (Females)
Resting Pr mm Hg	35	65 (53-75)
Squeeze Pr mm Hg	72	117 (100-134)
Squeeze Duration (sec)	16	25 (21-29)
Threshold 1st sensation (cc)	100	20(16-24)-3.9
Lt TLMEP ms	7.1	<4.9
Rt TLMEP ms	5.8	<5.0
Lt TS MEP ms	6.9	<4.9
Rt TS MEP ms	8.8	<5.0

Cochrane Review of Medical Therapy-2013

- 16 trials (11 cross over), n=558
- 11 Trials of F.Incontinence + Diarrhea
- 7 tested antidiarrheals, 6 enhance anal sphincter function (Phenylephrine, valproic acid), 2 tested Lactulose, 1 zinc aluminum
- Small studies, short F.up, meta-analysis not possible
- Risk of bias unclear

Conclusions:

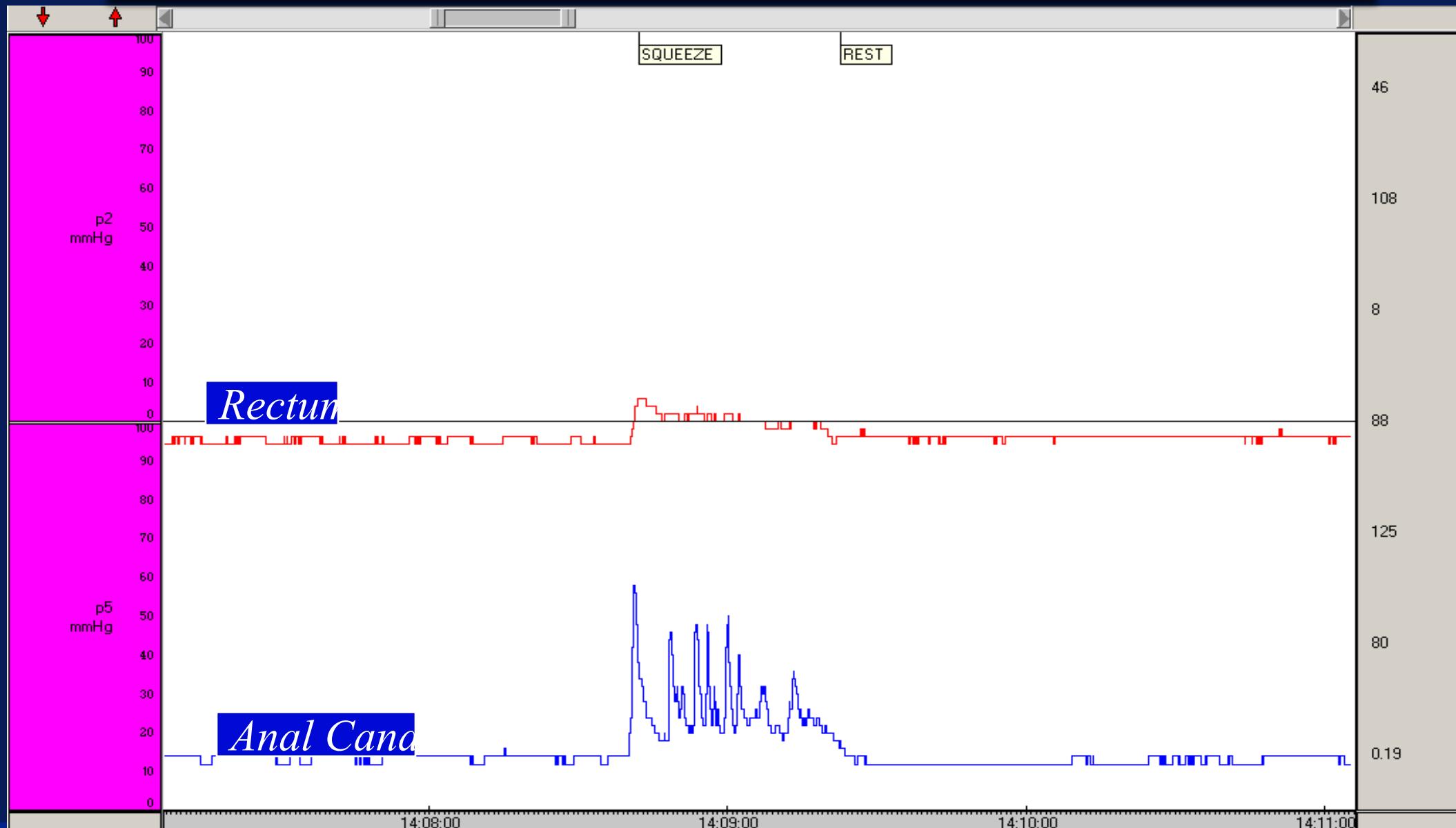
- Focus of most therapy was diarrhea not incontinence
- Little evidence to guide clinicians, Larger well designed trials are required

