Neurogenic Bladder

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Presenter Disclosure

- **Steve Crochetiere**
  - **Territory Manager for Coloplast**
- **Rebecca Charbonneau and Julie Reader**
  - **Nil**

Overview

- Anatomy
- Assessment
  - History, Physical, Investigations
- Treatment
  - Nonpharmacologic
  - Pharmacologic
  - Surgery
- Complications
  - UTIs
  - Stones
  - Autonomic dysreflexia

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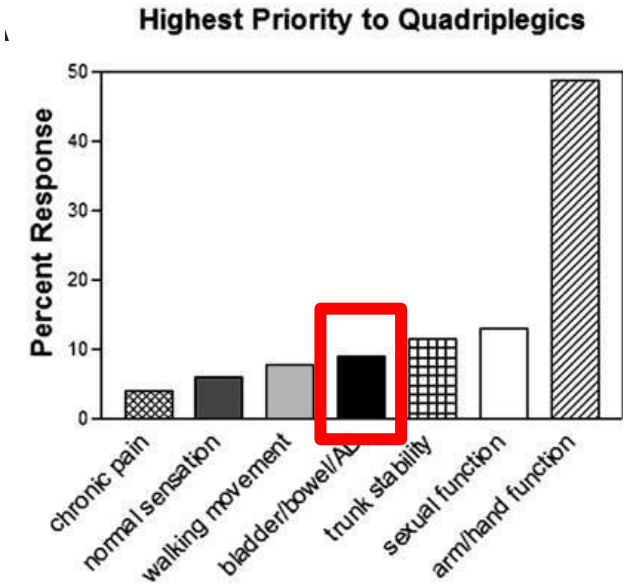
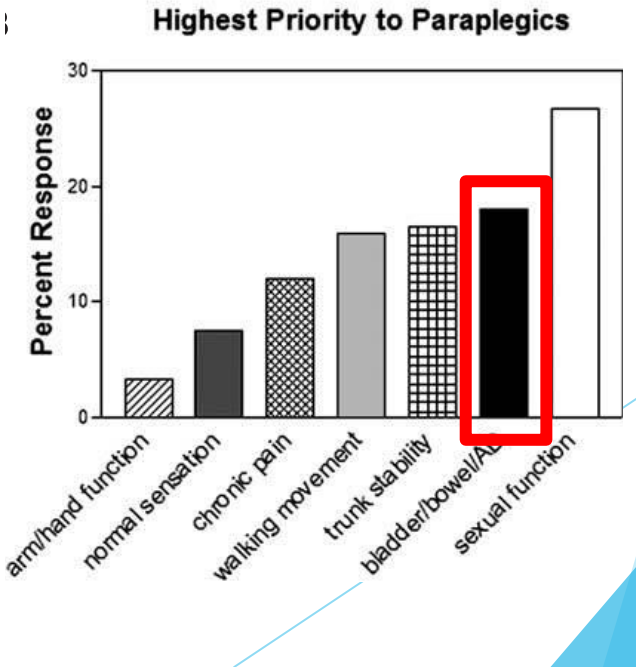
Targeting Recovery: Priorities of the Spinal Cord-Injured Population

KIM D. ANDERSON





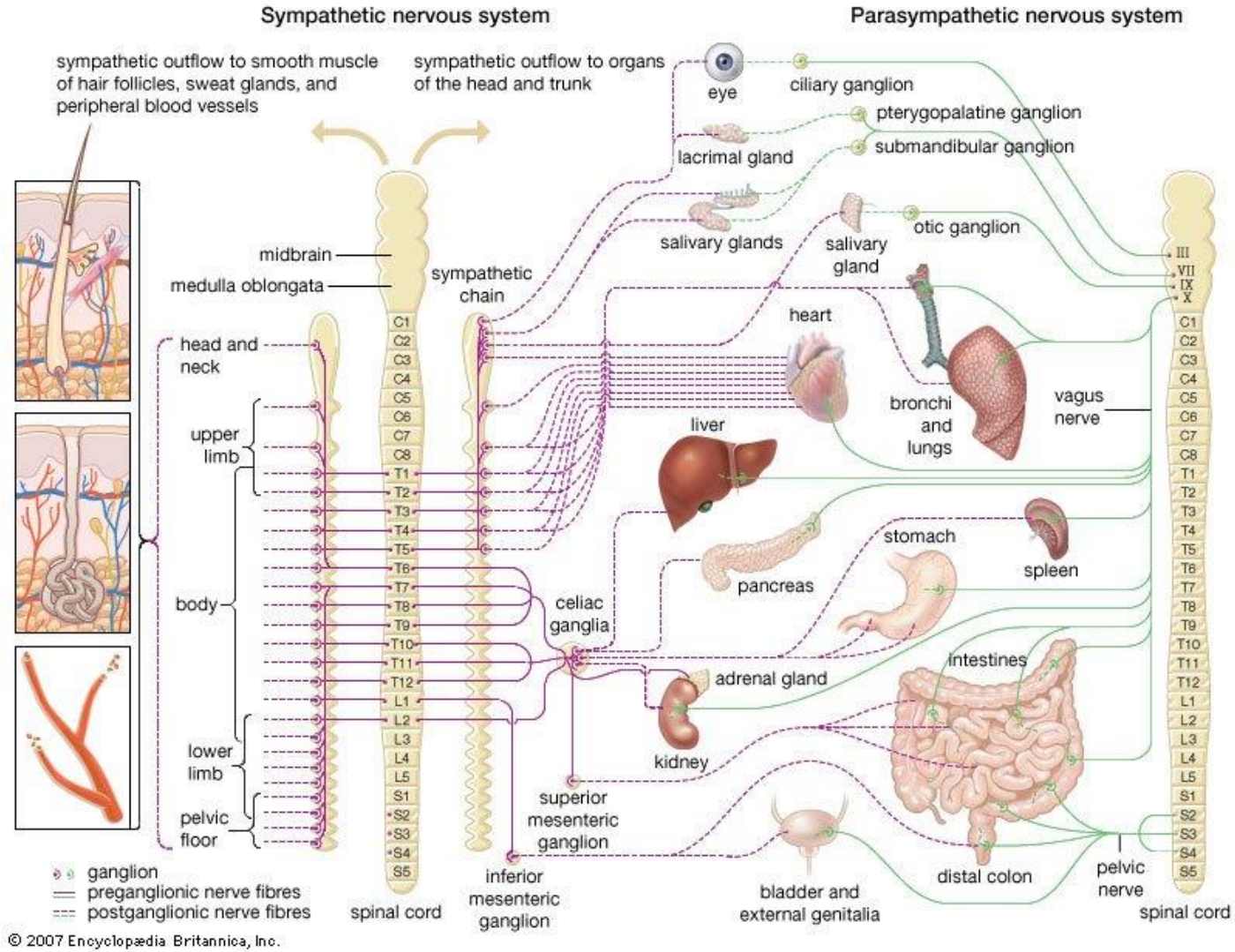
86000 people are living in Canada with SCI

70-84% have neurogenic bladder

Mortality rate due to renal insufficiency in SCI patients was as high as 50% in the 1960s and has dropped to less than 3%

