American Board of Internal Medicine®

Self-Assessment Module
2018-2019 Update in Internal Medicine
Module C0U Version 18-1

Confidential

Earning MOC Points

1. **Save** your answers from today's session

2. **Order** this module **on or before June 30, 2019** by logging in to your physician home page on www.abim.org

3. **Complete** and submit the module to ABIM. MOC points are granted when you achieve a passing score.

Claiming CME Credit

- CME credit may be claimed from ABIM by completing the CME survey upon successful completion of the module.

- If you receive CME credit from the Learning Session host for attending this session, you should not also claim CME from ABIM

Important Dates

June 30, 2019

Last day to **order** this module from ABIM

September 28, 2019

(If you order the module on or before June 30th)

Last day to **submit** the completed module to earn MOC points and claim CME credit

Question 1

Three years ago, Lyme disease was diagnosed in a 43-year-old man who was found to have erythema migrans. After a two-week course of doxycycline, his symptoms improved but did not fully resolve. During the past year, he has had chronic fatigue, night sweats, and aching joints, which have neither improved nor worsened. He has not had a rash. He takes ibuprofen as needed. The patient's medical history is not significant.

Question 1 - continued

Temperature is normal. No rash is noted, and the joints are normal. The remainder of the physical examination is unremarkable. Electrocardiogram reveals no abnormalities.

Borrelia burgdorferi antibodies are IgG positive and IgM negative. Complete blood count, basic metabolic profile, and liver biochemical studies are normal. Serum thyroid-stimulating hormone is 0.9 U/mL [0.5–4.0].

Question 1 – continued

Given the possibility that the patient's symptoms are related to his previous diagnosis of Lyme disease, which of the following is the best next step in the management of his condition?

A. No additional treatment ✓
B. Oral doxycycline for 12 weeks
C. Clarithromycin and oral hydroxychloroquine for 12 weeks
D. Intravenous ceftriaxone followed by oral antibiotic therapy for a total of three weeks

PLEASE Trial

- RCT in Europe
- 2 weeks IV ceftriaxone
  - 12 weeks oral doxycyline
  - 12 weeks oral clarithro + plaquenil
  - 12 weeks placebo
- Outcome: health related QOL
- No statistical differences

Question 2

An 85-year-old woman who has chronic atrial fibrillation is concerned that warfarin (4 mg daily), which she has been taking for ten years for stroke prevention, will increase her risk of life-threatening bleeding. She has never had a major bleeding event. She also has heart failure and hypertension, for which she takes furosemide (20 mg daily), lisinopril (10 mg daily), and carvedilol (12.5 mg twice daily). The patient has not had significant dyspnea on exertion, orthopnea, or paroxysmal nocturnal dyspnea, and she has not had loss of consciousness or syncope. During the past six months, she has fallen twice after losing her balance.

Question 2 - continued

The patient feels well. Pulse rate is 72 per minute and irregularly irregular, and blood pressure is 130/70 mm Hg with no orthostatic change. No jugular venous distention is present. Heart rate is normal. The lungs are clear. No lower extremity edema is noted. Mini-Cog screening is normal. Get Up and Go test reveals mild instability with turning but is otherwise normal. Complete blood count and basic metabolic profile are normal. INR is 2.67. A review of monthly INR values over the past year reveals that they are in the therapeutic range (2.0–3.0).

The patient is referred for physical therapy to prevent future falls.

Question 2 - continued

Risk of which of the following is likely to increase most with age in this patient?

A. Fatal gastrointestinal hemorrhage
B. Nonfatal gastrointestinal hemorrhage
C. Intracranial hemorrhage
✓ D. Ischemic stroke

20

Stroke vs. Bleeding Risk

- Cohort study of >70 yo treated with VKA
  - thrombotic events higher 80s-90s
  - no difference in major bleeding
  - any clinically relevant bleeding more likely in >90
- Risk of stroke higher than risk of traumatic intracranial hemorrhage unless fall rate very high (~295)

Question 3

A 51-year-old man with no previous psychiatric history comes to see you with his wife. She reports that he has had anxiety and some unusual thoughts. Three days ago, he completed treatment with omeprazole, amoxicillin, and clarithromycin for *Helicobacter pylori* infection associated with melena and a gastric ulcer. His wife says that one week ago, he told her that a neighbor was planning to steal his lawnmower. He has not mentioned this concern during the past two days and seems less anxious now. The patient now says that he does not recall having any suspicions about his neighbor.

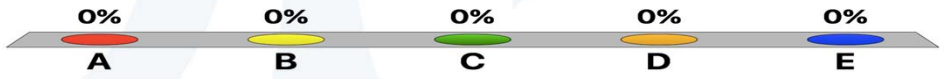
Question 3 - continued

The patient is in no acute distress and has a normal affect. Temperature is normal, pulse rate is 72 per minute, respirations are 14 per minute, and blood pressure is 124/70 mm Hg. On questioning, he does not exhibit any homicidal or suicidal ideations, and he has no paranoid thoughts. His memory is normal, and his thought process is logical. The remainder of the physical examination is normal. Today, hemoglobin is 11.3 g/dL [14–18] and was 11.5 g/dL upon discharge from the hospital three weeks ago.

Question 3 – continued

Which of the following is the most likely cause of the patient's symptoms?

A. *H. pylori* infection
B. Late-onset psychosis
C. Omeprazole
✓ D. Clarithromycin
E. Amoxicillin



20

Antibiomania

- Large, self-control case series
  - 66559 patients, 1824 had neuropsychiatric events
  - Clarithromycin associated with 4X risk
- Multiple antibiotics implicated in literature

H. pylori Therapy

- Bismuth based quadruple therapy is now first line when clarithromycin resistance exceeds 15%
- Clarithromycin resistance in U.S. around 20%
- Avoid clarithromycin based therapy in patients with any prior macrolide exposure

Question 4

A 35-year-old woman comes to see you for evaluation of right-sided, crampy flank pain that began ten hours ago. The pain radiates to her groin, worsens with certain positions, and its intensity varies. She has also had mild nausea without fever.

The patient appears to be uncomfortable, but she is lucid. Temperature is 37.2 C (99.0 F), pulse rate is 100 per minute, and blood pressure is 115/70 mm Hg. Cardiopulmonary examination reveals regular tachycardia, and the lungs are clear. The abdomen is soft, and the right side is slightly tender. Mild right costovertebral angle tenderness is present. Urinalysis reveals microscopic hematuria but no signs of infection. Non-contrast computed tomography of the abdomen and pelvis reveals a 4-mm obstructing right distal ureteral stone.