Goals of Neuromuscular Training for Fecal Incontinence

■ Biofeedback Therapy

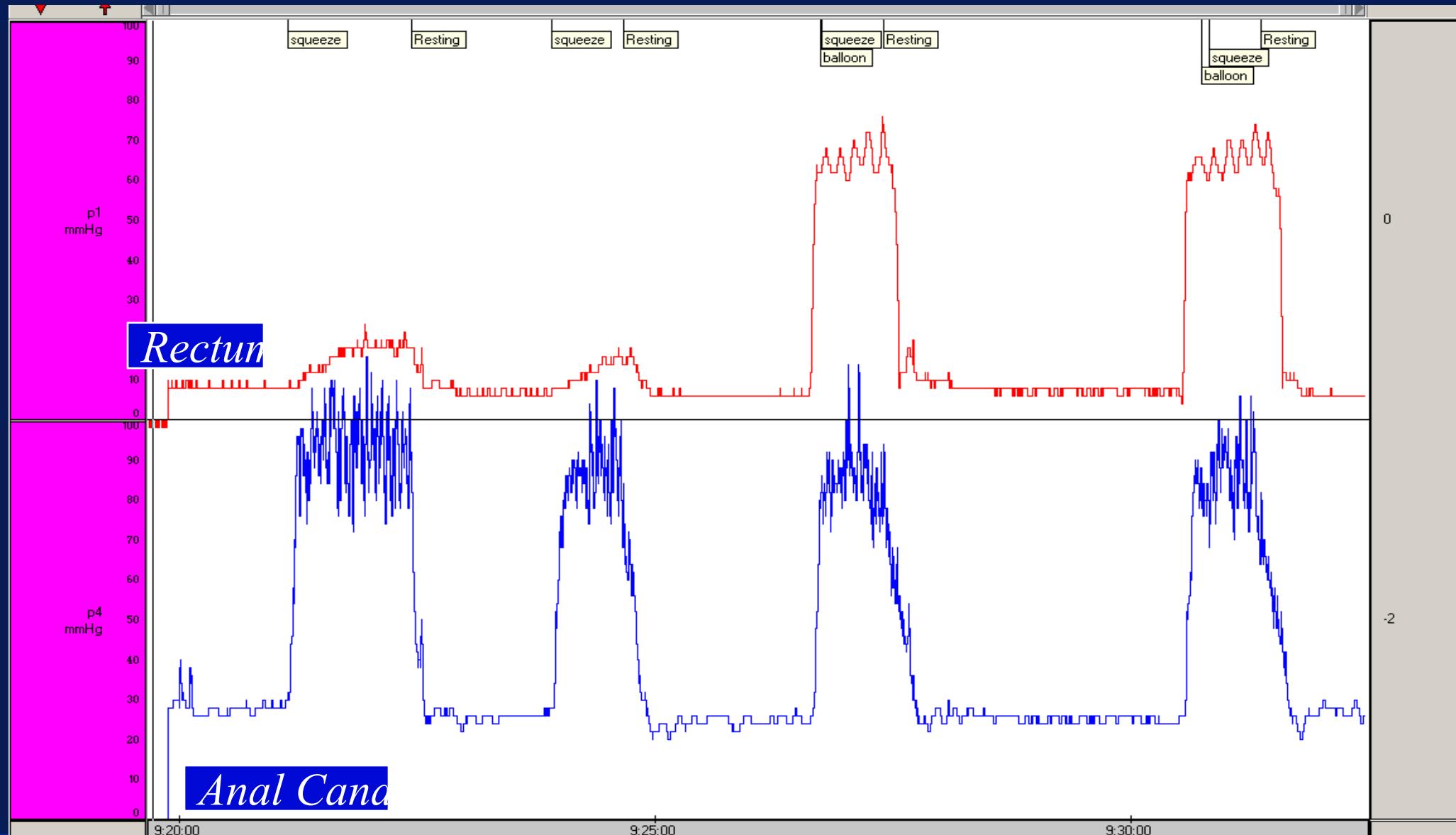
- Strengthen anal sphincter/Puborectalis muscle
 - Endurance + Strength
- Improve rectal sensation/sensory delay
- Rectoanal coordination training
 - Isolation of anal muscles
 - Control of Accessory Muscles
- Training to correct dyssynergia & evacuation

