Geriatric Medicine
First Edition

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Facilitator’s Guide and Answer Key
Introduction

The following nine workbook modules are self-learning tools originally prepared for medicine residents as a companion resource to our website at http://medicine.emory.edu/ger/reynoldsprogram/index.html. By clicking on the “Resource Modules” tab on the left of the website menu, you will be taken to the sections associated with each of the modules. This workbook focuses on core geriatric syndromes and problems that are likely to be encountered during the clinical practice of a family practitioner or internist.

Each module is divided in four parts. The first is a clinical vignette illustrative of the topic. This is followed by a set of tasks that include reading a general overview of the subject, and working with several educational tools available on the companion website. Finally, each module ends with a post-test with at least three “boards-style” multiple choice questions that will test your knowledge of the topic. Each of these modules is intended to be finished in around 60 minutes of uninterrupted time. References and key principle focus (the “Big 10” principles) are listed at the end of each module.

The general objectives for this workbook are:

1. Identify key topics in geriatric medicine and increase your knowledge base through a case-based format.
2. Describe the extent to which iatrogenic issues are part of the management of geriatric syndromes.
3. Describe the multifactorial nature of most geriatric problems.
BASICS IN GERIATRICS
“BIG 10”

1. Aging is not a disease
   a. Aging occurs at different rates
      1) Between individuals
      2) Within individuals in different organ systems
   b. Aging alone does not generally cause symptoms
   c. Aging increases susceptibility to many diseases and conditions (“homeostenosis”)
   d. Aging people are heterogeneous – some are very healthy, some are very ill

2. Medical conditions in geriatric patients are commonly chronic, multiple and multifactorial
   a. Older individuals commonly have multiple chronic conditions, making management complex and challenging
   b. Acute illnesses are superimposed on chronic conditions and their management
   c. Treatment for one chronic or acute illness can influence the management of other underlying conditions
   d. Multiple factors are generally involved in the pathogenesis of geriatric conditions

3. Reversible and treatable conditions are often underdiagnosed and undertreated in geriatric patients
   a. Older individuals, caregivers, and health professionals mistakenly attribute symptoms to “old age”
   b. Many conditions present atypically in the geriatric population
   c. Systematic screening for common geriatric conditions can help avoid undiagnosed, treatable conditions
   d. Geriatric “syndromes” are commonly undiagnosed and therefore not managed optimally, such as: delirium, gait instability and falls, urinary incontinence, pain, and malnutrition

4. Functional ability and quality of life are critical outcomes in the geriatric population
   a. Functional capacity, in combination with social supports, is critical in determining living situation and overall quality of life
   b. Small changes in functional capability (e.g., the ability to transfer) can make a critical difference for quality of life of older patients and their caregivers
   c. Standard tools can be used to measure basic and instrumental activities of daily living and overall quality of life

5. Social history, social support, and patient preferences are essential aspects of managing geriatric patients
   a. Understanding the patient’s life history and preferences for care are critical (place of birth, education, occupation, family relationships, spirituality, resources, willingness to take risks and utilize resources for care, etc)
   b. Living circumstances is critical to managing frail older patients
   c. Caregiver availability, health, and resources are critical determinants of care planning for frail older patients
6. **Geriatric care is commonly multidisciplinary**
   a. Interdisciplinary respect, collaboration, and communication are essential in the care of geriatric patients and their caregivers
   b. Various disciplines play an important role in geriatric care, e.g. nursing, rehabilitation therapists, dieticians, pharmacists, social workers, etc.

7. **Cognitive and affective disorders are highly prevalent and commonly undiagnosed at early stages**
   a. Aging is associated with changes in cognitive function
   b. Common causes of cognitive impairment include delirium, Alzheimer’s Disease, multi-infarct dementia
   c. Geriatric depression is often undiagnosed
   d. Screening tools for dementia, delirium, and depression should be used routinely

8. **Iatrogenic illnesses are common and many are preventable**
   a. Polypharmacy, adverse drug reactions, drug-disease interactions, drug-drug interactions, inappropriate medications all common
   b. Complications of hospitalization, such as falls, immobility and deconditioning can be serious and life threatening

9. **Geriatric care is provided in a variety of settings ranging from the home to long-term care institutions**
   a. There are specific definitions and criteria for admission to different types of care settings
   b. Funding for care in different settings varies and depends on many factors
   c. Transitions between care settings must be coordinated in order to avoid unnecessary duplication, medical errors, and patient injuries
   d. Integrated, multi-level systems provide the most coordinated care for complex geriatric patients

10. **Ethical issues and end-of-life care are critical aspects of the practice of geriatrics**
    a. Ethical issues arise almost every day in geriatric are
    b. Advance directives are critical for preventing some ethical dilemmas
    c. Principles of palliative care and end-of-life care are essential for high quality geriatric care
Objectives:

1. Discuss the diagnosis, etiology, management and prognosis for delirium.

2. Identify the 4 features of the CAM diagnostic algorithm and the criteria for diagnosing delirium.

3. Identify the risk factors for delirium.

4. List interventions to prevent and treat delirium.
Case Vignette:

BT is an 85 year old man who has been admitted to the hospital for repair of a hip fracture he sustained while playing golf. He has a history of hypertension and hypercholesterolemia, both of which are treated. On review of systems, he admits to “memory problems” and difficulty sleeping at night. The day after admission he undergoes total hip replacement. Blood loss is estimated at 300cc with two units of blood transfused during the surgery. He seems to recover well the next day after surgery, is talking with his family about “getting back on the course.”

Four days post-op his wife voices concern that he is “not himself.” He seems to ignore her at times during conversations and is not eating much. She says he is often confused, saying that he asks her if she’s “taken the dog out” when they haven’t had a dog in years. That night he pulls his IV line out and the nurse witnesses him trying to remove his Foley catheter.

Medications are:

- Aspirin 325mg po daily
- Atenolol 25mg po daily
- Simvastatin 20mg po qHS
- Propoxyphene/APAP 1 q4h prn pain
- Diphenhydramine 25mg po qHS prn sleep

The patient’s vital signs are normal except for a temperature of 95.4 F. He seems relatively alert but has difficulty answering questions. He is wearing wrist restraints but is surprised when you point them out to him. The remainder of the exam is normal except for the presence of a foley catheter and a clean, well-healing surgical site on the left hip.
Tasks:

1. Go to the delirium module on the Emory Geriatrics website, and find the section on slide presentations. Please view the presentation on delirium.

2. Apply the Confusion Assessment Method (CAM) as outlined in the assessment tools section to this patient. Does the patient meet criteria for delirium? If so, what specific aspects of the CAM are present?

3. Identify medications the patient is taking that can contribute to this patient's delirium, as outlined in the slide presentation.

4. Many factors associated with delirium may be present even before the patient arrives at the hospital. Were there factors associated with delirium present before this patient's admission?

5. Identify factors associated with delirium that occurred from the time of surgery until the manifestation of delirium on post-op day 4.
1. Which of the following symptoms is not a feature of delirium?
   a. Poor ability to concentrate on a specific question or task
   b. Inability to communicate verbally
   c. Acute onset often in relation to illness or injury
   d. Fluctuation in alertness or attention

2. In the non-ICU setting, the most appropriate initial management of delirium is
   a. Modify the environment (diurnal lighting variation, sound reduction)
   b. Limit use of restraints
   c. Pharmacologic treatment
   d. Evaluation by history, exam and diagnostics

3. Which diagnostic test is not appropriate for the routine initial evaluation of delirium?
   a. Complete blood count (CBC)
   b. Blood chemistry (Metabolic Panel)
   c. Random blood glucose (fingerstick)
   d. Lumbar puncture (LP)

4. Which of the following medications is least likely to precipitate delirium?
   a. Diphenhydramine
   b. Meperidine
   c. Propranolol
   d. Losartan
“Big 10” Principles

3. Reversible and treatable conditions are often underdiagnosed and undertreated in geriatric patients.

7. Cognitive and effective disorders are highly prevalent and commonly undiagnosed at early.

8. Iatrogenic illnesses are common and many are preventable.

References

Objectives:

1. Identify subtypes of dementia.

2. Discuss effective assessment of dementia.

3. Utilize the most common dementia assessment tools.

4. Develop management plans for dementia that include pharmacologic and psychosocial modalities.
Case Vignette:

JR is a 70 year old man who is brought to your outpatient clinic by his 45 year old daughter BG because of a perceived inability to care for him at home. She states that he is generally healthy, but over the course of the last 2 to 3 years she has noticed changes in his memory and behavior. She is mainly concerned about his wandering and need for constant supervision.

On history, she volunteers that she first noticed something was wrong when he started getting lost in the supermarket on grocery trips by himself. He used to be an excellent cook, but now can barely make himself a sandwich. JR also sometimes doesn’t recognize his grandchildren--- last week he yelled at his 10-year-old grandson to “get off my property.”

