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 is elevated (normal <126 mg/dL), indicating diabetes

2. Identify 3 methods we use to diagnose DM.

 - Fasting plasma glucose ≥126 mg/dL

- 2-hour plasma glucose ≥200 mg/dL during OGTT

- A1C ≥6.5%

- Random plasma glucose ≥200 mg/dL with symptoms

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

 - **Age >45 years**

- **Asian ethnicity**

- **History of gestational diabetes**

- **Overweight/obesity**

- Family history of diabetes

- Physical inactivity

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

- Polydipsia (increased thirst)

- Polyphagia (increased hunger)

- Polyuria (frequent urination)

- Fatigue

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?

 - Asian dietary preferences

- Cultural beliefs about medicine

- Family involvement in health decisions

- Language needs

- Traditional healing practices

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

- Decreases hepatic glucose production and improves insulin sensitivity
- Has a long safety record with minimal side effects
- Helps with weight loss, which is beneficial for S.S.

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

- Take medication with meals to minimize gastrointestinal side effects

- Take at the same time each day to maintain consistent blood glucose levels

- Never skip doses - if one is missed, take it as soon as remembered unless it's almost time for the next dose

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

    - Continue taking medications as prescribed
    - Check blood glucose more frequently (every 4-6 hours)
    - Stay hydrated with sugar-free fluids

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

    - Helps lower blood glucose levels
    - Assists with weight management
    - Improves insulin sensitivity
    - Help reduce cardiovascular risk factors

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

    - Start slowly and gradually increase activity
    - Aim for 150 minutes of moderate exercise per week
    - Check blood glucose before and after exercise

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

    - Diabetes educator
    - Dietitian
    - Endocrinologist

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.

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

 S.S. reports that her feet "burn or feel like there are pins in them"

13. What other findings in S.S.'s history increase her risk for developing neuropathy?
 - Uncontrolled blood glucose (A1C of 8.8%)
- History of gestational diabetes
- Being overweight (173 lbs at 5'3")

14. What would you teach S.S. about neuropathy?
    - "Looking at the condition of my feet every day is important"
    - "I will make an appointment with the eye doctor next week"
    - "Taking a walk for at least 20 minutes a day will help my DM"

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.

    a   Inspect feet daily for cuts, blisters, redness, swelling, or nail problems

    b   Wash feet in warm (not hot) water daily, dry thoroughly, especially between toes

    c   Moisturize feet but not between toes to prevent infection

    d   Never walk barefoot, always wear well-fitting shoes and clean socks

    e   Cut toenails straight across and file edges to avoid ingrown toenails

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

 - Nephropathy: Annual urine microalbumin test and serum creatinine

- Retinopathy: Comprehensive dilated eye exam yearly by an ophthalmologist

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	