Biofeedback-Incontinence- Before Therapy



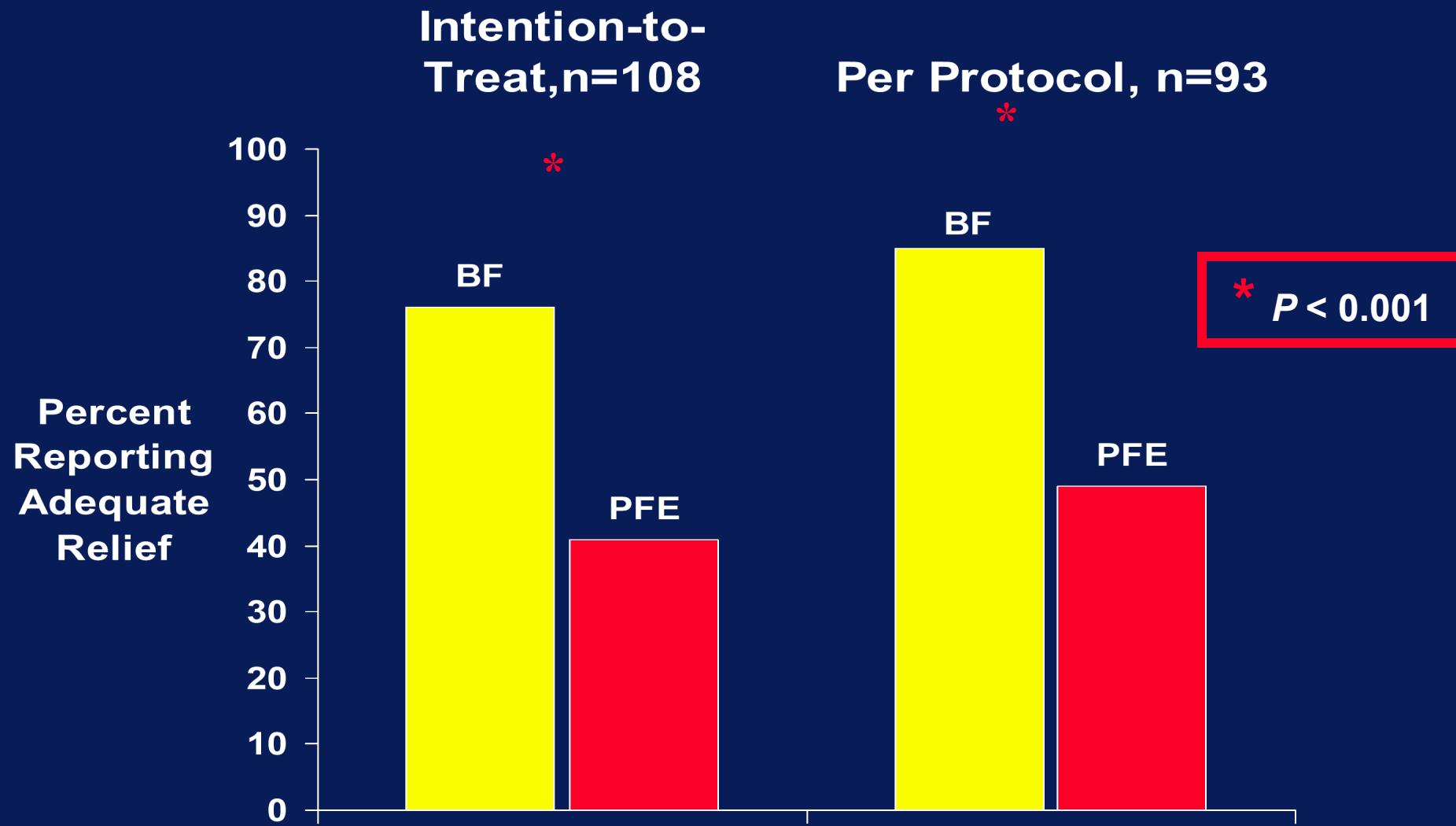
Courtesy of Rao SS

Biofeedback-Incontinence- After Therapy



Courtesy of Rao SS

Biofeedback vs Non-digital assisted squeezes-Incontinence: Primary Outcome



NIDDK- FIT Trial (2018-24)

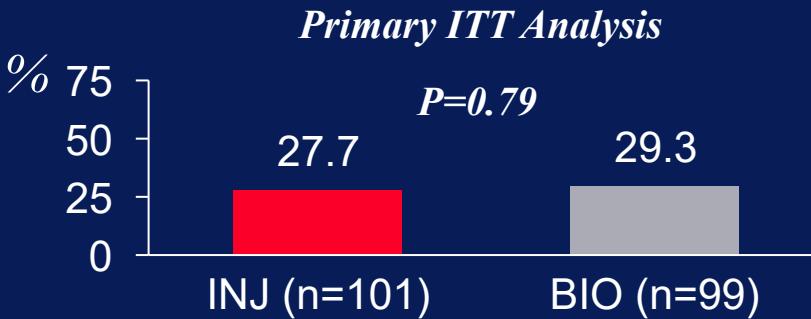
Mayo, Augusta,, U.Mich, UAB, UNC

200 FI Patients
were Randomized
to
Biofeedback or
Dextranomer
Injection

Biofeedback vs Dextranomer

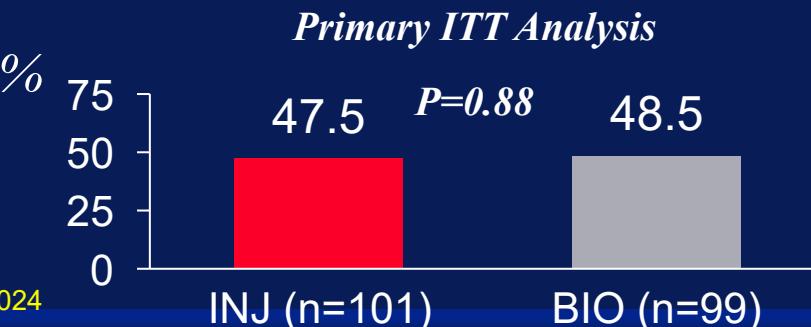
Primary Efficacy Outcome: 75%

Treatment Responder ($\geq 75\%$ reduction from baseline in number of average weekly FI episodes)



