Stuhl-Inkontinenz Update 2016

Neues in der Abklärung und der konservativen Therapie

H. Frühauf

37. Schweizerische Koloproktologie-Tagung

Bern, 16. Januar 2016, 09.05-09.35

Stadt Zürich
Stadtspital Triemli

Abteilung für Gastroenterologie

Universität Zürich

Fecal Incontinence – Epidemiology

nature publishing group

CLINICAL AND SYSTEMATIC REVIEWS 127

REVIEW

Epidemiology, Pathophysiology, and Classification of Fecal Incontinence: State of the Science Summary for the National Institute of Diabetes and Digestive and Kidney Diseases (NIDDK) Workshop

Adil E. Bharucha, MBBS, MD[1], Gena Dunivan, MD[2], Patricia S. Goode, MSN, MD[3], Emily S. Lukacz, MD, MAS[4], Alayne D. Markland, DO, MSc[3], Catherine A. Matthews, MD[5], Louise Mott, RN[6], Rebecca G. Rogers, MD[2], Alan R. Zinsmeister, PhD[7], William E. Whitehead, PhD[5,8], Satish S.C. Rao, MD, PhD[9] and Frank A. Hamilton, MD[10]

Am J Gastroenterol 2015; 110:127-36

Fecal Incontinence – Epidemiology

- **2nd most important cause for admission of elderly to nursing homes** [1]
- **Prevalence: General population 2.2 - 18,4%** [2-4]
  nursing home setting ~ 50% [5]
- **Only~ 1/3 ever discussed the problem with a physician** [3]

- **~ 400 Mio. USD / year for pads / diapers** [3]

+ ~ 1,5-7 Mrd. USD / year for nursing home care [6]

1. Rudolph, Mayo Clin Proc 2002; 77:271-5
2. Bharucha, Am J Gastroenterol 2015; 110:127-36
3. Johanson, Am J Gastroenterol 1996; 91:33-6
4. Nelson, JAMA 1995; 274:559-61
5. Nelson, Gastroenterology 2004; 126:S3-7
6. Rao, Am J Gastroenterol 2004; 99:1585-04

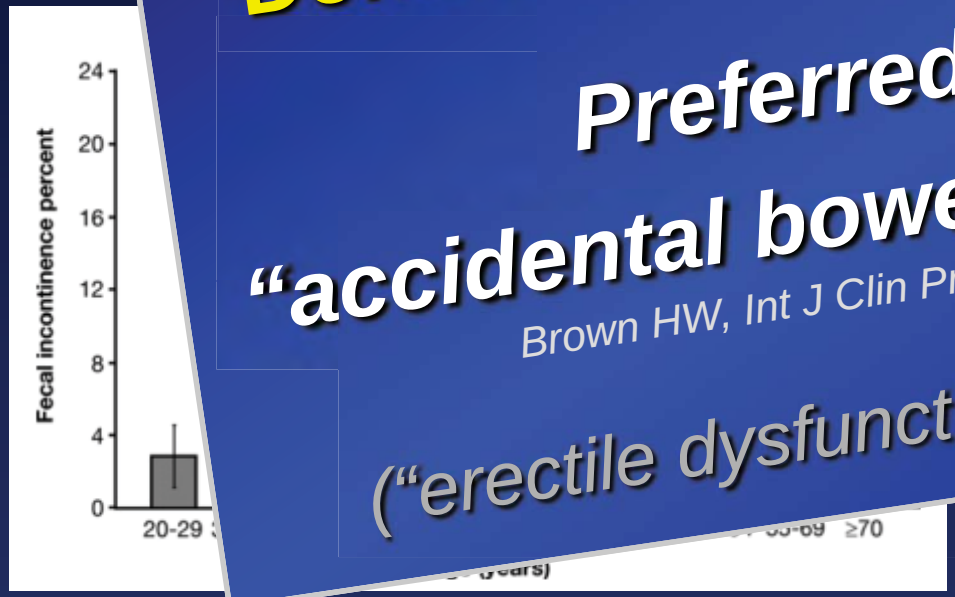
Fecal Incontinence - Prevalence

National Health and Nutrition Examination Survey (NHANES) &

Fecal Incontinence Severity Index 2005–2006

Estimated pr… …ts

F… …nth



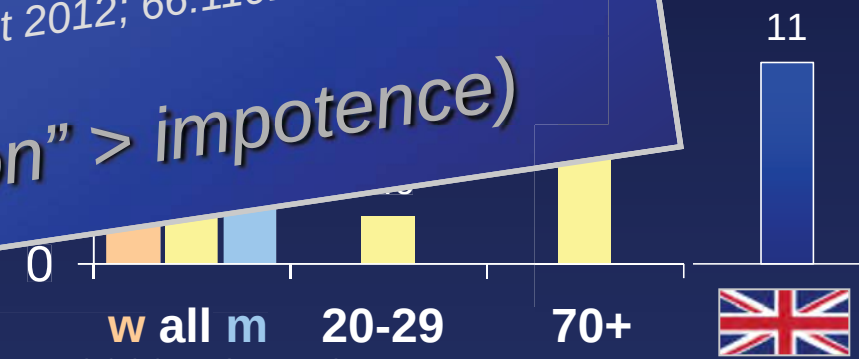
Definition and Reporting Bias

Preferred term:

"accidental bowel leakage" > FI

Brown HW, Int J Clin Pract 2012; 66:1101-8

("erectile dysfunction" > impotence)



Whitehead WE, Gastroenterology 2009; 137:512-7

Buckley BS, Int J Clin Pract 2009; 63:568-73

Online survey

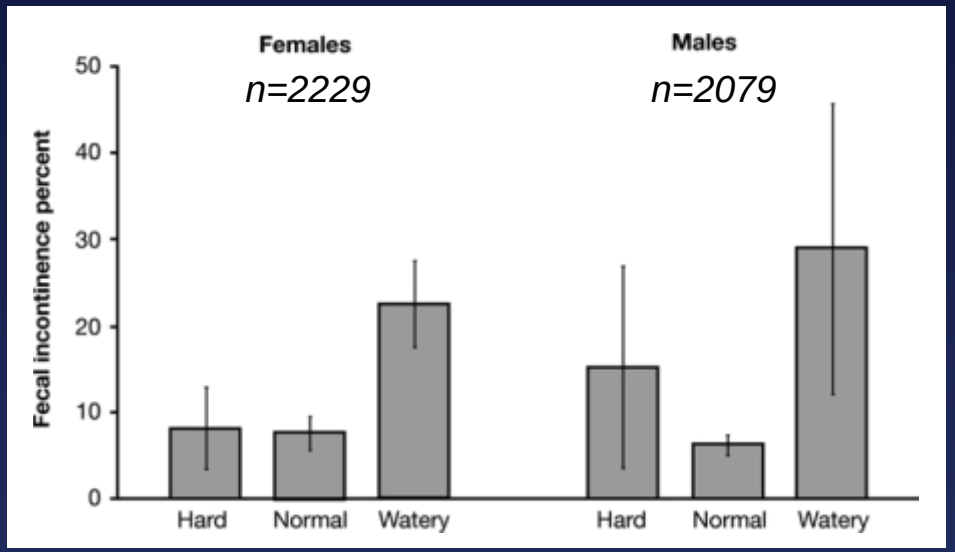
Fecal incontinence and stool consistency

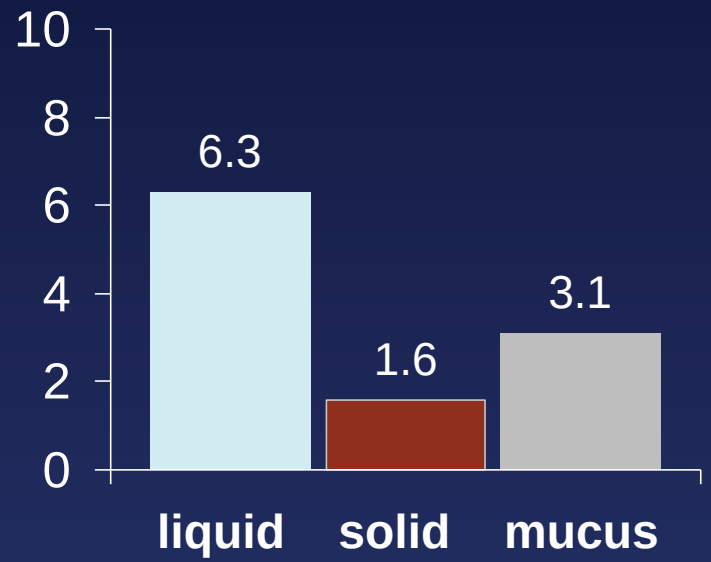
National Health and Nutrition Examination Survey (NHANES) &

Fecal Incontinence Severity Index 2005–2006

Estimated prevalence of FI in noninstitutionalized US adults

FI: accidental leakage of liquid, solid, or mucus ≥ 1 / last month





Whitehead WE, Gastroenterology 2009; 137:512-7

Hughes BT, Dig Dis Sci 2009; 54:2215-9

Predisposing factors for fecal incontinence

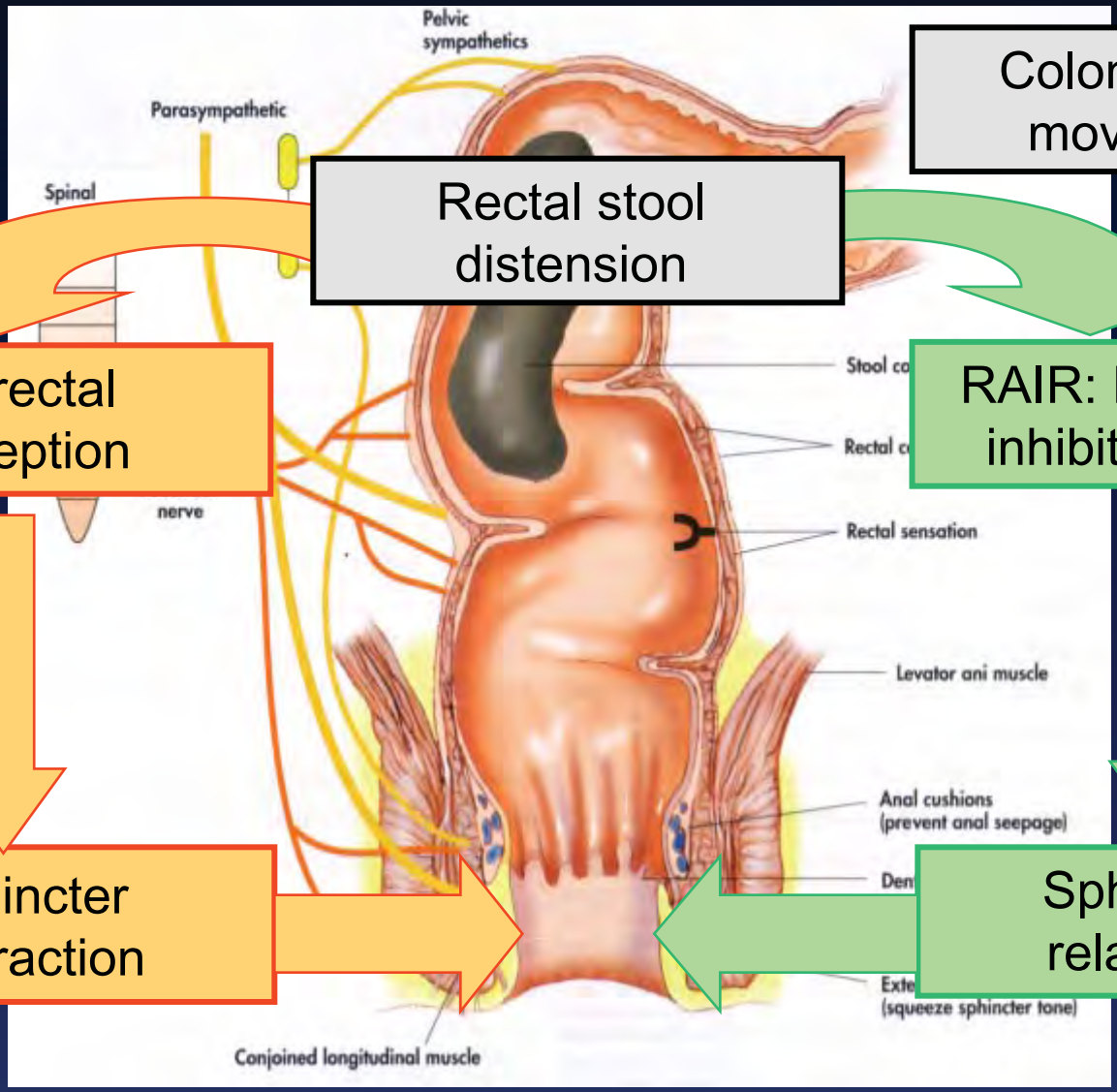
- Age
- Female sex
- Diarrhea:
  (weak or loose +
- rectal urgency
- burden of chro
- Urinary (urge) incontinence

