

1. Mr. Klosterman had a myocardial infarction. Explain what happened to his heart.
  - A. Myocardial infarction (MI), also known as a heart attack, occurs when the oxygen supply to the heart muscle is cut off. “Myo” means muscle, “cardial” refers to the heart, and “infarction” means death of tissue due to lack of blood supply. Mr. Klosterman’s arteries developed deposits of plaque overtime, gradually leading to a significant buildup that narrowed the blood flow to a portion of his heart. The buildup starved this portion of his heart of oxygen and nutrients, causing damage to the muscle, which resulted in an MI (Cleveland Clinic, 2013).
  
2. Mr. Klosterman’s chest pain resolved after two sublingual NTG at 3-minute intervals and 2 mgm of IV morphine. In the cath lab he was found to have a totally occluded distal right coronary artery and a 70% occlusion in the left circumflex coronary artery. The left anterior descending was patent. Angioplasty of the distal right coronary artery resulted in a patent infarct-related artery with near-normal flow. A stent was left in place to stabilize the patient and limit infarct size. Left ventricular ejection fraction was normal at 42%, and a posterobasilar scar was present with hypokinesis. Explain angioplasty and stent placement. What is the purpose of this medical procedure?
  - A. An angioplasty is performed in order to open a narrowed or blocked blood vessel by widening the artery with a medical “balloon.” A small incision is made through the access site in the skin, allowing the surgeon to insert a long, thin tube (catheter) carrying the angioplasty balloon or stent. Once the catheter is guided to the location of the blocked artery, the angioplasty balloon is inflated, improving the blood flow through the artery. To prevent the narrowing of the artery again, a stent, which is a tiny metal mesh tube, is inserted across the artery wall. Angioplasty and stent placement is performed to treat narrowed arteries (The Society for Vascular Surgery, 2012) (Bhimji, 2011).
  
3. Mr. Klosterman and his wife are concerned about the future of his heart health. What role does cardiac rehabilitation play in his return to normal activities and in determining his future heart health?
  - A. Cardiac rehabilitation plays a crucial role in the recovery of an MI and the prevention of future heart problems. Cardiac rehabilitation plays a role in improving an individual’s health and quality of life by addressing problems that can lead to future heart complications. A patient participating in a cardiac rehabilitation plan has the support of professionals from numerous disciplines, some of which may include doctors, nurses, exercise specialists, physical and occupational therapists, dietitians, and psychologists. Cardiac rehabilitation is a long-term commitment that would educate, train, and

counsel Mr. Klosterman to help him return to an active life (National heart, 2012).

4. What risk factors indicated in his medical record can be addressed through nutrition therapy?
  - A. Some issues that can be addressed through nutrition therapy include his family history for CAD, his tobacco use, and his current diet based on his 24hr recall. Nutrition therapy can be utilized to address the risk factors that come along with Mr. Klosterman's BMI status of 26.6, categorizing him as overweight. His medical records also indicate high cholesterol and LDL levels as well as low HDL and Apo A levels. Nutrition therapy can address these abnormal levels and guide Mr. Klosterman to select foods that are higher in nutritional value and contain small amounts of bad fats. A dietitian will be able to help guide Mr. Klosterman and his wife in preparing nutritionally sound meals that will help him achieve a healthy weight and decrease his risk of developing future heart problems (Nelms & Roth, 2013, p. 48-53).
  
5. What are the current recommendations for nutritional intake during a hospitalization following a myocardial infarction?
  - A. Immediately following the treatment of an MI, it is suggested that oral intake progress from liquids to soft, easily chewed foods with smaller, more frequent meals. This is protocol to decrease the risk of vomiting or aspiration following the procedure. Caffeine is also limited to prevent any interference with the heart and medications. After the patient is allowed to return to his/her normal activities, which is determined by the doctor, an individualized nutrition therapy plan would be implemented to reduce the patient's risk of developing future heart problems. The individualized nutrition plan would be based on the therapeutic lifestyle changes guide (Nelms, Sucher, Lacey & Roth, 2011, p. 319).
  
