


Intermittent Catheterization and Urinary Tract Infections

What does the evidence say



ALBERTA SPINAL CORD INJURY INITIATIVE
Going Forward Together

Acknowledgements

The Best Practices in UTI treatment for Intermittent Catheter Users is a project of the Alberta Spinal Cord Injury Initiative, a collaborative effort by Albertans with SCI, service providers, researchers and decision-makers committed to improving the lives of people affected by SCI and similar physical disabilities.

We gratefully acknowledge the Government of Alberta who recognized the value of the vision for the Alberta SCI community.

For more information on the AB SCI Initiative, contact the Canadian Paraplegic Association (Alberta) at (780) 424-6312 or go to www.cpa-ab.org.

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The Alberta SCI Initiative

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The Process

- SCI Action Strategy
- Task Team
 - Adaptive Equipment/Devices
 - Home Care/Attendant Care
 - Affordable Accessible Housing
- Action Plans
 - Catheters 1/8
 - Working Groups for each

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Our Working Group

- Katherine Moore, PhD, RN, CCCN
- Guy Coulombe, Consumer, Mgr CPA
- Bev Matheson, ED ACCD
- Raj Parmer, BN, RN, MN, CNS
- Luran Chittim, RN, BscN, NCA
- Teren Clarke, RN, BN, MM, Dir CPA(Alberta)
- Timothy Hill, Bsc, BhsC OT

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Rational

- Urinary tract infections (UTI) are a major health risk in clients with neurogenic bladders.
- Septicemia is among the leading causes of death in patients following SCI.

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Learning Outcomes

- Review best practices regarding catheter use.
- Gain new knowledge and skills in intermittent catheterization and UTI management.
- Discover new consumer and clinician resources for UTI prevention and treatment of recurrent UTI's.

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Outline

- Hand out resources
- Incidence and prevalence
- Neurogenic bladder and micturition
- Management, short & long term
- Catheter selection
- UTI prevention
- UTI treatment
- Conclusion

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The Facts

- There are over **86,000 people living with SCI** in Canada (RHI 2010).
- It is estimated that there are over **4,300 new SCI cases** in Canada each year (RHI 2010).
- Approximately **51% of Current SCI cases** are the result of traumatic injury (RHI 2010).

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Facts Cont.

- Approximately **49% of Current SCI cases** are the result of non-traumatic injury (disease) (RHI 2010).
- The estimated annual cost of traumatic injuries alone in Canada is approximately **\$3.6 billion** of which **\$1.8 billion** being direct health care costs (RHI 2010).

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Injuries by ASIA classification

- Incomplete tetraplegia - 29.5%
- Complete paraplegia - 27.9%
- Incomplete paraplegia - 21.3%
- Complete tetraplegia - 18.5%
- The most common neurologic level of injury is C5.

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Introduction

- Bladder dysfunction (neurogenic bladder) resulting in symptoms of urgency, day and night-time frequency, urinary retention, incontinence and urinary tract infections (UTI) is a pervasive issue in most neurologic diseases (Parkinson's disease, multiple sclerosis, diabetes, stroke, and spinal cord injury (SCI)).
- UTI has substantial negative psychological effects on individuals and is a major burden on the health care system.

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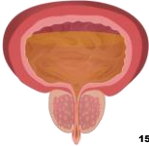
Introduction Cont.

- Treatment involves non-invasive continence management through toileting, fluid management, containment products, medications, and intermittent catheterization.
- The purpose of this review of clinical guidelines and best practice literature is to suggest a treatment approach for UTI in the neurogenic bladder specifically for those who are using intermittent catheterization as the primary method of bladder emptying.

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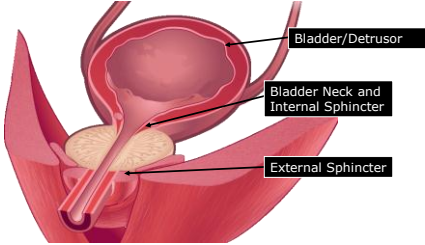
Neurogenic Bladder: Anatomy, Physiology, Diagnosis and Management

- Function of Lower Urinary Tract**
 - storage of urine under low intravesical pressure
 - periodic release of urine
 - controlled, coordinated, low pressure
 - appropriate time



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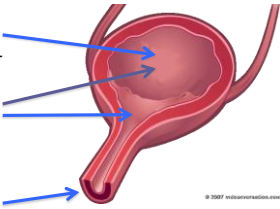
Anatomy of Micturition



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Anatomy of Micturition

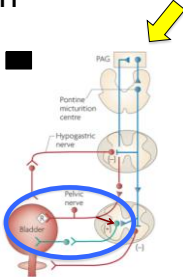
- Innervation**
 - Parasympathetic**
 - pelvic n (S234)
 - sensory/motor of detrusor
 - Sympathetic**
 - hypogastric n (T10-L2)
 - Motor internal sphincter
 - inhibits detrusor
 - Somatic**
 - pudendal n (S234)
 - Motor external sphincter



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Anatomy of Micturition

- Micturition Centres**
 - Suprapontine region**
 - allows void when socially acceptable.
 - Pontine MC**
 - coordinates detrusor contraction and outlet relaxation.
 - Sacral MC**
 - Stretch reflex centre.



