




1

**Fecal Incontinence
and
Sacral Nerve Modulation**


Marc Singer, MD, FACS, FASCRS
Professor, Division of Colon & Rectal Surgery
Loyola University Medical Center



2


DISCLOSURE OF FINANCIAL RELATIONSHIPS

- I have the following relevant relationship(s) to disclose:
 - Johnson & Johnson
 - Consultant





3

Introduction



- Professor of Colon & Rectal Surgery, Loyola University Medical Center
 - Regional Director Enhanced Recovery after Surgery Program (ERAS)
 - Medical Director Bloodless Medicine & Surgery Program



4

Loyola University Medical Center



5

Fecal Incontinence

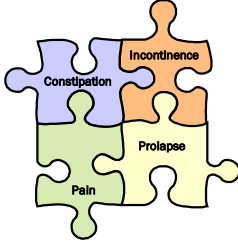



6

Pelvic Floor Disorders

- Large number of diagnoses
- Variable etiology
- Difficult to categorize / organize
- Difficult patients

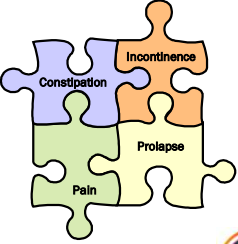

- **Incontinence**
- **Constipation**
- **Prolapse**
- **Pain**

7

Pelvic Floor Disorders

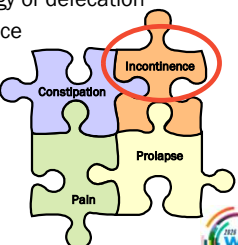

- Multidisciplinary approach
 - Colorectal surgery
 - Urogynecology
 - Obstetrics
 - Gynecology
 - Physical Therapy
 - Radiology
 - Nursing
 - Primary Care
 - Gastroenterology
 - Psychology
 - Urology
 - Nutrition
 - Pharmacy
 - Pediatric Specialists

8

Overview

- Anatomy and physiology of defecation
- Physiology of continence
- Incontinence
 - Etiologies
 - Evaluation
 - Treatments

