

NOVEMBER 2, 2018

# Catheterizing in the School Setting

Knowing the in's and out's



Children's Hospital Colorado  
*Here, it's different.™*

# Financial Disclosure

I have no financial disclosures

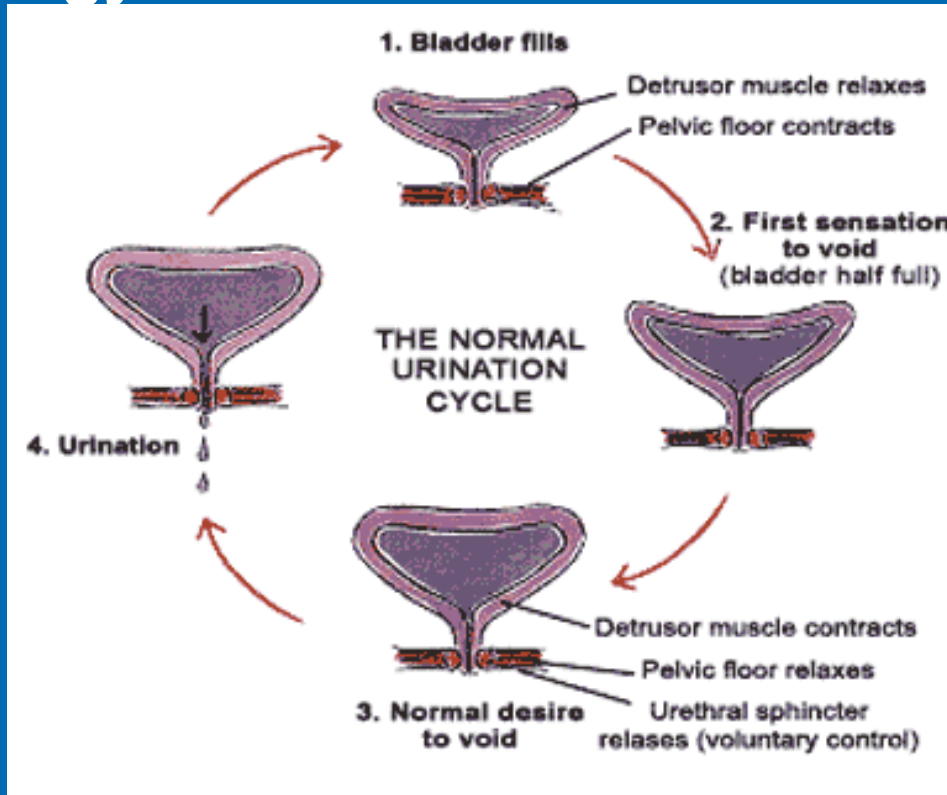


# Objectives

- Identify methods so children can attain continence
- List indications for continence procedures
- Identify goals of continence procedures
- Describe clean intermittent catheterization
- Become familiar with different catheterization products
- Trouble shooting catheterization



# Physiology of Urination



# Neural Control of the Bladder

Two discrete phases of micturition:

## Storage

- contraction of the striated sphincter (somatic innervation (voluntary))

- contraction of smooth muscle sphincter (sympathetic innervation (involuntary))

- inhibition of detrusor activity (sympathetic innervation)

