NEW MANAGEMENT STRATEGIES FOR URINARY INCONTINENCE

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and
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URINARY INCONTINENCE is NOT normal in aging
URINARY INCONTINENCE is

- Curable
- Manageable
  - keeping the patient more comfortable
  - making life easier for caregivers
  - minimizing complications/costs
Urinary Incontinence

- Involuntary loss of urine
- Sufficient amounts of frequency to be a social or health problem
Prevalence

- Increases with age
- Higher in women (2:1)
  - 17% - 55% elderly women
  - 11% - 34% elderly men
- > 80 y/o - same in both genders
- More common in acute care hospitals and nursing homes (50+%)
PREVALENCE OF URINARY INCONTINENCE

Conditions

Severe Community
Any Community
Acute Hospital
Nursing Home

Percentages
<table>
<thead>
<tr>
<th>CHANGE</th>
<th>PREDISPOSES TO</th>
</tr>
</thead>
<tbody>
<tr>
<td>✔ Detrusor overactivity</td>
<td>Frequency, urgency, nocturia &amp; urinary incontinence</td>
</tr>
<tr>
<td>✔ (20 % of healthy continent</td>
<td></td>
</tr>
<tr>
<td>persons)</td>
<td></td>
</tr>
<tr>
<td>✔ More urine output later in</td>
<td>Nocturia</td>
</tr>
<tr>
<td>day</td>
<td></td>
</tr>
<tr>
<td>✔ Increased PVR</td>
<td>Frequency, nocturia</td>
</tr>
<tr>
<td>✔ Decreased ability to</td>
<td>Frequency, urgency</td>
</tr>
<tr>
<td>postpone voiding</td>
<td></td>
</tr>
<tr>
<td>✔ Decreased total bladder</td>
<td></td>
</tr>
<tr>
<td>capacity</td>
<td>Frequency, urgency, nocturia</td>
</tr>
<tr>
<td>✔ Decreased detrusor</td>
<td>Decreased flow rate, elevated PVR, hesitancy</td>
</tr>
<tr>
<td>contractility</td>
<td></td>
</tr>
</tbody>
</table>
## Adverse Effects of Urinary Incontinence

<table>
<thead>
<tr>
<th>Physical</th>
<th>Psychosocial</th>
<th>Economic</th>
</tr>
</thead>
<tbody>
<tr>
<td>Odor</td>
<td>Embarrassment</td>
<td>Billion in direct and indirect costs annually</td>
</tr>
<tr>
<td>Discomfort</td>
<td>Social withdrawal</td>
<td>1995 – $26.3 billion spent</td>
</tr>
<tr>
<td>Perineal rashes</td>
<td>Isolation</td>
<td>($6,565/person &gt;65 years old)</td>
</tr>
<tr>
<td>Pressure Ulcers</td>
<td>Depression</td>
<td></td>
</tr>
<tr>
<td>Urinary infection</td>
<td>Need for nursing home care</td>
<td></td>
</tr>
<tr>
<td>Falls/fractures*</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sleep deprivation</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sexual dysfunction</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Odds ratio for urge incontinence: falls 1.26: non-spine fractures 1:34
Brown et al. JAGS 2000
COSTS OF URINARY INCONTINENCE

1995 – in the US $26.3 billion dollars
$3,565 per person > 65 years

Routine Costs – 43%
- pads, reusable briefs, laundry, catheterization

Incontinence Consequence Costs – 50%
- increased hospitalizations and longer LOS

Treatment Costs – 3%
- behavioral, surgical, pharmacological

Diagnostic Costs – 1%

Indirect Costs – 3%
- loss of income, home care costs

Clinician September 2003
**Sympathetic (adrenergic) Sphincter Contraction**

**Parasympathetic (cholinergic) Detrusor contraction**

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**TYPE OF NERVE** | **FUNCTION**
---|---
A PARASYMPATHETIC CHOLINERGIC *(Nervi Erigentes)* | Bladder contraction
B SYMPATHETIC | Bladder relaxation (by inhibition of parasympathetic tone)
C SYMPATHETIC | Bladder relaxation *(β adrenergic)*
D SYMPATHETIC | Bladder neck and urethral contraction *(α adrenergic)*
E SOMATIC (Pudendal nerve) | Contraction of pelvic floor musculature

