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## Neuro-Urology during the Covid-19 pandemic: triage and priority of treatments

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The need to postpone all elective medical activities (consultations and elective surgery) has emerged due to the experiences of some Italian regions during the current COVID-19 Pandemic. In fact, these activities may expose not only patients but also health workers to an increased risk of infection. Even though all screening measures are applied, as well as adherence to individual behavioural principles, the risk of contracting an infection by coming to the Hospital remains high.

All emergency procedures including unpostponable oncological treatments were excluded from these limitations, leaving some healthcare professionals feeling that the particularities of certain disorders and the potential harmful implications of putting them in “standby” had not been fully addressed, which is justified by the unexpected severity of this sanitary crisis<sup>1-3</sup>.

Indeed, these unprecedented times have put enormous pressure on both our professional and personal lives. With this in mind, we must look after Covid-19 patients while continuing to provide ongoing care for our existing patients. We know that urological management in neurological patients' needs to be tailored to individual circumstances, and this is even more pertinent during these uncertain times. It is clear to all that neurological patients are often fragile, exposed to many comorbidities and therefore high-risk targets for the virulence of COVID-19. From our point of view the correct way to manage this situation would be to advocate for a change in perspective, adopting an asymmetrical approach: focusing on our patients' special needs, but never neglecting the major community interest.

In this context the Neuro-Urology Commission of the Italian Society of Urodynamics with the support of the Italian Continence Foundation is urging a reconsideration of the emerging problems connected with managing neuro-urological patients and suggests steps to ensure continuous care during this pandemic period<sup>4</sup>. This paper is mainly based on expert opinions, taking into consideration local protocols and lack of healthcare resources. Due to time constraints, a rigorous consensus was not

possible, but an endorsement was requested from the International Continence Society board as we undoubtedly believe it will be helpful to the entire community to safeguard both healthcare professionals and patients.

We have therefore decided:

- To ascertain procedural steps that could serve as a temporary solution, during the pandemic period, aimed at minimising complications based on different Neuro-Urological patterns
- To define priority and timing for diagnosis and interventional procedures based on the different resources of the Centres (Spinal Unit versus Functional Urology Centre) compared to the individual patient risks (type of neurological burden, type of dysfunction, comorbidities) in the transition period concluding the pandemic crisis, and also once regular activity gradually resumes.

To fulfil the abovementioned proposals the following steps, have to be considered:

A great heterogeneity exists within our National Health Systems between the various referral centres for neuro-urological patients. Nevertheless, currently all deferrable face-to-face out-patient appointments have been cancelled. Video or telephone consultations, performed according to local privacy laws, must be undertaken everywhere<sup>5</sup>. This approach would avoid sudden interruption in follow-ups, and would have the benefit of offering some psychological support to a population which is under substantial stress; secondly, it would allow the possibility to identify medical matters that may qualify for urgent management or define a priority list of treatments to be performed once restrictions have been lifted, so as not to waste precious time once “normal activity” resumes. Investigation procedures such as ultrasonography and cystoscopy must be limited to undeferrable/urgent conditions or to selected inpatients where the lack of a proper diagnosis and treatment could delay a patient’s recovery and subsequent discharge. Conversely, urodynamics must be avoided throughout the lockdown phase. Subsequently, priority criteria should take into consideration the type of admission (in or outpatient) and evaluation (first diagnosis or follow-ups), besides the individual neuro-urological conditions, risk of complications and comorbidities. Meanwhile, non-invasive urodynamic measures such as keeping a bladder diary should be encouraged of all patients via a dedicated institutional email account or other possible methods according to local advisories. If indicated, tele prescription of antimuscarinics or other drugs should be done. Areas where pharmacological treatments cannot be prescribed electronically should be supported by a local urologist or GP. Urological care would continue to be provided to inpatients with neurological issues (e.g. within the Spinal Unit) ensuing adequate bladder rehabilitation programs with avoidance of deferrable invasive procedures.

