Clean Intermittent Catheterization-Best Practices to Individualize Patient Teaching Plans

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Objectives

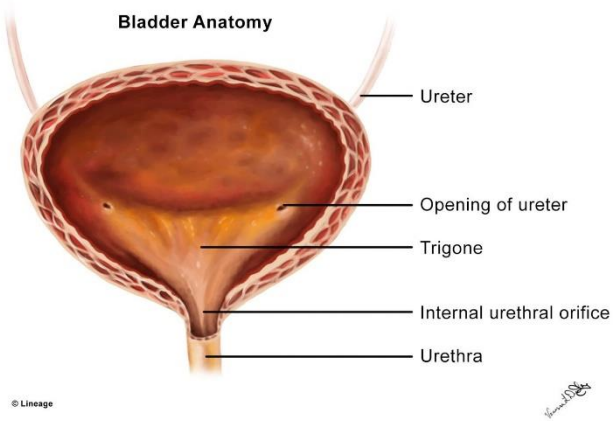
- Review the anatomy and physiology of the urinary system
- Describe the essential components of CIC
- Identify catheters, adaptive equipment, and various positions to optimize CIC teaching
- Utilize case studies, integrate best practices, and formulate individualized patient teaching plans

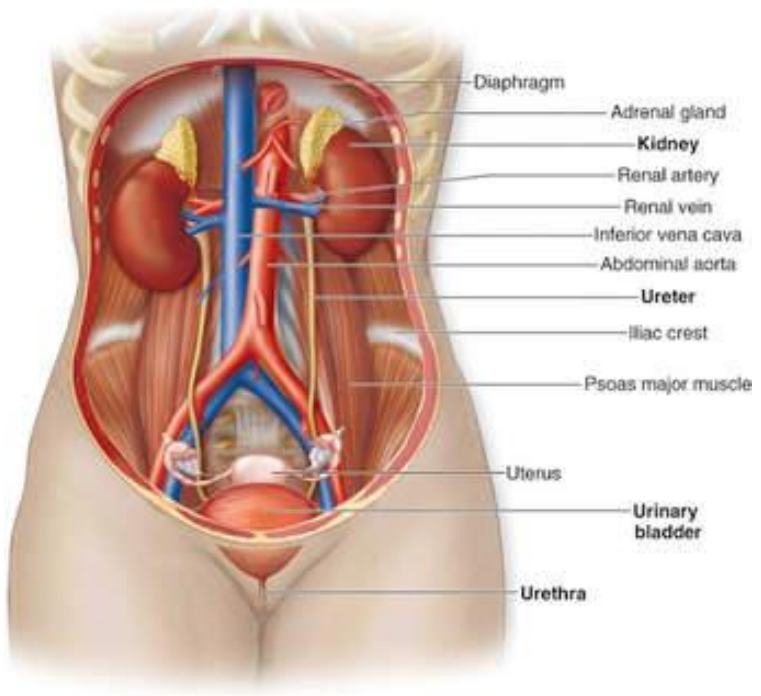
Disclosure

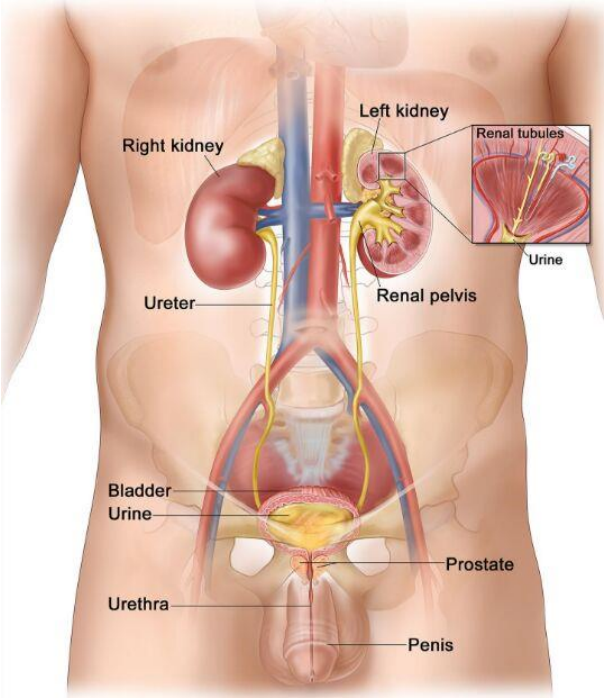
Leah Holderbaum is an occupational therapist, serving as an Account Manager for Urological Supplies for Numotion. She is not receiving financial compensation for the Iowa WOCN. Numotion is financially supporting Leah's speaking involvement at this event. Leah does not endorse one particular product over another. Product demonstrations are for educational purposes. Products have been provided on behalf of Numotion and various manufacturers.

