



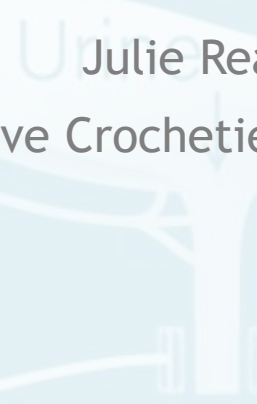
Bladder

Neurogenic Bladder

Rebecca Charbonneau MD

Julie Reader RN CNE

Steve Crochetiere End User



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Presenter Disclosure

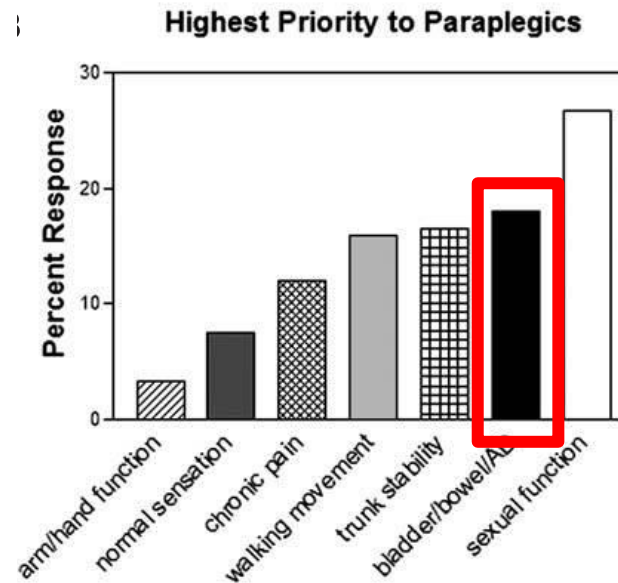
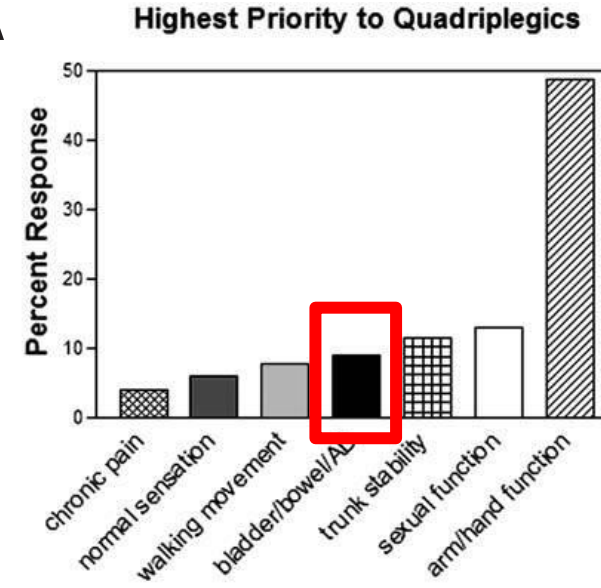
- ▶ **Steve Crochetiere**
 - ▶ Territory Manager for Coloplast
- ▶ **Rebecca Charbonneau and Julie Reader**
 - ▶ Nil

Overview

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

Targeting Recovery: Priorities of the Spinal Cord-Injured Population

KIM D. ANDERSON



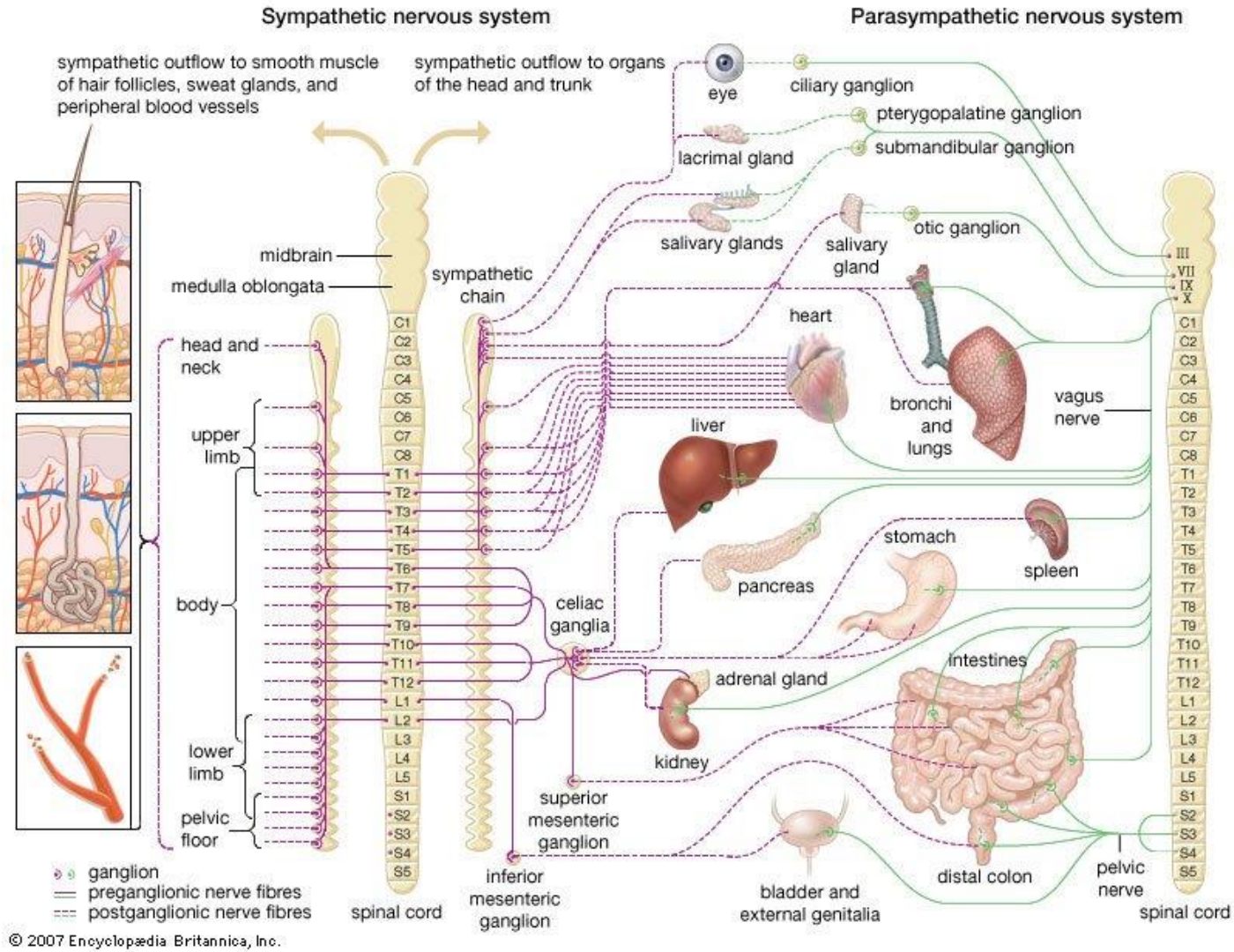
86000 people are living in Canada with SCI