9

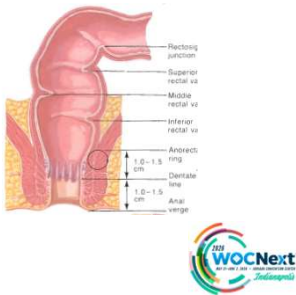
Anatomy and Physiology of Defecation



10

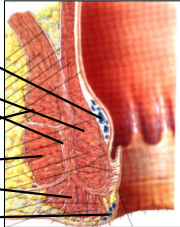
Anatomy

- Bony pelvis
- Rectum
- Pelvic floor
- Internal sphincter
- External sphincter

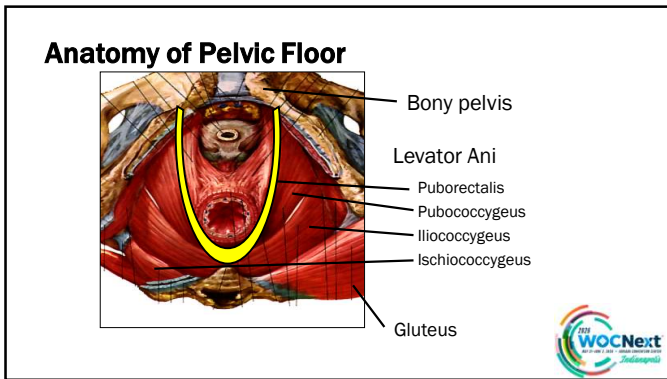


11

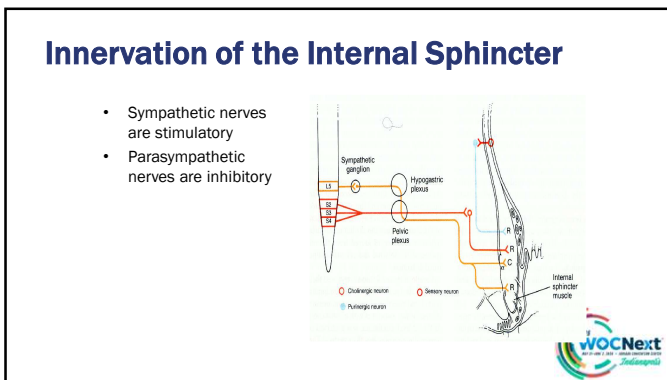
Sphincters



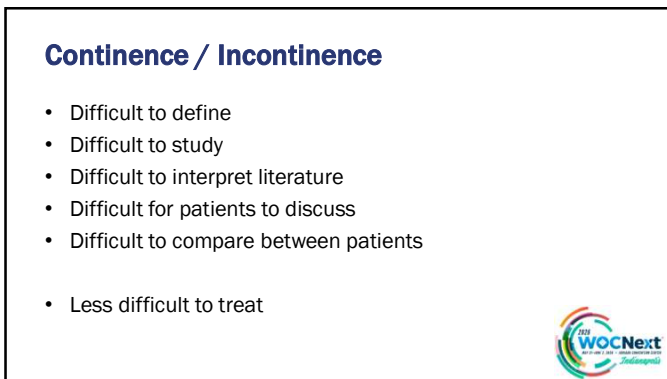
12



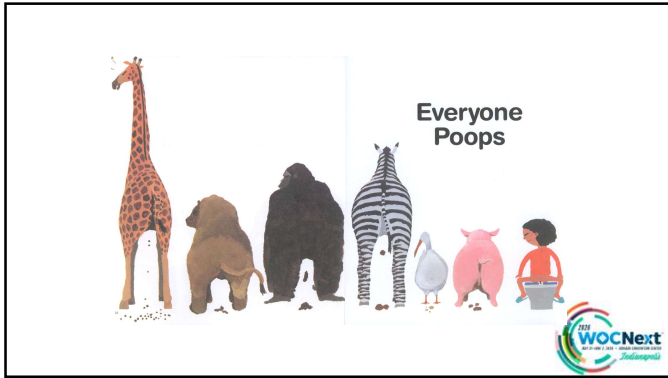
13



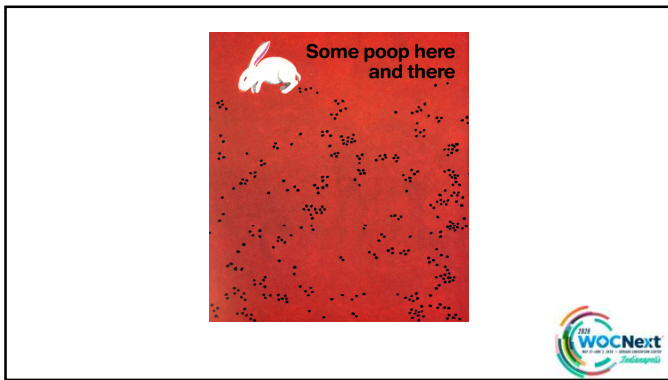
14



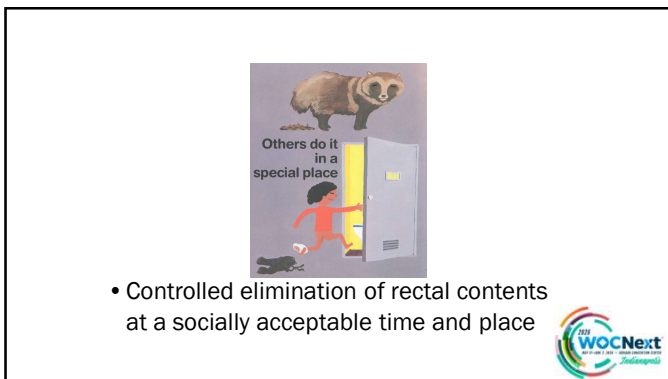
15



16




17



18

Physiology of Continence


- Complex interaction of factors
 - Psychiatric factors
 - Dietary factors
 - Stool volume and consistency
 - Neurologic component
 - Anal cushions
 - Mechanical factors
 - Anorectal angle
 - Rectal capacity
 - Sphincter function
 - Internal sphincter - involuntary resting tone
 - External sphincter - voluntary squeeze pressure
 - Anal sensation



19

Physiology of Continence





- Complex interaction of factors
 - Psychiatric factors
 - Dietary factors
 - Stool volume and consistency
 - Neurologic component
 - Anal cushions
 - Mechanical factors
 - Anorectal angle
 - Rectal capacity
 - Sphincter function
 - Internal sphincter - involuntary resting tone
 - External sphincter - voluntary squeeze pressure
 - Anal sensation



20

Physiology of Continence


- Diet modification
 - Fiber (25 - 30g / day)
- The quality and quantity of stool impacts the ability to defer defecation
 - Bowel evacuation program
 - Psyllium
 - Mineral Oil
 - Glycerine Suppositories

21

Physiology of Continence

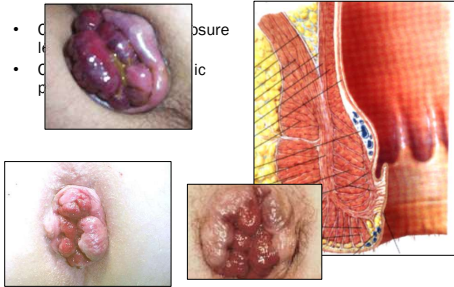

- Complex interaction of factors
 - Psychiatric factors
 - Dietary factors
 - Stool volume and consistency
 - Neurologic component
 - Anal cushions
 - Mechanical factors
 - Anorectal angle
 - Rectal capacity
 - Sphincter function
 - Internal sphincter - involuntary resting tone
 - External sphincter - voluntary squeeze pressure
 - Anal sensation



22

Anal Cushions



- C...
- C...
- P...

23

Physiology of Continence

- Complex interaction of factors
 - Psychiatric factors
 - Dietary factors
 - Stool volume and consistency
 - Neurologic component
 - Anal cushions
 - Mechanical factors
 - Anorectal angle
 - Rectal capacity
 - Sphincter function
 - Internal sphincter - involuntary resting tone
 - External sphincter - voluntary squeeze pressure
 - Anal sensation

24

Physiology of Continence

- Complex interaction of factors
 - Psychiatric factors
 - Dietary factors
 - Stool volume and consistency
 - Neurologic component
 - Anal cushions
 - Mechanical factors
 - Anorectal angle
 - Rectal capacity
 - Sphincter function
 - Internal sphincter – involuntary resting tone
 - External sphincter – voluntary squeeze pressure
 - Anal sensation



25

Is Fecal Incontinence Really a Problem?



26


Incontinence

- Socially and psychologically crippling
- Medications
- Undergarments
- Management of skin breakdown
- Female urinary/genital infections
- Social alienation
- Sexual dysfunction
- Depression
- Suicide



27

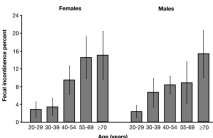
Is Fecal Incontinence Really Such a Big Problem?




28

Fecal Incontinence

- 8.3% Adult (W>M)
 - >23M adults
 - 15% >70 y/o
- 18-33% Hospitalized patients
- 50-70% Nursing Home
 - 2nd leading cause of admission






Whitehead. Gastro 2009



29

Fecal Incontinence in Healthy Women

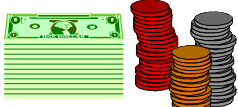

- Prevalence of symptomatic pelvic floor disorders in US women
 - Nygaard I. JAMA 2008
- 1961 women in 2005-2006 National Health and Nutrition Examination Survey
- 9.0% with FI

30

Incontinence

- The adult diaper industry >\$5 Billion annually
 - Baby diapers \$10B
- Total economic impact \$16-26 billion annually

31


Cost of Fecal Incontinence

ORIGINAL CONTRIBUTION


Economic Cost of Fecal Incontinence

Xiao Xu, Ph.D.¹ • Stacy R. Meneses, M.D.¹ • Melissa K. Zochowski, B.S.¹ • Dee E. Fenner, M.D.²