Modifiable risk factors:

- Rectocele — OR 4.9
- Current smokers — OR 4.7
- Obesity
- Inappropriate cholecystectomy — OR 4.2
- anal sphincter trauma
- Physical inactivity

Bharucha AE et al., Am J Gastroenterol 2015; 110:127-36

Anatomy and Physiology



Colonic mass movements

Rectal stool distension

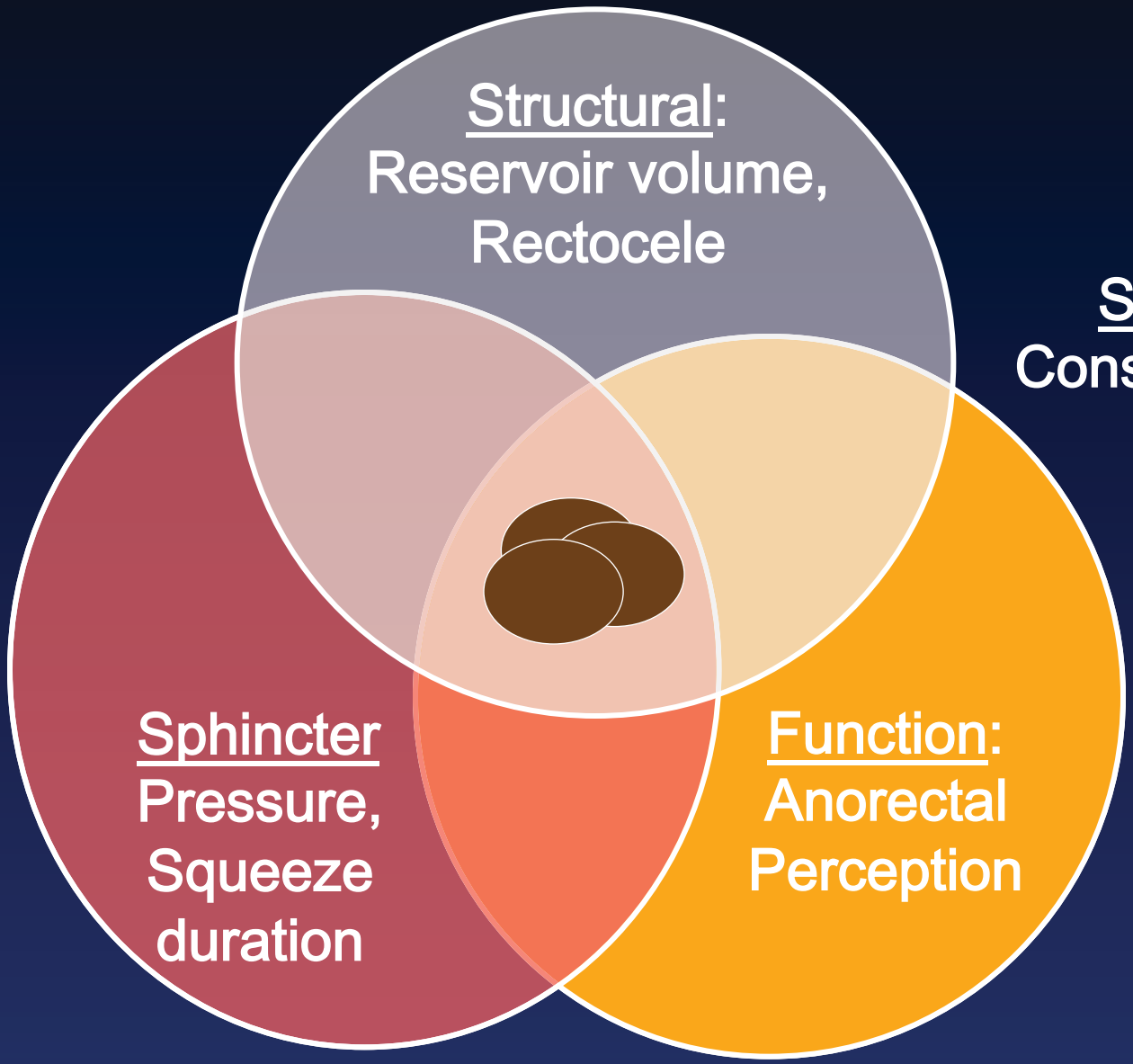
Anorectal Perception

RAIR: Rectoanal inhibitory reflex

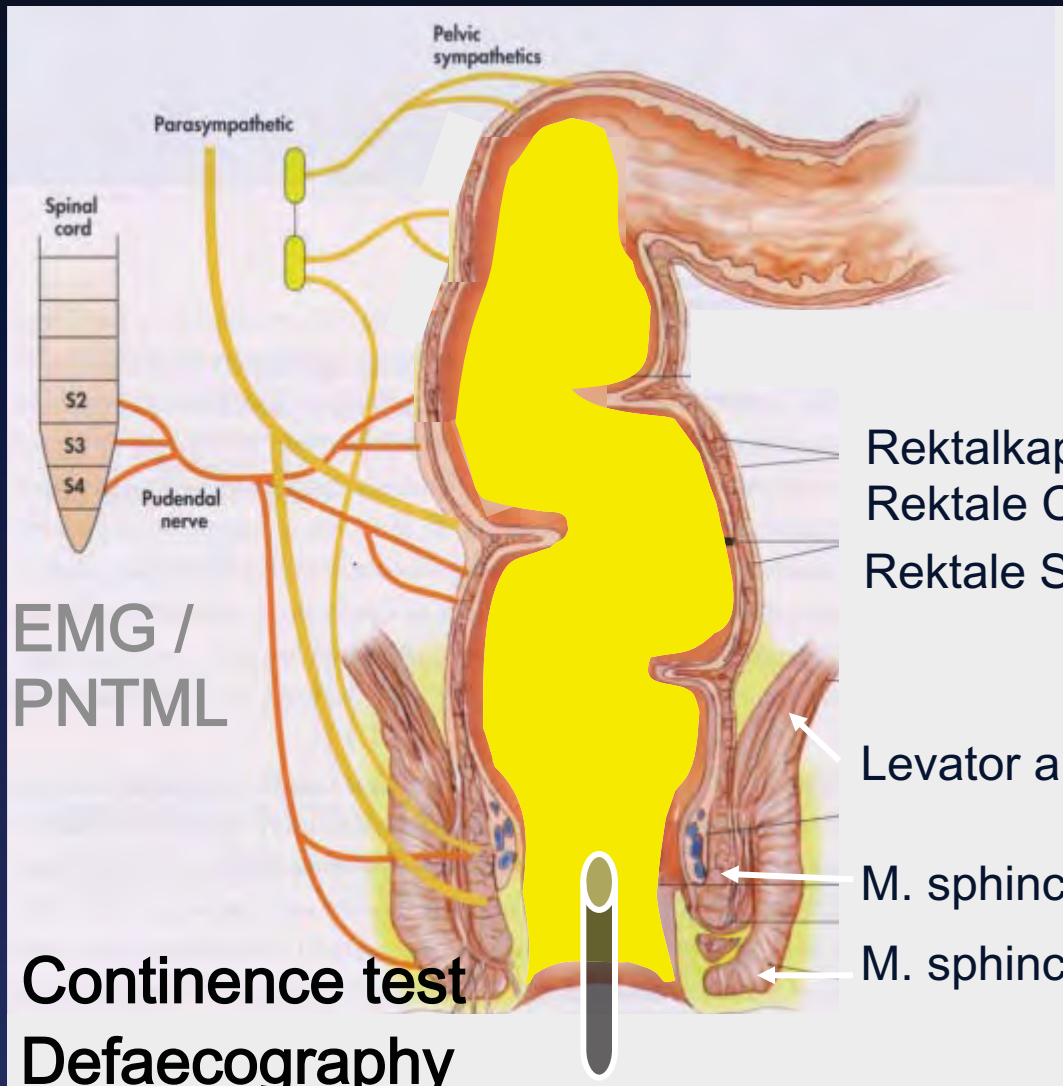
Sphincter contraction

Sphincter relaxation

Determinants of continence



Anorectal function tests