Bladder management is life saving

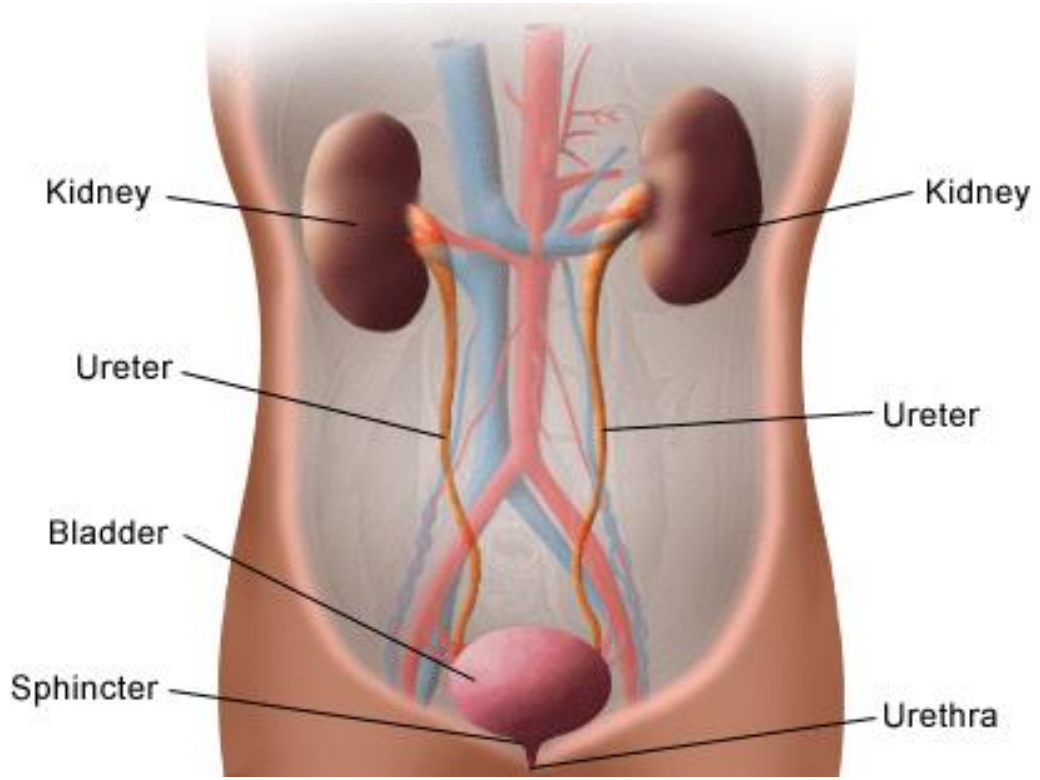
Sympathetic



Parasympathetic

From Hornykiewicz, Flattery: Autonomic Nervous System Neurotransmitters, in Principles of Medical Pharmacology, ed 3, University of Toronto Press, 1980, p 143

Kidney and Bladder



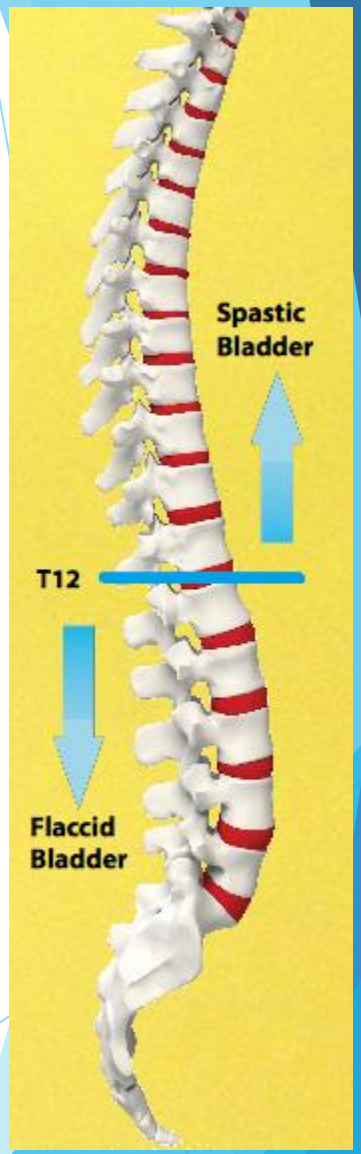
Spastic/Reflexic vs Flaccid/Areflexic bladder

Spastic bladder

- **UMN** injury
- Injuries **above** T12
- Voiding reflex **is** intact between bladder and spinal cord
- **Increased** bladder muscle and sphincter tone
- Sphincter muscle may not open when bladder squeezes to empty

Flaccid bladder

- **LMN** injury
- Injuries **below** T12
- Voiding reflex **not** intact
- **Decreased or loss** of bladder muscle and sphincter tone
- Bladder will continue to fill and may leak
- Unable to empty bladder voluntarily



History

- New or remote SCI?
- Current bladder management
- I/O
- Signs and symptoms of complications
- Functional hx: ADLs, hand function

Assessment

- Motor exam (hand function)
- ISNCSCI exam (AIS score)

Discuss current use of no longer recommended techniques:

- Overflow condom cath
- Crede maneuver
- Straining to void

Investigations

- Renal US – recommended baseline and yearly to look for hydronephrosis or stones
- UA and U Culture (if UTI suspected)
- Cystoscopy (hematuria, recurrent UTIs, stones)
- Urodynamic study or “UDS”

Bladder Management Goals

- Goals of bladder management:
  - Regular bladder emptying (q4-6h)
  - avoid stasis (6h max)
  - Avoid high volumes (500mL max) = keep fill pressures low
  - Avoid high voiding pressures
  - Prevent complications of stasis or failure to empty:
    - Acute: autonomic dysreflexia
    - Chronic: UTI, reflux, stones, strictures
  - Prevent unplanned voids/overflow
  - **Promote max independence**