Anatomy & Physiology

- The function of the bladder is to store and expel urine in a coordinated and controlled fashion.
  - Regulated by the central and peripheral nervous system







Upper vs. Lower Urinary Tract

Upper Urinary Tract

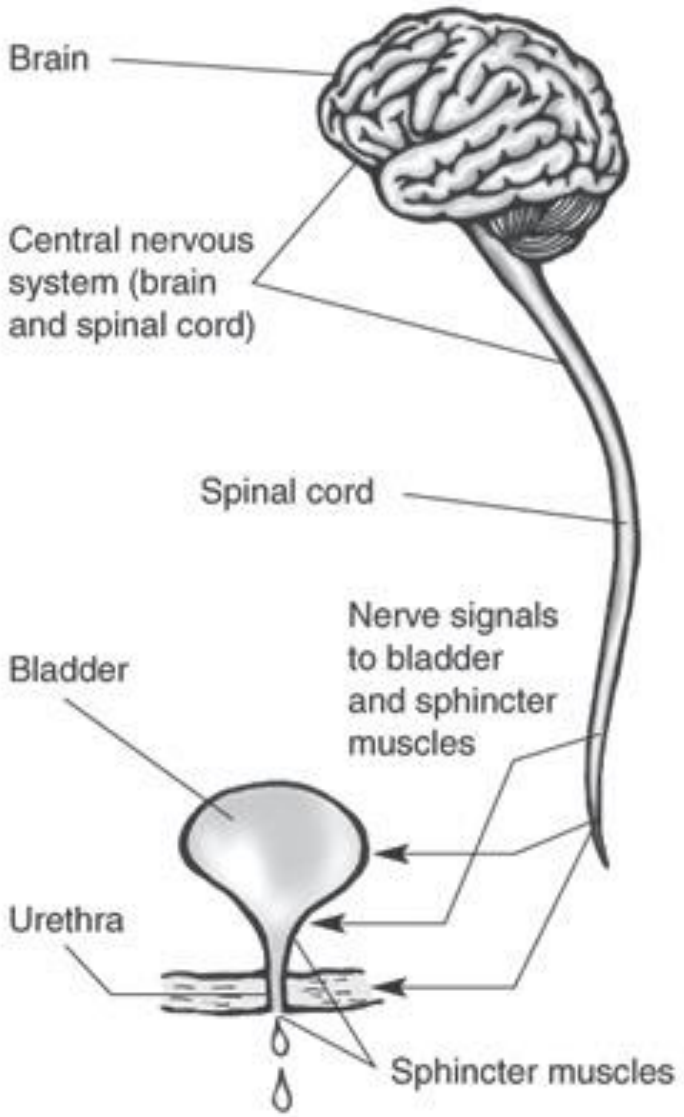
- Kidney
  - Renal parenchyma: secretes, concentrates, and excretes urine
  - Collecting system
- Peristaltic waves propel urine down ureters into bladder

Lower Urinary Tract

- Bladder
  - Detrusor
    - Smooth muscle bundles that freely crisscross and interlace with each other
  - Trigone
    - Located at the inferior base of the bladder and extends from the urethral orifices to the bladder neck

Neuroanatomy

- Bladder storage and emptying is a function of interactions among the peripheral parasympathetic, sympathetic, and somatic innervation of the lower urinary tract with modulation from the central nervous system.
- Normal voiding is a spinal reflex modulated by the central nervous system, which coordinates function of the bladder and urethra.



Normal Bladder Function

- Bladder is regulated by the cerebral cortex and the pontine micturition center (PMC)
  - PMC acts as an “on/off switch”
- Requires a functioning urinary system, intact spinal column, and higher center involvement

Autonomic Nervous System

Sympathetic system

- When active, causes the bladder to increase capacity without increasing detrusor resting pressure (accommodation)
- Stimulates the internal urinary sphincter to remain closed
- Inhibits parasympathetic stimulation, preventing bladder contractions
- Micturition reflex is suppressed

Parasympathetic system

- Stimulates the detrusor to contract
- Internal urethral sphincter becomes suppressed, allowing the internal sphincter to relax and open
- Activity of the pudendal nerve is inhibited, opening the external sphincter
- Result=facilitation of voluntary urination

Physiology

- An average person voids 4-8 times daily
- Normal bladder function consists of 2 phases: filling and emptying
- Normal micturition cycle requires the urinary bladder and urethral sphincter work as a coordinated unit to store and empty urine
  - Storage:
    - The bladder acts as a low pressure container
    - Urinary sphincter maintains high resistance to urinary flow
    - Bladder outlet remains closed
  - Elimination:
    - Bladder contracts to expel urine
    - Urinary sphincter opens
    - Unobstructed urinary flow and bladder emptying results