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%

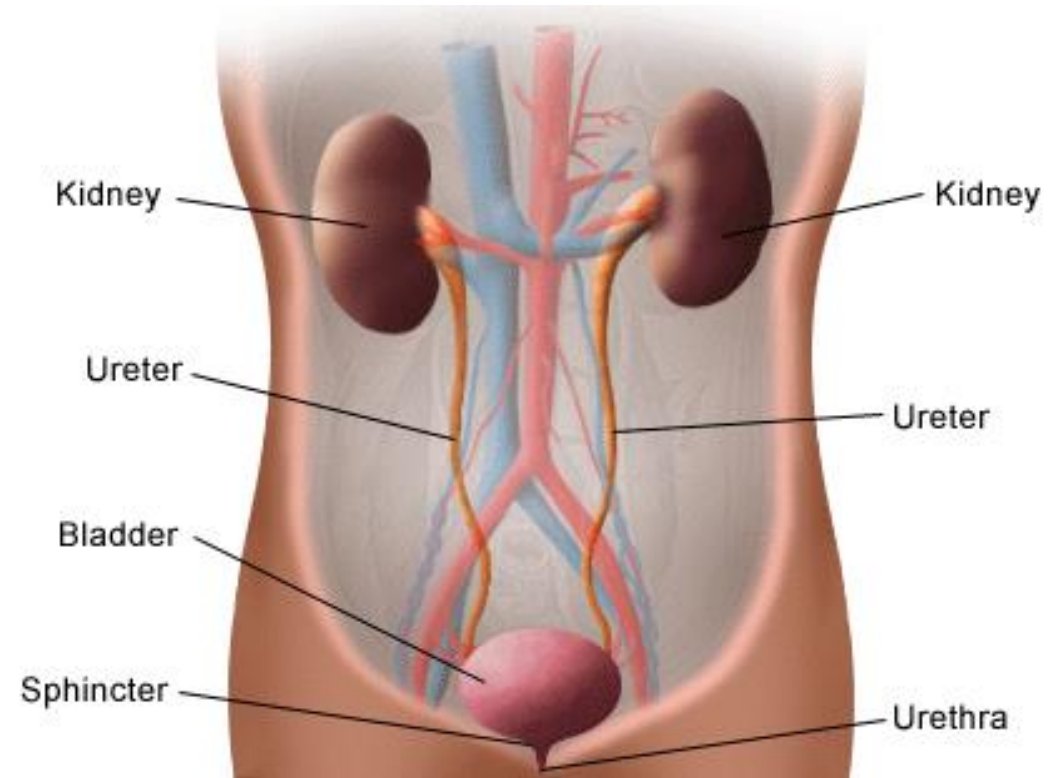
Bladder management is life saving

Sympathetic



Parasympathetic

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

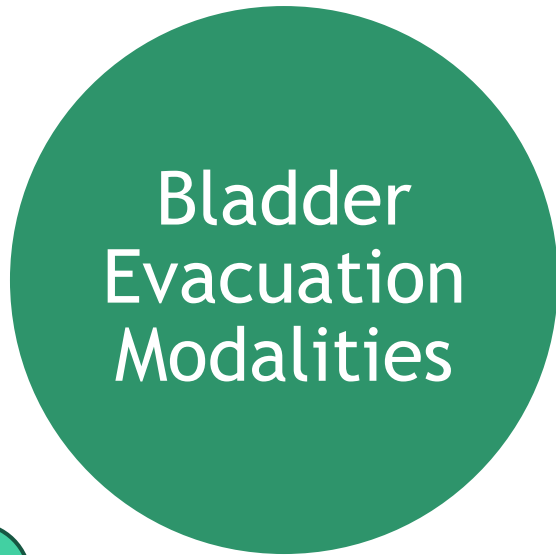
- ▶ Renal US - recommended baseline and yearly to look for hydronephrosis or stones
- ▶ UA and U Culture (if UTI suspected)
- ▶ Cystoscopy (hematuria, recurrent UTIs, stones)
- ▶ Urodynamic study or “UDS”