## Emptying

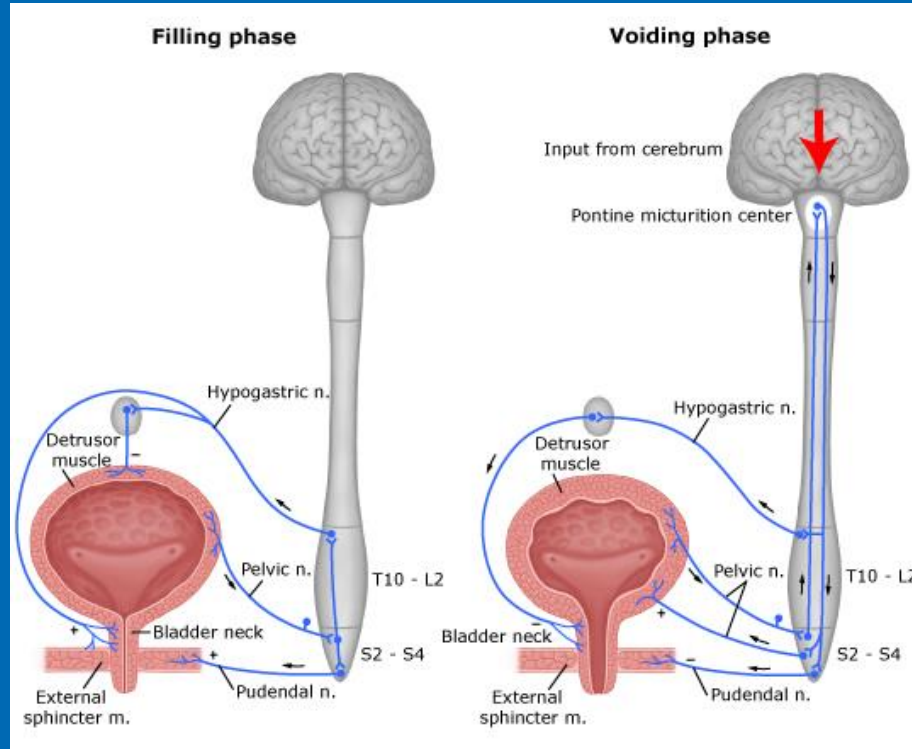
- relaxation of the striated sphincter (somatic innervation (voluntary))

- relaxation of the smooth muscle sphincter and opening of the bladder neck (sympathetic innervation)

- detrusor contraction (parasympathetic innervation (involuntary))



# Nerve innervation in bladder filling and emptying



# Attaining continence

- Timed voiding
- Medication
- Catheterization
- Bladder augmentation
- Continence procedures



# Continence procedures

## Urine continence

Mitrofanoff with/without bladder  
augmentation

## Bowel continence

ACE - Antegrade Continence Enema





# Goals of continence procedures

- Improved continence
- Increased independence
- Enhanced self-esteem
- Social acceptance



# Mitrofanoff

- A non-refluxing catheterizable channel to the bladder created from small bowel or appendix
- Most often exits the skin at the umbilicus
- Often coupled with bladder augmentation



# Indications

- Non-catheterizable urethra
- Sensate urethra
- More discrete for child needing assistance
- Decreased manual dexterity
- Difficult transfer from wheelchair
- Used with bladder augmentation for high-pressure bladder



# Mitrofanoff Procedure

- Appendix is separated from bowel with blood supply intact
- Opening created in blind end to form tube
- One end attached to the bladder with sutures
- Other end attached to stoma at umbilicus

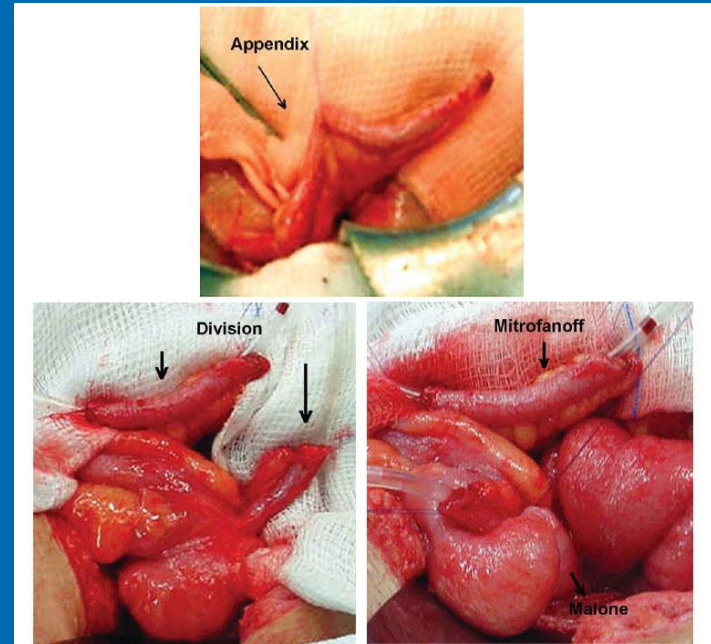


Figure 1 – The appendix was divided into two parts in order that its proximal part was utilized for intestinal catheterization and its distal part as a Mitrofanoff conduit for performing intermittent urinary catheterization.