EMG / PNTML

Continence test

Defaecography

Rektalkapazität

Rektale Compliance

Rektale Sensibilität

Rectal Barostat / Perception test

Levator ani

M. sphincter ani internus

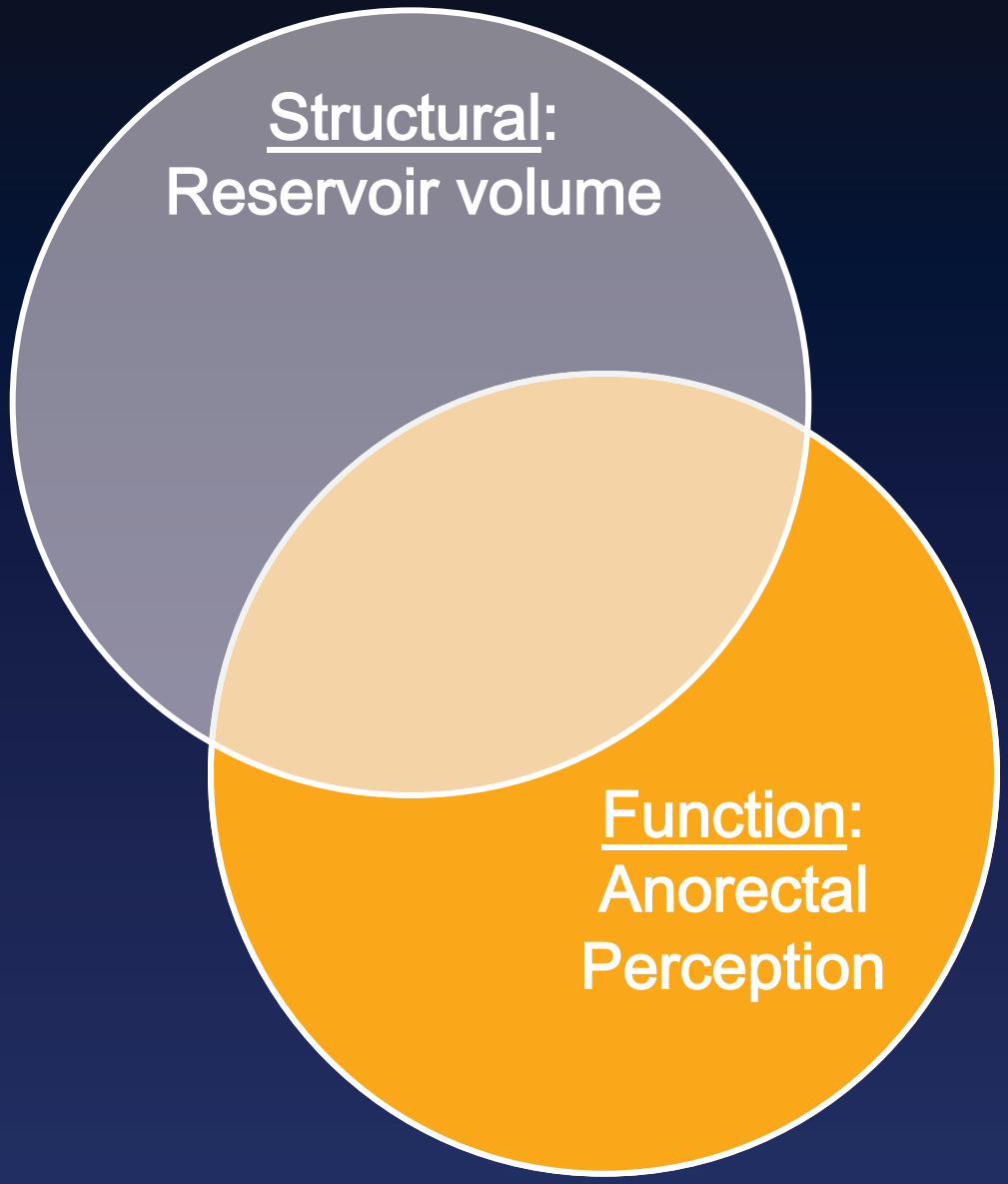
M. sphincter ani externus

Anorectal manometry

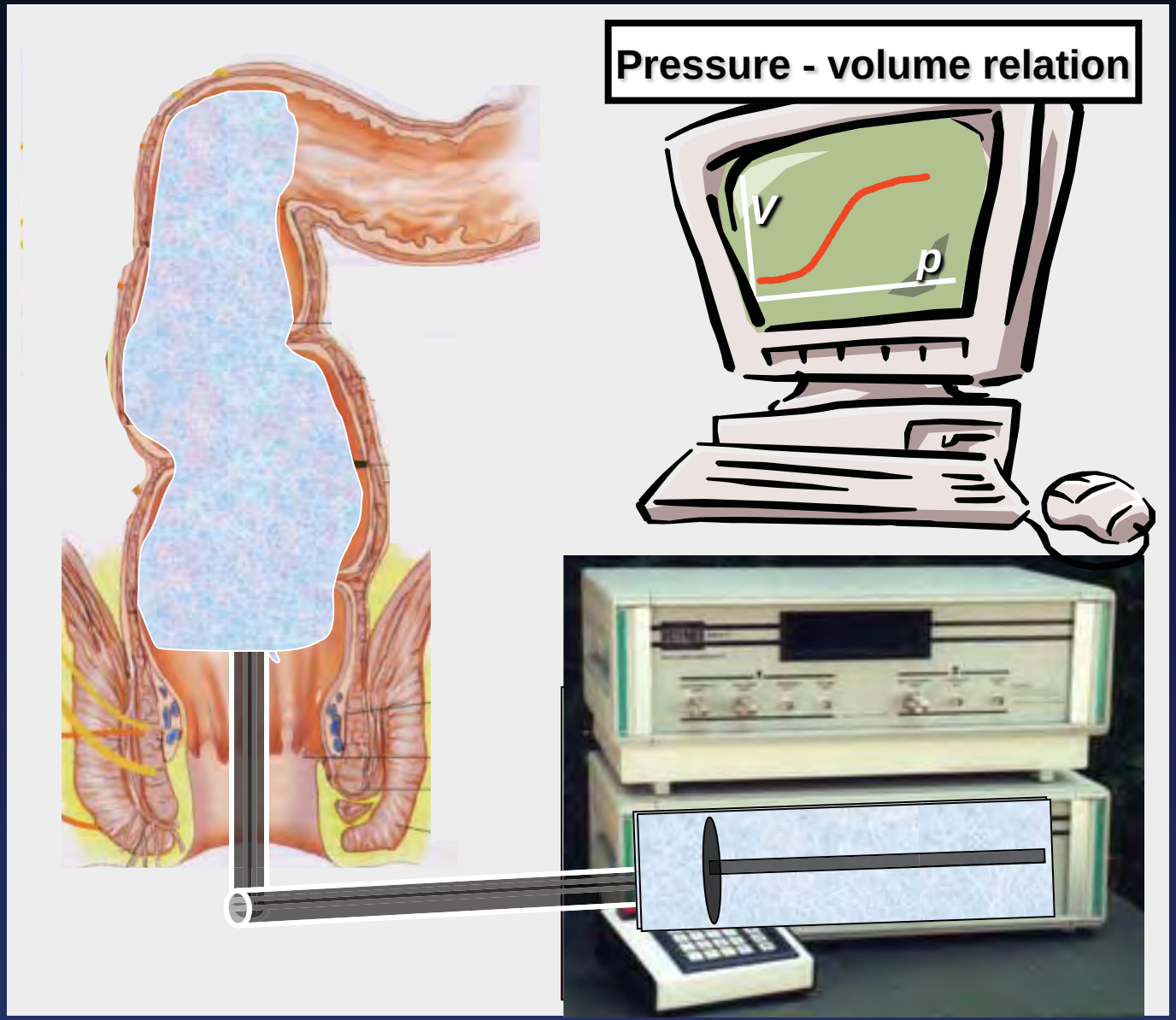
EUS

Fox MR,…Frühauf H et al. Digestion 2011; 83:46-53

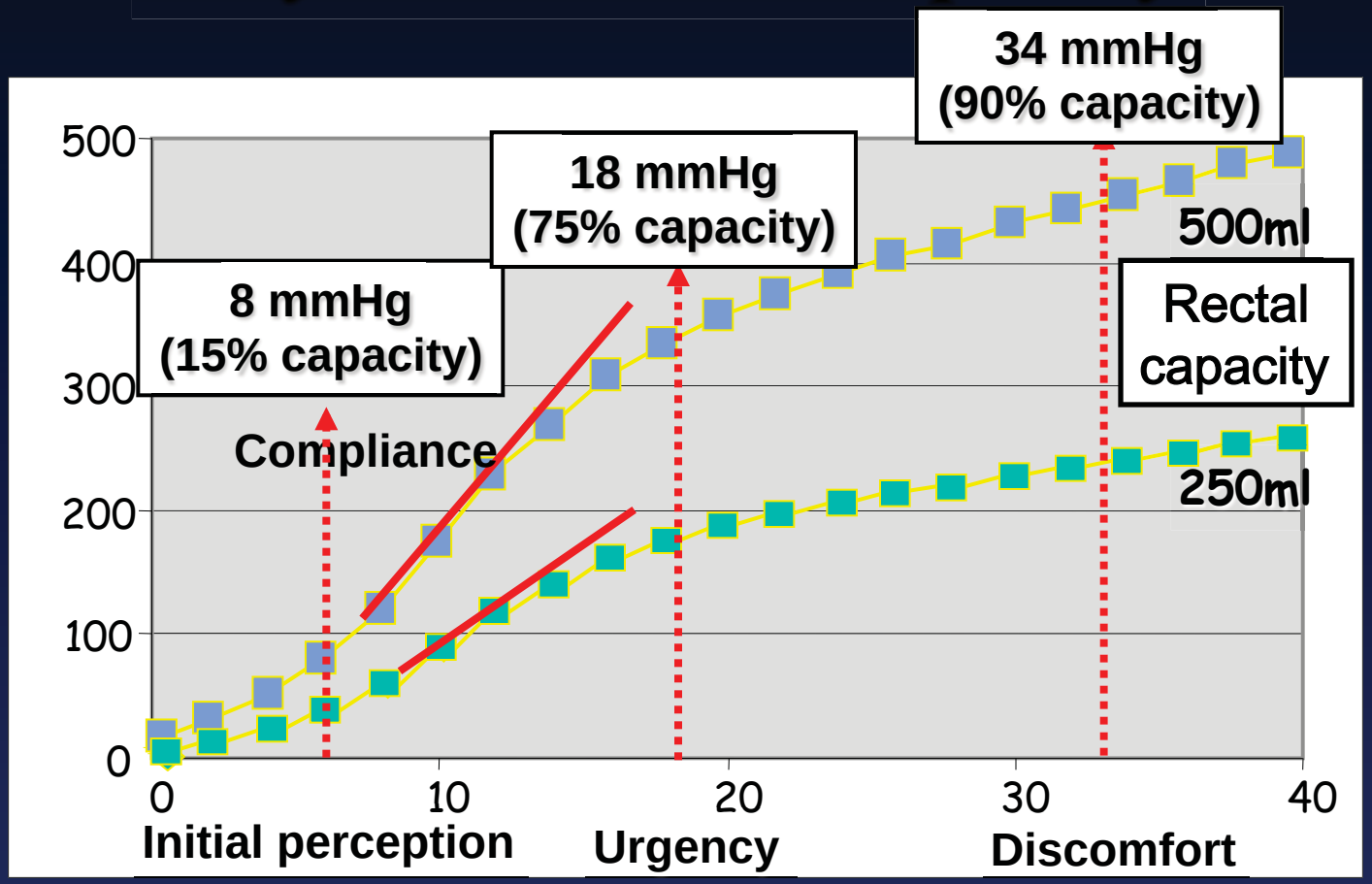
Determinants of continence



Rectal Barostat



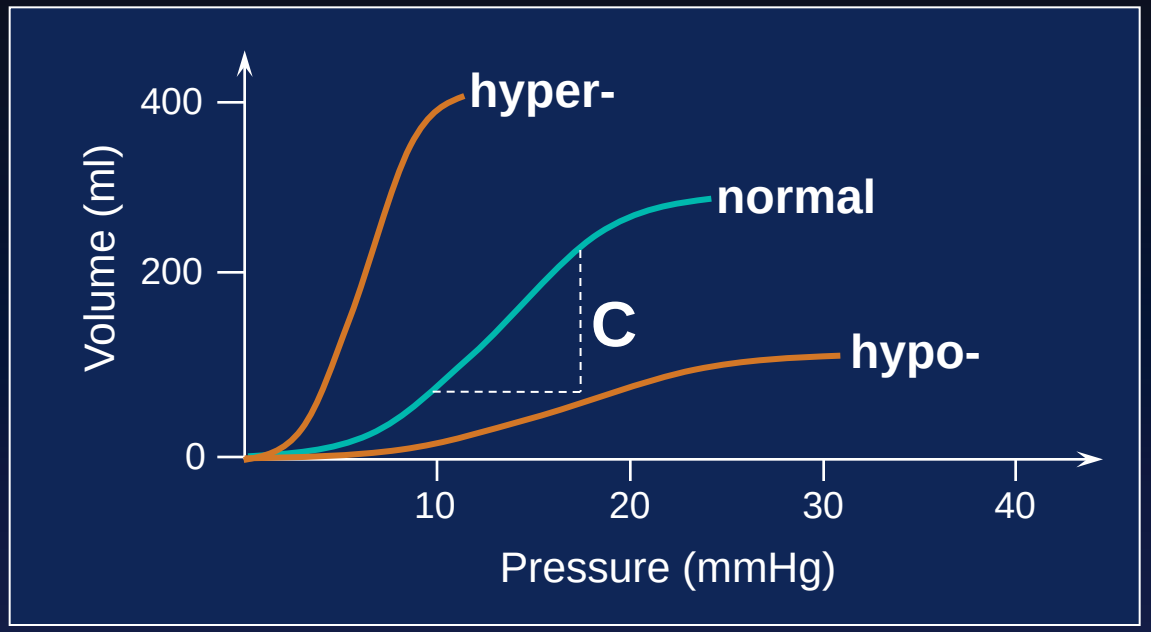
Rectal perception and compliance vary with rectal capacity