JR’s past medical history includes hypertension and coronary artery disease with a myocardial infarction 8 years ago. His medications include aspirin 81 mg daily, atenolol 25 mg daily, and hydrochlorothiazide 25 mg daily.

JR needs some help with bathing. As for other basic ADLs\(^1\), he can do his own transfers, feed, and toilet himself; with guidance, can do his own grooming and dressing. However, he is almost completely dependent in instrumental activities of daily living (IADLs).

As for his physical exam, vital signs are within normal limits. The rest of the physical exam is normal, including an evaluation of gait and balance. When you perform a Mini-Cog\(^2\) evaluation, he is able to only remember 1 out of 3 objects you asked him to retain. When asked to draw the face of a clock, he jumbles all the numbers together on one side of the clock face and is unable to figure out how to draw the hands.

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\(^1\) ADL = Activities of Daily Living, on the website see Geriatric Practice Tools > Comprehensive Geriatric Assessment; link is next to Functional: Functional Status section
\(^2\) Mini-Cog = Abbreviated cognitive screen, on the website see Geriatric Practice Tools > Other Assessment Tools > Dementia: Mini-Cog
BG appears anxious throughout the whole interview and keeps repeating statements like “I don’t know what else to do with him.” She is an only child and has no one else to help her with her father.

Tasks:

1. Go to the dementia module on the Reynolds website and look for "Key References." Read article #4 on Early Alzheimer's Disease by Kawas.

2. Go to "practice guidelines" and click on 3, a summary of the American Academy of Neurology guidelines for management of dementia.

3. Use the information from the case vignette as well as the clock-draw test to administer the Mini-cog test available in the “assessment tools” section of the website.

4. Use DSM-IV criteria to assess whether the patient has dementia. Compare with the criteria used in the DSM-IV definition.

5. Develop a management plan that incorporates a global approach, including medication and social interventions. Use overview for discussion on pharmacologic treatment, and you can also link to the Family Caregiver Alliance (go to “websites” in this module) for caregiver resources.
Post-Test:

1. A 75-year-old woman with history of hypertension and coronary artery disease comes to your primary care clinic with her husband because of memory loss, visual hallucinations, and frequent agitation. On exam, she has a masked facies and some cogwheel rigidity.

Which of the following is the most likely diagnosis?  
   a) Alzheimer’s disease  
   b) Vascular dementia  
   c) Dementia with Lewy bodies  
   d) Pick’s disease

2. An 87-year-old man comes into your clinic with his daughter. She is concerned about the fact that he has become increasingly forgetful over the last two years. He is widowed, and lives at home by himself. He is able to bathe, dress, and toilet himself. However, she has noticed that he has forgotten to pay several of his bills in the last several months, and sometimes takes a long time to come up with the names of his own children. Despite occasionally feeling lonely and missing his wife, he says he is in good spirits.

Which of these would be most appropriate to start in this patient at this time?  
   a) Sertraline  
   b) Galantamine  
   c) Memantine  
   d) Quetiapine

3. A 71-year-old man with a history of moderate Alzheimer’s dementia is seen in a primary care office with his son with a chief complaint of “behavior problems”. The patient lives with his son, who works as an attorney part-time and they have a hired caregiver for when the son is not at home. The son says he is frustrated because he has recently received reports from the caregiver that his father has been banging against doors and scratching the walls with his fingernails, behaviors which the patient rarely exhibits when the son is around. The patient is mobile and requires some assistance with most activities of daily living. His physical exam is only remarkable for a mini-mental exam of 17 out of 30. The son is looking for something that can “fix this problem”.

Which of these would be the best initial intervention?  
   a) Quetiapine, 12.5 mg twice a day as needed for agitation  
   b) Giving the caregiver a plan of activities to do with his father  
   c) Donepezil, 5 mg a day  
   d) Citalopram, 10 mg a day  
   e) Firing the caregiver
“Big 10” Principles:

3. Reversible and treatable conditions are often underdiagnosed and undertreated in geriatric patients.

4. Functional ability and the quality of life are critical outcomes in the geriatric population

5. Social history, social support, and patient preferences are essential aspects of managing geriatric patients.

7. Cognitive and affective disorders are highly prevalent and commonly undiagnosed at early stages.

References:

Objectives:

1. Identify risk factors for falls in the elderly.
2. Describe the key components of a gait assessment.
3. Develop management strategies for a patient with falls.
Case Vignette:

JW is an 82-year-old woman who is brought into the primary care clinic by her daughter. The patient’s daughter is concerned about several falls her mother has suffered in the last six months. The patient’s daughter states that the problem is limited to the home, with about five falls in the last month. There has been no definite pattern: one time she slipped on a rug during the day, another time she slipped on the threshold of her bathroom at night. On another occasion, she fell to the ground after feeling lightheaded when getting up from a chair. She has sustained only minor injuries with her falls, but has been staying in her room more because of a fear of falling.

JW has a known history of congestive heart failure and coronary artery disease, as well as insomnia. She takes furosemide, digoxin, aspirin, and trazodone as needed for sleep. On her physical exam her sitting blood pressure and pulse are 155/70 and 65. Standing, those values are 132/65 and 70. Cardiopulmonary exam is unremarkable. Visual acuity in the right eye is 20/200, and 20/30 in the left. Neurologic exam contains no focal abnormalities and good vibratory and fine-touch sensations in her lower extremities.; a mental status exam shows no significant findings.

As for her gait evaluation, you perform a “get-up-and-go” test. She is able to rise out of her chair without using her arms, but only after three attempts. She walks ten feet with slight sway, and turns around very carefully. She has to use her arms to sit back down. All told, the test takes 35 seconds.

The patient’s daughter is very concerned and is wondering what you could do. She is very afraid of the patient having a hip fracture the next time she falls.
Tasks:

1. View the “Falls in the Older Adult” slide presentation in the falls module for background on this subject.

2. Identify at least 5 possible risk factors for falls in this particular patient.

3. Read about the “timed get-up-and-go test” in the assessment tools section. Give your assessment of this patient’s test.

4. Identify 5 interventions you could make for JW that would decrease her risk of future falls.
1. An 87 year old woman comes into your primary care clinic with a complaint of shoulder pain. She says that she fell three days ago at home while walking out of her bathroom. She landed on her right shoulder and denies hitting her head. Your patient says she might have slipped on a rug, but she doesn’t remember. She has a past medical history of diabetes mellitus type 2 with peripheral neuropathy, hypertension, and osteoarthritis. She takes glipizide for her diabetes, lisinopril for her hypertension, amitriptyline for neuropathy, and acetaminophen as needed for joint pain. On examination, her postural vital signs are unremarkable. An evaluation of her gait shows her to have some mild swaying on ambulation only.

Which of these would you do first to decrease the risk of repeat falls?

a) Recommend that the patient purchase hip protectors
b) Start an exercise program directed by a physical therapist
c) Convince the patient to redecorate her home for improved safety
d) Lower her dose of glipizide
e) Change amitriptyline to another drug for neuropathy

2. A 75 year old man with diabetes and osteoarthritis is evaluated in your clinic for recurring falls.

Which of the following is most predictive of future dependence in his activities of daily living?

a) A T score on his bone density of -2.7
b) A greater than 20 point difference between sitting and standing systolic blood pressure
c) Taking 23 seconds to rise from a chair, walk ten steps, turn around, and sit down in that same chair
d) Impaired two-point discrimination in his lower extremities
e) A mini-mental status exam score of 20 out of 30

3. A 74 year old woman with recurrent falls is seen in your clinic with her daughter. She has a history of mild dementia, congestive heart failure, coronary artery disease, and hypertension. She takes furosemide, lisinopril, aspirin, metoprolol, olanzapine, and simvastatin currently. She lives by herself in an apartment she has lived in for forty years, and has help with housekeeping once a week. Her physical examination is remarkable for decreased proximal lower extremity muscle strength.

Which of the following is NOT an evidenced-based intervention for decreasing her risk of falling?

a) Discontinuing furosemide
b) Balance and gait training exercises
c) Initiating donepezil treatment
d) A home safety visit to reduce hazards
e) Discontinuing olanzapine
“Big 10” Principles:

4. *Functional ability and quality of life are critical outcomes in the geriatric population.*

6. *Geriatric care is commonly multidisciplinary.*

8. *Iatrogenic illnesses are common and many are preventable.*

References:


Objectives:

1. Identify potentially reversible conditions that can cause or contribute to urinary incontinence.

2. Utilize appropriate diagnostic tools for the different subtypes of incontinence.

3. Apply non-pharmacologic and medication-based treatments for incontinence.
Case Vignette:

Mr. B is an 82-year-old man who is seen in clinic because of incontinence. He has a history of Alzheimer’s type dementia, glaucoma, and dyspepsia, for which he takes donepezil, timolol eye drops, and ranitidine, respectively. He has a history of a transurethral resection of the prostate (TURP) at age 75, and according to his primary care physician his symptoms of frequency and nocturia did not respond to a recent trial of tamsulosin.