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

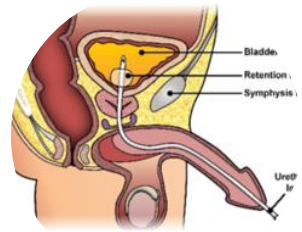


Conservative management (behavior only)
Timed voids, double voids, limit fluid intake / caffeine

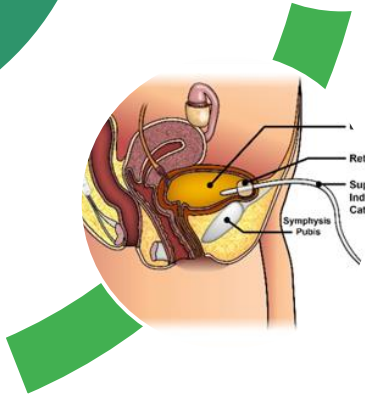


Intermittent Catheters

Clinically Preferred



Indwelling Catheter - Urethral



Indwelling Catheter - Suprapubic

Clinical best practice is not the only factor to consider...

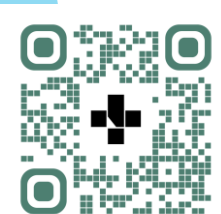
A Guide to Conversations with Patients: **Choosing the Best Method of Bladder Management for You**

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

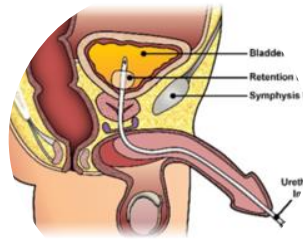
- A conversation about bladder management will take some time. Ensure you have dedicated at least 30 minutes to have this conversation.
- Book a time when all interested parties are available; a private space is best.



