Instructions:
Review the pt’s medical record below. Answer each question and show your calculations for each, if required. Reference all calculation formulas with the text and page number from PR (i.e., PR p. ____). You must type your answers! If not, questions will not be graded and you will receive 0 points. CS #2 is worth 50 points.

Medical Record Information:
Present Illness: MW is a 42 yo engineering technician referred to his family physician for evaluation of arterial hypertension detected during a routine evaluation at an employment site wellness fair & health screening. The BP reading was confirmed by repeat measurements over the course of one month. Pt relates no prior history of elevated BP but had been warned to “watch his weight.” Pt denies current symptoms of chest pain, SOB, edema, or visual symptoms. Pt smokes one pack of cigarettes a day; holds a desk job and plays tennis one or twice a week. Pt’s body weight has been increasing by 2-3 pounds per year for the last ten years.

Past Medical History: Pt had measles, mumps, and chicken pox in childhood and an appendectomy approximately 20 years ago. No hx of rheumatic fever, DM, or kidney disease.

Family History: Father died at age 48 from an acute MI; mother is being treated for essential hypertension.

Social History: Married with two children; wife works as a legal secretary.

Review of Systems: Patient has no complaints except for C/O occasional mild tension headaches.

Physical Exam: Somewhat overweight white male; 5 ft. 10 in., 190 #, small frame, waist circumference 96 cm. UBW 170 (10 years ago). BP 155/103 right arm, sitting, without postural changes. P 76 and regular. R 15. Neck without thyromegaly, venous distention, or bruits. Lungs clear to P&A. Heart: regular rhythm without murmur or gallop. Abdomen slightly obese, soft and without bruit. Extremities revealed no edema. Screening neurologic exam, including mental status exam, is completely WNL.

Laboratory: Hct: 48%, Hgb 16 g/dL, FBG 96 mg/dL, BUN 15 mg/dL. Lipid panel (fasting): T-chol 210 mg/dL, LDL 147 mg/dL, HDL 38 mg/dL, TG 150 mg/dL. U/A negative for glucose, protein and blood. EKG: normal sinus rhythm with rate of 80, normal intervals and no evidence of ischemia, strain, or hypertrophy. CXR unremarkable.

Rx: Lasix® 20 mg daily, Lipitor® 20 mg daily

Impression: Essential hypertension with elevated T-chol, LDL, and low HDL in a 42 yo overweight, otherwise healthy male with a positive family history of CHD.

Plan: Nutrition outpatient clinic referral for instruction in 1,500 kcal, 2 g Na, NCEP TLC diet. Encourage cessation of smoking and increase in exercise. RTC for BP and lipid panel check in 6 weeks.
24 Hr. Diet Recall

Client reports that this pattern is fairly typical of his usual weekday intake:

**Breakfast**
- Milk, 2%, 8 oz.
- Eggs, 2 poached
- Toast, wheat, 2 slices
- Butter, 1 Tbsp.
- Table salt, 1/8 tsp.

**McDonald’s Lunch**
- Diet Coke
- Quarter Pounder, with cheese
- French fries, small

**Dinner**
- Milk, 2%, 8 oz.
- Potato, baked, 1 med.
- Sour cream, 2 Tbsp.
- Chicken breast w/ skin, baked 6oz
- Broccoli, ½ cup
- Tossed salad, 1 cup
  - Lettuce, ½ tomato
  - Ranch Dressing, 2 Tbsp.
  - Roll, 1 small
  - Butter, 1 Tbsp.
  - Ice Cream, 10%, 1 cup
  - Table salt, 1/8 tsp.

