Urogynecology for the Hospitalist

Paul Moore, MD
Associate Professor
Division of Female Pelvic Medicine and Reconstructive Surgery
Department of Obstetric and Gynecology
University of Mississippi Medical Center
Female Pelvic Medicine and
Reconstructive Surgery

Urogynecology

1. Urinary Incontinence
2. Pelvic Organ Prolapse
3. Fecal Incontinence
4. Chronic Cystitis/Recurrent Urinary Tract Infection
   - Interstitial Cystitis
   - Hematuria
5. Sexual Dysfunction
   - Pelvic Pain
   - Vulvodynia
   - Menopause
Objectives

1. Understand urinary incontinence as a sign or symptom of other conditions and recognize potential treatment options

2. Understand the diagnosis, acute implications, and immediate treatment of pelvic organ prolapse

3. Understand the differential diagnosis, work up, and initial treatment of urinary retention in women

4. Understand proper and recommended diagnosis, evaluation, and treatment of acute and chronic urinary tract infections

5. Be familiar with the recommended diagnosis and workup for microscopic hematuria
Epidemiology

Female Pelvic Floor Disorders
Epidemiology

Prevalence of Pelvic Floor Disorders in US Women

- Life time risk of urogynecologic surgery by age 80 is 11%.

Not a joking matter

- Cost of incontinence
  - Lost wages
  - Incontinence products
  - Admissions to hospitals and care facilities
  - Emotional toll


The annual direct cost of urinary incontinence in the United States (in 1995 dollars) was estimated as $16.3 billion, including $12.4 billion (76%) for women and $3.8 billion (24%) for men.

The largest cost category was routine care (70% of costs for women), followed by nursing home admissions (14%), treatment (9%), complications (6%), and diagnosis and evaluations (1%).
Neurourology
Neurourology

• Neurotransmitters and Receptors
  - Sympathetic (Storage)
    ▪ Beta 3 receptors activated by noradrenaline
      - Promotes detrusor relaxation
    ▪ Alpha 1 receptors activated by noradrenaline
      - Promotes bladder neck contraction
  - Parasympathetic (Voiding)
    ▪ Muscarinic Receptors (M2 and M3) activated by acetylcholine
      - Promotes detrusor contraction
  - Somatic
    ▪ Nicotinic receptors activated by acetylcholine
      - Promotes external urethral sphincter contraction
Neurourology

- **Sympathetic (Storage)**
  - L1, L2, L3
    - Hypogastric Nerve
      » Via Inferior Mesenteric Ganglion

- **Parasympathetic ( Voiding)**
  - S2, S3, S4
    - Pelvic Nerves
      » Via end-organ ganglia

- **Somatic (Voluntary)**
  - S2, S3, S4 from Onuf’s Nucleus
    - Pudendal Nerve
Neurourology

- **Storage --- “Guarding Reflex”**
  - There is low pressure filling of as the bladder accommodates the urine volume
  - Distention (detected by alpha-delta fibers) produces low-level vesical nerve firing
  - Stimulation of the sympathetic system via spinal reflex pathways
  - All promoted and “coordinated” by pontine storage center
Neurourology

- Voiding
  - At some level of distention (via higher-level firing of the alpha-delta fibers), bladder fullness is recognized in the higher cortical areas
  - When socially acceptable, the PMC, (coordinated by the PAG):
    - Promotes the parasympathetic system
    - Inhibits the sympathetic and pudendal outflow
  - This results in:
    - Bladder neck relaxation
    - Relaxation of the external urethral sphincter
    - Detrusor muscle contraction
Neurologic Injury/Disease

Detrusor Overactivity
With or without Detrusor Sphincter Dyssynergia

Areflexic Impaired Contractility

Spinal Cord Injury
Pernicious Anemia

Cauda Equina
Pelvic Plexus
Sacral Injury

CVA
Parkinson's Disease
Normal Pressure Hydrocephalous
Cerebral Palsy
Frontal Lobe Lesion
Trauma/Spinal Cord Injury
Dementia
Patterns of bladder function in neurologic conditions

