

**Physiotherapist's Door to Door Assessment and treatment of Neurogenic Bladder Problems**  
**Workshop 29**  
**Dr Beth Shelly PT, DPT, WCS, BCB PMD**  
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Intake (Stohrer 1999, NICE 2012, Drake 2013, Unger 2014)

- History
  - Congenital anomalies
  - Surgeries
  - Present medication
  - Neurological deficits
  - Previous urinary dysfunction
- Social and family - caregiver availability
- Urinary incontinence / fecal incontinence
  - Predictability of UI
  - Position UI occurs in
  - Other circumstances related to UI
  - Current and past treatments: catheter, pads, pessary, clamp
  - Bother and QOL impact
- Mode of voiding
  - Position
  - Continuous or intermittent stream
  - Hesitancy or weak stream
  - PVR or sensation of incomplete emptying
  - Initiation of voiding
    - Voluntary
    - Increased intra-abdominal pressure: crede, abdominal straining
    - Triggered voiding: tapping, scratching
  - Self-catheterization
- Cognitive ability - Mini mental test
- Measured volume bladder diary
  - Record volume of voluntary void
  - Results of any triggered void or bladder expression
  - Record volume of intermittent catheter void
  - Type and volume of fluid intake
  - Occurrence of leak - circumstances
  - Sensations of bladder filling - urgency, reduced, absent
  - Success of urge suppression
  - Specific sensations related to bladder fullness: abdominal fullness, increased spasticity, autonomic dysreflexia

Physical Examination (Stohrer 1999, NICE 2012, Drake 2013)

- Sensation of S2-5: sharp/dull, light touch
- Reflexes: (Drake 2013)
  - S4, 5 - anal wink
  - L5 to S5 - bulbocavernosus reflex
  - L2 to L4 - knee reflex
  - L5 to S2 - ankle reflex
  - L1, 2 - cremasteric reflex
- ROM of lower body for positioning on the toilet
- Mobility for ambulation to the bathroom and transfers on and off toilet
- Finger dexterity for undressing, hygiene and catheter use
- PFM examination for weakness or spasm per vagina and or rectum
- Superficial EMG assessment of PFM

Many neurological conditions result in combinations of dysfunctions and various intensities of dysfunctions

It is essential to consider all dysfunctions and work closely with medical professional to determine the correct treatment approach.

More comprehensive chart provided in Unger 2014

Location of Lesion	Type of dysfunction	Simple description	Therapy directed toward
Supraspinal lesions - lesions above the brain stem	Neurogenic detrusor overactivity (NDO) with normal sphincter	Bladder is squeezing too much	Decrease overactive bladder
Spinal lesions	NDO with detrusor sphincter dyssynergia (DSD)	Sphincter is squeezing too much	Decrease PFM tension / spasm and improve PFM relaxation during emptying
Lower motor neuron lesions - lesions of the conus medularis or lower	Neurogenic detrusor underactivity (Areflexic bladder)	Bladder is not squeezing enough	Increase bladder contraction during voiding
	Striated sphincter denervation or weakness	Sphincter is not squeezing enough	Increase sphincter contraction

Overall Conservative management of neurogenic bladder

- Individualized to the patient in cooperation with caregivers
- Little high level evidence for any one treatment
- NICE guidelines give good outline of evidence related to treatment (NICE 2012)
- Overall goals of treatment is protection of upper urinary tract and improvement in QOL

Therapies to decrease overactive bladder (Wein 2002)

- Bladder training, timed voiding, habit training, prompted voiding, fluid management - a suitable component of a rehabilitation program level C (Drake 2013)
- PFM training with or without biofeedback
- Electrical stimulation

### Therapies to decrease PFM tension / spasm and improve PFM relaxation during emptying

- Manual stretching of PFM does not appear to have a lasting impact
- Biofeedback-assisted PFM coordination training
  - PFM relaxation
  - Train on the toilet with external EMG during voiding

