Geriatric Acute Care Test

Name: _______________________________  Date:____________

Level of training (circle):
PGY1    PGY2    PGY3    PGY4    MEDICAL STUDENT    FELLOW

SPECIALTY:  EM    OTHER

Please mark the single best choice for each of the following questions:

1. Which of the following medications is generally considered appropriate for use in older patients?

A. Amitriptyline (Elavil)
B. Diazepam (Valium)
C. Indomethacin (Indocin)
D. Oxycodone/acetaminophen (Percocet)
E. Propoxyphene/acetaminophen (Darvocet)

2. Mrs. Smith is a 75-year-old female presenting to the emergency department with complaints of burning on urination and urinary frequency. She has a past medical history of hypertension and atrial fibrillation. Her medications include hydrochlorothiazide, lisinopril, calcium supplements, and warfarin (Coumadin). She has no known drug allergies. You perform a urinalysis which is remarkable for nitrites and greater than 25 WBC per high powered field. Based on the above information, select the medication that would be most appropriate for treatment:

A. Cephalexin (Keflex)
B. Macrodantin (Macrobid)
C. Trimethoprim-sulfamethaxasole (Bactrim)
D. Vancomycin

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3. A 69 year old male presents to the emergency department complaining of neck pain and stiffness after a motor vehicle accident he sustained the day before. After a thorough evaluation, you diagnose the patient with neck strain. His most recent creatinine level (one week ago) was 0.7mg/dl. He has taken acetaminophen at home with minimal relief. He takes no other medications. Which of the following choices is most appropriate for symptomatic relief?

A. Cyclobenzaprine (Flexeril) 10mg  
B. Ibuprofen (Motrin) 400mg  
C. Ketorolac (Toradol) 10mg  
D. A and B

4. Which of the following conditions is most highly associated with the risk of receiving an inappropriate prescription medication as defined by Beers explicit criteria during discharge from an emergency department?

A. Acute abdominal pain  
B. Acute bronchitis  
C. Acute musculoskeletal pain  
D. Atypical chest pain

5. You are prescribing a medication for an 80 year old female with an estimated weight of 60kg and a creatinine of 1.4mg/dl. The medication you have selected based on best treatment evidence is primarily eliminated by the kidneys. What medication adjustments should be considered?

A. Avoid all medications that are primarily excreted by the kidneys  
B. Calculate the dose based on the patients creatinine clearance  
C. Give 50% of the recommended dose  
D. Make no medication adjustments

6. Which of the following are key features of delirium?

A. Acute change in mental status with fluctuating course  
B. Altered level of consciousness  
C. Difficulty focusing attention  
D. A and B  
E. All of the above

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7. A 71 year old woman is brought to the emergency department by police after being found wandering in the street. Her baseline mental status is unknown. She appears disheveled but is otherwise pleasant and attentive to questions. Further mental status examination reveals short-term memory loss, and she is unable to draw the face of a clock. The remainder of the physical and neurologic examination is unremarkable. Based on the information provided, the most likely diagnosis is:

A. Age associated memory loss  
B. Delirium  
C. Dementia  
D. Depression  
E. Schizophrenia

8. An 83 year old male nursing home resident is brought to the emergency department for "behavioral issues" one week status post repair of a left hip fracture. Nursing facility staff report that he has been agitated and accusing the nurses of trying to kill him. Prior to the surgery he was living independently and able to perform all activities of daily living. On physical examination he is agitated and confused. He is easily distracted and does not coherently respond to questions about orientation and memory. The most likely diagnosis is:

A. Alzheimer's disease  
B. Delirium  
C. Depression  
D. Mania  
E. Schizophrenia

9. Which of the following statements are true regarding delirium in the emergency department?

A. Delirium is a predictor of increased mortality in older ED patients  
B. Emergency physicians recognize delirium in the majority of cases  
C. Patients with mild delirium who have an unremarkable ED evaluation should be discharged home  
D. A and C  
E. None of the above

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10. Which of the following are considered potentially reversible etiologies of dementia?
A. Alzheimer’s disease
B. Hypothyroidism
C. Vitamin B12 deficiency
D. B and C
E. None of the above