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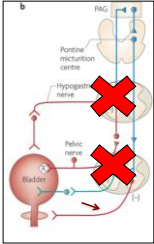
Classification of Neurogenic Bladder

- Neurogenic Detrusor Overactivity (DO)
 - Coordinated void at wrong time
 - Pathology anywhere in CNS
 - Manifestations
 - urge incontinence
 - small volumes/PVR/pressure
 - frequency.

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Classification of Neurogenic Bladder

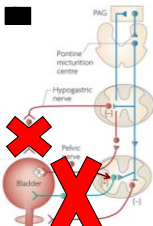
- Neurogenic DO with Detrusor Sphincter Dyssynergia
 - Cord lesion results in absence of PMC coordination.
 - Bladder contracts against closed outlet.
 - Occurs with SCI (63%)
 - more complete = more risk
 - Cervical and thoracic higher risk.
 - Manifestations
 - Leak may occur if pressure overcomes sphincter.
 - reflux, hydronephrosis, pyelonephrosis, stones renal failure, autonomic dysreflexia 2° high bladder pressure.



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Classification of Neurogenic Bladder

- Hyporeflexive/Atonic Bladder
 - LMN bladder
 - final common pathways disrupted
 - Cauda equina
 - autonomic neuropathy
 - Spinal shock
 - Manifestations
 - Urine retention
 - low pressure, incomplete voiding
 - overflow incontinence

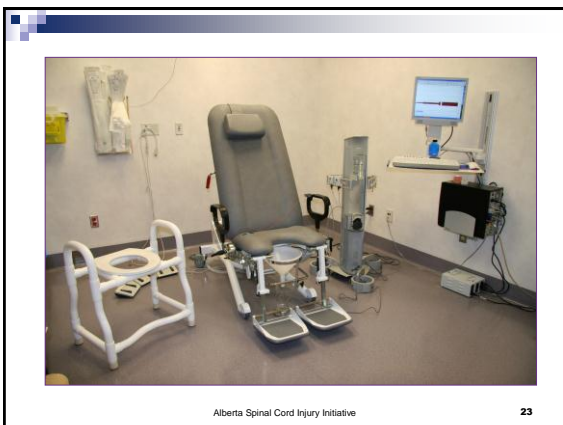


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Spinal Cord Injury: Patterns


Spinal Level	Normal	Detrusor Overactivity with DESD	Detrusor Overactivity No DESD	Detrusor Areflexia
Cervical	0%	55%	30%	15%
Thoracic	0%	90%	10%	0%
Lumbar	0%	30%	30%	40%
Sacral	12%	12%	12%	64%

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Bladder Management

- Initial Management
 - Spinal Shock – Flaccid Bladder
 - Focus: monitor ins and outs
 - Indwelling catheter
 - Until <2L/24h (usually up to 2wks).
 - Clean intermittent Catheterization
 - Most physiological.
 - Lowest risks.
 - Frequency: keep bladder volume under normal bladder capacity.
 - Teach patient self cath ASAP.



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Long term Management

- Goals:
 - Low pressure system with adequate storage.
 - Absence of incontinence.
 - Independence/lifestyle impact acceptable.
 - Minimize complications.

Common Methods

- Indwelling catheter.
- Clean/sterile intermittent catheterization.
- External catheterization Condom/ECD.
- Spontaneous; Normal, Spinchterotomy, condom.
- Stimulated; Rectal Stretch, Crede, Tapping, Valsalva.

Intermittent Catheter Selection

- Size
- Shape
- Islet type
- Materials
- Packaging
- Costs

What are “frequent” bladder infections?

- Bladder infections are also called urinary tract infections, or UTIs. They are a common problem for those with a neurogenic bladder.
- Bladder infections happen an average of two to three times a year for people who use intermittent catheterization to empty their bladder.

Bottom Line

- **If you have more than two bladder infections in the last twelve months, you need to take special action to treat them.**

How do you know if you have a bladder infection?