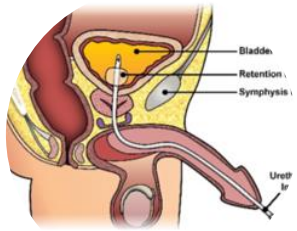
How to manage neurogenic bladder

- Most will need some level of adaptive bladder evacuation

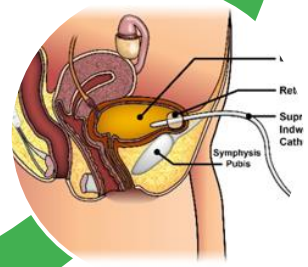
Bladder Evacuation Modalities

Intermittent Catheters

Clinically Preferred



Indwelling Catheter - Urethral

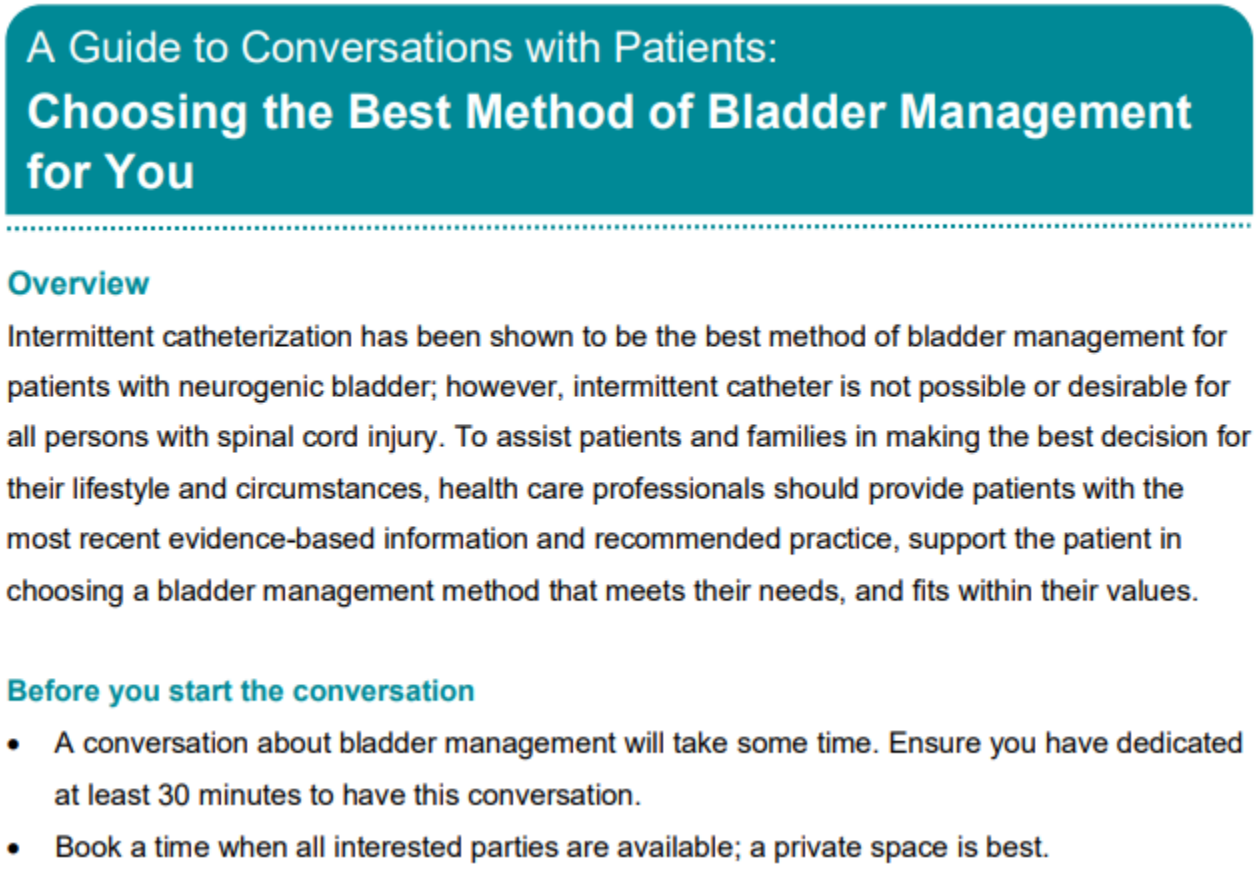


Indwelling Catheter - Suprapubic

Conservative management (behavior only)

Timed voids, double voids, limit fluid intake / caffeine

Clinical best practice is not the only factor to consider…



A Guide to Conversations with Patients:

Choosing the Best Method of Bladder Management for You

Overview

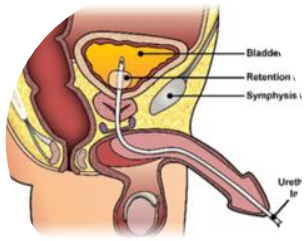
Intermittent catheterization has been shown to be the best method of bladder management for patients with neurogenic bladder; however, intermittent catheter is not possible or desirable for all persons with spinal cord injury. To assist patients and families in making the best decision for their lifestyle and circumstances, health care professionals should provide patients with the most recent evidence-based information and recommended practice, support the patient in choosing a bladder management method that meets their needs, and fits within their values.

Before you start the conversation

- A conversation about bladder management will take some time. Ensure you have dedicated at least 30 minutes to have this conversation.
- Book a time when all interested parties are available; a private space is best.

Bladder Evacuation Modalities

Intermittent Catheters



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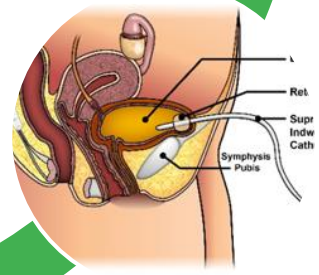
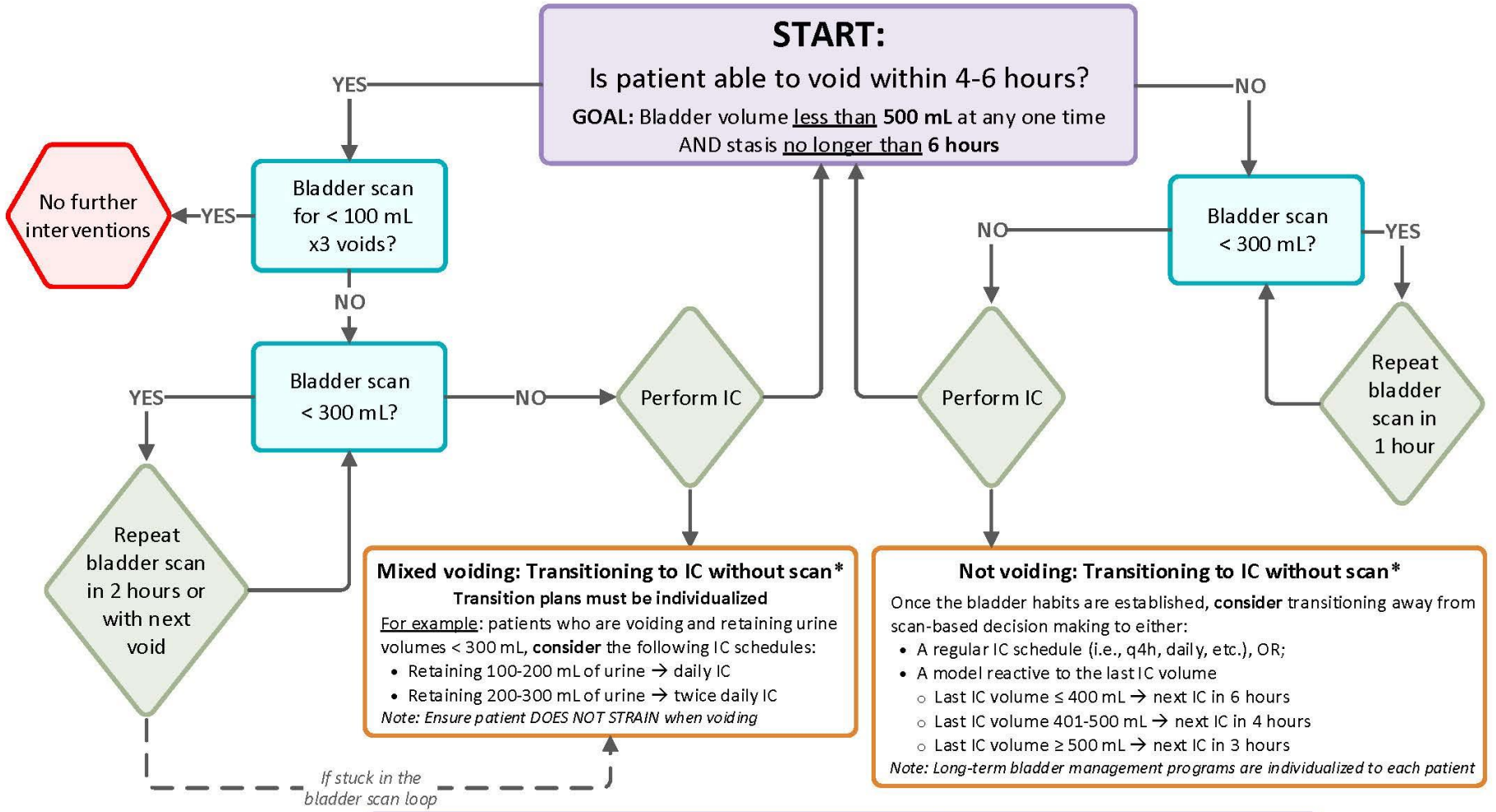


