

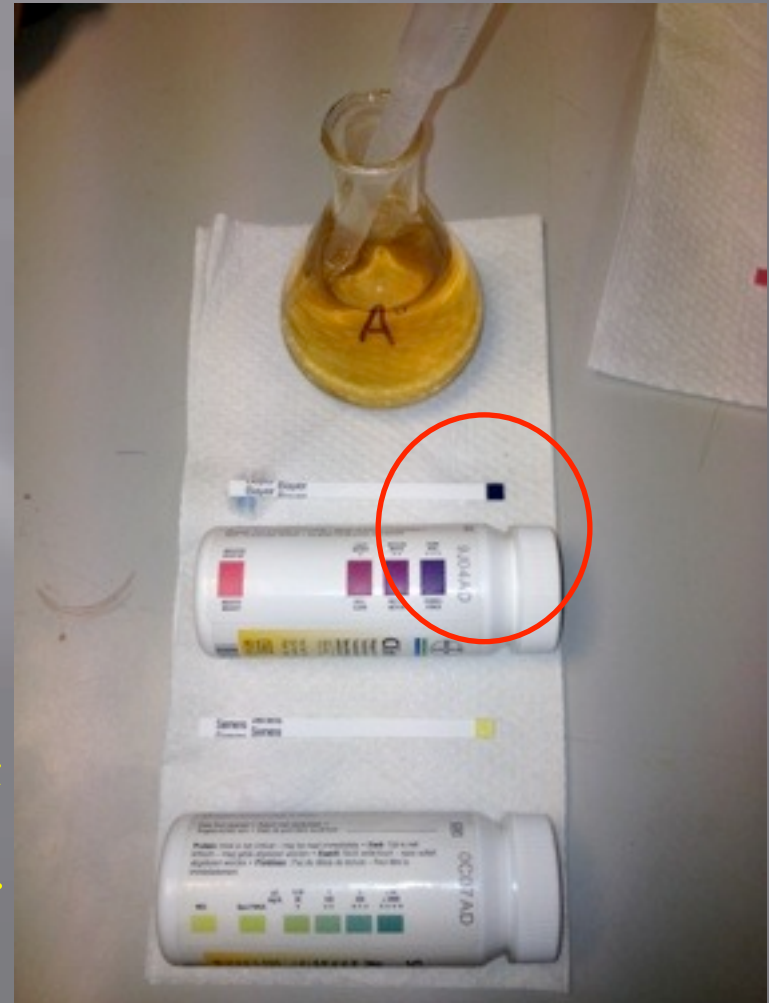
TESTING URINE

Drayton Manor High School

Glucose in urine

Glucose is the usable form of sugar that your body utilizes for energy. Glucose is not normally found in urine, so a positive reading immediately raises concerns.

The main reason for glucose in urine is **diabetes**. Since the body is not properly absorbing the glucose that it is receiving through the food you eat, it is expelling the excess in your urine. **Diabetics lack sufficient amounts of insulin, the hormone that regulates blood sugar. When insufficient amounts of insulin are in the blood stream, the concentration of glucose can get high. Your kidneys, which filter out blood, can only handle so much glucose before it begins to send it out in your urine.**



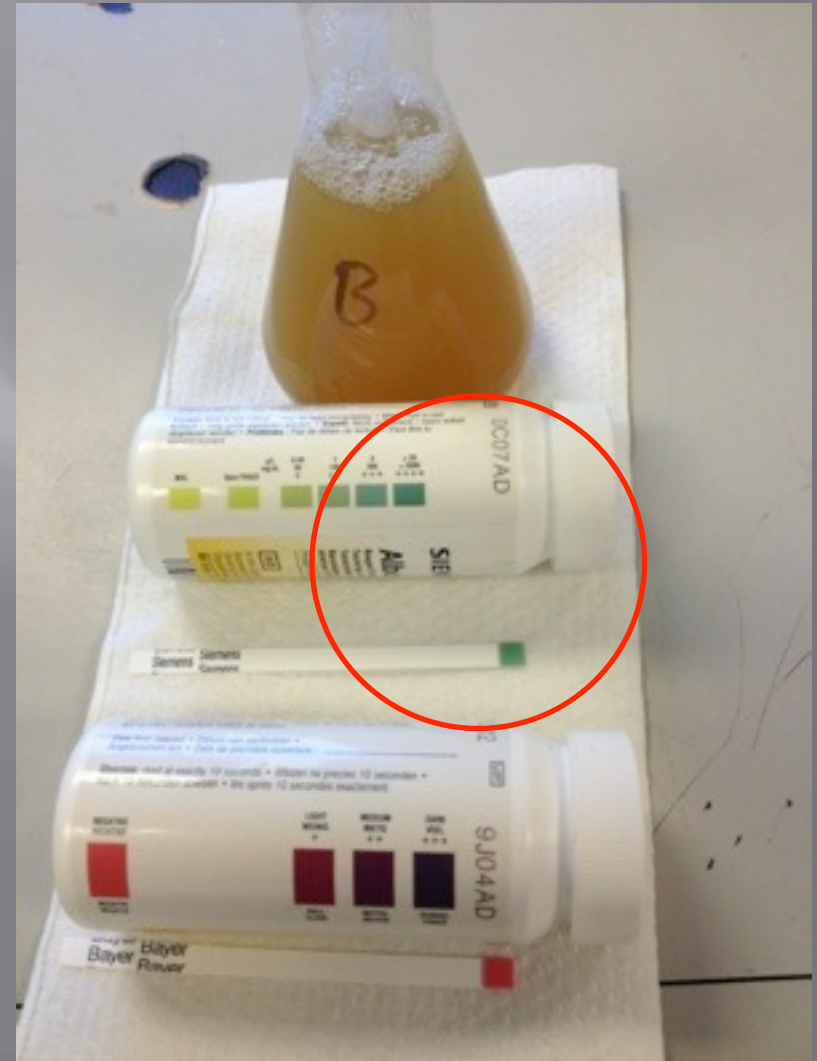
However, glucose in the urine doesn't always indicate diabetes. Other factors and diseases can play into a positive glucose reading. If you are **pregnant**, glucose is almost certainly going to be expelled in the urine. **Meningitis**, the inflammation of the protective membrane of the central nervous system, can also cause glucose in urine. Other possible causes include **brain disorders and tumours in the medulla of the kidney**. Even a **sugary meal** prior to your check-up could be the cause.