Secondary Efficacy Outcome: 50%

($\geq 50\%$ reduction from baseline in number of average weekly FI episodes)

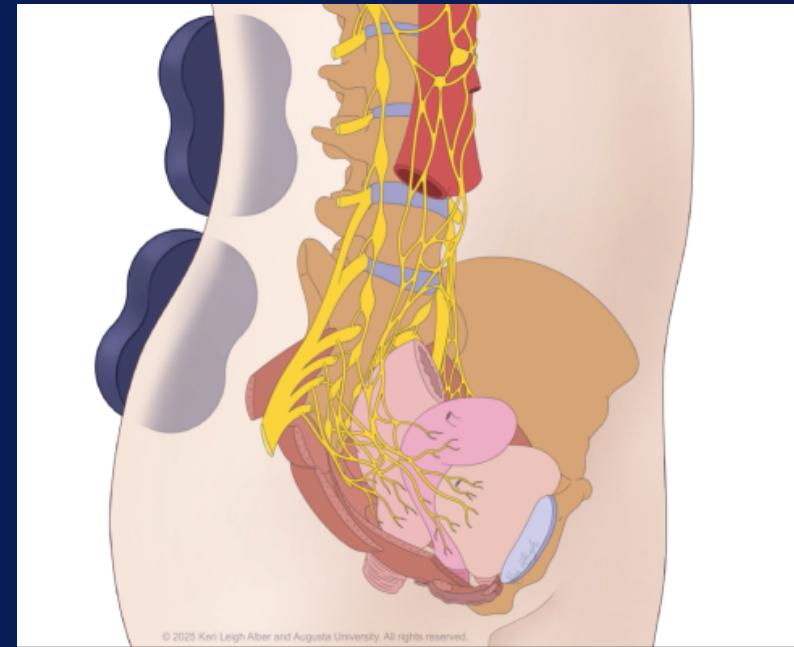


Surgical Treatment of Incontinence

- Dextranomer Injection
- Sphincteroplasty
- Rectal Augmentation
- SECCA procedure
- Sacral nerve stimulation
- Maloney-ACE procedure
- Colostomy