Fox MR, Digestion 2011; 83:46-53

Volume measurements are reproducible *within patients* and can be compared *between patients* after normalisation to rectal capacity

Barostat: compliance and sensitivity



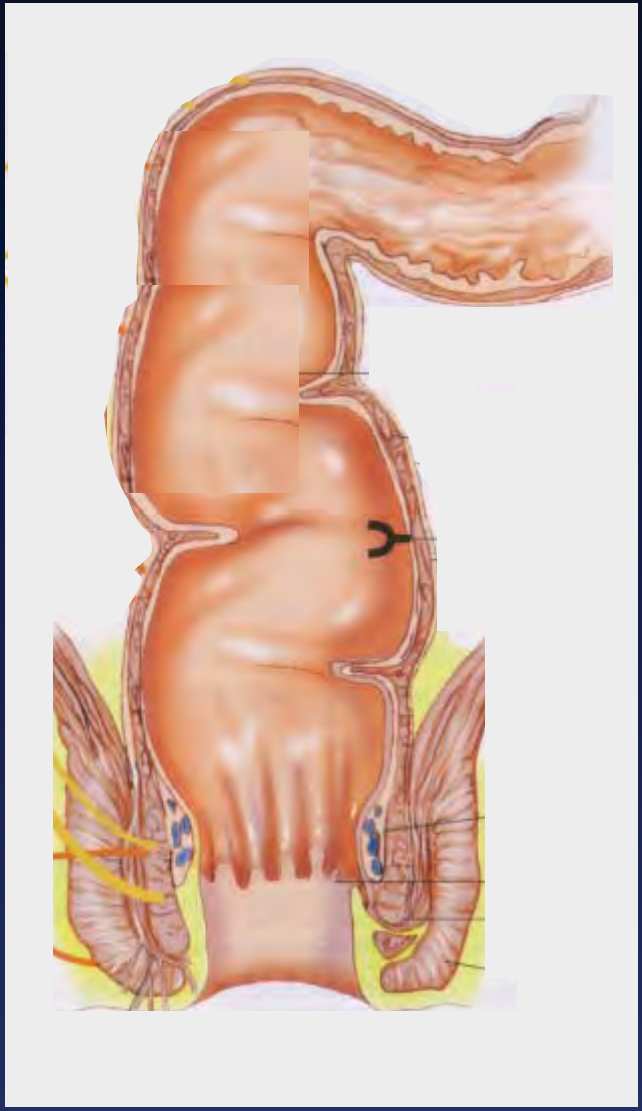
*hypo*compliant (‘rigid’): urgency → urge incontinence

Chan, Scott, Williams, Lunniss. Dis Colon Rectum 2005

- *hyper*compliant (‘too loose’): Rectal evacuation disorder
  +/- passive fecal inontinence

Gladman, Dworkin, Williams, Lunniss, Scott. Am J Gastroenterol 2005

Perception testing with „Rapid Barostat“

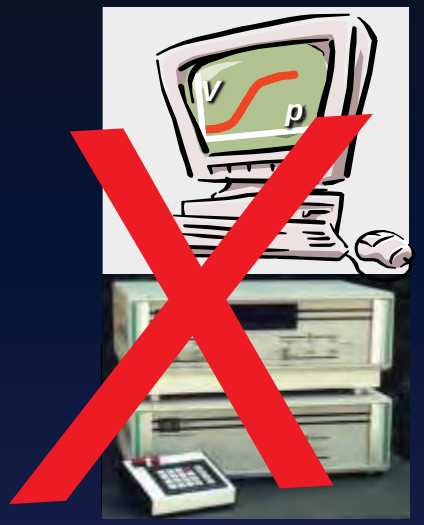


Perception thresholds

- **Initial perception**
- **Urgency**
- **Max. tolerated volume**

Rectal capacity

= **Vol @ 40 mmHg**

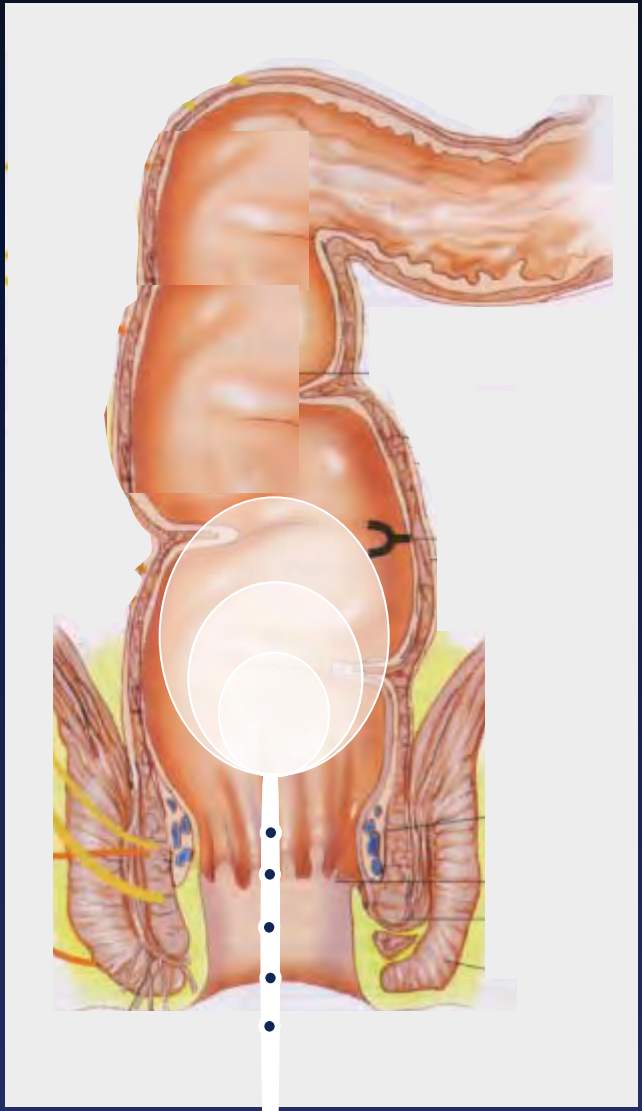


„Compliance“

- Pressure @ 50% rectal capacity

Sauter M, …, Fruehauf H Neurogastroenterol Motil 2014; 26:685-95

Perception testing with „Rapid Barostat“



Perception thresholds

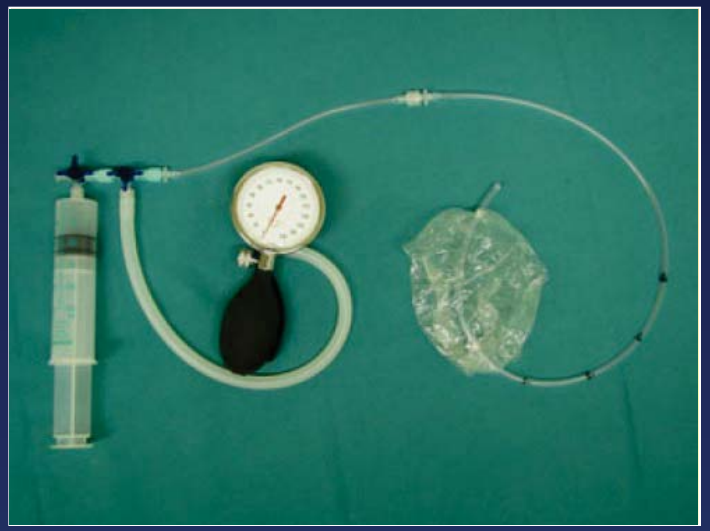
- **Initial perception** *(10-30% RC)*
- **Urgency** *(40-80% RC)*
- **Max. tolerated volume** *(>80 % RC)*

Rectal capacity (RC)