Filling Phase

- Bladder accumulates increasing volumes of urine
- Pressure within bladder remains low
  - Must be lower than urethral pressure during the filling phase, or urine leakage will result
- Passive event, dependent on intrinsic viscoelastic properties of the bladder and inhibition of parasympathetic nerves
- Sympathetic nerves facilitate storage
  - Inhibit parasympathetic nerves from triggering bladder contractions
  - Cause relaxation and expansion of the detrusor muscle
  - Close the bladder neck by constricting the internal urethral sphincter

- Pudendal nerve becomes excited, resulting in contraction of external urethral sphincter
- Continence reflex=Urethral pressure (resistance) is maintained higher than normal bladder pressure
  - Person will remain continent as long as urethral pressure is higher than pressure in the bladder
  - Person will be incontinent if urethral pressure is abnormally low, or if the intravesical pressure is abnormally high
  - Stress incontinence=Pressure transmitted to the bladder is greater than the urethra, urine leaks (physical activities, coughing, sneezing, laughing).

Emptying Phase

- Involuntary (reflexive) or voluntary transition from storage phase
  - Involuntary reflex voiding occurs in infants
- Pudendal nerve causes urethral sphincter and pelvic floor to relax
- Sympathetic nerves send a message to internal sphincter to relax and open
- Parasympathetic nerves trigger contraction of the detrusor
- Bladder contracts, pressure overcomes urethral pressure, resulting in urinary flow
- Unimpeded, automatic release of stored urine results
  - Conscious control of this reflex develops after infancy
  - Primitive voiding reflex may reappear with SCI

What is neurogenic bladder?

- The abnormal function of the urinary bladder due to any neurologic condition of the CNS, ANS, or SNS
  - Overactive bladder (spastic or hyper-reflexive)
  - Underactive bladder (flaccid or hypotonic)
- Urinary bladder malfunction due to neurologic dysfunction emanating from internal or external trauma, disease, or injury.

- *“Neurogenic Lower Urinary Tract Dysfunction”*
  - Confirmed pathology of the nervous system
  - Only diagnosed in the presence of confirmed neurological pathology

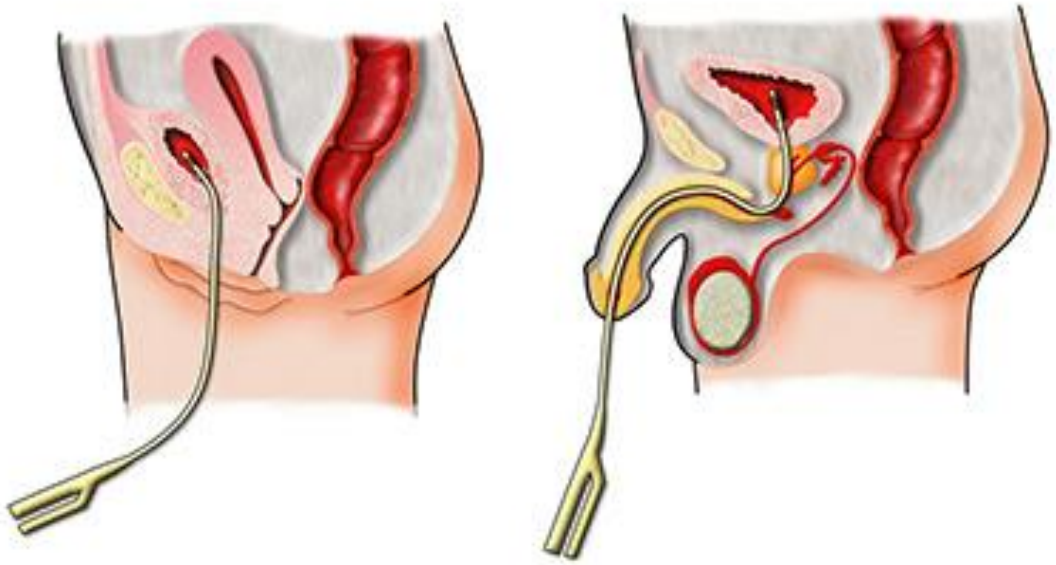
- Affects quality of life
  - Difficulty getting through the day without interruptions
  - Fear of going out with friends, taking vacations, or doing daily tasks
  - Fear of not being able to find a bathroom when necessary
  - Cancel activities, withdraw from lives
  - Affect work and relationships
  - Tired
  - Depressed
  - Anxious
  - Lonely
  - Skin problems
  - Infections

Goals of Bladder Management

- To maintain and preserve a functional, infection-free genitourinary system through prevention of upper and lower tract complications with a management system compatible with an injury-free lifestyle.
- To achieve and maintain adequate bladder drainage with low-pressure urine storage and voiding

Intermittent catheterization

- A method by which an individual or their caregiver empties the bladder at a specified time frequency by inserting a catheter into the bladder, draining the bladder, then removing the catheter.
  - Does not require an intact sacral micturition reflex
  - Provides complete bladder emptying and offers a practical means of obtaining a catheter-free state



