

## Supplemental Digital Appendix 1

### Self-Assessment Questions From Three Representative Modules

To illustrate the questions asked, we present below the question used for the 1-question format for three modules. This question always appeared at the beginning of every module, regardless of presence or total number of questions.

#### **2009 Modules**

##### **Module A: Hyperlipidemia**

A 57-year-old man presents for a health maintenance exam. He reports overall good health and has no specific complaints. Medical history is remarkable for hypertension, a single episode of gout about three years ago, gastroesophageal reflux, and seasonal allergies. He takes hydrochlorothiazide and Prilosec OTC, and uses a nasal steroid spray as needed. He used to smoke but quit 17 years ago. He drinks 2-4 alcoholic beverages per day. He works as a postal clerk, and doesn't get much exercise. Family history is remarkable for heart attack in a paternal aunt at age 62 and diabetes mellitus among several grandparents, aunts, and uncles. On exam, BP is 136/88, pulse 66, weight 86kg, height 172 cm, otherwise unremarkable. Since last screening lipid panel was 5 years ago, you perform another: total cholesterol is 214, LDL 134, HDL 36, triglycerides 234. Other labs include fasting glucose 88 and creatinine 0.9.

What is the most appropriate next step in management? (You may wish to use the NHLBI online clinical risk calculator at <http://hin.nhlbi.nih.gov/atpiii/calculator.asp>.)

- A) Diagnose hypercholesterolemia and encourage lifestyle measures, schedule follow-up in two months
- B) Diagnose hypercholesterolemia, encourage lifestyle measures, and start atorvastatin 10mg daily
- C) Diagnose hypertriglyceridemia, encourage lifestyle measures, and start gemfibrozil 600mg twice daily
- D) Encourage greater attention to diet and exercise, schedule follow-up in one year

*Answer: A*

This patient's cholesterol is above goal, based on risk factors (age, hypertension, and low HDL). However, we must combine this information with knowledge of his 10-year cardiac risk in order to make therapeutic decisions. Tools such as the NHLBI online clinical risk calculator can be helpful in this regard. This patient's 10-year risk is 14%, which puts him at intermediate risk.

##### **Module C: Diabetes mellitus**

A 64-year-old woman with diabetes returns to your office for six-month follow-up. She has successfully managed her diabetes for six years with diet and exercise, but most recent hemoglobin A1C is 7.9 and morning glucose ranges 110 to 160. Medical history includes hypertension, medically managed coronary artery disease, renal insufficiency, and hypothyroidism. Medications include furosemide, lisinopril, metoprolol, aspirin, and levothyroxine. She does not smoke or use alcohol. BP is 128/78, pulse 56, weight 83kg, height 170cm. There is a 1/6 systolic ejection murmur, otherwise normal physical exam. She mentions that she really hates needles, and that her insurance company doesn't cover prescriptions. Labs include normal CBC, K 4.1, creatinine 2.1, AST 24, LDL 79, and slightly elevated urinary microalbumin.

The most appropriate next step in management is:

- A) Metformin
- B) Glipizide
- C) Rosiglitazone
- D) Acarbose
- E) Insulin
- F) No change in therapy

*Answer: B*

Metformin, thiazolidinediones, and acarbose are all contraindicated in renal insufficiency. A sulfonylurea such as glipizide should be safe in renal insufficiency and is relatively cheap. Insulin would be another option, but would require daily administration with a needle.

## **2010 Module**

### **Module E: Osteoporosis**

A 61-year-old Caucasian woman presents for a general medical exam. Medical history is remarkable for hypertension, treated with lisinopril, depression, treated with citalopram, and cholecystectomy. She takes no other medications or supplements. She quit smoking 12 years ago, and uses alcohol perhaps once per week. Family history is unremarkable, including no history of fragility fracture. On exam, BP is 132/82, pulse 66, height 170cm (5' 7") and weight is 66kg (145 lbs) (BMI 22.8). The remainder of the exam is unremarkable.

