EAU GUIDELINES ON NEURO-UROLOGY

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Introduction

Neuro-urological disorders can cause a variety of long-term complications; the most dangerous being damage of renal function. Treatment and intensity of follow-up examinations are based on the type of neuro-urological disorder and the underlying cause.

Terminology

The terminology used and the diagnostic procedures outlined in this document follow those published by the International Continence Society (ICS).

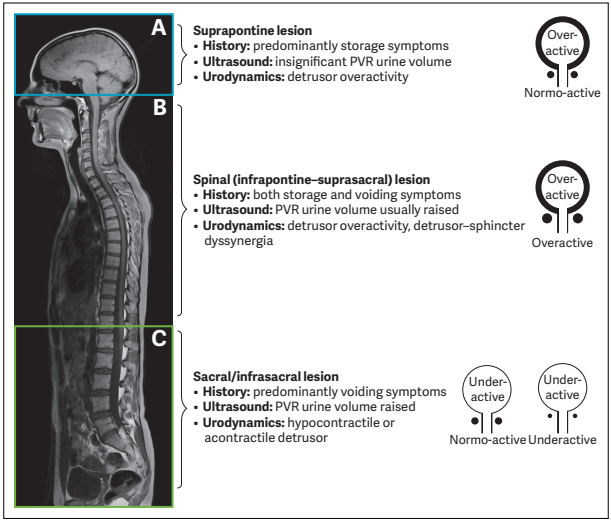
Risk factors and epidemiology

All central and peripheral neurological disorders carry a high risk of causing functional disturbances of the urinary tract.

Classification

The pattern of lower urinary tract (LUT) dysfunction following neurological disease is determined by the site and nature of the lesion. A very simple classification system, for use in daily clinical practice, to decide on the appropriate therapeutic approach is provided in Figure 1.

Figure 1: Patterns of lower urinary tract dysfunction following neurological disease



The pattern of LUT dysfunction following neurological disease is determined by the site and nature of the lesion. Panel A denotes the region above the pons, panel B the region between the pons and sacral cord and panel C the sacral cord and infrasacral region. Figures on the right show the expected dysfunctional states of the detrusor-sphincter system. Figure adapted from Panicker et al. with permission from Elsevier. PVR = post-void residual.

Diagnostic evaluation

Early diagnosis and treatment are essential in both congenital and acquired neuro-urological disorders, even in the presence

of normal neurological reflexes. Neuro-urological disorders can be the presenting feature of neurological pathology and early intervention can prevent irreversible deterioration of the lower and upper urinary tract.

Patient assessment

Diagnosis of neuro-urological disorders should be based on a comprehensive assessment of neurological and non-neurological conditions. Initial assessment should include a detailed history, physical examination, and urinalysis.

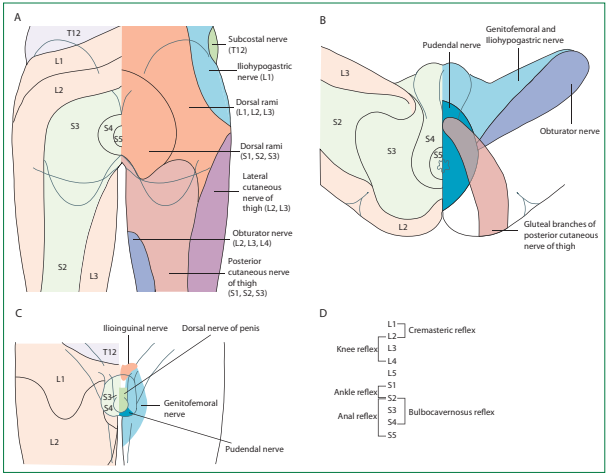
History

An extensive general and specific history is mandatory and should concentrate on past and present symptoms, disorders of the urinary tract as well as bowel, sexual and neurological function. Special attention should be paid to possible warning signs and symptoms (e.g. pain, infection, haematuria, fever) that warrant further investigation.

Physical examination

The neurological status should be described as completely as possible. All sensations and reflexes in the urogenital area must be tested, including detailed testing of the anal sphincter and pelvic floor functions (Figure 2). Availability of this clinical information is essential for the reliable interpretation of subsequent diagnostic investigations.

Figure 2: Lumbosacral dermatomes, cutaneous nerves, and reflexes



The physical examination includes testing sensations and reflexes mediated through the lower spinal cord. Abnormal findings would suggest a lesion affecting the lumbosacral segments; mapping out distinct areas of sensory impairment helps to further localise the site of lesion. Distribution of dermatomes (areas of skin mainly supplied by a single spinal nerve) and cutaneous nerves over the perianal region and back of the upper thigh (A), the perineum (B), male external genitalia (C) and root values of lower spinal cord reflexes (D). Figure adapted from Panicker et al., with parts A-C adapted from Standring, both with permission from Elsevier.