**Questions:**

1. Conduct a nutrient analysis of the 24 hr. recall above, using the *Food Processor* program on the UC Davis website: [http://nutrition.ucdavis.edu/admin/remote/](http://nutrition.ucdavis.edu/admin/remote/) Connect to the *Food Processor Remote Desktop Server* to access the database. For a review of how to use *Food Processor*, click on the *Nutrition 112 Lab* link. After you’ve input MW’s 24 Hour Recall, select “Spreadsheet” from the “Reports” menu. Remember, to print all food items, select the “+” for the day and meals for them to show up on your spreadsheet report (all foods entered must be included in the print-out). The spreadsheet is what you will save on your desktop and print out and turn in (you may print 4 per page to save paper). Please hand-write at the top “MW’s 24-Hour Recall.” Complete the table below and attach the data print-out at the end of the Case Study. Briefly discuss the overall adequacy of MW’s diet in the space below (partial credit will be given for providing only the daily totals without the print-out). (5 pts)

<table>
<thead>
<tr>
<th>Total calories:</th>
<th>2556 kcal</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total fat:</td>
<td>132.4 grams % of kcals: 46.6%</td>
</tr>
<tr>
<td>Saturated fat:</td>
<td>57.0 grams % of kcals:20.1%</td>
</tr>
<tr>
<td>Monounsaturated Fat:</td>
<td>25.4 grams % of kcals:8.9%</td>
</tr>
<tr>
<td>Polyunsaturated Fat:</td>
<td>15.9 grams % of kcals:5.6%</td>
</tr>
<tr>
<td>Carbohydrate:</td>
<td>209.2 grams % of kcals:32.7%</td>
</tr>
<tr>
<td>Protein:</td>
<td>132.8 grams % of kcals:20.8%</td>
</tr>
<tr>
<td>Fiber:</td>
<td>15.9grams</td>
</tr>
<tr>
<td>Cholesterol:</td>
<td>792.3mg</td>
</tr>
<tr>
<td>Sodium:</td>
<td>3474.0mg</td>
</tr>
<tr>
<td>Potassium:</td>
<td>2751.9 mg</td>
</tr>
</tbody>
</table>

**Adequacy of MW’s diet:**
Comparing the recommended intake data, MW’s diet has a little lower on dietary fiber, mono fat, poly fat, vitamin C, potassium, omega 3 fatty acid, omega 6fatty acid, and choline. It probably needs improvement all of them. Also, MW needs to improvement Vitamin B1, D, E. MW had adequate amount and higher level than the recommended intake of Protein, Fat, saturated fat, cholesterol, vitamin A, K, B2, B3, B6, B12, calcium, Iron, phosphorus, and sodium.
2. Make changes in the diet in order to make it consistent with a 2500 kcal TLC dietary plan and summarize your changes below. Highlight the changes that you have made on the “Spreadsheet” print-out for MW’s modified diet. Please hand-write at the top “MW’s 2500 kcal TLC Diet.” Complete the table below and attach the data print-out at the end of the Case Study. Briefly summarize the changes you’ve made in MW’s diet in the space below (partial credit will be given for providing only daily totals without the print-out). (5 pts)

<table>
<thead>
<tr>
<th>Total calories:</th>
<th>2497 kcal</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total fat:</td>
<td>65.4 grams % of kcals: 23.6%</td>
</tr>
<tr>
<td>Saturated fat:</td>
<td>12.9 grams % of kcals: 4.7%</td>
</tr>
<tr>
<td>Monounsaturated Fat:</td>
<td>14.6 grams % of kcals: 5.3%</td>
</tr>
<tr>
<td>Polyunsaturated Fat:</td>
<td>6.7 grams % of kcals: 2.4%</td>
</tr>
<tr>
<td>Carbohydrate:</td>
<td>366.3 grams % of kcals: 58.7%</td>
</tr>
<tr>
<td>Protein:</td>
<td>123.7 grams % of kcals: 19.8%</td>
</tr>
<tr>
<td>Fiber:</td>
<td>33.7 grams</td>
</tr>
<tr>
<td>Cholesterol:</td>
<td>177.5 mg</td>
</tr>
<tr>
<td>Sodium:</td>
<td>2260.7 mg</td>
</tr>
<tr>
<td>Potassium:</td>
<td>4082.9 mg</td>
</tr>
</tbody>
</table>

Summary of changes made:
**Breakfast:** Switched 2% milk to 1%, Change poached egg to egg white, switched butter to olive oil. To add one apple in the breakfast meal.

**Morning snack:** Add one soft garlic w/o salt pretzels; One cup of latte coffee.

**Lunch:** change diet coke to water; switched quarter pounder cheeseburger to roasted vegetable sandwich; Sweet potatoes w/skin instead of French fires small; Add one banana (med) and 1.1 oz. almonds nuts in the lunch meal.