- **Multiple Sclerosis**
  - Detrusor overactivity - >66%
  - Detrusor sphincter dyssnergia - 25%
  - Detrusor hyporeflexia - 20%

- **Parkinson’s Disease**
  - Detrusor overactivity - 50-75%
  - Psuedodyssynergia - <10%
  - Detrusor hyporeflexia - 12%

- **Stroke & Traumatic brain injury**
  - Initial areflexia
  - Detrusor overactivity is most common result

- **Diabetes mellitus**
  - Detrusor overactivity ~50% (early phase)
  - Impaired contractility/areflexia ~33% (late phase)
Urinary Incontinence
Types of urinary incontinence

- Stress incontinence
- Urgency incontinence
- Incomplete bladder emptying/Urinary retention
  - Overflow incontinence
Initial Evaluation of Urinary Incontinence

• **History**
  - Bladder symptoms
    - Frequency, Nocturia, Urgency, Ability to void
  - Situations that result in leakage

• **Physical**
  - Visualization of urinary incontinence with valsala or cough
  - Post-void residual
    - In and out catheter
    - Bladder scan/ultrasound

- Also need to examine for:
  - Vulvar and vaginal skin integrity
  - Pelvic organ prolapse
  - Extra-urethral leakage (e.g. fistula)
Incontinence Treatment

Stress
- Expectant Management
- Behavioral Therapies
  - Pelvic Floor Exercises
  - Timed Voiding
- Incontinence Pessary
- Surgery

Urgency
- Expectant Management
- Behavioral Therapies
  - Pelvic Floor Exercises
  - Biofeedback
  - Diet
  - Timed Voiding/Bladder Retraining
- Medications
- Neuromodulation
  - Percutaneous Tibial Nerve Stimulation
  - Sacroneuromodulation (Interstim)
- Intravesical Onbotulium Toxin (Botox)
<table>
<thead>
<tr>
<th>Drug Name</th>
<th>Formulation</th>
<th>Starting Doses</th>
<th>Generic Availability</th>
</tr>
</thead>
<tbody>
<tr>
<td>Darifenacin</td>
<td>Extended Release Oral (Enablex)</td>
<td>7.5 mg PO daily</td>
<td>No</td>
</tr>
<tr>
<td>Fesoterodine</td>
<td>Extended Release Oral (Toviaz)</td>
<td>4 mg PO daily</td>
<td>No</td>
</tr>
<tr>
<td>Oxybutynin</td>
<td>Immediate Release Oral (Ditropan)</td>
<td>5 mg PO BID-TID</td>
<td>Yes</td>
</tr>
<tr>
<td></td>
<td>Extended Release Oral (Ditropan XL)</td>
<td>5 mg PO daily</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Transdermal Gel (Gelnique)</td>
<td>Apply 1 package topically daily</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Transdermal Patch (Oxytrol)</td>
<td>Apply one 3.9 mg/24 hour patch every 3-4 days</td>
<td>No</td>
</tr>
<tr>
<td>Solifenacin</td>
<td>Immediate Release Oral (Vesicare)</td>
<td>5 mg PO daily</td>
<td>No</td>
</tr>
<tr>
<td>Tolterodine</td>
<td>Immediate Release Oral (Detrol)</td>
<td>2 mg PO BID</td>
<td>No</td>
</tr>
<tr>
<td></td>
<td>Extended Release Oral (Detrol LA)</td>
<td>4 mg PO daily</td>
<td></td>
</tr>
<tr>
<td>Trospium</td>
<td>Immediate Release Oral (Sanctura)</td>
<td>20 mg PO BID</td>
<td>Yes</td>
</tr>
<tr>
<td></td>
<td>Extended Release Oral (Sanctura XR)</td>
<td>60 mg PO QAM</td>
<td>No</td>
</tr>
</tbody>
</table>

BID = twice a day; OAB = overactive bladder; PO = by mouth; QAM = every morning; TID = 3 times a day.
Medications - Beta-3 Agonist

