Sleep Apnea Patient Case Study

Client Name: ZZ
DOB: 2/15/89
Sex: Female
Education: High school diploma; some vocational school
Occupation: Office receptionist
Hours of work: Monday – Friday 9:00 – 5:00
Household members: Mother 45, younger siblings (18, 20)
Ethnic background: Biracial (African American and Caucasian)
Religious affiliation: None
Referring physician: D. Smith, M.D.

Chief complaint:
Family noticed that ZZ appears to stop breathing for several seconds several times a night. She is extremely irritable when she gets up in the morning. She reports getting very sleepy while at work and fell asleep at her desk yesterday.

Pt hx:
Pt describes sleep disturbance for the past several years, including: sleeping with her mouth open, cessation of breathing for at least 10 seconds (per episode), snoring, restlessness during sleep, h/o enuresis, and morning headaches. ZZ’s co-workers have described deficits in attention span at work. Additionally, she has been overweight since she was born (14# at birth).
Onset: Actual date of onset unclear; pt first noticed onset of the above-mentioned symptoms about 1 year ago.
Type of Tx: None at present.
Meds: None at present.
Smoker: No
Family Hx: Mother: possible gestational DM; grandmother: type 2 DM.

PE:
General appearance: Somewhat tired and irritable 25 yo female.
Anthropometrics: ht: 5’7”; wt: 201#
Vitals: Temp 98.5°F, BP 123/80 mmHg, HR 85 bpm, RR 17 bpm.
Heart: Regular rate and rhythm, heart sounds nl.
HEENT: Eyes: Clear; Ears: Clear; Nose: nl mucous membranes; Throat: Dry mucous membranes, no inflammation, tonsillar hypertrophy
Genitalia: nl
Neurologic: Alert, oriented x 4
Extremities: No joint deformity or muscle tenderness, but pt complains of occasional knee pain. No edema.
Skin: Warm, dry; reduced capillary refill (approximately 2 seconds); slight rash in skin folds
Chest/lungs: Clear
Abdomen: Obese

Nutrition Hx:
General: Very good appetite with consumption of a wide variety of foods. Pt’s physical activity level is generally low. Pt reports feeling too exhausted to exercise after work. Prefers to watch television or read books. 24-hour recall:

<table>
<thead>
<tr>
<th>Meal</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Breakfast</td>
<td>2 breakfast burritos, 4 oz whole milk, 4 oz apple juice, 8 oz coffee with ¼ c cream and 2 tsp sugar</td>
</tr>
<tr>
<td>Break</td>
<td>12 oz coffee with ¼ c creamer and 2 tsp sugar</td>
</tr>
<tr>
<td>Lunch</td>
<td>2 bologna &amp; cheese sandwiches (2 slices enriched bread with 1 slice bologna &amp; 1 slice American cheese with 1 Tbsp mayonnaise per sandwich), 1-oz pkg corn chips, 2 mini donuts, 12 oz Coke</td>
</tr>
<tr>
<td>Snack</td>
<td>Peanut butter &amp; jelly sandwich (2 slices enriched bread with 2 Tbsp peanut butter and 2 Tbsp grape jelly), 12 oz Coke</td>
</tr>
<tr>
<td>Dinner</td>
<td>Fried chicken (2 legs and 1 thigh), 1 c mashed potatoes (made with whole milk and butter), 1 cup fried okra, 20 oz sweet tea</td>
</tr>
<tr>
<td>Snack</td>
<td>3 c microwave popcorn, 12-oz Coke</td>
</tr>
</tbody>
</table>

Food allergies/intolerances/aversions: NKA
Previous nutrition therapy? No
Food purchase/preparation: Primarily mother
Vit/min intake: Daily MVI

Dx:
R/O OSA secondary to obesity and physical inactivity

Tx Plan:
Polysomnography to diagnose OSA, FBG, HbA1C, lipid panel, psychological evaluation, nutrition assessment