*Peripheral nerves involved in micturition.*
BASIC TYPES OF URINARY INCONTINENCE

- Acute
  - Transient/reversible factors are common
- Persistent
  - Reversible factors may contribute
TRANSIENT/REVERSIBLE FACTORS

“D R I P”

D  Delirium, drugs, dietary (caffeine)
R  Restricted mobility, retention
I  Infection, inflammation, impaction
P  Polyuria, psychological
TYPES OF PERSISTENT URINARY INCONTINENCE

- Stress
- Urge
- Overflow
- Functional
OVERACTIVE BLADDER (OAB)

Urgency with or without incontinence, usually with frequency and nocturia, in the absence of pathological or metabolic conditions that might explain these symptoms.

(17 million affected)

URGE INCONTINENCE

■ Urge – Leakage of urine (variable but often larger volumes) because of inability to delay voiding after sensation of bladder fullness is perceived.

Diagnosis: Urinary frequency (8+/24 hrs), nocturia (2 or more/night, urgency

International Continence Society (ICS) 2001
Urge Incontinence

Causes:

- Associated with involuntary detrusor contractions (detrusor overactivity)
  - **Multiple Causes:**
    - Neurogenic: Detrusor hyperreflexia
      - Stroke, Parkinson's, or dementia
    - Local irritation from outlet obstruction, stone, or tumor
    - Non-neurogenic: Detrusor instability
      - Idiopathic
  - Associated with involuntary urethral relaxation (urethral instability)
STRESS INCONTENENCE

Sphincter mechanism failure to remain closed during bladder filling

- **Stress** - Involuntary loss of urine on effort or exertion, or on sneezing, coughing, or laughing.
- Any activity that increases abdominal pressure (pure SI is in the absence of detrusor contraction or an overdistended bladder).
Figure 6-6 Simplified schematic diagram depicting age-associated changes in pelvic floor muscle, bladder, and urethra-vesical position predisposing to stress incontinence. Normally (left), the bladder and outlet remain anatomically inside the intraabdominal cavity, and rises in pressure contribute to bladder outlet closure. Age-associated changes (e.g., estrogen deficiency, surgeries, childbirth) can weaken the structures maintaining bladder position (right); in this situation, increases in intraabdominal pressure can cause urine loss (stress incontinence).
OVERFLOW INCONTINENCE

Impaired detrusor contractility, bladder outlet obstruction, or both

- Loss of urine associated with overdistension of the bladder.
- Symptoms - Dribbling, urge or stress incontinence
OVERFLOW - CAUSES

- Underactive or acontractile detrusor
  - Poor bladder contractility - DM, low spinal cord injury, drugs, fecal impaction
  - **Neurogenic** - detrusor-sphincter dyssnergy (MS)

- Bladder outlet or urethral obstruction
  - Anatomical - Prostate, stricture, large cystocele anti-incontinence procedure
FUNCTIONAL INCONTINENCE

Urine loss caused by factors outside the lower urinary tract such as chronic impairment of physical and/or cognitive functioning.
FUNCTIONAL INCONTINENCE

CAUSES

- Chronic impairments of:
  - Cognitive function
  - Mobility, dexterity
- Environmental factors
- Psychological factors
Assessment of Geriatric Incontinence

Objectives

- Confirm the presence of UI
- Identify potential reversible factors
- Identify conditions requiring further evaluation before a therapeutic trial
- Develop an assessment and management plan.
Assessment of Geriatric Incontinence

Basic Assessment

- Focused history
- Bladder records/voiding diaries
- Targeted physical exam
- Urinalysis
- Post-void residual determination
Assessment of Geriatric Incontinence

**History**
(in addition to medical history)

- Establish impact of UI
  - Most bothersome symptom(s)
  - Interference with daily life
  - Pad use
- Medications - diuretics, etc.
- Fluid intake, caffeine, etc.
Assessment of Geriatric Incontinence

Physical Exam:

- Functional (toileting skills)
- Neurologic
- Abdominal
- Volume status (edema, CHF)
- Rectal (tone, impaction, prostate)
- Pelvic
  - Prolapse
  - Atrophy/Vaginitis
  - Mass
  - Cough test (hypermobility/leakage)
Assessment of Geriatric Incontinence

- Specimen collection
- Objectives
  - Rule out sterile hematuria
  - Identify bacteriuria/pyuria in patients with symptoms of UTI
  - Or associated with recent onset or worsening of UI
  - Rule out glucosuria.
Assessment of Geriatric Incontinence

Further Evaluation

- Laboratory tests
- Urological/gynecological exam
- Urodynamic tests
TREATMENT OF URINARY INCONTINENCE

- Behavioral
- Pharmacological
- Surgical
URGE
(OVERACTIVE BLADDER)

- Diet
- Bladder training
- Pelvic muscle exercises
- Biofeedback
- Pelvic floor muscle stimulation
- Protective pads
- Surgery (for detrusor instability)
- Drugs
Dietary Modification

- Caffeine or products with caffeine
- Alcoholic beverages
- Carbonated beverages
- Milk/dairy products
- Citrus juices and fruits
- Highly spiced foods
- Sugar and honey
- Corn syrup
- Artificial sweeteners
- Decrease fluid intake - Avoid > 2,400 cc’s fluid a day
BLADDERS TRAINING - RETRAINING

- Voiding schedule that:
  - increases voiding intervals between mandatory voidings
  - teach concomitant distraction or relaxation techniques. (urge suppression strategies)
  - increases bladder capacity

- Toileting programs for the functionally impaired patients
Anticholinergic Agents

- Oxybutynin (DitropanXL/Ditropan)
  - Both anticholinergic and direct smooth muscle relaxant properties
  - 15-90% success rate
  - **Dosage:** XL - 5 - 10mg/day/2.5 - 5 mg. B.I.D. to Q.I.D
  - Side effect: anticholinergic - confusion, dry mouth
- Tolterodine (Detrol 1 - 2 mg. B.I.D)
  - (Detrol LA 2 - 4 mg. Q day)
  - Less CNS and other side effects (dry mouth)
- Oxytrol Transdermal
  - Side effect profile low ie. dry mouth
  - Apply every 3 or 4 days (B.I.W.)
### NEWEST DRUGS

**Trospium (Sanctura)** - Quaternary amine (passage through blood-brain barrier) with antimuscarinic ($M_2$ & $M_3$) properties  
- Dose - 20 mg bid

**Darifenacin (Enablex)** - Potent muscarinic receptor antagonist  
- Tertiary amine with high affinity for $M_3$ Receptor  
- Dose – 7.5 or 15 mg/day

**Sulfenacin (Vesicare)** - Tertiary amine - with high affinity for $M_2$ and $M_3$ Receptor  
- Dose - 5 or 10 mg/day
## ANTICHOLINERGICS/ANTI MUSCARINIC

<table>
<thead>
<tr>
<th>Drug</th>
<th>Decreased UI Episodes Per week</th>
<th>Decreased Frequency</th>
<th>CNS</th>
<th>Dry mouth</th>
<th>Constipated</th>
<th>Other</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oxybutynin ER</td>
<td>71%</td>
<td>30%</td>
<td>4-12%</td>
<td>30-60%</td>
<td>6.5%</td>
<td>Hallucinations, Confusion</td>
</tr>
<tr>
<td>Oxybutynin Transdermal</td>
<td>±&lt;70%</td>
<td>±&lt;30%</td>
<td>3.2%</td>
<td>4%</td>
<td>3%</td>
<td>Site Irritation</td>
</tr>
<tr>
<td>Tolterodine LA</td>
<td>70+%</td>
<td>17-27%</td>
<td>1-4%*</td>
<td>23%</td>
<td>6%</td>
<td>Sommolence, Dizziness, 2%</td>
</tr>
<tr>
<td>Trosplum</td>
<td>60%</td>
<td>16-17%</td>
<td>4% (Headache)</td>
<td>22%</td>
<td>10%</td>
<td>Fatigue, 2% Hallucinations, Confusion</td>
</tr>
<tr>
<td>Solifenacin</td>
<td>60%</td>
<td></td>
<td>2% Dizziness</td>
<td>23%</td>
<td>13%</td>
<td>Blurred Vision 4-5%</td>
</tr>
<tr>
<td>Darifenacin</td>
<td>67%</td>
<td>16-17%</td>
<td></td>
<td>21%</td>
<td>19%</td>
<td></td>
</tr>
</tbody>
</table>