- **Mirabegron**
  - 25-50mg daily
  - Avoid in uncontrolled hypertension

<table>
<thead>
<tr>
<th>Adverse Events</th>
<th>M 50mg (%)</th>
<th>Placebo (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hypertension</td>
<td>6.1</td>
<td>6.6</td>
</tr>
<tr>
<td>UTI</td>
<td>2.7</td>
<td>3.7</td>
</tr>
<tr>
<td>Headache</td>
<td>3.2</td>
<td>2.0</td>
</tr>
<tr>
<td>Dry mouth</td>
<td>2.8</td>
<td>2.6</td>
</tr>
<tr>
<td>Constipation</td>
<td>1.6</td>
<td>1.4</td>
</tr>
</tbody>
</table>

Compared to Tolterodine
- Similar rates of adverse events
- No difference in efficacy

<table>
<thead>
<tr>
<th>Location</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cerebral cortex, hippocampus, salivary glands, eye</td>
<td>Memory and cognitive function, saliva and tear secretion</td>
</tr>
<tr>
<td>Smooth muscle, hippocampus, hindbrain, cardiac muscle, eye</td>
<td>Bladder contraction, heart rate, tear secretion</td>
</tr>
<tr>
<td>Smooth muscle, salivary glands, eye, brain</td>
<td>Bladder contraction, bowel motility, saliva and tear secretion, visual accommodation</td>
</tr>
<tr>
<td>Basal forebrain striatum, salivary glands</td>
<td>Unknown</td>
</tr>
<tr>
<td>Substantia nigra, eye</td>
<td>Visual accommodation</td>
</tr>
</tbody>
</table>
### Medications

<table>
<thead>
<tr>
<th>Table 1: Common Pharmacologic Therapies: Doses and Side Effect Rates*</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Antimuscarinics/Anticholinergics</strong></td>
</tr>
<tr>
<td>Oxybutynin ER (5–30 mg o.d.)</td>
</tr>
<tr>
<td>Oxybutynin CR (5–20 mg o.d.)</td>
</tr>
<tr>
<td>Oxybutynin patch</td>
</tr>
<tr>
<td>Tolterodine ER (4 mg o.d.)</td>
</tr>
<tr>
<td>Solifenacin (5–10 mg o.d.)</td>
</tr>
<tr>
<td>Trospium chloride (20 mg b.i.d.)</td>
</tr>
<tr>
<td>Darifenacin (7.5–15 mg)</td>
</tr>
<tr>
<td><strong>β₃-Adrenoreceptor Agonists</strong></td>
</tr>
<tr>
<td>Mirabegron (25–50 mg o.d.)**</td>
</tr>
<tr>
<td>Disease or Syndrome</td>
</tr>
<tr>
<td>---------------------</td>
</tr>
<tr>
<td>Dementia or cognitive impairment</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>Delirium</td>
</tr>
<tr>
<td></td>
</tr>
</tbody>
</table>

American Geriatrics Society 2015 Updated Beers Criteria for Potentially Inappropriate Medication Use in Older Adults. JAGS 63:2227-2246, 2015
Medications - Anticholinergics

• Important differences:
  • Extended release is preferred over immediate release
    • Less side effects
  • Darifenacin is most M3 selective
    • No difference in side effects
    • Avoid in combination with Coumadin

• Trospium
  • Quaternary Amine
    • Does not cross the blood brain barrier
    • Renal excretion
    • Take on empty stomach
<table>
<thead>
<tr>
<th>Reversible Causes of Urinary Incontinence</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>DIAPPERS</td>
<td>Pharmaceuticals</td>
</tr>
<tr>
<td>Delirium</td>
<td>Diuretics</td>
</tr>
<tr>
<td>Infection (UTI)</td>
<td>SGLT-2 inhibitors (gliflozins)</td>
</tr>
<tr>
<td>Atrophic urethritis/vaginitis</td>
<td>ACE - Inhibitors</td>
</tr>
<tr>
<td>Psychosocial/depression</td>
<td>Narcotics</td>
</tr>
<tr>
<td>Excessive fluid/overload/CHF</td>
<td>Sedatives</td>
</tr>
<tr>
<td>Restricted mobility</td>
<td>Anticholinergics</td>
</tr>
<tr>
<td>Stool impaction</td>
<td>Alpha agonists</td>
</tr>
<tr>
<td></td>
<td>Alcohol</td>
</tr>
<tr>
<td></td>
<td>Caffeine</td>
</tr>
</tbody>
</table>