Indwelling Catheter - Suprapubic

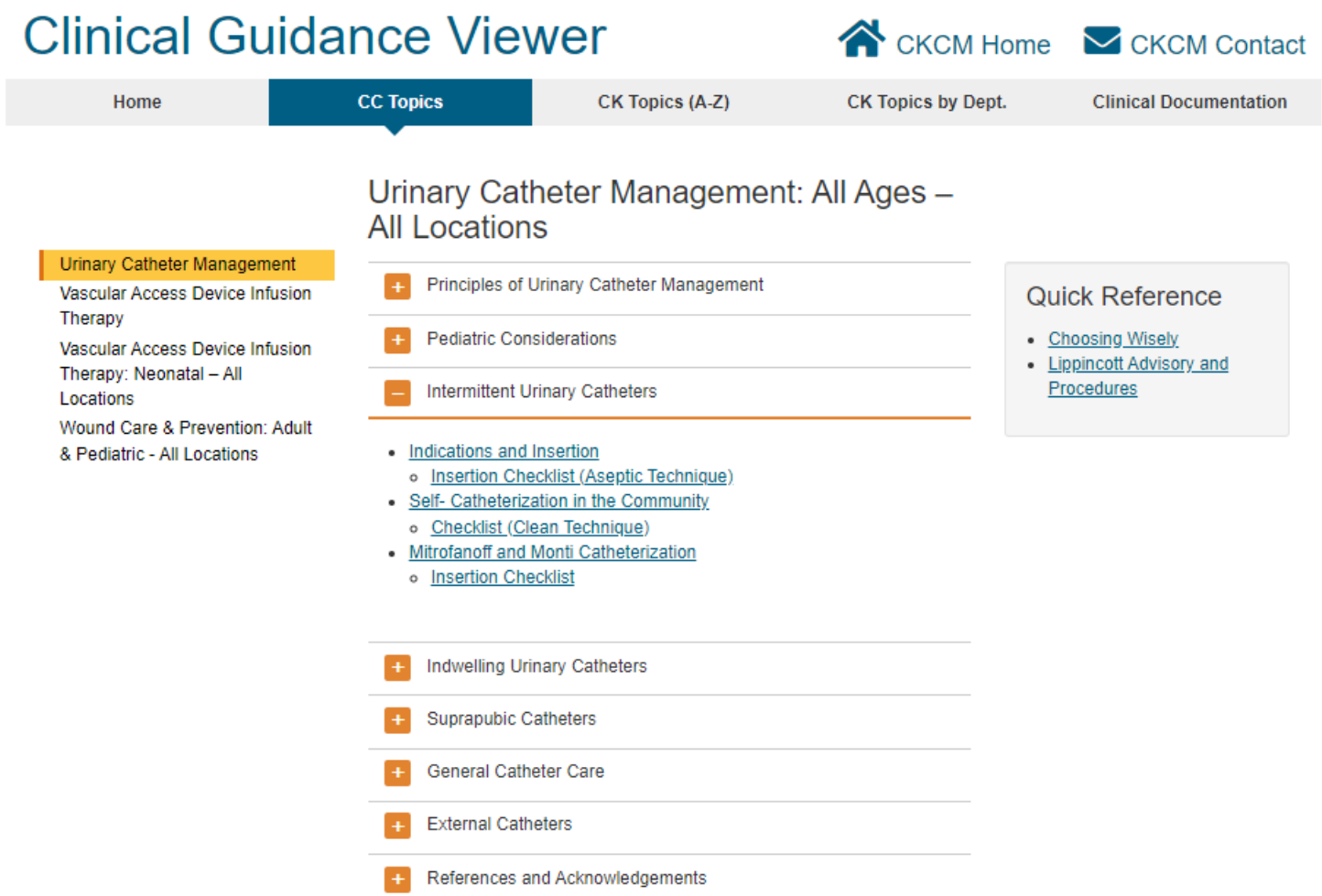
- Output ~2L/day
- < 500 mL q 4-6h
- Hand function or adaptive devices
  - Or person to perform

Alberta SCI Bladder Management Pathway, Intermittent Catheter (IC) Loop

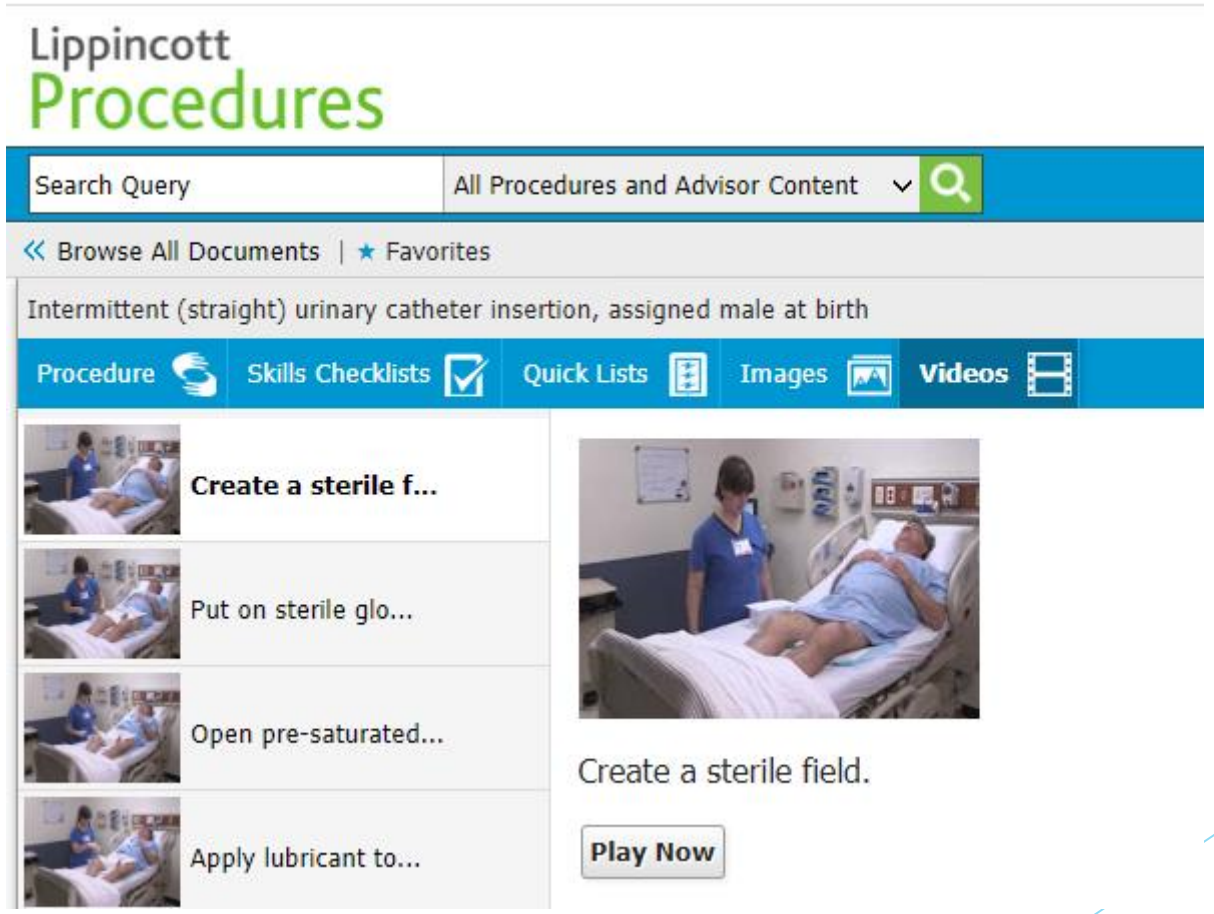
(also appropriate for non-SCI with neurogenic bladder)