* Self reported
<table>
<thead>
<tr>
<th>Drug</th>
<th>Dosage</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Darifenacin hydrobromide</td>
<td>7.5-15 mg PO once/d</td>
<td>$99.60</td>
</tr>
<tr>
<td><em>Enablex</em> (Novartis)</td>
<td><em>(7.5-15-mg ER tabs)</em></td>
<td></td>
</tr>
<tr>
<td>Oxybutynin chloride</td>
<td>5 mg PO bid or tid</td>
<td>22.80</td>
</tr>
<tr>
<td><em>Ditropan</em> (Ortho-McNeil)</td>
<td><em>(5-mg IR tabs; syrup)</em></td>
<td></td>
</tr>
<tr>
<td><em>Ditropan XL</em></td>
<td>5-30 mg PO once/d</td>
<td>64.20</td>
</tr>
<tr>
<td><em>(5-, 10-, 15-mg ER tabs)</em></td>
<td></td>
<td></td>
</tr>
<tr>
<td><em>Oxytrol</em> (Watson)</td>
<td>1 patch 2x/wk</td>
<td>88.16</td>
</tr>
<tr>
<td><em>(39 cm² transdermal patch)</em></td>
<td><em>(3.9 mg/d)</em></td>
<td></td>
</tr>
<tr>
<td>Solifenacin succinate</td>
<td>5 mg PO once/d</td>
<td>100.20</td>
</tr>
<tr>
<td><em>VESIcare</em> (GSK)</td>
<td><em>(5-, 10-mg tabs)</em></td>
<td></td>
</tr>
<tr>
<td>Tolterodine tartrate</td>
<td>1-2 mg PO bid</td>
<td>$105.60</td>
</tr>
<tr>
<td><em>Detrol</em> (1-, 2-mg IR tabs)</td>
<td></td>
<td></td>
</tr>
<tr>
<td><em>Detrol LA</em> (2-, 4-mg ER caps)</td>
<td>2-4 mg PO once/d</td>
<td>91.80</td>
</tr>
<tr>
<td>Trospium chloride</td>
<td>20 mg PO bid</td>
<td>82.20</td>
</tr>
<tr>
<td><em>Sanctura</em> (Indevus/Odyssey)</td>
<td><em>(20-mg tabs)</em></td>
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</tr>
</tbody>
</table>
STRESS INCONTINENCE

- Pelvic muscle exercises
- Biofeedback
- Bladder training
- Pelvic floor muscle stimulation
- Weight loss (if obese)
- Pessaries (vaginal/bladder prolapse)
- Surgeries (hypermobility/sphincter deficiency)
- Periurethral collagen injections
- Protective pads
- Drugs
Pelvic Muscle Exercises (Kegels)

- Exercises to strengthen the voluntary periurethral and pelvic muscles.
- Contract perivaginal muscles and anal sphincter as if to control urination or defecation BUT without contracting abdominal, buttock, or inner thigh muscles.
- 30 to 80 times a day, 10 seconds each and for at least 6 weeks.
BEHAVIORAL THERAPIES
Pelvic Muscle Rehabilitation

- Biofeedback
  - Use of electronic or mechanical instruments to relay information to patients about their physiological activity.
  - Alters bladder dysfunction by teaching people to change physiological responses that mediate bladder control.

- Other
  - Vaginal Cones
  - Electrical stimulation of muscles/nerves
DRUGS - SI

- **Estrogen Therapy**
  - Primary treatment in post menopausal women
  - Direct effect on urethral mucosal and periurethral tissues
  - Vaginal estrogen (oral only if used for other s/s)
    - Estradiol vag. tabs. (25ug.), estradiol vag. Rings 2 mg (7.5 ug/day), Estrogen vaginal creams.