¹ Department of Obstetrics and Gynecology, University of Michigan, Ann Arbor, Michigan
² Department of Internal Medicine, University of Michigan, Ann Arbor, Michigan




- Mail survey 537 University of Michigan patients
- Utilization of services and medications over 12 months for products, services, productivity loss
- Average total cost \$4110 (\$0-46,342)



32

Etiology of Incontinence



- Previous surgery
- Obstetric
- Aging
- Trauma
 - Stretch due to prolapse
 - Sexual
- Primary disease
 - IBD
 - IBS
 - Diarrhea
- Radiation
- Neurogenic causes
 - Central or peripheral
- Congenital abnormalities
- Miscellaneous
 - Malignancies
 - Constipation
- Idiopathic incontinence



33

Fecal Incontinence After Anorectal Surgery

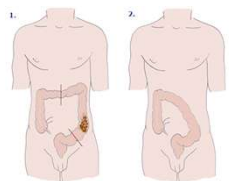

- Continence disorders after anal surgery-- a relevant problem?
 - Ommer A. Int J Colorectal Dis 2008.
- Literature Review
 - Sphincterotomy 0-45%
 - Hemorrhoid surgery 0-28%
 - Fistulotomy 0-64%
 - Fistula flaps 0-43%

34

Fecal Incontinence After LAR

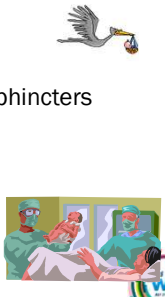

- Medical literature suggests that a more important factor for impaired defecatory function after rectal resection than the anal sphincter pressure
 - Schuld J. Colorectal Disease 2009
- Total Neoadjuvant (TNT)
- Robotic Surgery
 - >50% experienced frequency, transanal incontinence
- Transabdominal approaches

35

Etiology of Incontinence - OB



- Obstetric Injuries
 - Mechanical tear of the sphincters
 - Fenner Am J Obstet Gynecol 2003
 - Pudendal neuropathy
 - Up to 60%
 - Snooks Br J Obstet Gynaecol 1985
 - Jacobs Dis Colon Rectum 1990

36

Etiology of Incontinence - OB

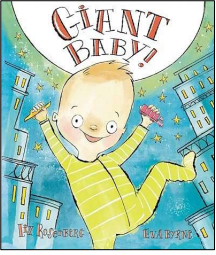

- U/S sphincter defects in 35% vaginal deliveries
 - Sultan Ah. NEJM 1993
- 3 months postpartum
 - 3.1% fecal incontinence
 - 25% incontinent to flatus
 - Eason E. CMAJ 2002
- 6 months postpartum
 - 17% if sphincter injury and 8% if Cesarean
 - Borello Obstet Gynecol 2006

37

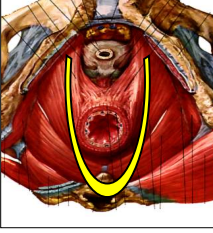
Obstetric Risk Factors

- Vaginal delivery
 - First vaginal birth
- Baby >9 pounds
- 3rd or 4th degree tears
 - 85% incontinence after primary repair
 - Sultan AH. BMJ 1994
- Forceps
- Vacuum-assisted delivery
- Midline episiotomy





38

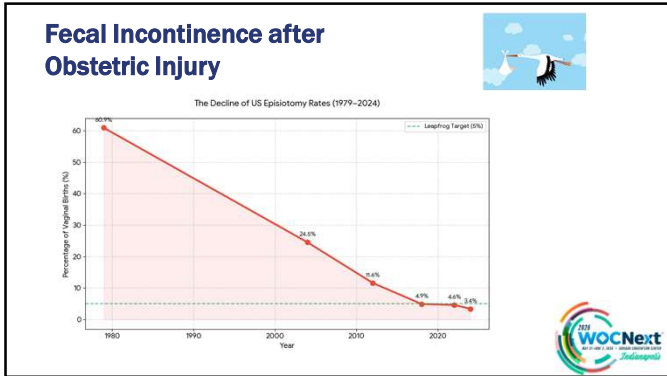
Etiology of Incontinence - OB



- The anterior portion of the sphincter in a woman
 - Contains only one loop of muscle
 - Is shorter than posterior
 - Is weaker than posterior
 - May cause incontinence when divided



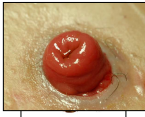
39



40

Etiology of Incontinence - OB

- 30% sphincter injuries... 3% report incontinence
 - Alternative methods of continence
 - Delayed onset of symptoms
 - Lack of reporting / lack of discussion
- Cesarean section protects sphincter, but does NOT fully prevent incontinence
 - Pudendal neuropathy



41

Evaluation of Continence


- History and Physical
- Proctoscopy / Colonoscopy
- Manometry
- Balloon Examination
- Pudendal nerve latencies
- Electromyography
- Endoanal ultrasound
- Motility Studies
- Defecography

Too much???

42

Evaluation of Incontinence


- History and Physical
- Proctoscopy / Colonoscopy
- Manometry
- Balloon Examination
- Pudendal nerve latencies
- Electromyography
- Endoanal ultrasound
- Motility Studies
- Defecography



43

Incontinence

- Patient reluctance
- Symptomatic evaluation difficult
- Interpersonal variability
- Validated instruments
 - Fecal Incontinence Quality of Life Index (FIQL)
 - Fecal Incontinence Severity Index (FISI)



44


FIQL

Q1. In general, would you say your health is:

1 D Excellent
2 D Very Good
3 D Good
4 D Fair
5 D Poor

Q2. For each of the items, please indicate how much of the time the item is a source for you (check the number that applies):