Protein in our body

Protein is very important. It is the building blocks of our body. Everything in our body except for the skeletal system is a form of protein; without protein we would not survive. It is because of this reason that **the body recycles protein. When blood passes through the kidneys, the filtration system in them removes all the waste matter but leaves the elements of blood, which include protein, behind.**

Protein in urine

Sometimes, the kidneys are not able to filter out only the waste matter and blood protein too is excreted. A certain amount of protein being excreted is unavoidable. Up to 150mg of protein being excreted is considered normal. However, in some cases, this can multiply quickly and result in too much protein being excreted from the body. This protein comes out in urine and is called proteinuria.



Causes of Proteinuria

- **Diabetes is the biggest cause of proteinuria.** High blood sugar levels damage the filters in the kidney, causing them to malfunction thus resulting in proteinuria. Diabetes is the leading cause of kidney damage in the United States.
- **People with hypertension or high blood pressure** are also more at risk of developing proteinuria. If the high blood sugar is not treated immediately, it can result in kidney damage.
- Some people are considered more at risk for proteinuria than others. For example, people of **African descent** are considered higher risk candidates than Caucasians, and are six times more likely to contract the disease. American Indians, Hispanics, and Pacific Islanders are also considered high risk candidates.
- **Overweight and obese people are also high risk candidates** as are people who have a history of weight problems in their family.

Symptoms of Proteinuria:

Proteinuria is a chronic illness and very rarely does it show any symptoms during the early stages. In fact, **the only way to diagnose proteinuria is through a protein in urine test**. This is the reason why diabetics and people who suffer from high blood pressure are recommended to take a test at least once a year to ensure that they are not developing proteinuria.

Some of the symptoms in the later stages are as follows (having symptoms doesn't necessarily mean you have a problem):

- ▣ Frothy or foamy urine
- ▣ Swelling of the hands, feet, abdomen or face
- ▣ Back pain and also pain near the lower ribs at the location of the kidneys.
- ▣ Burning sensation or pain while urinating
- ▣ Blood in the urine
- ▣ General feeling of being unwell, tired and nauseous.
- ▣ Shortness of breath
- ▣ Loss of appetite

Medical Cures for Proteinuria:

Below are examples to medical cures for proteinuria:

- Angiotensin-converting enzyme inhibitor (ACE) or angiotensin receptor blocker (ARB) medications to lower blood pressure and protect kidney function
- Dietician consultation and a healthy meal plan
- Diuretics
- Insulin or other medications to help control blood sugar levels in people with diabetes
- Low-protein diet
- Low-sodium diet
- Treatment of any underlying chronic conditions

Natural Cures to Proteinuria:

Natural cures are mostly recommended before medication such as diet control and lifestyle changes.

Below are examples of the natural cures that can be taken:

- Eating a lot of fruits, vegetables, legumes and grains is good.
- Lean meat such as chicken is better than red meat.
- Fish should be included in the diet.
- Salt and fat in food must be restricted.
- Water is better than carbonated or other drinks.
- At least 30 minutes of physical exercise is recommended on a daily basis.
- Alcohol consumption must be restricted to less than two small drinks per day.
- Stress levels should be reduced with de-stressing exercises such as yoga, tai chi, and meditation.
- It is important to maintain a healthy weight.
- Drink one glass of fresh bitter gourd juice each morning on an empty stomach. In case you do not have access to the plant, you can substitute it with bitter gourd seed powder. This can be mixed with water or even added

