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DFM 484
Case Study 6: Cardiovascular disease

7. What risk factors does Mrs. Anderson currently have?
Mrs. Anderson has high cholesterol, a mother who died from MI related to uncontrolled HTN, has stage 2 HTN, has an overweight BMI, is a former heavy smoker, and has low HDL levels with high LDL levels.

14. What are the most recent recommendations for nutrition therapy in hypertension?
Explain the history of and rationale for the DASH diet.
The DASH diet was studied in the 1990’s. Three groups were put on three different diets: one was a typical US diet, the second was a US diet with increased fruit and vegetables, and the third was the DASH diet (which is an intake of low saturated fat, low cholesterol, low total fat, increased fruit and vegetables, and low-fat dairy). After only two weeks the DASH diet group has decreased blood pressure, especially with the individuals having the highest blood pressure to start. A follow-up trial studied 3 groups adhering to the DASH diet with varying sodium intake. The lowest sodium group on the DASH diet has the greatest decrease in blood pressure.

The above general guidelines are the DASH criteria. More specifically, total sodium intake should be 2,400mg/day or less. Total alcohol intake should be limited to one drink per day or less for women, and two drinks per day or less for men. In terms of food groups, everyone on this diet should consume 7-8 grains; 4-5 vegetables; 4-5 fruits; 2-3 servings low-fat dairy; 6oz or less of meat, poultry or fish; 4-5 servings nuts, seeds, beans; 2-3 fats/oils; and less than 5 sweets per week. Higher intakes of calcium (1240mg) magnesium (500mg) and potassium (4700) are also recommended, along with 30 grams of fiber per day.

16. What are the Therapeutic Lifestyle Changes? Outline the major components of the nutrition therapy interventions.
Therapeutic Lifestyle Changes (TLC) are lifestyle habits for preventing the onset of atherosclerosis. They are relatively consistent with normal dietary guidelines for healthy individuals. They include:
- < 25-30 % kcals total fat
- < 7% kcals saturated fat
- < 200 mg/day cholesterol
- fiber 20-30gm/day
- CHO 50-60% of kcals
- Protein ~15% of kcals
- Exercise (expend about 200 kcal/day)
- Limit sodium to < 2400mg/day
- Plant sterol intake of 3.4gm

In terms of food groups, this translates to 2-4 servings of fruits; 3-5 of vegetables; 6 or more breads/pastas/whole grains; 2-3 low-fat/non-fat dairy products; ≤ 5 ounces of lean and extra lean meats; ≤ 2 egg yolks per week; ≤ 3 servings of fat; and limited sweet intake.
This kind of diet limits saturated fats and works to decrease cholesterol levels as well as increasing exercise, all of which work in tandem to promote health and discourage the development of atherosclerosis or hear disease.
18. Calculate Mrs. Anderson’s body mass index (BMI).
5’6”, 160lbs
167.64 cm = 1.6764 m
160 lbs = 72.7 kg
72.7kg/(1.6764m)^2 = 25.86 or 26 = BMI

19. What are the health implications of this number?
Though Mrs. Anderson is not obese, she is overweight. Any BMI 25 or over is indicative of overweight status. Along with being overweight, this patient is at higher risk for developing co-morbidities such as heart disease, HTN, and diabetes.

20. Calculate Mrs. Anderson’s resting and total energy needs using the Harris-Benedict equation.
655+ (9.56 x 72.7 kg) + (1.85 x 167.64 cm) – (4.68 x 54 years)
= 1407.43 or 1,407 kcals/day
1,407 REE x 1.3 activity factor = 1,829 kcals/day TEE

21. How many calories per day would you recommend for Mrs. Anderson?
I would recommend Mrs. Anderson limit her calorie intake to 1,329 kcals per day. This decrease of 500 kcals per day will enable her to lose one pound (3,500 kcals) per week. This is a healthy rate of weight loss.

23. Using a computer dietary analysis program or food composition table, compare Mrs. Anderson’s “usual” dietary intake to her prescribed diet (DASH/TLC diet).

<table>
<thead>
<tr>
<th>Food Item</th>
<th>Energy (kcal)</th>
<th>Sodium (mg)</th>
<th>Total Fat (g)</th>
<th>Saturated Fat (g)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Instant oatmeal, 1 packet</td>
<td>160</td>
<td>270</td>
<td>2</td>
<td>0</td>
</tr>
<tr>
<td>1 tsp margarine</td>
<td>34</td>
<td>1</td>
<td>3.8</td>
<td>.6</td>
</tr>
<tr>
<td>2 tsp sugar</td>
<td>33</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>½ C 2% milk</td>
<td>61</td>
<td>50</td>
<td>2.4</td>
<td>1.5</td>
</tr>
<tr>
<td>3 C coffee</td>
<td>7</td>
<td>14</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>1 C orange juice</td>
<td>108</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>1 glazed donut</td>
<td>190</td>
<td>90</td>
<td>11</td>
<td>5</td>
</tr>
<tr>
<td>1 can Campbell’s tomato bisque soup</td>
<td>220</td>
<td>780</td>
<td>7</td>
<td>2</td>
</tr>
<tr>
<td>10 saltines</td>
<td>120</td>
<td>380</td>
<td>3</td>
<td>0</td>
</tr>
<tr>
<td>1 can diet soda</td>
<td>1</td>
<td>41</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>6 oz baked chicken without skin, salted with pepper and garlic</td>
<td>281</td>
<td>1,126</td>
<td>6.1</td>
<td>1.7</td>
</tr>
<tr>
<td>1 large baked potato with salt and pepper</td>
<td>278</td>
<td>1,030</td>
<td>.4</td>
<td>.1</td>
</tr>
<tr>
<td>1 T butter</td>
<td>102</td>
<td>82</td>
<td>11.5</td>
<td>7.3</td>
</tr>
<tr>
<td>1 C carrots</td>
<td>55</td>
<td>90</td>
<td>.3</td>
<td>&lt;.1</td>
</tr>
<tr>
<td>1 tsp sugar</td>
<td>16</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>
The DASH diet does not have specific recommendations for calorie intake, though this number would fall within the healthy range of needed intake for the individual, and Mrs. Anderson is over-consuming her calories by about 1,272 calories per day. Her sodium intake is also highly above the 2,000 mg or less per day recommended level, at 5,183 mg. Her total fat intake is higher than recommended. She should have 30% or less of her calories come from fat, however she is consuming about 36% of her calories from fat. Finally, her saturated fat is also out of the recommended range of less than 7% per day at 11% of her calorie consumption.

