CLASS PREP: Endocrine

Scenario: Type 2 DM

S.S., a 58-year-old Asian woman, comes to the clinic with chronic fatigue, thirst, constant hunger, and frequent urination. She denies any pain, burning, or low-back pain on urination. She tells you she has had frequent vaginal yeast infections that she has treated with over-the-counter medication. She works full time at a bank and states she has difficulty reading numbers and reports, resulting in her making some mistakes. She says, "By the time I get home and make supper, I am too tired to do anything else." She says her feet often "burn or feel like there are pins in them." She has a history of gestational diabetes.In reviewing S.S.'s chart, you note she last saw the provider 6 years ago. Her current weight is 173 lbs (78.5 kg). She is 5'3" (135 cm) tall. Today her BP is 152/97 mm Hg. A random plasma glucose level is 291 mg/dL (16.2 mmol/L). The provider suspects she has developed type 2 diabetes (DM) and orders the laboratory studies shown in the chart.

Laboratory Test Results

Fasting glucose	184 mg/dL (10.2 mmol/L)
Hemoglobin A_{1c} (A_{1C})	8.8%
Total cholesterol	256 mg/dL (6.6 mmol/L)
Triglycer1ides	346 mg/dL (3.91 mmol/L)
Low-density lipoprotein (LDL)	155 mg/dL (4.01 mmol/L)
High-density lipoprotein (HDL)	32 mg/dL (0.83 mmol/L)
Urinalysis (UA)	+ glucose, – ketones

1. Interpret S.S.'s laboratory results.

Fasting glucose: a value of 184 is significantly elevated. Suggests poor blood sugar control.

A1C: A value of 8.8 is extremely high. Suggests poor and prolonged blood sugar control over the past 2-3 months.

Total Cholesterol: a value of 256mg is high. Increases the risk for cardiovascular diseases.

Triglycerides: a level of 346 is basically more than double the normal range of 150. Laos increases the risk of cardiovascular disease.

LDL: A value of 155 is elevated, and this "bad cholesterol" contributes to plaque build up known as atherosclerosis.

HDL: a value of 32 is low, and reduced the ability to further remove LDL from the body.

UA: positive glucose indicates that glucose is now being excreted through the urinary system due to an increased and prolonged amount of glucose currently in the blood.

2. Identify 3 methods we use to diagnose DM.

3 methods that are used to diagnose DM are

CLASS PREP: Endocrine

3. Name 6 risk factors for type 2 DM. Highlight those that S.S. has.

6 risk factors for type 2 DM are, obesity, unhealthy diet, sedentary lifestyle, increased age, hx of other diseases, family hx.

4. Which of her assessment findings are consistent with type 2 DM?

> The assessments that are consistent with type 2 DM is older age of 58, works full time at a bank so she is very unactive for most of her days, has a difficulty reading numbers and reports, is fatigued by the end of the day, has a history of gestational diabetes, is overweight at 78.5kg, and the random blood glucose value of 291 indicated hyperglycemia.

CASE STUDY PROGRESS

S.S. is diagnosed with type 2 DM. The provider starts her on metformin 500 mg orally each day at breakfast and atorvastatin 20 mg orally at bedtime. She is referred to the dietitian for instructions on starting a 1200-calorie diet using an exchange system to promote weight loss and lower glucose, cholesterol, and triglyceride levels. You are to provide teaching about pharmacotherapy and exercise.

5. How can you incorporate S.S.'s cultural preferences as you develop her teaching plan?

To incorporate S.S cultural preferences as I develop her teaching plan, I can start off by assessing what kinds of foods she eats regularly, and how to manage or make changes in diet according to cultural preferences. This way managing a diet doesn't have to be such a sudden change and can align with foods she is already so used to.

6. What is the reason for starting S.S. on metformin?

Metformin is an oral hypoglycemic agent and is used to lower blood sugar levels as a PO medication. It is usually first line and can help with weight management and doesn't need to be injected like insulin.

7. Outline the general teaching you would provide S.S. about oral hypoglycemic therapy.

OHA therapy should be taken with food and also should be used along side a healthy diet, regular exercise and follow ups with the PCP.

8. What would you teach S.S. to do if she becomes ill with the flu or viral illness?

I would teach S.S to continue taking her medications to regulate her blood glucose levels, continue eating small but nutritious meals and to contact her PCP if she begins to lose weight or have episodes of emesis. If she has episodes of emesis, her PO medication wont be able to work if they are just removed.

