

# ANO-RECTAL MANOMETRY

## THE ANO-RECTUM

- The normal function is storage and release of intestinal waste products.
- The volume of the rectum is 650-1200mL.
- The innervation of the rectum is via the sympathetic (L1-3) and parasympathetic (S2- 4) nervous systems.
  - The internal anal sphincter is innervated with sympathetic and parasympathetic fibers. Both are inhibitory and keep the sphincter in a constant state of contraction.
  - The external anal sphincter is skeletal muscles innervated by the pudendal nerve with fibers from S2-4.

## ELEMENTS OF ANORECTAL MANOMETRY (I)

- Ano-rectal manometry measures the resting & pressures generated by the sphincter complex of the anus.
  - Resting Pressure is 85% internal anal sphincter + 15% external anal sphincter, (normally 40-80mmHg)
  - Voluntary Squeeze Pressure is 100% due to the external anal sphincter, (normally 80-160mmHg)
  - The test measures pressure gradients all along the anal canal both *radially* and *longitudinally*.

## ELEMENTS OF ANORECTAL MANOMETRY (II)

- Sphincter length (usually 3cm) & symmetry
- Minimum Sensory Volume (usually 10-15mL)
  - Determined by instilling volume into rectal balloon until sensed by urge to defecate
- Resting Anal Inhibitory Reflex (RAIR)- corresponds to a decrease resting pressure attributed to balloon distension in the high pressure zone (HPZ) with an associated EAS contraction.

## USE OF ANORECTAL MANOMETRY

- Ano-rectal manometry can define hypo/hyperfunctional disorders of the sphincter complex
- Manometry can compare objective function with patient's subjective sensation of rectal fullness
- Often performed in conjunction with other clinical and diagnostic modalities: DRE, video defecography, and anal manometry with EMG.