Item	1	2	3	4	5
1) I feel a constant need to defecate	1	2	3	4	5
2) I feel a constant need to urinate	1	2	3	4	5
3) I feel a constant need to pass gas	1	2	3	4	5
4) I feel a constant need to pass stool	1	2	3	4	5
5) I feel a constant need to pass urine	1	2	3	4	5
6) I feel a constant need to pass gas	1	2	3	4	5
7) I feel a constant need to pass stool	1	2	3	4	5
8) I feel a constant need to pass urine	1	2	3	4	5
9) I feel a constant need to pass gas	1	2	3	4	5
10) I feel a constant need to pass stool	1	2	3	4	5
11) I feel a constant need to pass urine	1	2	3	4	5
12) I feel a constant need to pass gas	1	2	3	4	5
13) I feel a constant need to pass stool	1	2	3	4	5
14) I feel a constant need to pass urine	1	2	3	4	5
15) I feel a constant need to pass gas	1	2	3	4	5



45


FIQL

Q2: How do you feel about your bowel leakage? Indicate the extent to which you AGREE or DISAGREE with each of the following items. (If it is a concern for you, for reasons other than medical/bowel leakage, please check the box under "Not Applicable")

	Strongly Agree	Somewhat Agree	Neutral	Somewhat Disagree	Strongly Disagree	Not Applicable
a. I feel ashamed	1	2	3	4	5	<input type="checkbox"/>
b. I can not do many of things I want to do	1	2	3	4	5	<input type="checkbox"/>
c. I worry about how I will be seen	1	2	3	4	5	<input type="checkbox"/>
d. I feel depressed	1	2	3	4	5	<input type="checkbox"/>
e. I worry about others seeing what is on me	1	2	3	4	5	<input type="checkbox"/>
f. I feel that I am not a healthy person	1	2	3	4	5	<input type="checkbox"/>
g. I miss my life	1	2	3	4	5	<input type="checkbox"/>
h. I have not sex when I would like to	1	2	3	4	5	<input type="checkbox"/>
i. I feel different from other people	1	2	3	4	5	<input type="checkbox"/>
j. The possibility of bowel incontinence affects my work	1	2	3	4	5	<input type="checkbox"/>
k. I am afraid to have sex	1	2	3	4	5	<input type="checkbox"/>
l. I avoid traveling by plane or train	1	2	3	4	5	<input type="checkbox"/>
m. Social going activities	1	2	3	4	5	<input type="checkbox"/>
n. Whom I go to school with	1	2	3	4	5	<input type="checkbox"/>
o. Whom I go shopping with	1	2	3	4	5	<input type="checkbox"/>

Q3: During the past month, how often do you feel sad, discouraged, hopeless, or feel so many problems that you wonder if anything was worthwhile?


1 (I frequently do)
 2 (I very often do)
 3 (I often do)
 4 (I never - I think I bother me)
 5 (I never - I do not think I bother me)



46

FISI


	2 or More Times a Day	Once a Day	2 or More Times a Week	Once a Week	1 to 3 Times A Month	Never
a. Gas	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b. Mucus	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
c. Liquid Stool	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
d. Solid Stool	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>



47

Evaluation of Incontinence

- History and Physical
- Proctoscopy / Colonoscopy
- Manometry
- Balloon Examination
- Pudendal nerve latencies
- Electromyography
- Endoanal ultrasound
- Motility Studies
- Defecography



48

Evaluation of Incontinence

- Medications
- Diet
 - Teas
 - GLP-1

49

Always Evaluate the Stool

- Bulking agents can cure incontinence
 - R/O constipation with overflow
 - Children

50

Evaluation of Incontinence

- Bristol Stool Scale

51

Look at the Bottom!



52

Anal Cancers



53





Look at the Bottom!



54





Evaluation

- Anoscopy
- Procto table
- Patient straining
- Examine on commode
 - Prolapse
- Rigid / flexible proctoscopy







55

Rectal Prolapse vs Hemorrhoids



56

Hemorrhoids



57

Look at the Bottom!



Incontinence
OR
drainage from
fistula in ano?



58

Look at the Bottom!



Incontinence
OR
Crohn's
Disease?



59

History and Physical

- Inspect undergarments
- Assess perineum in women
- Additional anorectal pathology
 - Fistula, fissure, hemorrhoids
- Change position
 - Commode
- Exam under anesthesia



60

Look at the Bottom!



61

Exam Under Anesthesia



62

Evaluation of Incontinence



- History and Physical
- Proctoscopy / Colonoscopy
- Manometry
- Balloon Examination
- Pudendal nerve latencies
- Electromyography
- Endoanal ultrasound
- Motility Studies
- Defecography



63

Change in Bowel Habits


Rule out colorectal cancer!!!!!!



64

Evaluation of the Colon


- Post operative changes
 - Colorectal anastomosis
- Colon/small bowel shortened/diseased
- Crohn's
- Ulcerative colitis
- Radiation injury
- Irritable bowel syndrome
- Cancer / Polyps
- Malabsorption syndromes



65

Evaluation of Incontinence

- History and Physical
- Proctoscopy / Colonoscopy
- **Manometry**
- Balloon Examination
- Pudendal nerve latencies
- Electromyography
- Endoanal ultrasound
- Motility Studies
- Defecography



66

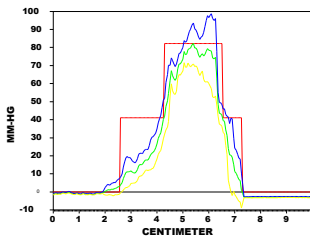
Manometry

- Anorectal manometry is an objective means of assessing the resistance to spontaneous defecation provided by the sphincter mechanism and the sensory capabilities of the rectum to provide a feeling of imminent defecation
- Manometry measures pressures



67

Normal Resting Continuous Pullout



68

Normal Values - Squeeze

- Squeeze pressures should be approximately double resting
- Change in squeeze pressure more important than actual squeeze pressure obtained
- Resting 40-80 mmHg
- Squeeze 80-160 mmHg



69

Evaluation of Incontinence

- History and Physical
- Proctoscopy / Colonoscopy
- Manometry
- Balloon Examination
- Pudendal nerve latencies
- Electromyography
- Endoanal ultrasound
- Motility Studies
- Defecography



