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Continent Urinary Diversions

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Patient Populations - Procedures

<ul style="list-style-type: none"> • Neuropathic bladder • Myelomeningocele • Lipomeningocele • Vacterl Syndrome • Cerebral Palsy • Spinal Cord Injury • Transverse Myelitis • Mitochondrial Disorder • Multiple Sclerosis • Non-neurogenic neurogenic bladder 	<ul style="list-style-type: none"> • Continent Cath Channel • Mace, Cecostomy tube • Bladder Neck Repair • Artificial Sphincter • Botox • Sacral Neuromodulation • Bladder Augmentation • Continent Urinary Reservoir Indiana Pouch *Ileal Chimney *Colon Conduit *Vesostomy
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Medical Management

- Bowel Programs:
Diet, Fluids, Medications, TAI, Timed Toileting
- Clean Intermittent Catheterization
- Incontinence Briefs
- Medications:
Anticholinergics: -Oxybutynin, Tolterodine
Oxytrol, Fesoterodine, Solifenacin, B3 agonist-Mirabegron

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Medical Management Goals Not Achieved

- Health Risk (medical)
- Renal risk
- Persistent elevation in bladder pressures/low compliance
- Quality of Life (social)
- Persistent Incontinence
- Persistent dependence on others for care



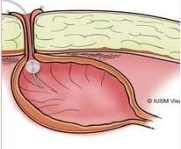

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Surgical Management

- Spectrum Defect- (based on compliance of bladder and outlet resistance of urinary sphincter)
Complete evaluation of lower urinary tract, fluorourodynamics, upper tract functional testing, Renal Scan,DMSA,
- Apt. with Urologist to discuss Options Pros/Cons of Intervention
- Parent advice: You are your child's greatest advocate and an equal partner in your child's care

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Incontinent Diversion Vesicostomy-Hostile Bladder



1. Continent diversion not always best option, sometimes continuous drainage necessary
2. Protects kidneys
3. Minimal care
4. Defunctionalized bladder
5. Temporary
6. Skin rashes
7. Outgrow diapers

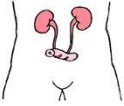
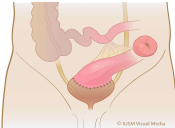

Gastrostomy button for clinical and urodynamic evaluation before vesicostomy closure.
J of Urol 1996 Aug;156: 2007 Dec

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Ileal Chimney, Colon Conduit

- Continent Diversion: not for everyone
- Useful if CIC not an option
- Drains continuously
- Protects kidneys
- Appliance works well
- Can be reversed

WOCN
Wound Ostomy Continence Nurse
Valuable Resource
Seen during Pre-op Clinic
Demos Appliance



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TAKE THE BULL BY THE HORNS!!!



Fort Worth, TX

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Surgical Management

- Discuss options to achieve dryness/protect kidneys
- Must discuss;
 - pros and cons
 - risks : short term, long term
 - pre-op clinic
 - hospitalization
 - post hospitalization care
 - pain management
- long-term expectations and obligations

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Treatment of Neurogenic Bladder Overactivity: Botox

- Resistance to therapy, intolerable side effects to medications
- Endoscopic procedure/outpatient
- Onset within 2 weeks after treatment
- Effect lasts ~ 6 months or more
- Side effects rare and minor (<10%)
- Efficacy:
 - Reduction from baseline incontinence: 40%-80%
 - 65%-87% of patients became completely continent (between cath)
 - Max cystometric capacity increased
 - Max detrusor pressure decreased
- Main issue is cost/insurance coverage...

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What is Interstim?

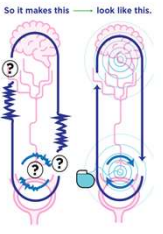
- Neuromodulator device marketed by Medtronic
- Sacral neuromodulation: application of mild electrical impulses to sacral nerves that activate or inhibit muscles and organs that contribute to urinary and bowel control
- Refractory
 - Urgency/Frequency
 - Urinary Incontinence
 - Incomplete emptying
- FDA approved 1997
- Refractory Constipation
 - FDA approved 2011
- Not FDA approved for pediatrics

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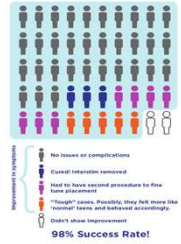
Interstim

How does Interstim work?
It uses "Sacral Neuromodulation" which means sending mild electrical impulses to stimulate the nerves used for bladder control.

