

NEUROGENIC LOWER URINARY TRACT DYSFUNCTION

EVALUATION



Neurogenic Lower Urinary Tract Dysfunction

- Prefer this term to “Neurogenic Bladder”
 - Neurological disease can have a functional impact on the entire lower urinary tract
 - Bladder
 - Bladder neck
 - Urethral sphincters(smooth and striated)
- There must be a relevant and identifiable neurological condition



Incidence of Lower Urinary Tract Dysfunction

- Spinal cord injury 70%–80%
- Multiple sclerosis 50%–80%
- Myelodysplasia 50%–75%
- Parkinson’s disease 15%–35%
- Diabetes 10%–30%
- Cerebrovascular disease 10%–15%



Lower Urinary Tract Function

1. Storage of urine at low pressure to protect upper tracts and assure continence
2. Complete/near complete voluntary evacuation of urine at a low pressure

Neurological disease can have a profound effect on storage and/or emptying *with or without symptoms*



Neurogenic LUTD: What's Affected ?

LETS MAKE IT SIMPLE

FILLING/STORAGE
EMPTYING/VOIDING
BOTH



The Micturition Cycle

- Whatever their differences, all authors would agree on certain general principles concerning the micturition cycle and its component parts
- These are simple but accurate
- These are used in evaluation and treatment

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Bladder Filling and Urine Storage

- Accommodation of increasing volumes of urine
 - At a low intravesical pressure (compliance)
 - With appropriate sensation
- A bladder outlet that is closed at rest and remains so during increases in intraabdominal pressure
- Absence of involuntary bladder contractions
 - Hyperreflexia
 - Instability
 - Uninhibited/reflex contraction
 - **Detrusor Overactivity**

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Urine Emptying/Voiding

- Coordinated bladder contraction of significant magnitude
- Absence of anatomic obstruction
- Concomitant lowering of resistance at the level of:
 - Smooth muscle of bladder neck and proximal urethra
 - Striated muscle that surrounds urethra

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LOWER URINARY TRACT DYSFUNCTION

- Pathophysiology simplified
 - 2 phase concept
 - Filling/Storage & Emptying
- Key factors
 - Bladder
 - Smooth sphincter
 - Striated sphincter
 - Sensation

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NLUTD: Special Attention

- Independence
- Mobility
- Hand Control
- Transfer Ability
- Prognosis (Stability vs Deterioration)

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Initial Management of Neurogenic Urinary Incontinence

HISTORY, level of lesion	Peripheral nerve lesion (e.g. radical pelvic surgery, Sacral cord/cauda equina lesion (e.g. lumbar disc prolapse))	Suprasacral infra-pontine and pontine lesions e.g. trauma, multiple system atrophy.	Suprapontine cerebral lesion (e.g. Parkinson's disease, stroke, multiple sclerosis)
CLINICAL ASSESSMENT <ul style="list-style-type: none"> • Further history • General assessment including of home circumstances • Urinary diary and symptom score • Assessment of functional ability, quality of life and desire for treatment • Physical examination: assessment of sensation in lumbosacral dermatomes, anal tone and voluntary contraction of anal sphincter, bulbocavernosus and anal reflexes, gait, mobility, contractures, hand function. • Urine analysis + culture (if infected: treat as necessary) • Urinary tract imaging, serum creatinine : if abnormal to specialised management • Post void residual (PVR) assessment by abdominal examination or optional by ultrasound 			

Abrams, Cardozo, Khoury, Wein. Incontinence 5th Edition 2013.

• INITIAL MANAGEMENT OF NEUROGENIC INCONTINENCE(2) ICI 2017

This assessment will give basic information, but does not yield precise neurological diagnosis

PRESUMED DIAGNOSIS

Stress urinary incontinence due to sphincter incompetence with negligible PVR

Urinary incontinence due to detrusor overactivity

Urinary incontinence associated with poor bladder emptying (significant PVR)

With negligible PVR

Depending on cooperation and mobility :

MANAGEMENT*

• Behavioural modification
• External appliances

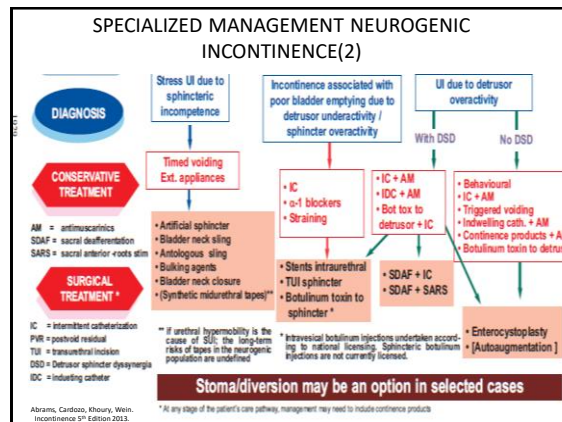
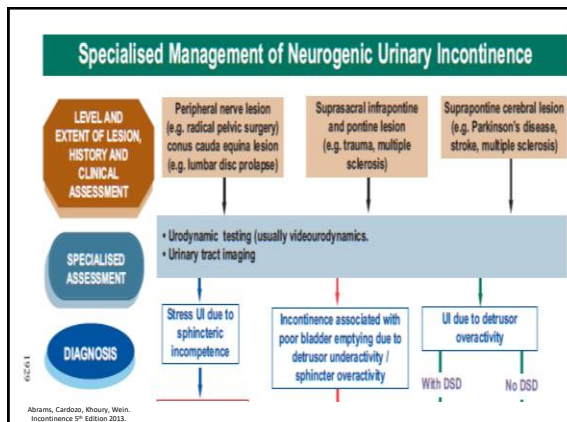
• Intermittent catheterisation**
with or without
• Antimuscarinics

