Bladder & Brain
What is the connection?

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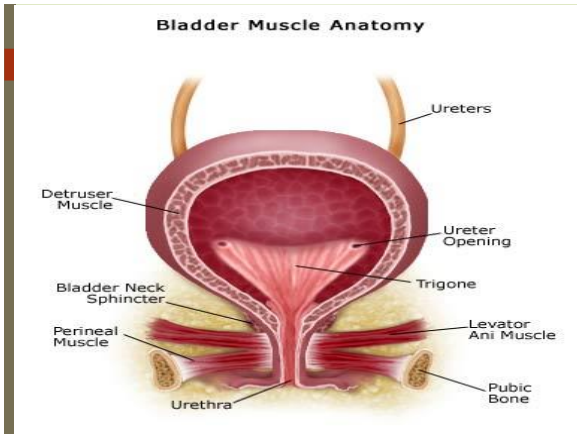
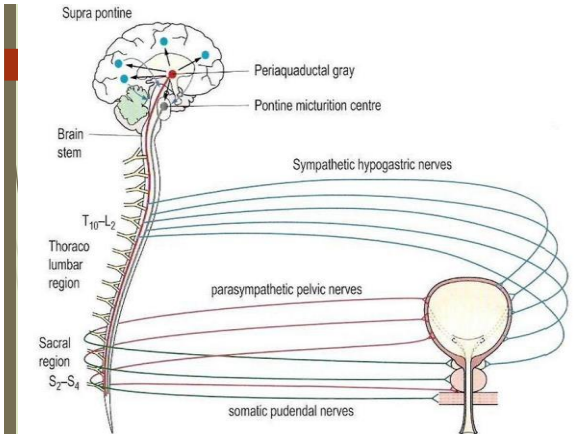
Objectives

- Outline the prevalence of urinary incontinence among stroke patients
- Review anatomy / physiology of voiding
- Describe the types of urinary incontinence
- Outline assessment and treatments to urinary incontinence management
- Referral to Urologist

Urinary Incontinence

- Approximately 50% of stroke patients have urinary incontinence during their acute admission.
- Decreases to 20% by 6 months post-stroke.
- 1 in 4 women experience UI
- 1 in 10 men experience UI





Brain & Spine Affects on Bladder

- Facilitatory: pons & hypothalamus ; parasympathetic pelvic nerves; somatic pudendal nerve
- Inhibitory : cerebral cortex (frontal lobe) & midbrain; sympathetic hypogastric nerves

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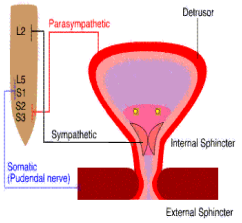
NORMAL BLADDER FUNCTION

STORAGE

- Bladder:
  - Compliant/low-pressure
  - Stable
  - Sensation of filling
  - Adequate capacity (350-500 mL)
- Outlet:
  - Closed at rest
  - Closed with cough/valsalva



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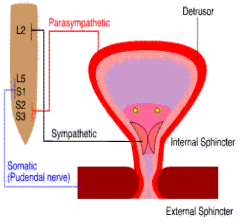
NORMAL BLADDER FUNCTION

EMPTYING

- Bladder:
  - Coordinated continuous contraction
  - >80% efficiency
- Outlet:
  - Coordinated relaxation of EUS and pelvic floor
  - Can voluntarily contract to stop flow



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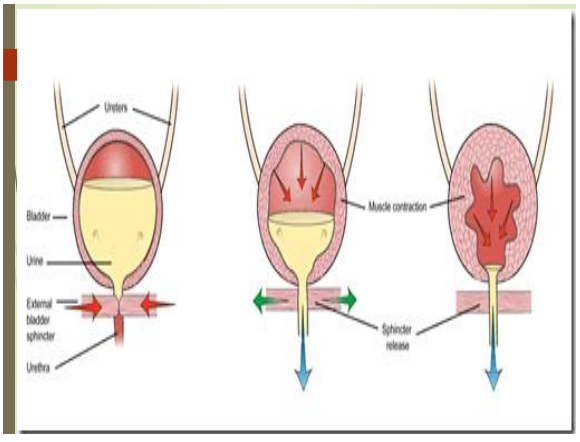


Risk Factors Associated with UI

- Age : decreased bladder capacity
  : residual urine
  : sensory awareness decreased
  : detrusor instability
- Diabetes: diabetic neuropathy
  : polyuria
  : Increased risk of UTI
- Severity and location of Stroke
- Prior Urological dysfunction and other disabling diseases

Types of Incontinence

- Retention with or without overflow incontinence
- Urgency Incontinence
- Functional Incontinence
- Stress Incontinence
- Mixed Incontinence

Stroke : Initial Result Cerebral Shock

- Occurs at time of initial stroke > 50%
- Lasts for 6-8 weeks
- Chemical signals disrupted

Results in:

- Deficient detrusor muscle contraction strength - primary cause of urinary retention in stroke patients.
- Smooth muscles of the bladder do not contract.