70

Pudendal Neuropathy

- Obstetrical injury
 - Traction injury
 - high birth weight
 - prolonged labor
 - forceps delivery
- Perineal descent > 3-4cm
- Rectal prolapse
- Diabetic neuropathy
- Aging



71

Evaluation of Incontinence

- History and Physical
- Proctoscopy / Colonoscopy
- Manometry
- Balloon Examination
- Pudendal nerve latencies
- Electromyography
- Endoanal ultrasound
- Motility Studies
- Defecography



72

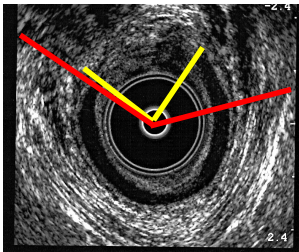
Endoanal Ultrasound

- Rotating endoluminal probe
- 16 MHz transducer
- Probe introduced to 8 cm and withdrawn
- Finger inserted into vagina to assess rectovaginal septum, anterior defects



73

Endoanal Ultrasound



74

Evaluation of Incontinence



- History and Physical
- Proctoscopy / Colonoscopy
- Manometry
- Balloon Examination
- Pudendal nerve latencies
- Electromyography
- Endoanal ultrasound
- **Motility Studies**
- Defecography



75

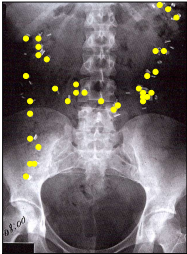
Colonic Motility Study Sitz Marker Study

- Primarily to evaluate constipation
 - Colonic inertia vs obstructed defecation
 - Overflow incontinence
- Ingest capsules (20)
- KUB days 3 & 5
 - Normal > 80% of markers evacuated

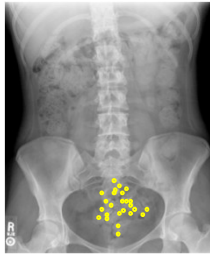


76


Sitz Marker Transit Study



Colonic Inertia



Obstructed Defecation



77



78

Evaluation of Incontinence

- History and Physical
- Proctoscopy / Colonoscopy
- Manometry
- Balloon Examination
- Pudendal nerve latencies
- Electromyography
- Endoanal ultrasound
- Motility Studies
- Defecography



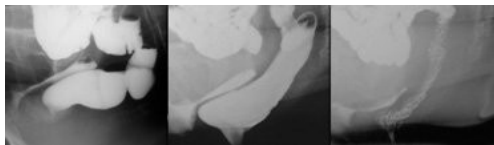
79

Defecography



80

Normal



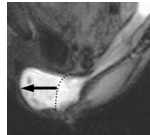
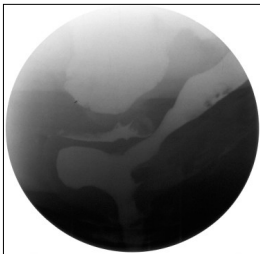
81

Intussusception



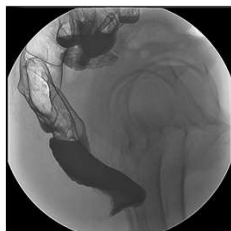
82

Rectocele






83

Rectocele



84



Now what?

85


Fecal Incontinence Treatment Options

- Dietary
- Behavioral Changes
- Bulking Agents
- Constipating Agents
- Enemas / Suppositories
- Pelvic Floor Therapy
- Injectable Agents
- Sacral Nerve Modulation
- Artificial Bowel Sphincter
- Sphincter Reconstruction
- Tibial Nerve Stimulation
- Bowel Irrigation Systems
- **Ostomy**

86



Perspective

87

Treatment Options

- Dietary
- Behavioral Changes
- Bulking Agents
- Constipating Agents
- Enemas / Suppositories
- Pelvic Floor Therapy
- **Injectable Agents**
- Sacral Nerve Modulation
- Artificial Bowel Sphincter
- Sphincter Reconstruction
- Tibial Nerve Stimulation
- Bowel Irrigation Systems
- Ostomy

88





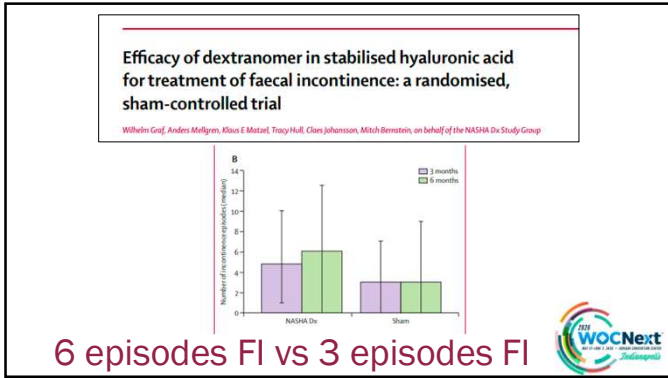


89

Perspective




90



91




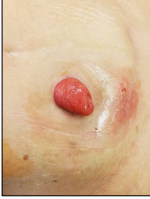
92



93

Treatment Options

- Dietary
- Behavioral Changes
- Bulking Agents
- Constipating Agents
- Enemas / Suppositories
- Pelvic Floor Therapy
- Injectable Agents
- Sacral Nerve Modulation
- Artificial Bowel Sphincter
- Sphincter Reconstruction
- Tibial Nerve Stimulation
- Bowel Irrigation Systems
- **Ostomy**





94

Perspective



95

"Best" Treatment



96

Diseases of the Colon & Rectum

Patients' Views of a Colostomy for Fecal Incontinence

Christine Norton, Ph.D., M.A.(Cantab.), RN,^{1,2} Jennie Burch, RN, B.Sc.(Hons.),¹
Michael A. Kamm, M.D., F.R.C.P., F.R.A.C.P.¹

Effect	Stoma (%)	Incontinence (%)
Not at all	~35	~5
A little	~40	~10
Quite a bit	~15	~25
A great deal	~5	~60

Figure 5. Perceived effect on quality of life.