**Dinner:** Switched 2% milk to orange juice; changed the 2 table spoon sour cream to 1 table spoon; changed chicken breast w/skin to chicken w/o skin; increase 1/2 cup broccoli to 1 cup; replaced salad dressing ranch with salad dressing vinaigrette Italian; changed one cup ice cream to strawberry yogurt.

**Dinner snack:** add one mini muffin tops blueberry, and 8fl oz. soymilk low fat.

3. Compare the fat and cholesterol in your modified diet to the target goals based on a caloric intake of 2,500 kcals/day. (4 pts)

<table>
<thead>
<tr>
<th></th>
<th>TLC Goal (% of kcals in diet or grams chol.)</th>
<th>MW’s Modified Diet (% of kcals in diet or grams chol.)</th>
<th>TLC Target grams in 2,500 kcals/d</th>
<th>MW’s Modified Diet (grams)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total fat:</td>
<td>25%~35%</td>
<td>23.6%</td>
<td>69.4~97.2 grams</td>
<td>65.4 grams</td>
</tr>
<tr>
<td>Saturated fat:</td>
<td>&lt;7%</td>
<td>4.7%</td>
<td>&lt;19.4 grams</td>
<td>12.9 grams</td>
</tr>
<tr>
<td>Monounsaturated fat:</td>
<td>≤20%</td>
<td>5.3%</td>
<td>≤55.6 grams</td>
<td>14.6 grams</td>
</tr>
<tr>
<td>Polyunsaturated fat:</td>
<td>≤10%</td>
<td>2.4%</td>
<td>≤27.8 grams</td>
<td>6.7 grams</td>
</tr>
<tr>
<td>Cholesterol:</td>
<td>≤200 mg/day</td>
<td>177.5 mg</td>
<td>&lt; 0.2 grams</td>
<td>1.8 grams</td>
</tr>
</tbody>
</table>
4. Interpret the results of MW’s lipid panel, identifying which of the lipids are elevated based on the NCEP ATP III Guidelines. List the desired therapeutic goal (TLC goal parameter) for LDL cholesterol for MW, based on the NCEP guidelines. (3 pts)

<table>
<thead>
<tr>
<th>Parameter</th>
<th>MW’s Value in mg/dL</th>
<th>Interpretation based on NCEP classification</th>
<th>Therapeutic goal</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Cholesterol</td>
<td>210 mg/dL</td>
<td>Borderline high</td>
<td></td>
</tr>
<tr>
<td>LDL Cholesterol</td>
<td>147 mg/dL</td>
<td>Borderline high</td>
<td>&lt;100 mg/dL (NTP p306 table 13.10)</td>
</tr>
<tr>
<td>HDL Cholesterol</td>
<td>38 mg/dL</td>
<td>Low (a major risk for heart disease)</td>
<td></td>
</tr>
<tr>
<td>Triglycerides</td>
<td>150 mg/dL</td>
<td>Borderline high</td>
<td></td>
</tr>
</tbody>
</table>

5. List 3 food choices that together will provide 1600 mg of potassium and provide no more than a total of 300 kcs. The food choices should be reasonable foods and serving sizes that could be used to recommend to a client that needs to increase potassium intake due to use of a potassium wasting diuretic. (3 pts)

<table>
<thead>
<tr>
<th>Food</th>
<th>Portion size</th>
<th>mg K provided</th>
<th>kcs provided</th>
</tr>
</thead>
<tbody>
<tr>
<td>Squash, acorn, baked cubes</td>
<td>1 cup</td>
<td>895.9 mg</td>
<td>115kcal</td>
</tr>
<tr>
<td>Banana, fresh, med</td>
<td>1 each</td>
<td>422.4mg</td>
<td>105kcal</td>
</tr>
<tr>
<td>Mushroom, sliced, stir fired</td>
<td>1 cup</td>
<td>427.7mg</td>
<td>28kcal</td>
</tr>
</tbody>
</table>