Potential Solutions

**Physical/cognitive disability**
- Treat underlying cause
- Bedside commode
- Walker
- Grab rails

**Fecal Impaction**
- Disimpaction
- Fiber
- Bowel regimen with stool softeners, laxatives
- Physical activity

**Fluid overload**
- Diet (sodium reduction)
- Adding or discontinuing diuretics based on situation
- Leg elevation
- Support stockings
- Decrease caffeine and alcohol

**Drug side effects/polypharmacy**
- Discontinue medications if appropriate
- Adjust dosing or timing

Nocturia

- Waking at night to void which is preceded and followed by sleep

Causes
- Low volume bladder
- Increased night time production
- Sleep disturbances

Treatment
- Treatment of underlying condition
- Overactive bladder medications
Nocturia

- Waking at night to void which is preceded and followed by sleep

- Causes
  - Low volume bladder
  - Increased night time production
  - Sleep disturbances

- Treatment
  - Treatment of underlying condition
  - Overactive bladder medications
  - DDAVP (desmopressin)

- Increased night time production
  - Polyuria >3L per 24h period
    - Poor diabetic control
    - Primary polydipsia
  - Nocturnal polyuria >33% of 24h urine production
    - Loss of diurnal arginine vasopressin
  - Fluid mobilization from edema or CHF
  - Excessive daytime fluid intake
  - Medications: diuretics, NSAIDs,
Nocturia

- Waking at night to void which is preceded and followed by sleep

- Causes
  - Low volume bladder
  - Increased night time production
  - Sleep disturbances

- Treatment
  - Treatment of underlying condition
  - Overactive bladder medications

Sleep disturbances

- Obstructive sleep apnea
  - Nocturia seen in 50% of untreated OSA
  - Increased ANP production
Pelvic Organ Prolapse
Pelvic Organ Prolapse

- The descent of one or more of the anterior or posterior vaginal wall, cervix, uterus, or apex of the vagina that correlates with relevant pelvic organ prolapse symptoms.
- Usually at the level of the hymen or beyond

Symptoms

- Complaint of a “bulge” or “something coming down” towards or through the vaginal introitus. This can be seen or felt.
- Urinary symptoms such as retention, frequency, or urgency can occur with anterior prolapse
- Incomplete defecation or the need for “splinting or digitation” can occur with posterior prolapse

Evaluation of Pelvic Organ Prolapse

• Physical Exam
• Assess level of bother
• Assess bladder emptying
  - Post-void residual (PVR)
    ▪ In and out catheter
    ▪ Ultrasound
• Pelvic floor muscle strength
Pelvic Organ Prolapse Treatment

- Expectant Management
- Pelvic Floor Muscle Exercises
- Pessary
- Surgery
Pessary

- Two most commonly used:
  - Ring with support
  - Gelhorn
- Both have been shown to be equally effective relieving symptoms of POP and voiding dysfunction on cross-over study.
  - Cundiff, et al. 2007
- Vaginal estrogen cream
- Initial f/u in 1-4 weeks
- Then 3-6 months

Complications
- Discharge/Odor
- Vaginitis
- Bleeding
- Ulceration
- Obstruction
- Fistula
- Hydronephrosis
Incomplete Bladder Emptying/Urinary Retention
“Overflow Incontinence”
Definitions

• Urinary retention - Complaint of the inability to pass urine despite persistent effort.

• Acute retention of urine - This is defined as a generally (but not always) painful, palpable or percussable bladder, when the patient is unable to pass any urine when the bladder is full.