Recommendations for history taking and physical examination

History taking	LE	GR*
Take an extensive general history, concentrating on past and present symptoms including urinary, sexual, bowel, and neurological functions.	4	A
Pay special attention to the possible existence of alarm signs (e.g. pain, infection, haematuria, fever) that warrant further specific diagnosis.	4	A
Take a specific history for each of the four mentioned functions.	4	A
Assess quality of life when evaluating and treating the neuro-urological patient.	2a	B
Use available validated tools including the Qualiveen and I-QoL for urinary symptoms and the QoL-BM for bowel dysfunction in multiple sclerosis and spinal cord injury patients. In addition, generic (SF-36 or KHQ) questionnaires can be used.	1a	A
Physical examination		
Acknowledge individual patient disabilities when planning further investigations.	4	A
Describe the neurological status as completely as possible, all sensations and reflexes in the urogenital area must be tested.	4	A
Test the anal sphincter and pelvic floor functions.	4	A
Perform urinalysis, blood chemistry, bladder diary, residual and free flowmetry, incontinence quantification and urinary tract imaging.	4	A

** All grade A recommendations are based on panel consensus.*

I-QoL = Incontinence Quality of Life Instrument; OoL-BM = Quality of Life Bowel Management scoring tool; KHQ = King's Health Questionnaire; SF-36 = Short Form 36-item Health Survey Questionnaires.

Urodynamic tests

Bladder diaries are considered a valuable diagnostic tool in patients with neuro-urological disorders. A bladder diary should be recorded for at least two to three days. Uroflowmetry and ultrasound assessment of post-void residual should be repeated at least two or three times in patients able to void. Invasive urodynamic studies comprise mandatory assessment tools to determine the exact type of neuro-urological disorder.

Recommendations for urodynamics and uro-neurophysiology

Recommendations	LE	GR
Record a bladder diary.	3	A
Non-invasive testing is mandatory before invasive urodynamics is planned.	4	A*
Perform a urodynamic investigation to detect and specify lower urinary tract (dys-)function, use same session repeat measurement as it is crucial in clinical decision making.	1b	A
Use video-urodynamics for invasive urodynamics in neuro-urological patients. If this is not available, then perform a filling cystometry continuing into a pressure flow study.	4	A*
Use a physiological filling rate and body-warm saline.	4	A*

Specific uro-neurophysiological tests are elective procedures and should only be carried out in specialised settings.	4	C

**Upgraded based on panel consensus.*

Video-urodynamics combines filling cystometry and pressure flow studies with radiological imaging. Currently, videourodynamics is considered to provide the most comprehensive information for evaluating neuro-urological disorders.

Treatment

The primary aims and their prioritisation when treating neurourological disorders are:
1. protection of the upper urinary tract;
2. improvement of urinary continence;
3. restoration of (parts of) the LUT function;
4. improvement of the patient's QoL.

Further considerations are the patient's disability, cost-effectiveness, technical complexity, and possible complications.

Conservative treatment

Assisted bladder emptying

Triggered reflex voiding is not recommended as there is a risk of pathologically elevated bladder pressures. Only in the case of absence, or surgically reduced outlet obstruction it may be an option.

Caution: bladder compression techniques to expel urine (Credé) and voiding by abdominal straining (Valsalva manoeuvre) create high pressures and are potentially hazardous, and their use should be discouraged.

Rehabilitation

In selected patients, pelvic floor muscle exercises, pelvic floor electro-stimulation, and biofeedback might be beneficial.

External appliances

Social continence for the incontinent patient can be achieved using an appropriate method of urine collection.

Medical therapy

A single, optimal, medical therapy for patients with neuro-urological symptoms is not yet available. Muscarinic receptor antagonists are the first-line choice for treating neuro-urological disorders.