Question 4 – continued

In addition to aggressive fluid resuscitation, which of the following is indicated for the treatment of this patient's ureteral stone?

A. Immediate ureteroscopy
B. Oxybutynin
C. Hyoscyamine
✓ D. Tamsulosin

20

Medical Expulsive Therapy

- 2016 Meta-analysis
  - Shorter time to passage
  - Fewer episodes of pain
  - Lower risk of surgery or admission

- 2018 Cochrane Review
  - Likely increase stone clearance
  - May increase risk of major adverse events
  - Less effective for ≤5 mm stones

Question 5

A healthy 60-year-old woman sees you for a periodic evaluation of her blood pressure. She has had no chest pain, headache, or vision changes. The patient has hypertension, for which she takes hydrochlorothiazide (25 mg daily), lisinopril (40 mg daily), and amlodipine (5 mg daily). During the past three days, she has not taken her blood pressure medications.

Pulse rate is 82 per minute, respirations are 14 per minute, and blood pressure is 198/100 mm Hg. The remainder of the physical examination is normal.

Question 5 - continued

Laboratory studies:

Blood urea nitrogen	18 mg/dL [8–20]
Serum creatinine (Six months ago 1.0)	1.1 mg/dL [0.7–1.5]
eGFR	55 mL/min/1.73 m^2
Serum electrolytes	Normal
Urinalysis	Normal

Electrocardiogram is normal. You reinforce the importance of adhering to her medication regimen and regularly measuring her blood pressure at home.

Question 5 – continued

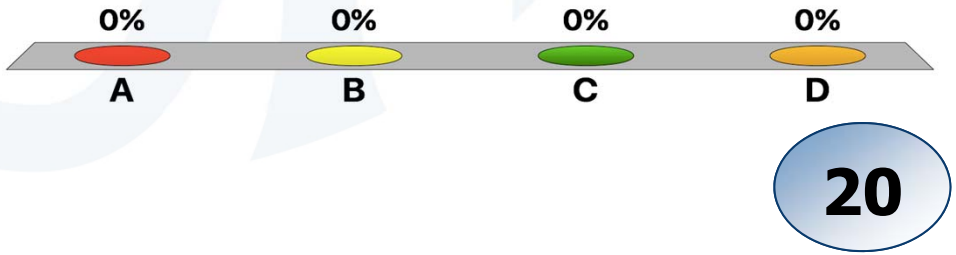
Which of the following should be done next for this patient?

A. Increase amlodipine to 10 mg daily, and schedule a follow-up evaluation in two days

B. Make no changes to medication, and schedule a follow-up evaluation in two days

C. Refer her to the emergency department for hypertensive urgency

D. Directly admit her to the hospital for hypertensive urgency



Asymptomatic Hypertensive Urgency

- BP >180/>110 without evidence of end-organ damage
- Retrospective cohort study 58K patients
  - No difference in major adverse CV events at 1 week, 1 month, or 6 months
  - BP control better at one month in group sent to ER, but no difference at 6 months
  - More patients admitted at 1 week and at 1 month in group referred to ER

Question 6

A 67-year-old woman who has obesity, type 2 diabetes mellitus, coronary artery disease, and hypertension sees you for a follow-up evaluation. Current medications are metformin, carvedilol, lisinopril, atorvastatin, and aspirin. The patient's kidney function has gradually worsened during the past three years. She is concerned that starting an additional hypoglycemic agent will make it more difficult to lose weight, and she wishes to avoid injections.

BMI is 34. Pulse rate is 66 per minute, and blood pressure is 138/84 mm Hg. The remainder of the physical examination is normal.

Question 6 - continued

Laboratory studies:

Hemoglobin A_{1C}	8.1% [4.0–5.6]
Serum creatinine	1.2 mg/dL [0.7–1.5]
eGFR	68 mL/min/1.73 m^2
Urine albumin-to-creatinine ratio	50 mg/g [less than 30]

The remainder of the basic metabolic profile is normal.

Question 6 – continued

Which of the following has been shown to have renoprotective effects in addition to improving control of type 2 diabetes mellitus?

- ✓ A. Empagliflozin
- B. Dapagliflozin
- C. Glimepiride
- D. Pioglitazone
- E. Sitagliptin

20

Empagliflozin

- EMPA-REG OUTCOME
  - Lower risk of incident or worsening nephropathy vs. placebo
  - Lower risk of progression to clinically relevant renal outcomes
- 2017 Meta-Analysis
  - Canagliflozin similar effects though not as robust
  - Dapagliflozin may worsen renal disease

Question 7

A 57-year-old woman sees you because she has had hot flushes for the past three years. Occasionally, they disrupt her sleep and cause her discomfort at work. Her last menstrual period was at age 54. Because she has heard that estrogen replacement is dangerous, she has instead tried behavioral measures, black cohosh, and venlafaxine, but her hot flushes have persisted. Currently, she takes no medications, and she does not smoke cigarettes. The patient has no history of headache or deep vein thrombosis, and she has had no surgeries. Her father had a myocardial infarction at age 66.

Vital signs and physical examination are normal.

Question 7 – continued

Which of the following best describes this patient's cardiac risk if she initiates combined estrogen-progesterone therapy at this time?

A. No increased risk because currently she is a nonsmoker

✓ B. No increased risk because onset of menopause was less than five years ago

C. Increased risk because she is older than 55 years

D. Increased risk because of her family history of coronary artery disease

20

Hormone Replacement Therapy

- RCT of HRT vs. placebo
- Change in carotid artery intima-media thickness primary outcome, secondary was CT assessment of CAD
  - Women less than 6 years past menopause benefitted
  - Women more than 10 years out showed no difference
- Subgroup analysis of WHI with similar findings

Question 8

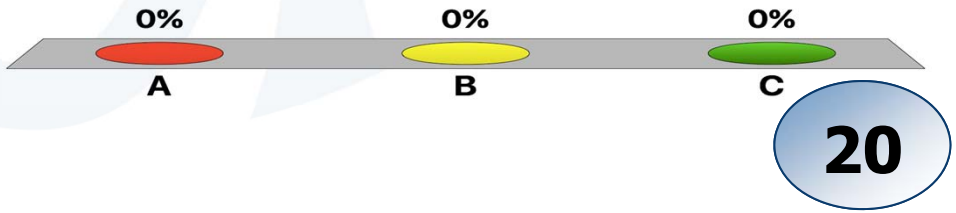
A 30-year-old man is seen in the clinic because he has had increased dyspnea, wheezing, rhinorrhea, and chest tightness for the past 24 hours. For the past week, he also has had nighttime cough, which is unusual for him. He was found to have asthma as a child. Typically, he needs his albuterol inhaler three times weekly. Current medications are albuterol via metered-dose inhaler and small-volume nebulizer as needed and fluticasone-salmeterol dry powder inhaler daily. The patient does not smoke cigarettes, and he does not own any pets.

