



## Geriatric Urinary Incontinence: A Cross-Disciplinary, Patient-Centered Approach

W11, 15 October 2012 09:00 - 12:00

| Start | End   | Topic  | Speakers   |
|-------|-------|--|--|
| 09:00 | 09:10 | Introduction and Objectives  | <ul style="list-style-type: none"> <li>• Tomas L Griebling</li> </ul>  |
| 09:10 | 09:35 | The Brain and Bladder in Older Adults: New Data on Pathophysiology of Urinary Incontinence | <ul style="list-style-type: none"> <li>• George Kuchel</li> </ul>      |
| 09:35 | 09:50 | Cognition, Affect, Motivation and Medications: Influence on Urinary Incontinence           | <ul style="list-style-type: none"> <li>• Catherine E DuBeau</li> </ul> |
| 09:50 | 10:10 | The Environment, Caregivers and Urinary Incontinence in Older Adults                       | <ul style="list-style-type: none"> <li>• Mary H Palmer</li> </ul>      |
| 10:10 | 10:30 | Questions  | All  |
| 10:30 | 11:00 | Break  | None   |
| 11:00 | 11:15 | Practical Methods of Measurement: Incontinence, Functional Status and Quality of Life      | <ul style="list-style-type: none"> <li>• Tomas L Griebling</li> </ul>  |
| 11:15 | 11:50 | Case Vignettes and Discussion  | All  |
| 11:50 | 12:00 | Questions  | All  |

### **Aims of course/workshop**

Despite extensive research and use of evidence-based practice, urinary incontinence remains highly prevalent in older adults. Successful care requires a strong working knowledge of fundamental geriatric principles. This workshop examines key concepts and their influence on this geriatric syndrome. Non-genitourinary disorders and conditions affecting cognition, affect and mobility will be discussed, including practical assessment methods. The impact of environment and caregivers will be explored. Multiple short case vignettes will illustrate and highlight key learning concepts. Each faculty member will bring their unique cross-disciplinary perspective while keeping focus on patient outcomes. Active audience participation will be encouraged.

### **Educational Objectives**

Urinary incontinence is highly prevalent in the geriatric population. Successful care requires a strong working knowledge of fundamental geriatric principles. This educational course provides a cross-disciplinary perspective of assessment and management of this condition with emphasis on patient outcomes. New scientific information with practical application about potentially mutable contributors outside the genitourinary tract will be reviewed. The panel includes two geriatricians, a geriatrics continence nursing specialist, and a geriatrics urologist who will discuss critical issues in the evaluation and management of elderly patients with urinary incontinence. Practical learning concepts will be highlighted through the use of multiple short case vignettes with active panel and audience discussion. This program will have broad appeal to attendees who seek an interactive session and who work with older adults in their practice and research.

# **Geriatric Urinary Incontinence: A Cross-Disciplinary Patient-Centered Approach**

## **The Brain and Bladder in Older Adults: New Data on Pathophysiology of Urinary Incontinence**

**George Kuchel, MD**  
Citicorp Chair in Geriatrics and Gerontology  
Professor of Medicine and Chief – Division of Geriatrics  
Director – University of Connecticut Center on Aging  
The University of Connecticut  
Farmington, Connecticut USA

## **Cognition, Affect, Motivation and Medications: Influence on Urinary Incontinence**

**Catherine E. DuBeau, MD**  
Professor of Medicine  
Clinical Chief – Division of Geriatric Medicine  
University of Massachusetts Medical School  
UMassMemorial Medical Center  
Worcester, Massachusetts USA

## **The Environment, Caregivers, and Urinary Incontinence in Older Adults**

**Mary H. Palmer, PhD, RN, C**  
Helen W. & Thomas L. Umphlet Distinguished Professor in Aging  
Interim Co-Director, Institute on Aging  
University of North Carolina at Chapel Hill  
Chapel Hill, North Carolina USA

## **Practical Methods of Measurement: Incontinence, Functional Status and Quality of Life**

**Tomas L. Griebing, MD, MPH (Course Director)**  
**John P. Wolf 33<sup>rd</sup> Masonic Distinguished Professor of Urology**  
Professor and Vice-Chair – Department of Urology  
Faculty Associate – The Landon Center on Aging  
Assistant Dean for Student Affairs  
The University of Kansas  
Kansas City, Kansas USA

## Case Study #1

**Profile:** Mr. Jones is a 74 year old man diagnosed with Parkinson's disease 6 years ago. He has had some progression of his symptoms over the past year, and is now using a quad-cane for ambulation, to assist with balance. His Hoehn-Yahr Scale score is 3 (balance impairment, mild to moderate disease, physically independent). He is able to stand up slowly from a sitting position during the day, but prefers to have help to get out of bed at night. He lives at home (two story house) with his 70 year old wife who is in good health and physically independent. He does require some assistance with bathing and dressing.