# Stoma Formation

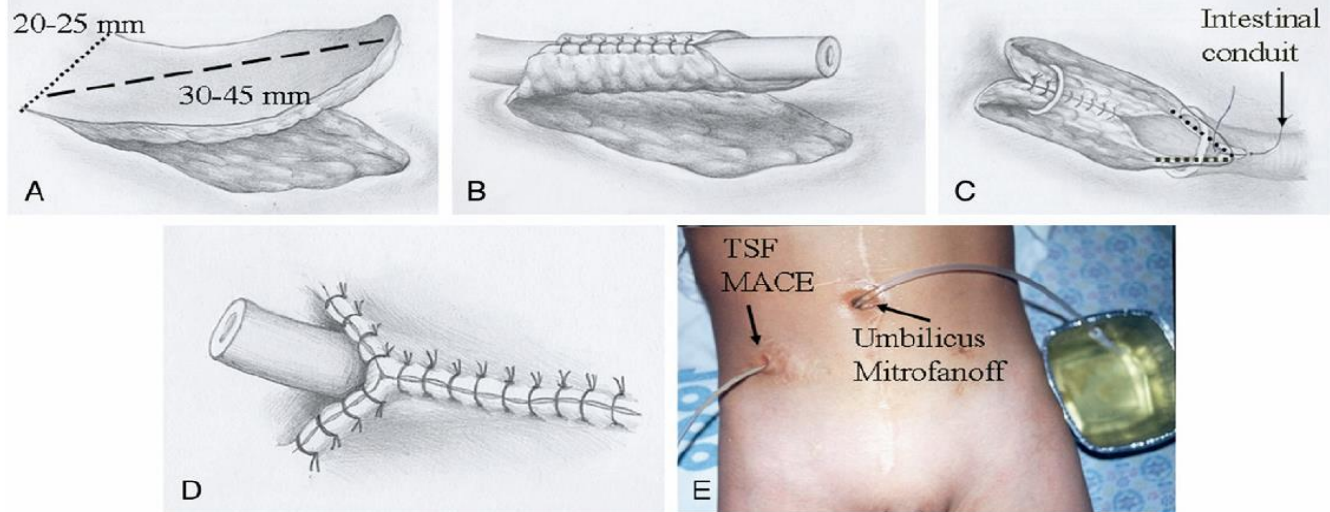


FIG. 1. TSF reconstruction. *A*, development of rectangle skin flap. *B*, tubularization of skin flap over catheter. *C*, anastomosis of skin tube to intestinal conduit. *D*, final result. *E*, final result in patient showing TSF and umbilicus.



# Antegrade Continence Enema (ACE)

- A non-refluxing catheterizable channel to the cecum providing antegrade colonic lavage to empty the bowel
- Created from appendix (if available) or small bowel
- Stoma may be found at umbilicus or lower abdomen



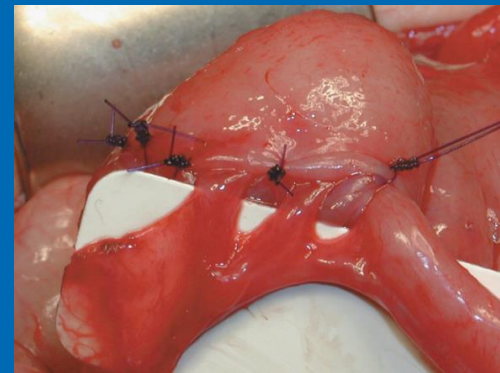
# Indications

- Neurogenic bowel
- Congenital anomalies
- Fecal incontinence
- Severe constipation
- Aged 5+
- All conservative measures fail
  - diet modifications, laxatives, enemas or suppositories



# ACE Procedure

- Appendix is folded back on itself OR small bowel is resected and tubularized
- Cecum is wrapped around the base of the tube as a continence mechanism
- Tissues are overlapped around an 8F or 10F catheter
- Cecum is affixed to abdominal wall
- Stoma created