Peak expiratory flow is 70% of predicted. Physical examination is otherwise normal.

Question 8 – continued

In addition to starting an oral corticosteroid, which of the following is the most appropriate next step for this patient?

A. No additional therapy at this time
B. Azithromycin, 500 mg daily for three days
C. Telithromycin, 800 mg daily for ten days



Asthma Exacerbation

- Current guidelines do not recommend antibiotics unless clear evidence of infection (fever, purulent sputum, imaging evidence of pneumonia)

- AZALEA trial – RCT 199 pts
  - 3 days azithromycin vs. placebo
  - No difference in symptom scores, quality of life scores, lung function

Question 9

A 39-year-old man has pain after twisting his lower back while playing basketball one day ago. The pain radiates from his back to his left buttock, and it is difficult for him to walk. He has not had fever or urinary symptoms. The patient has been taking nonprescription ibuprofen and applying heat to the affected area. Currently, he rates his pain as 9 of 10 (on a scale from 0, no pain, to 10, most severe pain). He has no malignancy and has not lost weight. Two years ago, he experienced similar pain that persisted for several months before it improved with physical therapy.

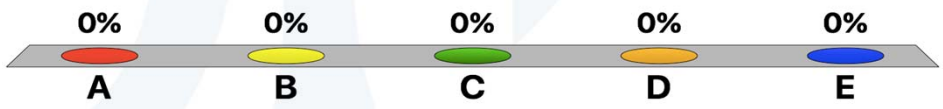
Question 9 - continued

Straight leg raising test is negative. In the lumbar region, bilateral mild tenderness along the paraspinal muscles is noted. Neurologic, motor, and sensory examinations are normal. You decide against ordering any imaging studies. The patient requests strong pain medication. He has no history of a substance use disorder, and your state's prescription drug monitoring program reveals no prescriptions during the past year. You recommend non-pharmacologic therapy in addition to a prescription opioid followed by a transition to nonsteroidal anti-inflammatory drugs after improved pain control has been achieved.

Question 9 – continued

Which of the following is the most appropriate opioid therapy to initially manage this patient's pain?

A. Extended-release oxycodone, 10 mg every 12 hours for up to five days
B. Immediate-release oxycodone, 5 mg every six hours for up to ten days
C. Immediate-release oxycodone, 5 mg every six hours for up to 14 days
✓ D. Immediate-release morphine sulfate, 15 mg every six hours as needed for up to five days
E. Extended-release morphine sulfate, 15 mg every 12 hours as needed for up to 14 days



20

Opiates for Acute Pain

- Opioid therapy for acute pain increases likelihood of long term use
- Guidelines recommend immediate release preparation, lowest effective dose
- 3 days of therapy generally sufficient, more than 7 days rarely indicated

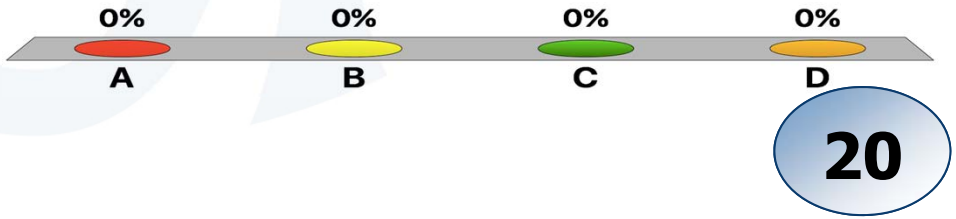
Question 10

A 60-year-old woman has a positive fecal immunohistochemical test (FIT) for occult blood as part of colon cancer screening. She has had no gross bleeding or other bowel symptoms. Her first colonoscopy at age 50 was negative except for diverticula identified in the sigmoid colon. Recently, she decided to undergo an annual FIT instead of another colonoscopy. She would prefer to delay colonoscopy unless it is absolutely necessary. The patient has type 2 diabetes mellitus and osteoarthritis. Current medications are metformin (1000 mg twice daily) and acetaminophen (650 mg three times daily as needed). Physical examination is normal.

Question 10 – continued

Which of the following is the best management strategy for this patient?

A. Repeat FIT
B. Multi-target stool DNA testing
C. Colonoscopy as soon as possible
D. Colonoscopy in one year



CRC Screening

- Current USPSTF guidelines:
  - Routine for 50-75
  - FOBT or FIT annually
  - FIT-DNA every 1-3 years
  - Colonoscopy every 10 years
  - CT colonography or flex sig every 5 years
  - Flex Sig every 10 years plus FIT annually
- If screening test positive, follow up with colonoscopy ASAP

Question 11

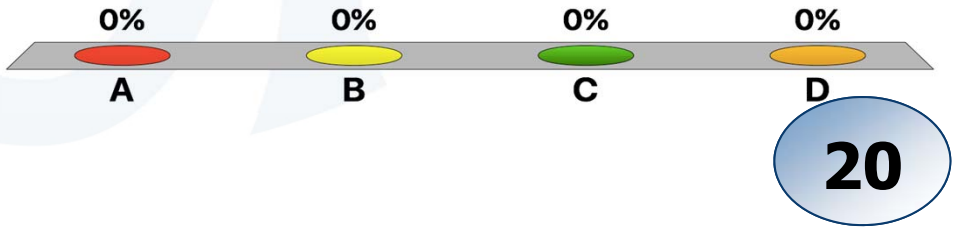
Four months ago, a 60-year-old man had a diagnostic coronary angiogram that showed three vessels with greater than 50% stenosis. His cardiologist recommended that he undergo coronary artery bypass grafting (CABG), and today the patient seeks your opinion regarding this procedure. He has not had chest pain with low-level activity or at rest, but he has noted dyspnea while climbing stairs and moderate activity. His medical history is significant for a myocardial infarction, and he had a 20-pack-year history of cigarette smoking until he quit 15 years ago. He also has hyperlipidemia and hypertension. Current medications are atorvastatin, furosemide, carvedilol, lisinopril, eplerenone, digoxin, and aspirin.

