

How do levels of blood glucose fluctuate throughout the day in someone with diabetes compared to someone without diabetes?

Procedure

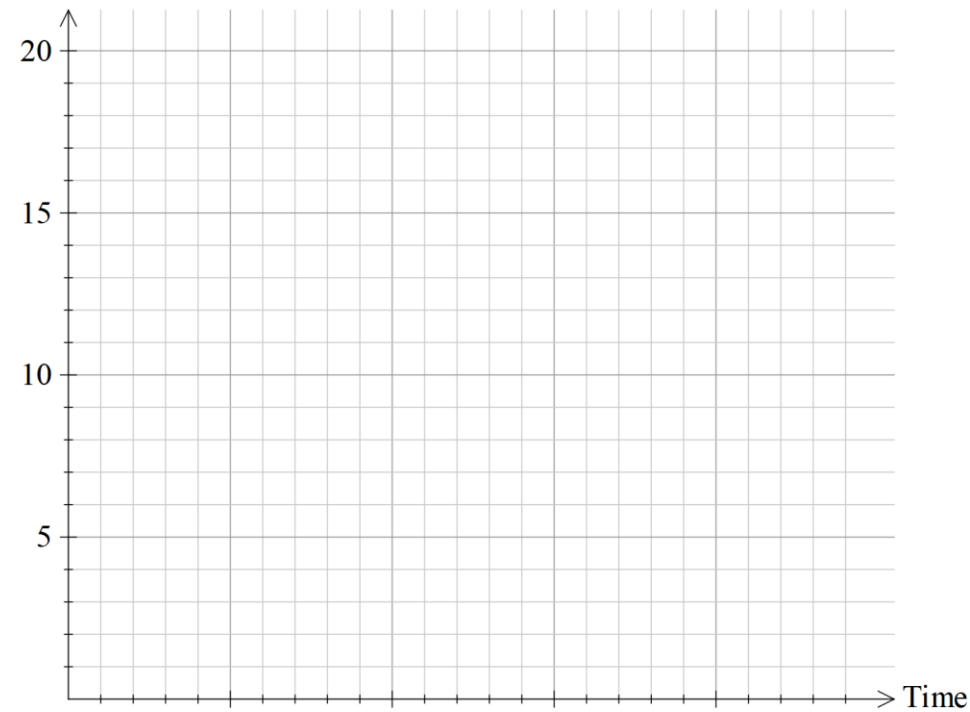
Compare the following blood glucose concentration data provided for Maria and Tamika. One of these young women has diabetes. Blood glucose concentrations were monitored over 15 h for both. Both women ate identical meals at the same times, and got equal amounts of exercise at the same times. Neither is presently taking insulin.

Event	Time	Blood Glucose Concentration (mmol/L)	
		Maria	Tamika
Wake up	8:00 AM	4.0	10.0
1 hour after breakfast	9:00 AM	7.0	14.0
Pre-Lunch	12:00 PM	4.5	10.0
2 hours after lunch	2:00 PM	6.0	15.0
Mid-Afternoon	3:00 PM	4.5	10.0
1 Hour after Exercise	4:00 PM	4.0	4.0
Pre-Supper	6:00 PM	4.5	9.0
1 Hour After Supper	7:00 PM	6.5	18.0
Bedtime	11:00 PM	4.5	12.0

Analysis

1.) Plot both sets of data on the same graph and draw a smooth line of best fit for each.

Blood Glucose Level (mmol/L)



2.) A healthy range for blood glucose is 4.5 to 5.0 mmol/L. In general, a person with moderate diabetes would take an insulin shot if the blood glucose level went above 13 to 15 mmol/L. On your graph, indicate which woman is diabetic and which is not. How do you know?

3.) During what times and activities would the pancreas of the healthy person release insulin. How did insulin affect her body at these times?

4.) During what times and activities would the pancreas of the healthy person release glucagon. How did glucagon affect her body at these times?

5.) What medication could the woman with diabetes could take to help her blood glucose levels return to healthy levels after a meal. Explain how this treatment would work.

6.) During exercise, Tamika's blood glucose drops dramatically. What could she do to help raise her blood glucose to a healthy range?