Total = 1746mg  Total = 248kcal

6. List & number MW’s risk factors for CHD, based on the presentation data from his medical record. (2 pts)

1. Smoke pack of cigarette a day
2. High blood pressure (155/103 mmHg)
3. All TG, LDL, T-cholesterol are in the Borderline high (based on NCEP classification)
4. Low HDL cholesterol (38 mg/dL, in high risk for CVD)
5. Family history: father died from acute MI; Mother is being treated for essential hypertension, and positive family history of CHD.
6. Overweigh (BMI 27.3)
7. Sedentary Lifestyle: holds a desk job and plays tennis one or twice a week.
8. Metabolic syndrome. (MW’s labs indicate his TG= 150mg/dL, HDL chol.= 38mg/dL , and BP= 155/103 mmHg )

(Nut116 AL lecture: cardiovascular disease p7)

7. What is metabolic syndrome & does MW meet the criteria? Why or why not? (2 pts)

Metabolic syndrome is a group of risk factors that occur together and increases the risk for heart disease and other diseases such as diabetes and stoke. It needs three of the risk factors like below list to be diagnosed

The criteria for metabolic syndrome involves:
1. Abdominal obesity: the waist circumference > 102 cm for men, waist circumference > 88 cm for women.
2. Insulin resistance: the fasting plasma glucose≥ 100 mg/dL.
3. Blood pressure: ≥ 130/ 85 mmHg.
4. Triglyceride: ≤ 150 mg/dL.
5. HDL cholesterol: < 40 mg/dL for men, < 50 mg/dL for women.

Yes, MW does meet the criteria. Because his blood pressure amount is 150/103 mmHg which is >130/85 mmHg risk range. TG is 150 mg/dL, HDL is 30 mg/dL which is lower than 40mg/dL. MW has three of the risk factors; therefore he meets the criteria for metabolic syndrome.

8. How do each of MW’s prescribed medications work? What effect will these medications have on his nutritional care? Refer to the medication information in the NTP or PR texts or [http://www.pdr.net](http://www.pdr.net) (online Physician’s Desk Reference). Cite the resource used for each drug. (4 pts)

**Lasix**

Lasix: Furosemide is an antihypertensive loop diuretic administered by oral, IV or IM route. It works by inhibiting absorption of sodium and chloride in the proximal and distal tubules and in the loop of Henle. It may cause excessive fluid and/or electrolyte loss.

Effect on nutrition:
1. Profound diuresis: MW would need to consume more fluid needed in diet (fluid/ electrolyte imbalance) in order to avoid dehydration and/or blood volume reduction.
2. The drug inhibits the absorption of Na+ and Cl-, so the diets need to have more sodium and potassium due to potassium wasting.
3. The Lasix would reaction loss of appetite and restlessness. Therefore it would want to follow up to make sure his calorie intake is not at too great a deficit.


**Lipitor**

Lipitor : Atorvastatin calcium

“HMG-CoA reductase inhibitor; inhibits conversion of HMG-CoA to mevalonate (precursor of sterols, including cholesterol). Inhibit the rate limiting enzyme in hepatic cholesterol synthesis”

Effect on nutrition:

There are no alcohol and grapefruit in diet because there will be an increase in HbA1C, fasting plasma glucose; therefore it needs to have diet low in sugar, and carbohydrate foods.

[http://www.pdr.net](http://www.pdr.net)
You assess MW’s knowledge of a low-sodium, NCEP TLC diet as being limited to “just don’t add any salt to food and avoid fried foods.” He also tells you that he dislikes nonfat milk. He knows that he needs to make some changes, but did not feel like he knew what to do on his own. After discussion with you (the RD) using motivational interviewing techniques, the client is now verbalizing confidence to try to make some changes. Some mutually agreeable goals are set: he usually eats fast food for lunch but is willing to eat in the work cafeteria 2-3 times/wk, he agrees to substitute fruit for 1 or 2 high calorie foods each day, and he would like to make time to exercise >30 min 3 days/wk.