Mr. Jones presents for evaluation of mixed urinary symptoms. He has been diagnosed with benign prostatic hyperplasia (BPH) about 4 years ago, and has been on medication therapy. He reports a slow urinary stream, with difficulty starting his urination, and does not feel that he completely empties his bladder when he voids. He complains of urinary frequency (12 times / day), urgency, and some urge incontinence (3-5 times / day). He has nocturia (3 times / night) and occasionally wakes up wet. He uses pads only if he is going out of the house.

### Other Current and Past Medical History:

Parkinson's disease has been relatively stable, with some progression over the past year (balance). His medications for this have been stable except for a slight increase in his levodopa therapy. No evidence of multi-system atrophy.

Hypertension moderately controlled. Adjustments to medications are ongoing with his primary care physician.

Angina – treated about 12 years ago, nonactive  
Negative coronary artery angiography at that time

Mild memory changes over the past two years

|                  |   |
|------------------|---|
| Height:          | 6'3"  |
| Weight(lbs):     | 265   |
| BP (mmHg)        | 155/87  |
| Pulse(bpm)       | 80  |
| Respirations/min | 16  |
| Temperature (F): | 98.3°   |
| Chest :          | Clear to auscultation and percussion  |
| Abdomen :        | Soft, nondistended  |
| Neurologic :     | Pill-rolling tremor   |
| Genital exam :   | Penis circumcised, no lesions; testes slightly atrophic, no masses            |
| Rectal exam:     | 40 gram prostate, smooth, no nodules, normal sphincter tone, no rectal masses |

### Past Surgical History / Family and Social History

Non-smoker, non-drinker  
Retired college professor (economics)  
Mother died at 91 – congestive heart failure  
Father died at 84 – stroke  
Two daughters (54 and 51) – both in good health  
One lives in town, and one lives 500 miles away

|                                   | Year |
|-----------------------------------|------|
| Bilateral inguinal hernia repairs | 2001 |
| Right total knee replacement      | 2004 |

**Review of Systems:**

Mild joint pain in hands and knees (arthritis)  
 Occasional constipation  
 Wears glasses, normal hearing  
 Otherwise negative

**Medications:**

carbidopa : levodopa (25 : 250) – four times daily  
 tamsulosin 0.4 mg PO q HS  
 finasteride 5 mg PO q Day  
 furosemide 20 mg PO at 8 am and noon  
 donepezil 10 mg PO q Day  
 acetaminophen prn for joint pain  
 fiber and stool softeners prn for constipation

**Labs:**

EKG:  
 Normal sinus rhythm  
 CXR:  
 Clear without masses or infiltrates

|                    |      |
|--------------------|------|
| Na                 | 142  |
| K                  | 3.9  |
| BUN                | 11   |
| Creatinine         | 0.8  |
| PSA                | 2.7  |
| Hemoglobin (gm/dl) | 11.3 |
| Hemocrit           | 32%  |

**Additional Tests:**

- Timed-Up-and-Go = 57 seconds (using quad-cane)
- Hoehn-Yahr Scale score = 3 (balance impairment, mild-moderate disease, physically independent) – although does request assistance getting in and out of bed
- Mini-Cog assessment = Missed 2 items on recall, normal clock-drawing
- Mini-Mental State Examination (MMSE) = 25 (missed interlocking pentagrams,
- ADL = independent on all activities except bathing and dressing (requires one-person assist)
- IADL = requires some assistance with most activities. He does not drive, and requires help to use transportation. His wife takes care of shopping, meals, and the family finances
- Geriatric Depression Scale = 2 (non-depressed) (does not feel ‘full of energy’; and has ‘more problems with memory’)
- Post-void residual volume = 170 mL

# **The Brain and Bladder in Older Adults: New Data on Pathophysiology of Urinary Incontinence**

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**Citicorp Chair in Geriatrics and Gerontology**  
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**The University of Connecticut**  
**Farmington, Connecticut USA**

## **Role of Nervous System in Bladder Storage and Voiding**

- Urothelial cells, myofibroblasts and sensory nerve cells mediate the sensation of bladder filling and distension<sup>1</sup>
- Periaqueductal gray (PAG) regions in the brainstem receive these sensory signals which then project to the insula, a region of the cerebral cortex which lies in the fissure between temporal and frontal lobes, playing a role in emotion and body homeostasis.
- Anterior cingulate cortex (ACG) monitors and controls, while the prefrontal cortex makes ultimate decisions<sup>2</sup>.