### Therapies to increase bladder contraction during voiding

- Intermittent catheterization - accepted standard (Drake 2013)
- Triggered Reflex Voiding - Provocation of bladder contraction
  - Attempts to initiate reflex detrusor contraction
  - Inappropriate if urodynamics show
    - Signs of reflux
    - Inadequate detrusor contraction – need some intact muscle fibers to provoke
    - Outlet obstruction of any type including PFM tension
  - Reflex voiding may result in autonomic dysreflexia in patients with neurological disorders: paroxysmal HTN, anxiety, sweating, HA, bradycardia
  - Has a limited role and can be potentially dangerous (Drake 2013)
  - Techniques
    - Suprapubic tapping or percussion: 7-8 percussions with intervals of a few seconds (as fast as you can); gross reflex contraction of the detrusor and EUS, when tapping stops the EUS should relax while detrusor contraction continues
    - Thigh scratching
    - Anorectal manipulation
    - Pubic hair pulling
    - Stroking / tickling lower back
- Bladder expression - Increasing intra abdominal pressure
  - Aggressive techniques and dangerous maneuvers done with caution (Drake 2013)
  - Not used in patients with reflux, PFM spasm or DSD
  - Lean forward - Leaning forwards places slight compression on the abdomen, changes the angle of the bladder and urethra, and may encourage emptying.
  - Gentle whistling, blowing a toy or balloon – pursed lipped exhaling against mild resistance provides gentle increased intra-abdominal pressure and encourages PFM relaxation and urine emptying.
  - Valsalva maneuver – Bearing down with closed glottis significantly increased intra abdominal pressure and may help relax the PFM and encourage bladder emptying. May result in POP or hemorrhoids and should only be used in acute cases with physician monitoring.
  - Credé maneuver – Press down onto the bladder just behind the pubic bone. This can initiate a detrusor contraction but can also increase the chance of POP. It should only be used when other methods fail, with physician instruction, in a patient with hypo or atonic bladder.
- Timed voiding / habit training / bladder training
  - Usually very large voiding intervals need to slowly decrease time between voids
  - Goal is to go to the toilet and try to void every 2 to 3 hours
  - May or may not need to use trigger techniques or catheterization

### Ideas and Advice to Help Promote Full Voiding

- Privacy – Paruresis, also called shy bladder, is the inability to urinate in public. Maintaining as much privacy as possible increases bladder emptying for most patients.
- Toilet position - sit fully on the toilet
  - Full relaxation of PFM overflow muscles (adductors and gluteals in particular) is necessary for full PFM relaxation and will increase bladder emptying
  - Sitting relaxed and supported
  - Both feet flat on the floor and fully supported
  - Adequate hip flexion to encourage PFM relaxation
- Relaxation – Take time to fully relax all muscles for full emptying. In some cases it is helpful to distract yourself on the toilet by reading, singing or reciting a poem. This is especially important in patients with anxiety.
- Double voiding - After initial void, stand, move, sit down, and attempt to void again.
  - Toilet Exercises - ideas to encourage full emptying, Do not valsalva
    - Sit completely on toilet, relax legs
    - Lean forward bending at the hips 3 times
    - Relax and allow urine to come out
    - Stand up then sit down (double voiding)
    - Relax and allow urine to come out
    - Several gentle PFM contractions and large relaxation
    - Relax and allow urine to come out
    - Do not push
- Running water - The sound of running water can initiate voiding however over use of the method can lead to OAB and UII with the sound of water running.

### Therapies to increase sphincter contraction

- PFM training with or without biofeedback
- Overflow or functional PFM training
- Electrical stimulation - may be an option in cases of PFM weakness (not in complete denervation) however no research exists (Drake 2013)

### Evidence for conservative management of UI in patients after Stroke

- PFM exercises (PT), timed voiding and prompted voiding (RN), functional bathroom activities (OT) - significant decrease in frequency of accidents and need for assistance to toilet in treatment group as compared to control group. (Couran 2012)
- PFM exercises decrease urinary frequency and UI by pad test RCT (Tibaek 2005)
- PFM exercises with bladder retraining - systemic review found little evidence in stroke patients (Dumoulin 2005)
- Restoration of functional mobility - RCT shows benefit in stroke patients (Wilkander 1998)
- UI is a strong predictor of discharge status, functional recovery, and return to social activities. (Dumoulin 2007)