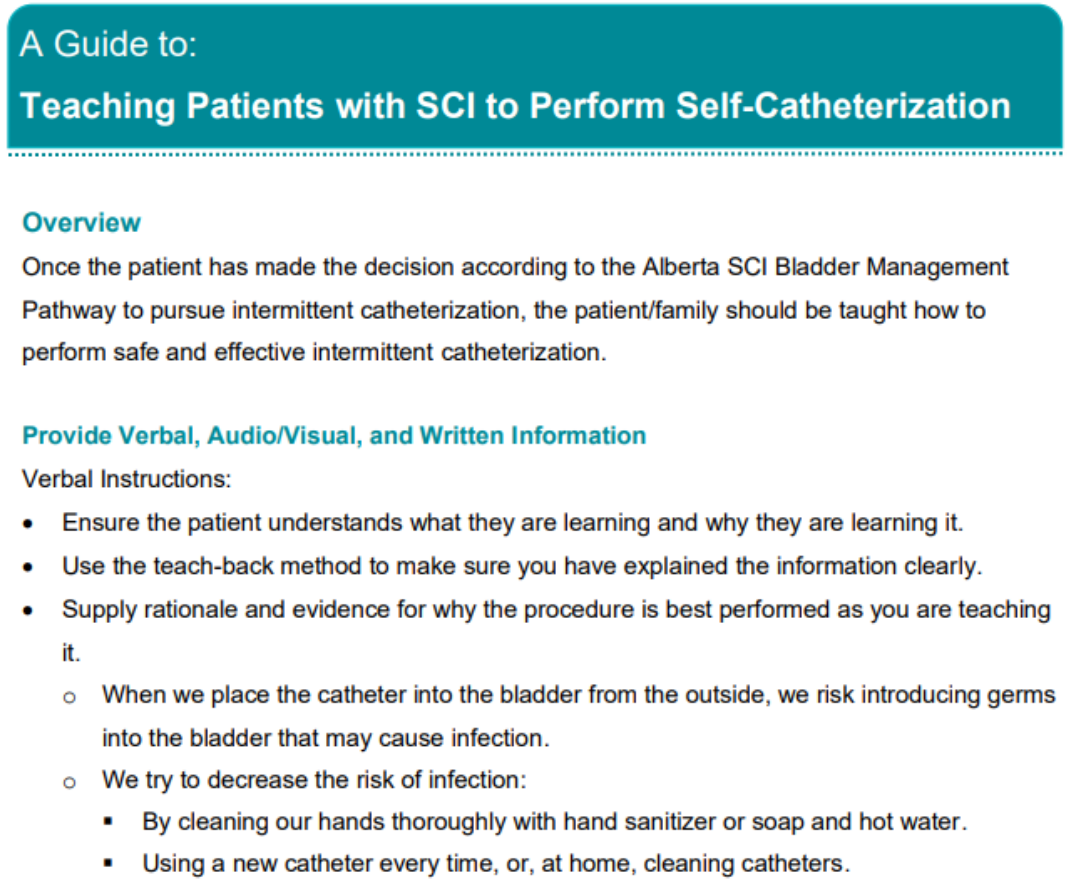
How to perform an IC (for providers)



Lippincott Resources for Nurses



Teaching patients to self-cath in acute care or rehab



A Guide to:

Teaching Patients with SCI to Perform Self-Catheterization

Overview

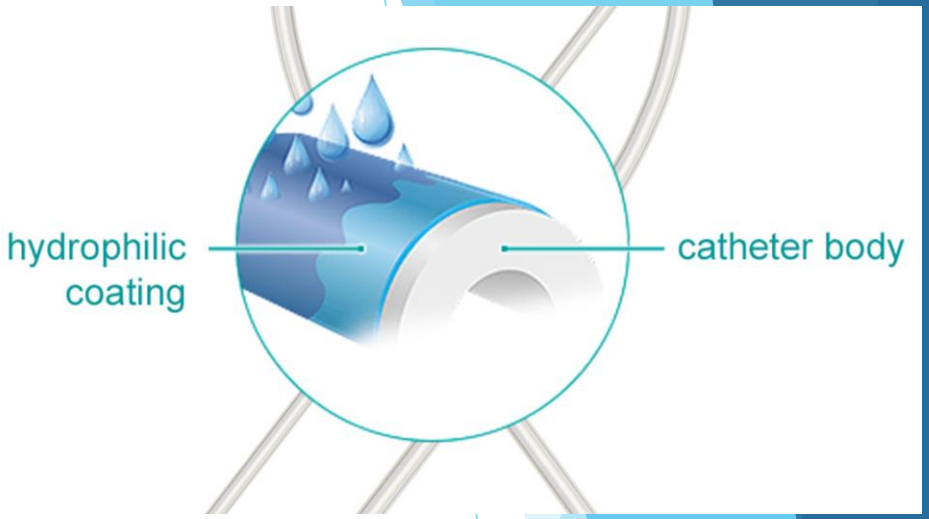
Once the patient has made the decision according to the Alberta SCI Bladder Management Pathway to pursue intermittent catheterization, the patient/family should be taught how to perform safe and effective intermittent catheterization.

Provide Verbal, Audio/Visual, and Written Information

Verbal Instructions:

- Ensure the patient understands what they are learning and why they are learning it.
- Use the teach-back method to make sure you have explained the information clearly.
- Supply rationale and evidence for why the procedure is best performed as you are teaching it.
  - When we place the catheter into the bladder from the outside, we risk introducing germs into the bladder that may cause infection.
  - We try to decrease the risk of infection:
    - By cleaning our hands thoroughly with hand sanitizer or soap and hot water.
    - Using a new catheter every time, or, at home, cleaning catheters.

Catheters



Uncoated Catheters

Pre-Lubricated Catheters

Hydrophilic Catheters

- Gauge
- Length
- Tip
- No-touch
- All-in-one (closed system)
- Compact

Gauge

Length

Tip

Standard Catheter Connector Colour Chart							
Catheter Size	8	10	12	14	16	18	20
Colour							
Tube Size	2,7	3,3	4	4,7	5,3	6	6,7

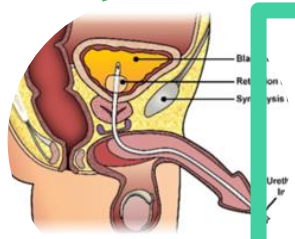
No-touch

Compact

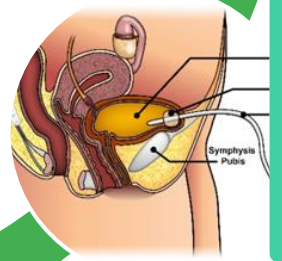
All-in-one (closed system)

Bladder Evacuation Modalities

Intermittent Catheters
- +/- voiding



Indwelling Catheter - Urethral

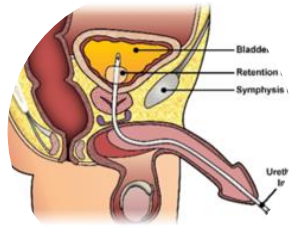


Indwelling Catheter - Suprapubic

- Independence
- Don’t need great hand function
- Intake isn’t a factor

Bladder Evacuation Modalities

Intermittent Catheters
- +/- voiding



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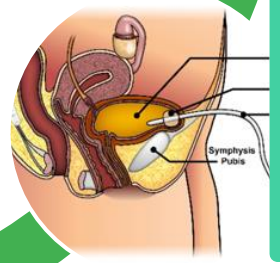