## **Parkinson's Disease (PD)**

- Bladder and bowel dysfunctions are common in Parkinson's disease<sup>3,4</sup>
- Unlike motor manifestations, these often do not respond to levodopa<sup>3,4</sup>
- Altered dopamine-basal ganglia circuits are felt to contribute to presence of DO<sup>3,4</sup>
- 19% of PD subjects have DO during storage with weak detrusor activity during voiding<sup>5</sup>
- Functional bladder outlet obstruction in some with increased EMG activity during voiding which has been attributed to detrusor sphincter dyssynergia (DSS)<sup>6</sup>
- Other studies have suggested that DSS and elevated PVRs are rare in the setting of PD, yet are much more common in individuals with multiple combined atrophy (MCA)<sup>7</sup>

## **CNS White Matter Hyperintensities (WMH)**

- Formerly known as leukoaraiosis<sup>8</sup>
- Cerebral white matter contains fiber pathways which include axons linking cortical areas to each other and to subcortical structures<sup>9</sup>
- White matter hyperintensities are very common on MRI scans conducted in older adults
- Depending on extent and localization, individuals may be asymptomatic or may suffer from specific deficits

- Individuals are especially vulnerable to developing disconnection syndromes involving frontal/subcortical pathways which result in declines in mobility, affect, executive function and incontinence<sup>10,11</sup>
- Presence of WMH in the right inferior frontal regions and selected WM tracts were found to predict UI, UI severity and degree of bother in 100 community-dwelling older adults<sup>12</sup>.
- Total volume of WMH was also found to be a sensitive predictor of declines in voiding, mobility and cognition in these individuals<sup>11</sup>, with WMD representing a shared risk factor for these conditions
- In another study, regional activation on fMRI more prominent in subjects with increased WMD burden, suggesting that activity targeted at suppressing urgency increased<sup>13</sup>.
- Hypertension<sup>14</sup>, diminished nocturnal dip in BP<sup>14</sup> and proteinuria<sup>15</sup> have been associated with WMD raising the possibility that aggressive hypertension treatment might delay the onset and progression of WMD and its related disability

### **A System-Based Approach to Bladder Control and Continence**

- Goal of therapy must be to address those symptoms which most impact functional independence and are especially troublesome from the patient's individual perspective
- "Bladder-centric" perspective is insufficient in many older patients
- Ability to sense and then appropriately process the sensation of urgency may be an even more important determinant of continence than the actual presence or absence of urgency
- Compensatory mechanisms may include activation of brain regions as part of an effort to suppress detrusor contraction<sup>13</sup>, increased activation of supplemental motor areas as a potential means of favouring better urethral and pelvic muscle control<sup>16</sup>, CNS-mediated increases in bladder compliance in order to facilitate urine storage<sup>17</sup> and efforts to walk more rapidly to a suitable bathroom setting<sup>18</sup>.
- It is not uncommon for declines in mobility or higher brain function to result in an individual with manageable urgency to then progress to urgency incontinence
- Multi-component interventions designed to both improve bladder control via prompted voiding and to also improve gait performance through an exercise training regiment can be effective in frail older adults<sup>19</sup>
- Targeted interventions (e.g. trial of intensive blood pressure control) designed to slow the progression of brain white matter disease and related declines in mobility performance may also help promote continence<sup>20</sup>.