Recommendations on drug treatment

Recommendations	LE	GR
Use antimuscarinic therapy as the first-line medical treatment for neurogenic detrusor overactivity.	1a	A
Alternative routes of administration (i.e., transdermal or intravesical) of antimuscarinic agents may be used.	2	A
Maximise outcomes for neurogenic detrusor overactivity by considering a combination of antimuscarinic agents.	3	B
Prescribe α-blockers to decrease bladder outlet resistance.	1b	A
Do not prescribe parasympathomimetics for underactive detrusor.	1a	A
Do not prescribe drug treatment in neurogenic stress urinary incontinence.	4	A*

**Upgraded based on panel consensus.*

Recommendations for catheterisation

Recommendations	LE	GR
Use intermittent catheterisation, whenever possible aseptic technique, as a standard treatment for patients who are unable to empty their bladder.	3	A
Thoroughly instruct patients in the technique and risks of intermittent catheterisation.	3	A
Use a catheter size between 12-16 Fr.	4	B*
Avoid indwelling transurethral and suprapubic catheterisation whenever possible.	3	A

**Upgraded based on panel consensus.*

Recommendations for minimal invasive treatment

Recommendations	LE	GR
Use botulinum toxin injection in the detrusor to reduce neurogenic detrusor overactivity in multiple sclerosis or spinal cord injury patients if antimuscarinic therapy is ineffective.	1a	A
Bladder neck incision is effective in a fibrotic bladder neck.	4	B

Recommendations for surgical treatment

Recommendations	LE	GR
Perform bladder augmentation in order to treat refractory neurogenic detrusor overactivity.	3	A
Place an autologous urethral sling in female patients with neurogenic stress urinary incontinence who are able to self-catheterise.	4	B*
Insert an artificial urinary sphincter in male patients with neurogenic stress urinary incontinence.	3	A

**Upgraded bases on panel consensus.*

Urinary tract infections (UTI)

Patients with neuro-urological disorders, especially those with spinal cord injury, may have other signs and symptoms in addition to, or instead of, traditional signs and symptoms of a UTI in able-bodied individuals.

Recommendations for the treatment of UTI

Recommendations	LE	GR
Do not screen for or treat asymptomatic bacteriuria in patients with neuro-urological disorders.	4	A*
Avoid the use of long-term antibiotics for recurrent urinary tract infections.	2a	A
In patients with recurrent UTI, optimise treatment of neuro-urological symptoms and remove foreign bodies (e.g. stones, indwelling catheters) from the urinary tract.	3	A

In patients with neuro-urological disorders, UTI prophylaxis must be individualised since there is no optimal prophylactic measure available.	4	C

**Upgraded based on panel consensus.*

Sexual (dys)function and fertility

Patients with neurological disease often suffer from sexual dysfunction, which frequently impairs QoL.

Recommendations for erectile dysfunction and male fertility

Recommendations	LE	GR
Prescibe oral phosphodiesterase type 5 inhibitors as first-line medical treatment in neurogenic erectile dysfunction.	1b	A
Give intracavernous injections of vasoactive drugs (alone or in combination) as second-line medical treatment in neurogenic erectile dysfunction.	3	A
Offer mechanical devices such as vacuum devices and rings to patients with neurogenic erectile dysfunction.	3	B
Reserve penile prostheses for selected patients with neurogenic erectile dysfunction.	4	B*
Perform vibrostimulation and transrectal electroejaculation for sperm retrieval in men with spinal cord injury.	3	B
Perform microsurgical epididymal sperm aspiration, testicular sperm extraction and intracytoplasmic sperm injection after failed vibrostimulation and/or transrectal electroejaculation in men with spinal cord injury.	3	B

Counsel men with spinal cord injury at or above Th 6 and fertility clinics about the potentially life-threatening condition of autonomic dysreflexia.	3	A*

**Upgraded based on panel consensus.*

Recommendations on female sexuality and fertility

Recommendation	LE	GR
Do not offer medical therapy for the treatment of neurogenic sexual dysfunction in women.	4	A*
Take a multidisciplinary approach, tailored to individual patient's needs and preferences, in the management of fertility, pregnancy and delivery in women with neurological diseases.	4	A*

**Upgraded based on panel consensus.*

Follow-up

Neuro-urological disorders are often unstable and the symptoms may vary considerably, even within a relatively short period. Regular follow-up is therefore necessary.

Recommendations for follow-up

Recommendations	LE	GR
Assess the upper urinary tract at regular intervals in high risk patients.	4	A*
Perform a physical examination and urine laboratory every year in high risk patients.	4	A*
Any significant clinical changes should instigate further, specialised, investigation.	4	A*
Perform urodynamic investigation as a mandatory baseline diagnostic intervention in high-risk patients at regular intervals.	3	A

**Upgraded based on panel consensus.*

Summary

Neuro-urological disorders present a multi-faceted pathology. Extensive investigation and a precise diagnosis are required before the clinician can initiate individualised therapy. Treatment must take into account the patient's medical and physical condition and expectations with regard to his/her future social, physical, and medical situation.

This short booklet text is based on the more comprehensive EAU Guidelines (ISBN 978-90-79754-91-5), available to all members of the European Association of Urology at their website, http://www.uroweb.org/guidelines.