11. A 79 year old man presents to the emergency department after a motor vehicle accident complaining of diffuse abdominal pain. His past medical history is unknown. Physical examination reveals a regular pulse of 96 beats per minute and blood pressure of 100/60mm/Hg. He is somewhat confused (GCS 14) and his abdomen is diffusely tender to palpation. Based on the information available, which of the following statements is most accurate regarding the care of this patient?
A. Caring for this patient in a trauma center is associated with lower mortality risk
B. This patient has no evidence of hemorrhagic shock
C. This patient is likely to have decreased cardiovascular functional reserve
D. A and C
E. All of the above

12. Which of the following statements regarding cervical spine injuries in older adults is most accurate?
A. Most cervical spine injuries are precipitated by motor vehicle accidents
B. C2 fracture is less common in older adults
C. Older adults are at increased risk for central cord syndrome
D. Plain radiographs will detect over 99% of all cervical spine injuries

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13. A 72 year old male presents after a fall with right hip and groin pain. He is unable to bear weight on his right lower extremity. Physical exam reveals no gross deformity. Passive range of motion of the right hip produces severe pain in the hip and groin. Radiographs of the hip and pelvis are unremarkable for fracture or dislocation. Based on the information available, what is the next most appropriate step?

A. Admit for placement in skilled nursing facility for physical and occupational therapy
B. Discharge home with an ambulatory assist device (walker or crutches), analgesics, and orthopedic follow up
C. Obtain MRI of the hip and pelvis
D. Obtain lumbar spine radiographs to rule out acute vertebral compression fracture

14. Which of the following accounts for the majority of trauma related injuries and deaths in older persons?

A. Burns
B. Elder abuse
C. Falls
D. Motor vehicle accidents
E. None of the above

15. Which of the following are considered categories of elder abuse?

A. Financial
B. Emotional
C. Physical
D. A and C
E. All of the Above

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16. Which of the following statements is true regarding the reporting of elder abuse?

A. Only some states have statutes or adult protective service laws addressing elder abuse
B. Most states mandate the reporting of suspected elder abuse
C. Physicians report elder abuse in the majority of cases
D. Neglect without evidence of physical abuse does not constitute elder abuse

17. A 75 year old man presents to the emergency department complaining of severe back pain after lifting a heavy chair. He has tried acetaminophen at home without relief. His past medical history includes diabetes and hypertension. After a thorough evaluation, a diagnosis of back strain is made. Which of the following medications is most appropriate for the management of this patient’s symptoms?

A. Cyclobenzaprine (Flexeril) 10mg
B. Metaxalone (Skelaxin) 800mg
C. Ibuprofen (Motrin) 800mg
D. Hydrocodone/acetaminophen (Vicodin) 5mg/500mg

18. A 68 year old man presents to the emergency department after an episode of syncope in atrial fibrillation. On physical examination he is tachycardic with a blood pressure of 80/48mmHg. You decide to pursue DC Cardioversion for unstable atrial fibrillation. Which of the following is the best choice for procedural sedation in this patient?

A. Diazepam (Valium)
B. Etomidate (Amidate)
C. Midazolam (Versed)
D. No sedation
E. Propofol (Diprivan)

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19. Which of the following are physiologic changes associated with the aging process that can impact outcomes during procedural sedation?

A. Decrease in efficiency of pulmonary gas exchange  
B. Decrease in renal mass and blood flow  
C. Exaggerated response to endogenous catecholamines  
D. A and B  
E. All of the above

20. A 69 year old female presents to the emergency department after falling on her right knee. She notes mild to moderate pain in the knee and is able to ambulate with minimal difficulty. Her past medical history includes high blood pressure. She has no history of peptic ulcer disease or renal insufficiency. After a thorough evaluation you diagnose her with a knee contusion. Which of the following choices is most appropriate for outpatient management of her pain?

A. Ibuprofen 400mg  
B. Ibuprofen 800mg  
C. Ketorolac 10mg  
D. Naproxen 500mg  
E. Propoxyphene/acetaminophen (Darvocet)

21. Chose the most accurate statement regarding the management of acute pain in older emergency department patients:

A. Opioid analgesics should be started at lower doses and slowly increased as needed  
B. Narcotics should be avoided whenever possible in favor of non-steroidal anti-inflammatory agents due to adverse side effect profiles  
C. Older patients tend to get too much pain medication, resulting in higher rates of adverse events  
D. Older patients tend to over-report pain

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22. Which of the following statements regarding acute appendicitis in older patients is most accurate?