= **Vol @ 40 mmHg** *(200-450 ml)*

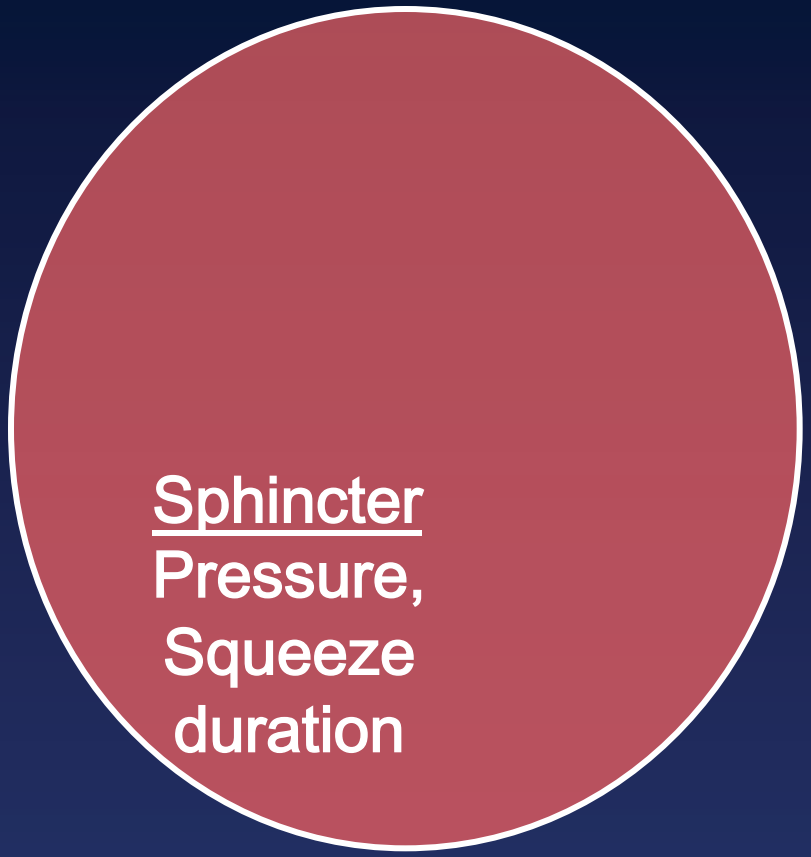
„Compliance“

- Pressure @ 50% rectal capacity



Sauter M, …, Fruehauf H Neurogastroenterol Motil 2014; 26:685-95

Determinants of continence



High-resolution anorectal manometry

„solid state catheter“

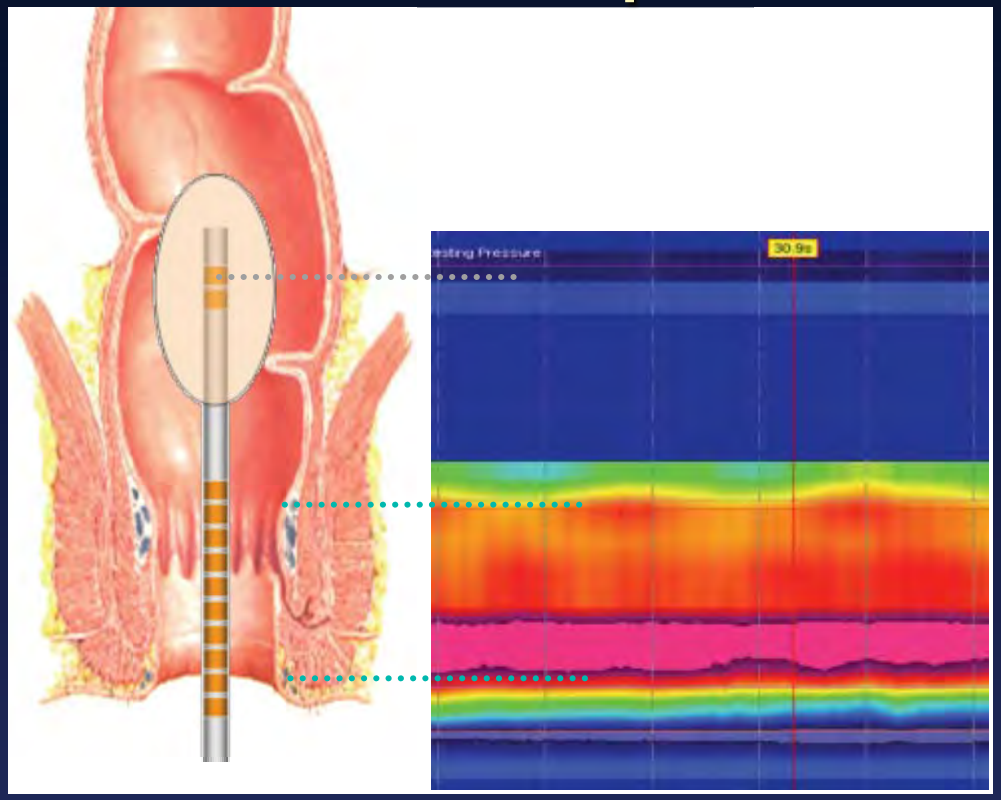
2 intrarectal pressure sensors

10 pressure sensors in anal canal

Manoscan AR 360,
Sierra Sientific Instruments,
Los Angeles, U.S.A.

High-resolution anorectal manometry

→ color coded 2D plot

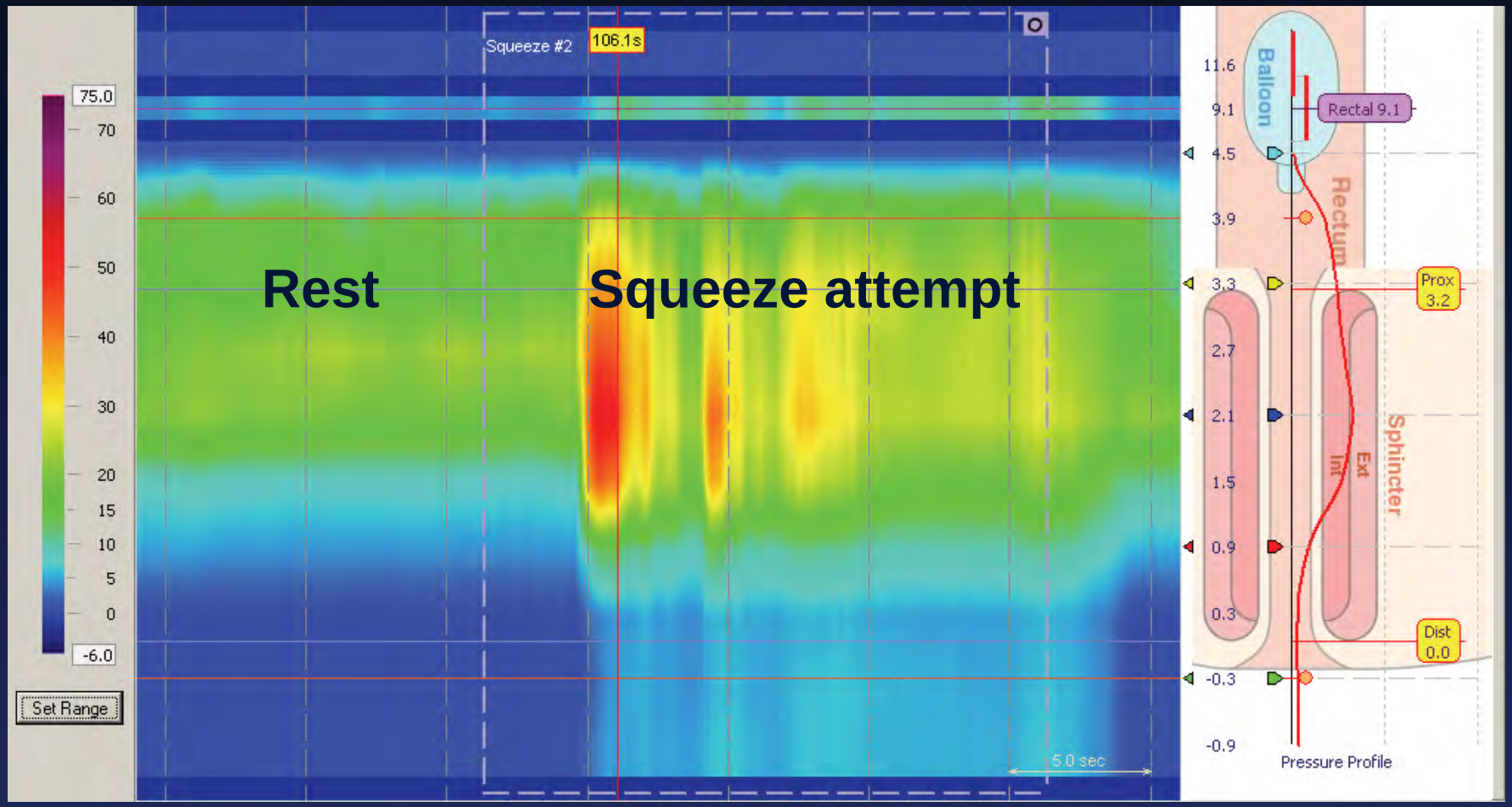


Interpolation

Clouse et al. AJP 1996

Manoscan AR 360,
Sierra Sientific Instruments,
Los Angeles, U.S.A.

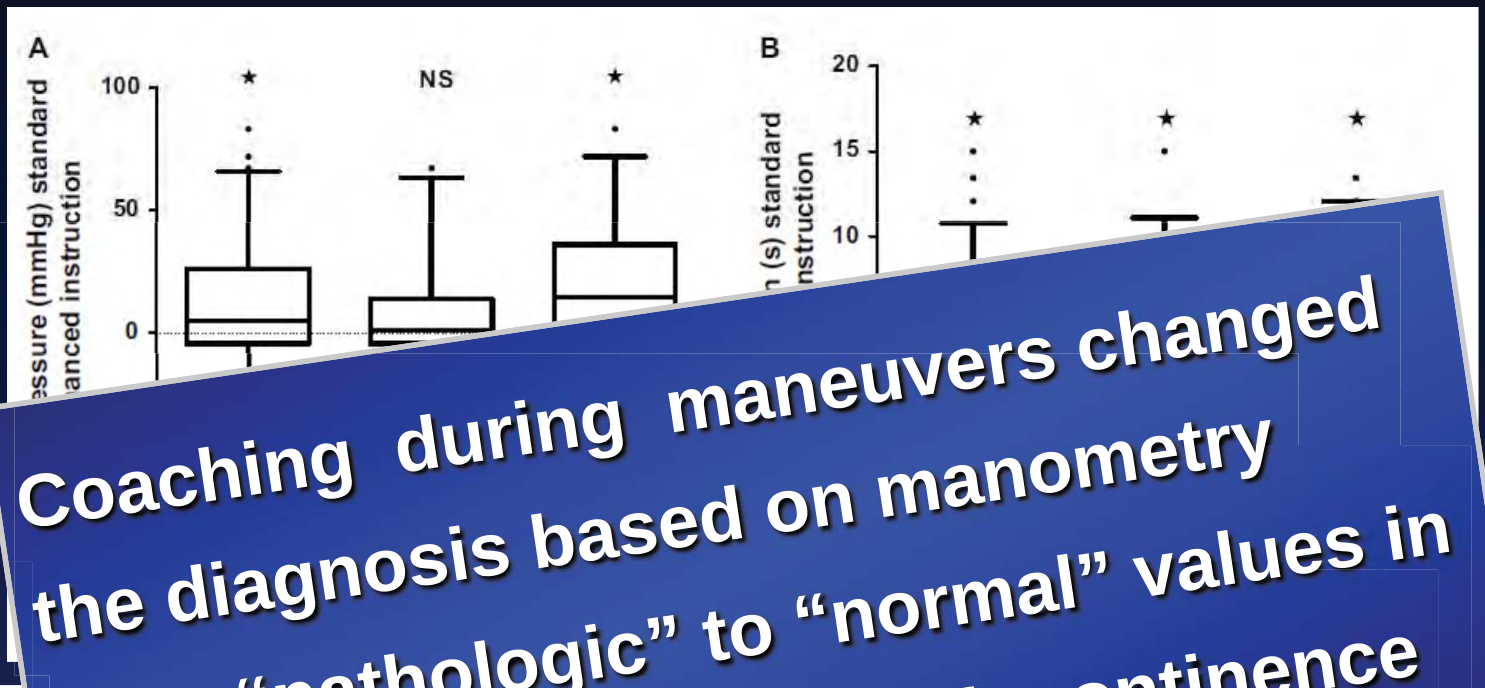
Combined passive and urge incontinence



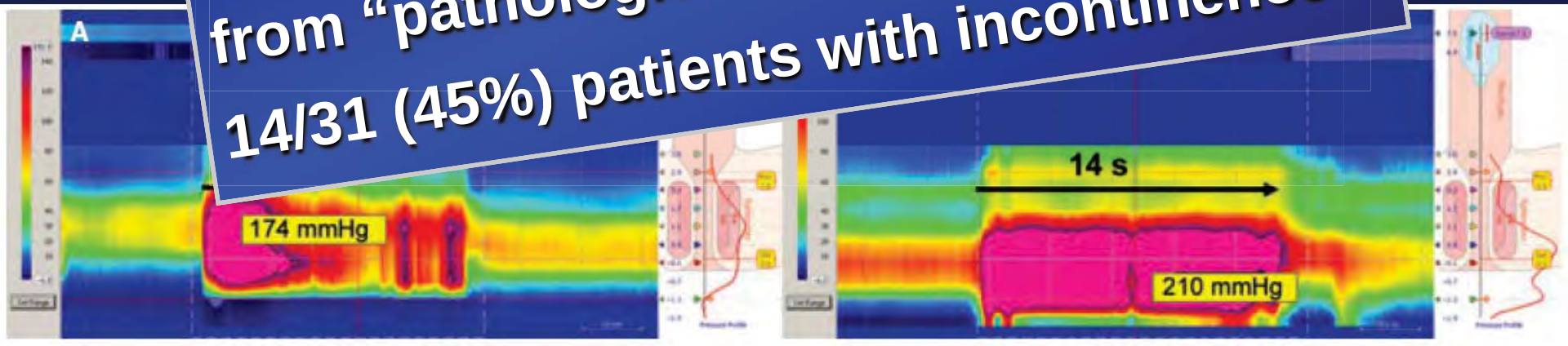
Decreased resting pressure and inappropriate and shortened squeeze pressure (rise) in an elderly female patient. *Additionally decreased rectal capacity and anorectal hypersensitivity (not shown)*