Echocardiogram reveals trace mitral regurgitation and a left ventricular ejection fraction of 27%.

Question 11 – continued

Which of the following best describes the outcomes related to CABG in this patient?

A. No improvement in all-cause mortality or cardiovascular mortality at ten years
B. Improvement in cardiovascular mortality but not all-cause mortality at ten years
C. Improvement in cardiovascular and all-cause mortality
D. Increased ten-year all-cause mortality



STICHES Trial

- 1212 patients with EF <35% and CAD amenable to CABG
  - CABG + GDMT
  - GDMT
- CABG associated with more favorable results across all long-term outcomes including cardiovascular and all-cause mortality
- Effect durable over time

Question 12

A 52-year-old man who has type 2 diabetes mellitus and hypertension sees you for a follow-up evaluation after resolution of his first episode of acute gout. He has no history of kidney stones or renal problems. The patient drinks one bottle of beer daily. Current medications are metformin, atorvastatin, and lisinopril.

BMI is 32. No joint swelling, tenderness, or masses are noted. Serum creatinine is 0.8 mg/dL [0.7–1.5], eGFR is greater than 60 mL/min/1.73 m2, and serum uric acid is 9.8 mg/dL [3.0–7.0].

Question 12 – continued

Which of the following is the most appropriate next step for the management of the patient's gout?

A. Allopurinol daily
B. Allopurinol and colchicine daily
C. No scheduled therapy ✓
D. Febuxostat daily

20

Urate Lowering Therapy

- Urate lowering therapy indicated for
  - Tophus/tophi on exam
  - More than 2 attacks per year
  - CKD stage 2 or worse
  - History of urolithiasis
- Guidelines recommend against ULT in most patients with first episode or infrequent attacks

Question 13

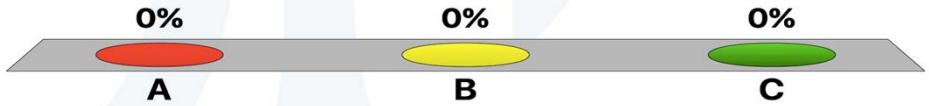
An otherwise healthy 69-year-old woman sees you for evaluation of fatigue, which she has had for the past three years. Two years ago, complete blood count, basic metabolic profile, and thyroid function were normal. Because her symptoms persisted, repeat laboratory studies were obtained six months ago; serum thyroid-stimulating hormone (TSH) was 7.42 U/mL [0.5–4.0]. One week ago, serum TSH was 7.40, and serum free thyroxine (T4) was 0.9 ng/dL [0.8–1.8]. The patient has hypertension, for which she takes amlodipine.

Vital signs are normal. Weight of 73 kg (162 lb) is unchanged from one year ago. Except for a BMI of 30, physical examination is normal. Thyroid antibody testing is negative.

Question 13 – continued

Which of the following is the best next step in the management of the patient's thyroid disorder?

A. Start levothyroxine now and increase dosage only if serum TSH rises above 10 U/mL or if thyroid antibodies test positive
B. Start levothyroxine now and titrate after serum TSH normalizes
C. ✓ Monitor if serum TSH exceeds 10 U/mL or new onset of symptoms before prescribing any medication



20

Subclinical Hypothyroidism

- TRUST trial
  - Age >65 with subclinical hypothyroidism
  - levothyroxine to normal TSH vs. placebo
  - No differences at one year
  - 60% of those screened had normalization of the TSH prior to randomization
- Guidelines recommend ongoing monitoring, treatment if TSH >10

Question 14

A 64-year-old man sees you to establish care. He has no symptoms or health concerns, all of his vaccinations are up to date, and he undergoes colon cancer screening regularly. The patient has no sleeping difficulties and feels well rested during the day. He had a 40-pack-year history of cigarette smoking, but he quit nine years ago. He walks one to two miles daily. He takes no medications.

Vital signs are normal. The lungs are clear, breath sounds are slightly diminished bilaterally, and no wheezing is heard.

Question 14 – continued

In addition to low-dose computed tomography of the chest to screen for lung cancer, which of the following should be performed now to evaluate the patient's lung function?

A. No additional testing
B. Complete pulmonary function testing
C. Polysomnography
D. Spirometry

20

Screening for COPD

The USPSTF recommends against screening for COPD in asymptomatic adults due to lack of evidence that it improves outcomes or alters the disease course.

Question 15

A 63-year-old man sees you for a follow-up evaluation of mild chronic fatigue, a slow decline in physical stamina, intermittent insomnia, short- and long-term memory decline, decreased libido, and erectile dysfunction. He says that he is not depressed. The patient also has hypertension and hyperlipidemia, for which he takes lisinopril and atorvastatin.

Vital signs and physical examination are normal. Results of cognitive screening also are normal.

Question 15 - continued

Laboratory studies:

Hemoglobin	16 mg/dL [14–18]
Serum creatinine	1.0 mg/dL [0.7–1.5]
eGFR	Greater than 60 mL/min/1.73 m^2
Serum thyroid-stimulating hormone	0.7 U/mL [0.5–4.0]
Serum creatine kinase	100 U/L [55–170]
Serum testosterone	260 ng/dL [291–1100]

Question 15 – continued

Testosterone replacement therapy most likely will improve which of the following in this patient?