A. Older patients are more likely to present with leukocytosis and fever.
B. Older patients are more likely to present with vague abdominal complaints.
C. Older patients are less likely to have delayed presentation.
D. Older patients are at lower risk for misdiagnosis

23. A 75 year old man presents to the emergency department complaining of acute left flank pain and left sided abdominal pain. Physical examination reveals a diaphoretic patient in severe distress. Vital signs include a blood pressure of 200/125 mm/Hg and heart rate of 115 beats/minute. You note left costovertebral angle tenderness to percussion and left mid abdominal tenderness to palpation. Urinalysis reveals 6-10 RBC per high powered field. Serum creatinine is .7 mg/dl (normal). Which of the following is the next most appropriate action?

A. Discharge home once adequate pain control is achieved with urinary strainer and urology follow-up
B. Hospitalize to rule out myocardial infarction
C. Obtain renal stone protocol computed tomography (CT)
D. Obtain thoraco-abdominal computed tomography (CT) with intravenous contrast

24. A 66 year old woman comes to the emergency department with severe abdominal pain, abdominal distension, low grade fever, and tachycardia. She describes a history of abdominal pain that usually occurs 10-15 minutes after eating, gradually increases in severity, and then slowly resolves over 3 hours. Her past medical history includes peripheral vascular disease, hypertension, and atrial fibrillation. Physical examination reveals a patient in moderate distress complaining of severe abdominal pain. The abdomen is soft and distended with few audible bowel sounds and mild, diffuse tenderness.

Which test is most helpful in confirming the diagnosis?

A. Abdominal angiography
B. Abdominal computed tomography (CT) with intravenous and oral contrast
C. Computed tomography (CT) of the aorta
D. Esophagogastroduodenoscopy (EGD)
E. Right upper quadrant ultrasound

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25. A 72 year old male presents to the emergency department with a 3 day history of diffuse lower abdominal pain associated with nausea and loss of appetite. The patient denies fevers, chills, vomiting, diarrhea, or dysuria.

On physical examination he is afebrile with normal vital signs. His abdomen is moderately tender to palpation throughout the lower quadrants. Right sided costovertebral angle tenderness is noted to percussion.

Laboratory values include a WBC of 8 k/ul (within normal range) and a serum creatinine of .6mg/dl. Urinalysis is remarkable for 6-10WBC, and 6-10 RBC per high powered field.

Which of the following is the most appropriate next step in the management of this patient?

A. Administer a single dose of intravenous antibiotics and discharge home on ciprofloxacin
B. Administer intravenous antibiotics and hospitalize for acute pyelonephritis
C. Discharge home with analgesics and abdominal pain precautions
D. Obtain abdominal computed tomography (CT) with oral contrast

26. A 69yo man presents to the emergency department complaining of epigastric pain, nausea, and vomiting that started one hour ago. On physical examination he is alert, in moderate distress and diaphoretic. His vital signs include a pulse of 110 beats per minute, temperature of 37.0C, BP 130/56mmHg, and respiratory rate of 26 breaths per minute. On physical examination you note mild epigastric tenderness to palpation. Based on the information provided, which of the following is the next most appropriate action?

A. Obtain abdominal computed tomography (CT)
B. Obtain arterial blood gas
C. Obtain electrocardiography (ECG)
D. Obtain serum amylase and lipase levels

END OF TEST
Geriatric Acute Care Test Answer Key

1. D
Amitriptyline, diazepam, indomethacin, and propoxyphene/acetaminophen (Darvocet) are all on the Beers list of potentially inappropriate medication use in older patients. Amitriptyline is highly anti-cholinergic and may precipitate confusion and delirium. When benzodiazepines are indicated, shorter acting agents such as lorazepam are preferred. Indomethacin has the most CNS side effects of any NSAID and may also precipitate confusion and delirium. Propoxyphene/acetaminophen (Darvocet) offers little analgesic benefit over acetaminophen while carrying side effects typical of narcotic analgesics. Oxycodone/acetaminophen (Percocet) is not included on the Beers list and can be a suitable choice for the management of pain in older patients.