So it makes this — look like this.




But does it work in kids?
In a study performed in our clinic with 50 kids here's what we found.



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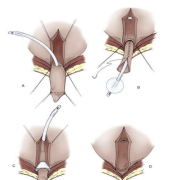
Cath Channel

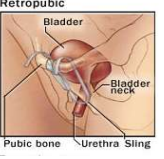


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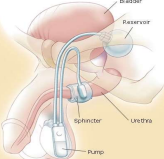
Treatment Options - Low Outlet Resistance

- Artificial urinary sphincters (Demo Device)
- Periurethral slings
- Bladder neck reconstruction
- Bulking agents - Deflux
- Bladder neck closure – Choose wisely





Retropubic
Bladder
Bladder neck
Pubic bone
Urethra Sling



Bladder
Reservoir
Sphincter
Urethra
Pump

©2005 Perceptive Medical Systems and Research. All rights reserved. Image courtesy of Perceptive Medical Systems, Inc., Westborough, MA.

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Patient/Family Commitment Catheterization Readiness Program



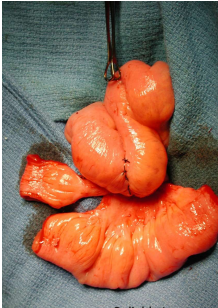
Meet another patient,
support groups
DVDs, storybooks , dolls,
play therapy, child life
Flash cards, coloring books

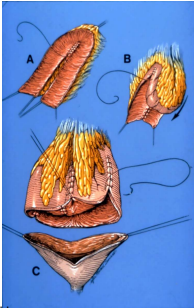


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Bladder Augmentation

Still The Gold Standard
(For Some Patients)




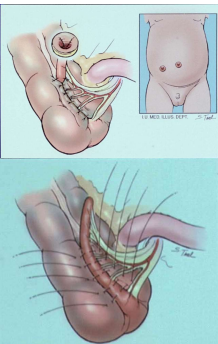


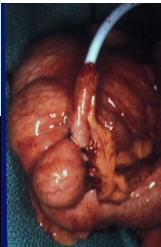
Reliably increases capacity and lowers pressure

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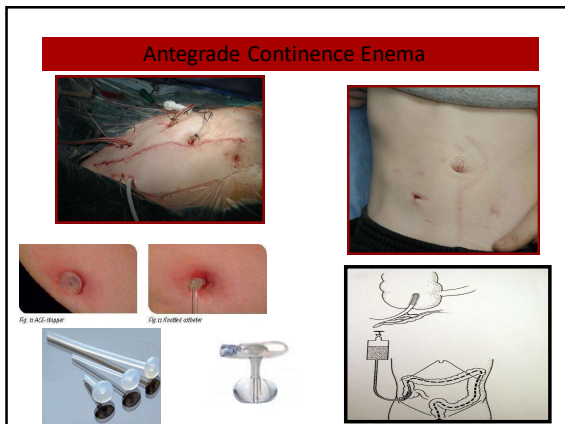
Fecal Continence - Antegrade Continence Enema