6. What is the healthy weight range for an individual of Mr. Klosterman's height?
  - A. Based on his current weight and height, Mr. Klosterman's BMI was calculated to be 26.6, which classifies him as overweight. The healthy weight range for an individual of Mr. Klosterman's height of 5'10" is 129-174 pounds or a BMI ranging from 18.5 to 24.9 (CDC, 2011).
    - $H=1.78m$
    - $W=83.9kg$
    - $BMI= kg/m^2$ 
      - >  $18.5=kg/1.78m^2$ 
        - $58.6kg= 129lbs$
      - >  $24.9=kg/1.78m^2$ 
        - $78.9kg= 174lbs$
  
7. This patient is a Lutheran minister. He does get some exercise daily. He walks his dog outside for about 15 minutes at a leisurely pace. Calculate his energy and protein requirements.

- A. Current Energy Requirements= 1,647 kcal; Protein Requirements= 67g/day (Nelms, Sucher, Lacey & Roth, 2011, p. 60)
- Mifflin-St. Jeor REE for Men:  $10(W \text{ in kg}) + 6.25(H \text{ in cm}) - 5(\text{age in years}) + 5$ 
    - >  $10(185\text{lb}/2.2\text{lb}) + 6.25(70\text{in.} \times 2.54\text{cm}) - 5(61\text{yr}) = 1,647\text{kcal}$
    - > TEE:  $1,647 \times 1.00 = 1,647 \text{ kcal}$ 
      - 1.00- sedentary (Baur, Liou & Sokolik, 2012, pg. 118)
  - The recommended dietary allowance of protein for an adult male over 50 years of age is .8 g/kg/day. Mr. Klosterman's protein requirements per day would be 67g.
    - >  $84\text{kg} \times .8\text{g/kg/day} = 67\text{g of protein/day}$
8. Using Mr. Klosterman's 24-hour recall, calculate the total number of calories he consumed as well as the energy distribution of calories for protein, carbohydrate, and fat using the exchange system.
- A. Total Calories Consumed: 2,349kcal (see chart below for details)
- Calories from Protein= 465kcal or 19.8%
  - Calories from Carbohydrate= 1,245kcal or 53.0%
  - Calories from Fat= 639kcal or 27.2%
- (Nelms, Sucher, Lacey & Roth, 2011, p. A-109-A-123)