He lives with his daughter and is ambulatory, but is dependent in all basic activities of daily living because of dementia. She reports that his condition seems to be worsening, and he now is voiding about every 2 hours during the day and 4 – 5 times between the hours of 9:00 p.m. and 7:00 a.m. while he is in bed. During the day, the episodes seem to come on without warning, and he is only able to make it to the bathroom about half the time.

About a month after his clinic visit, his daughter notices that over the course of a couple days his incontinence is almost continuous: he is now only voiding in his diapers. He also has become increasingly confused and agitated. The on-call doctor over that weekend prescribes risperidone and lorazepam for his agitation, and diphenhydramine for insomnia, and his problems only seem to get worse. After a fall the next day, he is taken to the emergency department, where he is found to have a temperature of 101F, cloudy urine, and fecal impaction on examination. A post void residual bladder volume yields 500 ml of cloudy urine. He is then admitted to the hospital.
Tasks:

1. Read the slide presentation on incontinence on the Reynolds website module on this topic.

2. What subtype of incontinence does the patient have in part 1? What diagnostic tools would you use? What nonpharmacologic and drug-based treatments would be appropriate in this case?

3. Using the DRIP mnemonic outlined in the slide presentation, what could some possible reversible causes be for this patient’s incontinence in Part 2?
Post-Test:

1. An 85-year old man with a history of benign prostatic hyperplasia and no history of prostate cancer or prostate procedures comes into your outpatient clinic complaining of chronic incontinence. He says that he is frustrated because he is nearly always wet, and doesn’t notice when he is about to become incontinent. When he does go to the bathroom to void, he has difficulty initiating a urinary stream, and has some dribbling afterward.

What type of incontinence does this patient most likely have?
   a) Urge incontinence
   b) Stress incontinence
   c) Overflow incontinence
   d) Transient incontinence from a urinary infection
   e) Functional incontinence

2. A 70-year old woman with a history of congestive heart failure and diabetes mellitus is seen in your clinic because of frequent episodes of incontinence. She says that these episodes happen without warning, usually in the context of coughing or sneezing.

Which of these interventions is most likely to help with her incontinence?
   a) Tolterodine
   b) Topical estrogen
   c) Pelvic muscle exercises
   d) Tamsulosin
   e) Augmentation cystoplasty

3. You are the new primary care physician for a 78 year-old-man with advanced Alzheimer’s disease who lives in a nursing home. Other than his dementia, he is relatively healthy, and is able to participate in group activities. His nurse is very concerned about his chronic incontinence. She states that, since he has been admitted, he has chronically been wetting his diaper. She is concerned that she has noticed increasing breakdown in his perineal skin, and would like a treatment for his incontinence.

What would be the best initial treatment?
   a) Pelvic muscle exercises
   b) Tolterodine
   c) An indwelling urinary catheter
   d) On a set schedule, encourage the patient to get up and void
“Big 10” Principles:

1. Aging is not a disease.

3. Reversible and treatable conditions are often underdiagnosed and undertreated in geriatric patients.

6. Geriatric care is commonly multidisciplinary.

References:


Objectives:

1. Identify which medications are considered inappropriate for use in elderly patients.

2. Recognize the risks of polypharmacy in the elderly and learn the principals of evaluating and reducing these risks.
Case Vignette:

ST is an 87 year old woman who is brought by her son to your office to establish primary care. The son recently moved his mother here from Florida because of increasing concerns about her health and safety of her living situation. The medical problems listed on the outside medical records that come with the patient include: hypertension, sleep problems (both initiating and maintaining sleep), degenerative joint disease, peripheral edema, mild dementia, intermittent daytime urge type urinary incontinence, and gait problems but without history of falls. New concerns that the son has about his mother are (1) possible depression- her husband died 10 months ago and her social interactions have decreased, her hygiene has worsened, and she seems more apathetic; and (2) her inability to take her numerous medications correctly.

Her current medication list is:
Captopril 12.5 mg t.i.d.
Nifedipine 10 mg t.i.d.
Furosemide 20 mg b.i.d.
KCl 10 meq b.i.d.
Propoxyphene 65mg, 1 every 6 hours if needed for joint pain
Digoxin 0.125 mg daily
Cimetidine 100 mg qhs
Indomethacin 25 mg b.i.d.
Diphenhydramine 50 mg qhs

Review of systems is negative for diabetes mellitus, congestive heart failure (outside echocardiogram report shows LVEF 55% with mild diastolic dysfunction), cardiac arrhythmias (except for one episode of atrial fibrillation 14 years ago during her hospitalization for cholecystectomy), GERD, peptic ulcer disease, or peripheral neuropathy.

Physical examination shows a blood pressure of 135/84 without orthostatic changes, regular pulse of 76, normal cardiopulmonary findings, findings of chronic DJD of knees
and hands, trace bilateral ankle edema, somewhat depressed affect, Mini-mental Status Exam (MMSE) of 25 (out of possible 30), and Geriatric Depression Scale score of 9 (>5 consistent with depression).

Tasks:

1. Go to the Medication Use module on the Emory website, and read the slide presentation on Medication Use. You may also use tables 1 and 2 of the updated Beers’ criteria under “Practice Guidelines” as a reference.

2. What current medications of the patient’s are considered potentially inappropriate to use in the elderly?

3. Which of the patient’s medications do not have a specific indication for their use?

4. Which current medications might be exacerbating or precipitating some of the patient’s problems? What patient problems are not being treated by her current medical regimen?

5. Identify at least 5 medication changes you could make that could improve the medical treatment and medication compliance of the patient.
Post-Test:

1. You are called because a 90 year old nursing home patient of yours has been acting more confused over the past several days. Vital signs are normal and the patient has no signs or symptoms suggesting an infection, myocardial infarction, or dehydration. The possibility of her medications causing the increased confusion is raised. None of her medications are new and there have been no dosage changes within the past week.

Which one of her following medications is the LEAST likely to be contributing to her increased confusion?
  a) Trazodone
  b) Phenytoin
  c) Diltiazem
  d) Clonazepam
  e) Naprosyn

2. An 82 year old female comes in complaining of decreased appetite due to low grade nausea for the past month. She has no complaint of abdominal pain, constipation, diarrhea, fever, lower urinary tract symptoms, dysphagia, or heartburn. Her past medical history includes a CVA a year ago, CHF due to systolic dysfunction, GERD, hyperlipidemia, hypertension, and diabetes mellitus type 2 (X 1 year). Her blood glucose readings at home have been between 80 and 180 over the past month. Her medications include: esomeprazole, digoxin, clopidogrel, glyburide, simvastatin, and lisinopril. On exam her BP is 135/85 without orthostatic changes, HR = 72 and regular; cardiovascular, pulmonary and abdominal exams are benign; stool negative for occult blood, and neurological findings are not changed from her baseline.

Which of the following actions would MOST LIKELY lead to a diagnosis and treatment of the patient’s nausea and anorexia?
  a) Check hemoglobin and hematocrit, iron and TIBC, and increase esomeprazole dose to b.i.d.
  b) Add metoclopramide and order a gastric motility study
  c) Hold her simvastatin and order a liver panel and CPK
  d) Hold her digoxin and order a serum digoxin level
  e) Check her electrolytes and BUN and creatinine and order a renal ultrasound
3. An 84 year old man with COPD and chronic atrial fibrillation has been on a stable dose of warfarin for over a year, with INR values being between 2.0 and 2.8. Recently he was admitted to the hospital with a severe urinary tract infection. Now he comes to your office for his post hospital visit. His urinary symptoms have resolved, but he complains that his gums bleed easily. His current medications are: warfarin (at same dose as prehospitalization), trimethoprim/sulfamethoxazole (to complete his UTI treatment), terazosin (for bladder outlet symptoms), theophylline (for COPD), low dose aspirin, and over the counter gingko biloba (to help with his memory). Blood tests show that his INR is now 6.8.

Which of the following medications would LEAST LIKELY to be contributing to his bleeding and altered INR?

f) Trimethoprim/sulfamethoxazole  
g) Terazosin  
h) Theophylline  
i) Aspirin  
j) Ginko biloba
“Big 10” Principles:

2. *Medical conditions in geriatric patients are commonly chronic, multiple and multifactorial.*

8. *Iatrogenic illnesses are common and many are preventable.*

References:

Objectives:

1. Recognize the spectrum of pain severity, and understand the appropriate setting for different types of pain medication.