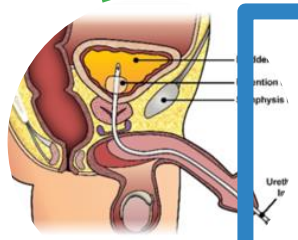
Indwelling Catheter - Suprapubic

- Minor surgical (IR)
- Improved sexual function/experience & body image
- Bypasses any urethral damage or obstruction (stricture, erosion, prostatitis/urethritis/ epididymitis)

Bladder Evacuation Modalities

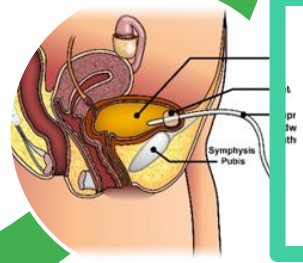
Intermittent Catheters

- +/- voiding



Indwelling Catheter - Urethral

- Meatal erosion, scrotal fistula, epididymitis



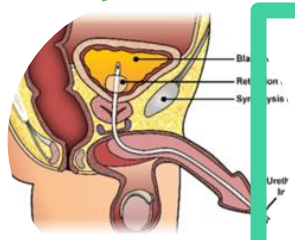
Indwelling Catheter - Suprapubic

- Risk of leakage

Bladder Evacuation Modalities

Intermittent Catheters

- +/- voiding



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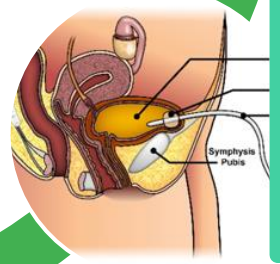


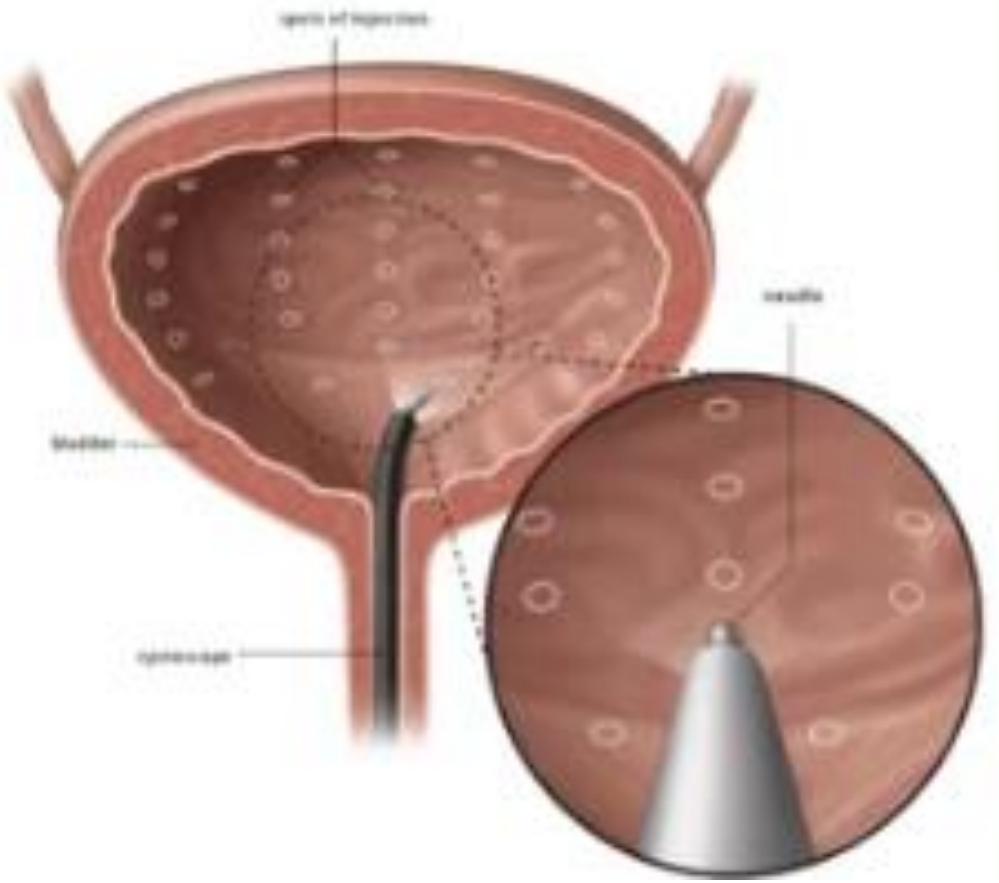
Indwelling Catheter - Suprapubic

- Disadvantages:
  - Bladder stones
  - Hematuria
  - Bacteremia
  - Risk of cystoscopy
  - Increased bladder cancer risk if catheter x10+ years and hx smoking

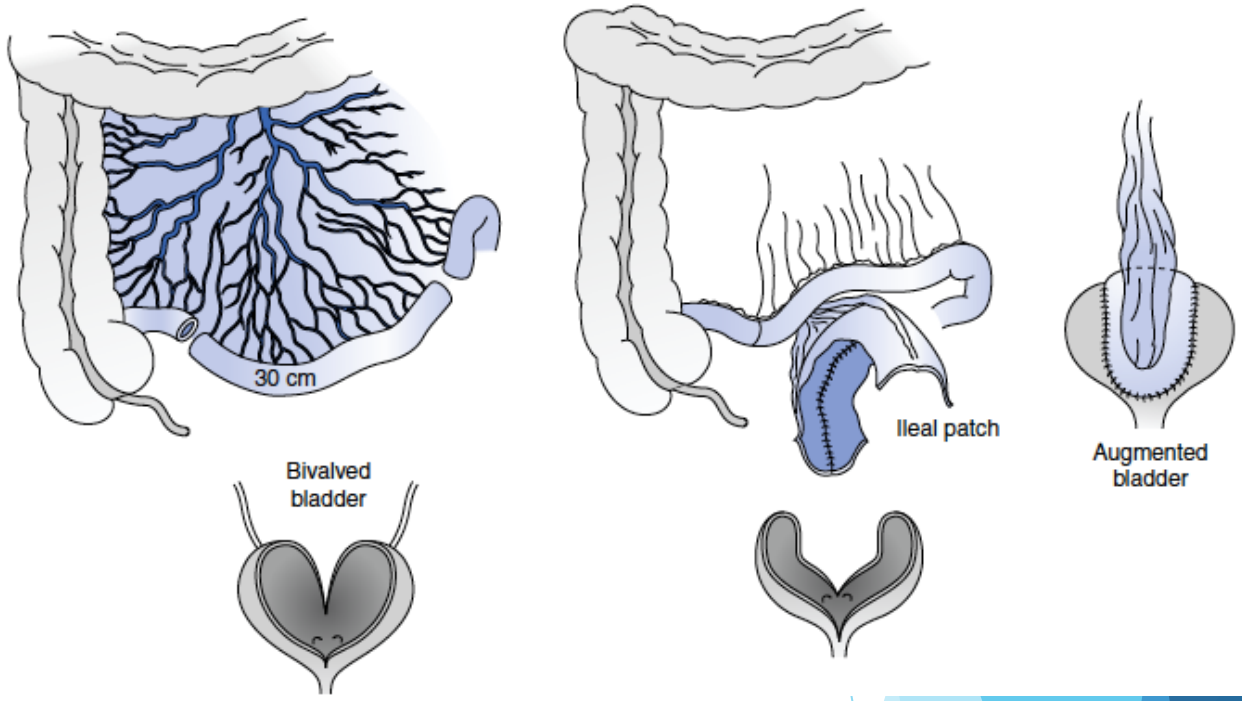
PT OT
Nursing tools

Pharmacologic

- Anticholinergics
  - oxybutynin (Ditropan) cheapest but most side effects
  - solifenacin (Vesicare)
- Beta agonists
  - mirabegron (Myrbetriq): well tolerated
- Alpha-adrenergic antagonist
  - tamsulosin (Flomax),
- Botox detrusor – relaxation of detrusor



Bladder Treatment



- Surgical
  - Increase Storage:
    - Augmentation cystoplasty
    - Electrical stimulation
    - Mitrofanoff: Continent urinary diversion – pouch with ileocecal junction
    - Artificial sphincter (requires sensation of fullness)
  - Improved emptying
    - TURP, prostatectomy, sphincterotomy, sphincteric stent

Braddom, R. L. (1996). Physical medicine & rehabilitation. Philadelphia: Saunders.