Rationale: IC provides a method of emptying the bladder without leaving an indwelling catheter and lessens the frequency of long-term complications

Sterile Technique vs. Clean Technique

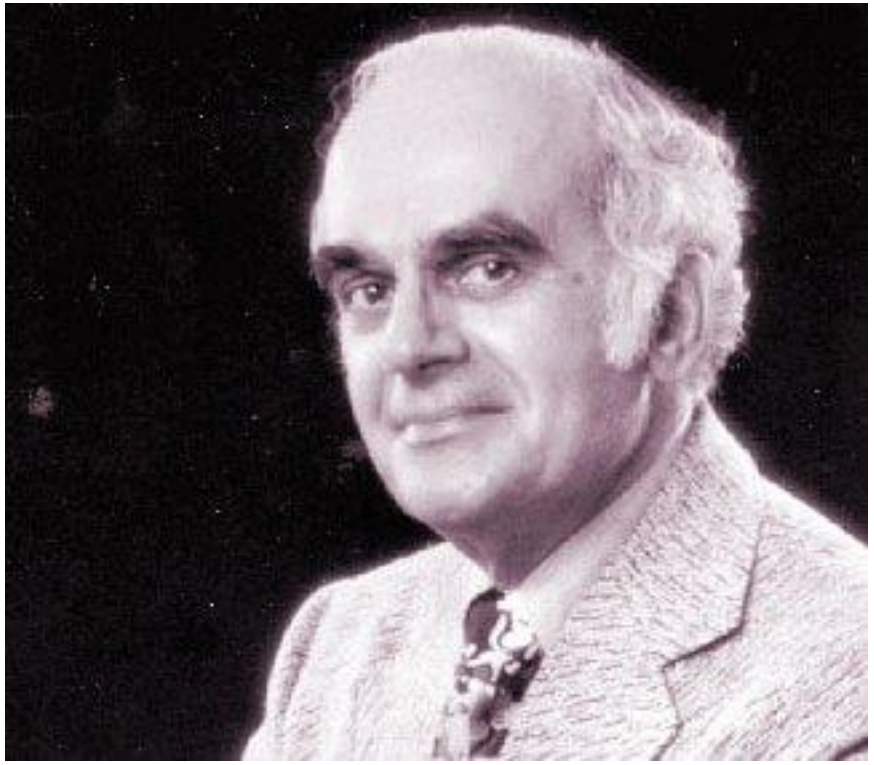
Sterile ("No touch/Touchless") technique

- Guttman, 1954, described this technique as a way of reducing infection
- Used for a restricted period of time
- Performed by nursing, typically in institutional settings
- Recommended for older individuals, or those with a weak immune system
- Not intended to be a long-term method of bladder management

Clean technique

- Accommodates for the difficulty of completing sterile technique in a "real life", normal living environment
- Prevents high residual volumes, and reduces risk of UTI
- Results in lower rate of infection compared to indwelling catheters
- Hands should be washed or aseptic towelettes should be used before and after
- Penis or labia (front to back!)/urethral orifice should be cleansed prior to cathing using appropriate wipes, or soap and water

Intermittent Catheterization



- One of the oldest urologic procedures
  - Dates back ~3000 years

- Dr. Jack Lapides
  - Pioneer of CIC, 1971
    - “Host resistance factors were sufficient to prevent symptomatic urinary infection provided the bladder was emptied frequently.”
  - Described the procedure for CIC, which has become a life saving and first line of management for those individuals who are unable to empty their bladder spontaneously, when desired
    - If the bladder is not emptied regularly, elevated storage pressures can lead to upper tract damage

Intermittent Catheterization

Benefits

- Can be performed by individual, caregiver, or health care professional
- Intermittent catheterization is the best solution for bladder decompression of motivated individuals who can physically and cognitively participate in their care
- Preferred by men and women, over indwelling catheters
- Healthy alternative
- Can be performed anywhere
- Patient autonomy
- Freedom from catheters, tubes, or bags
- Unimpeded sexual relations
- Preserves function of upper tract
- Provides means of complete bladder emptying without indwelling catheter
- Prevents over distention of bladder
- Decreases risk of UTI
- Decreases risk of urethral trauma
- Increases independence in self care
- Simulates normal voiding schedule and maintains continence

Barriers/Risks

- Candidates for IC must have motivation, and intact physical and cognitive abilities
- Bladder infection/UTI
- Urethral trauma (hematuria, false passages, stricture)/inflammation
- Stricture
- Urethritis
- Epididymitis
- Orchitis
- Pain/discomfort
    - IC should NOT be painful! Re-assess technique and products used
- Insurance coverage may not be adequate
    - Increased expense for patient

Intermittent Catheterization

- Catheter length
  - 6” (female) to 16” (male)
- French size
  - Diameter of catheter
  - 6 Fr to 18 Fr
- Tip
  - Straight
  - Coude
    - Used to advance passed the prostate, or anatomical barriers
- Lubrication
  - Separate package
  - Gel (water soluble)
  - Hydrophilic