# Stoma Formation

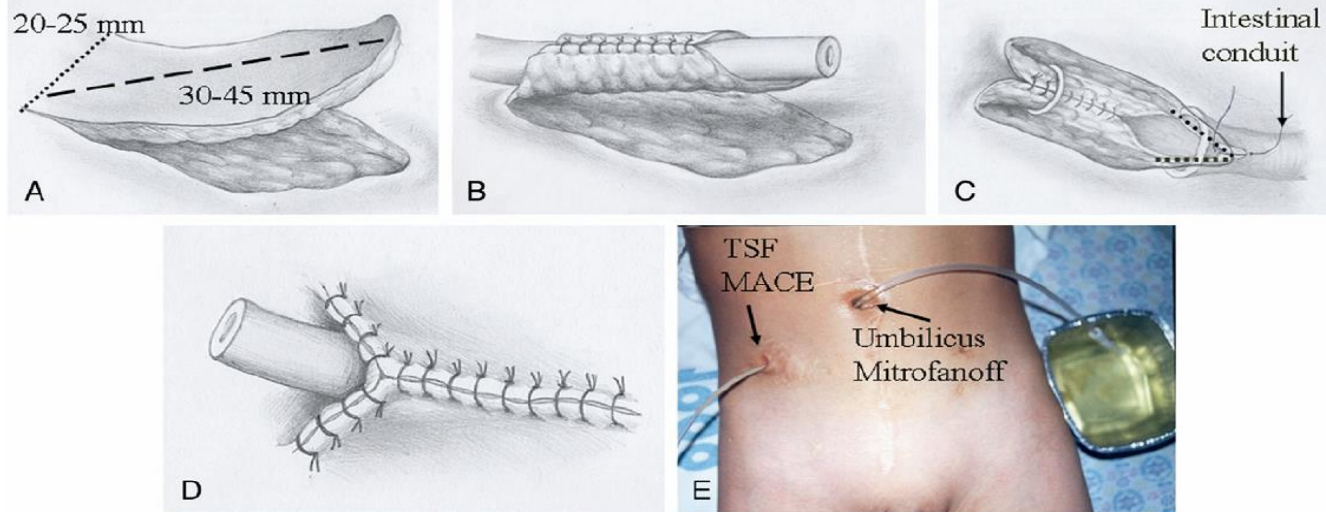
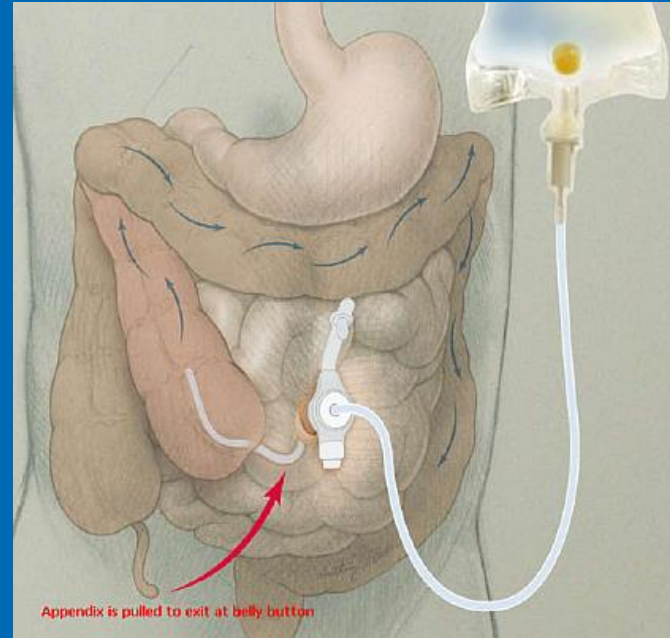


FIG. 1. TSF reconstruction. *A*, development of rectangle skin flap. *B*, tubularization of skin flap over catheter. *C*, anastomosis of skin tube to intestinal conduit. *D*, final result. *E*, final result in patient showing TSF and umbilicus.