### Evidence for conservative management of UI in patients with Multiple Sclerosis

- Best candidate for PT - mild MS, without PFM spasticity or dyssynergia (De Ridder 1999)
- Poor success - elevated PVR (McClurg 2008)
- Guideline recommendations for PFM training
  - Fowler 2009 - UK consensus, grade B
  - Pannek 2012 - EAU guideline, no grade given
  - Cetinel 2013 systematic review and consensus report, grade A
- PFM exercises versus sham - decreased pad weight, number of pads and nocturia (Lucio 2010)
- PFM exercises plus EMG and electrical stimulation vs no treatment RCT (Vahtera 1997)
  - Significant improvement in UI, nocturia, and improved bladder emptying.
  - Men > women
- PFM exercises plus EMG and electrical stimulation vs sham electrical stimulation RCT (McClurg 2008)
  - Significant improvement in UI by pad test, IIQ, UDI, IPPS and decreased PVR
  - 85% in the active group, 47% in the control group
  - PFM strength improved equally in both groups
- Biofeedback assisted PFM exercises are not superior to PFM exercises alone (Klarskov1994)
- Transcutaneous posterior tibial nerve stimulation resulted in significant decrease in urgency, frequency and leakage without increase in PVR - no control group (de Seze 2011)
- TENS to sacral dermatomes (Skeil 2001)
  - Mixed neuro diseases, but mostly MS patients
  - Diary showed significant improvement - decrease in 24 hour frequency, UI episodes and clothing changes
  - Risk for increased PVR

### References

Cetinel B, et al. Management of lower urinary tract dysfunction in multiple sclerosis; a systematic review and Turkish consensus report *Neurourol Urodyn* 2013;32:1047-1057.

Cournan M. Rehabil Nurs. Bladder management in female stroke survivors: translating research into practice. 2012 Sep-Oct;37(5):220-30.

DeRidder D, Vermeulen C, DeSmet F, et al. Clinical assessment of pelvic floor dysfunction in multiple sclerosis. *Neurourol Urodyn*. 1998;17:337-542

de Seze M, et al. Transcutaneous posterior tibial nerve stimulation for treatment of the overactive bladder syndrome in multiple sclerosis: results of a multicenter prospective study. *Neurourol Urodyn* 2011;30:306-311.

Drake MJ, et al Neurological urinary and fecal incontinence. In *Incontinence 5th ICI eds* Abrams P, Cardozo L, Khoury S, Wein A. 2013.

Dumoulin C, Korner-Bitensky N, Tannenbaum C. Urinary incontinence after stroke: does rehabilitation make a difference? A systematic review of the effectiveness of behavioral therapy. *Top Stroke Rehabil.* 2005 Summer;12(3):66-76.

Fowler CJ, et al. A UK consensus on the management of the bladder in multiple sclerosis. *J Neurol Neurosurg Psychiatry* 2009;80:470-477.

Klarskov P, et al. Biofeedback treatment of bladder dysfunction in multiple sclerosis. A randomized trial. *Scand J Urol Nephrol Suppl.* 1994;157:61-65.

Lucio AC, et al. Pelvic floor muscle training in the treatment of lower urinary tract dysfunction in women with multiple sclerosis. *Neurourol Urodyn* 2010;29:1410-1413.

McClurg D, et al. Neuromuscular electrical stimulation and the treatment of lower urinary tract dysfunction in multiple sclerosis - a double blind, placebo controlled, randomized clinical trial. *Neurourol and Urodynam* 2008;27:231-237.

NICE Guideline 148 - Urinary Incontinence in Neurological Disease 2012

Pannek J, et al. European Association of Urology. Guidelines on lower urinary tract dysfunction 2013.

Skeil D, Thorpe AC. Transcutaneous electrical nerve stimulation in the treatment of neurological patients with urinary symptoms. *BJU Int.* 2001 Dec;88(9):899-908.

Stohrer M, Goepel M, Kondo A, et al. The standardization of terminology in neurogenic lower urinary tract dysfunction. *Neurourol Urodyn.* 1999;18:139-158

Tibaek S et al. Pelvic floor muscle retraining is effective in women with urinary incontinence after stroke: a randomized, controlled and blinded study. *Neurourol and Urodynam* 2005;24:348-357.

Unger CA, et al. Neuroanatomy, neurophysiology, and dysfunction of the female lower urinary tract: a review. *Female Pelvic Med and Reconstructive Surg* 2014;20(2):65-75.

Vahtera T, Haaranen M, Viramo-Koskela AL, Ruutianen J. Plevic floor rehabilitation is effective in patients with multiple sclerosis. *Clinical Rehabilitation.* 1997; 11: 211-219.

Wein AJ. Neuromuscular dysfunction of the lower urinary tract and its management. In: Walsh PC, Retik AB, Vaughan ED, Wein AJ, eds. *Campbell's Urology.* Philadelphia, Pa: WB Saunders; 2002:931-1026.

Wilkander B et al. An evaluation of multidisciplinary intervention governed by functional independence measure (FIM) in incontinent stroke patients. *Scand J Rehabil Med.* 1998;30:15-21.