Coaching: Instruction and Feedback

Coaching during anorectal manometry



Coaching during maneuvers changed the diagnosis based on manometry from "pathologic" to "normal" values in 14/31 (45%) patients with incontinence



Heinrich H, Fruehauf H, Neurogastroenterol Motil 2013; 25:230-7, e16

High-resolution anorectal manometry

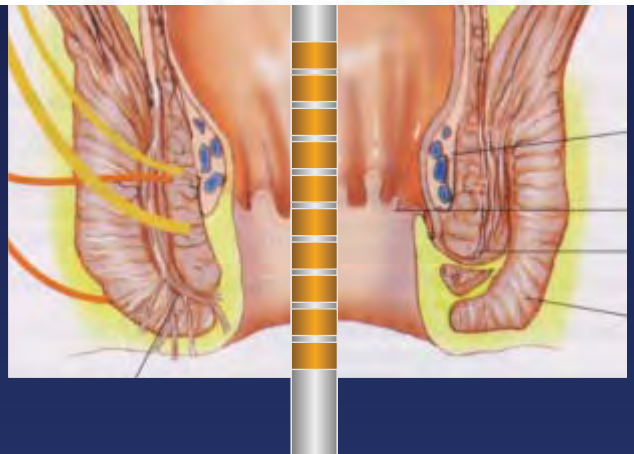
J Neurogastroenterol Motil, Vol. 22 No. 1 January, 2016
pISSN: 2093-0879 eISSN: 2093-0887
http://dx.doi.org/10.5056/jnm15168
Journal of Neurogastroenterology and Motility

Technique Review

How to Perform and Interpret a High-resolution Anorectal Manometry Test

Tae Hee Lee[1] and Adil E Bharucha[2*]

[1]*Institute for Digestive Research, Soonchunhyang University Seoul Hospital, Seoul, Korea; and* [2]*Clinical Enteric Neuroscience Translational and Epidemiological Research, Mayo Clinic and Mayo Foundation, Rochester, Minnesota, USA*



- Less movement artifacts

Jones P, Am J Gastronenterol 2007
Sauter M, Neurogastroenterol Motil 2014

HR-ARM: Normal values in women

Table 2. Normal Values of High-resolution and High-definition Anorectal Manometry in Women

Authors	Noelting et al[22]		Noelting et al[22]		Li et al[23]		Lee et al[24]		Carrington et al[7]		Cross-Adame et al[27]	
Years	2012		2012		2013		2014		2014		2015	
Gender	F (n = 30, < 50 years)		F (n = 32, ≥ 50 years)		F (n = 46)		F (n = 27)		F (n = 96)		F (n = 42)	
Ethnic	Western		Western		Asian		Asian		Western		Western	
Method	HR-ARM		HR-ARM		HD-ARM		HR-ARM		HR-ARM		HD-ARM	
Manufacturer	Given		Given		Given		Sandhill		MMS		Given	
Variables	Mean ± SEM	10th, 90th percentile	Mean ± SEM	10th, 90th percentile	Mean ± SEM	95% CI	Median	IQR	Mean ± SD	Min, Max	Mean	95% CI
Maximum resting pressure	88 ± 3	68, 122	63 ± 5	33, 91	68.5 ± 2.4	63.6-73.4					76	71-81
Mean resting pressure					60.2 ± 2.2	55.8-64.6	32	24-42	65 ± 19	25, 111		
Maximum squeeze pressure	167 ± 6	115, 209	162 ± 12	99, 248	167.4 ± 8.4	150.5-184.3	75	61-89	225 ± 89	76, 503	205	186-224
HPZ length (cm)	3.6 ± 0.1	2.8, 4.4	3.5 ± 0.2	2.4, 4.5	3.5 ± 0.1	3.3-3.7			3.5 ± 0.8	1.6, 6	4	3.8-4.2
Duration of sustained squeeze (sec)	12 ± 1	3, 23	14 ± 3	3, 23	14.7 ± 0.8	13.2-16.3			11 ± 9	2, 30	28	27-30
Anal squeeze increment	73 ± 6	23, 113	96 ± 12	28, 171			20	12-28	113 ± 62	20, 281		
Residual anal pressure	63 ± 5	35, 97	32 ± 5	3, 94	65.2 ± 6.7	51.8-78.7	19	10-35	43 ± 21	12, 110	36	28-43
Anal relaxation rate (%)	32 ± 5	7, 65	25 ± 10	−68, 91	27.2 ± 2.9	21.2-33.0	30	0-75	24 ± 22	0, 83		
Intrarectal pressure	20 ± 3	0.7, 47	32 ± 5	5, 72	45.8 ± 7.2	31.2-60.4	37	27-51	64 ± 31	18, 200	39	34-45
Rectoanal pressure differential	−41 ± 6	−74, −1	−12.6 ± 6	−55, 32	−12.8 ± 8.5	−29.8-4.1	16	5-30				
First sensation (mL)	33 ± 2	20, 40	32 ± 2	20, 40	40 ± 1.8	36.3-43.6	10	10-20			24	21-26
Desire to defecate (mL)	56 ± 3	40, 75	59 ± 4	40, 90			60	50-70			88	79-96
Urge to defecate (mL)	86 ± 5	60, 120	96 ± 5	60, 120	92.6 ± 4.4	82.2-98.6	115	98-153			139	130-147
Discomfort (mL)					145 ± 5.2	134.6-155.4					193	182-204
Balloon expulsion time	31 ± 10	4, 75	17 ± 9	3, 15			15	10-30				

HPZ, high pressure zone; F, female; HR-ARM, high-resolution anorectal manometry; HD-ARM, high-definition anorectal manometry; SEM, standard error of the mean; SD, standard deviation; IQR, interquartile range; Min, minimum; Max, maximum; CI, confidence interval.

Lee TH, Bharucha AE, J Neurogastroenterol Motil 2016; 22:46-59

Principles of treatment

→ **Therapy according to etiology**

- Anorectal problem ?

- concomitant medical conditions ?

Education + self manage

Incontinence in the setting of diarrhea:
Identify and treat underlying disease !

Biofeedback

Bulking agents

Psyllium

1-2x 1-2 KL/d in Aq

- ***Metamucil®, Laxiplant soft®***
  Plantaginis-ovatae
  - stool consistency ↑

Sterculiae gummi

- ***Normacol®***

Approved for constipation, Transit time ↓

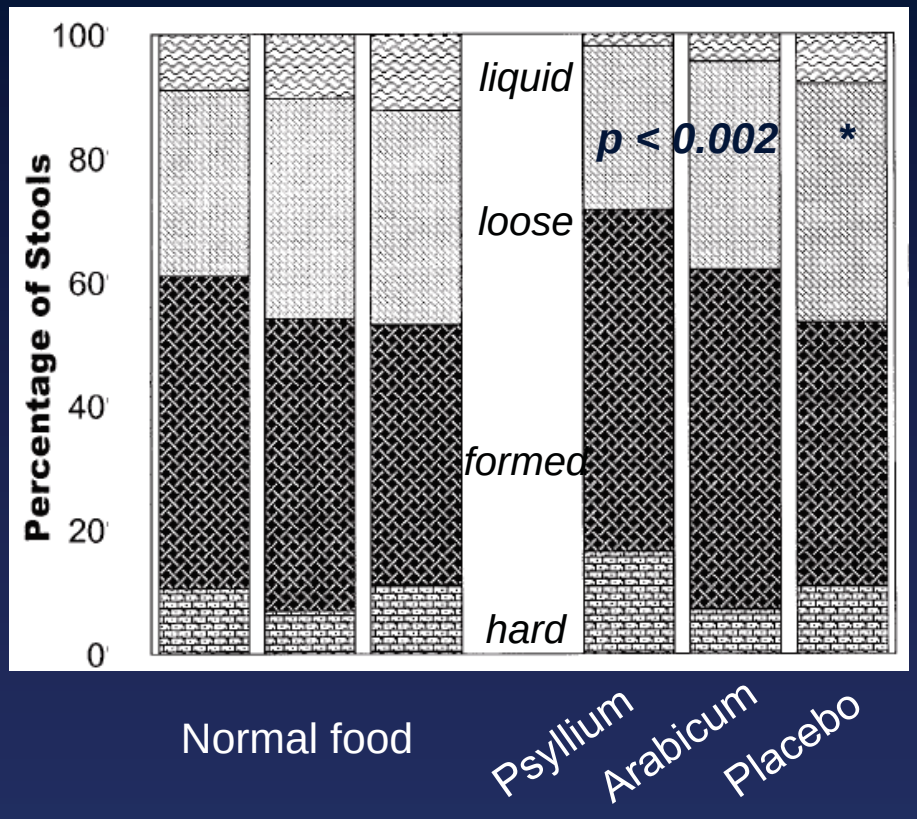
CAVE: Meteorism

Bharucha, Gastroenterology 2003; 124:1672-8
Andrews, Nat Clin Pract Gastroenterol Hepatol 2005; 2:516-25

Bulking agents - evidence

RCT, prospective, single-blind
n=39, FI with loose stools
25g Metamucil / 25g Gummi arab. / Plac.