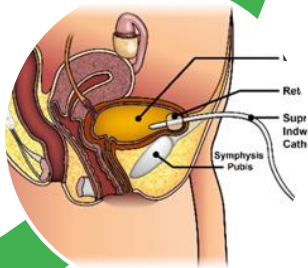
Bladder Evacuation Modalities



Intermittent Catheters



Indwelling Catheter - Urethral

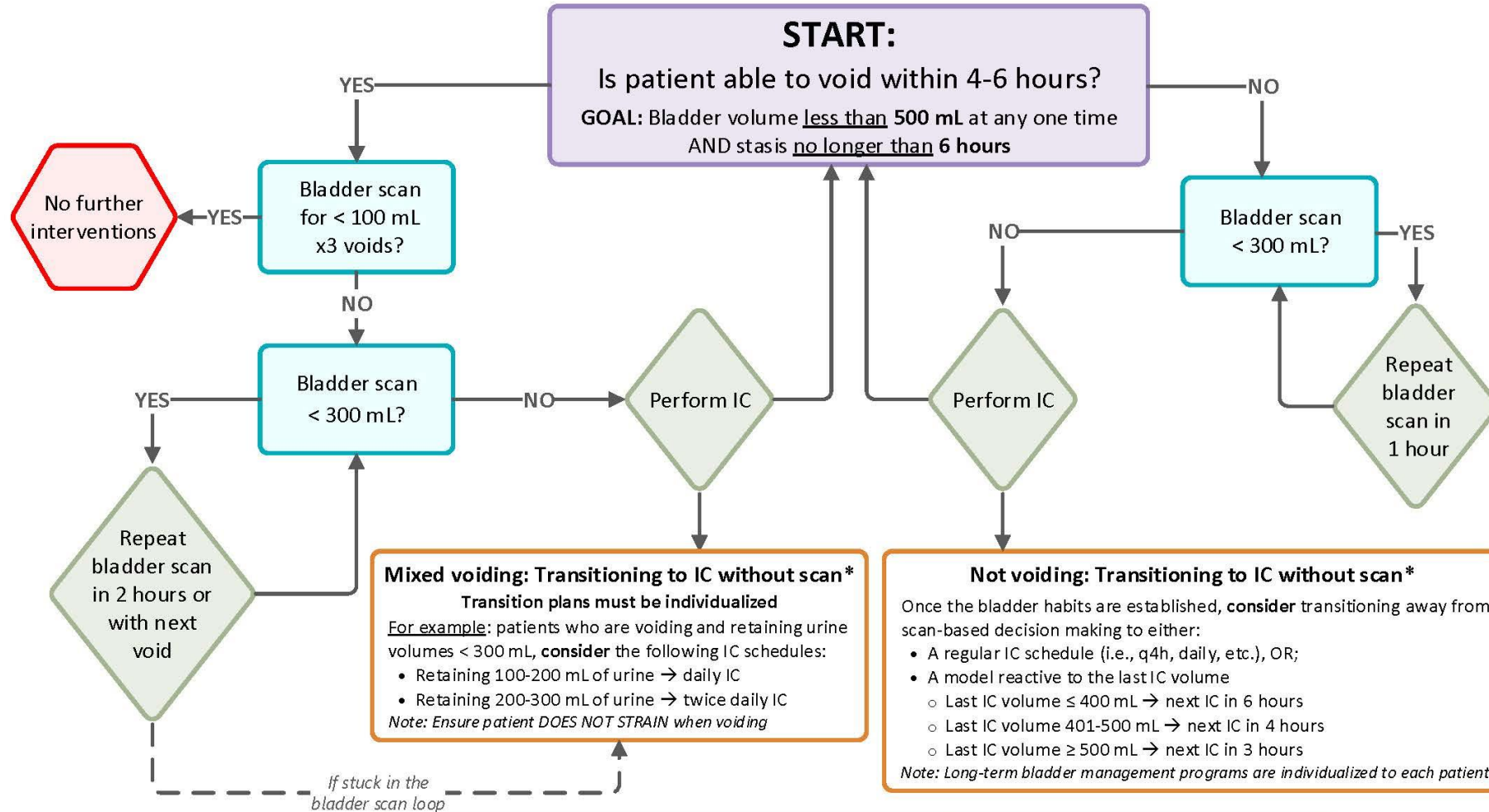


Indwelling Catheter - Suprapubic

- 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)



Mixed voiding: Transitioning to IC without scan*
Transition plans must be individualized
For example: patients who are voiding and retaining urine volumes < 300 mL, consider the following IC schedules:

- Retaining 100-200 mL of urine → daily IC
- Retaining 200-300 mL of urine → twice daily IC

Note: Ensure patient DOES NOT STRAIN when voiding

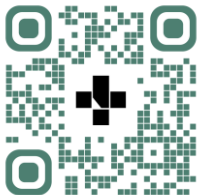
Not voiding: Transitioning to IC without scan*
Once the bladder habits are established, consider transitioning away from scan-based decision making to either:

- A regular IC schedule (i.e., q4h, daily, etc.), OR;
- A model reactive to the last IC volume
 - Last IC volume ≤ 400 mL → next IC in 6 hours
 - Last IC volume 401-500 mL → next IC in 4 hours
 - Last IC volume ≥ 500 mL → next IC in 3 hours

Note: Long-term bladder management programs are individualized to each patient

Additional Considerations

- * If bladder scans are not available, substitute bladder scan with a true post-void residual via intermittent catheter
- If incontinent of urine between scheduled IC OR patient experiences problematic urinary retention:
 1. Consider UTI, overactive bladder, or overflow incontinence
 2. Refer to Physiatry
- Consider reinsertion of indwelling urinary catheter if patient's condition changes (i.e., hemodynamic instability)



How to perform an IC (for providers)

Clinical Guidance Viewer

 CKCM Home  CKCM Contact

Home

CC Topics

CK Topics (A-Z)

CK Topics by Dept.

Clinical Documentation

Urinary Catheter Management

Vascular Access Device Infusion Therapy

Vascular Access Device Infusion Therapy: Neonatal – All Locations

Wound Care & Prevention: Adult & Pediatric - All Locations

Urinary Catheter Management: All Ages – All Locations

+ Principles of Urinary Catheter Management

+ Pediatric Considerations

– Intermittent Urinary Catheters

- [Indications and Insertion](#)
 - [Insertion Checklist \(Aseptic Technique\)](#)
- [Self- Catheterization in the Community](#)
 - [Checklist \(Clean Technique\)](#)
- [Mitrofanoff and Monti Catheterization](#)
 - [Insertion Checklist](#)

+ Indwelling Urinary Catheters

+ Suprapubic Catheters

+ General Catheter Care

+ External Catheters

+ References and Acknowledgements


Quick Reference

- [Choosing Wisely](#)
- [Lippincott Advisory and Procedures](#)







Lippincott Resources for Nurses






Lippincott Procedures

Search Query All Procedures and Advisor Content ▼ 

[<< Browse All Documents](#) | [★ Favorites](#)

Intermittent (straight) urinary catheter insertion, assigned male at birth

Procedure  Skills Checklists Quick Lists  Images  Videos 

	Create a sterile f...	 <p>Create a sterile field.</p> <p>Play Now</p>
	Put on sterile glo...	
	Open pre-saturated...	
	Apply lubricant to...	



Teaching patients to self-cath in acute care or rehab

A Guide to:

Teaching Patients with SCI to Perform Self-Catheterization

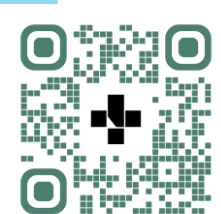
Overview

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.



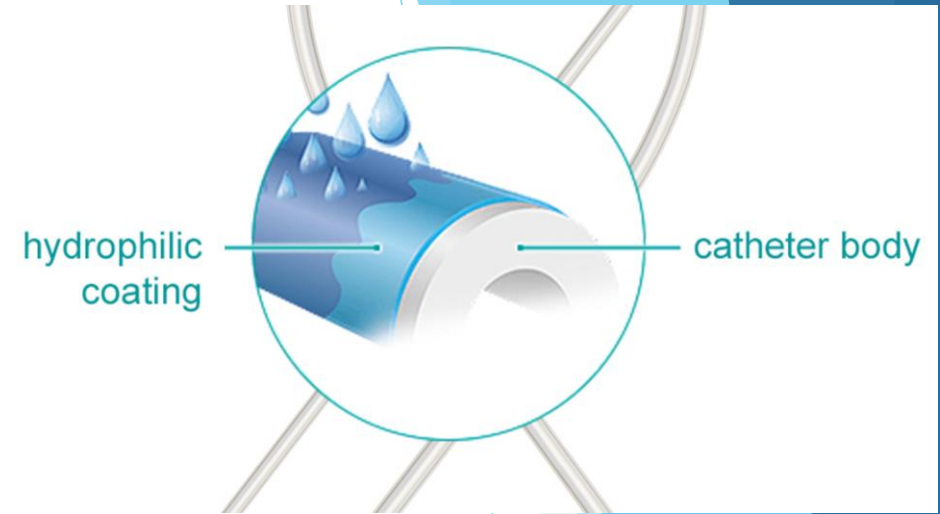
Catheters



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)