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# **Cognition, Affect, Motivation and Medications: Influence on Urinary Incontinence**

**Catherine E. DuBeau, MD**

**Professor of Medicine**

**Clinical Chief – Division of Geriatric Medicine**

**University of Massachusetts Medical School**

**UMassMemorial Medical Center**

**Worcester, Massachusetts USA**

## **1. Cognition**

- a. Neuropsychiatric disorders affecting incontinence
  - i. Dementias
  - ii. Stroke
  - iii. Parkinsons disease
- b. Mechanisms
  - i. Involvement of cortical and subcortical areas governing micturition
  - ii. Cognition
  - iii. Functional impairment and decline
- c. Cognitive assessment in UI evaluation and management
  - i. Measures
    1. Mini-Cog
    2. MiniMental State Exam

## **2. Affect and Motivation**

- a. Epidemiological association between depression and UI
- b. Possible mechanisms
- c. Role of incontinence in worsening depression
- d. Assessment for depression in UI evaluation and management
  - i. ICI Recommendation
  - ii. Geriatric Depression Scale

## **3. Medications and UI**

- a. Application of Geriatric Pharmacotherapy principles
  - i. Polypharmacy
  - ii. Prescribing cascades
  - iii. Drug-disease interactions
  - iv. Drugs to Avoid in Older Persons: Beers Criteria

- b. Mechanisms by which drugs can cause/worsen UI
  - i. LUT effects
  - ii. CNS effects
  - iii. “Indirect effects” on continence
- c. Evidence base for drugs causing UI
  - i. Alpha blockers
  - ii. Estrogen
  - iii. Antianxiety/hypnotics
  - iv. Cholinesterase inhibitors
  - v. Drugs associated with urinary retention
  - vi. Other medications

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# **The Environment, Caregivers, and Urinary Incontinence in Older Adults**

**Mary H. Palmer, PhD, RN, C**  
**Helen W. & Thomas L. Umphlet Distinguished Professor in Aging**  
**Interim Co-Director, Institute on Aging**  
**University of North Carolina at Chapel Hill**  
**Chapel Hill, NC USA**

## **Environment and its role in geriatric urinary incontinence**

What do we mean by the term, “environment”?

In this context, the environment consists of the physical, social, and cultural conditions surrounding the older adult.

Why is the environment important?

The environment can powerfully affect, both positively and negatively, the physical and psychological health of the older adults, as well as their ability and motivation to function within that environment.

Repetitive stress injuries, occupational injuries, and psychological stress are all observed environmental effects on the individual in the workplace. The environments in which older adults live exert no less powerful influence on them.

## **Environmental Factors affecting Urinary Continence:**

### Physical factors:

Household settings:

Lighting, location of and distance to toilet, privacy, toilet height, cleanliness, presence of clutter, fall hazards

Public places:

Provision of public toilets, awareness of toilet locations, access to toilets, safety, cleanliness, privacy

Health care delivery settings:

Acute care: restraints, use of absorbent products

Long-term care: toilet or commode access, barriers to dignity and privacy

Social factors:

Household settings:

Living alone vs. with spouse, intergenerational households, knowledge, attitudes and beliefs about urinary incontinence and its treatment and management

Neighbors and neighborhood:

Social engagement and social isolation

Social and spiritual groups:

Social support, social engagement, and coping

Cultural factors:

Norms regarding urinary continence, cleanliness and hygiene

Expectations and beliefs regarding aging

Stigma

Attribution for the problem/attribution for the solution by the public accepted or rejected by the affected older adults



## **Caregivers and Urinary Incontinence in Older Adults**

### Informal caregivers:

Availability, knowledge, skill level, attitudes, and beliefs about urinary incontinence, and burden of care.

Resources available to family caregivers.

### Formal caregivers:

#### Caregivers in home health care:

Assessment and treatment of urinary incontinence by home health care nurses.

Education and other resources for home care staff.

#### Caregivers in long-term care:

Staff knowledge, attitudes, and beliefs, behavioral interventions and other treatment and management strategies.