Overflow with Urinary Retention

Symptoms:

- Periodic or continuous dribbling of urine
- Usually associated with symptoms of slow stream and difficulty urinating
- Full lower pelvic sensation
- Can occur post stroke – > 50% in initial 6-8 weeks. Approximately 21% (Gelber) remaining with retention

Overflow Incontinence due to Retention

Pathophysiology:

- Outlet Obstruction
- Under active detrusor muscle
- Injury to brain (pons / frontal lobe), spine or peripheral nerves.
- More prevalent in hemorrhagic / large ischemic strokes

Contributing Factors

- BPH
- Urethral Strictures
- Peripheral Neuropathy – diabetes
- Neurologic disease – UMN; LMN; Peripheral nerves
- Anticholinergic / antispasmodic meds

Urge Incontinence Symptoms

- Loss of urine with a strong unstoppable urge to urinate
- Usually associated with frequent urination during the day and night
- Referred to as overactive bladder
- Occurs in post stroke 37% (Gelber)

Urge Incontinence Overactive Bladder (OAC)

Pathophysiology:

- Detrusor instability
- Detrusor hyperreflexia
- Brain, spine, peripheral nerve damage

Contributing Factors:

- Neurological disorders
- Caffeine
- Constipation
- Atrophic Changes
- UTI
- Medications-eg diuretics
- Bladder Disorders

Stress Incontinence

- Loss of urine with a sudden increase in intra-abdominal pressure (i.e. Cough, sneeze, exercise)
- Most common in women
- Can occur in men after prostrate surgery
- Should be aware if patient had this condition prior to stroke for treatment planning.

Stress Incontinence

Pathophysiology

- Sphincter incompetence
- Urethral Instability

Contributing Factors

- Pelvic prolapse after childbirth
- Caffeine
- Decreased estrogen - postmenopausal
- Sphincter weakness or damage - prostatectomy

Functional Incontinence

- Urine Leakage associated with an inability to toilet appropriately because of cognitive or physical impairments, psychological factors, or environmental barriers

Functional Incontinence

Pathophysiology
- Normal bladder and urethral function

Contributing Factors
- Physical
- Cognitive
- Environmental
- Psychological
- Language barrier
- Physical restraints
- Hospital Environment
- Fatigue

Nursing Assessment of Urinary System

Nursing History for UI

Characteristics of incontinence

- Onset and duration **. Prestroke Continence**
- Frequency and time of day
- Precipitating factors (i.e. sneezing / coughing)
- Associated urgency
- Type of urinary flow
- Leakage – Use of protective pads/ briefs

History

- Toileting Patterns – frequency during the day and night **Bladder diary**
- Awareness of a full bladder
- Ability to delay voiding
- Sensation of incomplete bladder emptying
- Obstructive symptoms
- UTI symptoms

History

Genitourinary History

- Childbirths, surgery, prolapsed organs
- recurrent UTI
- Previous incontinence Hx & tx

Relevant Medical Hx

- Diabetes, Depression, Acute Illnesses, Renal disease, CHF, Previous strokes, Parkinsons, and/or dementia, cancer (gyne/CNS)

History

- Medications – Diuretics, sedatives, hypnotics, anticholinergics, amitriptyline, opioids
- Prior caffeine and alcohol drinking patterns
- Client's / caregivers perceptions. Desire to change
- Environmental factors

Physical Examination

- General Neurological Status
- Cognition and Affect
- Mobility – manual dexterity, gait and balance
- Language / Communication abilities

Physical Examination

Abdominal Examination

- Visual Inspection – asymmetry, scars, mass
- Palpation / Percussion of bladder
- Sensory Assessment – depends on type of stroke
- Assess for suprapubic tenderness