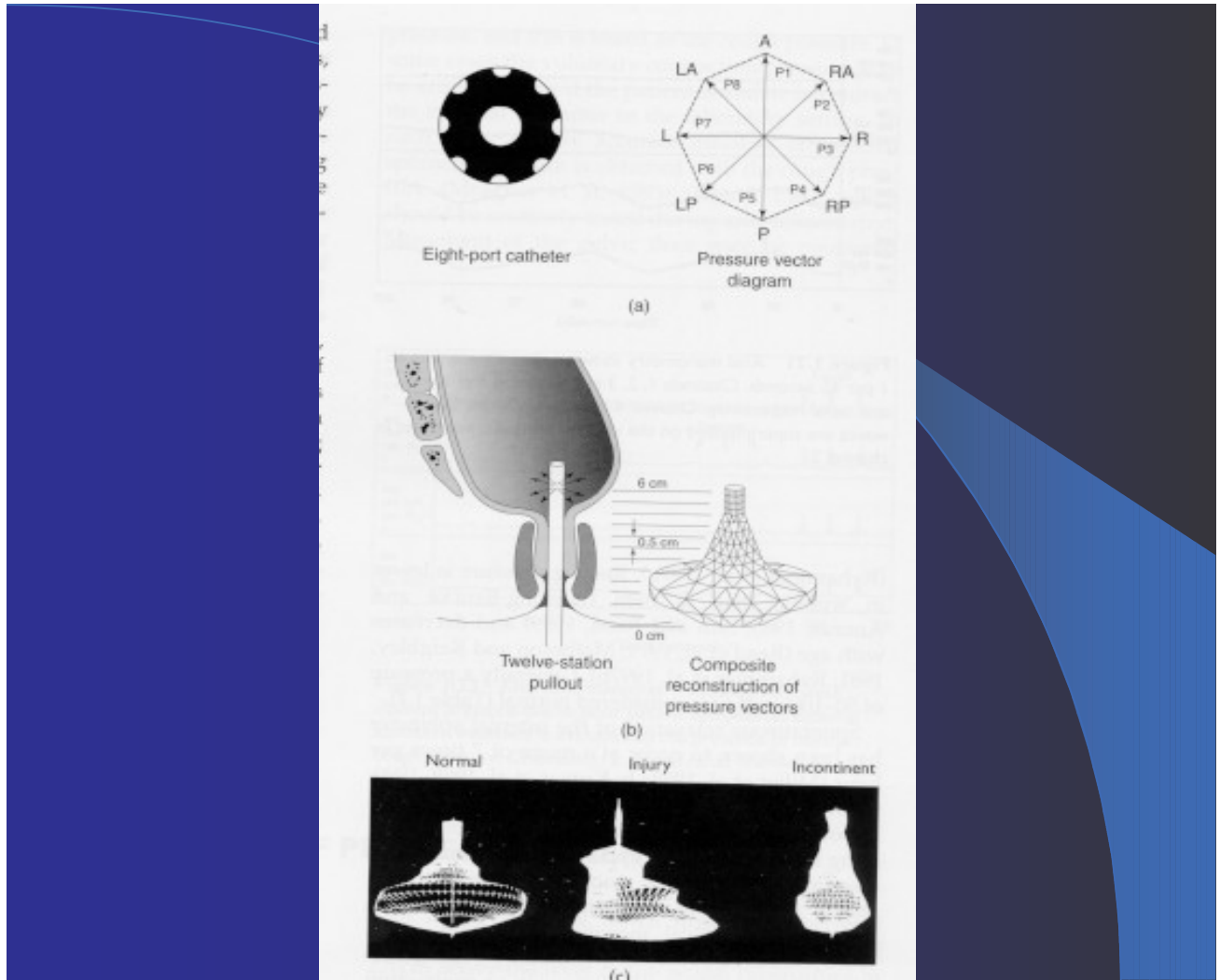
## INDICATIONS

- Fecal Incontinence
- Constipation
- Pre/Post Surgical Evaluation
- Other
  - Functional Anorectal Pain
  - Pelvic Floor Dyssynergia
  - Hirschsprung's Disease