2. Demonstrate knowledge of dosing conversions among different types of opioids.


4. Learn to recognize and treat the side effects of various types of pain medication.
Case Vignette:

J.S. is an 81-year-old woman with a history of degenerative joint disease (DJD) being seen in your primary care clinic with a chief complaint of chronic right knee pain. It is a dull ache which she rates 4 out of 10, but it has gotten slightly worse over the last year. She takes 200 mg of ibuprofen about twice a day when the pain is worse. She would like to know if you could prescribe anything stronger.

In addition to DJD, she also has hypertension treated with amlodipine. She is on no other medications at this time.

On exam, she has normal vital signs. Her right knee has a small effusion but is not warm to the touch. The knee has a full range of motion but does have some crepitus with flexion and extension. X-rays of the knee show narrowing of the joint space. Her lab tests are remarkable for a hemoglobin level of 9.8 and a BUN and creatinine of 20 and 1.5 respectively.

At the patient’s second visit two month later, she tells you that her pain initially improved with the regimen you prescribed, but it has steadily worsened over the last few weeks. On her exam and X-ray there is no appreciable change from prior evaluations.

During the subsequent six months she was started on oxycodone, titrated up to 20 mg twice a day. The patient tells you that she is tired of being on pills, and would prefer to be on a “pain patch” instead, citing a commercial for a transdermal analgesic she recently saw on television.
Tasks:

1. Go to “Slide Presentations” in the Pain module and review the presentation titled “Pain Management in the Elderly”.

2. In the same presentation, find and review the WHO pain ladder\(^3\). Come up with an appropriate initial pain regimen for your patient.

3. What changes would you make in her regimen after the second visit?

4. After the third visit, how would you convert her pain medication to a fentanyl transdermal patch? You may use the calculators available on the “assessment tools” section of the online module.

\(^3\) © World Health Organization; permission to use obtained from http://www.who.int/about/licensing/en/index.html.
Post-Test:

1. A 67-year-old woman is seen in your office with a complaint of pain in her right leg. She had a laminectomy in her lumbar spine several months ago and since then has had shooting pains in her leg which are generally worse at night. She would like you to prescribe a pain medication for her.

Which would be the best initial choice in her case?
   a) Oxycodone 5 mg three times a day
   b) Ibuprofen 600 mg four times a day
   c) Tramadol 50 mg every six hours as needed
   d) Nortriptyline 25 mg every night
   e) A lidocaine patch applied to the most painful area of the leg

2. R.B., one of your primary care patients, comes into your office with a complaint of increasing back pain. She is a 70-year-old woman with recently diagnosed multiple myeloma, with lesions in the lumbar spine. As per your prior prescription, she is taking oxycodone/acetaminophen 5/325 tablets as needed for the pain. She tells you at the visit that she is taking on average eight tablets a day. Two tablets provide transient relief, but the pain returns to its maximum intensity within four hours. She wants to know if there’s a better regimen you could prescribe.

Which of these regimens would likely provide the best pain relief?
   a) Fentanyl transdermal patch, 25 mcg/hr changing every 72 hours
   b) Increase the patient’s supply of oxycodone/acetaminophen so that she could take it more often
   c) Sustained-release morphine, 15 mg twice a day, and give immediate release morphine, 5 mg every four hours as needed
   d) Hydromorphone, 2 mg every 3 hours, as needed
   e) Sustained release oxycodone, 20 mg twice a day, in addition to immediate release oxycodone, 10 mg every four hours as needed.

3. A 73-year-old woman with a history of pancreatic cancer comes into your clinic with a complaint of lower abdominal pain and bloating for the last few days. Her medications are: acetaminophen 650 mg three times daily, a 25 mcg fentanyl patch changed every 72 hours, and atorvastatin 10 mg daily.

Which would you be the best initial step?
   a) Give docusate, 100 mg twice a day
   b) Give senna tablets, two twice daily
   c) Perform bladder catheterization
   d) Obtain a urine sample
   e) Give psyllium powder mixed with water, once a day
An 81-year-old woman with degenerative joint disease in the right knee comes to your clinic complaining of pain in that knee. She says there has been a steady progression of the pain, and that it is now 5/10 in intensity. On physical examination you notice that there is a mild effusion, with barely perceptible temperature difference between the two knees. When testing the range of motion, you notice a mild crepitus.

Besides initiating a scheduled analgesic such as acetaminophen, or an NSAID, what other pain relief techniques would you recommend?

a) Arthrocentesis  
b) Gabapentin, 100 mg three times daily  
c) Aerobic and resistance training involving the lower extremities  
d) Acupuncture  
e) Fluoxetine

“Big 10” Principles:

4. Functional ability and quality of life are critical outcomes in the geriatric population.

10. Ethical issues and end-of-life care are critical aspects of the practice of geriatrics.

References:

Objectives:

1. Identify the predispositions of the older patient for injury or adverse event during hospitalization
2. Identify common complications of hospitalization in the elderly
3. Develop preventative strategies for the hazards of hospitalization of the elderly
4. Recognize early warning signs of complications
5. Develop treatment for those complications
Case Vignette:

An 82 year old unmarried woman is admitted after a ground-level fall at home (lives alone) and suffers a left femoral neck fracture. She has a history of heart failure and diabetes, and is placed on an 1800 kCal, 2gm sodium, ADA diet. On admission she appears alert and demonstrates good insight into her condition. Her blood pressure and lab studies are normal. She undergoes open reduction and internal fixation (ORIF) of the fracture that evening and receives blood transfusions perioperatively. She is placed on DVT prophylaxis with enoxaparin, her indwelling urinary catheter is left in, she is started propoxyphene/acetaminophen 1-2 tabs q4h prn pain, and continued on her home medications (furosemide 20mg po daily, lisinopril 5 mg po daily, metoprolol 25 mg po bid, simvastatin 20mg po daily, and glyburide 10mg po daily).

Over the next two days, the patient continually refuses physical therapy despite her weight bearing status being “as tolerated (WBAT).” She claims pain is the major reason. The nursing staff also reports that she is not eating well (under 25% of her meals). She also has not received any visitors since admission and social services is unable to contact her next of kin. The following day she develops a fever and a urine culture reveals *E. coli*, >100,000 colony count. After two days of appropriate antibiotic therapy she continues to spike fevers and her mental status appears confused. Her blood pressure is stable, pulse is 110 and her pulse oxymetry is 86% on room air. Blood sugar is 46. Physical exam reveals basilar rales, tachycardia with a 2/6 holosystolic murmur in the lower precordium, and a 5 cm area of non-blanchable erythema at the base of her spine with central dusksness and macerated skin. Her surgical site appears intact with good healing.

A chest x-ray is done which shows no obvious evidence of pneumonia or heart failure; a CT of the chest with PE (pulmonary embolism) protocol contrast shows no evidence of PE or DVT. Her labs reveal sodium of 156, potassium of 2.9, BUN of 45, creatinine of 2.1, a hemoglobin level of 13.5 gm/dL and a WBC count of 10.5.
Tasks:

1. It is not uncommon for older persons to develop complications during a hospital stay. Identify the complications that have occurred in the patient described in the vignette.

2. Identify those complications that could have been prevented.

3. In the references section of this module, link to Creditor’s article “Hazards of Hospitalization of the Elderly”. Read this article, then print out a copy of Figure 1, circling those factors that contributed to the patient’s decline. Then connect those to the complications listed above.

4. Think about what could have been “done better.” Can you identify at least one process that might have helped avoid these complications?
Post-Test:

1. Which of the following is not a significant predictor of functional decline in a hospitalized elderly patient (and thus increases the risk of needing a skilled nursing facility on discharge)?
   a) Presence of delirium
   b) Advanced age
   c) Multiple medical comorbidities
   d) Atypical presentation of illness

2. Physiologic consequences of aging that contribute to functional decline while hospitalized include all of the following except:
   a) Baroreceptor insensitivity predisposing to syncope and falls
   b) Decreased visual acuity predisposing to delirium
   c) Decreased fat:lean body mass ratio causing reduced energy reserves
   d) Reduction in epidermal/dermal vascular supply increasing pressure ulcer risk

3. The drug class most likely to cause complications in hospitalized patients is:
   a) Hormone preparations (insulin or steroids)
   b) Antimicrobials (antibiotics and antivirals)
   c) Antineoplastic drugs
   d) Anticoagulants (warfarin and heparin)

4. An 85 year old patient is admitted to the internal medicine service for treatment of pneumonia with hypoxia. She is placed on oxygen supplementation by nasal cannula, an IV is started for intravenous antibiotics, she is placed on bed rest and given subcutaneous heparin for thromboembolic disease prevention. By day three of her admission she is responding to therapy and shows improvement of her hypoxia; she is prepared for discharge the next day and is looking forward to returning to her home. That night, she falls while trying to transfer out of bed to her bedside commode alone.