24. What nutrients in Mrs. Anderson’s diet are of major concern to you?
Mrs. Anderson is over-consuming calories, sodium, total fat, and saturated fat. Her sodium levels are the most alarming, as she is consuming over twice the upper limit.

25. From the information gathered within the intake domain, list possible nutrition problems using the diagnostic term.
Excessive energy intake NI-1.5
Excessive oral food/beverage intake NI-2.2
Excessive fat intake NI-5.6.2
Excessive mineral intake of sodium NI-5.10.2

27. Interpret Mrs. Anderson’s risk of CAD based on her lipid profile.
Upon being admitted to the hospital, Mrs. Anderson’s labs were as follows: High cholesterol of 270mg/dL; high LDL of 210mg/dL; high LDL/HDL ratio of 7.0; high triglycerides of 150mg/dL. If any of these levels are high, a patient is at higher risk of developing CAD. Since Mrs. Anderson’s labs were all high within her lipid profile, she is at greater risk for developing CAD.

38. Select two high-priority nutrition problems and complete PES statements for each.
1. Excessive energy intake related to dietary intake of high fat foods as evidenced by 24-hour food recall, total fat intake of 36% kcals, saturated fat intake of 11% kcals, and BMI of 27.

2. Excessive mineral intake of sodium related to high consumption of processed foods and added dietary sodium as evidenced by 24-hour food recall, sodium intake of 5,183 mg/day, and blood pressure of 160/100.
40. When you ask Mrs. Anderson how much weight she would like to lose, she tells you she would like to weigh 125, which is what she weighed most of her adult life. Is this reasonable? What would you suggest as a goal for weight loss for Mrs. Anderson?

For Mrs. Anderson to weigh 125 she would need to lose 35 pounds. This may be difficult for her to achieve unless she is highly motivated and good with accountability and self-regulation. If 125 is her normal adult weight, it may be somewhat reasonable for her to achieve and maintain. However, it is unclear how much time has elapsed since she weighed 125, and the longer it has been since she has maintained that weight the harder it will be to achieve it. A more reasonable goal would be starting with a 10-pound loss and then seeing how closely she sticks to her diet.

41. How quickly should Mrs. Anderson lose this weight?

A healthy rate of weight loss is 1-2 pounds per weeks. Mrs. Anderson should likely aim to lose 1 pound per week, which is already a significant decrease in calorie intake from her usual intake. This 10-pound loss should take her two-and-a-half months to achieve.

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

1. Excessive energy intake related to dietary intake of high fat foods as evidenced by 24-hour food recall, total fat intake of 36% kcalories, saturated fat intake of 11% kcalories, and BMI of 27.

**Ideal goal:** 1 pound per week weight loss, with an overall goal of a 10-pound loss (150lb).

**Intervention:** Decrease calorie intake to 1,189 kcalories per day, limiting fat intake to 30% of calorie intake and saturated fat to 7% calorie intake. Replace saturated fats like butter with olive oil and replaced high fat desserts such as donuts and ice cream with whole grain muffins or jams on whole grain bread. Increase physical activity by walking 30 minutes every day.

2. Excessive mineral intake of sodium related to high consumption of processed foods and added dietary sodium as evidenced by 24-hour food recall, sodium intake of 5,183 mg/day, and blood pressure of 160/100.

**Ideal goal:** Limit sodium intake to 2,000 mg/day or less.

**Intervention:** Omit added salt in cooking. Limit intake of processed foods. Increase consumption of fresh fruit and vegetables. Eat a varied diet and used fresh herbs and spices when cooking to add flavor.

43. Identify the major sources of saturated fat and cholesterol in Mrs. Anderson’s diet. What suggestions would you make for substitutions and/or other changes that would help Mrs. Anderson reach her medical nutrition therapy goals?

Donuts, butter, ice cream, and Ranch dressing are all the highest sources of Mrs. Anderson’s saturated fat intake. She can replace the butter with healthier fats such as olive oil and can replaced the Ranch dressing with something healthier such as oil and vinegar or freshly squeezed lemon juice. She can decrease her intake of sweets by limiting her ice cream to only one serving (1/2 cup instead of 2 cups) or—even better—by incorporating naturally sweet foods such as whole fruit. The donut may be replaced by a whole grain muffin or piece of bread with unsweetened jam.