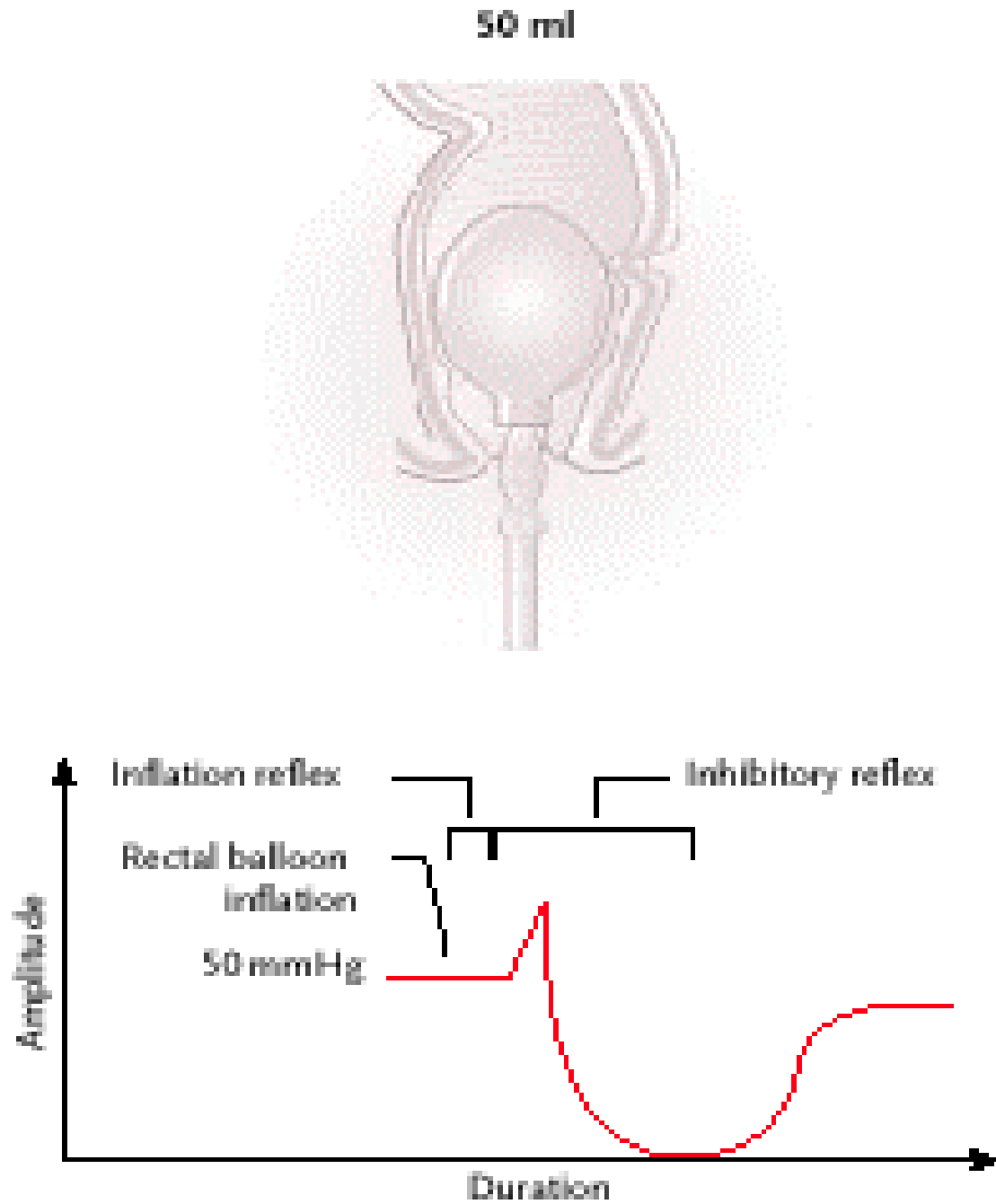
## TECHNIQUE AND PROCEDURE

- May bowel prep 2-4 hours prior to test
- Insert solid state or water-perfused probe with radial transducers or ports
- Allow return to baseline pressure (~5 min)
- Patient asked to squeeze, relax, and strain while pressures are measured within the anal canal

# TECHNIQUE AND PROCEDURE



## NORMAL MANOMETRIC TRACING



**RAIR tracing in a healthy subject**

ANOMANOMETRIC FINDINGS SEEN WITH SPECIFIC DISEASES

Clinical situation	Resting P (IAS)	Squeezing P (EAS)	Pushing P	RAIR	Comments
<b>A. Normal</b>	Normal (good tone)	High	Low	+	
<b>B. Fecal Incontinence (multiple etiologies)</b>					
1. Overflow incontinence d/t: a. rectal fecal impaction - decreased sensation - obtuse anorectal angle - chronic stimulation of RAIR  b. neoplasm	Low	Low	Low	+	-The extent of the P drop can often correspond to the extent of disease/debilitation  -RAIR difficult to assess given low resting and squeezing pressures
2. Abnormal pelvic floor d/t: a. neurogenic causes - pudendal nerve disruption/weakness - neuropathy (dm, scleroderma, multiple sclerosis) - generalized neuropathy or cord lesion  b. sphincter disruption - obstetrical trauma - surgical trauma - trauma (other)	Low	Low	Low	+/-	-It is often helpful if not essential to utilize EMG studies to evaluate neurogenic causes of fecal incontinence, although diagnosis can often be made on history alone.
<b>C. Constipation</b>	Normal	High	High		In the absence of obstructive pathology, failure for sphincter relaxation during pushing often contributes to constipation.
<b>D. Hirshsprung's</b>	Low	Low	Low	-	Negative RAIR is pathognomonic for Hirshsprung's

## OTHER ASSESSMENT TOOLS

- Sphincterography: analyzes EAS muscle contraction and relaxation radiographically, using a flexible balloon connected to liquid barium.
- Defecography: radiographically assesses the shape and position of the rectum as it empties.
- Pudendal nerve studies
- EMG
- Anal ultrasonography

## REFERENCES

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