2. A
Macrodantin is included on the Beers list of potentially inappropriate medication use in older patients. Macrodantin can cause renal failure in older patients, and its use should generally be avoided. TMP/SMX (Bactrim) interacts with warfarin and can result in dangerous elevations in INR and risk of bleeding. Vancomycin is not clinically appropriate for the treatment of simple UTI. Cephalexin (Keflex) covers E. coli, and has no known significant interaction with warfarin.


3. B
Skeletal muscle relaxants are included on the Beers list of potentially inappropriate medications in older patients. These medications can be sedating, can precipitate confusion, and should generally be avoided. Ketorolac is also included on the Beers list and carries an increased risk of renal failure and gastrointestinal bleeding. Ibuprofen can be appropriate for use in older patients if contraindications such as renal insufficiency, peptic ulcer disease, or warfarin use are absent. Ibuprofen should be used with caution in patients taking anti-
hypertensive agents or diuretics (it may lower the efficacy of these drugs), and patients with congestive heart failure.

4. C
Older emergency department patients with acute musculoskeletal pain have been shown to be at increased risk for receiving a potentially inappropriate medication based on Beers criteria. These patients are often prescribed skeletal muscle relaxants or high risk non-steroidal anti-inflammatory agents.


5. B
Glomerular filtration rate (GFR) declines significantly with age. However, because there is also a concomitant decrease in muscle mass the decline in GFR is often not reflected by an elevation in serum creatinine. Thus, patients with normal creatinine levels (especially those in the higher range of normal) may still have renal insufficiency and need dose adjustments based on creatinine clearance.


6. E
Delirium is characterized by an acute change in mental status with fluctuating course of severity. Key abnormalities in mental status include difficulty focusing attention, evidence of illogical flow of ideas, and alteration in level of consciousness.

7. C

This patient exhibits classic features of dementia. Dementia is characterized by chronic, pathologic short term memory loss. Additional features may include (but are not limited to) deficits in executive functioning (such as inability to draw a clock), difficulty performing simple calculations, language impairment, and failure to name familiar objects. This patient would not meet criteria for delirium based on lack of findings of inattention (she is described as attentive to questions).


8. B

This patient exhibits several classic findings of delirium – an acute alteration in mental status, altered level of consciousness, illogical flow of ideas, and difficulty focusing attention.


9. A

Emergency department patients with delirium who are discharged home from the ED are at greater risk for mortality compared to counterparts without delirium. Approximately 10% of all older ED patients may suffer from delirium. Unfortunately, delirium is poorly recognized by emergency physicians.


10. D

Potentially reversible cases of dementia include vitamin B12 deficiency, hypothyroidism, and normal pressure hydrocephalus. Treating these underlying conditions more often results in halting progression of associated dementia rather than marked improvement in existing deficits. Thus, the earlier these conditions are diagnosed, the better the prognosis is.


11. D

This patient's presentation is concerning for hemorrhagic shock. Baseline blood pressure values in older patients are often higher than in younger counterparts. A blood pressure of 100/60mm Hg may represent hypotension in a 79 year old with abdominal trauma. In addition, altered mental status in this patient could signify cerebral hypoperfusion.

Older trauma patients cared for in trauma centers have a much lower risk of mortality than those cared for in non-trauma centers. Older patients are also likely to have decreased cardiovascular functional reserve.

Aschkenasy MT, Rothenhaus TC. Trauma and falls in the elderly. Emergency Medicine Clinics of North America 2006; 24:413-432

12. C

Falls are the number one cause of cervical spine injury in older patients. These patients are at increased risk for ligamentous injuries of the spine resulting in anterior or central cord syndromes.

C2 fractures are also more prevalent in older patients. Plain radiographs may be difficult to interpret due to pre-existing degenerative joint disease in this population.

Aschkenasy MT, Rothenhaus TC. Trauma and falls in the elderly. Emergency Medicine Clinics of North America 2006; 24:413-432

13. C

“Normal” plain radiographs of the hip are inadequate to rule out hip fracture in older patients in whom there is a high clinical suspicion. It is important to diagnose non-displaced hip fractures early in order to minimize the risk of subsequent displacement with movement or attempts at weight bearing. Displaced femoral neck fractures have a much higher incidence of avascular necrosis, and in general warrant hip replacement surgery.