<b>Mid-Morning Snack</b>	<b>Exchange</b>	<b>Protein</b>	<b>Carbohydrates</b>	<b>Fat</b>	<b>Calories</b>
1 Large Cinnamon Raisin Bagel	4 oz.= 4 starch	3gx4= 12g 12gx4kcal/g=48kcal	15gx4=60g 60gx4kcal/g=240kcal	1gx4=4g 4gx9kcal/g=36kcal	324
1 tbsp. FF Cream Cheese	1 tbsp= Free Food	0kcal	5gx1=5g 5gx4kcal/g=20 kcal	0kcal	20
8 oz. Orange Juice	8 oz= 2 fruits	0gx2=0g 0gx4kcal/g= 0kcal	15gx2=30g 30gx4kcal/g= 120kcal	0gx2=0g 0gx9kcal/g=0kcal	120
Coffee	Free Food	-	-	-	-
<b>Lunch</b>					
1 c canned vegetable beef soup	1 c= 1 combination food	0gx1=0g 0gx4kcal/g= 0kcal	15gx1= 15g 15gx4kcal/g=60kcal	0gx1=0g 0gx9kcal/g= 0kcal	60
4 oz. Roast Beef	4 oz.=4 meat substitutes	7gx4=28g 28gx4kcal/g=112kcal	0gx4=0g 0gx4kcal/g=0kcal	3gx4=12g 12gx9kcal/g= 108kcal	220
Lettuce	Free Food	-	-	-	-
Tomato	1 cup raw= 1 starchy vegetable	2gx .25= .5g .5gx4kcal/g=1kcal	5gx .25=1.25g 1.25gx4kcal/g=5kcal	0gx .25=0g 0gx9kcal/g= 0kcal	6
Dill Pickles	1.5 medium= 1 serving (free food)	0gx1=0g 0gx4kcal/g= 0kcal	4gx1= 4g 4gx4kcal/g=16kcal	0gx1=0g 0gx9kcal/g= 0kcal	16
2 tsp. Mayonnaise	2 tsp.= 2 fats	0gx2= 0g 0gx4kcal/g=0kcal	0gx2=0g 0gx4kcal/g= 0kcal	5gx2= 10g 10gx9kcal/g=90kcal	90
2 Slices of Bread	2oz= 2 starch	2gx2=4g 4gx4kcal/g=16kcal	15gx2=30g 30gx4kcal/g=120kcal	1gx2=2g 2gx9kcal/g= 18kcal	154
1 Small Apple	4 oz= 1 fruit	0gx1=0g 0gx4kcal/g= 0kcal	15gx1=15g 15gx4kcal/g= 60kcal	0gx1=0g 0gx9kcal/g=0kcal	60
8 oz. 2% Milk	8 oz= 1 milk	8gx1= 8g 8gx4kcal/g= 32kcal	12gx1=12g 12gx4kcal/g=48kcal	5gx1=5g 5gx9kcal/g= 45kcal	125
<b>Dinner</b>					
2 Lean Pork Chops (3 oz. each)	6 oz= 6 lean meats	7gx6=42g 42gx4kcal/g=168kcal	0gx6=0g 0gx4kcal/g=0kcal	1gx6=6g 6gx9kcal/g= 54kcal	222
1 Large Baked Potato	1 large= 4 starch	3gx4=12g 12gx4kcal/g=48kcal	15gx4=60g 60gx4kcal/g=240kcal	0gx4=0g 0gx9kcal/g=0kcal	288
2 tsp. Margarine	2 tsp= 2 fats	0gx2= 0g 0gx4kcal/g=0kcal	0gx2=0g 0gx4kcal/g= 0kcal	5gx2= 10g 10gx9kcal/g=90kcal	90
½ c Green Beans	½ c= 1 nonstarchy vegetable	2gx1=2g 2gx4kcal/g= 8 kcal	5gx1=5g 5gx4kcal/g= 20kcal	0gx1=0g 0gx9kcal/g= 0kcal	28
½ c Cabbage	½ c= Free Food	0gx1=0g 0gx4kcal/g=0kcal	2gx1=2g 2gx4kcal/g= 8kcal	0gx1=0g 0gx9kcal/g= 0kcal	8
1 tbsp. Salad Dressing	1 tbsp= 1 fat	0gx1= 0g 0gx4kcal/g=0kcal	0gx1=0g 0gx4kcal/g= 0kcal	5gx1= 5g 5gx9kcal/g=45kcal	45
1 Slice Apple Pie	1/6 of 8 in. pie= 3 carbs+ 2 fats	0gx0=0 0gx4kcal/g= 0kcal	15gx3=45g 45gx4kcal/g= 180kcal	5gx2= 10g 10gx9kcal/g= 90kcal	270
<b>Snack</b>					
8 oz. 2% Milk	8 oz= 1 milk	8gx1= 8g 8gx4kcal/g= 32kcal	12gx1=12g 12gx4kcal/g=48kcal	5gx1=5g 5gx9kcal/g= 45kcal	125
1 oz. Pretzels	1 oz.=1 starch	0gx1=0g 0gx4kcal/g=0kcal	15gx1=15g 15gx4kcal/g=60kcal	2gx1=2g 2gx9kcal/g=18kcal	78
<b>TOTALS</b>		<b>465kcal (19.8%)</b>	<b>1245kcal (53.0%)</b>	<b>639kcal (27.2%)</b>	<b>2349kcal</b>