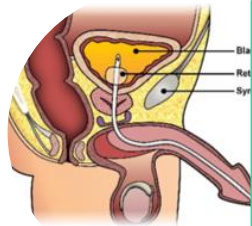


Bladder Evacuation Modalities

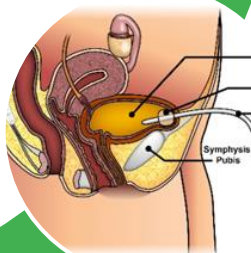


Intermittent Catheters

- +/- voiding



Indwelling Catheter - Urethral



Indwelling Catheter - Suprapubic

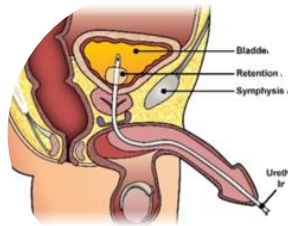
- Independence
- Don't need great hand function
- Intake isn't a factor

Bladder Evacuation Modalities

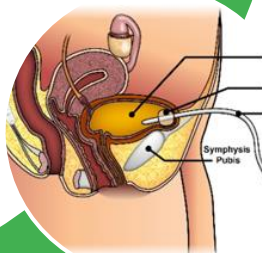


Intermittent Catheters

- +/- voiding



Indwelling Catheter - Urethral



Indwelling Catheter - Suprapubic

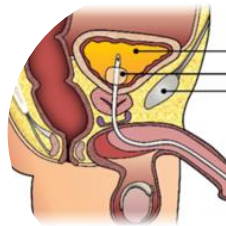
- Minor surgical (IR)
- Improved sexual function/experience & body image
- Bypasses any urethral damage or obstruction (stricture, erosion, prostatitis/urethritis/epididymitis)

Bladder Evacuation Modalities

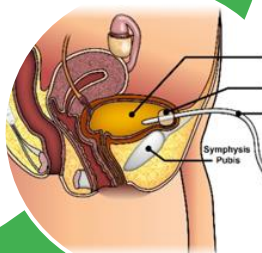


Intermittent Catheters

- +/- voiding



Indwelling Catheter - Urethral



Indwelling Catheter - Suprapubic

- Meatal erosion, scrotal fistula, epididymitis

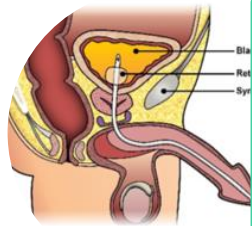
- Risk of leakage

Bladder Evacuation Modalities

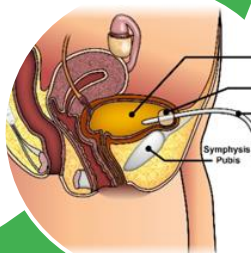


Intermittent Catheters

- +/- voiding



Indwelling Catheter - Urethral



Indwelling Catheter - Suprapubic

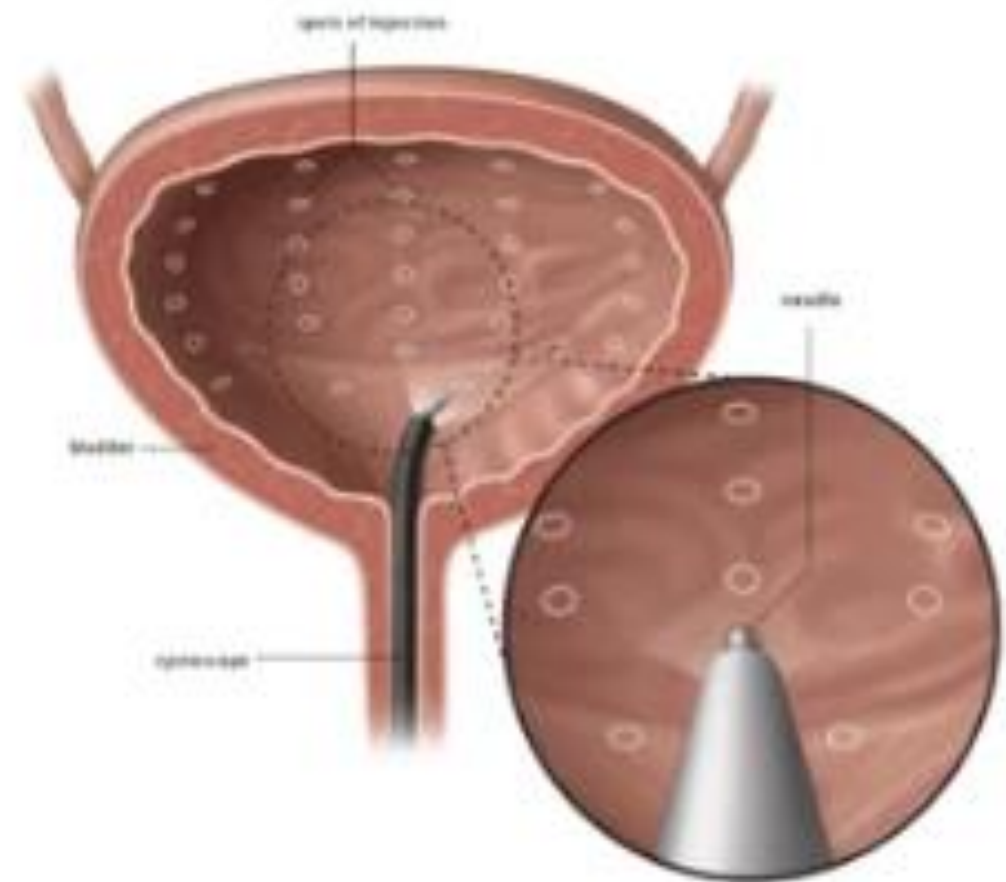
- Disadvantages:
 - Bladder stones
 - Hematuria
 - Bacteremia
 - Risk of cystoscopy
 - Increased bladder cancer risk if catheter x10+ years and hx smoking