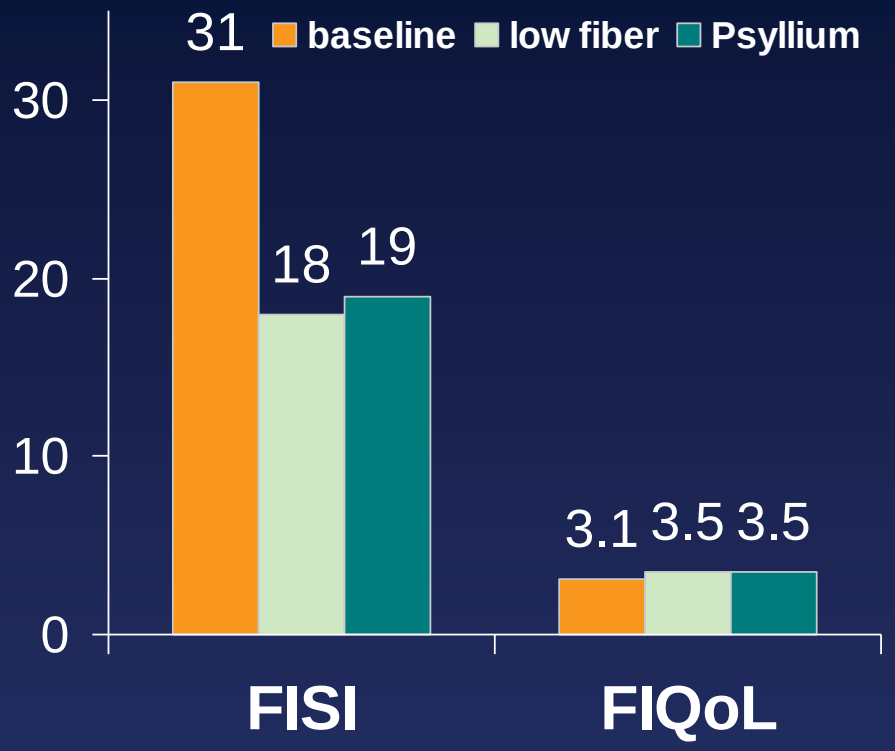
8d Baseline **31d Fiber**



Bliss DZ, Nurs Res 2001; 50:203-13

RCT, doubleblind cross-over
n=36, 2x6 weeks Loperamid 2x2 mg +
low fiber vs. 2x1 TL Psyllium p.o.

FI Severity Index & QoL



Lauti M, Colorectal Dis 2008; 10:553-62

Loperamid

Loperamid
(Imodium®)

- **3(-4)x 2-4 mg/d, titrate,** *Sirup !*
- ***30 min prior to meals and social events***

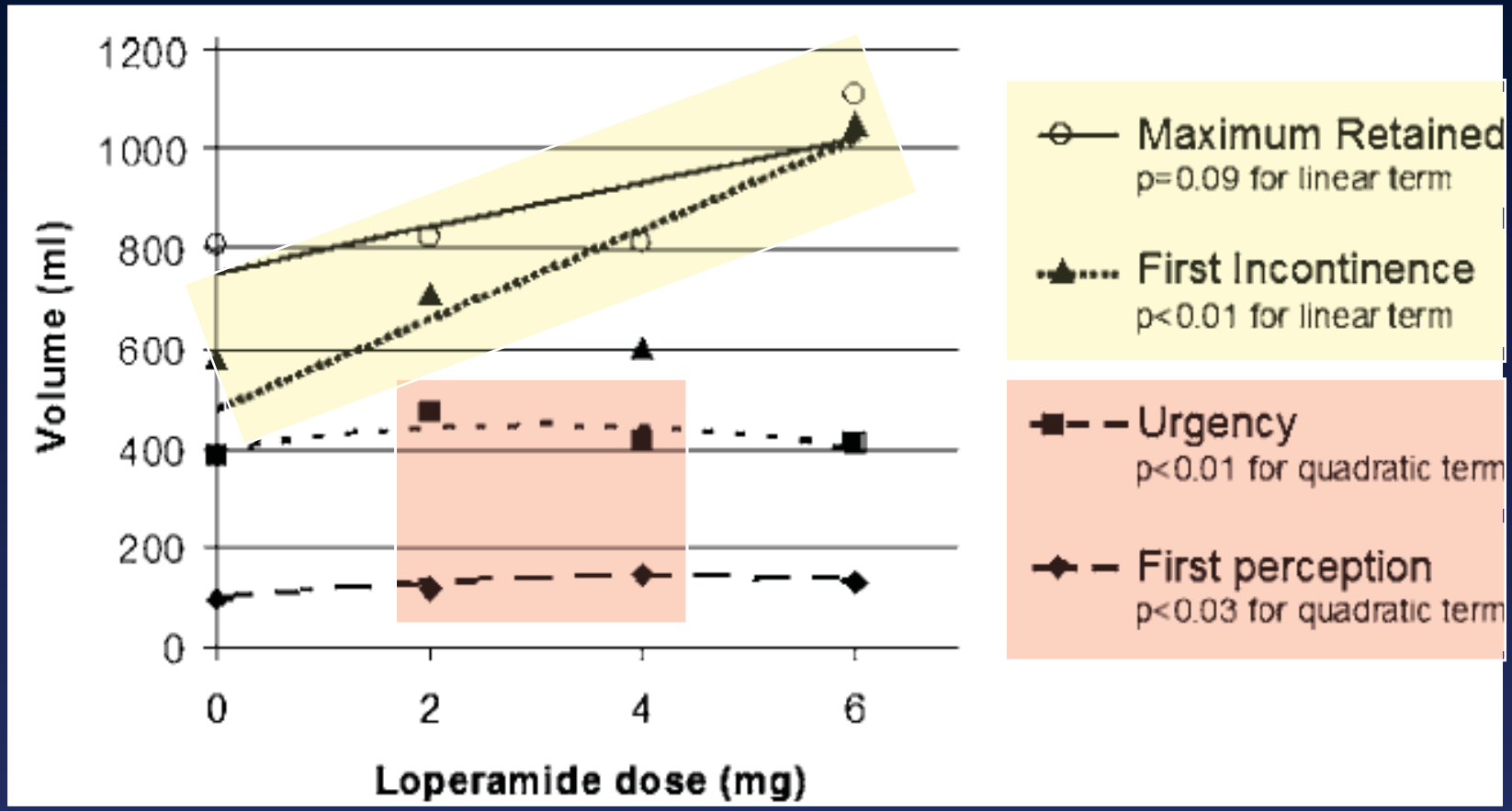
- **Stool weight ↓**
- **Stool frequency ↓**
- **Stool consistency ↑**
- **Incontin. episodes ↓**
- **Urgency episodes ↓**

cebo		*Loperamide*		
ange	*Mean*	*Range*	*Mean*	P *value*
–466	186	0–467	102	<0.001
–54	17	1–44	11	<0.001
–100	57	0–100	40	<0.001
–6	0.9	0–6	0.6	<0.01
–27	5.3	0–7	1.52	<0.001

Read M et al., Dig Dis Sci 1982; 27:807-14

Loperamid: Visceral perception

RCT, doublelblind, n=10
obese patients on 3x120 mg Orlistat (Xenical® = lipase inhibitor),
Loperamid 2, 4 oder 6 mg/d vs. Placebo, cross-over for 2 Wochen



Fox M et al., Dig Dis Sci 2005; 50:1576-83

Medikamentöse Therapie

Phenylephrin

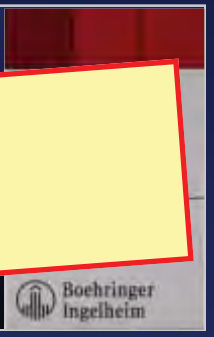
- Stimulates

In CH/D no formulation available !

Clonidine

- ***Catapresan®***

Insufficient effects and data !

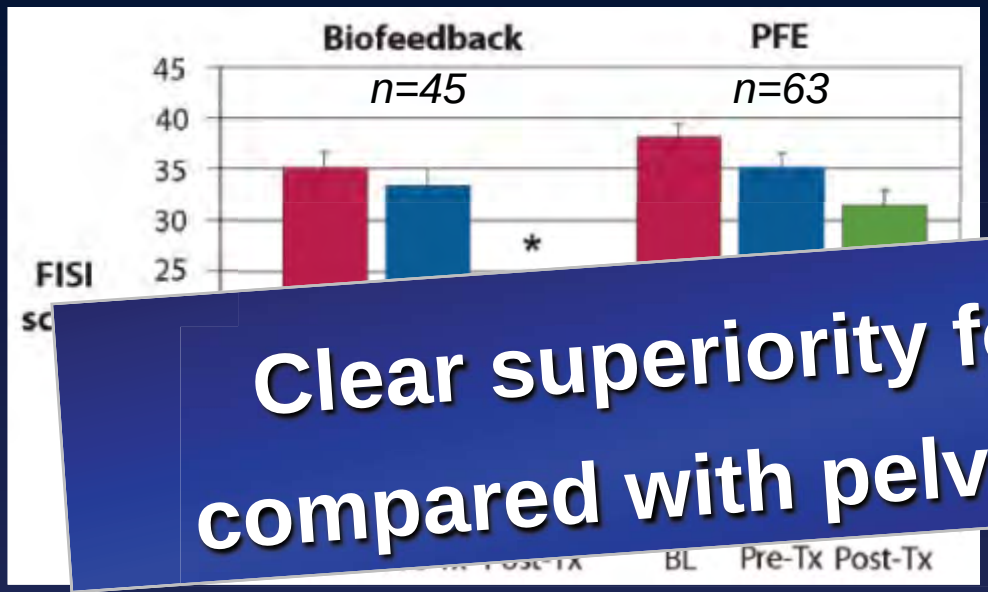


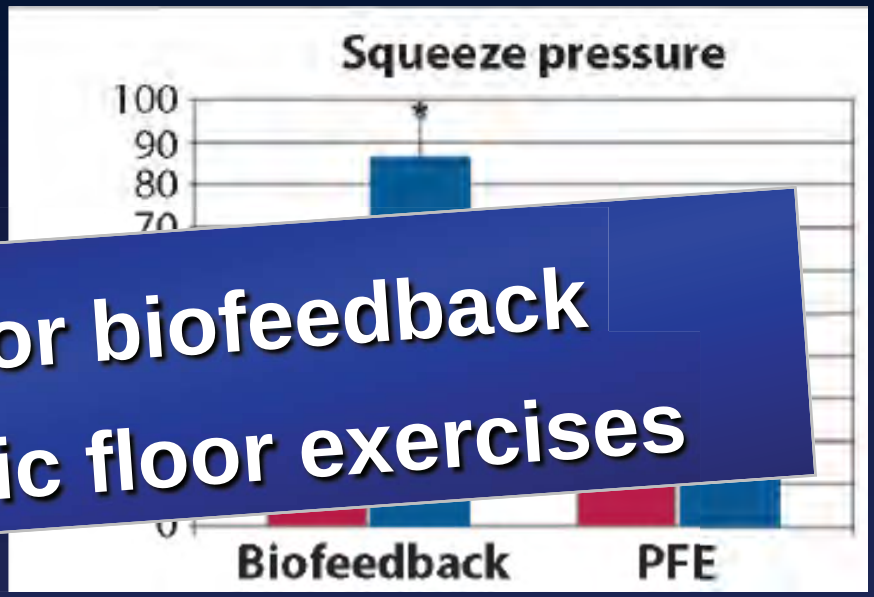
Bharucha, Gastroenterology 2003; 124:1672-8
Bharucha, Clin Gastroenterol Hepatol 2014; 12:843-51 e2

Biofeedback

prospective RCT

n=108 patients with fecal incontinence non-responding to medication





Clear superiority for biofeedback compared with pelvic floor exercises

Adequate relief @ 3 mon f/u	**Biofeedback:**	**79%**
(persisting for 1 year)	**PFE:**	**41%**