9. Examine the chemistry results for Mr. Klosterman. Which labs are consistent with the MI diagnosis? Explain. Why were the levels higher on day 2?
- A. Cardiac troponin T is a biological marker used to diagnose an MI. According to Mr. Klosterman's lab results, his troponin I and T markers were much higher than the reference range. During an MI the necrotic cardiac cells do not regenerate and are replaced by scar tissue instead. This leads to high troponin T levels. The lab results for troponin T were higher on day two because the time of peak elevation occurs within 12-48 hours after the initial elevation. Troponin T level will usually return to normal 7-10 days following the initial elevation. Another lab result to consider when making an MI diagnosis is the CPK-MB levels. On day one, Mr. Klosterman's lab results showed that he was at the normal level for CPK-MB, however on the second and third day, the results showed that his numbers peaked. These results correspond to the time frame of peak elevation for CPK-MB levels, 12-24 hours following the initial time of elevation. CPK-MB levels tend to return to normal 72-96 hours following the initial elevation (Nelms, Sucher, Lacey & Roth, 2011, p. 318).
10. What is abnormal about his lipid profile? Indicate the abnormal values.
- A. A lipid profile includes serum cholesterol, HDL-C, LDL-C, TC: HDL-C ratio, and serum triglycerides. A lipid profile may also include Apo A and Apo B levels. Mr. Klosterman's cholesterol, LDL, and LDL/HDL ratio levels were above the reference ranges, while his HDL-C and Apo A levels fell below the reference ranges. Mr. Klosterman's Apo B and triglyceride levels were normal. His abnormal levels are indicated in red below (Nelms, Sucher, Lacey & Roth, 2011, p. 320).

	Reference Range	12/1 1957	12/2 0630	12/3 0645
Cholesterol (mg/dL)	120-199	235	226	214
HDL-C (mg/dL)	>55 F, >45M	30	32	33
LDL (mg/dL)	<130	160	150	141
LDL/HDL ratio	<3.22 F <3.55 M	5.3	4.7	4.3
Apo A (mg/dL)	101-199 F 94-178 M	72	80	98
Apo B (mg/dL)	60-126 F 63-133 M	115	110	105
Triglycerides (mg/dL)	35-135 F 40-160 M	150	140	130

(Nelms & Roth, 2013, p. 51-52)

11. Mr. Klosterman was prescribed the following medications on discharge. What are the food-medication interactions for this list of medications?

<b>Medication</b>	<b>Possible Food-Medication Interactions</b>
Lopressor 50 mg daily	Lopressor is a brand name beta-1-blocker medication that decreases heart rate and cardiac output. Calcium may interfere with the absorption of Lopressor and may cause nausea, diarrhea, upset stomach, dry mouth, stomach pain, gas or bloating, and/or heartburn (Nelms, Sucher, Lacey & Roth, 2011, p. 291).
Lisinopril 10 mg daily	Lisinopril is a generic ACE inhibitor drug that reduces blood pressure by decreasing peripheral vascular resistance. Individuals with hypertension, particularly elderly patients, should avoid natural licorice and salt substitutes. Lisinopril may worsen renal function, hyperkalemia, and dysgeusia, as well as cause dry, nonproductive cough, and hyperkalemia (Nelms, Sucher, Lacey & Roth, 2011, p. 291).
Nitro-Bid 9.0 mg twice daily	Nitro-bid is a brand name nitrate drug that widens blood vessels and can lead to nausea, vomiting, abdominal pain, and dryness of the mouth (Nelms, Sucher, Lacey & Roth, 2011, p. 291).
NTG 0.4 mg sl prn chest pain	NTG is a generic nitrate drug (nitroglycerin) that widens blood vessels and causes nausea, vomiting, abdominal pain, and dryness of the mouth (Nelms, Sucher, Lacey & Roth, 2011, p. 291).
ASA 81 mg daily	ASA, also know as aspirin, helps to prevent the reoccurrence of a heart attack, but can cause stomach irritation and/or liver damage with excessive use. Avoid consuming alcohol while taking aspirin due to the increased risk of developing stomach bleeding or chronic liver damage (MedlinePlus, 2011).

12. You talk with Mr. Klosterman and his wife, a math teacher at the local high school. They are friendly and seem cooperative. They are both anxious to learn what they can do to prevent another heart attack. What questions will you ask them to assess how to best help them?