ZZ’s Non-fasting Lab Values
<table>
<thead>
<tr>
<th></th>
<th>NORMAL</th>
<th>UNITS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Albumin</td>
<td>3.5-5</td>
<td>4.8</td>
</tr>
<tr>
<td>Total protein</td>
<td>6-8</td>
<td>6.2</td>
</tr>
<tr>
<td>Prealbumin</td>
<td>16-35</td>
<td>33</td>
</tr>
<tr>
<td>Transferrin</td>
<td>250-380 (women)</td>
<td>254</td>
</tr>
<tr>
<td></td>
<td>215-365 (men)</td>
<td></td>
</tr>
<tr>
<td>Sodium</td>
<td>136-145</td>
<td>138</td>
</tr>
<tr>
<td>Potassium</td>
<td>3.5-5.5</td>
<td>4.2</td>
</tr>
<tr>
<td>Chloride</td>
<td>95-105</td>
<td>101</td>
</tr>
<tr>
<td>PO₄</td>
<td>2.3-4.7</td>
<td>4.6</td>
</tr>
<tr>
<td>Magnesium</td>
<td>1.8-3</td>
<td>2.1</td>
</tr>
<tr>
<td>Osmolality</td>
<td>285-295</td>
<td>288</td>
</tr>
<tr>
<td>Total CO₂</td>
<td>23-30</td>
<td>29</td>
</tr>
<tr>
<td>Glucose</td>
<td>70-110</td>
<td>108</td>
</tr>
<tr>
<td>BUN</td>
<td>8-18</td>
<td>8</td>
</tr>
<tr>
<td>Creatinine</td>
<td>0.6-1.2</td>
<td>0.6</td>
</tr>
<tr>
<td>Uric acid</td>
<td>2.8-8.8 (women)</td>
<td>4.0-9.0 (men)</td>
</tr>
<tr>
<td>Calcium</td>
<td>9-11</td>
<td>9.2</td>
</tr>
<tr>
<td>Bilirubin</td>
<td>≤ 0.3</td>
<td>0.1</td>
</tr>
<tr>
<td>Ammonia (NH₃)</td>
<td>9-33</td>
<td>8</td>
</tr>
<tr>
<td>ALT</td>
<td>4-36</td>
<td>5</td>
</tr>
<tr>
<td>AST</td>
<td>0-35</td>
<td>6</td>
</tr>
<tr>
<td>AKP</td>
<td>30-120</td>
<td>99</td>
</tr>
<tr>
<td>CPK</td>
<td>30-135 (women)</td>
<td>72</td>
</tr>
<tr>
<td></td>
<td>55-170 (men)</td>
<td></td>
</tr>
<tr>
<td>LDH</td>
<td>208-378</td>
<td>220</td>
</tr>
<tr>
<td>CHOL</td>
<td>120-199</td>
<td>190</td>
</tr>
<tr>
<td>HDL-C</td>
<td>&gt; 55 (women)</td>
<td>50</td>
</tr>
<tr>
<td></td>
<td>&gt; 45 (men)</td>
<td></td>
</tr>
<tr>
<td>VLDL</td>
<td>7-32</td>
<td>30</td>
</tr>
<tr>
<td>LDL</td>
<td>&lt; 130</td>
<td>110</td>
</tr>
<tr>
<td>LDL/HDL ratio</td>
<td>&lt; 3.22 (women)</td>
<td>2.2</td>
</tr>
<tr>
<td></td>
<td>&lt; 3.55 (men)</td>
<td></td>
</tr>
<tr>
<td>Apo A</td>
<td>101-199 (women)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>94-178 (men)</td>
<td></td>
</tr>
<tr>
<td>Apo B</td>
<td>60-126 (women)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>63-133 (men)</td>
<td></td>
</tr>
<tr>
<td>TG</td>
<td>35-135 (women)</td>
<td>114</td>
</tr>
<tr>
<td></td>
<td>40-160 (men)</td>
<td></td>
</tr>
<tr>
<td>T₃</td>
<td>4-12</td>
<td>5</td>
</tr>
<tr>
<td>T₄</td>
<td>75-98</td>
<td>78</td>
</tr>
<tr>
<td>HbA₁c</td>
<td>3.9-5.2</td>
<td>5.5</td>
</tr>
</tbody>
</table>
Questions:

1. ZZ has been diagnosed with OSA. Define *sleep apnea* and explain the relationship between sleep apnea and obesity. (2 pts)

Sleep apnea is a serious disorder that occurs when a person stops breathing repeatedly during his/her sleep. Most common cause of sleep apnea is due to excess weight and obesity, which associated with soft tissue of mouth and throat. (WebMD).