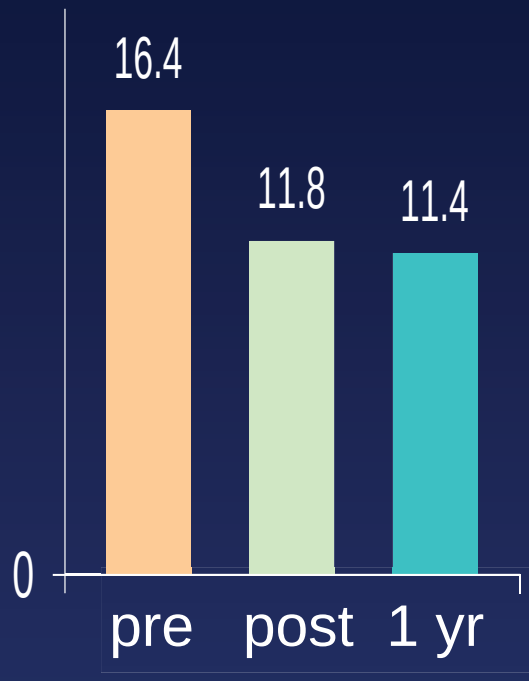
Heymen S et al., Dis Colon Rectum 2009; 52:1730-7

Biofeedback: Long term results

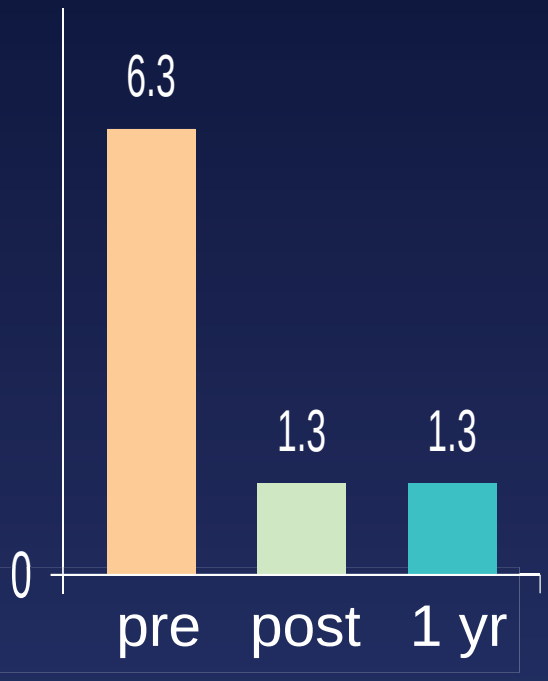
Prospective RCT

n=105 pat. with fecal incontinence nonresponding to medical therapy

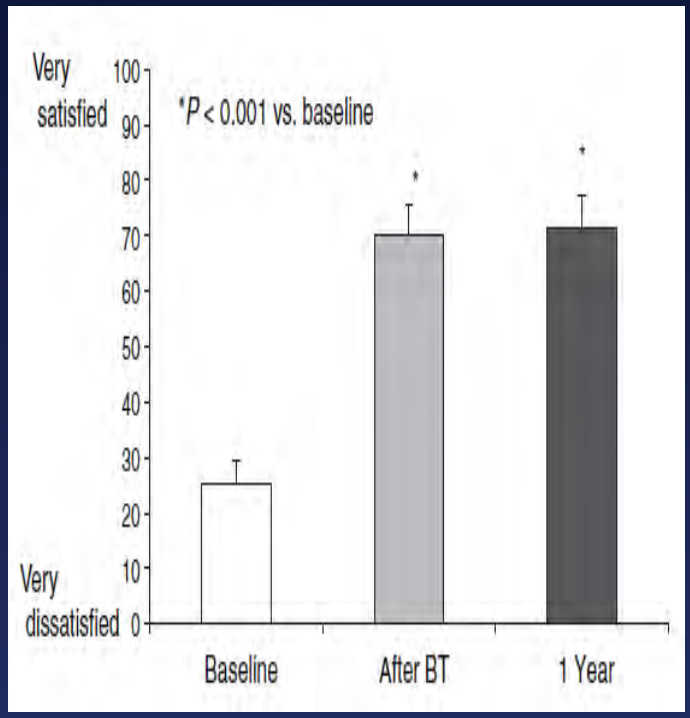
Stool frequency/wk



Incontinence episodes/wk

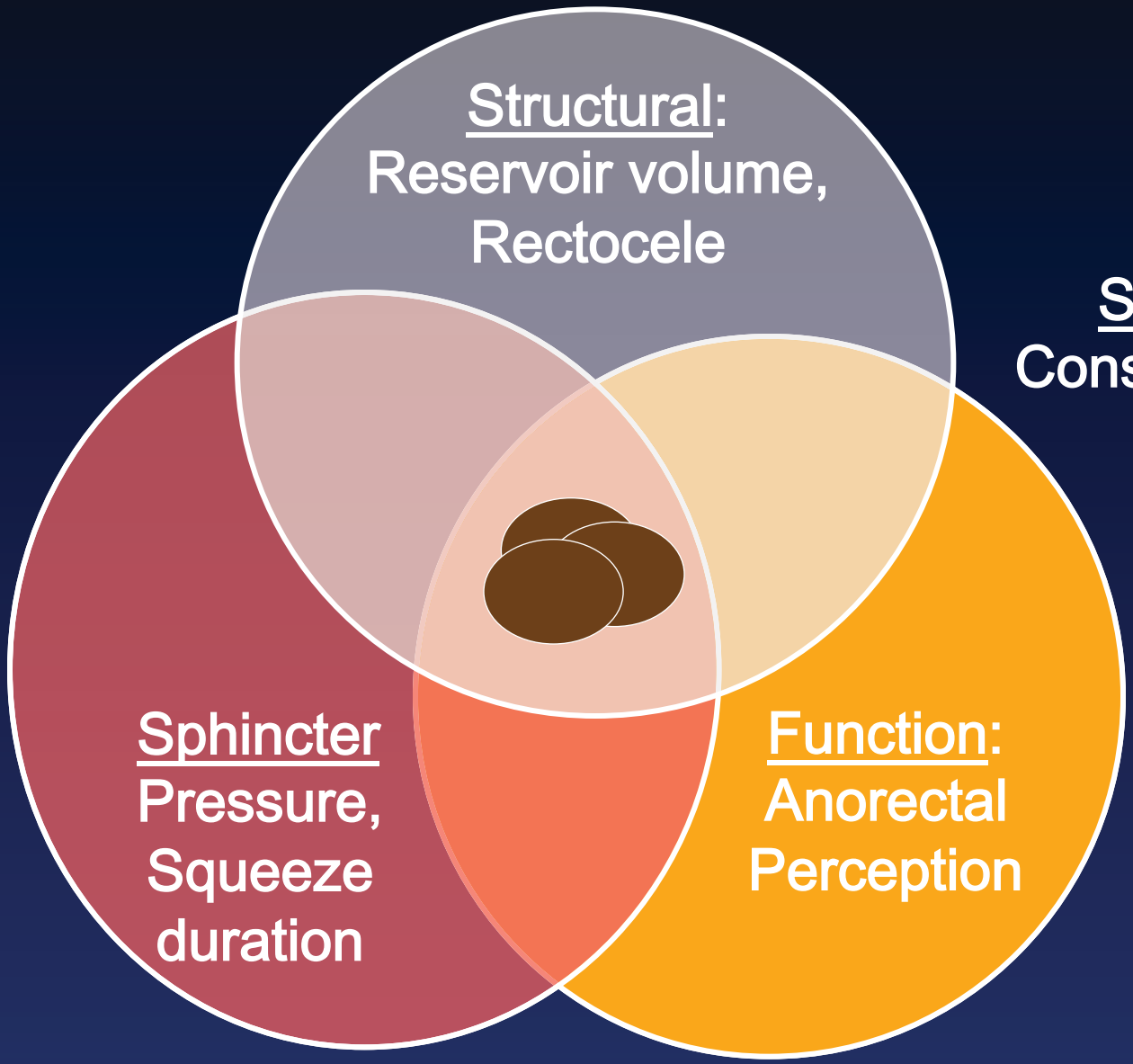


Patient satisfaction

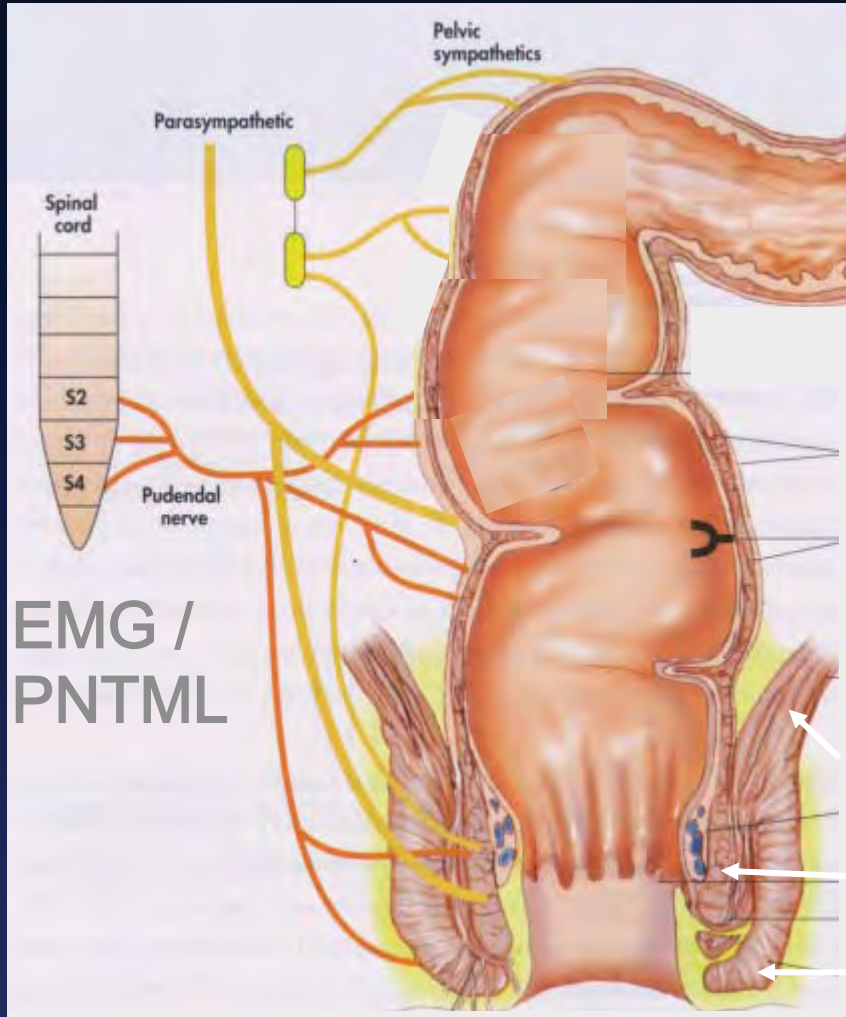


Ozturk, Rao et al. Aliment Pharmacol Ther 2004; 20:667-74

Summary: Determinants of continence



Anorectal function tests



EMG / PNTML

Rektalkapazität
Rektale Compliance
Rektale Sensibilität

Rectal Barostat / Perception test

Levator ani

M. sphincter ani internus

M. sphincter ani externus

Anorectal manometry

Defaecography

EUS

Fox MR,…Frühauf H et al. Digestion 2011; 83:46-53