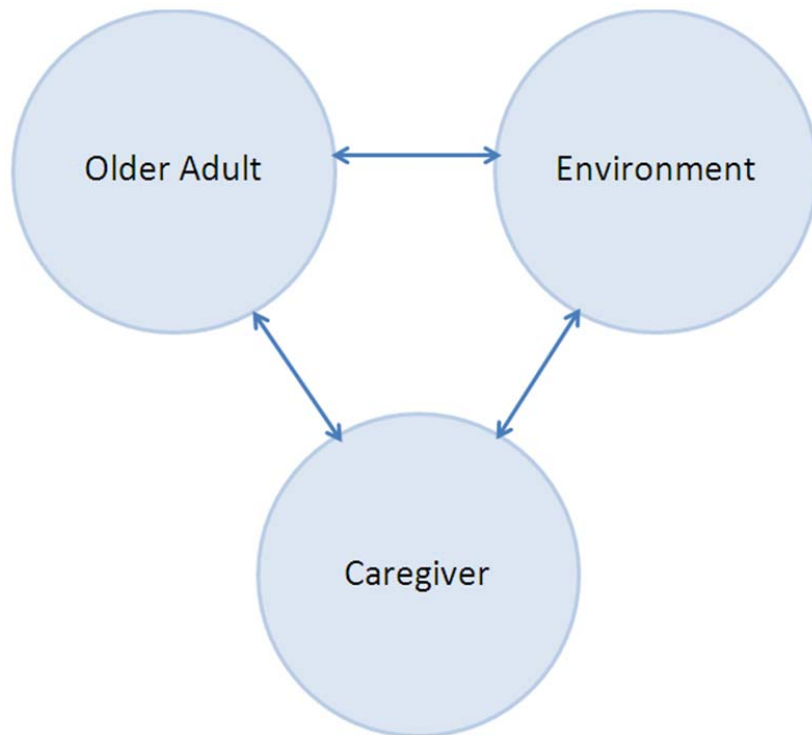
Impact of residents' and families expectations and preferences.

#### Caregivers in acute-care:

Use of absorbent products, knowledge, attitudes, and beliefs about urinary incontinence and aging.

## Changing the paradigm from Incontinence Care to Continence Promotion

The older adult does not exist in isolation from either the environment or the caregiver. The environment interacts with the older adult cognitive and toileting abilities to either support or threaten continence. Similarly, the caregiver interactions with the older adult either support or threaten continence. Just as important, the environment supports or threatens the caregiver's behavior in promoting continence.



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# **Practical Methods of Measurement: Incontinence, Functional Status and Quality of Life**

**Tomas L. Griebeling, MD, MPH**  
**John P. Wolf 33<sup>rd</sup> Masonic Distinguished Professor of Urology**  
**Professor and Vice-Chair – Department of Urology**  
**Faculty Associate – The Landon Center on Aging**  
**Assistant Dean for Student Affairs**  
**School of Medicine**  
**The University of Kansas**  
**Kansas City, KS USA**

## **Frailty**

Frailty compared to normal aging

Increased vulnerability

Decreased ability

Senescence (cellular aging)

Cellular / subcellular

Collagen deposition (including bladder)

Alterations in tissue vasculature

Apoptosis (programmed cell death)

Frailty as a Geriatric Syndrome

Multidimensional, multiple systems

Complex interactions

Clinical outcomes

## Two Theories of Frailty

- Caused by multiple age associated physiological changes

Compounded by chronic disease

Sometimes an end-stage result of disease

Dose-response relationship / summary measure of disease accumulation

Predictive of mortality

- Frailty is a distinct physiological entity

Frailty is a primary defect

Decreased physiological function

Loss of homeostatic regulation

Biomarkers may indicate change

Telomere shortening

Free radical formation

Dysregulation multiple systems

Loss of energy (cellular)

Spiral of functional decline

## Clinical versus Subclinical Frailty

Possible target for intervention / prevention / rehabilitation

## Clinical Frailty

No single accepted diagnostic criteria

Changes occur along a spectrum of clinical conditions

'Physiotype' vs. 'Phenotype'

#### Operational Definitions Frailty

3 or more signs / symptoms indicative of frailty

Decreased strength (quadriceps / hand grip)

Decreased energy (easy fatigue / exhaustion)

Slowed gait speed

Diminished physical activity

Unintentional weight loss

High risk for progression to disability

Frail / vulnerable elderly often excluded from clinical trials

#### Biomarkers and Frailty in Older Adults

Sarcopenia

Hypogonadism

Insulin resistance

Cortisol resistance

Oxidative stress – free radical formation

Elevated pro-inflammatory markers

IL-6

C-reactive protein

Dysregulation of intracellular communication

Undernutrition

Selenium

Vitamin E

Carotenoids

Polyunsaturated fatty acids

#### Prevention and Treatment

Frailty increases risk of mobility and cognitive impairments

Increases risk for urinary and fecal incontinence

Treatment of underlying physiological problems

Maintenance of strength and nutritional intake

Preservation of muscle mass and prevention of sarcopenia

### **Clinical Assessment and Measurement**

#### **ADL – Activities of Daily Living**

- Measurement of level of dependence vs. independence on performing various daily tasks (bathing, grooming, dressing, toileting, etc.)

#### **IADL – Instrumental Activities of Daily Living**

- Includes a higher level of cognitive or complex task functioning regarding daily life tasks (using a telephone, balancing a checkbook, etc.)