Physical Examination

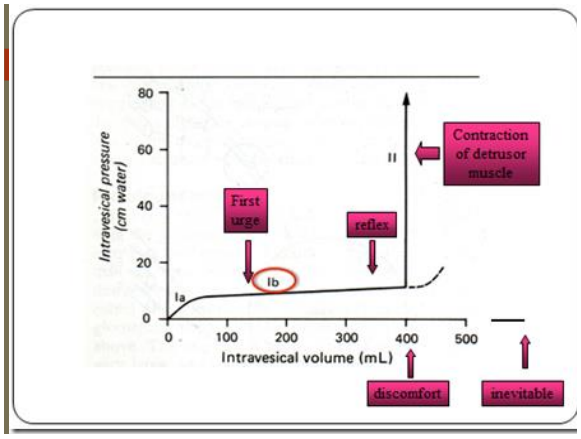
Genital / Rectal Examination

- Assess for bruising, bleeding, swelling, skin breakdown / condition , organ prolapse and discharge.
- Anal – sphincter tone and sensation, fecal impaction

Diagnostic Assessments

Diagnostic Tests of UI

- Urinalysis
- Urine culture
- Post void residuals (> 300 mls demonstrates inadequate voiding)
- bladder scanner – 3 post void scans or in/out catheters (gold standard)
- Urinary diary –3 days pre-implementation
- Urodynamics, cystocopy, cystometry



Treatments of Urinary Incontinence

Treatment of Urinary Incontinence

- Promoting adequate fluid intake – primarily during the day time – limit after supper
- Limit or eliminate caffeine intake
- Treat any symptomatic UTI
- Assess medications contributing to UI – adjust timing of diuretics; review analgesics and sleeping medications

Treatment of Urinary Incontinence

- Avoid foley – In / out catheters preferred
- Early Mobilization / toileting – use of adaptive clothing
- Proper positioning
- Prevention of constipation
- Language impairments – communication system

Treatment of UI
Urinary Retention with Overflow

- PVR > 300-400 mls
- Frequency of in/out caths based on volumes
- Sterile technique only on immuno-compromised patients – otherwise teach patient clean technique
- Cholinergics: bethanecol chloride – stimulates contraction of detrusor muscle

Urinary Retention
Indwelling versus Suprapubic

Indwelling

- No invasive procedure
- Familiar to care providers

Suprapubic

- More comfortable
- Decrease risk of patulous (female) or erosion (male)
- May decrease risk of UTI

Treatment of Urge Incontinence - RNAO

Urge Incontinence

- Prompted Voiding (RNAO Guidelines)
  - Monitoring
  - Prompting
  - Praising

Treatment of Urge Incontinence

- Scheduled / Timed Voiding - voiding at consistent times –
- Toileting at regular intervals, initially during the daytime.
- Bladder retraining – a bladder pattern is determined for 3 days in a bladder diary. Analyze the patterns and then client learns to extend the times and inhibit urge to void

Behavioural & Physical Strategies

- Bladder retraining – Mind / Body:

Increase the time between voiding and the patient's ability to suppress the bladder contractions by education on urge suppression techniques

kegel exercises

- Pelvic Physical therapy – assess pelvic floor function and strengthens pelvic floor muscles
  - *Biofeedback equipment*

Mechanism of action & Treatment Goals for Urgency

- Anticholinergic/ Antimuscarinic
  - Block bladder M2 & M3 receptors
  - ↓ Detrusor muscle contractions & relax bladder
- B3-Agonist
  - Increase bladder capacity
- Goal: ↓ urinary urgency, frequency &/or nocturia if present

Pharmacologic treatment of UI (OAB)

- Oxybutynin (Ditropan)
  - Various forms
  - Gold standard
  - Start slow & increase slowly
- Tolterodine (Detrol IR & LA)
- Fesoterodine (Toviaz)
- Darifenacin (Enablex)
- Solifenacin (Vesicare)
- Trospium (Trosec)
- Mirabegron (Myrbetriq)

Side Effects

- Common: **Dry mouth, blurred vision, constipation**, GI upset, GERD, Dizziness, drowsiness, heat intolerance, headache
- Serious: ↓ **cognition,** confusion, **falls**, **tachycardia**, urinary retention, anxiety, flushing

Dry mouth management

- Most common side effect (bothersome)
- Sugarless candy, saliva substitutes or pilocarpine 1 % eye drops
- May consider switching pharmaceutical form, lowering dose or changing agent
- Start slow, increase slowly

WHEN TO REFER

- Urinary urgency/frequency that does not improve with conservative measures ± 1-2 medications
- Urinary incontinence that does not improve with conservative measures ± 1-2 medications
- Urinary retention and cannot do CIC or incontinence between caths
- Recurrent UTIs (2 or more in 6 months, or 3 or more in 1 year)
- Gross hematuria
- Worsening kidney function, especially with hydronephrosis on ultrasound

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