# ACE Flushes

- Daily enema
- BM Q 24 hr
- Gravity bag
- 30-60 min
- Use toilet
- H<sub>2</sub>O or saline
- +/- medications





# Three Months post surgery



# Returning to School- After ACE

- Inpatient stay is usually 3-5 days
- Child will be able to return to school when he feels ready and is off narcotics
- Stoma requires daily wound care for 5 days
- Catheter will be in place for 4-6 weeks or until the follow up appointment
- Daily catheterizations are necessary to keep the stoma open even if a flush isn't planned for that day



# Returning to school After Mitrofanoff

- The child will be able to return to school when he/she feels ready and is off narcotics
- A catheter will be inserted into the Mitrofanoff to keep it open for 3-4 weeks after surgery
- A suprapubic catheter may also be in place to allow the bladder to heal
- Catheters will be connected to collection bag or routed to diaper to allow urine drain freely
- After 4 weeks, the child will be able to catheterize intermittently



# Catheterization

Via Urethra

Via Mitrofanoff



# Clean Intermittent Catheterization (CIC)

- Temporary insertion of a catheter into the bladder using clean (not sterile) technique
- Clean = washing hands and area to be catheterized
- Just as safe as sterile intermittent catheterization
- King et al. (1992) compared SIC to CIC with 23 patients in each group. No difference in development of UTI, bacteriuria or fever between two groups.





## CIC Continued

- Catheters may be washed and re-used or disposed of after each use
- Lavallee, et al. (1995) compared hydrogen peroxide, vinegar, dishwashing detergent, and tap water to clean catheters contaminated with Pseudomonas and E. coli. They concluded that rinsing and drying catheters immediately after use was most effective at reducing bacteria to very near zero.



## Why CIC?

- CIC helps to completely empty the bladder, which:

- Decreases urinary tract infections

- Reduces incontinence episodes

- Prevents urinary tract damage



# Colonization vs Infection

- Asymptomatic Bacteriuria (colonization)
  - <100,000 cfu/ml and/or multiple colony types
  - Colonization occurs in most/all CIC patients
    - Long-term catheterization: 3-6 weeks
    - Clean intermittent catheterization: 2-3 months
  - Prophylactic antibiotics are not indicated
  - Antibiotics limited to symptomatic UTI only
  - Periodic screening with urine culture not indicated



# Who Needs CIC?

- Spinal Cord Injury
- Spinal Defects (spina bifida, tethered cord)
- Muscular Sclerosis
- Transverse myelitis
- Urine retention



## How Often?

- CIC is usually performed every 3-4 hours in children, or about how often we would expect them to void
- Frequency is prescribed by health care provider



# Catheters

- Straight
- Coudé
- Hydrophilic
- Closed system



# Step by Step Catheterization

- Assemble supplies
- Wash hands with warm, soapy water. Rinse and pat dry
- Position child (toilet, wheelchair, supine)
- Separate labia/retract foreskin and clean skin/stoma with wet wipe
- Lubricate catheter, if necessary
- Gently insert catheter into urethra until urine flow begins
- If resistance met at sphincter, keep catheter in position until sphincter fatigues, then continue inserting catheter
- Drain bladder
- When urine stops flowing, slowly retract catheter. If more urine is seen, continue draining bladder
- Remove catheter from urethra or stoma



