

### Scenario: Type I DM

You work in the diabetes (DM) center at a large teaching hospital where you meet K.W. She is a 20-year-old Hispanic woman who was released from the hospital 2 days ago after being diagnosed with type 1 DM. Nine days ago, K.W. went to see the provider after a 1-month history of frequent urination, thirst, severe fatigue, blurred vision, and some burning and tingling in her feet. She attributed those symptoms to working long hours at the computer. Her random glucose level was 410 mg/dL (22.8 mmol/L). The next day her laboratory values were as follows: fasting glucose 335 mg/dL (18.6 mmol/L), A1C 8.8%, cholesterol 310 mg/dL (8.03 mmol/L), triglycerides 300 mg/dL (3.39 mmol/L), HDL 25 mg/dL (0.65 mmol/L), LDL 160 mg/dL (4.14 mmol/L), ratio 12.4, and creatinine 0.9 mg/dL (80.0 μmol/L). Her body mass index was 29.6 with a BP 160/96 mm Hg. She was admitted to the hospital for control of her glucose levels and the initiation of insulin therapy with carbohydrate (CHO) counting. After discharge, K.W. has been referred to you for diabetes education. You are to cover 4 areas: pharmacotherapy, glucose monitoring, basic nutrition therapy, and exercise.

1. What is the overall teaching goal with a patient newly diagnosed with type 1 DM?

Insulin treatment needs to be well calculated with carbohydrate intake, glucose level and administered at the correct time. Monitor the foods you will eat and their carbs because it can directly affect glucose level in the blood. Learn objectives as to why exercise is necessary and can provide benefits with type 1 diabetes.

2. What assessments do you need to make before starting your session?

Patient readiness, review H & P, have clear idea for teaching and have resources handy to give the patient to take home

3. K.W. was started on sliding scale lispro (Humalog) four times daily and glargine (Lantus) insulin at bedtime. What are the significant differences between the 2 therapies?

Humalog is rapid action and can start working within 15 minutes, help used to mimic how the pancreas releases during meals

Lantus is long acting is released steadily and continuously, onset is 0.8-4hr and can last for 16-24 hr keeping glucose levels stable overnight

4. Outline important content to include about insulin therapy.

A lot of insulin therapy needs to be injected to help with glucose levels. These injections can be multiple times a day at different times to help with glucose levels. Some are fast acting such as the

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Humalog and others are long acting which can maintain levels through the day and overnight such as lantus. Some insulins can be a mealtime bolus depending on when you're going to eat, what your glucose level is, and when you plan on eating.

5. What specific points would you include about managing insulin therapy? **Select 5 options.**

- a. Store unopened insulin in the freezer.
- b. The insulin can be used if it is yellow but not expired.
- c. **The fastest subcutaneous absorption is from the abdomen**
- d. **Administer the lispro (Humalog) within 15 minutes of eating.**
- e. **Ideally, the glargine (Lantus) should be administered at bedtime.**
- f. A prefilled syringe can be stored for 24 hours at room temperature.
- g. Always administer the injections in the same, easy-to-reach location.
- h. **The current vial of lispro (Humalog) can be kept at room temperature for 1 month.**
- i. **Two injections will be needed to administer lispro (Humalog) and glargine (Lantus).**

6. What is the best way to determine whether K.W. can safely self-administer insulin?

- a. Having her describe the process step-by-step
- b. Evaluating her A1C levels and daily glucose logs
- c. **Observing her draw up and administer an insulin dose**
- d. Asking her to rate her confidence in her ability to give a self-injection

7. Outline important content to review about glucose monitoring.

Glucose monitoring is crucial in DM because it can help the patient determine what foods to eat, activity patterns and drug dosage. It can show duration of insulin, trends, and alert for any concerning glucose levels. Can help alert to episodes of hyper or hypoglycemia.

8. K.W. states her diet is mostly fast foods. The foods she cooks at home are high in starch and fat.

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Her mealtimes often vary from day to day because of her work schedule. What is CHO counting? Why might this method work well for K.W.?

CHO is a meal planning technique used to keep track of the amount of carbs eaten at each meal and per day. This will work well for K.W. because it'll allow her to get an idea of how much insulin to give during meals times. It will also allow her to monitor her carbs since she eats majority of fast food which has high amounts of carbs and she cooks foods high in starch which she will have to calculate for.

9. Outline important points to cover about a basic nutrition plan with CHO counting.

Monitor and maintain an average amount of carbs consumed day to day to help with glucose level. Include all parts of the food plate to have a well-rounded nutritious diet and avoid alcohol as this can cause hypoglycemia when taking insulin.

10. K.W. states that she currently does not exercise at all. What benefits will K.W. receive from taking part in an exercise program?

An exercise program can help her lower glucose levels. She can also lose weight while exercise which can have a direct effect on her levels as well

11. What do you need to teach K.W. about safe exercise?

She needs to be careful of hypoglycemia occurring during exercise, exercise an hour after her meals, bring a snack, and check glucose frequently.

12. Describe 3 suggestion you can make to help her deal with her condition and follow the treatment plan.

Record a food diary, food prep each week, join an active group (such as Pilates, bike riding) or get a gym membership

13. What outcomes could you use to determine if your teaching with K.W. was effective? Check her A1C, monitor fasting and random glucose, check triglycerides, cholesterol, and BMI every month. Check to see if she can restate any teaching points.

## CASE STUDY PROGRESS

K.W. calls the clinic several days later reporting that she has "the flu." She has been nauseated and vomited once during the night. She has had 2 loose stools. She states that she does have a few chills and may have a

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low-grade fever but does not have a thermometer. She did not check her glucose level this morning or take her insulin because she has not eaten.

15. Based on these findings, you recognize that K.W. may be experiencing \_\_\_\_hyperglycemia\_\_\_\_. The priority intervention is to \_\_\_monitor glucose level\_\_\_\_.

Options for 1	Options for 2
hyperglycemia	administer the normal morning insulin dose
hypoglycemia	ingest a rapid acting carbohydrate
	measure her glucose level

Use an X to indicate whether the instructions below are Indicated (appropriate or necessary) or Contraindicated (could be harmful) for K.W. about managing illness and DM.

Instruction	Indicated	Contraindicated
a. Check glucose level every 2-3 hours throughout the day.	X	
b. Maintain strict NPO status		X
c. Use over-the-counter medications for symptom control.		X
d. Obtain a yearly influenza vaccine.	X	
e. Take insulin as ordered; call back if there you have concerns so the HCP can adjust insulin doses	X	
f. Someone should be with her in case of an emergency.	X	