• Behavioural modification,
• Antimuscarinics,
• Continence products,
• Indwelling catheter

Specialised management preferable for more "tailored" treatment

*At any stage of the patient's care pathway, management may need to include continence products

Abrams, Cardozo, Khoury, Wein. Incontinence 5th Edition 2013.



Neurogenic Lower Urinary Tract Dysfunction

- Symptoms**
 - Frequency
 - Urgency
 - Incontinence
 - Urge
 - Unaware
 - Incomplete emptying / retention
 - Pain
 - Recurrent UTI
- Sequela**
 - Recurrent UTI
 - Pyelonephritis
 - Hydronephrosis
 - Renal Failure

Usually when associated with high pressure storage, DSSD and poor emptying

Important Historical Factors

- Current urological symptoms
 - Enuresis, F,U, UI, BOO, UTI, etc.
- Past GU, Med, Surg Hx
 - Similar past symptomatology
 - Prior neurologic, pelvic surgery
 - Prior bladder or urethral surgery
 - Associated bowel/sexual symptoms
 - Medications
- Limitations
 - Hands/dexterity
 - Mobility
 - Environment: Supportive care, caregivers, etc
 - Other medical issues: PROGNOSIS from neuro

The Neurourologic Evaluation

- History
- Physical examination
- Neurourologic evaluation
- Renal function studies
- Urine bacteriologic studies
- Upper tract evaluation
- Voiding cystourethrogram
- Endoscopic examination
- Urodynamic studies
- Videourodynamic studies

Urodynamics: Definition

Currently this term may be applied collectively to all those studies that objectively quantitate a parameter or parameters that are felt to describe the activity of the bladder and outlet during the filling and/or emptying phases of micturition

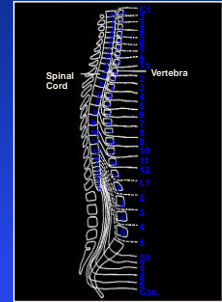
The Role of UDS (ICS Committee) (2)

- To predict the outcome, including undesirable side effects, of a contemplated treatment.
- To confirm the effects of intervention or understand the mode of action of a particular type of treatment; especially a new one.
- To understand the reasons for failure of previous treatments for LUT dysfunction



Patterns of NLUTD

- Lesions above the brain stem
 - Often detrusor overactivity
 - Depends on whether lesion destructive or irritative and whether area involved is normally (+) or (-)
 - External sphincter dyssynergy rarely (if ever) occurs
- Lesions between brain stem and sacral cord
 - Generally associated with detrusor overactivity
 - +/- sphincter dyssynergy (striated)
 - If complete and above T₆, may be associated with sympathetic (smooth muscle) dyssynergy also
- Lesions of sacral SC and distal
 - Often (but not always) detrusor areflexia
 - Generally normal, decreased and/or fixed ((non-relaxing) sphincter



Urodynamics

- Utility in prognosis and treatment
 - Presenting LUTS do not correlate well with of type, extent or level of injury/disease.....or UDS findings
 - Severity of symptoms and PE do not correlate well with prognosis or “danger” to upper tracts.....or UDS findings
 - In SCI, level of injury not always predictive of UDS*
 - Correlation of imaging and UDS not exact
- Therefore management often dictated by UDS

*Weld and Dmochowski, 2000



The Commandments



The Study Must Reproduce
the Symptoms or Clinical
Condition



If a study does not reproduce the symptoms or clinical condition during the appropriate phase (filling, storage, or emptying), then it is worthless, insofar as that patient is concerned



The appropriate study (choosing which is important) done so as to reproduce the symptoms or clinical condition will always yield pertinent information



If a study is abnormal, but the abnormality seems unrelated to the primary symptom or clinical condition, which is not reproduced during the study, the abnormality may be:

- An artifact of the study
- Clinically insignificant
- Pertinent



The simplest, most easily reproducible study that gives the answer is always the best



Blaivas



“Not everything that counts can be counted, and not everything that can be counted, counts.”

Albert Einstein



Lines, curves, and numbers
cannot make a diagnosis



They support or deny
clinical impressions



Urodynamics

Must be an interactive process.
This means that UDS are not
done the same way in everyone.



Urodynamics: An Interactive Process

- Understand the patient's complaint
- Tailor the evaluation accordingly
- Use the proper studies to reproduce the condition
- Draw the proper conclusions



Assessment → Treatment

- Bladder (reservoir)
 - Normal
 - Abnormal
 - Overactive
 - Underactive
- Outlet
 - Normal
 - Abnormal
 - Overactive



NLUTD: Followup

- Critically important
- Urology must be involved
- At least yearly when "stable"
- What are we looking for ?
 - Infections, episodes of sepsis
 - Renal function deterioration
 - Stones



Thank You