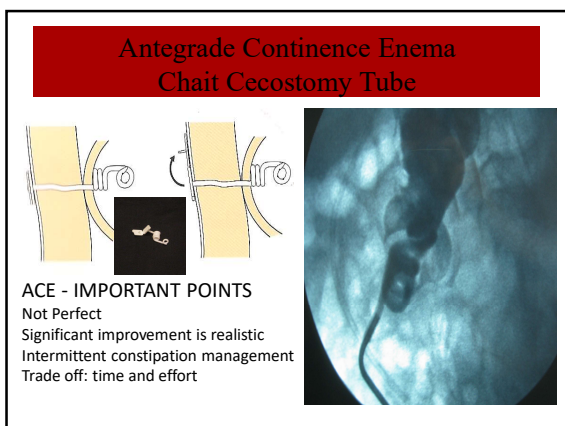




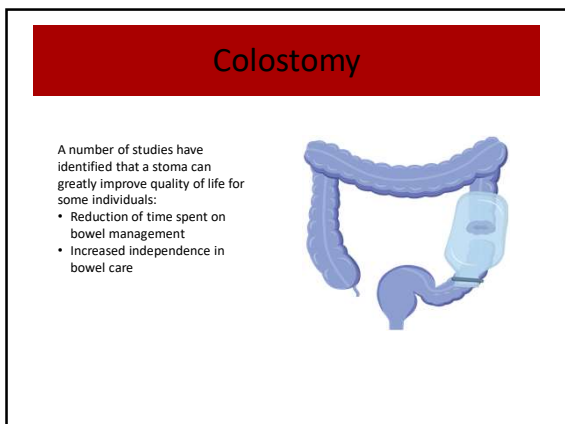
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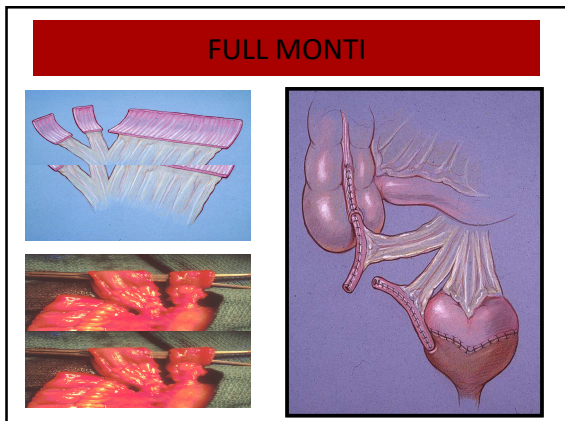
DG2

Slide 21

DG2

Good diagram but the stoma would be higher up the colon probably at the end of the transverse colon at the splenic curve

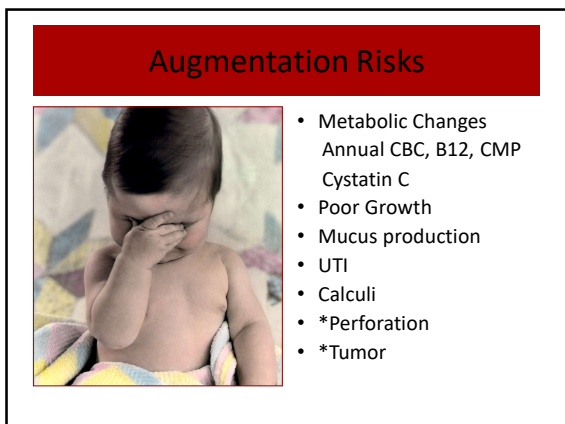
Denise Gamblin, 8/3/2018



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Calculi

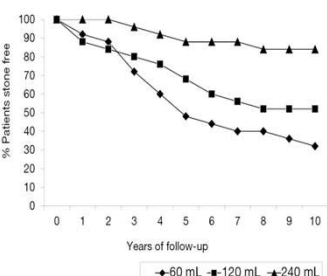
- 10-52% RISK OF BLADDER CALCULI
- Mucus production
 - RUTI
 - Calculi



- Long-term commitment to follow-up
- Irrigations
- Consistent cath schedule with efforts at complete emptying

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Only Way to Reduce Risk: High Volume Lavage




Years of follow-up	60 mL	120 mL	240 mL
0	100	100	100
1	95	90	98
2	85	80	95
3	75	75	92
4	65	70	90
5	55	65	88
6	45	60	85
7	40	55	83
8	38	52	82
9	35	50	81
10	32	48	80

*Husman, D., 2015, Transition and Lifelong Care in Congenital Urology

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PERFORATION-8%

CT Cystogram



REPEAT OFFENDERS

Standard cystogram



41 patients with 53 ruptures

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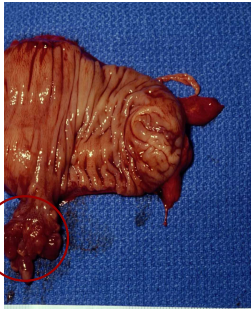
TUMOR FORMATION

Long term commitment to follow-up

Neuropathic bladder has a 4fold-6fold increase in bladder cancer risk compared to general population

Colon-ileal cystoplasty 1.5% per 10yrs

Annual Surveillance:
Urologic history changes
abnormal RUS imaging,
hematuria , pain
4 symptomatic UTI,
then additional evaluation with
cytology, cystoscopy, CT