97

World Journal of Surgery © 2008 by the Society International de Chirurgie
Published Online 29 August 2008 World J Surg (2008) 30: 1805-1808
DOI: 10.1007/s12029-008-9201-6

Is the Quality of Life Better in Patients with Colostomy than Patients with Fecal Incontinence?

Patrick Colquhoun, MD,¹ Roberto Kaiser Jr., MD,¹ Jonathan Efron, MD,²
Eric G. Weiss, MD,¹ Juan J. Noguera, MD,¹ Anthony M. Vernava III, MD,²
Steven D. Wexner, MD¹

- Stoma NOT for FI
- No differences
 - Physical function
 - Bodily pain
 - General health perceptions
 - Vitality
 - Emotional or mental health
 - Mental or physical component scales
- Stoma patients higher
 - Social function
 - Coping
 - Embarrassment
 - Lifestyle
- Stomas **better** QOL

98

Outcomes Not Always Great

99

Dietary Therapy????

100

Treatment of Incontinence

- Diet modification
 - Fiber (25 - 30g/ day)
- The quality and quantity of stool impacts the ability to defer defecation
 - Bowel evacuation program
 - Psyllium
 - Mineral Oil
 - Glycerine Suppositories

101

Foods	Serving Size	Total fiber (grams)
Navy beans, cooked	1 cup	19.1
Lentils, cooked	1 cup	15.9
Pinto beans, cooked	1 cup	15.4
Black beans, cooked	1 cup	15.3
Artichokes, cooked	1 cup	14.4
Lima beans, cooked	1 cup	13.2
Garbanzo beans	1 cup	12.9
Baked beans, cooked	1 cup	10.4
Soybeans, boiled	1 cup	10.3
Pean, cooked	1 cup	8.8
Pistachios	1 cup	8.0
Blackberries	1 cup	7.6
Blackberry, frozen, cooked	1 cup	7.6
Lettuce, iceberg	1 head	6.5
Pean with skin	1 medium	6.3
Bran flakes	1/2 cup	6.3
Oat bran muffin	1 medium	5.2
Broccoli, boiled	1 cup	5.1
Apple, with skin	1 medium	4.4
White Rice, cooked	1 cup	4.1
Brussels sprouts, cooked	1 cup	4.1
Oatmeal, cooked	1 cup	4.0
Strawberries	1/2 cup	3.8
Brown rice, cooked	1 cup	3.5
Almonds	1 oz	3.5
Strawberries	1 cup	3.3
Orange	1 medium	3.1
Banana	1 medium	3.1
Potato, with skin, baked	1 medium	2.9
Cucumber, peeled, raw	1 large	2.0
Bread, whole-wheat	1 slice	1.9
Corn, sweet	1 ear	1.8
Carrot	1 medium	1.7
Raisins	2 tablespoons	1.0
Bread, wheat	1 slice	0.8
Bread, white	1 slice	0.8
Strawberry, red or green	1/2 grapes	0.8

102

103

Behavioral

104

Medical Treatment of Incontinence

- Dietary changes
- Bulking agents
 - Fiber
- Antidiarrheal agents
 - Loperamide
 - Diphenoxylate
- Narcotics
 - Tincture of opium
 - Codeine

105

Pelvic Floor Therapy - Biofeedback

- Three components
 - Exercise of external sphincter
 - Training the discrimination of rectal sensations
 - Training the synchrony of internal and external sphincter responses during rectal distention
- Visual cues to physiologic stimuli/responses
- Training occurs 1/week over 8 weeks
- Minimal risk
- Can repeat over time



106

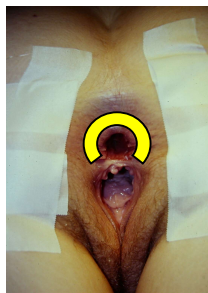
Surgical Treatment of Incontinence

- Overlapping Sphincteroplasty
- Artificial Sphincter
- MACE
- Stoma
- Sacral Neuromodulation