• Chronic retention of urine - This is defined as a non-painful bladder, where there is a chronic high PVR.
Pathophysiology

• Varies depending on condition

• Usually involves one of these mechanisms:
  - Detrusor underactivity
  - Obstruction
Prevalence

- No reliable numbers
- One random sample of women showed elevated PVRs
  - 100mL in 8-9% of patients
  - 150mL in 5% of patients

Clinical presentation

- Pain in the pelvis (if acute)
- Urinary frequency or urgency
- Feeling of incomplete emptying
- Slow or intermitted stream
- Hesitancy
- Incontinence
- Recurrent urinary tract infection
Differential Diagnosis

• Detrusor underactivity
  - Age
  - Diabetes mellitus
  - Neurologic disorders
  - Medications

• Obstruction
  - Anatomic
    ▪ Urethral distortion
    ▪ External urethral compression
    ▪ Intrinsic urethral lesion
  - Functional
    ▪ Dysfunctional voiding
    ▪ Detrusor sphincter dyssynergia
    ▪ Fowler’s syndrome
    ▪ Primary bladder neck obstruction
Diagnosis

- History and physical
- Post void residual
  - >100-150mL
  - >200mL
- Simple uroflometry
- Multi-channel urodynamics with EMG
- Videourodynamics

- Laboratory evaluation
  - BUN/Creatinine
- Urethrocystoscopy
  - Evaluate for intrinsic lesion
- Renal ultrasound
  - To evaluate for hydronephrosis
Treatment - Initial options

• Clean intermittent self catheterization
• Foley catheter
Treatment - Long-term options
Treat the underlying etiology

• Detrusor underactivity
  - Sacral neuromodulation
  - Intraurethral valve-pump

• Obstruction
  - Anatomic
    ▪ Correct obstruction
  - Functional
    ▪ Pelvic floor physical therapy
    ▪ Medications (Alpha blockers)
    ▪ Sphincteric botulinum
    ▪ Sacral neuromodulation
Urinary Tract Infections
Epidemiology

- Annual Incidence is 12%
- By age 30, 50% of women have had at least one UTI
  - 25% of these recur within 6 months
- The incidence increases with age
- 10% of women over the age of 60 will have recurrent UTIs
Microbiology

- E. coli is most common pathogen
  - 75-90%
  - P-fimbriated associated with pyelonephritis
- Staphylococcus saprophyticus
- Klebsiella
- Enterbacter
- Serratia
- Proteus
  - Consider evaluation for renal stones
- Pseudomonas
  - Usually due instrumentation/catheter use
- Staph Aureus
  - Consider renal abscess
- Candida
  - Especially in those with DM or are immunocompromised
<table>
<thead>
<tr>
<th>Risk Factors</th>
<th>Not Risk Factors</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sexual activity</td>
<td>Coital voiding patterns</td>
</tr>
<tr>
<td>Spermicides</td>
<td>Fluid habits</td>
</tr>
<tr>
<td>Previous UTI</td>
<td>Voiding habits</td>
</tr>
<tr>
<td>Family history of UTI</td>
<td>Douching</td>
</tr>
<tr>
<td>Congenital abnormalities</td>
<td>Tampons</td>
</tr>
<tr>
<td>Pelvic Anatomy</td>
<td>Type of underwear</td>
</tr>
<tr>
<td>- Decreased distance from urethra to anus</td>
<td>Hot tubs</td>
</tr>
<tr>
<td></td>
<td>BMI</td>
</tr>
</tbody>
</table>
Clinical Presentation

- Acute onset of
  - Dysuria
  - Frequency
  - Urgency
  - Nocturia
  - Suprapubic discomfort
  - Worsening incontinence
  - Microscopic hematuria
  - Gross hematuria

- Upper Urinary Tract Infection
  - Fever
  - Chills
  - Malaise
  - Flank pain
  - CVA Tenderness
  - Nausea
  - Vomiting
**Diagnosis**