   The most likely reason for her fall is:
   a) Tethers causing an acute confusional state
   b) Failure to use a foley catheter to reduce need for ambulation
   c) Bed rest causing muscular deconditioning and weakness
   d) Malnutrition causing peripheral neuropathy and poor motor coordination
“Big 10” Principles:

2. Medical conditions in geriatric patients are commonly chronic, multiple and multifactorial.

4. Functional ability and quality of life are critical outcomes in the geriatric population.

8. Iatrogenic illnesses are common and many are preventable.

9. Geriatric care is provided in a variety of settings ranging from the home to long-term care institutions.

References:


Objectives:

1. Identify the disease processes that present as the geriatric syndrome “Adult Failure To Thrive” (AFTT)
2. Develop an approach to the systematic evaluation of social, physical and functional processes that lead to AFTT.
3. Identify the role of the interdisciplinary team in the treatment of the AFTT syndrome.
4. Identify the special nutritional needs of the older patient and the risk factors for malnutrition.
5. Be able to perform nutrition screening using the Mini Nutritional Assessment (MNA).
Case Vignette:

Mrs. A is a 76 year old woman brought in to the ER by her daughter with whom she lives. She was admitted to the hospital last month for a UTI, which was treated, and she was discharged home to her daughter's care. Her daughter says that she stopped eating this week and “won't get out of bed,” and she has lost about 7 kg in the last month. She further states that she is unable to continue to care for Mrs. A anymore and wants her placed in a nursing home.

Mrs. A is unable to provide much information on interview, but is noted to have mild inattention and poor insight into her medical condition. When asked about her weight loss and poor oral intake, she states, “I’m not much of an eater” and appears unconcerned. The daughter states that she “barely eats breakfast – I leave the plate in front of her and she eats only the eggs,” drinks two cups of tea, and refuses to eat vegetables or fruits and “snacks on cookies sometimes.”

Mrs. A’s past medical history is significant for a stroke 2 years ago with resolution of neurologic deficit (left hemiparesis), hypertension, high cholesterol, and hypothyroidism. She takes lisinopril 10mg daily, simvastatin 20mg daily, aspirin 81mg daily, and levothyroxine 50mcg daily. Her current weight is 36 kg and her height is 150cm. Mid-arm circumference is 23cm, and calf circumference is 32cm. BP is 100/65, HR 104, RR 20. Her exam is significant for a cachectic appearance, the absence of a goiter, minimal intact dentition, normal cardiopulmonary exam, mildly distended abdomen with normal bowel sounds and slightly increased tympani, and 1+ edema of the arms and legs. Affect is mildly blunted, moderately withdrawn. Patient does not admit to depressive thoughts, but says she does have less energy and has lost interest in leaving the house. No pressure ulcers are seen.
Laboratory findings include:

<table>
<thead>
<tr>
<th>Test</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sodium</td>
<td>145 mEq/L</td>
</tr>
<tr>
<td>Potassium</td>
<td>3.8 mEq/L</td>
</tr>
<tr>
<td>BUN</td>
<td>9 mg/dL</td>
</tr>
<tr>
<td>Creatinine</td>
<td>0.4 mg/dL</td>
</tr>
<tr>
<td>Calcium</td>
<td>8.1 mg/dL</td>
</tr>
<tr>
<td>Total protein</td>
<td>5.6 gm/dL</td>
</tr>
<tr>
<td>Albumin</td>
<td>2.1 gm/dL</td>
</tr>
<tr>
<td>Alk. Phos</td>
<td>120 unit/L</td>
</tr>
<tr>
<td>AST</td>
<td>14 unit/L</td>
</tr>
<tr>
<td>ALT</td>
<td>12 unit/L</td>
</tr>
<tr>
<td>TSH</td>
<td>5.79 mcIU/L</td>
</tr>
<tr>
<td>B12</td>
<td>204 pg/mL</td>
</tr>
<tr>
<td>Folate</td>
<td>5.2 ng/mL</td>
</tr>
<tr>
<td>WBC</td>
<td>4.3 $10^3$/mcL</td>
</tr>
<tr>
<td>HGB</td>
<td>8.7 gm/dL</td>
</tr>
<tr>
<td>HCT</td>
<td>26.2%</td>
</tr>
<tr>
<td>PLT</td>
<td>140 $10^3$/mcL</td>
</tr>
</tbody>
</table>

Her total cholesterol is 120 mg/dL, with an LDL of 78 mg/dL and an HDL of 40 mg/dL. Urinalysis shows leukocyte esterase with 5 WBC/HPF but otherwise negative. Chest radiograph shows mild perihilar prominence but no acute changes.

Tasks:

1. Read the case vignette on page one and identify the physical, functional, and social disorders leading to her admission.

2. Read Hickson’s “Malnutrition and ageing” article and identify the patient’s malnutrition risk factors (see page 4 of the article for a reference table).

3. Calculate the patient’s BMI using the online calculator posted on the web module.

4. Use the patient’s vignette to complete an MNA screen for malnutrition risk. If positive, proceed to calculate the MIS (Malnutrition Indicator Score).
Post-Test:

An 87 year old woman is admitted for “nursing home placement” to the hospital. You are unable to contact the family for more information, but the ER note states she “lives alone.” She appears disheveled with poor hygiene and has loose skin folds worrisome for significant weight loss. She is afebrile and no focal neurologic deficits are noted, but the patient exhibits blunted affect, lethargy, and poor memory.

1. All of the following are appropriate for the initial diagnostic workup in this patient except:
   a) Mini-mental state exam (MMSE)
   b) Geriatric depression scale (GDS)
   c) Lumbar puncture
   d) Nutrition assessment (MNA)
   e) Complete blood count and comprehensive chemistry

The patient is found to be profoundly dehydrated with a sodium of 152 and a BUN:Creatinine ratio of 40. She receives intravenous hydration and becomes more alert, but continues to eat less than 25% of her meals. She is also found to have profound depressive symptoms as evidenced by the GDS, as well as anxiety symptoms. The decision to start an antidepressant is made.

2. Which of the following antidepressants is least likely to contribute to anorexia in this patient?
   a) Nortriptyline
   b) Paroxetine
   c) Mirtazapine
   d) Sertraline
   e) Clonazepam

Lab results also show an albumin of 2.5 mg/dl and a ferritin of 42 mg/dl. Her BMI is calculated to 17 kg/m². In combination with her weight loss, there is high suspicion of malnutrition in this patient. Both blood and urine cultures return with growth of Escherichia coli and antibiotic therapy is initiated.

3. Which of the following is not a predictor of malnutrition in this patient?
   a) Weight loss more than 10% in a 6-month period
   b) BMI below 21 kg/m²
   c) Albumin less than 3.0 mg/dl
   d) The presence of dementia or depression
“Big 10” Principles:

1. *Aging is not a disease.*

2. *Medical conditions in geriatric patients are commonly chronic, multiple, and multifactorial.*

3. *Functional ability and quality of life are critical outcomes in the geriatric population.*

References:

Objectives:

1. Recognize that older patients are more likely to require multiple settings of care in the recovery from serious illness.

2. Identify several settings of care and the skilled services provided in each setting.

3. Identify a patient’s skilled needs and match them to an alternate setting of care.

4. Incorporate transitions of care into the discharge planning of the older patient.
Case Vignette:

Mr. H is an 87 year old man admitted for a fall with a right femoral neck fracture. He lives alone and says he fell when he tried to get up out of a chair to answer the telephone. He undergoes successful hip repair (ORIF) but develops delirium post-operatively. After four days, his delirium resolves but he has become markedly weak and is unable to transfer out of bed without assistance. The physical therapy team assesses the patient and reports:

- Supervision for bed mobility
- Ambulates 25 feet with a rolling walker without assistance
- One-person assist for transfer to chair, walker, or commode

Mr. H is discharged with home health physical therapy. Two days later he is re-admitted by the home health agency nurse after she found him on the floor when arriving for her daily visit. Evaluation in the ER shows a confused patient with pain in the right hip. Radiograph reveals the fracture line of the hip has widened and the screw is misaligned. He undergoes total hip replacement, and again suffers delirium due to intraoperative blood loss. Mr. H recovers after six days with multiple transfusions and antibiotic therapy to treat “presumed pneumonia.” Physical and occupational therapists then reassesses the patient and find:

- Moderate assist (one person) for bed mobility
- Unable to use a rolling walker, standing balance poor
- Can only tolerate sitting on the edge of the bed for a few minutes
- Two-person assist for transfer to chair, walker or commode
- Dependent on one-person assist for bathing, dressing, toileting

The patient’s daughter arrives and is upset, and refuses to allow the patient to be discharged home again “until he is fixed!”
Tasks:

1. Go online to review the slide presentation in the Transitions in Care module. Identify the characteristics of the following settings of care:
   a) Acute rehabilitation
   b) Subacute rehabilitation
   c) Home health therapy
   d) Outpatient rehabilitation

2. Which setting was most appropriate for Mr. H after his initial hospitalization? After the second?

3. Why was a home health agency insufficient for Mr. H's needs after his first hospitalization?

4. If Mr. H completes his next transition with the following abilities:
   • Transfer from bed to walker independently
   • Ambulates 100 feet without assist, 200 feet with supervision only
   • Independent for toileting
   • Supervision for dressing
   Identify which home health services he might need.
Post-Test:

1. A right-handed 72-year old patient requires rehabilitation from a left middle cerebral artery stroke affecting temporal and parietal regions. Focal deficits include dysphagia and right-sided hemiparesis with gait instability and paralysis of the right hand. Decision is made to transfer him to a subacute rehab unit.