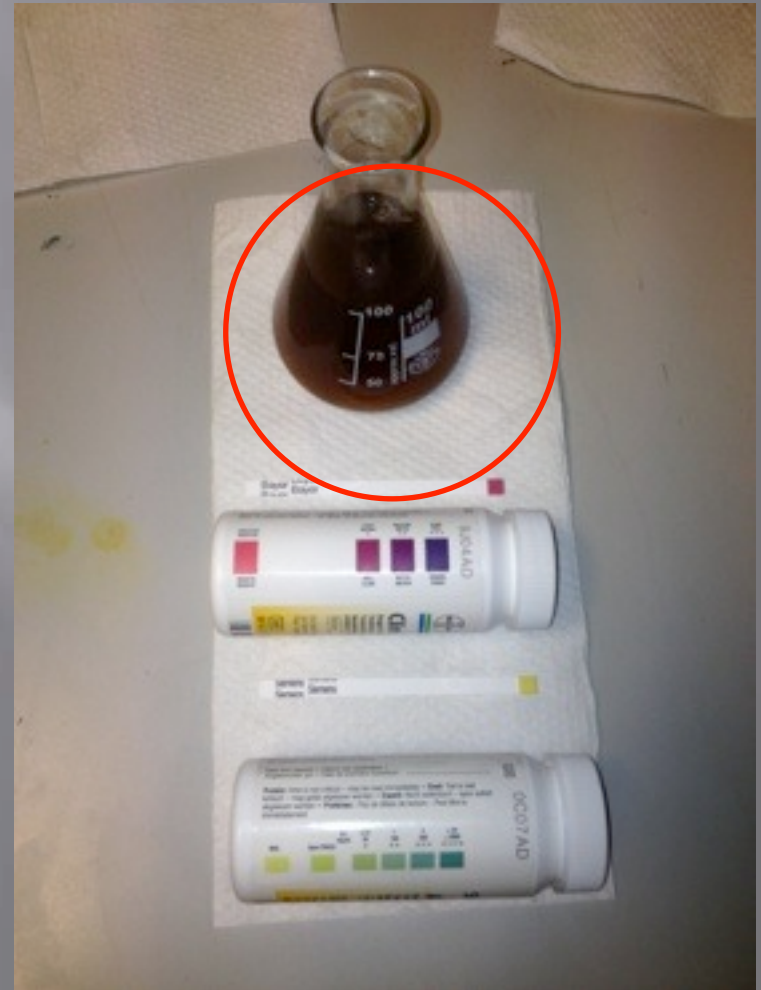
Dehydration

Symptoms may include **headaches, decreased blood pressure and dizziness.**

Untreated, it causes **delirium, unconsciousness and death.**

Signs include **abnormally dark or cloudy urine, decreased urine volume,** unexplained tiredness, irritability, lack of tears when crying

Treatment for severe cases include **intravenous saline fluids,** but usually **drinking water, together with something sugary and salty** is enough.



Drug Testing in Sport

Drug testing has become an increasingly large part of both professional and amateur sports. An athlete can be called for drug testing at any time, in or out of competition. During competition, some sports only carry out drug testing on the winning team or top three competitors. Others will test by random selection from all competitors.

The procedure

When called for a drugs test the athlete can have a representative, e.g. their coach or team doctor present, so that the testing is according to the rules and guidelines. **A sample is provided and split into two bottles and sealed by the athlete. A code number will be attached to the bottle and recorded to ensure the correct result is given whilst remaining anonymous.**

Following the sampling procedure the athlete must **complete a medical form** which states all medicines, drugs and substances taken over the last week. From medicines, to supplements and prescribed drugs. If any of these substances are on the prohibited list the athlete must hold a Therapeutic Use Exemption (TUE).

The samples are then sent to a registered laboratory where sample A is tested using **gas chromatography and mass spectrometry. If a positive result is found with sample A, the athlete is notified before sample B is also tested.** If this too is positive, the relevant sporting organisations are notified whose responsibility it is to decide what penalties or bans are to be imposed.

Lance Armstrong Case Study

- Cycling athletes are one of the most heavily tested groups in sports so how could the most noted cyclists in the world get away with it for so long? With a combination of science and cleverness.
- Armstrong admitted to using several banned substances, but the one that may have made the biggest difference is EPO. EPO is a glycoprotein that is produced naturally in the body and stimulates the production of red blood cells in bone marrow. Red blood cells carry oxygen throughout the body. For an endurance athlete, this is the key to victory.
- Taking EPO increases the oxygen processing capacity of the circulatory system beyond what it would naturally be. There was no test for laboratory-created EPO until the early 2000s, but even then it was not terribly sensitive. Armstrong likely resorted to one of several drugs that boost natural EPO production. Although, high levels of natural EPO are treated with a lot of suspicion. Lance Armstrong spent years avoiding anti-doping agency testers when he knew he would be caught. He learned from the mistakes of others, and counted on his celebrity to keep him above suspicion. In the end, it was his staggering accomplishments that convinced many people of his shady dealings. Armstrong was very clever to leverage biology and chemistry to win those seven tours, but now he's paying the price for what was quite clearly cheating.