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

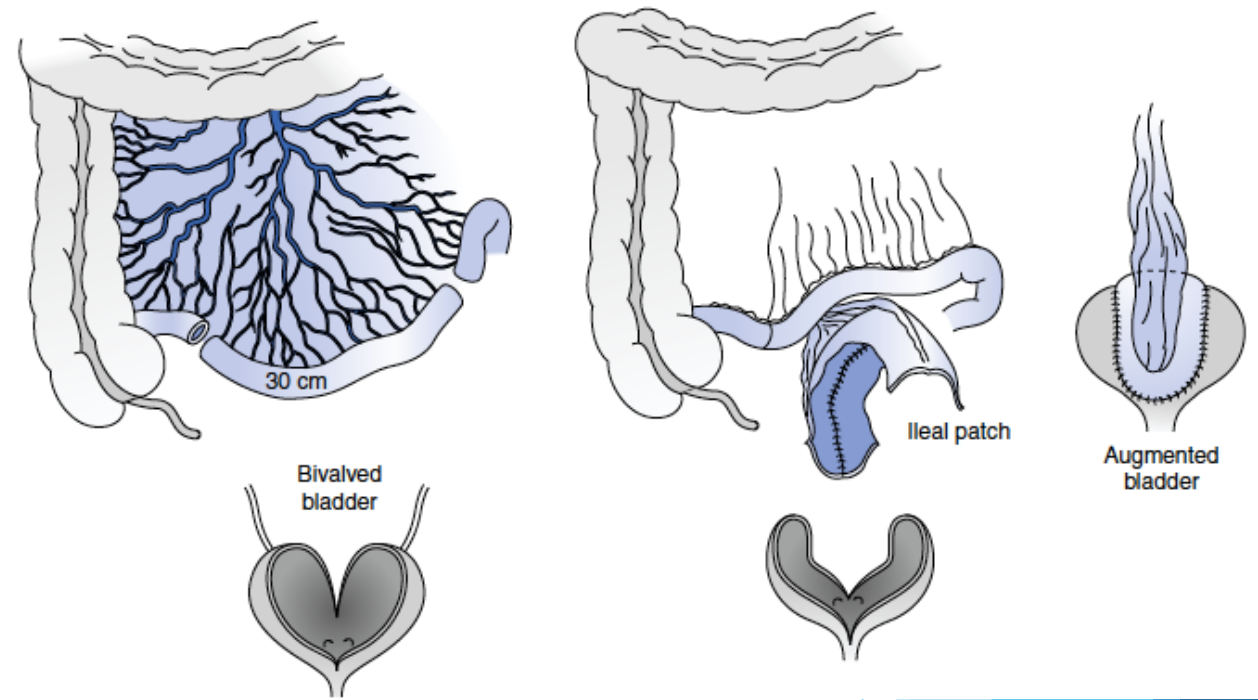
▶ Surgical

▶ 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



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”

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

PERFORM
U/A,
C&S

Meets criteria of
pyuria, bacteria and
new signs &
symptoms?

NO

Stop UTI
algorithm and
look for
alternate
cause

YES

**Does the patient appear
systemically unwell?**

*(Fever, hypotension, increased serum WBC,
confusion, lethargy or other constitutional
symptoms not explained by another cause?)*

NO

Wait for culture result
when available initiating
culture directed antibiotic
treatment

YES

**Treat empirically with most effective
agents for local antibiograms;
may change based on sensitivities
when culture available**

- First diagnosed UTI, treat with 7-day course of antibiotics
- Subsequent diagnosed UTIs, treat with 10 to 14-day course of antibiotics

Consider other avenues for bladder management to treat and prevent further infections:

- Pharmacologic management
 - Anticholinergics/antimuscarinics
- Non-Pharmacologic management
 - Catheter method & schedule
 - Hand hygiene
 - Technique and materials
 - Fluid intake management

