

DISEASE MANAGEMENT

The primary aims for treatment of neuro-urological symptoms, and their priorities, are protection of the upper urinary tract (UUT), achievement (or maintenance) of urinary continence, restoration of lower urinary tract (LUT) function, improvement of the patient's quality of life (QoL).

Further considerations are the patient's disability, cognition, social support, caregiver support, cost effectiveness, technical complexity and possible complications.

1. NON-INVASIVE CONSERVATIVE TREATMENT

Assisted bladder emptying: The Credé manoeuvre, Valsalva manoeuvre, and triggered reflex voiding are techniques to improve voiding. These increase intravesical pressure, which may cause risks such as urinary tract infections (UTI), high intravesical pressure, and incontinence. Use should be avoided unless urodynamics confirm that pressures remain within safe limits.

External appliances: Urine collection devices like pads and condom catheters are used to achieve social continence. The penile clamp is contraindicated in neurogenic detrusor overactivity (NDO) due to the risk of high intravesical pressure and pressure sores or necrosis in patients with altered or absent sensations.

Neuro-urological rehabilitation: Bladder rehabilitation aims to restore bladder function in neuro-urological patients. Electrical stimulation of pudendal nerve afferents inhibits micturition reflex and detrusor contraction. This therapy may help restore the balance between excitatory and inhibitory spinal or supraspinal inputs, although evidence is mostly based on small, non-comparative studies.

Peripheral temporary electrostimulation: Tibial nerve stimulation and transcutaneous electrical nerve stimulation (TENS) are safe and might be effective for treating neurogenic LUT dysfunction. TENS has shown improvement in urodynamic and bladder diary parameters in multiple sclerosis (MS) patients, post-stroke patients, and spinal cord injury (SCI), improving bladder capacity and reducing detrusor-sphincter dyssynergia.

Peripheral temporary electrostimulation combined with pelvic floor muscle training and biofeedback (PFMT): in MS patients significantly reduces neuro-urological symptoms. Incomplete SCI patients showed no benefit from combining intravaginal electrostimulation with PFMT for reducing urinary incontinence (UI).

Intravesical electrostimulation: This method increases bladder capacity and improves bladder sensation in patients with incomplete SCI or myelomeningocele (MMC). It may also improve voiding and reduce residual volume in patients with NDO.

Repetitive transcranial magnetic stimulation: This technique has shown improvement in neuro-urological symptoms in Parkinson disease (PD), SCI, and MS patients but is still under investigation, particularly for MS patients with underactive bladders.

2. DRUG TREATMENT

Drugs for storage symptoms:

Antimuscarinic drugs are first-line for treating NDO, increasing bladder capacity and reducing UI. However, they come with side effects such as dry mouth and cognitive impairment, especially in older patients. Higher doses or combinations may improve outcomes but should be used cautiously. Newer drugs like solifenacin show benefits with fewer cognitive effects.

Recommendations	Strength rating
Use antimuscarinic therapy as the first-line medical treatment for neurogenic detrusor overactivity.	Strong
Prescribe α -blockers to decrease bladder outlet resistance.	Strong
Do not prescribe parasympathomimetics for underactive detrusor.	Strong

Drugs for voiding symptoms: For detrusor underactivity, cholinergic drugs like bethanechol may promote bladder emptying but are not widely used. α -blockers such as tamsulosin reduce bladder outlet resistance and improve voiding efficiency. Some drugs for increasing bladder outlet resistance may help with mild SUI but need further research.

3. MINIMALLY INVASIVE TREATMENT

Catheterization: Intermittent catheterisation (IC) is recommended for neuro-urological patients unable to empty their bladder. While it has better outcomes than indwelling catheters, patient satisfaction may be low, especially in SCI patients due to recurrent UTIs. Hydrophilic catheters lower UTI risk, and patients need proper self-catheterisation training.

Intravesical Drug Treatment: Intravesical oxybutynin reduces side effects compared to oral treatment for NDO. Vanilloids like capsaicin show some promise but are not licensed for use and have safety concerns.

Botulinum Toxin Injections: Botulinum toxin A is effective for NDO and neuro-urological disorders, providing long-lasting relief with repeat injections. Side effects include UTIs and urinary retention, with intermittent catheterisation often needed.

Bladder Neck and Urethral Procedures: Surgical interventions such as bladder neck or sphincter incision or urethral stents may be required to reduce bladder outlet resistance and protect the UUT. However, these procedures carry a high risk of complications, including urinary incontinence.

Recommendations	Strength rating
Use intermittent catheterisation as a standard treatment for patients who are unable to empty their bladder.	Strong
Thoroughly instruct patients in the technique and risks of intermittent catheterisation.	Strong
Avoid indwelling transurethral and suprapubic catheterisation whenever possible.	Strong

Recommendation	Strength rating
Offer intravesical oxybutynin to neurogenic detrusor overactivity patients with poor tolerance to the oral route.	Strong

Recommendations	Strength rating
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.	Strong