Translumbbosacral Neuromodulation Therapy (TNT): Randomized Trial

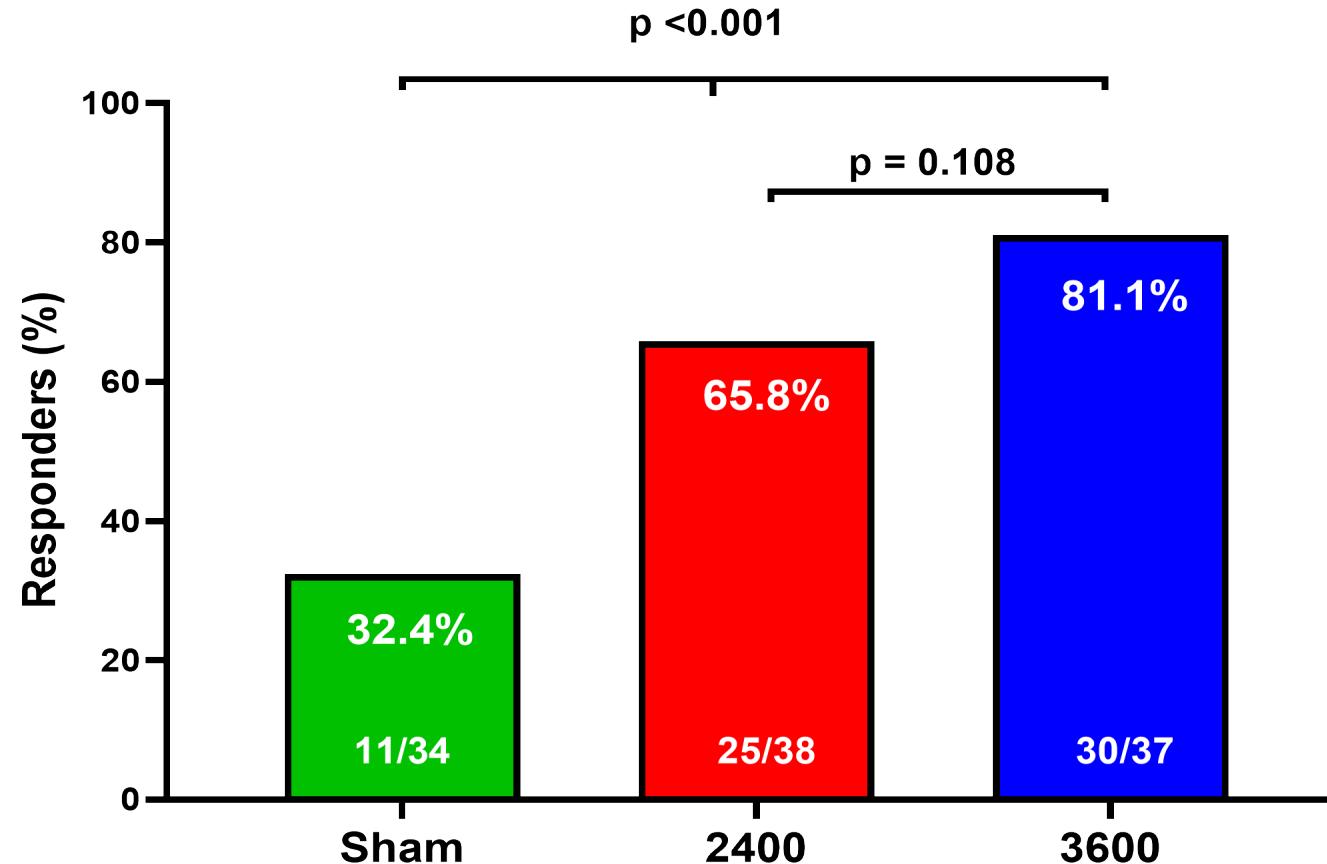