14. C

Falls are the number one cause of trauma related injury and mortality in older patients, followed by motor vehicle accidents (including pedestrians struck) and then thermal injuries.

15. E

Financial, emotional, and physical abuse are all considered types of elder abuse.

16. B

All states have statutes or adult protective service laws to address elder abuse, and most states mandate reporting of suspected abuse. Unfortunately, physicians report abuse only in a small minority of cases (possibly due to lack of recognition). Neglect is considered a form of elder abuse.


17. D

Skeletal muscle relaxants are included on the Beers list, and should generally be avoided in older patients. Advanced age, diabetes, and hypertension put this patient at risk for NSAID induced renal failure, and use of high dose NSAIDS should be avoided. Hydrocodone/acetaminophen (Vicodin) would be an appropriate choice for outpatient management of this patient’s pain.

18. B

Etomidate has few if any cardiovascular side effects, and is unlikely too contribute to hypotension. It is the drug of choice for sedation in older patients with hypotension. Propofol and benzodiazepines can cause worsening hypotension. Electrical cardioversion is a painful procedure, and this patient should receive sedation.

19. D

Pulmonary gas exchange can become less efficient with aging, putting these patients at increased risk for prolonged hypoxemia with apnea or hypoventilation during procedural sedation. Chest wall compliance also decreases. In addition, renal mass and blood flow tend to decrease with age. Serum creatinine levels often fall in the “normal” range in these patients due to concomitant decrease in muscle mass. Thus, medication doses should be calculated based on creatinine
clearance, even in patients with “normal” creatinine values. Older patients do not have an increased response to endogenous catecholamines.

20. A

While low to moderate dose NSAIDS may be appropriate, high dose and longer acting NSAIDS should generally be avoided in older patients with other risk factors for renal failure (such as hypertension). Propoxyphene/acetaminophen (Darvocet), ketorolac (Toradol), and long term use of longer acting NSAIDS (such as naproxen) are also included in the Beers list of potentially inappropriate medication use in older patients.

21. A

Older patients tend to underreport pain, and there is a trend towards undertreatment of pain in these patients. Narcotics are often appropriate for moderate to severe pain, and in many circumstances provide safer options than NSAIDS. When parenteral opiates are indicated, it is best to “start low and go slow” – starting with lower initial doses and slowly titrating as needed.


22. B

Older patients with acute appendicitis are at higher risk for misdiagnosis. These patients often have atypical presentations including complaints of vague abdominal pain and often lack fever or leukocytosis. In addition, they are more likely to have delayed presentations to the emergency department.


23. D

This patient's history and physical examination findings are concerning for symptomatic abdominal aortic aneurysm. Ruptured abdominal aortic aneurysm (AAA) with retroperitoneal hematoma can mimic symptoms of nephrolithiasis. Microscopic hematuria may also be present. Associated findings of uncontrolled hypertension and left sided abdominal tenderness make this case especially concerning for AAA. Non-contrast renal stone computed tomography (CT) is insufficient to rule out this diagnosis.


24. A

This patient's presentation is classic for mesenteric ischemia. Mesenteric ischemia is typically characterized by post-prandial abdominal pain out of proportion to abdominal tenderness found on physical exam. Low grade fever may also be present. Patients with bowel infarction may present with symptoms of frank peritonitis. Of the choices provided, mesenteric angiography is most likely to reveal the diagnosis. CT angiography, if available, can also be useful.

25. D

Older patients with acute abdominal pain are at high risk for misdiagnosis. Older patients with acute appendicitis often have vague abdominal complaints, atypical findings on physical examination, and lack fever or leukocytosis. Leukocytes in the urine are often present due to ureteral irritation, or may also be an incidental finding. There should be a low threshold for further imaging (such as CT scan) in these patients.

26. C

While all of these choices may be indicated in the evaluation of this patient, ECG to evaluate for inferior myocardial ischemia or infarction should be the first test performed. Other tests can be pursued subsequently as indicated.