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BLADDER DYSFUNCTION IN MULTIPLE SCLEROSIS

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Society

Effective diagnosis and management of bladder dysfunction makes it possible for people with multiple sclerosis (MS) to continue their recreational and work activities with comfort, dignity and confidence.

It is important to note that:

- Bladder dysfunction occurs in approximately 80% of people living with MS, in people with minimal symptoms and those with major impairments.
- Bladder symptoms, including frequency, urgency and incontinence, may negatively impact social and vocational activities.
- Bladder symptoms are often mismanaged, precipitating such problems as acute urinary retention, damage to the detrusor (primary bladder muscle) and urinary tract infections (UTIs).

NORMAL BLADDER FUNCTION

The bladder wall consists of three main layers: the mucosa, submucosa, and detrusor muscle. The detrusor, a thick layer of smooth muscle, expands to store urine and contracts to expel urine. Storage and emptying of the bladder are regulated by the internal and external urethral sphincters. Sphincters are normally in a closed position, needing stimulation to open. Continence depends on sphincter–detrusor coordination.

When approximately 250 to 300 cc of urine fill the bladder, the internal pressure activates stretch receptors in the bladder wall. The stretch receptors signal the nervous system, small contractile waves occur in the detrusor muscle, and the internal urethral sphincter automatically relaxes. The external sphincter is consciously tightened and the urge to urinate becomes apparent. Voluntary voiding occurs when two actions occur simultaneously: the detrusor muscle contracts to expel the urine and the external sphincter relaxes and opens to allow the urine to pass freely into the urethra and out of the body.

NEUROGENIC BLADDER DYSFUNCTION IN MS

The demyelination of MS interferes with signals between the bladder, the spinal cord, and brain, causing urination to become less controlled. Dysfunction may occur in the detrusor, external sphincter, or in the coordination of their functions. The detrusor can be hyperactive, signaling the urge to void at very low urinary volume, or hypoactive, allowing a dangerously large amount of urine to accumulate before signals to void are initiated.

Storage Dysfunction

Storage dysfunction, or overactive bladder, may be caused by an overactive detrusor muscle that contracts prematurely, as soon as a small amount of urine enters the bladder, continually signaling the need to void. The bladder does not fill to normal capacity, which results in the following symptoms:

- **Urgency**: inability to delay urination
- **Frequency**: need to urinate repeatedly
- **Nocturia**: need to urinate during the night
- **Incontinence**: inability to control time and place of urination

Emptying Dysfunction

Demyelination in the spine interrupts signals to the voiding reflex, resulting in failure to empty the bladder. The bladder fills, but the spinal cord is unable to send the signal to the brain to relax the sphincter, and/or the bladder to contract adequately, causing the bladder to retain urine and sometimes fill beyond normal capacity. Emptying dysfunction can lead to:

- **Urgency**
- **Dribbling**: uncontrolled leaking of urine
- **Hesitancy**: delay in ability to urinate, though need to void is experienced
- **Incontinence**
- **Infection**

Combined Dysfunction or Detrusor-External Sphincter Dyssynergia (DESD)

Detrusor–external sphincter dyssynergia—or failure to store combined with failure to empty, often associated with high bladder (detruser) pressures, occurs as a result of the lack of coordination between muscle groups. Urine is trapped in the bladder, leading to:

- **Urgency**
- **Hesitancy**
- **Dribbling**
- **Incontinence** (detrusor hyperreflexia)
- **Infection**
- **Renal injury**

URINARY TRACT INFECTION

People with MS who are unable to empty their bladder because of bladder emptying dysfunction increase their risk for UTI development. Retained urine may encourage the growth of bacteria and allows mineral deposits to settle and form stones that irritate bladder tissues. The symptoms of a UTI are:

- **Urgency**
- **Frequency**
- **Dysuria**: burning sensation during urination
- **Abdominal or lower back pain**
- **Fever**
- **Increased spasticity**
- **Dark, foul-smelling urine**

Because sensory loss may prevent people with MS from noticing some of these symptoms, they should pay particular attention to any significant changes in the color or smell of their urine, or any abrupt increase in other MS symptoms.