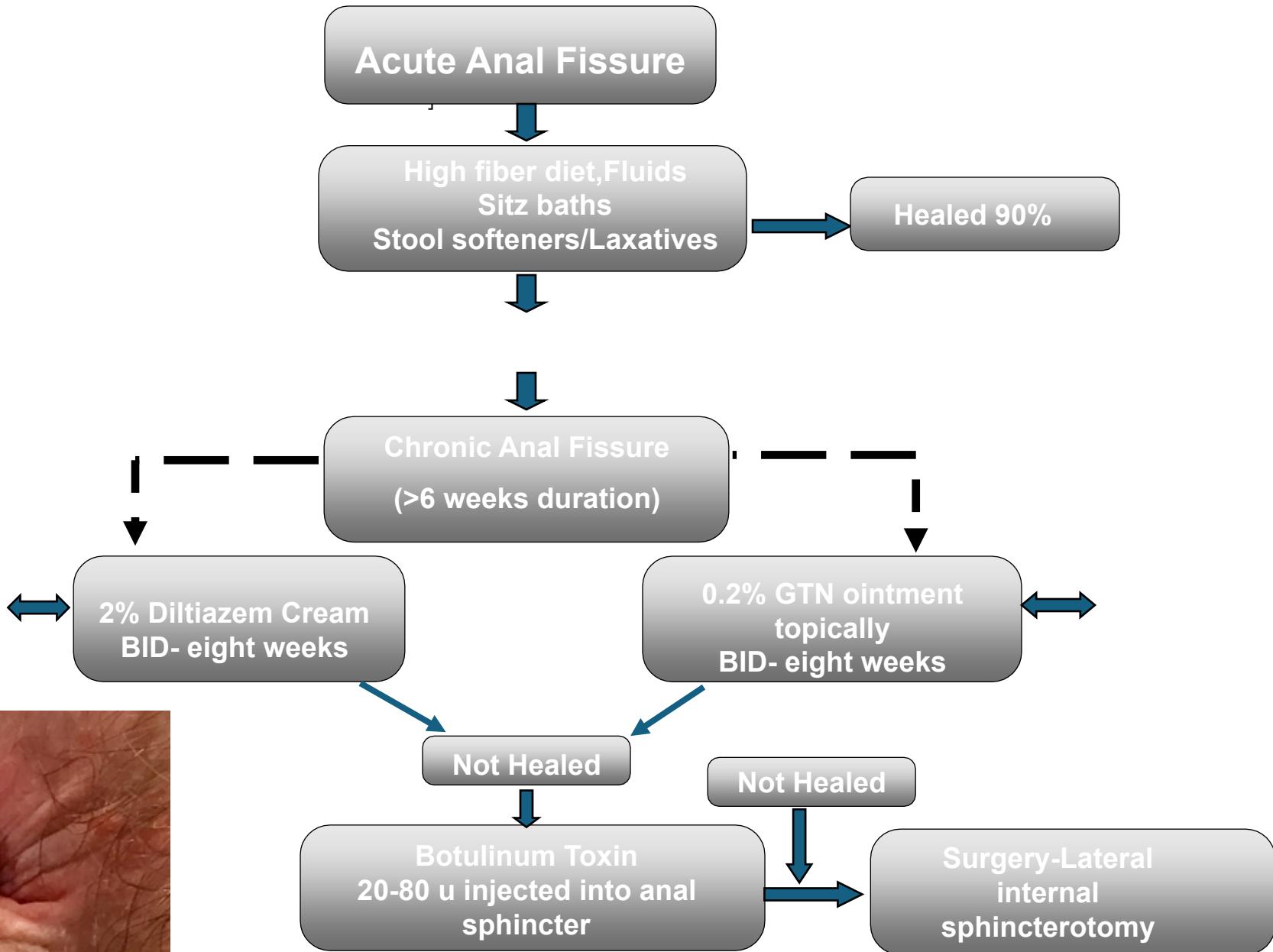
Frequency	Stimulations	Train
1 Hz	2400	2
1 Hz	3600	2
1 Hz	Sham	2