2. ZZ’s BMI is **31.5kg/m^2**, which indicates that she is **Obese Class I**. (2 pts)

\[
\text{BMI (kg/m}^2\text{)} = \left( \frac{91.36\text{kg}}{1.7018^2} \right) = 31.545 \rightarrow \text{Obese I}
\]

3. ZZ’s IBW is **61.4 kg +/- 5%** and her percent IBW is **149%**. (2 pts)

\[
\text{IBW} = 100 + (5\times7) = 135 + 2.2\times91.36 = 61.36 \rightarrow 61.4 \text{kg} \pm \text{5%}
\]

\[
\% \text{IBW} = \left( \frac{91.36\text{kg}}{61.36\text{kg}} \right) \times 100 = 148.89 \rightarrow 149\% \text{IBW}
\]

4. Using the Mifflin-St Jeor equation (from PR), calculate ZZ’s kcal needs for weight maintenance. (2 pts) **2369-2538 kcal/day**

\[
\text{RMR} = (9.99 \times \text{wt.}) + (6.25 \times \text{ht.}) - (4.92 \times \text{age}) - 161
\]

\[
\text{RMR} = (9.99 \times 91.36\text{kg}) + (6.25 \times 170.18\text{cm}) - (4.92 \times 25) - 161 = 1692.3114 \rightarrow 1692 \text{ kcal/day}
\]

Activity Factor (1.4-1.5)

1692 kcal/day X 1.4 = 2368.8 kcal/day

1692 kcal/day X 1.5 = 2538.0 kcal/day

\[\rightarrow 2369-2538 \text{ kcal/day}\]

(PR; page 9).

5. How much protein does ZZ need? (2 pt) **49.1g-61.4g protein/day**.

\[
\text{IBW} = 61.4\text{kg (From Q. #3)}
\]

\[
61.4\text{ kg} \times 0.8 = 49.12\text{g pro/day}
\]

\[
61.4\text{ kg} \times 1.0 = 61.40\text{g pro/day}
\]

\[\rightarrow 49.1-61.4\text{g pro/day}\]

(PR; page 10).

6. How much fluid does ZZ need each day? (1 pt) **2741-3198 mL/day**.

Based on her 24-hr recall, is she receiving □ adequate □ inadequate fluid in her diet?

Method 1:

\[
91.36\text{kg} \times 30\text{mL} = 2740.8\text{mL/day}
\]

\[
91.36\text{kg} \times 35\text{mL} = 3197.6 \text{mL/day}
\]

\[\rightarrow 2741-3198\text{mL/day}\]

(PR; page 11).

She is receiving adequate fluid in her diet. According to her 24-hour recall, her estimated fluid intake is (84 fl.oz) x (30mL) = 2520mL, which is relatively close to her daily fluid requirement.

7. List 2 nutrients or dietary components (not kcals) that you might be concerned about for this patient, stating the reason for your concern. (2 pts)

1. Inadequate fiber intake: According to the 24-hr recall, pt has not consumed any fruits, vegetables, or grains with high fiber. Lack of fiber intake might lead to increase risk of developing type 2 DM.

2. Inadequate calcium intake: According to pt’s 24-hr recall, pt does not achieve the recommended dietary intake for calcium. Due to lack of calcium intake, it might be the cause of occasional knee pain.
8. Why did Dr. Smith order a lipid profile and blood glucose tests? What lipid and glucose levels are considered altered (i.e., outside of normal limits)? Evaluate ZZ’s lab results. (2 pts)

Dr. Smith orders a lipid profile and blood glucose tests because these tests are for pts with type 2 diabetes and cardiovascular disease. These tests help to plan to improve pt’s health and also used to monitor for those who have diabetes. Outside of normal limits for these tests would be when the sugar level is above 140 mg/dL. According to pt’s lab results, her glucose level is within the range, but in border line of high normal range. Also, LDL is above 100 mg/dL.

(WebMD)

9. Write an “ADIME” note for ZZ. Select two nutrition problems and complete PES statements for each within the note. For each PES statement written, establish an ideal goal (based on signs and symptoms) and an appropriate intervention (based on etiology). Include calculations on an attached sheet, including references for equations (PR p.__). (4 pts each = 16 pts)

A: ZZ is a 25 yo female African American and Caucasian. Pt is 5’7”, weighs 201#; BMI 31.5 Obese I. Pt works as office receptionist and reports getting sleepy while at work and feeling too exhausted after work. Pt describes sleep disturbance for the past several years and complains of occasional knee pain. Pt’s physical activity level is generally low; she prefers to watch television or read books after work. Pt reports very good appetite with consumption of a wide variety of foods. She has been overweight since she was born as 14# at birth. Pt’s family history states possible gestational DM for mother and her grandmother diagnosed with type 2 DM.