Complications of neurogenic bladder

- UTI
- Hydronephrosis
- Urinary Lithiasis (Stones)
- Autonomic dysreflexia
- Renal failure

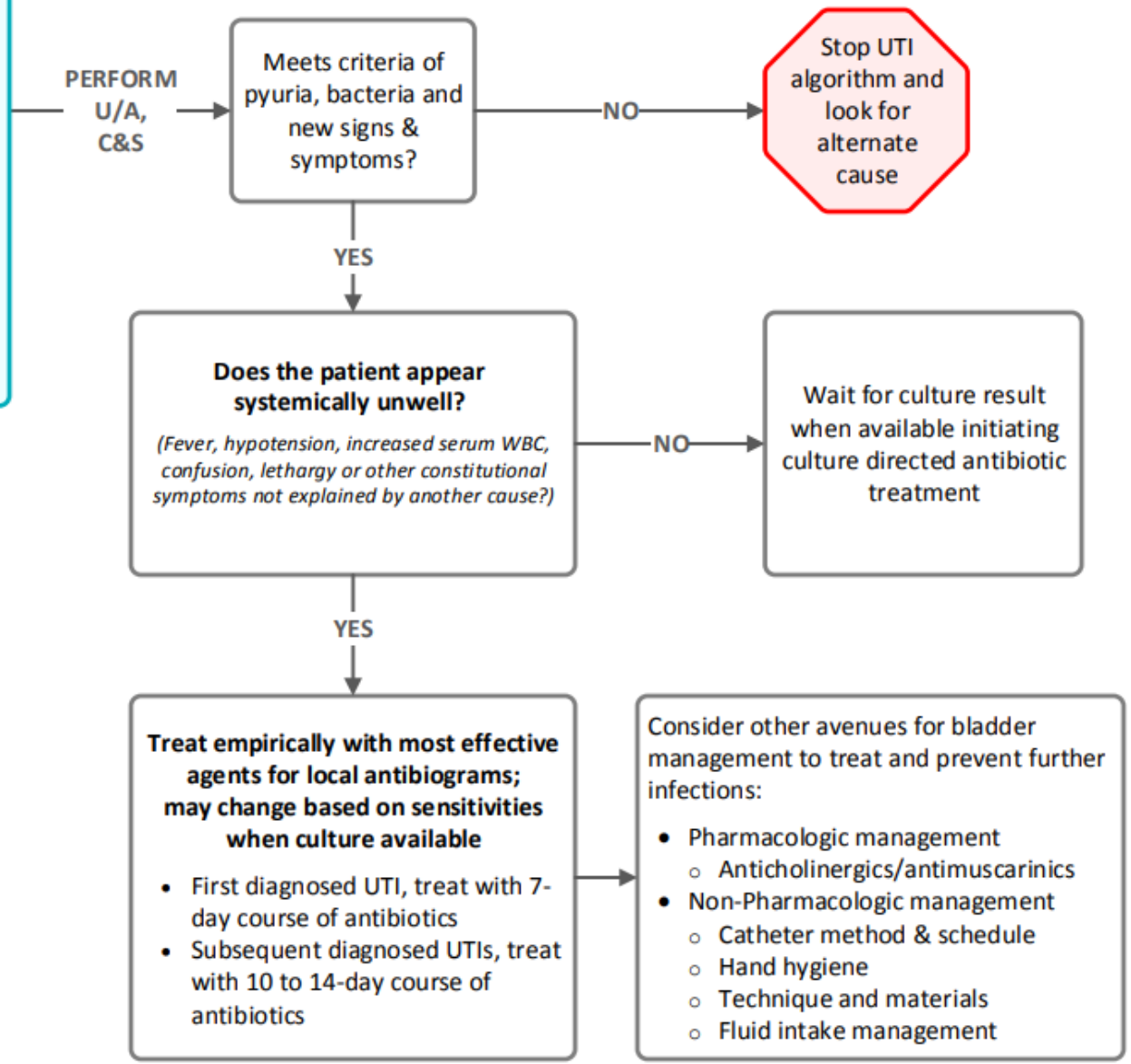
UTI

- Caution between diagnosing UTI versus bacteriuria/colonization
- Symptoms of UTI
  - New incontinence – UTI OR overactive bladder OR overflow incontinence
  - Foul smelling urine, cloudy urine, hematuria, fever, increased spasticity, bladder pain, AD
- Prevention
  - single use hydrophilic catheters,
  - hand hygiene,
  - drink 2L/day,
  - if doing CIC – keep each catheterization BELOW 500cc,
  - prevent constipation,
  - ensure no stones on ultrasound,
  - medications/botox to keep bladder “quiet”

Alberta SCI UTI Diagnosis Algorithm

Triggers for screening/assessment for urinary tract infection (UTI) for SCI patients:

- On admission and daily
- New onset signs & symptoms
- Fever (≥ 38 degrees C)
- Hematuria
- Cloudy urine
- Foul smelling urine
- New onset incontinence
- Increased spasticity
- Dysuria
- Urgency
- Autonomic dysreflexia