**Urine Dip**
- Considered positive with the presence of leukocytes or nitrites
  - Sensitivity 75%
  - Specificity 82%
- If positive for both leukocytes and nitrites
  - Sensitivity 98-99%
- Leukocytes
  - PPV - 19-88%
  - NPV - 97-99%
- Nitrites
  - PPV - 94%

**Urine Culture**
- Considered gold standard
- >100,000 CFU
- >100 CFU (or less) can be considered positive in a symptomatic patient or catheter obtained specimen
- Always obtain in situations of:
  - Recurrent UTI
  - Complicated UTI
  - Suspected pyelonephritis
Radiologic Imaging --- Consider in these situations

- **Renal Ultrasound**
  - Incomplete cure or recurrent of same organism
  - Recurrent pyelonephritis
- **Noncontrast CT**
  - Concern for renal stones
    - Proteus urine cultures
- **MRI**
  - Suspected urethral diverticulum
Role of Cystoscopy

• Urethrocystoscopy in women with recurrent UTI is controversial as findings seldom change management

• It is reasonable to consider in patients with
  - Inadequate response to therapy
  - Gross hematuria
  - Suspected urethral diverticulum
  - Suspected foreign body (mesh or suture)
  - Concern for bladder cancer
Treatment---Simple Acute Cystitis

- **Expectant management**
  - Spontaneous resolution in 25-42% of women

- **Antibiotic Treatment**
  - Nitrofurantonin (Macrobid) 100mg BID 5-7 days
    ▪ Efficacy 84-95%
  - Sulfamethoxazole/Trimethoprim 800/160 (Bactrim DS) BID 3 days
    ▪ Efficacy 90-100%
    ▪ Unless local resistance is >20%
  - Fosfomycin 3gm once
    ▪ Efficacy 91%
    ▪ Expensive

  - b-lactam agents (Augmentin, cefdinir, cefaclor, cephalexin) for 3-7 days can be used when needed
    ▪ Efficacy 79-80%
  - Amoxicillin or Ampicillin should not be used empirically
    ▪ High prevalence of resistance worldwide

- **Fluoroquinolones 3 day course**
  - Efficacy 85-98%
  - Developing resistances
  - NEVER FIRST LINE AGENT
## Adult Treatment Recommendations

The table below summarizes the most recent recommendations for appropriate antibiotic prescribing for adults seeking care in an outpatient setting. Antibiotic prescribing guidelines establish standards of care and focus quality improvement efforts.

The table also offers information related to over-the-counter medication for symptomatic therapy. Over-the-counter medications can provide symptom relief, but have not been shown to shorten the duration of illness. They also have a low incidence of minor adverse effects. Providers and patients should weigh the potential for benefits and minor adverse effects when considering symptomatic therapy.

Download a [Quick Reference Table](#) of this information, as well as resources for your practice from Get Smart’s Print Materials for Healthcare Professionals section.

<table>
<thead>
<tr>
<th>Condition</th>
<th>Epidemiology</th>
<th>Diagnosis</th>
<th>Management</th>
</tr>
</thead>
</table>
| Acute uncomplicated cystitis | - Cystitis is among the most common infections in women and is usually caused by *E. coli*. | - Classic symptoms include dysuria, frequent voiding of small volumes, and urinary urgency. Hematuria and suprapubic discomfort are less common. - Nitrites and leukocyte esterase are the most accurate indicators of acute uncomplicated cystitis | For acute uncomplicated cystitis in healthy adult non-pregnant, premenopausal women:
  - Nitrofurantoin, trimethoprim/sulfamethoxazole (TMP-SMX, where local resistance is <20%), and fosfomycin are appropriate first-line agents.  
  - Fluoroquinolones (e.g. ciprofloxacin) should be reserved for situations in which other agents are not appropriate. |
Researchers working at Walter Reed Institute of Research have found *mcr-1* E. coli in a bacteria cultured from a Pennsylvanian who sought treatment for a urinary tract infection. This is the first confirmed appearance of the colistin-resistant strain of the bacteria in a human in the United States.

