

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).

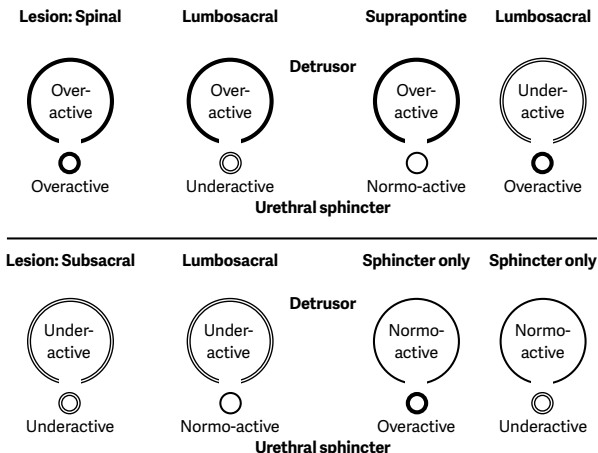
Risk factors and epidemiology

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

Classification

A functional classification for motor function based on urodynamic and clinical findings is proposed (Figure 1).

Figure 1: The EAU-Madersbacher classification system*



*Adapted from Madersbacher et al.

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 and disorders of the urinary tract, bowel, and 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: The neurological status of a patient with neuro-urological symptoms must be described as completely as possible (a - dermatomes, b - associated reflexes)

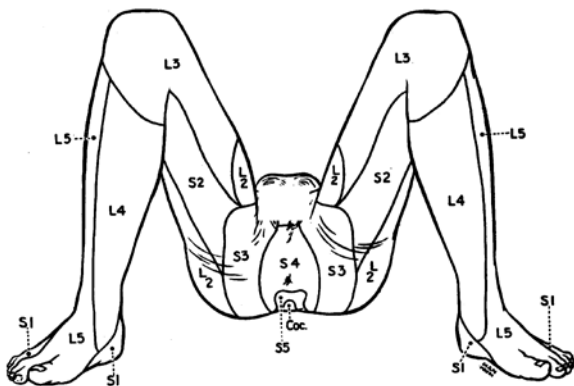


Fig. 2a - Dermatomes of spinal cord levels L2-S4.

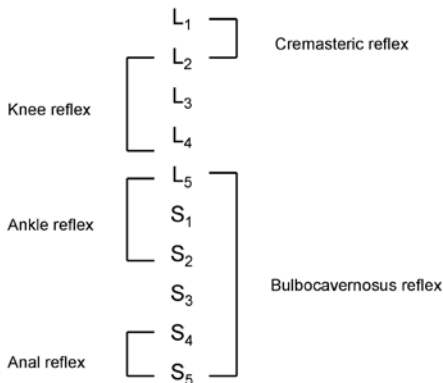


Fig. 2b - Urogenital and other reflexes in lower spinal cord.

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 2-3 days. Uroflowmetry and US assessment of post-void residual should be repeated at least 2 or 3 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	GR
The recording of a bladder diary is advisable.	A
Non-invasive testing is mandatory before invasive urodynamics is planned.	A
Urodynamic investigation is necessary to detect and specify LUT (dys-)function and help with formulating a management plan.	A
Same session repeat measurement can be helpful in clinical decision making.	C
Video-urodynamics is the gold standard for invasive urodynamics in neuro-urological patients. If this is not available, then a filling cystometry continuing into a pressure flow study should be performed.	A
A physiological filling rate and body-warm saline must be used.	A
Specific uro-neurophysiological tests are elective procedures.	C

LUT = lower urinary tract.

Video-urodynamics combines filling cystometry and pressure flow studies with radiological imaging. Currently, video-urodynamics is considered to provide the most

comprehensive information evaluating neuro-urological disorders.

Table 1: Characteristic findings in neuro-urological disorders*

Filling phase

- Increased, decreased, or absent bladder sensation
- Vegetative non-specific sensations
- Low bladder compliance
- High capacity bladder
- Detrusor overactivity, spontaneous or provoked
- Incompetent urethral closure mechanism

Voiding phase

- Acontractile or underactive detrusor
- Bladder outlet obstruction
- Detrusor Sphincter Dyssynergia (DSD)
- Non-relaxing urethral sphincter obstruction

These signs warrant further neurological evaluation, as LUTD may be the presenting symptom of a neurological disease.