#### **Fall Risk**

- Falls are a significant cause of both morbidity and mortality in elderly patients
- Fall prevention is critical in helping to reduce risk
- Should include both patient and environmental assessment

- Things we do to patients can increase fall risk (catheters, restraints, some medications, etc.)
- Assessment of gait and balance (see below)

### **Cognitive Assessment**

- Assessment of cognitive function – general vs. specific techniques
- Mini Mental State Exam (MMSE)
- Mini-Cog – 3 item recall and clock-drawing test
- Provides understanding of baseline function which can help in assessing subsequent problems (delirium)
- Important in ability to give informed consent (capacity)

### **Mobility Assessment**

- Mobility assessment methods
  - Get-Up-And-Go Test
    - Patient stands from chair, walks 10 feet, turns, returns to chair, and sits down
    - Time vs. untimed
- Ability to shower
  - Measures ADL, level of independence
  - Includes some other domains including balance, strength, etc.
- Gait and balance assessment

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## Case Study #2

**Profile:** Mrs. Kilby is an 86 year old woman who was discharged from General Hospital after surgical repair for a left hip fracture on May 6, 2012. She is white of Irish-German descent, a widow of 5 years, and she has one daughter, Katherine Rose, who is 60 year old and lives in the same town as Mrs. Kilby. Prior to her hip fracture, Mrs. Kilby lived alone in her home of 55 years, despite her daughter's urging to sell the house and move into an apartment closer to her. Ms. Rose says that her mother admits to be lonely at times, but she preferred to live alone with her cat, Harry and dog, Ron. Mrs. Kilby had been standing on a foot stool in her bedroom trying to take down curtains when she lost her balance and fell. Mrs. Kilby lay for 8 hours before her daughter found her and called 911. Although Mrs. Kilby wants to go back home, at 4 days post-surgery she is being admitted to a skilled care facility for rehabilitation. Hospital physical therapy notes indicate that Mrs. Kilby was gotten out of bed with the assistance of a physical therapist twice during her stay during each time she sat in a chair in her room and walked to the door of her room with walker and aid of physical therapist. The day before discharge, Mrs. Kilby refused to go to the PT department because of abdominal pain.

**Current medical history:** (on admission to skilled facility): Mrs. Kilby appears agitated and confused not knowing where she is and she is calling for Ron. She is wearing absorbent briefs but denies history of urinary incontinence. Hospital nurses' notes indicate that she has been incontinent of urine and bowels since surgery. A clean and dry surgical bandage is on her left hip. She is missing two teeth due to the fall the resulted in the hip fracture. Her lower lip has two sutures and a large yellowish bruise is on her left cheek. Evidence of bruising is on her left forearm and Mrs. Kilby winces when the area is touched. A stage two pressure ulcer with no exudate on her sacrum is noted.

|                  |                                   |
|------------------|-----------------------------------|
| Height:          | 5'1"                              |
| Weight(lbs):     | 108                               |
| BP (mmHg)        | 140/72                            |
| Pulse(bpm)       | 90                                |
| Respirations/min | 24                                |
| Temperature (F): | 99.2°                             |
| Breath sounds :  | decreased on left, clear on right |
| Bowel sounds :   | normoactive                       |
| Abdomen :        | soft nondistended                 |
| Genital exam :   | deferred                          |
| Rectal exam:     | deferred                          |

### Past history:

No access to medical history of parents. Prior to her hip fracture, Mrs. Kilby was healthy and active, and she rarely visited a physician.

|                            | Year |
|----------------------------|------|
| Vaginal delivery           | 1952 |
| Cataract surgery both eyes | 2008 |

### Medications:

Diphenhydramine 15 mg, p.o. hs for sleep  
 Acetaminophen 650 mg, p.o. q 6 h prn pain  
 Prior to hip fracture (at home):  
 5 gin soaked golden raisins q.d. for arthritis pain  
 1 tab multivitamins for seniors q.d.

### Labs: First day post-op

EKG:  
 normal sinus rhythm

CXR:  
 left lower lobe infiltrate

|                    |      |
|--------------------|------|
| Na                 | 142  |
| K                  | 3.8  |
| BUN                | 36   |
| Creatinine         | 2.3  |
| Glucose            | 124  |
| Hemoglobin (gm/dl) | 10.2 |
| Hemocrit           | 30%  |





## Notes

Record your notes from the workshop here