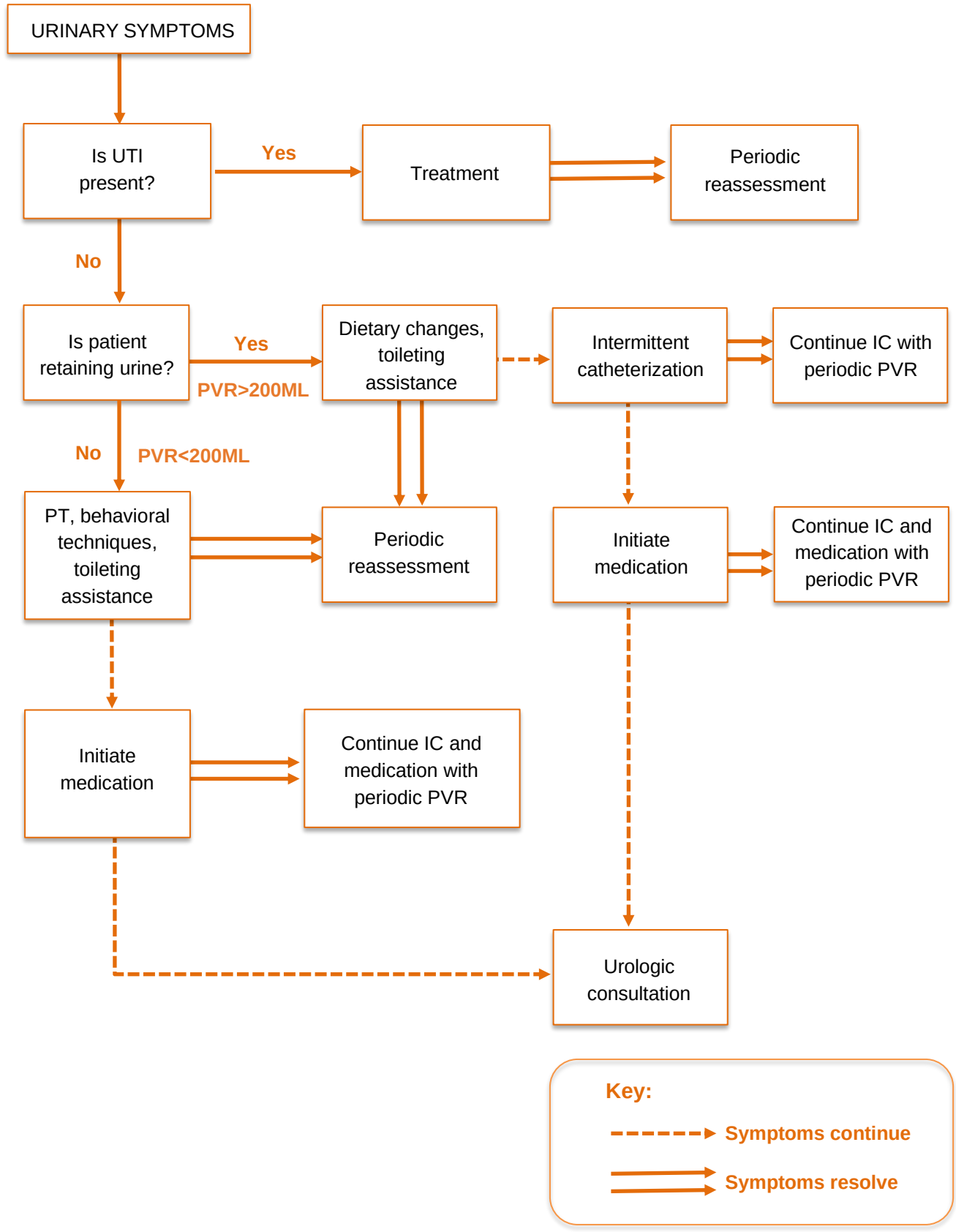
An abrupt increase in symptoms could signal a pseudoexacerbation, defined as a temporary flare-up of symptoms—unrelated to new damage in the central nervous system—which is typically caused by an elevation in core body

temperature resulting from an infection, heat and/or humidity, or strenuous exercise. The elevated body temperature interferes with nerve conduction, resulting in symptoms such as muscle weakness, tingling, blurred or double vision and more spasms. The symptoms generally return to baseline without treatment once the body temperature returns to normal. Since pseudoexacerbations are common with UTIs, it is important to check for a bladder infection when a patient reports a sudden worsening of MS symptoms.

ANALYSIS AND MANAGEMENT OF BLADDER SYMPTOMS

Obtain a detailed bladder history. Recurrent or persistent urinary symptoms require early consultation and assessment by a urologist, most appropriately one who is experienced in MS.

Algorithm for Analysis and Management of Bladder Symptoms (see page 6 for notes)



Notes for the Algorithm

1. Testing for UTI

- Use urinalysis/culture and sensitivity to test for UTI. Have appropriate antibiotic therapy initiated if UTI is present.

2. Evaluation of post-void residual (PVR)

- Person must be well-hydrated.
- When person needs to void, have them urinate and measure volume.
- Measure residual volume in bladder by ultrasound or catheterization.
- Add voided and residual volumes to determine bladder capacity.

3. Intervention

Storage dysfunction—Capacity below 200 ml and/or residual less than 200 ml

- Pelvic floor exercises
- Behavioral techniques—limiting caffeine, maintaining adequate fluid intake during day
- Absorbent pads (men and women) and for men a condom-like sheath that connects to drainage
- Assess mobility issues (ability to get to toilet)
- Oral anti-muscarinics or oral β_3-adrenoceptor agonists as second line to behavioral modifications
- Transdermal (TDS) oxybutynin (patch or gel)

Emptying dysfunction

- Residual greater than 200 ml
  - Intermittent self-catheterization (ISC)
  - Dietary changes to increase acidifying urine
  - Assess mobility issues (ability to get to toilet)
  - Antispasmodics or sympatholytics

Combined or detrusor–external sphincter dyssynergia (DESD)

- Residual greater than 200 ml
- Symptoms persist despite intermittent catheterization
  - Intermittent catheterization
  - Anticholinergic medications
  - Antispasmodic medications
  - Sympatholytics

4. Urologic consultation

- Inability to relieve symptoms requires urologic consultation
- Additional diagnostic measures may be needed: ultrasound, radioisotope renal scan, computerized tomography intravenous pyelogram (CTIVP), urodynamic studies, cystoscopy
- Urologist may offer further treatments for overactive bladder, including intradetrusor onabotulinumtoxinA or neuromodulation

Resources

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Patient Resources

National MS Society MS Navigator® Program

The Society's MS Navigator program offers referrals to healthcare providers familiar with MS, educational opportunities and assistance accessing services, benefits and expanded healthcare solutions. To connect, call **1-800-344-4867,** chat or email **ContactUsNMSS@nmss.org**.

Urinary Dysfunction and MS

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