You screen for osteoporosis using a DXA scan. The results show a T score in the femoral neck -2.2 and a T score in lumbar spine -1.8. The FRAX calculator (<http://www.shef.ac.uk/FRAX/tool.jsp?locationValue=9>) gives her a 10-year fracture risk of 1.6% for the hip and 10% for major fracture.

The most appropriate action at this point is:

- A) No change in therapy
- B) Ensure adequate calcium and vitamin D intake
- C) Prescribe estrogen
- D) Prescribe raloxifene
- E) Prescribe alendronate

*Answer: B*

This 61-year-old woman needs to be screened for osteoporosis because she is relatively thin and does not currently use hormone replacement therapy. Her DXA scan results show osteopenia. These results can be used along with other information to estimate her 10-year risk of osteoporotic fracture. Current guidelines suggest that, based on her risk, she does not require prescription drug therapy. However, adequate calcium and vitamin D should be encouraged to maintain bone mineral density.

## Supplemental Digital Appendix 2

### Residents' Posttest Knowledge Scores and Self-reported Time for Completion, for Each Module by Year and Combined, Mayo School of Graduate Medical Education, January 2009–July 2010

No. of questions	2009 modules				2010 modules				
	A: Hyperlipidemia	B: Asthma	C: Diabetes mellitus	D: Depression	E: Osteoporosis	F: Tobacco dependence	G: Cervical screening	H: Dementia	I: Combined (N = 180)
<b>Knowledge scores*</b>									
0	-	-	-	-	71.7 (2.5)	75.5 (2.3)	67.5 (2.8)	73.9 (2.9)	73.1 (1.3)
1	70.1 (2.9)	81.7 (3.0)	75.8 (2.9)	71.2 (3.4)	67.4 (2.4)	74.2 (2.4)	68.4 (2.6)	72.7 (3.0)	72.9 (1.0)
5	68.1 (2.8)	73.5 (3.3)	75.7 (3.2)	74.3 (3.0)	—	—	—	—	72.8 (1.5)
10	67.2 (3.1)	79.9 (3.3)	76.3 (2.9)	77.1 (2.7)	71.9 (2.4)	80.7 (2.4)	73.0 (2.7)	76.5 (3.0)	75.7 (1.1)
15	67.1 (3.1)	77.7 (3.6)	77.1 (2.7)	75.7 (3.0)	72.6 (2.6)	83.5 (2.3)	67.7 (2.9)	73.8 (2.9)	74.4 (1.0)
<b>Time†</b>									
0	—	—	—	—	39.6 (3.5)	35.2 (3.4)	48.8 (4.1)	43.1 (3.8)	46.6 (1.9)
1	45.3 (6.2)	52.0 (5.8)	55.5 (7.7)	52.4 (7.1)	37.8 (3.4)	36.7 (3.6)	41.3 (3.9)	44.2 (3.9)	44.2 (1.5)
5	52.1 (5.9)	51.1 (6.8)	61.3 (8.3)	41.5 (6.1)	-	-	-	-	43.2 (2.4)
10	51.6 (6.6)	59.3 (6.8)	50.1 (7.7)	58.3 (5.5)	48.4 (3.3)	45.9 (3.5)	42.9 (4.2)	47.3 (4.2)	49.8 (1.8)
15	52.4 (6.5)	61.3 (6.9)	60.7 (7.1)	53.1 (6.2)	54.0 (3.4)	40.0 (3.3)	44.2 (4.4)	41.5 (3.9)	50.6 (1.9)

\* Values represent least square means (standard error of the mean) for posttest score (% correct).  $P = .04$  for ANOVA across all 5 groups, adjusting for module and presence/absence of a pretest. N = 107 for 2009; N = 138 for 2010.

† Values represent least square means (standard error of the mean) for self-reported time (in minutes).  $P < .0001$  for ANOVA across all 5 groups, adjusting for module and presence/absence of a pretest. N = 106 for 2009; N = 131 for 2010.