- A. (Baur, Liou & Sokolik, 2012, pg. 118)
- Do you follow a special diet?
  - What meals do you regularly eat?

- What are your favorite snack foods?
- How is your food usually prepared (baked, broiled, steamed, poached, fried)?
- What beverages do you drink daily and how much?
- Are there any particular eating habits you would like to change?

13. What other issues might you consider to support successful lifestyle changes for Mr. Klosterman?

- A. I would consider encouraging Mr. Klosterman to increase his physical activity level and guide him in the development of a realistic way to do so. I would also recommend resources to guide him through a tobacco cessation plan if he was willing to participate.

14. From the information gathered within the assessment, list possible nutrition problems using the correct diagnostic terms.

- A. (Academy, 2013, p. 149-151)
- Excessive energy intake: NI-1.3
  - Excessive oral intake: NI-2.2
  - Overweight/obesity: NC-3.3
  - Undesirable food choices: NB-1.7
  - Physical inactivity: NB-2.1

15. Select two of the identified nutrition problems and complete the PES statement for each.

- A. (Nelms & Roth, 2013, p. 48-53)
- Excessive energy intake related to being overweight as evidenced by a 24-hour diet recall and BMI of 26.6.
  - Physical inactivity related to his sedentary lifestyle as evidenced by patient self-report.

16. For each of the PES statements you have written, establish an ideal goal (based on the signs and symptoms) and an appropriate intervention (based on the etiology).

- A. Goal: decrease Mr. Klosterman's caloric intake from 2,349kcal/day, based on his 24-hour recall, to 1,647kcal/day, which is his calculated total energy expenditure needs. I would suggest that Mr. Klosterman monitor his food consumption through a daily food log, which would be useful in a future counseling session. During a follow-up session I would also want to re-access his weight and BMI to see if his adjusted energy intake had any impact on these figures (Academy of Nutrition and Dietetics, 2013, p. 20).

- Mifflin-St. Jeor REE for Men:  $10(W \text{ in kg}) + 6.25(H \text{ in cm}) - 5(\text{age in years}) + 5$

$$> 10(185\text{lb}/2.2\text{lb}) + 6.25(70\text{in.} \times 2.54\text{cm}) - 5(61\text{yr}) = 1,647\text{kcal}$$

$$> \text{TEE: } 1,647 \times 1.00 = 1,647 \text{ kcal}$$

- 1.00- sedentary (Baur, Liou & Sokolik, 2012, pg. 118)

- B. Goal: increase Mr. Klosterman's physical activity from 15 minutes/day to 30 minutes per day, in increments of 10 minutes or longer, of moderate-

physical. I would encourage Mr. Klosterman to keep an exercise log so that we could monitor his physical activity level at the next appointment (Academy of Nutrition and Dietetics, 2013, p. 91).

17. Mr. Klosterman and his wife ask about supplements. My roommate here in the hospital told me I should be taking fish oil pills.” What does the research say about omega-3-fatty acid supplementation for this patient?
  - A. Linolenic acid is an essential omega-3-fatty acid that is primarily found in cold-water fishes and fish oils. The American Heart Association recommends that adults with coronary heart disease consume 1g of EPA and DHA (types of omega-3-fatty acids) daily (Nelms, Sucher, Lacey & Roth, 2011, p. 313). Adults with high cholesterol levels are recommended to take 2-4g of EPA and DHA supplements daily. Omega-3-fatty acid supplements should only be taken under the supervision of a health care provider (Ehrlich, 2011).
  
18. What would you want to assess in three to four weeks when he and his wife return for additional counseling?
  - A. I would assess any weight changes Mr. Klosterman has undergone within the 3-4 week time period to see if he was making progress towards his ideal body weight. I would request a 24-hour food log to assess his current dietary consumption. I would also reevaluate his lipid profile to see if his cholesterol and LDL levels decreased while his HDL and Apo A levels increased. I would also want to see if his LDL/HDL ratio is within the reference range. Mr. Klosterman’s lab data and BMI would help me assess his progress and inform me if any adjustments need to be made as we continued his nutrition therapy plan.

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