9. List and number 3 major teaching points (dietary advice) that you will need to discuss with MW in order for him to understand and follow a 2400 mg Na diet. (3 pts)

1. Increase potassium in diet. (Increase fruits and nuts and vegetable intake. Ex: banana, beet…)
2. Remove the saltshaker from the table, Limit condiments mustard, ketchup, pickles, and sauces. (Less intake fast food)
3. Avoid use can food and curing food, use mostly fresh foods. (EX: avoid intake much fruits can, bacon, pickles)

(Lecture slide P34: Cardiovascular Disease& Hypertension)

10. List and number 3 major teaching points (dietary advice) that you will need to discuss with MW in order for him to understand and follow the NCEP TLC diet. (3 pts)

1. Balance intake of fatty acid – reduce saturated fat < 7% and try to incorporate more MUFAs and PUFAs. To reduce full-fat dairy products and desserts and choosing to eat healthier oils such as olive oil and canola oil as well as nuts and avocados.
2. Incorporate 2-4 g stanol or sterol esters daily in diet through fortified margarine spreads, soymilk, juice, cereal, granola bars, or Benecol chews.
3. Learn about the portion size. Show the picture about the Myplate for pt. Make the pt. can know the size easier.

11. MW is Jewish and resides in the SF Bay Area. Describe and explain kosher dietary laws and any dietary restrictions you would need to consider when counseling MW. (4 pts)

Kosher laws indicate that food and animal products can be unlawful or legal to consume or use.
1. Kosher dietary law restricts consumption certain animals. This restriction includes the flesh, organs, egg and milk of forbidden animals (Forbidden animal includes pork, shrimp, crabs, lobster or mussel).
2. All blood must be drained from meat and poultry or broiled out of it before it is eaten.
3. The cow, sleep, bull and sheep, salmon, tuna, and herring are the animal that allows being consumed by kosher.
4. Kosher dietary law restricts consumption mix of meat with dairy. Like the meat cannot eat with milk.
5. Fish, eggs, fruits; vegetables and grains can be eaten with either meat or dairy.
6. Animals that are allowed to consume must slaughter accordance to the Jewish law.
7. For the kosher dietary law, Grape products made by non-Jews may not be eaten. There is no grape juice or wine or grape base derived juice can be consumed unless is from kosher winery.

In counseling MW, I would need to be sensitive to these restrictions and make sure to discuss with him and understand the implications of this in his diet plan. I will make sure to not include a
combination food made with milk and meat. I will not to suggest seafood, such as shrimp, crab…and not suggest pork for him too.

(http://www.jewfaq.org/kashrut.htm)

4. MW has been referred to your Nutrition Clinic by his primary care physician for instruction on a 1,500 kcal, 2.4-g Na, TLC diet. Summarize your observations, assessment and plan of action in a SOAP note. Base your note on the pertinent information given in the presentation data, 24 hr recall, and questions above. It is important that you assess whether you feel that the current referral diet Rx (1,500 kcal, 2-g Na, NCEP TLC diet) is realistic and appropriate for your client’s needs. Remember that this is an outpatient setting and the client is referred to you for counseling, which you will begin on this visit. Attach the SOAP note below and a separate sheet with all calculations as an attachment (the calculations may be hand-written). (12 points)

S: Pt. make one pack of cigarettes a day, holds a dark job and plays tennis one or twice a week. Pt.’s body weight has been increasing by 2~3 pounds per year for the last ten years. Report pt. has family history of positive for CVD.

O: 43 yo male, Ht=5’8”, BW=190 pounds, BMI=27.3; marginally overweight

**Labs data:**

<table>
<thead>
<tr>
<th>Test</th>
<th>Value</th>
<th>Normal</th>
</tr>
</thead>
<tbody>
<tr>
<td>FBG</td>
<td>96 mg/dL</td>
<td>Normal</td>
</tr>
<tr>
<td>Tchol</td>
<td>210 mg/dL</td>
<td>Borderline high</td>
</tr>
<tr>
<td>HDL</td>
<td>38 mg/dL</td>
<td>Low, risk for CVD</td>
</tr>
<tr>
<td>LDL</td>
<td>147 mg/dL</td>
<td>Borderline high</td>
</tr>
<tr>
<td>TG</td>
<td>150 mg/dL</td>
<td>Borderline high</td>
</tr>
<tr>
<td>BP</td>
<td>155/103 mmHg</td>
<td>HTN stage 1</td>
</tr>
</tbody>
</table>