It must be clear that we are acting in an emergency situation, comparable in some ways to a war context. In this situation the right balance between urgency of the procedure, risks of contagion, accessibility to anaesthesiological assistance as well as to health care units and other post-operative care, and the lack of resources due to the demands of Covid-19 patients have to be taken into account on a local basis. The aim of this document is not to serve as a guideline but rather as suggestions to assist practitioners who might be unsure how to prioritize Neuro-urological adult patients. The indications of maximum time limit are based on clinical practice and may be lower if the local epidemiological situation permits it. Giving a medium post-epidemic time limit should help practitioners organize access to the operating theatre when activity slowly resumes.

<b>Diagnosis</b>	<b>Procedure</b>	<b>Maximum time limit during Pandemic</b>	<b>Maximum time limit after Pandemic</b>	<b>Observations</b>
<i>Asymptomatic obstructive hydronephrosis with</i>	Ureteral stent, Nephrostomy	4 weeks	4 weeks	considering the local trend of the outbreak, to avoid risks of infection

<i>conserved renal function</i>				
<b><i>Chronic urinary retention</i></b>	Intermittent Catheter (IC) training	No limitations	Any moment catheterization teaching is possible	IC training during pandemic could be limited for lack of healthcare resources.  Consider indwelling catheter when IC training cannot be offered
<b><i>Chronic Urinary retention +/- urinary incontinence +/- chronic pelvic pain</i></b>	Electric stimulation (TENS; IVES; etc.), Perineal rehabilitation, neuromodulation	No limitations	Whenever possible	Consider indwelling catheter +/- pain therapy  Physiatrists intervention should be suppressed except urgent need
<b><i>Neurogenic Stress incontinence</i></b>	Device implantation	Not indicated	No limitations	Social continence can be assured with pads, urethral or external catheters
<b><i>Neurogenic Erectile dysfunction refractory to conservative treatment</i></b>	Prosthesis implantation	Not indicated	No limitations	
<b><i>Defective implants or devices</i></b>	Removal of prosthesis	No limitations	At whatever time with the correct logistics available	
<b><i>Erosion from implants or prosthesis without infection</i></b>	Prosthesis removal	max 4 weeks	max 2 weeks	Evaluate singularly
<b><i>Infected implants</i></b>	Prosthesis removal	Variable (max 7 days)	Variable (max 7 days)	Infected implants may progress rapidly to systemic infection and emergently treated.  Consider antibiotic coverage waiting for Covid-19 swab results if elective surgery is planned
<b><i>Patient with implanted stage I sacral neuromodulation (SNM)</i></b>	Explanation SNM stage I or positioning of stage II SNM	4-6 weeks  complete SMN explanation or removal of the external connection	4-6 weeks	Second stage should be done only after the pandemic to obviate the need of following short term follow-ups or further complications
<b><i>Detrusor sphincter dyssynergia</i></b>	Urethral sphincter Botox injection or sphincterotomy	No limitation	No limitation	Differ until end of epidemic  Pursue IC or when not possible indwelling catheter
<b><i>Neurogenic detrusor overactivity without prior urodynamic risk factors for the upper urinary tract</i></b>	Botulinum toxin detrusor injection	Not indicated	8 weeks	Consider increase of antimuscarinics dosage, adding another antimuscarinic (also intravesical oxybutinin) and/or beta adrenergic
<b><i>Neurogenic detrusor overactivity with prior urodynamic risk</i></b>	Botulinum toxin detrusor injection	8 weeks	4 weeks	In the meantime, consider indwelling catheter or increasing antimuscarinics dosage, adding another antimuscarinic

<i>factors for upper urinary tract (e.g. vesico urethral reflux) or history autonomic dysreflexia</i>				(also intravesical oxybutinin) and/or beta adrenergic. Alpha-blockers can be indicated if signs or symptoms of autonomic dysreflexia
<i>Detrusor overactivity with/without reduced refractory compliance</i>	Enterocystoplasty +/- ureteral reimplantation	Not indicated	24 weeks	Consider indwelling catheter in the meantime
<i>Bladder stone in neurogenic bladder</i>	Endoscopic removal of stone / cistolithotomy	Not indicated	3-6 weeks	consider in the meantime indwelling catheter. Patients with possible autonomic dysreflexia crises or high intravesical pressures should be carefully evaluated and planned before.

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