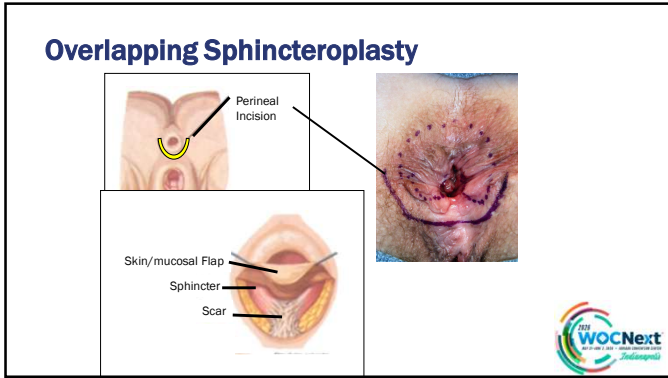


107

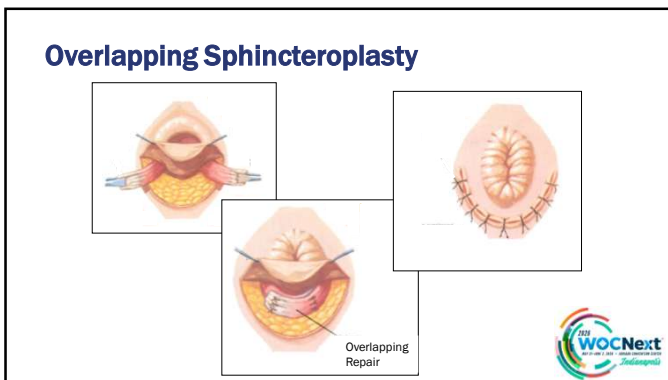
Sphincteroplasty



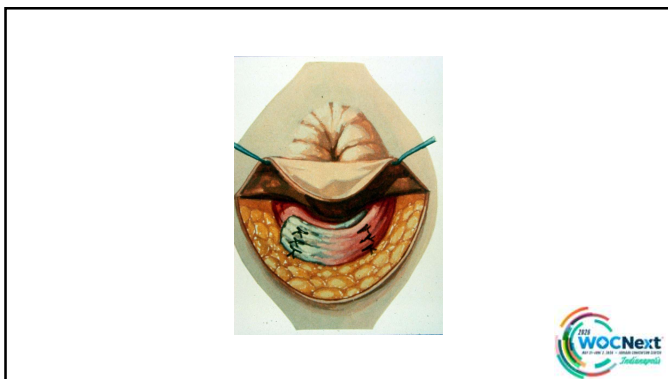
108



109



110




111

Success of Sphincteroplasty

- **Short term success 70-100%**
- **Long term results 25-50%**


<ul style="list-style-type: none"> - Tan JJ DCR 2007 - Madoff Lancet 2004 - Rao SS Am J Gastroenterology 2004 - Muller C Arch Surg 2005 - Cook TA Br J Surg - Fang DT. DCR 1984 - Abcarian DCR 1989 - Fleshman DCR 1991 	<ul style="list-style-type: none"> - Malouf 2000 - Halverson 2002 - Gutierrez 2004 - Barisic 2006
-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	---------------------------------------------------------------------------------------------------------------------------------------------



112

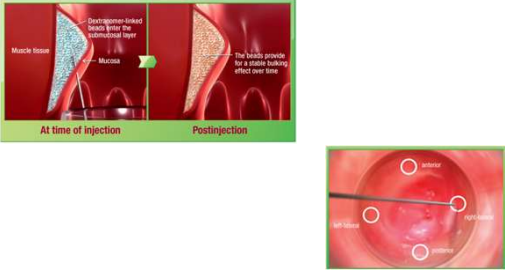

Sphincteroplasty

- Disappointing long term results
 - 50% return to incontinence at 5-10 years
- Repeat sphincteroplasty is possible
- Unclear if overlapping repair has disrupted or simply functional decline



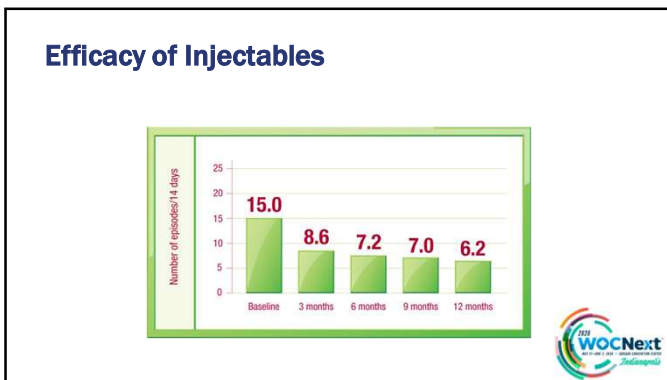
113

Injectable Bulking Agents

114

115




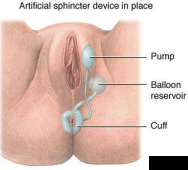
116

Artificial Bowel Sphincter


- AMS Acticon Neosphincter

117

Artificial Bowel Sphincter

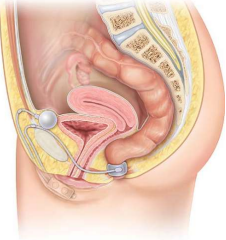



1 touch activates the pump to remove fluid from cuff




118

Artificial Bowel Sphincter



- Infections 40-60%, erosion, ulceration, obstructed defecation, pain

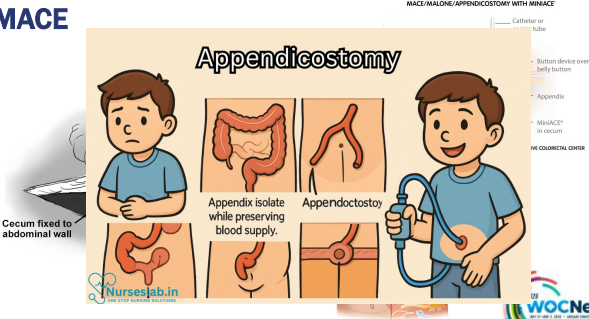


119

MACE

MACE/MALONE/APPENDICOSTOMY WITH MINACE

Appendicostomy



Cecum fixed to abdominal wall

Appendix isolate while preserving blood supply.

Appendicostomy



Catheter on tube

Button device over belly button

Appendix

MINACE in Lacum

MC COLONRECTAL CENTER

120



121

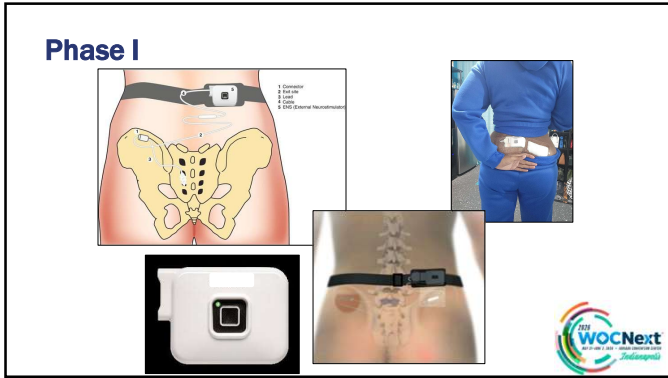
Sacral Nerve Stimulation

- Mechanism not clear
- Low amplitude electrical current to sacral nerve
- 3rd sacral foramen is best
 - Mixed nerve root containing voluntary somatic, afferent sensory, and efferent autonomic motor nerves
- Modulation of nerves and muscles of PF
 - May not effect sphincter function
 - Mowatt G Cochrane Database 2007
 - Colonic motility
 - Michelsen HB Br J Surg 2008

122

Phase I

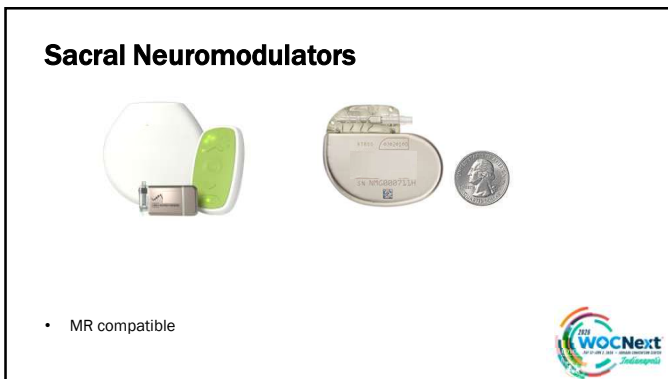
123



124



125



126


Sacral Nerve Stimulation

ORIGINAL ARTICLES

Sacral Nerve Stimulation for Fecal Incontinence
Results of a 120-Patient Prospective Multicenter Study