Labs: CHOL: 190 mg/dL, HDL-C: 50 mg/dL, VLDL: 30 mg/dL, LDL: 110 mg/dL, LDL/HDL ratio: 2.2, Glucose: 108 mg/dL
Medications: None
Diet Rx: None
EER: 2369-2538kcal
Protein requirement: 49.1-61.4g pro/day
Fluid requirement: 2741-3198mL/day

D:

PES: Overweight/Obesity (NC-3.3) r/t excess energy intake and low physical activity aeb high intake shown in 24-hr recall data and BMI of 31.5; obese I.
Lack of food choice knowledge (NB-1.7) r/t poor recommended foods aeb lab results and 24-hour recall.
(Lecture 7: Interventions)

I:

GOAL:
-Encourage to lose weight 1~2# per week to reach IBW.
-Agrees to be more active

RECOMMENDATIONS:
-Increase physical activity to 30 min./day at least 3 days/week and add on additional 5 minutes each week.
-Decrease energy dense food consumption
-Encourage smaller portion sizes (portion control)

M/E:

MONITOR:
-Make Follow-up appointments every two weeks.
-Evaluate meal plan and keep food record to monitor diet.
-Implement reasonable exercise goals on daily basis.
-Monitor weight loss weekly and re-evaluate dietary recommendations.

Gloria Kwak
Nutrition Student
11/12/14 2:00PM

You see ZZ two months later in the out-patient clinic and she is 4 weeks s/p T&A and is ready and motivated to work on her weight. She has maintained her weight at 200#. She states that her sleeping habits have improved and she is ready to change her lifestyle. She is following no special diet. With adequate sleep she has more energy and she is able to exercise now and is currently walking her dog 10 minutes per day after work.

A 24-hour recall reveals:
<table>
<thead>
<tr>
<th>Breakfast: (on way to work)</th>
<th>Lunch: (work cafeteria)</th>
<th>Dinner: (at home)</th>
</tr>
</thead>
<tbody>
<tr>
<td>McDonald’s Egg McMuffin</td>
<td>Cheeseburger (double)</td>
<td>Collard greens with bacon</td>
</tr>
<tr>
<td>Hash browns x 2</td>
<td>Small salad (lettuce, tomato)</td>
<td>Macaroni and cheese</td>
</tr>
<tr>
<td>Large coffee</td>
<td>Ranch dressing</td>
<td>Green salad</td>
</tr>
<tr>
<td>4 creamers</td>
<td>Large diet soda</td>
<td>Blue cheese dressing</td>
</tr>
<tr>
<td>2 packets sugar</td>
<td>Steak</td>
<td>1 can soda</td>
</tr>
<tr>
<td></td>
<td>Small salad (lettuce, tomato)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Hash browns x 2</td>
<td></td>
</tr>
<tr>
<td></td>
<td>2 packets sugar</td>
<td></td>
</tr>
</tbody>
</table>

10. If ZZ’s goal is to reduce her weight to 160 pounds in the next 6 months how many kcals should she eat each day? (2 pt) (assume that there are 4.3 weeks per month) **1369-1538 kcals/day.**

Women: RMR=(9.99 x wt.) + (6.25 x ht.) – (4.92 x age) -161
RMR=(9.99 x 91.36kg) + (6.25 x 170.18cm) – (4.92 x 25) -161= 1692.3114 → 1692 kcal/day

Activity Factor (1.4-1.5)
1692 kcal/day X 1.4= 2368.80 kcal/day
1692 kcal/day X 1.5= 2538.00 kcal/day
→ 2369-2538 kcal/day

201#/160#/41#
41#/ (4.3wk. X 6 months)= 1.589 # loss/week → 1.6# weight loss/week

Reduce calorie intake of 1000 kcal/day to lose about 2# (Lecture-9-Obesity)
→ 1369-1538 kcal/day
(PR; page 9).