A. Walking distance
B. Fatigue
✓ C. Sexual function
D. Cognitive ability

20

Testosterone Replacement

- Endocrine society recommends against offering to all men with low levels

- RCT 790 men >65, testosterone <275
  - Moderate improvement in sexual function
  - Some benefit in mood/depression symptoms
  - No benefit in vitality or walking distance

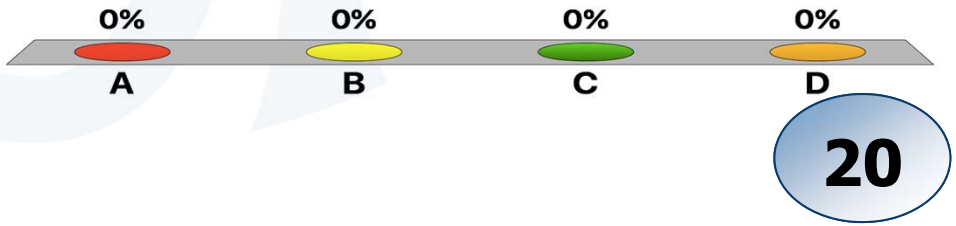
Question 16

A 45-year-old African American man who has sickle cell trait and type 2 diabetes mellitus sees you in the office. He takes metformin (1000 mg twice daily). The patient feels well, and physical examination is unremarkable. Hemoglobin A_{1C} is 6.9% [4.0–5.6].

Question 16 – continued

Which of the following is the impact of the patient's sickle cell trait on his hemoglobin A_{1C} level?

A. No impact
B. Hemoglobin A_{1C} underestimates past glycemia
C. Hemoglobin A_{1C} overestimates past glycemia
D. Hemoglobin A_{1C} cannot be used to estimate glycemic control because of a variable relationship to blood glucose levels



A1C and Sickle Cell Trait

- Pooled data from two well established cohort studies
  - A1C lower in patients with sickle trait than in those without trait at any level of fasting or 2 hour postprandial glucose
  - Difference greater at higher glucose levels
  - Estimated to be 0.3% lower

Question 17

A 55-year-old man who has type 2 diabetes mellitus, obesity, hypertension, and hyperlipidemia sees you for a periodic health evaluation. Approximately one month ago, he had a single episode of visible blood in his urine. He has not had fever, chills, nausea, dysuria, urinary urgency, incontinence, or abdominal pain. Current medications are insulin glargine, insulin aspart, metformin, hydrochlorothiazide, atorvastatin, and aspirin.

The patient is in no acute distress. Temperature is 36.6 C (98.0 F), pulse rate is 85 per minute, and blood pressure is 130/75 mm Hg. The abdomen is nontender, and bowel sounds are positive. No costovertebral angle tenderness is noted.

Question 17 - continued

Laboratory studies:

Hemoglobin A_{1C}	7.0% [4.0–5.6]
Serum creatinine	0.8 mg/dL [0.7–1.5]
eGFR	Greater than 60 mL/min/1.73 m^2
Urinalysis	
Blood	Negative
Protein	Negative
WBCs	0/hpf

Question 17 – continued

In addition to obtaining a computed tomography urogram, which of the following is indicated for the evaluation of the patient's hematuria?

A. Obtain a urine culture
B. Order a 24-hour urine cytology
✓ C. Refer for cystoscopy
D. Order further testing only if symptoms recur

20

Hematuria High Value Care

1. Ask patients with microscopic hematuria about gross hematuria
2. Do not use screening urinalysis in asymptomatic adults
3. Confirm blood on dipstick with urine micro finding of >3 RBC/hpf
4. Refer for urology testing in all gross hematuria even if self-limited

Hematuria High Value Care

5. Consider urology referral for cystoscopy and imaging in adults with microscopic hematuria in the absence of some demonstrable benign cause
6. Pursue evaluation of hematuria even if the patient is on antiplatelet therapy or anticoagulation
7. Do not obtain urine cytology or other molecular markers in initial evaluation

Question 18

For three days, a 70-year-old woman has had worsening cough, chest pain, and dyspnea. Her husband has not noticed any changes in her mental status. She is regularly evaluated by her primary care physician. Results of a recent mammogram were normal. The patient takes no medications. She has never smoked cigarettes and does not drink alcoholic beverages. She has not recently traveled.

Temperature is 38.4 C (101.1 F), pulse rate is 94 per minute, respirations are 22 per minute, and blood pressure is 100/65 mm Hg. Oxygen saturation by pulse oximetry is 87% on room air and 92% with the patient breathing 2 L/min of oxygen. The patient has increased work of breathing. On the right side, crackles and egophony without decreased fremitus are heard.

Question 18 - continued

Laboratory studies:

Hematocrit	35% [37–47]
Hemoglobin	12.5 g/dL [12–16]
Leukocyte count	13,000/μL [4000–11,000]
Blood urea nitrogen	22 mg/dL [8–20]
Serum creatinine	0.9 mg/dL [0.7–1.5]
eGFR	Greater than 60 mL/min/1.73 m^2
Serum electrolytes	
Sodium	135 mEq/L [136–145]
Potassium	4.0 mEq/L [3.5–5.0]
Bicarbonate	22 mEq/L [23–28]

Question 18 - continued

Radiograph of the chest reveals a right lower lobe opacity and no effusion. The patient is admitted to the hospital and treated with intravenous levofloxacin (750 mg daily). Within two days, her temperature and oxygen saturation are normal, and she is ready to be discharged.

Question 18 – continued

Which of the following is the best next step to complete this patient's treatment?

A. Oral levofloxacin, 750 mg daily for a total antibiotic course of three days

✓ B. Oral levofloxacin, 750 mg daily for a total antibiotic course of five days

C. Oral levofloxacin, 750 mg daily for a total antibiotic course of ten days

D. Continuation of intravenous levofloxacin for a total antibiotic course of five days

20

IDSA Guidelines

- Treat CAP for minimum of 5 days
  - can discontinue therapy then if afebrile for 48-72 hours, normal vital signs, mentation and oxygenation normal
- RCT in Spain of 312 patients
  - Noninferiority of 5 days of therapy vs. usual care determined by physician

Question 19

A 55-year-old man who has essential hypertension, obstructive sleep apnea, and type 2 diabetes mellitus was prescribed atorvastatin for primary cardiovascular disease prevention two months ago. Two weeks ago, he noted cramping in his calves with walking. He discontinued the atorvastatin because he was concerned with muscle toxicity; his cramping resolved during the next few days. The patient has never smoked cigarettes.

Today, the patient feels well. Blood pressure is 125/75 mm Hg. No edema or muscle tenderness is noted on physical examination.

Question 19 - continued

Laboratory studies:

Hemoglobin A_{1C}	7.2% [4.0–5.6]
Serum creatinine	0.9 mg/dL [0.7–1.5]
eGFR	Greater than 60 mL/min/1.73 m^2
Serum cholesterol	
Total	180 mg/dL [desirable: less than 200]
HDL	35 mg/dL [low: less than 40]
LDL	120 mg/dL [near-optimal: 100–129]
Serum creatine kinase	65 U/L [55–170]

Question 19 – continued

Which of the following is the best approach to treatment now?