**Rx:**

- Lasix: 20 mg daily
- Lipitor: 20 mg daily
- Estimated kcal needs: 2525.28 kcal/day
- Estimated protein needs: 52.73-65.91g/day
- Estimates fluid needs: 1977.30 ml

**Calculated calories need:**

- Total fat: 713.3~998.6 gram; Saturated fat: 199.7 gram; Monounsaturated Fat: 570.6 gram; Polyunsaturated Fat: 285.3 gram; Carbohydrate: 1426.5~1711.8 gram; Protein: 428.0 gram

**Energy requirement:**

- EER: 2853 Kcal

**24-hour dietary recalls analysis data:**

- Total fat: 130.4 gram (46.6% of Kcal); Saturated fat: 57.0 gram (20.1%); Monounsaturated Fat: 25.4 gram (8.9% of Kcal); Polyunsaturated Fat: 15.9 gram (5.6% of Kcal); Carbohydrate: 209.2 gram (32.7% of Kcal); Protein: 132.8 gram (20.8% of Kcal); Fiber: 15.9 grams; Cholesterol: 792.3 grams; sodium: 3274.0 mg; potassium: 2751.9 mg.
A: (1) **PES nutrition DX statement.**

- Excessive sodium intake (NI-5.10.2.7) r/t predominantly fast food and processed food diet AEB 24 hour dietary recall intake of approx. 3274.0mg sodium compared to the Recommended 2400 mg.
- Excessive saturated fat intake (NI-5.6.2) r/t atherogenic diet of butter, whole-fat dairy products, large portion and low activity AEB 24 hour dietary recall intake of saturated fat intake @ 20.8 % of total kcal compared to the recommended 7% of kcals.

(2) Pt’s current diet is 2556kcal exceeds the prescribed diet of 1500 kcal needs. Base on Pt’s 24 Hr. diet recall, pt. has lower on dietary fiber, mono fat, poly fat, vitamin C, potassium, Vitamin B1, D, E. MW had higher level than the recommended intake of Protein, Fat, saturated fat, cholesterol, vitamin A, K, B2, B3, B6, B12, calcium, Iron, phosphorus, and sodium.

(3) Diet Rx: pt. may benefit from the low-fat diet, and low- sodium.

(4) Pt is on Lipitor, HMG-CoA reductive inhibitor and inhibits the rate-limiting enzyme in hepatic cholesterol synthesis. Pt. should avoid alcohol, and grapefruit. There might be an increase in HbA1c, (FPG), diet need to be low in sugar and carbohydrate food. Also, Pt. is on Lasix, loop diuretic; inhibiting Na+ and Cl- absorption in the proximal, distal tubules and in the loop of Henle. So the diets need to have more sodium because the potassium wasting. Pt’s diet needs to increase fluid intake to prevent dehydration and/or blood volume reduction.

(5) Base on the interview, Pt have food and nutrition related knowledge deficit but is motivated and have confident to make some change and set agreeable goals. Base on the subjective and objective information, pt will comply with goals of tx plan.

---

P: P:

Goal: start on a 2500 Kcal diet base on TLC diet because MW’s calculated EER is 2853 Kcal and weight loss to 1-2 lb per week.

Recommendation:

New diet: 2500 Kcal, total fat: 69.44 gram- 97.22 gram, saturated fat: < 19.4 gram, Monounsaturated fat: 55.56 gram, Polyunsaturated fat: 27.78 gram, cholesterol: < 0.2 gram, carbohydrate:312.50 gram- 375.0 gram, Protein: 93.75 gram

1. educate pt regarding healthy food choices ( choose skim milk, lean meat, and whole grain foods) and teach TLC diet by giving dietary advice such as 1 tsp of sodium is 2000mg Na, teach about portion size and explain with picture about Myplate, avoid processed and can food.

2. encourage exercise > 30 minute a day

Behavioral goal:

1. substitute one or 2 calories dense snack with fruits
2. limit dine out/ fast food to 3 times per week
3. complete food log for two week

Monitor:

1. check the food diary
2. check blood pressure,
3. check body weight
4. Review the food log with pt.

Follow up:

Make an appointment to return in 2 weeks