Steven D. Weaver, MD,* John A. Collier, MD,* Gladys Dvorodets, MD, Tracy Hall, MD,§ Richard McCullum, MD,** Miranda Chan, MD, Jennifer M. Ewings, MD,** Adam S. Shcherer, MD,†† David Margolin, MD,‡‡ Michael England, MD,§§ Howard Kaufman, MD,** William J. Snopce, MD,|| Ely Mittle, MD,*** Heidi Chan, MD,††† Paul Pritz, MD,††† Deborah Nigro, MD,‡‡‡ Robert D. Madoff, MD,§§§ Darin R. Lewis, PhD,¶¶¶ and Anders Mellgren, MD, PhD,|||


- 1 year, 83% achieved success
 - 41% perfect continence
- 2 years, 86% success
- Mean 9.4 episodes/week
 - 1.9/week (1year)
 - 2.9/week (2 years)



127

SNS Results

- 61 studies
- 79% patients experienced 50% reduction in weekly FI episodes
- 84% experienced 50% or more improvement at 3 years

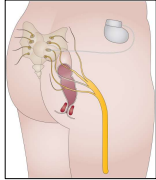



Thin Br J Surg 2013

128

SNS Results

- 10-15 years battery
- Results NOT depend upon
 - Sphincter defect
 - Pudendal neuropathy
 - Previous sphincteroplasty
- 10-20% explanation

129

Reference

CLINICAL PRACTICE GUIDELINES

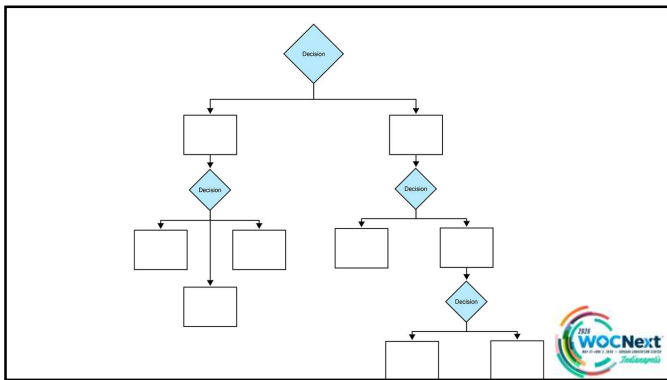
The American Society of Colon and Rectal Surgeons Clinical Practice Guidelines for the Management of Fecal Incontinence

Liliana G. Bordeianou, M.D., M.P.H.¹ • Amy J. Thorsen, M.D.²
Deborah S. Keller, M.S., M.D.³ Alexander T. Hawkins, M.D., M.P.H.⁴
Craig Messick, M.D.⁵ • Lucia Oliveira, M.D., Ph.D.⁶ • Daniel L. Feingold, M.D.⁷
Amy L. Lightner, M.D.⁸ • Ian M. Paquette, M.D.⁹

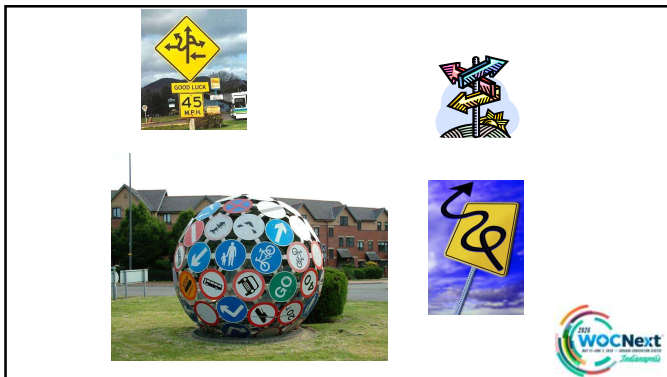
Diseases of the Colon & Rectum 66(5): p647-661, May 2023



133



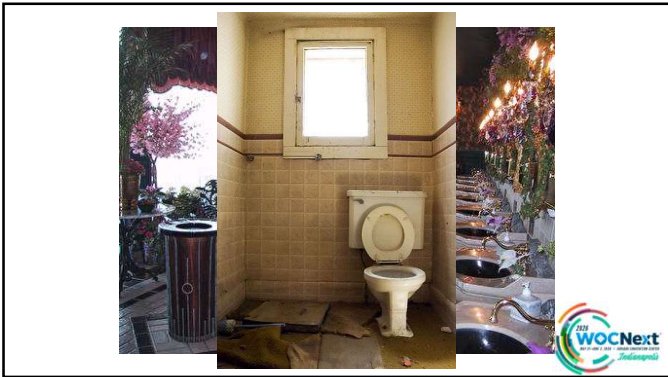
134



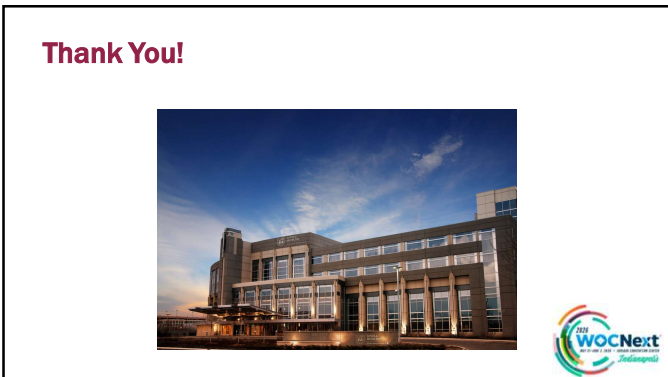
135



136



137



138