IC facts

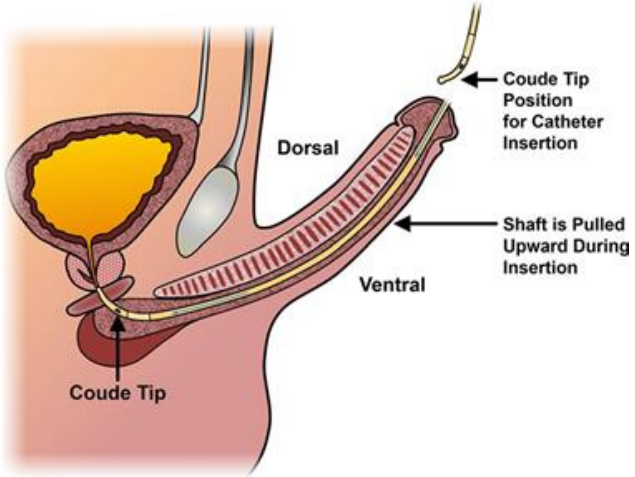
- Bladder must be drained on a regular basis
  - Timed intervals (every 4, 6, or 8 hours)
  - Bladder volume
- The average adult bladder holds approximately 400-500 mL of urine
- Amount drained should not exceed 500 mL
  - Fluid intake may need to be decreased
  - Frequency of catheterizations may need to be increased

Infection rate

- Incidence of bacteria in the bladder is 1-3% per catheterization
- 1-4 episodes of bacteriuria occur per 100 days of intermittent catheterization performed 4 times daily
- Infections that do occur are usually managed without complications
- Use of a hydrophilic-coated catheter for IC delays the onset of first antibiotic-treated symptomatic UTI
- Reduced incidence of symptomatic UTI

Intermittent catheterization: Male

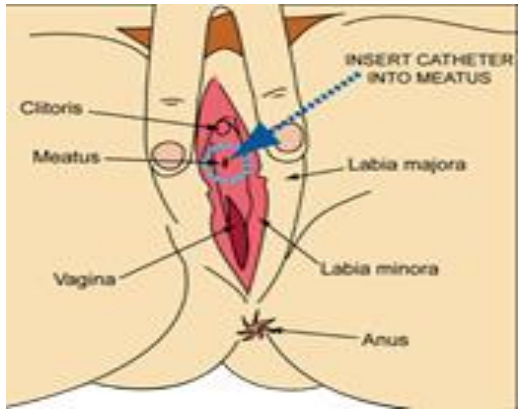
- Extend penis upward (Urethra is “S” shaped)
- Insert catheter until you meet resistance. Relax. Breathe.
- Apply mild gentle pressure (Do not force) until catheter passes freely and urine begins to flow
- Once urine stops flowing, pull the catheter back slowly to empty residual urine



Intermittent catheterization: Female

- Separate labia
- Insert catheter until urine begins to flow. Relax. Breathe.
- Once urine stops flowing, pull catheter back slowly to empty residual urine

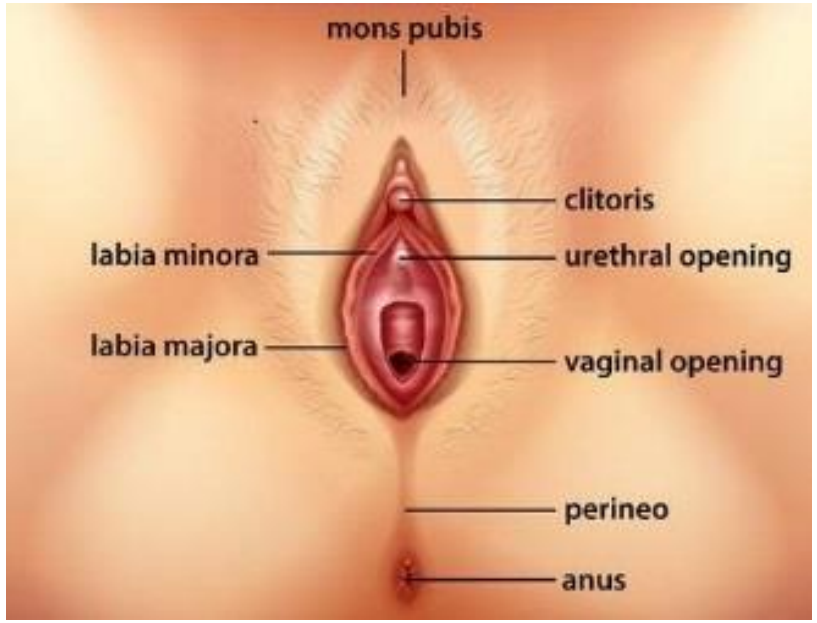
If the catheter is accidentally inserted into vagina/rectum (it happens!!!), do NOT reinsert the same catheter into the urethra!