TNT: Primary Efficacy Outcome

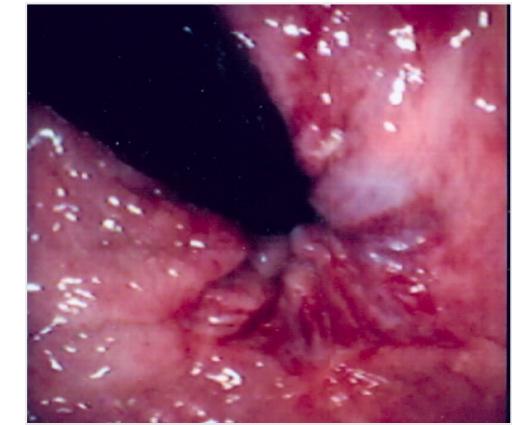
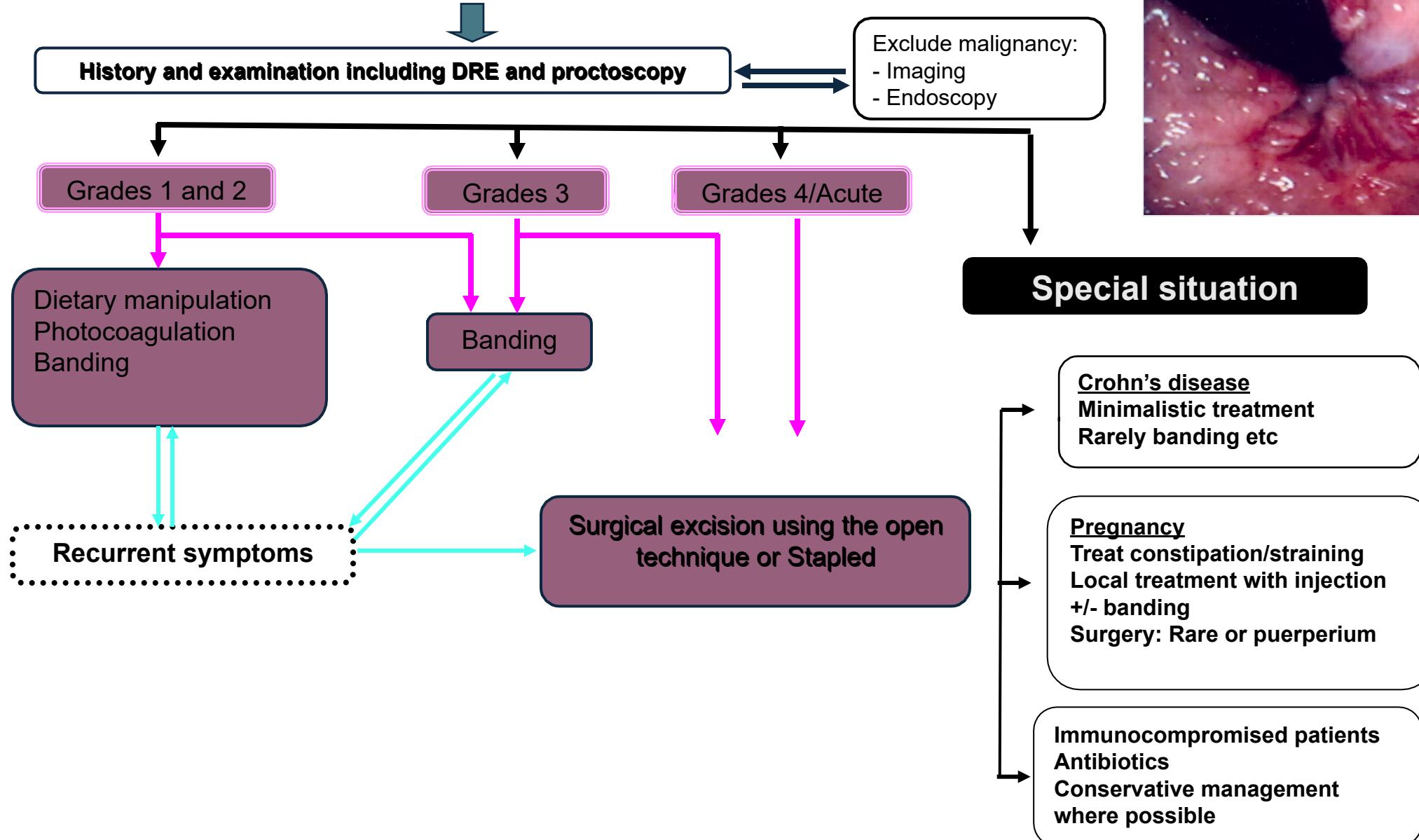
ITT analysis, n=109

50% reduction in FI episodes compared to baseline





Management of Symptomatic Hemorrhoids



Take Home Points

- Detailed History, Physical & DRE important
- Electronic Stool Diary APPs enable accurate History & Severity assessment
- **Dyssynergic defecation**
 - Is common but missed clinically
 - HRM and BET provide accurate diagnosis
 - Biofeedback is the preferred treatment; Home BT-future
- **Fecal incontinence**
 - Is multifactorial
 - ARM, Anal Ultrasound, MRI, TAMS test are complementary
 - Biofeedback First line and effective
 - Selected cases surgery or SNS or Dextranomer injection
 - Novel treatments: Home Biofeedback & TNT
- **Anal Fissure: Conservative rx helps 80%**
- **Hemorrhoids: Banding**