# Considerations

Wheel chair bound - accessibility

Required assistance vs independence

IEP, cathing help, schedule

Developmental capacity

Visit with school nurse for outline of program



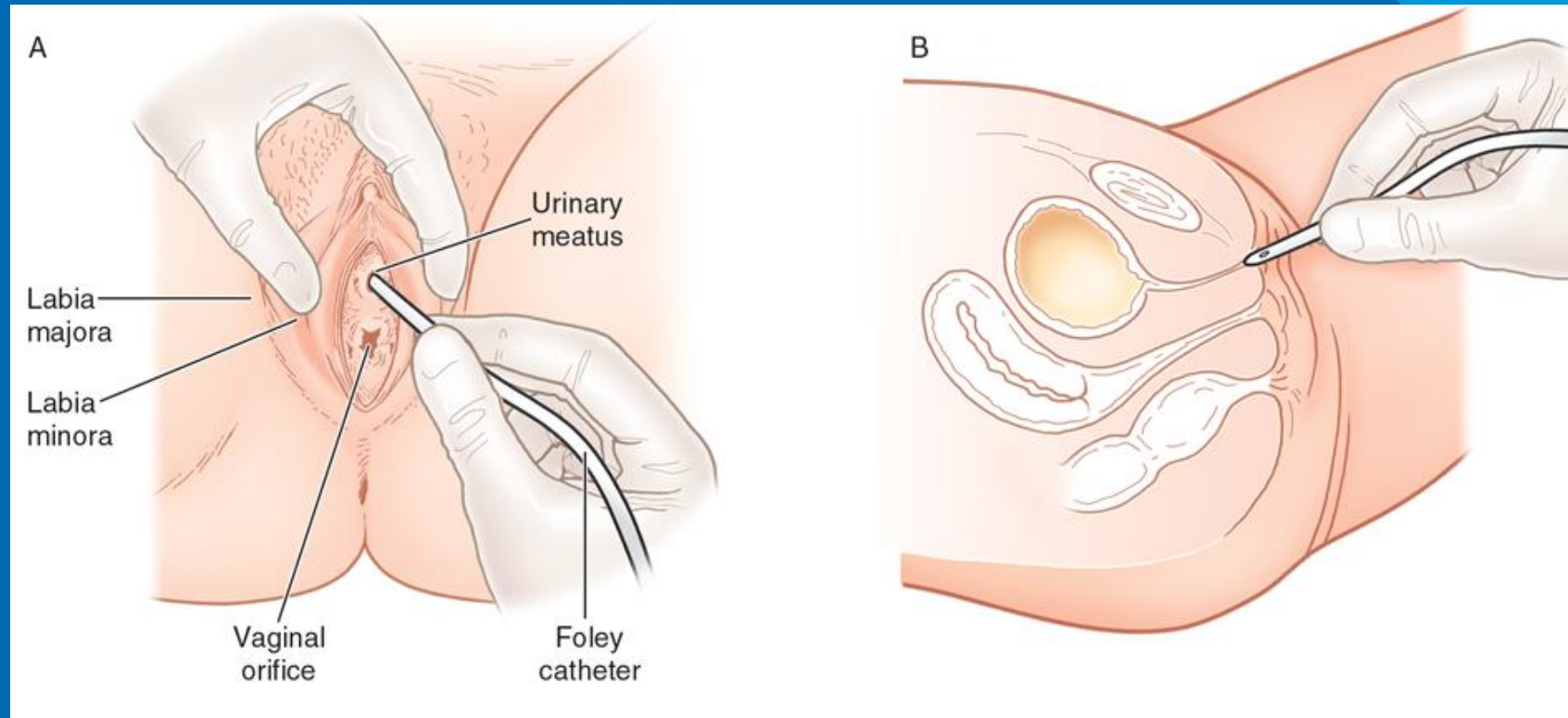


# Tips for Mitrofanoff School Care

Set up outline with the family

- Tips and tricks they know for child
- Review common issues with specific child's site, cathing technique
- Encourage child to participate in cathing if age and developmentally appropriate
- Always have plenty of supplies
  - multiple catheter as well as 1 size below current cathing size
  - Lubricant
  - Sink for child to wash hands if independent
- Set up cathing schedule at school and stick to it





Source: Reichman EF: *Emergency Medicine Procedures, Second Edition*; www.accessemergencymedicine.com  
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## Tips for Urethral Catheterization

- Set up all supplies for easy access
- Work to visualize the anatomy and urethral meatus first - pull forward rather than out
- Can consider rolling up a towel and placing under the child's bottom/sacrum for leverage
- Identify the clitoris and make sure not pushing catheter into it
- Pull up on the clitoral area and mons pubis to decompress tissue in the area



## Tips for Urethral Catheterization (cont)

- If insert catheter and no urine return, leave catheter in that location - this can act as a locator for the vagina and help avoid insertion there again
- Have a second catheter available if miss with the first
- Can consider use of a coude catheter
- If meeting resistance at the sphincter, stop and have the child take a deep breath



# Trouble Shooting

Bladder spasms

Anticholinergic medication

Pain or discomfort

- Tylenol/Motrin
- Consideration for a smaller catheter for a period of time
- Consideration for an indwelling catheter for 1 week



# Trouble Shooting cont.

## Leaking of urine

drainage bags, pads or diapers  
increase CIC, increase bladder flushes  
anticholinergic medication

## Stoma stenosis - difficulty passing catheter

- Have a smaller catheter on hand
- Change patient position
- Insert a smaller catheter and tape to skin, drain to diaper or bag.
- Can consider catheterization urethrally if no surgeries have been performed on the urethra
- If catheter cannot be inserted, go to Urology Clinic or Emergency Room



# Thank you for your time!

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