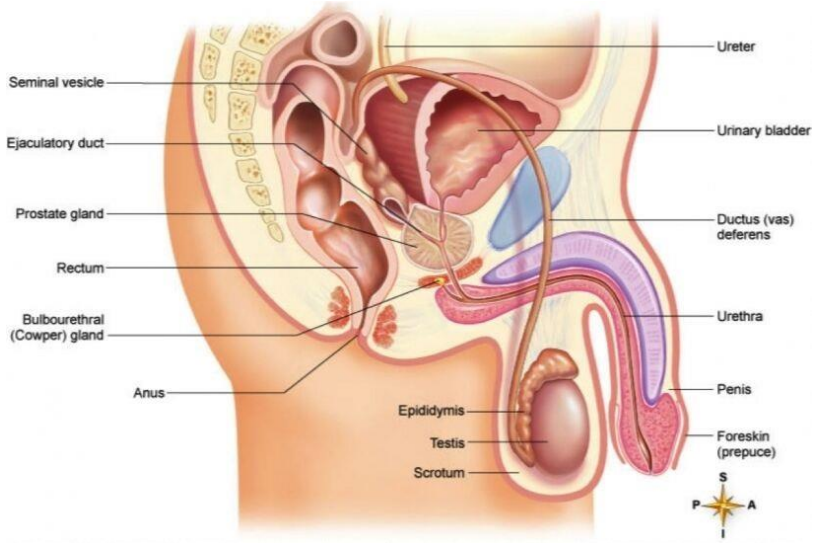


THE BIG PICTURE

Ideal Model for Bladder Management

- Interdisciplinary
- Responsive
- Reality-based





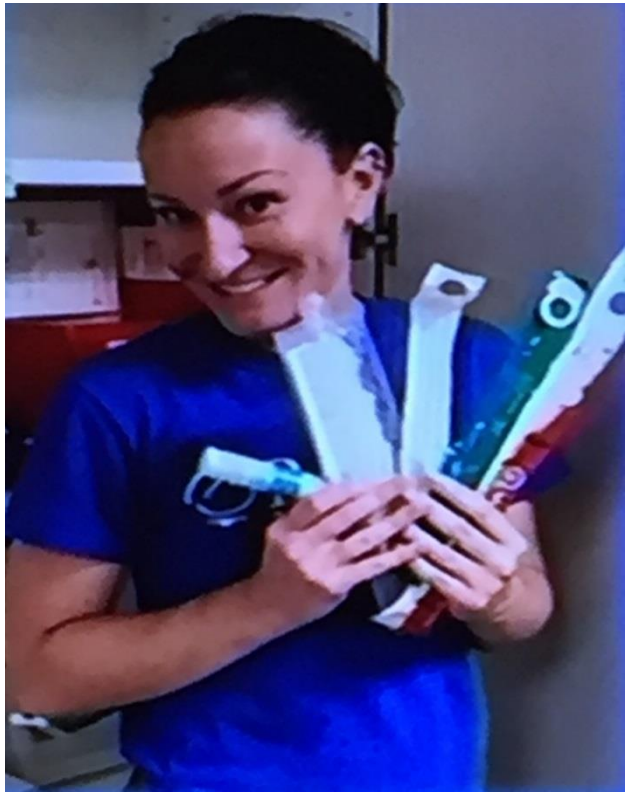
Educate and Inform

- Review anatomy (<u>Do NOT assume!)</u>
- Provide input regarding effectiveness of bladder program relative to the client's daily routines
  - The clinician must have a full understanding of the individual's bladder needs

- Describe and provide education on health risks associated with non-compliance
  - AD
  - Constipation
  - UTI
  - Vesico-ureteral reflux

Catheter selection

- Insurance dictates coverage
  - Closed vs open system
- Hand function
- Basic straight vs hydrophilic (lubricated)
- Type of lubricant
- Rigidity
  - Too rigid can cause trauma
  - Too flexible can be difficult to manage, curling
- Females using male catheters



Reimbursement

- A4351: straight tip, with or without coating or hydrophilic
- A4352: coude tip, with or without coating or hydrophilic
  - Documented prostate issues/inability to pass straight catheter, and ease with use of coude
- A4353: with insertion supplies
  - Immune-compromised
  - Reside in a nursing facility
  - Experience vesico-ureteral reflux
  - Pregnant females with SCI
  - 2 or more UTIs within a 12 month period (Medicare)