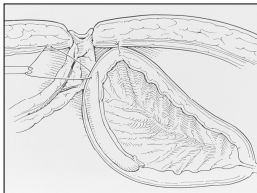


**Husman, D., 2015. Transition and Lifelong Care in Congenital Urology

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Channel Complications
Bladder-544, Mace-415 = 959

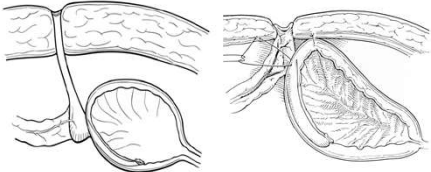
- Stoma Stenosis-15%
- Angulation of Channel
- Leakage-3%
- Trauma
- Obliteration
- Abscess
- Polyp
- Most occur first 5 yrs



Continence mechanism based on flap valve
Reservoir pressure is transmitted against wall of conduit

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Channel Complications



Often managed by leaving a catheter in for 7-14 days. Most surgical revisions occur in first 5 yrs

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Pre-op Checklist

- **Developmental Pediatrics**
- Cognitive review of patient and parents
- Neuropsych development (delays, disorders)
- Determine commitment to self care and understanding of procedure, possible complications (nonbiased opinion)
- Evaluate growth and development, feeding issues, nutritional status, BMI. Dietary consult if indicated to ensure healing.
- Protein drinks

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Constipation - Bowel Prep


- Kub 2 weeks preop
- Bowel prep
- Continue current bowel program
- Miralax, enemas, exlax
Light or liquid diet (24hrs)
- Inpatient rare: renal insufficiency (nephrology consult), prior bowel obstruction, electrolyte issues or prior abdominal surgery



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Surgical Considerations

- **Comorbidities;**
- consults: pulmonary, neurology, cardiology, general surgery, endocrinology
- **Neurosurgery Consult;** should be within 6 mos.
- shunt series, tethered cord
- **Orthopedic consult** (if > 6mos) scoliosis
- **Nephrology consult** if renal insufficiency bowel prep management, B/P control and effects of augmentation, metabolic acidosis,



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Ancillary Support Checklist

- **Social Services:** families follow-up compliance history, foster care history, FMLA, insurance issues, post-op care, school concerns
- **PT/OT consult:** toileting apparatus, post-op activity plan hospital and home, **decub prevention**, medical supplies
- **School Issues:** homebound tutoring, school support
- **Child Life:** pre-op tour, evaluate coping skills, best learning technique
- **WOCN:** Patient education regarding appliance



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Future Counsel-They do grow up!

- Family planning
- Healthy life-style
- Folic Acid
- NO SMOKING
- High risk pregnancy-support of reconstructive surgeon helpful at delivery
- Commitment medical follow-up (adult clinic)
- Commitment to self care
- Avoid rapid weight gain

2015, Transition and Lifelong Care in Congenital Urology


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Pre-op

- Pre-op checklist
- Bowel Prep Instruction, labs, urine culture
- Nutrition
- Articles on Bladder Augmentation, Catheterizable Channels, Spina Bifida Newsletters, Latex Allergy
- Post-op instructions for Mace, S/P tube irrigation
- Medical Alert Information
- Homebound Tutoring letter for School/work
- Support groups

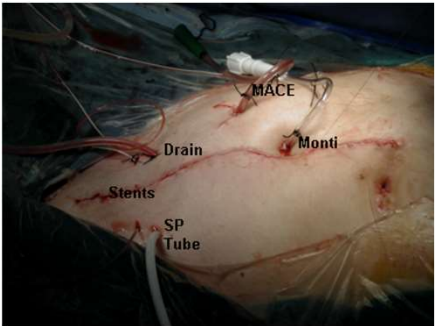
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Patient Education-Pre and Post-op



- Pre-op clinic
- Video
- Channel catheterization
- Mace flush
- Irrigation

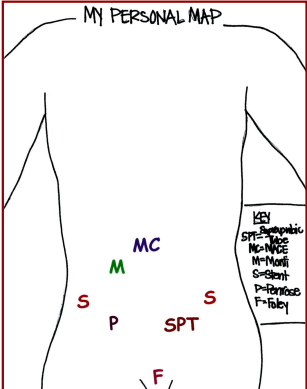
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KEEP BLADDER DRAINING