- **Alpha-adrenergic Agonist Drugs**
  - Pseudoephedrine (15-30 mg. PO TID)
  - Increases bladder outlet resistance
  - Relieves symptoms with minimal S/E(?)

- **Tricyclic Antidepressants**
  - Both alpha-adrenergic agonist activity and anticholinergic properties
  - For mixed (SI and UI).
## Outcome of Therapy for Stress Incontinence

<table>
<thead>
<tr>
<th></th>
<th>Muscle Exercise</th>
<th>Bladder Training</th>
<th>Alpha Agonist</th>
<th>Retropubic Suspensions</th>
<th>Needle Suspension</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cured (%)</td>
<td>12</td>
<td>16</td>
<td>0-14</td>
<td>87</td>
<td>84</td>
</tr>
<tr>
<td>Improved (%)</td>
<td>75</td>
<td>54</td>
<td>19-60</td>
<td>5</td>
<td>4</td>
</tr>
<tr>
<td>Total (%)</td>
<td>87</td>
<td>70</td>
<td>19-74</td>
<td>83</td>
<td>88</td>
</tr>
<tr>
<td>Complications</td>
<td>0</td>
<td>0</td>
<td>5-33</td>
<td>20</td>
<td>20</td>
</tr>
</tbody>
</table>
OVERFLOW INCONTINENCE

- Assisted voiding
- Intermittent or chronic catheterization
- Protective pads/garments
- Surgery (BPH, prolapse, tumor/stone, etc.)
- Drug therapy
Sphincter - Alpha-Adrenergic Antagonists

- Selective for alpha-1-adrenoreceptors
  - Tamsulosin (Flomax) – α1A blocker
    - Not indicated for treatment of HBP
    - Single dosage: 0.4 mg.
  - Alfuzosin (Uroxatral)* - α1 blocker
    - Less risk for hypotension
    - Potent CYP3A4 inhibitor
    - 10 mg ext. release tablet daily

- Terazosin (Hytrin), Doxazosin (Cardura), and Prazosin (Minipress)
  - Anti-hypertensive agents
  - Relieves symptoms of BPH
  - Dose: Hytrin - 1 to 10 mg. each day

* The Medical Letter Jan. 5, 2004
Toileting Programs for the Functionally Impaired Patients

- **Habit Training**
  - Scheduled per patient habit i.e. after meals

- **Scheduled Toileting**
  - Scheduled voiding at regular times with no systematic effort to motivate the patient to delay voiding and resist urge.

- **Prompted Voiding**
  - Attempt to encourage patients to discriminate their incontinence status and request toileting assistance from caregivers.
Indications for Catheter

- Urinary retention - PVR consistently > 200). Consider voiding trials.

- Terminal illness or severe impairment which makes positioning or clothing changes uncomfortable, or which is associated with intractable pain.

- Stage III or IV pressure ulcers where urine will impede healing.
MOISTURE RELATED BREAKDOWN

- Skin that is too dry is 2.5 times more likely to breakdown.
- Skin that is too wet is 5 times more likely to breakdown.

Allman RM Pressure Ulcers Among the Elderly JAMA 320(13):850-853
Potential Complications of an Indwelling Catheter

- **Bacteriuria Risk:**
  - Foley: 3%-10%/day, 75%-95% after one month
  - Suprapubic catheter: 17%-40% less than a Foley
  - Condom catheter: 12%/month
  - Intermittent catheter: 1%-3% per insertion.

Potential Complications of an Indwelling Catheter

In hospitalized patients with bacteriuria:

24% developed UTI
3.6% developed catheter associated bacteremia

Add $676 for each UTI
Add $2,836 for bacteremia

Saint S. Am J Infect Control 2006;28: 68-75
CATHETER MANAGEMENT

- Closed system
- Irrigate only for obstruction, not routine
- Anchor to bed or leg to prevent excessive tension/pulling
- Cleanse with routine hygiene from meatus downward and as gently as possible
Websites for Patient Information

😊 The National Association for Continence
www.nafc.org

😊 The Simon Foundation
www.simonfoundation.org