Published reports say that the patient, a 49-year-old woman from Pennsylvania, has since recovered.
Asymptomatic Bacturia

- Bacturia without symptoms
- Does not need to be treated in the non-pregnant woman
Recurrent or Relapsing Urinary Tract Infection

- Recurrent UTI
  - 3 or more infections in a year
  - 2 or more infections in 6 months
  - Infections must be separated by more than 2 weeks or have documented treatment success in between infections
  - Culture proven

- Relapsing infection
  - Recurrent infection with the same bacteria within two weeks
  - Culture proven
Treatment of Recurrent UTI

• Topical Estrogen
  - Normalizes vaginal flora and pH of the vagina
  - Supported by RCTs
  - Oral estrogens not shown to be helpful

• Cranberry Capsules
  - Inhibits adherence of bacteria to uroepithelial cells
  - Mixed data on effectiveness
Suppression Antibiotics

- Postcoital Prophylaxis
  - 92% effective
  - Single dose of antibiotic as soon after intercourse as possible

- Patient initiated/self-diagnosis and treatment
  - 85-95% effective
  - High patient satisfaction
  - Less antimicrobial exposure
  - Urine culture should be obtained periodically
  - Patient should have reliable symptoms

- Continuous suppression antibiotic
  - 95% effective
  - Increased risk of side effects
  - Increased risk of resistance
  - Duration of 6 months (up to 12 months at times)
# Treatment of Recurrent Urinary Tract Infections

## Antibiotic Choices

<table>
<thead>
<tr>
<th>Antibiotic</th>
<th>Dose/Preparation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nitrofurantoin</td>
<td>50-100mg</td>
</tr>
<tr>
<td>TMP-SMX (Bactrim)</td>
<td>40/200mg or 80/400mg</td>
</tr>
<tr>
<td>TMP (Trimethoprim)</td>
<td>100mg</td>
</tr>
<tr>
<td>Cephalexin</td>
<td>250mg</td>
</tr>
<tr>
<td>Fosfomycin</td>
<td>3g sachet</td>
</tr>
</tbody>
</table>
Other Strategies

• Avoid spermicides if routinely used
  - Change to alternate form of contraception as spermicide use alters the vaginal flora

• Methenamine Salts
  - Converted to formaldehyde in urine
  - No clear evidence
  - Con be tried in recurrent UTI situations that have not responded to usual antibiotic strategies

• Adhesion blockers (D-mannose)
  - Little data to routinely recommend
  - Likely few side effects

• Probiotics
  - Inconsistent efficacy with oral or vaginal dosing
Other Strategies

• Voiding habits
  - Postcoital voiding
• Fluid habits/intake
• Avoiding delayed urination
• Direction of wiping
• Underwear type
• Avoid Douching

None of these strategies have been shown to be effective in case-control studies.

They are low risk and could be suggested.
Microscopic Hematuria
Microscopic Hematuria

• Diagnosis
  - ≥ 3 RBC per HPF on microscopic urinalysis
    ▪ Not diagnosed on urine dip stick
    ▪ Only single finding needed
    ▪ Not associated with any other cause (UTI)

Microscopic Hematuria

- **Work-up**
  - History and physical to identify any other potential cause and access risk for bladder cancer
  - Determine renal function
    - BUN/Creatinine
  - CT urogram
    - Evaluation of the upper urinary tract
  - Urethrocystoscopy
    - Evaluation of the lower urinary tract
  - Cytology and urine markers are NOT part of the routine evaluation

Conclusions
Conclusions

- Consider neurologic disorders when treating urinary incontinence
- Recognize the various types of urinary incontinence, their treatments, and potential side effects
- Recognize reversible causes of urinary incontinence
- Consider pelvic organ prolapse as a potential cause or urinary retention or recurrent urinary tract infections
- Remember to check post void residual
- Use appropriate antibiotics and strategies for treating acute and recurrent urinary tract infection
- Initiate hematuria work up when appropriate