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MY PERSONAL MAP




**Inpatient
Post-op care**

**Bedside Map
on
all patients**

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Post-op care


- Bladder irrigation
- Mace procedure
- Adaptive equipment/OT
- Ostomy supplies/WOCN
- Supplies
 - ... 3-6wk later
- Catheters removed
- Patient instructed on self cath
- Bladder irrigation
- Mace Stopper



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Post-op Bladder Management

- Catheterize and empty bladder to completion, can aspirate with syringe /open sp to verify empty
- CATH SCHEDULE IS SLOWLY INCREASED TO GRADUALLY STRETCH UP BLADDER
- First 48hrs q 2 hrs /day, can open SP tube at night
- Progress to q3hr/day 3
- Day 7 q 4hrs, start cathing at 1/2 way through night
- SP tube removed when patient confident with cathing



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Bladder Irrigation





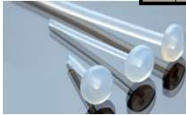
- Augmented bladders continue to create mucus
- Irrigate daily decreases stone formation, ? UTI
- Can be done with normal saline, antibiotics, mucamyst, or baking soda
- High volume lavage

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Mace Instruction

- Start flush day 3-4 post-op with 50ML, increase by 50ML Q 4 Days
- May start to use enema/feeding bag > 200ML
- Roller clamp-gravity feed
- Adjust rate if cramping discomfort, use luke warm tap water
- Mace stopper, L stent, Mickey button




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Initial Post-Operative **MACE/Bowel Channel** Care

MACE catheter

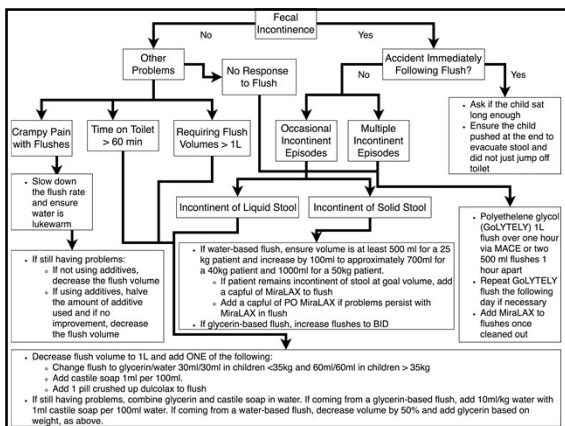
- To drainage bag/capped
- This tube should be flushed once daily at the same time each day.
- Supplies needed:
 - Catheter tipped 60ml syringe
 - Alcohol wipe
 - Tap water
 - Flush bag (to be used after reaching 200ml of water)
- Increase flush amount by 50 ml of tap water every 4th day, according to the flush schedule
- Other instructions: _____

___ 50ml	___ 450ml
___ 50ml	___ 450ml
___ 50ml	___ 450ml
___ 100ml	___ 500ml
___ 100ml	___ 500ml
___ 100ml	___ 500ml
___ 150ml	
___ 150ml	
___ 150ml	
___ 200ml (may start to use enema set)	
___ 200ml	
___ 200ml	
___ 250ml	
___ 250ml	
___ 250ml	
___ 300ml	
___ 300ml	
___ 300ml	
___ 350ml	
___ 350ml	
___ 350ml	
___ 400ml	
___ 400ml	
___ 400ml	



Riley Pediatric Urology 8/2012

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Timing for Continence Surgery

- No optimal time for surgery
- Many factors effect timing
- Each child is unique
- Each family is unique
- Most parents concerned at school age
- Parental advice

You are your child's greatest advocate and an equal partner in your child's care




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Nurse Practitioner PRE - OP CLINIC

First 178 patients 8/2018

- 14cancellations
- Evaluation tool needed
- Anecdotal: much easier to do discharge and post-op education
- Kids love the videos and making a connection with other kids




Reason for cancellation

- Maturity
- Nutrition
- Change of surgical plan

No one failed secondary to inadequate bowel prep, some modifications to the surgical plan: ie addition of botox, diversion vs augmentation, chait vs ace

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Patient Centered Goals



- More informed consent
- Less postoperative complications
- Improved transition to self care
- Patient centered care
- Continued evaluation of program
- Evaluate quality of life (pre/post-op)

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All Children Have the Right



9/23/2021 Thank yousjking@iu.edu 49

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