9. What benefits would S.S. receive from exercising?

Some benefits from exercise are improved blood glucose control, maintained weight and healthy weight loss, and most importantly, and increased sensitivity to insulin due to the bodies increasing demands and uptake of sugar.

10. What would you teach S.S. about exercise?

CLASS PREP: Endocrine

I would start off by teaching that exercise doesn't have to be extremely intense and vigorous. Exercise can be at least 30 minutes per day to be effective, several days per the week. Things as simple as walking and jogging can be sufficient. I would then let S.S know to stay hydrated to replace fluids lost and to no attempt to lose more than a pound or two per week.

11. Besides the dietitian, what interprofessional and community referrals may be appropriate for S.S.?

S.S can be referred to the pharmacist for medication management. S.S can be seen by PT or an exercise specialist to create a tailored exercise regimen WNL. Finally, they can be seen by a certified diabetes educator to provide in depth knowledge and teaching about the disease.

CASE STUDY PROGRESS

S.S. comments, "I've heard many people with diabetes lose their toes or even their feet." You take this opportunity to teach her about neuropathy and foot care.

I would respond that in some cases with DM, people do have amputations that are usually at their toes or feet. This is because uncontrolled diabetes can cause neuropathy, which is decreased sensation and feelings due to nerve damage. This leads to improper care to areas like the feet and toes because any pain due to ulcers or infection goes unnoticed, which is when surgery becomes the intervention.

12. Which symptoms lead you to believe S.S. has some form of neuropathy?

She has a feeling of burning and pins at her toes after her days of working at the bank. This sedentary lifestyle and increased blood glucose levels can form neuropathy,. She is also experiencing retinopathy due to blurred vision.

13. What other findings in S.S.'s history increase her risk for developing neuropathy?

14. What would you teach S.S. about neuropathy?

I would teach S.S that neuropathy is one of the biggest complications that goes unnoticed and disregarded by many diabetes patients. It is manageable with daily assessments of the legs/toes/feet, and any sudden changes should be made aware of to the PCP and managed by controlling blood glucose levels.

15. Because S.S. has symptoms of neuropathy, placing her at risk for foot complications, you realize you need to instruct her on foot care. Outline 5 points you would include when teaching her about foot care for persons with DM.

S.S foot should be checked daily for any changes. They must be kept clean, dry and intact with moisture such as lotions. Proper footwear that is roomy and comfortable to ensure the feet are damaged should be bought and used. When trimming toenails, it must be done delicately to prevent ingrown toenails that may cause damage and go unnoticed. Finally, they must continue metformin with exercise and proper nutrition to control blood glucose and prevent neuropathy overall.

16. What ongoing monitoring will S.S. need for nephropathy and retinopathy?

S.S can be followed up with an ophthalmologist to create a baseline and to assess any possible complications. With nephropathy, labs like BUN and Cr levels can be taken to access for signs of AKI.

17. At the conclusion of the visit, which statements indicate S.S. has an accurate understanding of the teaching you provided about DM? Select 4 correct options.

a. "When I am ill, I do not need to take the metformin."

b. "The only place it is safe to go barefoot is in my house."

c. "It is best to take the metformin at breakfast and dinner."

d. "Looking at the condition of my feet every day is important."

e. "I will make an appointment with the eye doctor next week."

f. "Taking a walk for at least 20 minutes a day will help my DM."

g. "If I take my medicine, I can eat what I want, and my glucose will be fine."

h. "I will be able to stop the metformin when my pancreas starts working better."

i. CASE STUDY PROGRESS

j. 18. S.S. returns to the clinic 6 weeks later for a follow-up appointment. She met with the diabetic educator and is making changes to her eating habits and has started walking. **For each assessment finding, use an X to indicate whether the interventions were Effective (helped to meet expected outcomes), Ineffective (did not help to meet expected outcomes), or Unrelated (not related to the expected outcomes).**

Assessment Finding	Effective	Ineffective	Unrelated
a. Reports stress incontinence when she coughs, sneezes			X
b. BP 130/78 mm Hg			X
c. Fasting blood glucose level results: 153 mg/dL		X	
d. Weight loss of 6 pounds (2.7 kg)	X		
e. Reports decreased tingling in her toes.	X		
f. Reports continued blurred vision.		X	
g. Eating dinner with her husband every night.			X
h. Hemoglobin A1C level results: 8.2%		X	
i. Reports of frequent urination		X	