A. Begin ezetimibe
B. Begin red yeast rice supplementation
✓C. Resume atorvastatin
D. No further treatment

20

Statin Adverse Reactions

- Retrospective Cohort Study
  - 22% of patients reported adverse effects
  - 70% of those still received statin Rx
    - 10-20% decrease in major CV events
- For patients with mild muscle symptoms
  - evaluate for vitamin D deficiency, hypothyroidism
  - Check for drug interactions
  - Try another statin or a lower dose

Question 20

A 74-year-old man who has gastroesophageal reflux disease and hyperlipidemia had a permanent pacemaker implanted several years ago for symptomatic bradycardia. Neurologic symptoms that may be cerebellar in origin have now developed, and you would like him to undergo magnetic resonance imaging (MRI) of the brain. Recently, his electrophysiologist interrogated the patient's pacemaker device and found it to be functioning optimally; however, it is not MRI-conditional approved. Current medications are omeprazole and simvastatin.

Electrocardiogram reveals sinus rhythm at 64 beats per minute with normal intervals and no acute changes. Serum creatinine is 1.2 mg/dL [0.7-1.5], and eGFR is 59 mL/min/1.73 m2.

Question 20 – continued

Which of the following is the best next step in the evaluation of this patient?

A. Place a temporary pacemaker as a precaution, and then obtain MRI of the brain
B. Consult electrophysiology to pre-program his pacemaker, and then obtain MRI of the brain
C. Order computed tomography of the head without contrast
D. Order computed tomography of the head with contrast

20

MagnaSafe Registry

- Prospective registry of 1000 patients with pacemakers, 500 patients with ICD not “MRI Conditional”
- Pre-programmed device
- Non-thoracic MRI at 1.5 tesla
- No device or lead failure

Question 21

A 45-year-old man comes to the emergency department because he has had progressive swelling of the left leg and mild dyspnea for four days. Ultrasound reveals occlusive left popliteal thrombus, and computed tomographic pulmonary angiogram shows subsegmental right-sided pulmonary emboli. The patient has not had any recent immobilization or trauma, and he is not taking any medications known to cause thrombosis. He also has prediabetes. He has no history of thrombosis, and he has no known family history of venous thrombus.

Question 21 – continued

Before the patient is discharged from the hospital, which of the following tests should you order?

A. Factor 5 Leiden and prothrombin gene mutation
B. Antiphospholipid antibodies
C. Prostate-specific antigen level
D. No further thrombophilia testing is indicated ✓

20

Thrombophila Testing

- 7% of general population has inherited thrombophilia, risk of VTE 3-20X higher
- No evidence for primary prophylaxis
- Choosing Wisely
  - In patients with provoked or unprovoked VTE, inpatient testing is not indicated
  - Results do not affect management
  - Not cost effective and may be inaccurate

Question 22

A 58-year-old man who has chronic cough and mild dyspnea was hospitalized for worsened shortness of breath and diffuse wheezing. Radiograph of the chest was clear. His oxygen saturation by pulse oximetry was 89% on room air and 95% breathing 3L of oxygen. Exacerbation of chronic obstructive pulmonary disease was diagnosed, and the patient was prescribed nebulized albuterol, azithromycin, and oral corticosteroids. He was discharged after three days and completed the course of his medications at home. He also has hypertension and benign prostatic hypertrophy. For the past 40 years, he has smoked one and one-half pack of cigarettes daily.

Question 22 - continued

Current outpatient medications are tamsulosin, lisinopril, amlodipine, nebulized albuterol, and budesonide-formoterol. Two weeks after his discharge from the hospital, the patient sees you for a follow-up evaluation and to undergo spirometry testing.

Temperature is normal, pulse rate is 78 per minute, and blood pressure is 144/86 mm Hg. Pulmonary examination reveals scattered wheezing, but air movement is good. Spirometry reveals an FEV1 of 95% of predicted, FVC of 85% of predicted, and an FEV1/FVC ratio of 0.85 after bronchodilator. Computed tomogram of the chest shows mild thickening of the airway walls. No opacities, masses, emphysema, or bullae are noted.

Question 22 – continued

Based on the patient's testing results and symptoms, which of the following is the most likely diagnosis?

A. Chronic obstructive pulmonary disease
B. Bronchiectasis
C. Symptomatic tobacco use with preserved lung function
D. Interstitial lung disease

20

Symptoms without COPD

- Observational study of 2700 current or former smokers matched with nonsmoker controls
- Patients did not meet GOLD criteria for COPD (FEV1:FVC <0.70 on spirometry after bronchodilator)
- Respiratory symptoms in 50% of current/former smokers
  - 42% used bronchodilators
  - 23% inhaled corticosteroids

Question 23

Three months ago, you prescribed citalopram (20 mg daily) to a 28-year-old woman who has depression. She was tolerating the medication well two weeks later. At the patient's four-week follow-up evaluation, the dosage was increased to 40 mg daily. She has had no adverse effects, but she has not noted any improvement in her symptoms. Today, her PHQ-9 score is 15, which is unchanged from three months ago. She reports that she has not had thoughts of self-harm, mania, or anxiety. Screening for alcohol abuse is negative. Serum thyroid-stimulating hormone is 0.8 U/mL [0.5 – 4.0].

Question 23 – continued

Which of the following is the best next step?

A. Increase dosage of citalopram to 80 mg daily
B. Transition citalopram to sertraline
C. Transition citalopram to trazodone
D. No change to the current therapy is needed; follow patient for six more weeks

20

STAR-D Trial

- 12 weeks of citalopram, 30% of patients achieved complete remission
- Of the remaining patients, 25% responded favorably to alternative therapy with sertraline, venlafaxine, or bupropion
- Additional 1/3 responded to augmentation with bupropion

Question 24

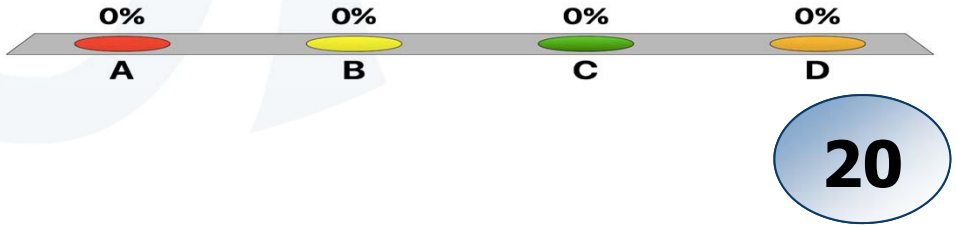
A 55-year-old woman sees you after she recently fell and fractured her left tibia. An orthopedist applied an immobilizing brace and walking boot; she will not need surgery. She has never had a clot or bleeding disorder but is concerned that immobilization will increase her risk for thrombosis because her sister had a pulmonary embolism while pregnant. She also has hypertension and type 2 diabetes mellitus. Current medications are lisinopril, atorvastatin, and metformin. The patient quit smoking cigarettes ten years ago.

