



AL-Mustaqbal University College
Radiology Techniques Department

First Class

Particle General Chemistry

Third lecture (3)

Blood sugar

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Blood sugar

Blood sugar, or glucose: is the main sugar found in your blood. It comes from the food you eat, and is your body's main source of energy. Your blood carries glucose to all of your body's cells to use for energy.

Diabetes is a disease in which your blood sugar levels are too high. Over time, having too much glucose in your blood can cause serious problems. Even if you don't have diabetes, sometimes you may have problems with blood sugar that is too low or too high. Keeping a regular schedule of eating, activity, and taking any medicines you need can help.



In humans, a blood glucose level of 4 grams, or about a teaspoon, is critical for normal function in a number of tissues, and the human brain consumes approximately 60% of blood glucose in fasting, sedentary individuals. A persistent elevation in blood glucose leads to glucose toxicity, which contributes to cell dysfunction and the

pathology grouped together as complications of diabetes. Glucose can be transported from the intestines or liver to other tissues in the body via the bloodstream. Cellular glucose uptake is primarily regulated by insulin, a .hormone produced in the pancreas

Blood sugar regulation

The body's homeostatic mechanism keeps blood glucose levels within a narrow range. It is composed of several interacting systems, of which hormone regulation is the .most important

There are two types of mutually antagonistic metabolic hormones affecting blood glucose levels:

*catabolic hormones (such as glucagon, cortisol and catecholamines) which increase blood glucose

*Anabolic hormone (insulin), which decreases blood .glucose

Sample source

Glucose testing in a fasting individual, show comparable levels of glucose in arterial, venous, and capillary blood. But following meals, capillary and arterial blood glucose levels can be significantly higher than venous levels. Although these differences vary widely, one study found that following the consumption of 50 grams of glucose, "the mean capillary blood glucose concentration is higher

than the mean venous blood glucose concentration by 35%

Measurement techniques

Two major methods have been used to measure glucose. The first, still in use in some places, is a chemical method exploiting the nonspecific reducing property of glucose in a reaction with an indicator substance that changes color when reduced. Since other blood compounds also have reducing properties (e.g., urea, which can be abnormally high in uremic patients), this technique can produce erroneous readings in some situations . The more recent technique, using enzymes specific to glucose, is less susceptible to this kind of error. The two most common employed enzymes are glucose oxidase and hexokinase.[28] Average blood glucose concentrations can also be measured. This method measures the level of glycated hemoglobin, which is representative of the average blood glucose levels over the last, approximately, 120 days