Assessment

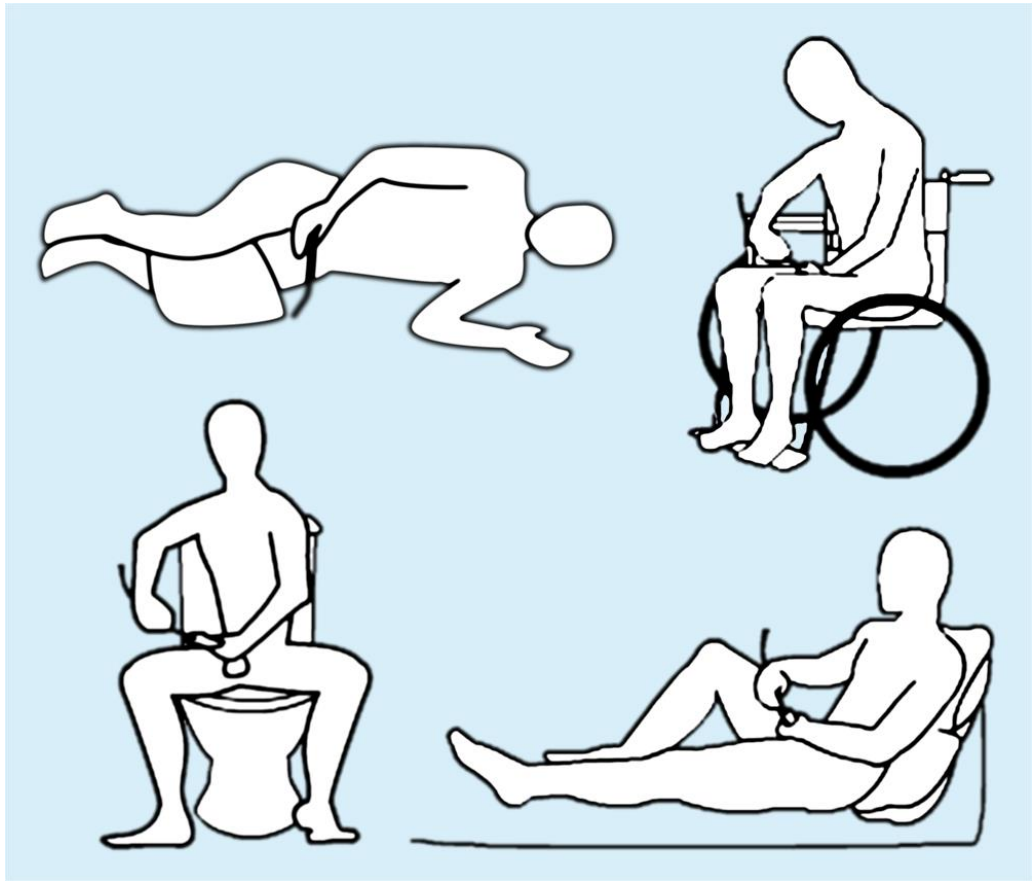
- Consideration of feasibility of the bladder management program integration within the individual's life
  - Physical abilities
    - Dexterity
    - Core flexibility
    - Strength
    - Balance/posture
  - Cognitive function
  - Sensation
  - Tone
  - Willingness to learn/anxiety
  - Personal factors
  - Environmental factors
  - Cultural and spiritual beliefs
  - Roles
  - Routines
  - Bowel function
  - Support of family/caregivers
  - Financial considerations

Clothing Management

- When?
- Where?
- How?