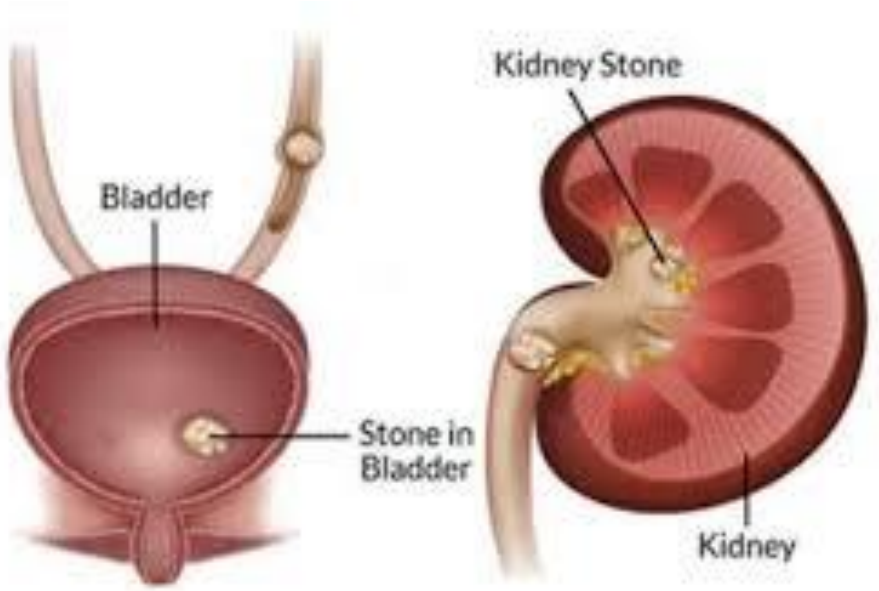


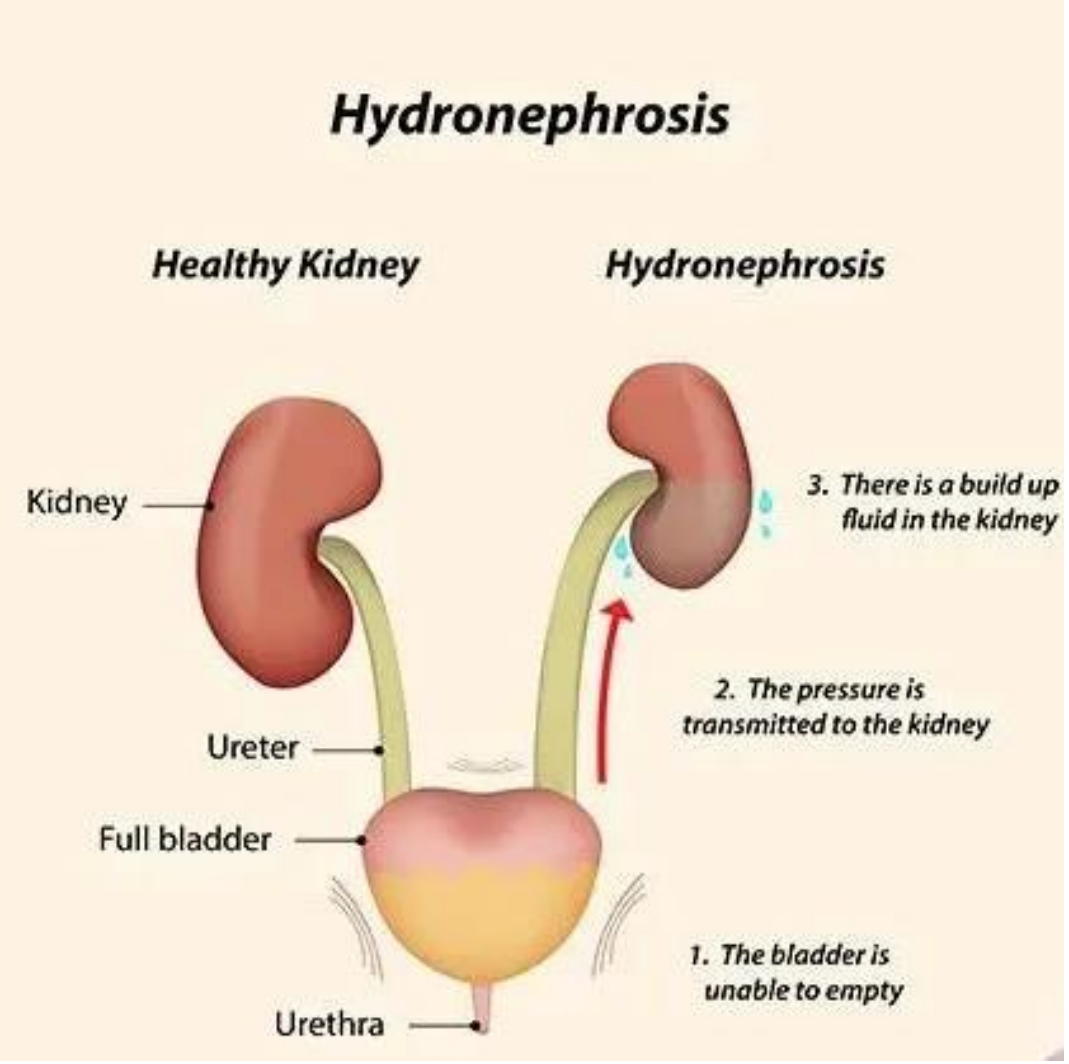
UTI prevention methods with limited evidence

- Evidence is NOT sufficient for:
  - Antimicrobial prophylaxis
  - Silver or antimicrobial catheters
  - Cranberry
  - Probiotics
  - Methenamine salts
  - Urine acidification
  - D-Mannose
  - Routine irrigation with normal saline

Stones

- Increased risk of stones after SCI
- Bladder stones more common with indwelling catheters (urethral AND SP)
- Hydration is key but needs to be balanced
  - if using CIC limit to 2L per day.
  - If indwelling target to 3L per day of fluids.

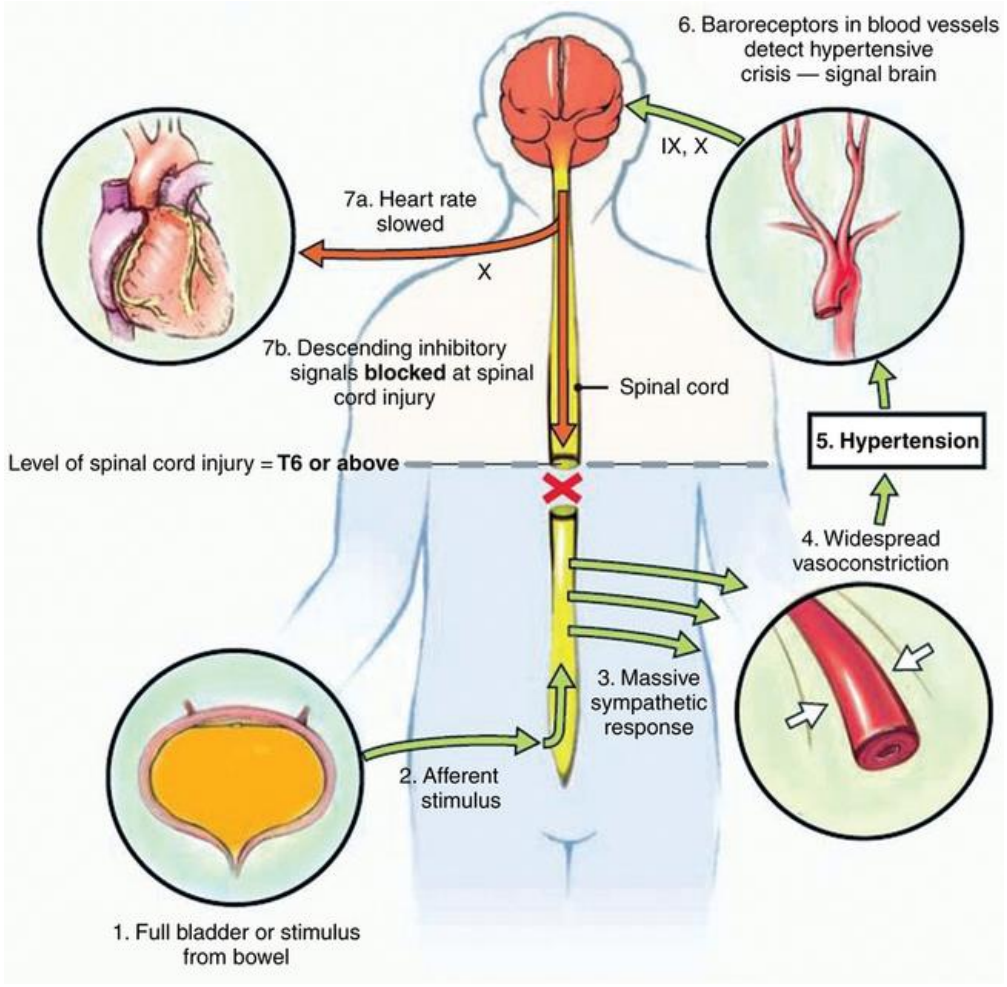




Hydronephrosis

- Renal Failure

Autonomic Dysreflexia



Autonomic Dysreflexia

- AHS resources
  - Include bladder, bowel, AD, pain, skin, spasticity, transitions
  - Search “spinal cord injury” on AHS.ca

Thank you