The patient is ambulating. BMI is 33. Blood pressure is 118/74 mm Hg. Except for a brace and walking boot on the lower left leg, physical examination is normal.

Question 24 – continued

In addition to encouraging the patient to ambulate, which of the following should you recommend to reduce her risk for symptomatic venous thromboembolism?

A. Dabigatran
B. Warfarin
C. Enoxaparin
D. Anticoagulation is not indicated ✓



POT-KAST and POT-CAST

- 8 days low molecular weight heparin after arthrocentesis (1451 pts)
- LMWH for the duration of casting in patients
- Neither group demonstrated a change in prevention of VTE or in bleeding risk

Question 25

One hour ago, a 62-year-old woman had severe headache at home. After she became less responsive, her family members called emergency medical technicians. Upon arrival to the emergency department, the patient is somnolent and opens her eyes to briefly communicate. She is confused, uses inappropriate words, and responds to localized pain (Glasgow Coma Score is 11). The patient has coronary artery disease. Current medications are metoprolol, clopidogrel, and atorvastatin.

Emergent computed tomography without intravenous contrast reveals an intracerebral hemorrhage confined to the left basal ganglia with slight surrounding edema and no mass effect or midline shift. INR is 1.0, and platelet count is 170,000/μL [150,000 – 450,000].

Question 25 – continued

Platelet transfusion is associated with which of the following outcomes in patient's such as this woman?

A. Decreased recurrent bleeding
B. Increased odds of death or dependence
C. Increased chance of functional recovery
D. Decreased length of hospital stay

20

PATCH Investigators

- Multicenter open-label masked endpoint randomized trial in 190 pts
- Supratentorial intracranial hemorrhage taking antiplatelet therapy for at least 7 days prior to the bleed
- Standard care vs. standard care plus platelet transfusion within 90 minutes of brain imaging
- Odds of death or dependence higher in transfusion group

Question 26

A 61-year-old man who has non-ischemic cardiomyopathy, hypertension, and obesity sees you in the office. Current medications are carvedilol, atorvastatin, lisinopril, chlorthalidone, and aspirin. He smokes cigarettes.

Cardiac examination reveals normal rate and regular rhythm, a grade 2/6 systolic ejection murmur along the right upper sternal border, and no gallops or rubs. The lungs are clear. No lower extremity edema is noted. Hemoglobin is 12.4 g/dL [14–18]. Serum creatinine is 1.30 mg/dL [0.70–1.30], and eGFR is 54 mL/min/1.73 m^2; basic metabolic profile is otherwise normal.

Question 26 - continued

Echocardiogram shows left ventricular ejection fraction of 35%, mild mitral regurgitation, trace aortic stenosis, and mild pulmonary hypertension. Electrocardiogram reveals sinus rhythm at 64 beats per minute and normal axis and intervals. No acute changes are seen.

Question 26 – continued

Which of the following is the most appropriate method to reduce the risk of thromboembolism in this patient?

A. Continue aspirin only
B. Add clopidogrel
C. Replace aspirin with rivaroxaban
D. Replace aspirin with warfarin

20

Risk of Thrombotic Complications

- Comparison of aspirin (162, 300, or 325 mg) vs. warfarin in patients with heart failure with reduced ejection fraction in sinus rhythm
- Warfarin lowered rate of nonfatal CV events but increased risk of major bleeding to a greater degree
- Aspirin lowered all cause mortality as compared to warfarin

Question 27

A 50-year-old man sees you for a follow-up evaluation of type 2 diabetes mellitus with mild albuminuria. Generally, he feels well. Current medications are metformin (500 mg twice daily), insulin glargine (10 units daily), atorvastatin (40 mg daily), and losartan (50 mg daily).

Laboratory studies:

Hemoglobin A_{1C}	7.0% [4.0–5.6] (One year ago 7.5%)
Serum creatinine	1.7 mg/dL [0.7–1.5]
eGFR	55 mL/min/1.73 m^2 (One year ago 63 mL/min/1.73 m^2)
Serum potassium	3.8 mEq/L [3.5–5.0]

Question 27 – continued

In addition to referring the patient to nephrology for evaluation, which of the following is the best next step in management?

A. Discontinuation of metformin
B. Continuation of current treatment
C. Replacement of metformin with glipizide
D. Discontinuation of losartan

20

Metformin

- Demonstrated benefit in patients with mild to moderate CKD
  - studied in eGFR down to 30 with reduction in all cause mortality
- Decrease in all-cause mortality and hospital readmission in CHF

Question 28

An 89-year-old woman who has lived in a nursing home for the past two years is brought to the emergency department because of altered mental status. She has hypertension and Alzheimer's disease, which requires assistance with instrumental activities of daily living and two of her basic activities of daily living (bathing and dressing). Until two days ago, she was interactive and ate her meals in the dining room. She has since stopped eating, sleeps for most of the day, and does not recognize staff members. The patient has also been incontinent of urine. Because of her cognitive impairment, she is unable to verbalize any additional symptoms.

Question 28 - continued

The nursing home has sent you a 12-month record of her oral temperatures, which range from 36.0 C (96.8 F) to 36.3 C (97.4 F). She takes chlorthalidone (25 mg daily), and her current drug regimen has not changed recently.

The patient is sleepy but arousable. She is inattentive and unable to answer questions. Temperature is 37.6 C (99.6 F), pulse rate is 92 per minute, respirations are 16 per minute, and blood pressure is 110/60 mm Hg. No rash is present. Cardiopulmonary examination is normal. The abdomen is soft with mild suprapubic tenderness. No edema is noted in the extremities.