**Modified from ICS publication.*

Recommendations for history taking and physical examination	GR*
History taking	
An extensive general history is mandatory, concentrating on past and present symptoms including urinary, sexual, bowel, and neurological functions.	A
Special attention should be paid to the possible existence of alarm signs, such as pain, infection, haematuria, fever, etc, that warrant further specific diagnosis.	A
A specific history should be taken for each of the four mentioned functions.	A
Physical examination	
Individual patient handicaps should be acknowledged in planning further investigations.	A
The neurological status should be described as completely as possible. Sensations and reflexes in the urogenital area must all be tested.	A
The anal sphincter and pelvic floor functions must be tested.	A
Urinalysis, blood chemistry, bladder diary, residual and free flowmetry, incontinence quantification and urinary tract imaging should be performed.	A
Quality of life should be assessed when evaluating and treating the neuro-urological patient.	B
The available validated tools are Qualiveen, a specific long-form and short-form tool for spinal cord lesion and multiple sclerosis patients. In addition, generic (SF-36) or specific tools for incontinence (I-QOL) questionnaires can be used.	B

* All grade A recommendations are based on panel consensus.

Treatment

The primary aims when treating neuro-urological disorders and their priorities 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 treatments	LE	GR
For NDO, antimuscarinic therapy is the recommended first-line medical treatment.	1a	A
Alternative routes of administration (i.e., transdermal or intravesical) of antimuscarinic agents may be used.	2	A
Outcomes for NDO may be maximised by considering a combination of antimuscarinic agents.	3	B
To decrease bladder outlet resistance, α -blockers could be prescribed.	1b	A
For underactive detrusor, no parasympathicomimetics should be prescribed.	1a	A
In neurogenic stress urinary incontinence, drug treatment should not be prescribed.	4	A

NDO = neurogenic detrusor overactivity.

Recommendations for minimal invasive treatment		
Intermittent catheterisation	LE	GR
Intermittent catheterisation - whenever possible aseptic technique - should be used as a standard treatment for patients who are unable to empty their bladder.	3	A
Patients must be well instructed in the technique and risks of intermittent catheterisation.	3	A
The catheter size should be 12-16 Fr.	4	B
Whenever possible, indwelling transurethral and suprapubic catheterisation should be avoided.	3	A

Recommendations for minimal invasive treatment	GR
Botulinum toxin injection in the detrusor is the most effective minimally invasive treatment to reduce neurogenic detrusor overactivity.	A
Bladder neck incision is effective in a fibrotic bladder neck.	B

Recommendations for surgical treatment	LE	GR
In order to treat refractory detrusor overactivity, bladder augmentation is recommended. Detrusor myectomy is an acceptable alternative in highly selected cases.	3	A
In female patients with neurogenic stress urinary incontinence who are able to self-catheterise, placement of an autologous urethral sling should be used.	4	B
In male patients with neurogenic stress urinary incontinence, artificial urinary sphincter should be used.	3	A

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.

Guidelines on the treatment of UTI	LE	GR
Asymptomatic bacteriuria in patients with neuro-urological disorders should not be treated.	4	A
The use of long-term antibiotics in recurrent UTIs should be avoided.	2a	A
In patients with recurrent UTI, treatment of neuro-urological symptoms should be optimised and foreign bodies (e.g. stones, indwelling catheters) should be removed 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

UTI = urinary tract infection.

Sexual (dys)function and fertility

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

Guidelines on ED and male fertility	LE	GR
In neurogenic ED, oral PDE5Is are the recommended first-line medical treatment.	1b	A
In neurogenic ED, intracavernous injections of vasoactive drugs (alone or in combination) are the recommended second-line medical treatment.	3	A
In neurogenic ED, mechanical devices such as vacuum devices and rings can be effective and may be offered to patients.	3	B
In neurogenic ED, penile prostheses should be reserved for selected patients.	4	B

In men with SCI, vibrostimulation and transrectal electroejaculation are effective methods of sperm retrieval.	3	B
In men with SCI, MESA, TESE or ICSI may be used after failed vibrostimulation and/or transrectal electroejaculation.	3	B
In men with SCI, especially at or above T6, it is essential to counsel patients at risk and fertility clinics about the potentially life-threatening condition of autonomic dysreflexia.	3	A

ED = erectile dysfunction; ICSI = intracytoplasmic sperm injection; MESA = microsurgical epididymal sperm aspiration; PDE5Is = phosphodiesterase type 5 inhibitors; SCI = spinal cord injury; TESE = testicular sperm extraction.

There is no effective medical therapy for the treatment of neurogenic sexual dysfunction in women (GR: A). In women with a neurological disease, the management of fertility, pregnancy and delivery requires a multidisciplinary approach tailored to an individual patient's needs and preferences (GR: A).

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.

Guidelines for follow-up	LE	GR
In high-risk patients, the upper urinary tract should be assessed at least every six months.	4	A
In high-risk patients, physical examination, and urine laboratory should take place every year.	4	A
Any significant clinical changes should instigate further, specialised, investigation.	4	A
Urodynamic investigation is a mandatory baseline diagnostic and in high-risk patients, should be done at regular intervals.	3	A

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 978-90-79754-80-9), available to all members of the European Association of Urology at their website, <http://www.uroweb.org>.