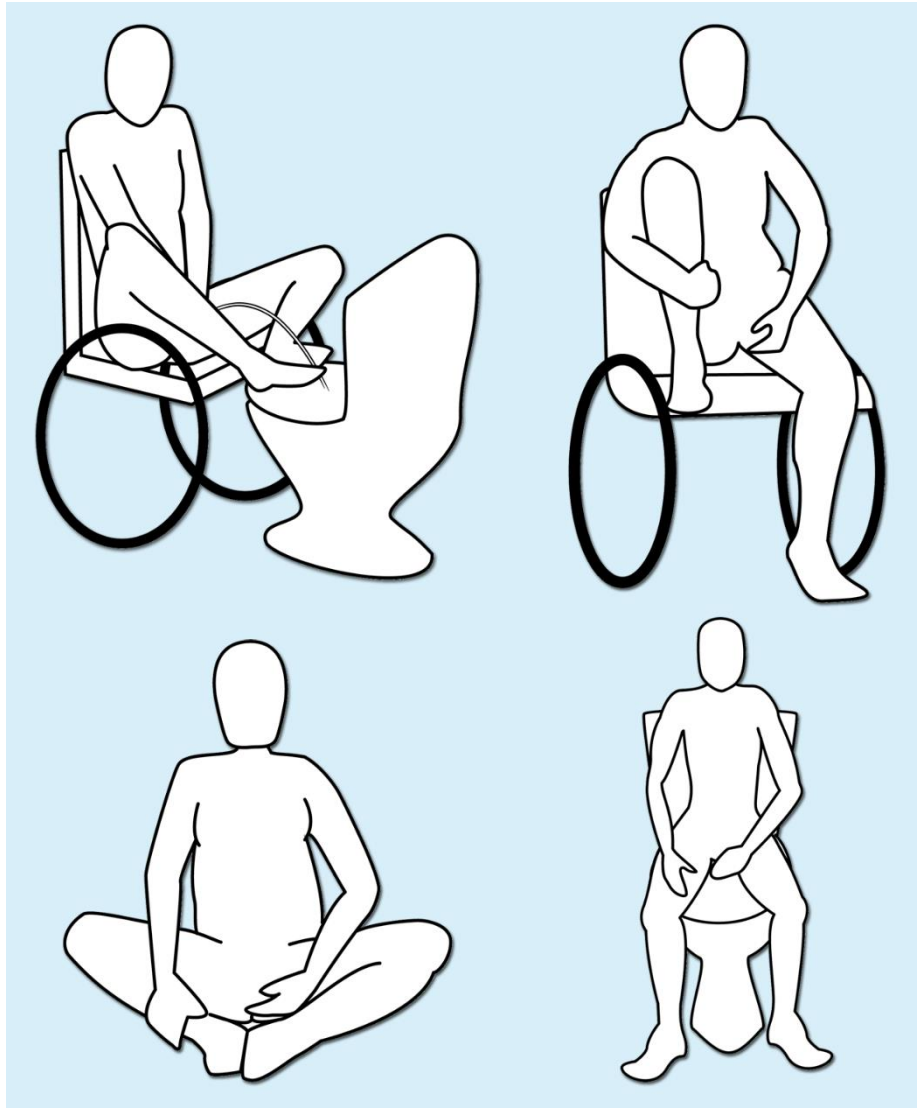
- Modifications???

Positioning



Male

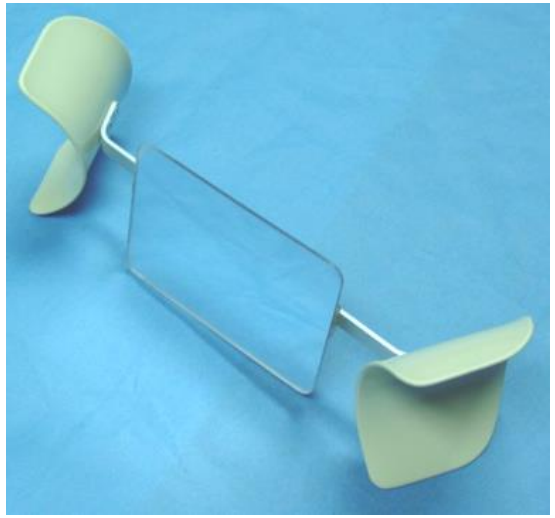
Female



Independent IC

- https://www.youtube.com/watch?v=e3bodOkVGH4

Adaptive equipment



Icon

https://www.iconundies.com/

Bladder Management Quotes:

- “The patient just needs set-up for cathing!”
- “No way bro! Exit ONLY!”
- “Both of her hands work, so why isn’t she cathing yet?”
- “Is she going to be able to cath?”
- “It’s so slippery!”
- “It’s like a game of Skee Ball.”
- “My donut has disappeared!”
- “Is that a freckle?”
- “…it’s the wink, not the clover!”

WWCQD???

- The patient demonstrates difficulty inserting or removing the catheter
- Urine is not flowing/the catheter gets clogged
- Urine is leaking around the catheter
- There is blood in/on the catheter

KG

- 23 year old female involved in an ATV accident, 2 months after graduating from nursing school. She sustained a C5 AIS, A injury. She has a TLSO and C-Collar that must be worn at all times. She has a supportive family and boyfriend, and wants to be self sufficient.
  - What is the goal for bladder management?
  - Where do you begin?
  - What do you anticipate as the end result for her bladder management?

“Liv”

- 19 year old female with diagnosis of antecubital pterygium from childhood, now presents following a bilateral cerebellar hemorrhage and vertebral artery dissection. She exhibits significant ataxia, poor coordination, visual deficits, frequent UTIs, is nonverbal, and is NPO. Cognitively, minimal deficits are noted. She has a very supportive family; her mother is a respiratory therapist but plans to be the primary caregiver.
  - What is the goal for bladder management?
  - Where do you begin?
  - What do you anticipate as the end result for her bladder management?

Mr. R.

- 67 year old single male with progressive prostate cancer and mets, currently in IP Rehab. He has recently undergone multiple radiation treatments. He recently had a cervical surgery secondary to the cancer spreading to his spine, resulting in wearing a CTO for 12 weeks. He is overweight. He ambulates with min assist and a RW. He is currently being dependently cathed by nursing, using sterile technique.
  - What is the goal for bladder management?
  - Where do you begin?
  - What do you anticipate as the end result for her bladder management?

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Questions???

Thank you so much!!!

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