11. Do you think that a goal of losing this much weight in 6 months, by diet alone, is a realistic one for ZZ? Why or why not? (1 pt) ☐ yes ☐ no

No, a goal of losing this much weight in 6 months, by diet alone, is not realistic for ZZ. It is difficult to lose more than 10% of weight within 6 months by diet only. By diet control and increase of physical activity may be more realistic on losing weight.

12. ZZ is in which stage of the “Stages of Change?” Provide evidence for your choice. (1 pts) Stage #3 Preparation.

ZZ is in stage #3 Preparations. She states that her sleeping habits have improved; therefore, she has more energy and is now able to exercise. She started walking her dog for 10 minutes per day after work and she is not following any special diet. However, she is now motivated to work on her weight and ready to change her lifestyle.

13. List 4 dietary (food) strategies that ZZ can incorporate into her eating pattern to make her diet healthier. (1/2 pt ea = 2 pts)

1. Drink water or tea, instead of sugar-sweetened beverages.
2. Instead of ranch and blue cheese dressing, try lower fat dressings, such as balsamic dressing, to help reduce calorie.
3. Prepare homemade sandwich for a meal and try to avoid high-caloric foods (fast foods).
4. Increase consumption of fiber (fruits and vegetables).

14. List 4 realistic ways for ZZ to increase her physical activity, aside from going to a gym. (1/2 pt ea = 2 pts)

1. Instead of walking her dog for 10 minutes per day, walk for 20 minutes or increase 5 minutes each day.
2. Bike or walk to grocery store (or any near store), instead of drive.
3. Stretch, yoga, or clean the house while watching television.
4. Take stairs instead of elevator.

15. List 4 behavioral strategies (other than diet/physical activity) that ZZ could use to reduce her kcal intake.(1/2 pt ea = 2 pts)

1. Instead of buying food, prepare food at home with fresh and healthful ingredients.
2. Control portion size by using smaller plate when consuming meal, so smaller portion looks larger.
3. Check/evaluate nutrition labels and chooses foods with higher nutrient density.
4. Allow family members to participate eating healthful together.
16. ZZ’s long-term (outcome) goal is to weigh 175 pounds; she will need measurable short-term goals as well. Please choose one strategy from each of the questions 14-16 and set a measurable goal for each of these that ZZ can work toward during the two-week period between her appointments with you. Remember…SMART goals. (3 pts)

<table>
<thead>
<tr>
<th>#13 Drinking water</th>
</tr>
</thead>
<tbody>
<tr>
<td>Instead of sugar-sweetened beverages, drink water/tea, or at least get smaller size. For the first week, start as making changes for every other day and then progress to daily change. Record amounts of water/tea consumed everyday.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>#14 Walking the dog</th>
</tr>
</thead>
<tbody>
<tr>
<td>Start walking the dog for 10 minutes on a daily basis and gradually increase the time to 20~30 minutes. Not only walking but also try light jogging with the dog. Use pedometer to measure how many steps or distance you walk.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>#15 Control portion size</th>
</tr>
</thead>
<tbody>
<tr>
<td>Control portion size by using smaller plate when consuming meal. Using smaller plate will reduce energy dense food consumption. Although it is smaller portion, using smaller plate will look larger. Record what you eat and its portion sizes.</td>
</tr>
</tbody>
</table>

17. If the above interventions do not work and ZZ reaches a plateau after losing 20 pounds, what do you think the next appropriate step should be and why? (1 pt)

If the above interventions do not work, the next appropriate step should be increasing more intense physical activity. Such as sports that burns more calories and gain muscle. Sports, swimming, tennis or hiking, not only helps you lose weight but also it can be a new hobby and becomes daily basis.

18. What is the optimal length of weight management therapy for ZZ? (1 pts)

The optimal length of weight management therapy for ZZ is 6 months.


She is not a candidate for gastric bypass surgery because her BMI (31.5) is lower than 35, which can lead to high risk for surgery. Also, she does not have any history of weight loss treatments that have failed in the past. Before concerning to have gastric bypass surgery, pt should manage weight loss by non-surgical treatments first.

(Lecture9: Obesity)

20. What would you assess during this follow-up counseling session? (2 pts)

During this follow-up counseling session, I would assess pt’s willingness to follow restricted diet, readiness to increase physical activities, and respond to behavioral changes. State the pt’s issues and clarify agreement that a problem exists. Explain causes of problems. Discuss/recommend alternative solutions.