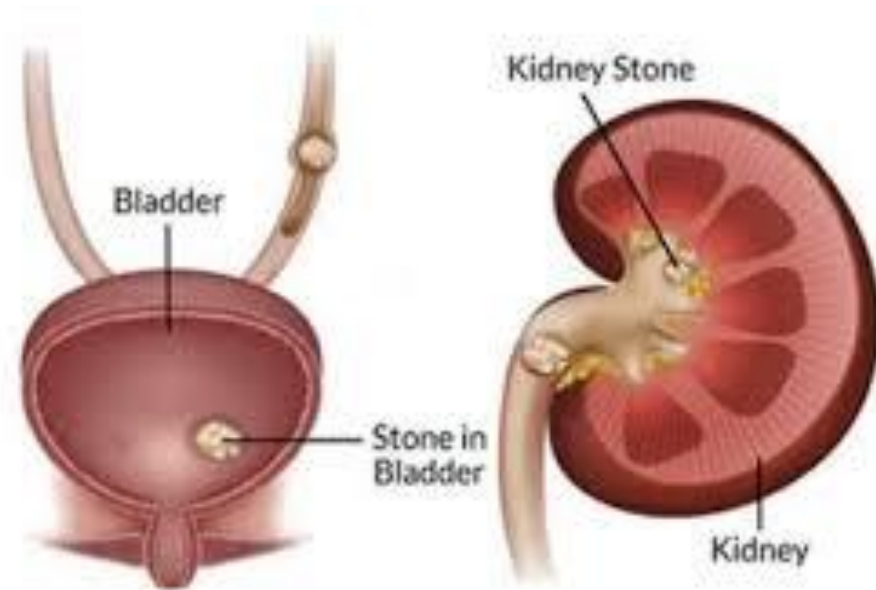


UTI prevention methods with limited evidence

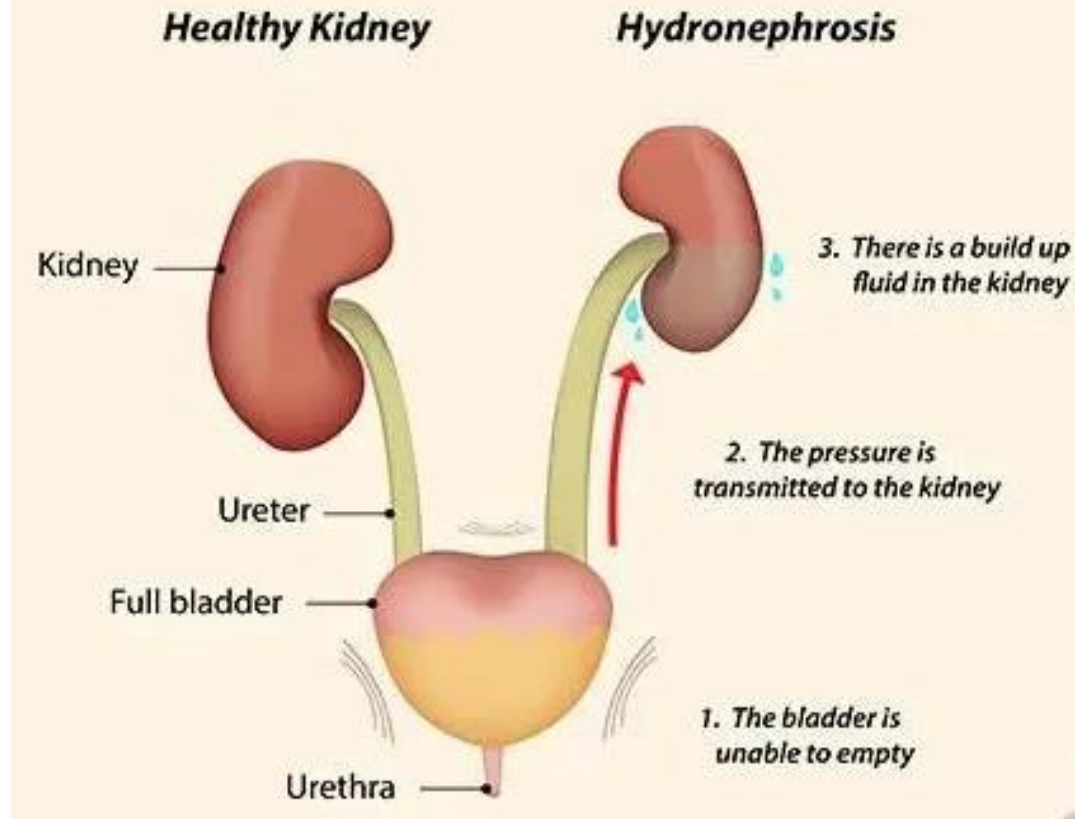
- ▶ Evidence is NOT sufficient for:
 - ▶ **Antimicrobial prophylaxis**
 - ▶ Silver or antimicrobial catheters
 - ▶ Cranberry
 - ▶ Probiotics
 - ▶ Methenamine salts
 - ▶ Urine acidification
 - ▶ D-Mannose
 - ▶ Routine irrigation with normal saline

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.



