

Pelvic Muscle Rehabilitation Clinical Manual

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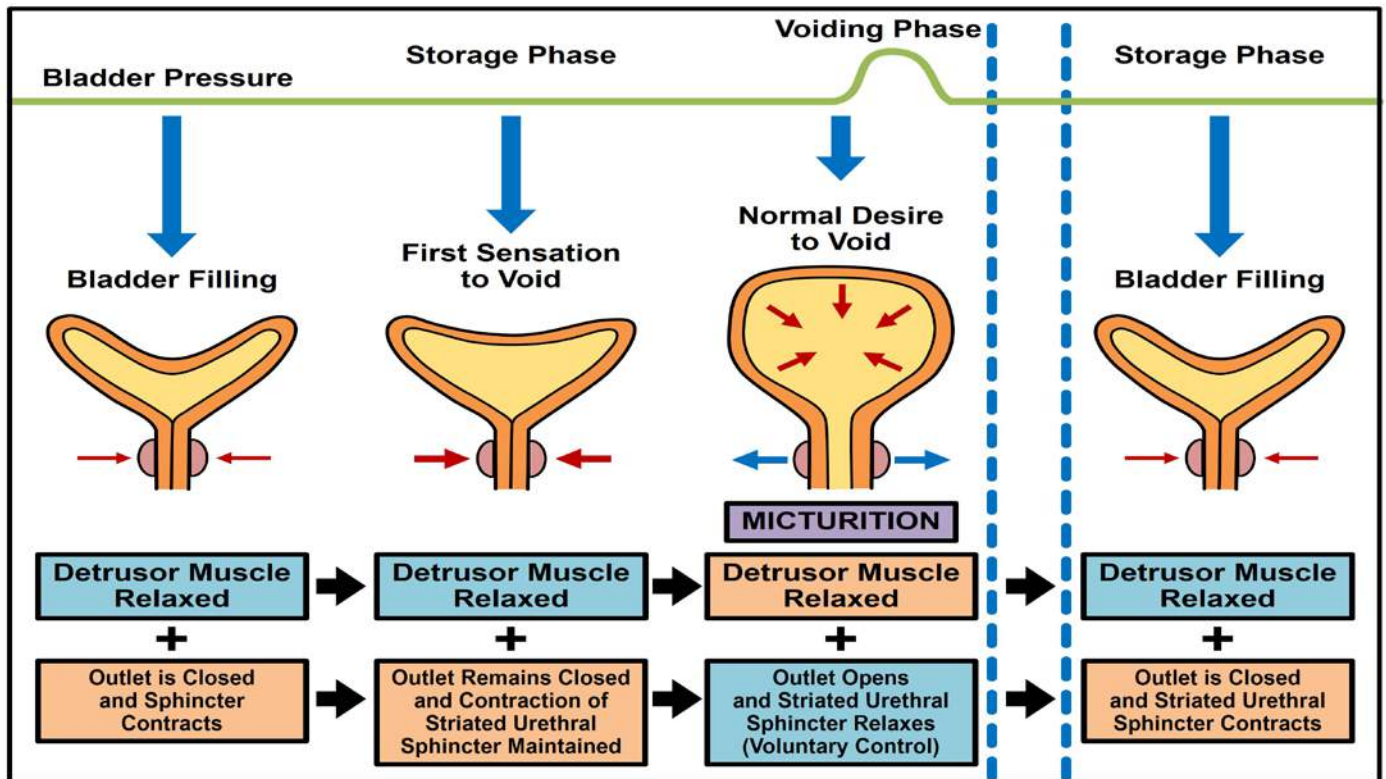
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Understanding Micturition

To secure complete bladder emptying, bladder pressure has to be strong throughout micturition and the urethral sphincters have to remain released. In summary, the function of the lower urinary tract is regulated by a complex neural control system located in the brain and spinal cord. This control system performs a simple switching circuit to maintain a reciprocal relation between the reservoir or “tank” (bladder) and outlet or “hose” (urethra and sphincters). In order to understand bladder disorders it is important to understand voiding and how the bladder empties. Below is a schematic of the steps of the Normal Micturition Cycle.



Common Age Changes

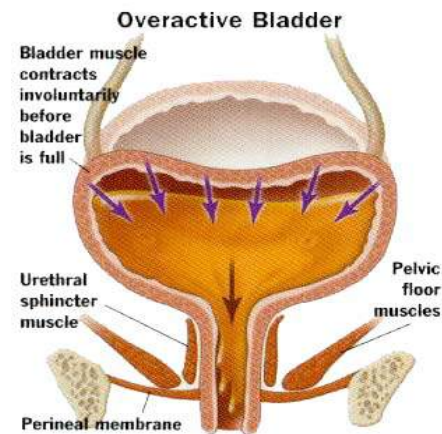
Although bladder disorders are common among the elderly population they are not a normal part of aging. Though there are physiological, psychological, and environmental changes that accompany aging, they do not directly cause the bladder to malfunction, but they do predispose the elderly to an increased risk or incidence of disorders. Normal age-related changes that occur in the urinary system are:

- There is a 30% to 40% loss of functional cells (nephrons) in the kidneys and a decrease in the kidney's ability to filter blood and concentrate urine.
- Most of kidney perfusion and urine production occurs at night causing nocturia.
- Decrease in functional bladder capacity causes older adults to void more frequently. Voiding pattern may be every 3 to 4 hours and once or more often at night.
- The sensory nerves from the spinal cord and brain age creating breaks in the neural pathway. There is “short-circuiting” of nerve firing, and messages may not completely reach the brain. In general, the nervous system takes longer to respond to sensory stimuli. This causes the bladder urge sensation to be delayed thus decreasing “warning time.”
- The prostate gland in men enlarges causing slight urethral obstruction and lower urinary tract symptoms (LUTS) such as frequency and urgency.

There are three types of persistent or chronic urinary incontinence: urgency, stress, and overflow. These may be seen in combination and referred to as a “mixed” type. It is important to determine the type of incontinence in order to select the best method of management.

Urgency Urinary Incontinence (UUI) – Overactive bladder (OAB)

The most common type of UI seen in the elderly is urgency urinary incontinence (UUI), the involuntary loss of urine associated with a sudden, strong desire to void. It is provoked by involuntary or *overactive bladder contractions* (sometimes referred to as bladder spasms). This type of UI has been described as “overactive bladder” as seen in the illustration to the right. UUI is caused by *detrusor overactivity*, which may be isolated or associated with central nervous system disorders. Local genitourinary conditions such as cystitis, urethritis, atrophic vaginitis, tumors, stones, diverticula, outflow obstruction, UTI, impaired bladder contractility can lead to UUI. Central nervous system disorders such as stroke, Parkinson’s, Alzheimer’s disease, brain tumor or aneurysm, and spinal cord injury and medical conditions such as diabetes mellitus, inadequate fluid intake, and habitual frequent voiding can all cause UUI.



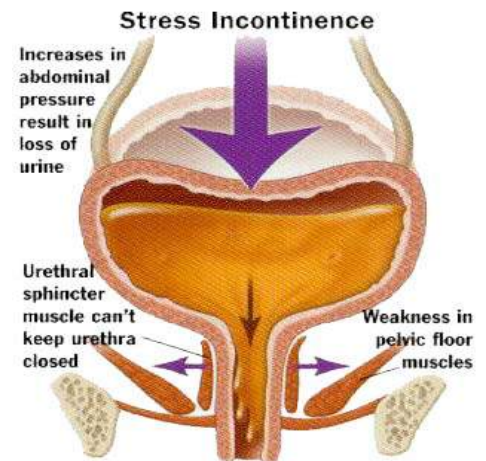
Older adults may have detrusor overactivity, but do not empty their bladder completely. This can cause chronic urinary retention and decreased urge sensations. This may be referred to as reflex incontinence.

Signs and Symptoms

- ✓ Urine loss on the way to the bathroom.
- ✓ **Urgency:** sudden urge to void, that is intense and comes on suddenly.
- ✓ **Frequency:** voiding > 8 times in a 24-hour period, usually in small volumes.
- ✓ **Nocturia:** awakening at night one or more times because of the need or urge to urinate.
- ✓ **Nocturnal enuresis** incontinence during sleep.
- ✓ Volume of urine loss measures several hundred milliliters with complete bladder emptying occurring in many instances.
- ✓ Timing of leakage is usually unpredictable and can occur in any position and at any time.
- ✓ Usually urgency precedes an incident of UI, but in some cases, no warning occurs at all.
- ✓ Leakage is usually triggered by certain events such as cold weather or the sound of running water.
- ✓ Complaints of “key in the lock” or “garage door syndrome,” strong urges to void as soon as one returns home, regardless of how recently the bladder was emptied.

Stress Urinary Incontinence (SUI)

Stress incontinence is the loss of urine associated with increases in intra-abdominal pressure. Primary cause is sphincteric dysfunction, due to relaxation and weakness of the pelvic floor muscles and reduction in urethral resistance. In women, multiple childbirths, estrogen deficiency, or trauma to the external urinary sphincter can lead to SUI. In men, pelvic trauma or sphincter damage during prostate cancer treatments are causes. SUI, is reported in men after prostatectomy more than in men who receive radiotherapy. This is primarily because of damage to the internal urinary sphincter at the time of surgery.



MEDICAL COMPLIANCE PROTOCOL

SUBJECT: TREATMENT PROTOCOL (BLADDER)

PURPOSE:

- ◆ To detail treatment goals
- ◆ To identify treatment components.

