

**Case Study 3: Y.L.**

**Scenario**

Y.L. makes an appointment to come to the clinic where you are employed. She has been complaining of chronic fatigue, increased thirst, constantly being hungry, and frequent urination. She denies any pain, burning, or low back pain on urination. She tells you she has a vaginal yeast infection that she has treated numerous times with OTC (over-the-counter) medication. She admits to starting smoking since going back to work full time as a clerk in a loan company. She also complains of having difficulty reading numbers and reports making frequent mistakes. She says by the time she gets home and makes supper for her family, then puts her child to bed, she is too tired to exercise. She reports feet hurt; they often “burn or feel like there are pins in them.” She reports that after her delivery, she went back to her traditional eating pattern which you know is high in carbohydrates.

In reviewing Y.L.’s chart, you notice she has not been seen since the delivery of her child 6 years ago. She has gained a considerable amount of weight; her current weight is 173 lb. Today her BP is 152/97 mm Hg and her plasma glucose is 291 mg/dL. The PCP (primary care provider) orders the following labs: UA, HbA1c (hemoglobin A1c), fasting CMP, CBC, fasting lipid profile, and a baseline 24-hour urine collection to assess Creatinine clearance. The lab values are as follows: fasting glucose 184 mg/dL, A1c 10.4, UA +glucose, - ketones, cholesterol 256 mg/dL, triglycerides 346 mg/dL, LDL (low-density lipids) 155 mg/dL, HDL (high-density lipids) 32 mg/dL, ratio 8.0. Y.L. is diagnosed with type 2 diabetes.

After meeting with Y.L. and discussing management therapies, the PCP decides to start MDI (multiple dose injection) insulin therapy and have the patient count carbohydrates. Y.L. is scheduled for education classes and is to work with the diabetes team to get her blood sugar under control.

1. Identify the three methods used to diagnose DM.
  - HGB-A1C
  - Fasting blood glucose
  - Random blood glucose
  - 2 hour postprandial oral glucose tolerance test
2. Identify three functions of insulin.
  - Help glucose transport into the cell to bring down glucose levels
  - Stimulate liver to store glucose
  - Enhances the storage of dietary fat in adipose tissue
3. Insulin’s main action is to lower blood sugar levels. Several hormones produced in the body inhibit the effects of insulin. Identify three.
  - Glucagon
  - Cortisol
  - Growth hormone
4. Y.L. was stated on lispro (Humalog) and glargine (Lantus) insulin with carbohydrate counting. What is the most important point to make when teaching the patient about glargine?
  - Glargine has a duration of 24 hours. Dosing can be done at any time of the day but must be done at the same time everyday
5. Because Y.L. has been on regular insulin in the past, you want to make sure she understands the difference between regular and lispro. What is the most significant difference between these two insulins?
  - Rapid acting insulin is given more frequently, it has a rapid onset and shorter duration. Regular insulin is for routine treatment and is the only insulin type that can be given intravenously.

6. What is the peak time and duration for lispro insulin?

- Peak: 30-90
- Duration: 3-5 hours

7. Y.L. wants to know why she can't take NPH and regular insulin. She is more familiar with them and has taken them in the past. Explain why the provider chose lispro and glargine insulin over NPH and regular insulin?

- NPH cannot be mixed with glargine.
- NPH may be easier for the patient to take since it saves them from having to inject themselves twice, but it is unpredictable. Patients that take NPH with regular insulin have a risk for high or low blood glucose because the peak time of these two insulins overlap. When these two insulin peak times overlap, it is similar to giving the patient 2 insulins at once.
- Lispro is a rapid acting insulin used mostly around meal times to help control postprandial hyperglycemia and prevent nocturnal hypoglycemia. Glargine has a longer duration, it works slowly to release insulin over time. The peak times of these two insulins do not overlap.