Which of the following therapy modalities will be useful in his recovery?

a) Physical therapy  

b) Speech therapy  

c) Occupational therapy  

d) All of the above

2. All of the following are considered “skilled needs” under Medicare A for post-acute benefits except for:

a) IV therapy  

b) Wound care for stage 3 or 4 pressure ulcers  

c) Assistance with ADLs (bathing, toileting)  

d) Enteral feeding through a new PEG tube

3. An 84-year old patient with moderate Alzheimer’s dementia and congestive heart failure suffers a new hip fracture. She is able to ambulate a few feet with a walker two days after surgery. Physical therapy says that she is following commands well and has a good potential to recover to her baseline ambulatory status (independent). She is unable to tolerate more than an hour of therapy due to her CHF however.

The most appropriate location for her rehabilitation would be:

a) Subacute rehabilitation  

b) Home health rehabilitation  

c) Outpatient physical therapy  

d) Acute rehabilitation
A 92-year old woman with advanced osteoarthritis has been falling frequently in her apartment at an assisted living facility. The facility social worker says that the patient can no longer meet the level of independence required for her apartment and she is admitted to the hospital for falls. Workup reveals moderate dehydration and malnutrition. She does not show significant delirium but has an MMSE of 16/30. She demonstrates poor insight into her medical condition and is unable to follow commands with either the physical therapist or the occupational therapist. The physical therapist also doubts she will be able to walk safely, even with a walker, and will require wheelchair use. An out-of-town daughter arrives and says that her mother can’t come live with her, then she asks you for recommendations.

Which of the following is the most realistic discharge plan for the patient?

a) Another assisted living facility; she is safe enough for an independent unit
b) A subacute unit; her rehabilitation potential is very good
c) A nursing home; the patient is unable to be rehabilitated to independence
d) A hospice; the patient has advanced dementia and is likely to die in a month

“Big 10” Principles:

4. **Functional ability and quality of life are critical outcomes in the geriatric population.**

5. **Social history, social support, and patient preferences are essential aspects of managing geriatric patients.**

9. **Geriatric care is provided in a variety of settings ranging from the home to long-term care institutions.**
References:


Facilitator’s Guide

Includes Answer Key
Module 1: Delirium

Relevant ACGME Core Competencies:
Medical Knowledge, Practice-Based Learning and Improvement

Tasks:

1. Self-explanatory.

2. Using a brief CAM assessment, the patient exhibits *acute onset with fluctuation, inattention, and disorganized thinking.*

3. *Diphenhydramine* is a high-risk agent likely to cause delirium from direct antihistamine and indirect anticholinergic effects. *Propoxyphene* is a CNS active agent that may also precipitate delirium, especially in conjunction with other centrally-active drugs. Atenolol has poor blood-brain barrier penetrance and is unlikely to cause delirium as other beta blockers, such as propranolol, can. Aspirin and simvastatin are not associated with delirium.

4. The patient’s admitted memory disturbance and insomnia are potential markers of previously existing cognitive impairment that may indicate early dementia, a strong risk factor for delirium.

5. Events that occurred in this patient’s first four days of hospitalization that increased his risk of delirium included:
   a. Anemia due to blood loss
   b. Anesthesia during surgery (there is no difference between local or general anesthesia)
   c. Medications (see #2)
   d. Application of foley catheter
   e. Application of restraints

Post-Test:

1. The answer (b). Poor concentration, acute onset, and fluctuation are hallmarks of delirium and are the key identifiers on the CAM (confusion assessment method) tool. Inability to verbally communicate does not necessarily indicate delirium, as delirium can be excluded without verbal communication. The CAM-ICU allows the assessment of patients who are intubated.

2. The answer is (d). Delirium will not resolve until the underlying causes are identified and treated. Medications are reserved once non-pharmacologic interventions are tried. Although limiting the use of restraints and modifying the environment to be more peaceful are good ways to prevent the likelihood of delirium, once delirium develops they are not as effective.
3. The answer is (d). A blood count, blood chemistry, and fingerstick glucose are very appropriate as an initial lab set. However, routine lumbar puncture in delirium is not recommended unless there is high clinical suspicion of meningitis or encephalitis.

4. The answer is (d). Propranolol is a beta blocker that crosses the blood-brain barrier and is likely to cause sedation and possibly delirium. Both meperidine and diphenhydramine have anticholinergic activity, a direct cause of delirium. Angiotensin receptor antagonists, as well as ACE inhibitors, have not been implicated in the development of delirium and neither exhibits anticholinergic activity.

Module 2: Dementia

Relevant ACGME Core Competencies:
Medical Knowledge, Practice-Based Learning and Improvement

Tasks:
1. Self-explanatory
2. Self-explanatory
3. With a 1/3 memory screen and abnormal CDT, he has a positive screen for dementia.
4. According to DSM-IV, the patient has a diagnosis for dementia. He has a memory abnormality (1/3 objects recalled), agnosia (doesn’t recognize his grandchildren), executive dysfunction (can no longer cook). He does not have apraxia from history, as he is independent in basic ADLs except for some help with bathing and nothing in the history or evaluation indicates aphasia.
5. It’s important to approach the issue from a biopsychosocial perspective. Because of his need for constant supervision as well as some ADL needs, he could be classified as having a moderate dementia. He could be a candidate for cholinesterase inhibitors and memantine. He also needs caregiver support and needs community resources such as adult day care and home care. You should also encourage him to enlist other family support.

Post-Test:
1. The answer is (c). This patient has a presentation compatible with Parkinson’s disease, as well as visual hallucinations and agitation that make dementia with
Lewy bodies (DLB) the most likely possibility. She has the central feature of DLB, which is progressive cognitive decline, as well as two core features: visual hallucinations and Parkinsonism.

2. The answer is (b). This man has significant memory problems as well as executive dysfunction (inability to pay bills), causing enough impairment to classify him as having dementia under DSM-IV. Although he is still living alone and managing well with his basic activities of daily living, he does have a mild dementia. Because of this, he is a candidate for treatment with galantamine, an acetylcholinesterase inhibitor. Memantine would be appropriate for moderate to severe dementia. Though he occasionally misses his wife, he does not meet criteria for major depression. Therefore, sertraline is not indicated.

3. The answer is (b). The patient has neuropsychiatric disturbances associated with dementia. The evidence for nonpharmacologic interventions to help with problem behaviors is stronger than for medications, including atypical antipsychotics.

Module 3: Falls

Relevant ACGME Core Competencies:
Medical Knowledge, Practice-Based Learning and Improvement

Tasks:

1. Self-explanatory.

2. Risk factors associated with falls include poor vision, abnormal gait, environmental factors in the house (e.g. rugs), incontinence, medications (furosemide and trazodone leading to orthostasis, digoxin), and deconditioning due to fear of falling.

3. The patient took more than 30 seconds, so she is at increased risk for falls and dependence. Aspects of her test, such as sway, difficulty in pivoting, and problems getting back to a seated position add to the assessment.

4. a. Changes in dose or discontinuation of furosemide or trazodone.
   b. Obtaining a serum digoxin level, to assess whether her dose is safe.
   c. Referral for vision testing.
   d. A home safety evaluation.
   e. A referral to a physical therapist for balance and strength training, as well as a possible assistive device.
   f. Treating the causes of incontinence in this patient (including reevaluating the furosemide dose).
Post-Test:

1. The answer is (e). Amitriptyline is a drug with significant anticholinergic side effects that could be associated with increased confusion and falls in the elderly. Discontinuing it would be a quick and potentially effective intervention to decrease falls. Hip protectors could reduce the impact of a fall, but not the probability of a fall itself. An evaluation of gait only revealed some balance issues, and not problems with proximal strength, so (b) would be a less effective option. (c) could be a helpful intervention, but it is not the simplest or most effective out of the options available. There is no evidence of hypoglycemia, so (d) is not the right answer.