Question 28 - continued

Laboratory studies:

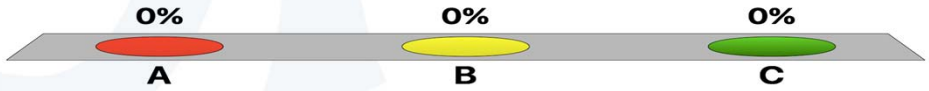
Hemoglobin	12.2 g/dL [12–16]
Leukocyte count	8900/μL [4000–11,000]
Platelet count	340,000/μL [150,000–450,000]
Blood urea nitrogen	19 mg/dL [8–20]
Serum creatinine	1.1 mg/dL [0.7–1.5]
eGFR	Greater than 60 mL/min/1.73 m^2
Urinalysis	
WBCs	Too numerous to count
Bacteria	Too numerous to count

Radiograph of the chest and electrocardiogram show no acute findings. The patient is admitted to the hospital.

Question 28 – continued

Based on the patient's urinalysis results, which of the following is the most appropriate treatment?

A. Antibiotics to treat urinary tract infection
B. Antibiotics only if urine culture is positive
C. No antibiotics



20

Fever

- Fever in older adult residents of long-term care facilities
  - single oral temp >100.0 or
  - Repeated oral temp >99 or repeated rectal temp >99.5 or
  - Increase in temperature of >2 degrees above baseline, if known
- Patient with delirium and fever and evidence of urinary tract infection

Question 29

A 58-year-old woman who has obesity and type 2 diabetes mellitus sees you for evaluation of severe hidradenitis suppurativa of her axillae. She also has hypertension, stage 3 chronic kidney disease, and chronic heart failure with a left ventricular ejection fraction of 45%. Although she has used topical medications, taken multiple courses of antibiotics, and had surgical drainage of her lesions, her symptoms have persisted. Recently, her dermatologist recommended adalimumab, an anti-tumor necrosis factor (TNF)-alpha inhibitor. Current medications are minocycline, atorvastatin, lisinopril, and metformin.

BMI is 34. Blood pressure is 138/76 mm Hg. Several inflamed cystic lesions in both of the axillae and scarring from a previous surgery are noted. Trace edema is seen in the legs. The remainder of the physical examination is normal.

Question 29 - continued

Laboratory studies:

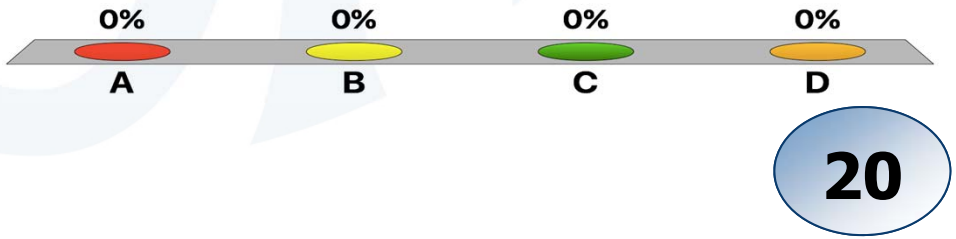
Complete blood count	Normal
Hemoglobin A_{1C}	7.1% [4.0–5.6]
Serum creatinine	1.4 mg/dL [0.7–1.5]
eGFR	40 mL/min/1.73 m^2

Radiograph of the chest and electrocardiogram show no acute findings. The patient is admitted to the hospital.

Question 29 – continued

Which of the following should you tell this patient regarding her use of an anti-TNF-alpha inhibitor to treat her hidradenitis suppurativa?

A. This medication has been shown to be ineffective in similar patients
B. A partial improvement is expected ✓
C. A complete remission is expected
D. Use of this medication is contraindicated



Adalimumab

- May worsen pre-existing heart failure
- Use with caution in elderly who have a higher rate of infection & malignancy
- Some improvement with hidradenitis suppurativa but effect may wane over time

Question 30

A 35-year-old woman who has been treated with ropinirole for restless legs syndrome during the past year sees you for follow-up evaluation. Although her dosage was increased one month ago, her symptoms have persisted. Initially, her nighttime symptoms resolved, but in the past two months, they have returned and are more severe. The patient continues to have an uncomfortable sensation and the urge to move her legs. Symptoms are worse at night, but they also intermittently occur throughout the day at varying levels of severity. She notes that they improve with movement.

Vital signs are normal. No skin findings are noted. Distal pulses are strong. Sensation is intact.

Question 30 - continued

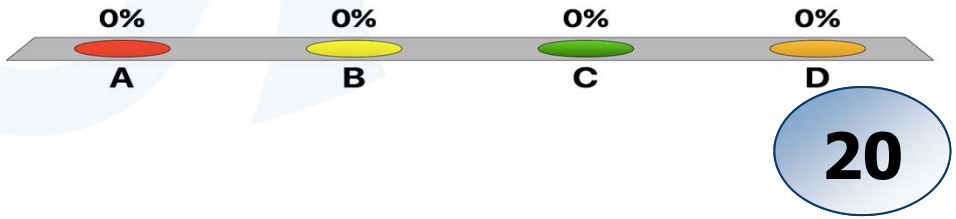
Laboratory studies:

Hemoglobin	13 g/dL [12–16]
Blood urea nitrogen	12 mg/dL [8–20]
Serum creatinine	1.0 mg/dL [0.7–1.5]
eGFR	Greater than 60 mL/min/1.73 m^2
Serum ferritin	180 ng/mL [11–211]

Question 30 – continued

Which of the following is indicated to treat worsening restless legs syndrome in this patient?

A. Addition of intravenous iron
B. Addition of rotigotine
C. Addition of olanzapine
D. Transition from ropinirole to pregabalin ✓



Augmentation in RLS

- Dopaminergic treatment of RLS
  - Highly effective initially in relief of symptoms
  - Symptoms often return with severity matching or exceeding pretreatment
- Best Practice: avoid dopaminergic treatment altogether
- Risk factors for augmentation: low iron stores, worse initial symptoms, family history of restless leg syndrome

Earning MOC Points

1. **Save** your answers from today's session

2. **Order** this module **on or before June 30, 2019** by logging in to your physician home page on www.abim.org

3. **Complete** and submit the module to ABIM. MOC points are granted when you achieve a passing score.