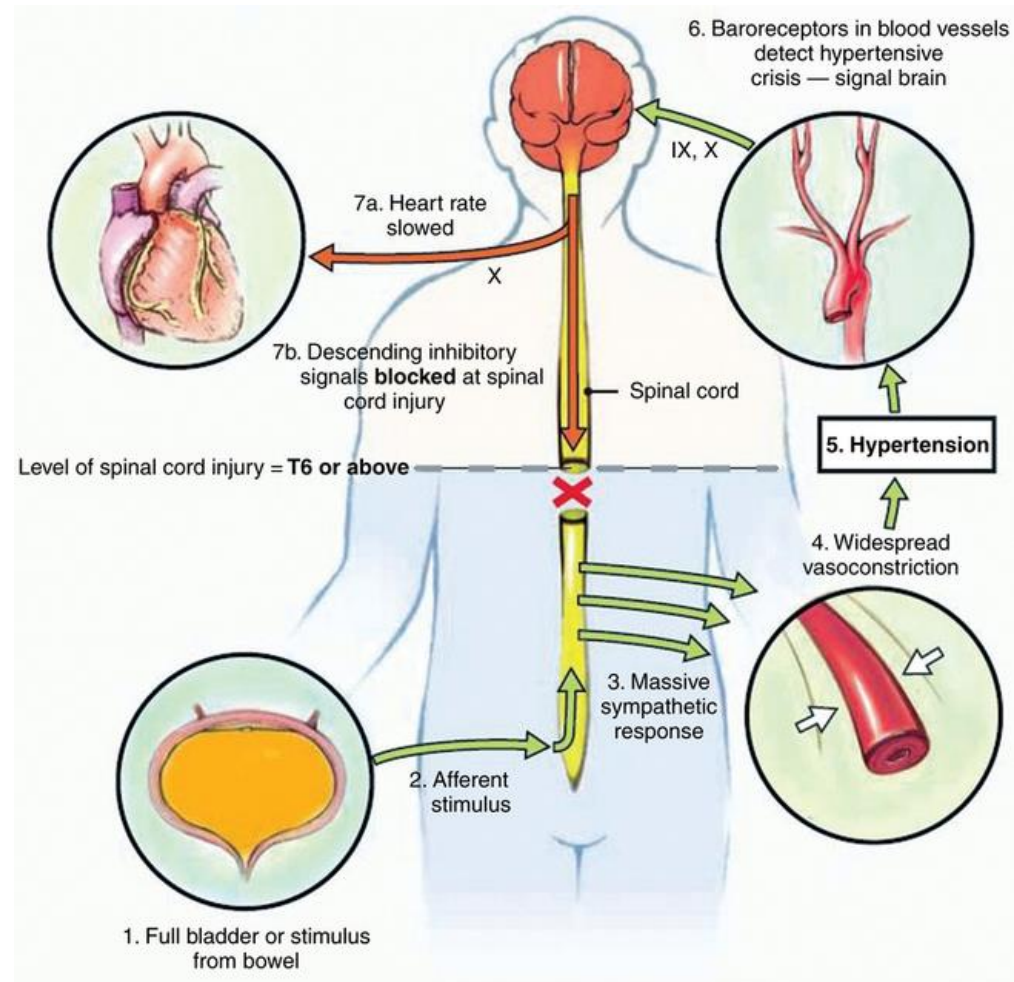
Hydronephrosis



Hydronephrosis

- ▶ Renal Failure

Autonomic Dysreflexia



Autonomic Dysreflexia

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

https://www.albertahealthservices.ca/scns/Page13965.aspx

Information about nursing at AHS sites | SCNS & Resources

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Home > About AHS > Strategic Clinical Networks > NRV SCN > Projects & Initiatives > Care for Patients with Spinal Cord Injury in Hospital

Care for Patients with Spinal Cord Injury in Hospital

Neurosciences, Rehabilitation & Vision Strategic Clinical Network™

[Standardized Topics](#) | [Resources & Best Practice Guidelines](#)

In Alberta, there are four sites, including five programs, in the two major urban cities that provide acute, post-acute and inpatient rehabilitative care for patients with acute spinal cord injury (SCI). Additionally, patients who live with SCI can be admitted to any of the 98 hospitals in Alberta for issues unrelated to their SCI. Care of persons with SCI is diverse, complex and involves several care disciplines, and it is currently not standardized provincially.

The NRV SCN is leading a provincial initiative to improve and standardize the nursing and allied health care for patients with spinal cord injury (SCI) in Alberta acute care and inpatient rehabilitation hospitals. The goal of this initiative is to: decrease practice variation, improve patient and family experience, improve transitions in care, and to improve safety for patients.

Summary of Initiative

- [Standardization of Nursing and Allied Health Care for Patients with Spinal Cord Injury in Alberta Hospitals](#)

Standardized Topics

Ten topics were prioritized for standardization. The following topics are completed, other topics will be posted as they are completed.

Autonomic Dysreflexia

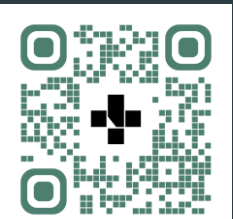
- [AD Pocket Card](#) – Autonomic Dysreflexia: Adult Protocol, Support Document
- [Autonomic Dysreflexia: Adult](#) – Protocol
- [Autonomic Dysreflexia: Recognition & Treatment in Alberta-Education Video](#)
- [AHS Autonomic Dysreflexia: Adult Protocol](#) – FAQ
- [Helping others understand your Autonomic Dysreflexia](#) – Brochure

Quick Reference

- [Exploring the Patient Experience of Spinal Cord Injury: From Acute Hospital to Inpatient Rehabilitation](#) (presentation)
- [Empowerment, Communication and Navigating Care: The Experience of Persons With Spinal Cord Injury From Acute Hospitalization to Inpatient Rehabilitation](#) (article)

Questions/Suggestions

Email: neurorehabvision.scn@ahs.ca



The background features several question marks in various shades of blue and light blue, some appearing as soft shadows. On the right side, there are overlapping, semi-transparent blue geometric shapes, including triangles and polygons, creating a modern, abstract design.

Thank you