2. The answer is (c). The get-up-and-go test is a validated tool to test for problems with gait and functional dependency. Findings of osteoporosis (a), orthostatic hypotension (b), or peripheral neuropathy (d), are not as predictive of functional impairment. Dementia is associated with functional dependence, but the MMSE is not designed for this outcome.

3. The answer is (c). Reducing doses of psychoactive medications or diuretics, reduction in home hazards, and balance and gait training are all part of proven multifactorial interventions to reduce falls. Acetylcholinesterase inhibitors like donepezil have not been proven to do so.

Module 4: Incontinence

Relevant ACGME Core Competencies:
Medical Knowledge, Practice-Based Learning and Improvement

Tasks:

1. Self-explanatory.

2. This patient has urge incontinence (UI). In older men, benign prostatic hyperplasia can be a common cause for UI. Because Mr. B’s incontinence seems to have worsened recently, it would be appropriate to do a urinalysis to make sure he has not developed an infection. A urinalysis will also exclude glucosuria, a sign of diabetes (although it would be unusual for an 82 year old to suddenly develop diabetes). Mr. B should have a post-void residual determination because men are at risk for urinary retention from an enlarged prostate or urethral blockage from a stricture than can develop after prostate surgery. Mr. B’s dementia makes prompted voiding the most appropriate intervention to decrease his episodes of incontinence. Biofeedback and bladder training are not helpful in patients with advanced dementia. As for pharmacologic management, bladder relaxant drugs such as tolterodine or oxybutinin may be indicated.
However, in this patient it will be important to watch for side effects such as delirium, dry mouth, constipation, exacerbation of dyspnea, and increase in intraocular pressure in patients with glaucoma.

3. Psychoactive drugs, specifically benzodiazepines (lorazepam), older antihistamines (diphenhydramine), and antipsychotics (risperidone), can all contribute to urinary incontinence. Benzodiazepines and antipsychotics may do this by affecting the ability to mobilize to the bathroom, while diphenhydramine accomplishes this by virtue of its anticholinergic side effects. Urinary infection and fecal impaction are also playing a role.

Post-Test:

1. The answer is (c). He suffers from overflow incontinence secondary to chronic urinary obstruction. Stress incontinence is very uncommon in men (option b). If it were urge incontinence, he would be receiving some warning that he needs to void. Because it is chronic, it is less likely to be caused by something new, such as a urinary tract infection. He is fully able to go to the bathroom by himself, so this is not functional incontinence.

2. The answer is (c). This patient has stress incontinence, which has been shown to more responsive to behavioral interventions, like pelvic muscle exercises, than drug treatments such as topical estrogen. Estrogen in fact has shown little efficacy in clinical trials. Tolterodine is helpful in urge, not stress incontinence. Alpha blockers such as tamsulosin have a very limited role in women. Augmentation cystoplasty is a surgical treatment for patients with diminished bladder capacity.

3. The answer is (d). In a patient with functional incontinence and cognitive impairment, prompted voiding has been shown to reduce the severity of the problem by half (Ouslander, et al. JAMA. 1995; 273:1366-70). Pelvic muscle exercises, anticholinergics, and alpha blockers don’t address the issue. While a urinary catheter would address the problem of skin breakdown and eliminate the incontinence, it would be associated with a high risk of urinary infections and falls.
Module 5: Medication Use

Relevant ACGME Core Competencies:
Medical Knowledge, Practice-Based Learning and Improvement

Tasks:

1. Not applicable

2. According to the latest Beers’ Criteria for potentially inappropriate medication use in older adults, the patient’s medications that are inappropriate independent of diagnosis are: propoxyphene, cimetidine, indomethicin, and diphenhydramine.

3. According to the ACOVE indicators for Medication Use in the Elderly, all medications need to have a specific indication for their use. Neither digoxin (which was given for one peri-operative event of atrial fibrillation that occurred many years prior without further episodes) nor cimetidine have a current indication for use and discontinuation is recommended.

4. It is possible that the nifedipine precipitated or exacerbated the peripheral edema (leading to the need for furosemide, which in turn led to the need to add KCl). The furosemide may be exacerbating the urinary incontinence. The patient has untreated depression and unaddressed cognitive dysfunction, with difficulty correctly taking her complicated medication regimen. The propoxyphene, cimetidine, indomethicin, and diphenhydramine could all be exacerbating her cognitive dysfunction.

5. a. Change the t.i.d dosed captopril to a once daily dose of another ACE-inhibitor (such as lisinopril).
   b. Patient has no specific reason to be on nifedipine other than hypertension and is treated with another antihypertensive (ACE-inhibitor) at less than maximum effective dose. In addition, the nifedipine may be exacerbating or precipitating the peripheral edema. Discontinue the nifedipine.
   c. Once nifedipine is discontinued, try stopping furosemide (and KCl), as may not need.
   d. Discontinue digoxin and cimetidine, as there are no current indications for their use.
   e. Discontinue indomethicin and propoxyphene, as they may be exacerbating patient’s cognitive status and the indomethicin may have increased renal toxicity in this elderly patient. May add acetaminophen or twice a day (with food) NSAID such as naprosyn if needed for osteoarthritis pain.
   f. Discontinue diphenhydramine and consider beginning an agent such as mirtazapine, which is an antidepressant with sleep inducing properties (ie, one medication to treat two medical problems).
Post-Test:

1. The answer is (c) diltiazem. Even though medications and dosages may have not recently changed, toxicity in the elderly can still occur, due to subtle changes in drug metabolism or clearance over time, or other interacting medical conditions. Trazodone, an antidepressant, and clonazepam, a benzodiazepine, are both CNS active agents that can cause confusion. All NSAIDS, including naprosyn, have been associated with confusion in the elderly. Phenytoin, especially when at serum levels above the therapeutic range, also is associated with confusion. Diltiazem is the one medication listed that is not associated with increased confusion in the elderly.

2. The answer is (d) hold the digoxin and order serum digoxin level. Digoxin toxicity in the elderly often presents differently than in younger adults. Anorexia, nausea, and/or confusion are much more common manifestations of digoxin toxicity in the elderly than is bradycardia or arrhythmias. Lack of symptoms, negative abdominal exam, and negative stool occult blood make worsening GERD, peptic ulcer disease, or gastritis less likely as a cause for the nausea. History is not consistent with diabetic gastroparesis, as diabetes is a new diagnosis and the nausea doesn’t just occur with eating. Likewise, there is nothing from history or physical exam to suggest HMG-CoA inhibitor toxicity or renal failure.

3. The answer is (b) terazosin. Many medications and over the counter phytotherapies can prolong the anticoagulation effects of warfarin. This can be due to effects on protein binding (theophylline) or drug metabolism (trimethoprim/sulfamethoxazole or ginko biloba). In addition, although low dose aspirin is not contraindicated in patients on warfarin, in the setting of a high INR, its use can exacerbate bleeding. Terazosin has no known effects on the metabolism, bioavailability, or action of warfarin.

Module 6: Pain Management

Relevant ACGME Core Competencies: Medical Knowledge, Practice-Based Learning and Improvement

Tasks:

1. Self-explanatory.

2. This patient has mild chronic degenerative joint disease of the right knee. She has been on a low dose of a non-steroidal anti-inflammatory drug (NSAID) on an as-
needed basis with little success. Because of her renal insufficiency, acetaminophen would probably be a better first-line drug for her. Also, a scheduled regimen, as opposed to as-needed dosing, will likely provide better pain relief. A sample regimen could be acetaminophen 650 mg, three times a day.

3. Following the WHO pain ladder, the patient has moved on to stage 2 after her pain has progressed on scheduled acetaminophen. You may initiate an as-needed opiate, such as oxycodone at 5 mg per dose, in addition to the acetaminophen. If this doesn’t work, she may need a scheduled opiate titrated to effect.

4. By using the calculator provided through the Reynolds website, you can find that the most appropriate conversion would be to a 25 mcg/hr patch. However, the conversion range is wide, so the equivalency might not be perfect. This means that you also should prescribe as-needed medication for the patient.

Post-Test:

1. The answer is (d). The patient’s pain in this case could be described as neuropathic. The best choice to treat this type of pain would be a tricyclic antidepressant, in this case nortriptyline.

2. The answer is (e). In a patient who has persistent pain that is not responding adequately to as-needed opiates, the most appropriate regimen would include a controlled-release opiate for basal pain, as well as a shorter-release preparation for breakthrough pain. On average, she is taking 40 mg of oxycodone daily. If you are to follow the above formula, giving a daily total of 40 mg of sustained-release oxycodone along with a breakthrough dose of shorter-release oxycodone (option e) would be appropriate. Option (a) is less desirable because it does not provide a breakthrough dose. Option (b) raises the risk of acetaminophen overdose, and does not provide maintenance analgesic dosing. Option (c) gives basal and breakthrough doses of morphine, but considering that 1 mg oxycodone is equivalent to 1.5 mg of oral morphine, the basal dose being given is too low. Option (d) just gives more immediate-release medication, so it is less desirable.