PROCEDURE:

The clinician can use the *Treatment Recommendations* medical record to indicate specific treatments for individual patients. Clinician should:

- * Review symptoms and progress at each visit.
- * Track symptoms to include urinary incontinent episodes, voiding frequency, use of pad/absorbent products and devices and fluid intake patterns (time/type/amount).
- * Review Bladder Daily/Voiding Record with patient. It is recommended that patient maintain a diary throughout the course of active treatment to provide an objective method of tracking progress and outcomes.
- * Review sEMG PFM measurement to determine muscle strength, control and isolation. Document if muscle contraction and relaxation is improving or unchanged from a previous visit.

Sample Documentation of Muscle Evaluation

PELVIC MUSCLE EVALUATION:

EMG MANOMETRY **SENSOR TYPE:** VAGINAL RECTAL EXTERNAL SKIN

POSITION: LYING SITTING STANDING

MUSCLE RECRUITMENT EVALUATION: YES NO **IF YES, SITE:** ABDOMEN GLUTEAL THIGH

BASELINE EVALUATION: IRREGULAR STEADY ELEVATED

MUSCLE CONTRACTION: _____ MVS **SECONDS HOLD:** _____ **SECONDS REST:** _____

CONSISTENCY: POOR FAIR GOOD **# REPETITIONS:** _____

MUSCLE RELAXATION/REST: _____ MVS **CONSISTENCY** POOR FAIR GOOD **# REPETITIONS:** _____

BIOFEEDBACK THERAPY: YES NO **# MINUTES:** _____

- * Suggest monitoring of accessory muscle using additional sEMG channel if patient is having a difficult time isolating PFM.
- * Suggest audio and visual EMG biofeedback session (lasting average 15-20 minutes).
- * Review behavior modification and lifestyle changes to include restrictions of bladder irritants, adequate fluid intake, and bowel regularity (see Section 5).

Sample Frequency-Volume Chart with Analysis

Time	Amount Voided	Activity	Urine Leakage (Yes/No)	Urgency Present (Yes/No)	Fluid Intake Type/Amount
2:30 AM	6 oz	Awakening to go to bathroom	No	Slight	
5:00 AM	7 oz	Rushing to bathroom	Yes	Strong	12 oz coffee 6 oz. orange juice
7:45 AM	6 oz	Brushing teeth	Yes	Yes	
8:20 AM	4 oz	Waited too long	Yes	Strong	8 oz coffee
9:15 AM	5 oz			No	10 oz water 12 oz Diet coke
12:25 pm	6 oz	Washing clothes	Yes	Yes	12 oz soda-Diet C
2:45 pm	8 oz			Yes	4 oz water
4:15 pm	8 oz	coughing	Yes	No	8 oz water
5:30 pm	5 oz			No	
6:30 pm	8 oz	Washing dishes	Yes	No	12 oz. Diet coke
7:45 pm	8 oz			No	4 oz. wine, 8 oz w
8:20 pm	6 oz			No	4 oz water
10:50 pm	5 oz			No	

Type of Pad Serenity large pads & underwear # Pads Used 5 - 6 oz

Comments: usually wear the underwear product for added protection when I go out

Analysis : 70 yo female whose record indicates both urge and stress UI symptoms (mixed UI) with OAB symptoms of urgency which is present 5 times many in the morning and frequency which occurs 12 times, 10 during waking hours with nocturia x 2. Large intake averaging 80 ozs with a large caffeinated beverage intake. Client voids frequently (82 ozs) and in small amounts.

SUBJECT: MEASUREMENT OF PELVIC FLOOR MUSCLE USING ELECTROMYOGRAPHY (sEMG)

PURPOSE:

- To educate patient about the use of the PFMs to restore continence.
- To identify, measure and develop muscle contraction and relaxation through electronic instrumentation.
- To provide accuracy and consistency in surface electromyogram (sEMG) evaluation and muscle measurements.

BACKGROUND:

The diagnostic assessment includes sEMG analyzed in 4 phases: (1) *initial baseline phase*; (2) *rapid contraction phase*; (3) *tonic contraction and endurance phase*; and (4) *late baseline phase*. This evaluation is performed at the onset of every session. PMR management consists of 6 possible therapeutic modalities, employed depending on the diagnostic evaluation: (1) *down-training*; (2) *accessory muscle isolation*; (3) *discrimination training*; (4) *muscle strengthening*; (5) *endurance training*; and (6) *electrical stimulation (if appropriate)*.

The sEMG data is measured in Microvolts (mvs). The actual threshold of PFM strength required for maintaining continence is unknown at this time, as is unknown the normal values for PFM strength. The baseline and all follow-up sEMG recordings should include measurements of:

First Set:

- ⇒ Sub-Maximum or "short/quick" muscle contractions of 2 seconds duration.
- ⇒ Muscle returns to resting of 2 to 5 second duration.

The graph to the right shows quick – 2-second contractions at the baseline visits and 4 weeks later. Height of the contraction appear to have doubled from baseline to 1st visit.