- fever
- chills
- delirium or confusion
- malaise/lethargy
- back or side pain above the pelvis and below the ribs
- blood in urine

Infection Cont.

- pelvic discomfort
- increased incontinence
- increased spasticity
- autonomic dysreflexia
- the need to catheterize more frequently

What should I do if I think I have a Bladder Infection?

- Increase the amount of water you are drinking and aim for clear or light yellow urine.
- If there is no change in the first 24 hours after the start of symptoms visit your doctor.
- Have your urine tested for bacteria.

Treating frequent bladder infections

- Obtain a urine culture and sensitivity test after 24 hours of symptoms.
- Antibiotic treatment is started after urine culture is obtained and bacteria type confirmed along with 3 or more identified physical symptoms of infection.
- Nurse will review your technique and hygiene.
- A renal (Kidney), and bladder ultrasound will be performed.

Treatment Approach Cont.

- Your kidney function will be tested.
- A referral will be made to a Urologist specializing in neurogenic bladder issues.
- The Urologist may test bladder function using Urodynamic studies (UDS), and/or perform a visual inspection inside your bladder called a cystoscopy. He/she may order further radiology studies.

Treatment Approach Cont.

- The urologist may talk to you about other options, such as treatment of bladder muscle tone, other oral or injected medications, alternative methods of voiding or surgery.
- Cranberry extract pills, D-Mannose pills and/or Vitamin C may reduce infection rate.

Preventing Future bladder infections

- Drink enough fluids to have clear, light yellow urine (1.7 L for a 58Kg person or 30 ml per Kg).
- Don't over fill your bladder. A good bladder capacity is 400-500 ml.

Prevention

- Catheterize 4 to 6 times per day. Change the amount you drink and the number of times you catheterize to achieve urine volumes less than 500 ml each time.
- Catheterize during the night if your morning urine volume is greater than 500 ml.
- Try drinking less before bedtime to decrease your need to catheterize during the night.

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Prevention

- Limit your caffeine. Drink no more than 4 cans of cola or 1 large coffee or tea per day. Caffeine increases bladder muscle activity and can increase incontinence. Incontinence leads to skin breakdown.
- Follow a regular bowel routine to achieve regular, soft stools. Constipation can lead to bowel incontinence, which increases the risk of infection.

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Prevention

- When catheterizing, always have clean hands and clean supplies. Always keep the area around your urinary opening clean.
- If you can, do your own catheterization. There is less risk of infection than if someone assists you.
- Clean your catheters thoroughly with liquid Sunlight® soap. Air dry them and store them in a clean container or bag.

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Prevention

- Throw out your catheters after 4 to 6 uses, or sooner if they are rough, cracked or discoloured.
- Eat well and get enough sleep and exercise. A physiotherapist can help design an exercise routine that works for you.
- Have an annual kidney and bladder ultrasound along with bloodwork.

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Prevention

- See a urologist regularly to check your bladder function, and to be screened for bladder stones or bladder cancer.
- Taking supplements such as cranberry extract pills, D-Mannose pills and vitamin C (500 mg per day) may help you prevent urinary tract infections.

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Prevention

- Talk to a doctor or nurse who specializes in urology or spinal cord injury if:
 - you are having trouble managing your urine amounts.
 - you are having trouble cleaning your supplies well enough.
 - you have more than two bladder infections in a 12 month period.

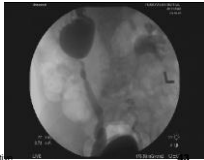
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Bladder Management

■ Long Term

- Minimize long term urological risks.
 - CIC
 - US and Cr yearly
 - Cystoscopy
 - Stones, tumors, stricture
 - Urodynamics
 - Establish type of neurogenic bladder.
 - Can be video or non-video.



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Conclusions

■ Goals of Management:

- Low pressure system with adequate storage.
- Absence of incontinence.
- Independence/lifestyle impact acceptable.
- Minimize complications.

■ Achieved with:

- Regular CIC.
- Investigations when changes in symptoms.
- Yearly urological screening.
- Urological Consultation.

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Resources

- SCI U <http://www.spinalcordconnections.ca/Spotlight/Spotlight-Content-1.aspx>
- Video of Catheterization <http://www.youtube.com/watch?v=DlImiBijuKQ&noredirect=1>
- SCIRE Rehabilitation Evidence <http://www.scireproject.com/rehabilitation-evidence/bladder-management>
- Geneva Foundation for Medical Education and Research http://www.gfmer.ch/Guidelines/Urinary_tract_infections_urinalysis/Catheter-associated-urinary-tract-infection.htm
- Spinal Cord Connections <http://www.spinalcordconnections.ca/default.aspx>

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