3. The answer is (b). This patient has constipation secondary to opiate use. Most patients who take opiates should prophylactically be treated with laxatives to stimulate bowel motility. Neither docusate (stool softener) nor psyllium (bulking agent) achieve this goal. Neither (c) nor (d) address the issue of constipation.

4. The answer is (c). Aerobic and anaerobic exercise have been shown to help with patients with chronic musculoskeletal pain. There is very little fluid in this patient’s joint, so arthrocentesis would not be useful. Because this is not neuropathic pain, there is no role for gabapentin. Acupuncture has not been shown in peer-reviewed scientific trials to help more than placebo in patients with degenerative joint disease. There is little reason to think that depression is the cause for this pain, so (e) is not correct.
Module 7: Hazards of Hospitalization

Relevant ACGME Core Competencies:
Medical Knowledge, Practice-Based Learning and Improvement, Systems-Based Practice

Tasks:

1. Complications include:
   a. Dehydration due to continuance of diuretics post-operatively (preventable)
   b. Urinary tract infection due to indwelling urinary catheter (preventable)
   c. Debility due to uncontrolled pain (preventable) and recent surgery (not preventable)
   d. Pressure ulcer due to debility and incontinence (preventable)
   e. Dropped oral intake due to pain (preventable) and other unidentified causes (not preventable?)
   f. Delirium due to all of the above (preventable)

2. See above

3. Not applicable

4. There are a number of possible answers to this question. Protocols to reconcile medications, and control the use of indwelling foley catheters are helpful. There was failure to notice decreased oral intake – this was reported to the staff but not acted upon. Refer to Flacker and Marcantonio’s article on delirium (JAGS 2001;49(5):516-522).

Post-Test:

1. The answer is (b). The presence of delirium, advanced age of the patient, and the atypical presentation of illness are all identified causes of functional decline during hospitalization in a meta-analysis by McCusker, Kakuma and Abrahamowicz. However, the same analysis failed to show a correlation between the presence of multiple medical comorbidities and decline. (Reference: McCusker, Kakuma and Abrahamowicz, Journal of Gerontology: Med Sci.2002; 57A(9))

2. The answer is (c). Older adults are known to suffer from reduced baroreceptor sensitivity which leads to falls through orthostasis. Delirium, a known cause of falls, can be caused by sensory impairment when hospitalized, especially visual and auditory impairments. Older people also have a reduction in subcutaneous
tissue thickness and dermal vascular supply through atherosclerosis which increases the likelihood of dermal ischemia and pressure ulcers. In older people, there is an increase in fat to lean body mass ratio, not a decrease, which leads to increased likelihood of debility related to a low reserve of muscle mass. (Reference: Creditor, Annals of Internal Medicine. 1993; 118(3))

3. The answer is (b). In a quality improvement study by EM Schimmel at the Yale University School of Medicine, a prospective study of over 1000 patients admitted to a New Haven community hospital showed that the majority of adverse events occurring in hospitalized patients were due to medications. Of those, 35 adverse events were related to antimicrobials such as penicillin and nitrofurantoin (27 of these events were allergic, 8 toxic). Hormone preparations such as steroids and insulin were responsible for 24 events, half of which were hypoglycemia related to insulin. Antineoplastic drugs caused 14 toxic events, and anticoagulants caused 9 toxic events. (Reference: Schimmel, Quality and Safety in Health Care. 2003; 12)

4. The answer is (c). Bed rest is a common precipitant of deconditioning, and functional decline due to this sole event is likely within just a few days of bed rest. The rate of decline dramatically increases with both advanced age and reduced lean body mass. As a result, muscular deconditioning is a common cause of falls in older hospitalized patients. Additionally, falls related to deconditioning are much more likely to occur in the evening. In this patient, there is no evidence to support delirium. Foley catheters are associated with an increase in falls and delirium, not a decrease, and their indirect result of decreased ambulation is unfavorable for the reasons listed above. Peripheral neuropathy is unlikely to occur during the short duration of malnutrition during this patient’s acute illness. (Reference: Creditor, Annals of Internal Medicine. 1993; 118(3))
Module 8: Adult Failure to Thrive and Malnutrition

Relevant ACGME Core Competencies:
Medical Knowledge, Practice-Based Learning and Improvement, Systems-Based Practice

Tasks:
1. Factors leading to the patient’s admission include functional decline, weight loss, malnutrition, depression, and caregiver breakdown.
2. Risk factors from Hickson’s table include poor appetite, poor dentition, history of CVA, disability, depression.
3. BMI is 16.0
4. MNA Screen is positive (Score is about 2, and given +/- 2 variance still well below the cutoff of 11). MNA Assessment (MIS) is 6.5, for total MNA score of 8.5 (meets criteria for protein calorie malnutrition).

Post-Test:
1. The answer is (c). The MMSE, GDS and MNA are important assessment tools in evaluating the older patient with a “failure to thrive” presentation. A complete blood count and comprehensive chemistry can help identify the presence of dehydration, anemia, infection and other illnesses that can contribute to AFTT as well. However, as this patient has no focal neurologic deficits a lumbar puncture is unlikely to be helpful in the initial diagnostic workup and meningitis is an extremely uncommon infection in these presentations.

2. The answer is (c). Selective serotonin reuptake inhibitors (SSRIs) such as sertraline and paroxetine have been associated with anorexia in some patients. Benzodiazepines such as clonazepam are also associated with loss of appetite. Mirtazapine has less anorexia, and is associated in some studies with an increase in appetite.

3. The answer is (c). Albumin is a widely used biochemical marker for nutritional assessment, but a low level isn’t specific for malnutrition. In patients with acute infection or bed-ridden status, albumin levels can drop below 3.5 mg/dl from previously normal levels and are not reliable in acute illness. However, weight loss over a period of 6 months, a low BMI, and the presence of a cognitive or affective
disorder are highly predictive of malnutrition and all three are part of the screening section of the MNA (mini nutritional assessment) tool.

Module 9: Transitions of Care for Older Patients

Relevant ACGME Core Competencies:
Medical Knowledge, Practice-Based Learning and Improvement, Systems-Based Practice

Tasks:

1. Not applicable

2. Mr. H most likely would have benefited from admission to a post-acute care unit, such as subacute rehabilitation, rather than discharge home. This is supported by the patient’ needing assist his transfers to chair or walker, and his ambulation distance of 25’ (community re-entry with home health services should be around 200’, or independent at >500’). If he had been living with someone that could assist him, a home discharge would have been sufficient, but in this case the patient lived alone. The second admission leaves little choice as he requires two-persons to assist him to a chair and he cannot stand safely.

3. See above #2.

4. At 200’ walking distance and ability to transfer, the patient may satisfactorily use home health services, however he still requires supervision for some activities. Therefore, his daughter should visit him daily to assist him with these activities. He does not require 24 hour supervision so home health is sufficient. Physical therapy will help him with improving his walking distance, and occupational therapy will help improve his dressing skills. Occupational therapy also will help evaluate his home environment and determine if he needs any special adaptive devices, though much of this can be done by the occupational therapist in the subacute rehabilitation unit. Home health nurse would be required if there were active medical issues; this is not the case with Mr. H. A social worker also may be sent out by a home health agency and help Mr. H locate community resources, such as meals-on-wheels, to help his recovery. A speech therapist is not indicated in our scenario as there is neither dysarthria nor dysphagia.
Post-Test:

1. Answer is (d). The patient’s dysphagia will benefit from speech therapy, his gait can be rehabilitated with physical therapy, and occupational therapy can help him adapt to using his left hand.

2. Answer is (c). Assistance with ADLs (activities of daily living) is not a primary skilled benefit under Medicare. However, it can be an adjunct skill and added to Medicare A benefit which is active for another skill, such as the other three answers.

3. Answer is (a). She would have to be able to tolerate more than three hours for acute rehabilitation. She is unsafe to return home due to her limited mobility, and requires more frequent therapy that can be provided in an outpatient setting.

4. Answer is (c). There is no evidence to support a one-month lifespan in the history. Her inability to follow commands seriously restricts her ability to be rehabilitated and she will not be able to benefit from inpatient rehabilitation on either an acute or a subacute unit. Her need for a wheelchair, as well as her cognitive deficit, makes being able to live safely in an independent unit of an assisted living facility unlikely. However, she would be able to go to an assisted living facility that had services for disabled patients, and some assisted living facilities do specialize in the care of patients with advanced dementias.