



MANAGING KETONES AT HOME

Symptoms of ketones:

- Test positive for ketones using urine sticks or blood test of ketones
- Thirsty/dehydrated
- Breath smells like sour apples or acetone
- Going to the toilet often
- Frustrated and irritable
- Stomach cramps
- Vomiting and nausea



Why do ketones occur?

The most common reason for ketones to occur is **due to a lack of insulin**.

This can be caused by a variety of reasons:

- Did you skip your injection?
- Could your insulin pen have been in the sun or gotten too cold?
- Are there bubbles in your insulin pen meaning that you injected air instead of insulin?
- Are you using the same injection site too often so that the insulin was not absorbed?
- For pump users: could your cannula site be blocked?



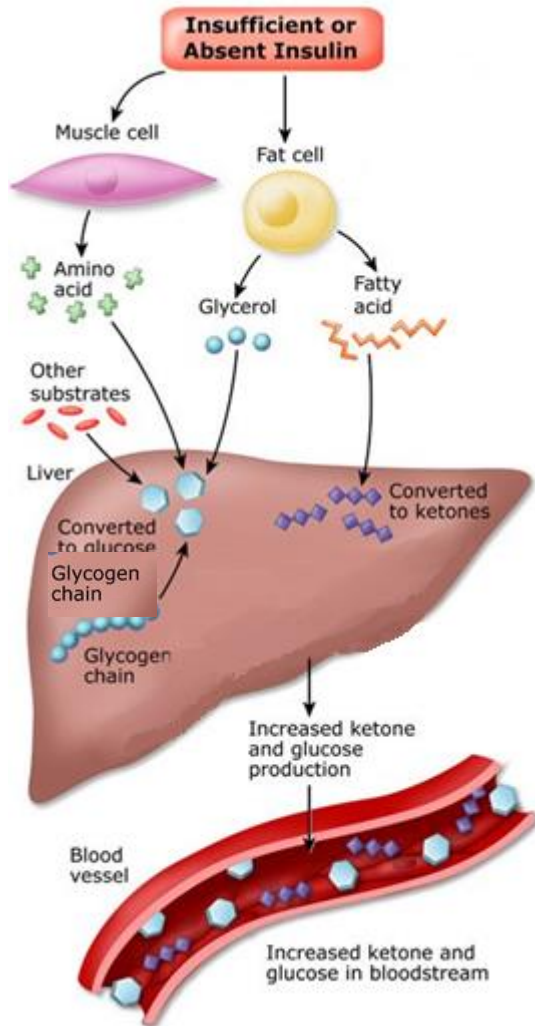
**If you are vomiting and cannot keep fluids down, you need to go to the hospital immediately
Always contact your diabetes nurse or doctor to get help**



What causes ketones?

In a healthy state:

Insulin is used to move glucose from the blood stream into the cells of our bodies. When you have the correct amount of insulin, our cells use the glucose we get from our food as an energy source.



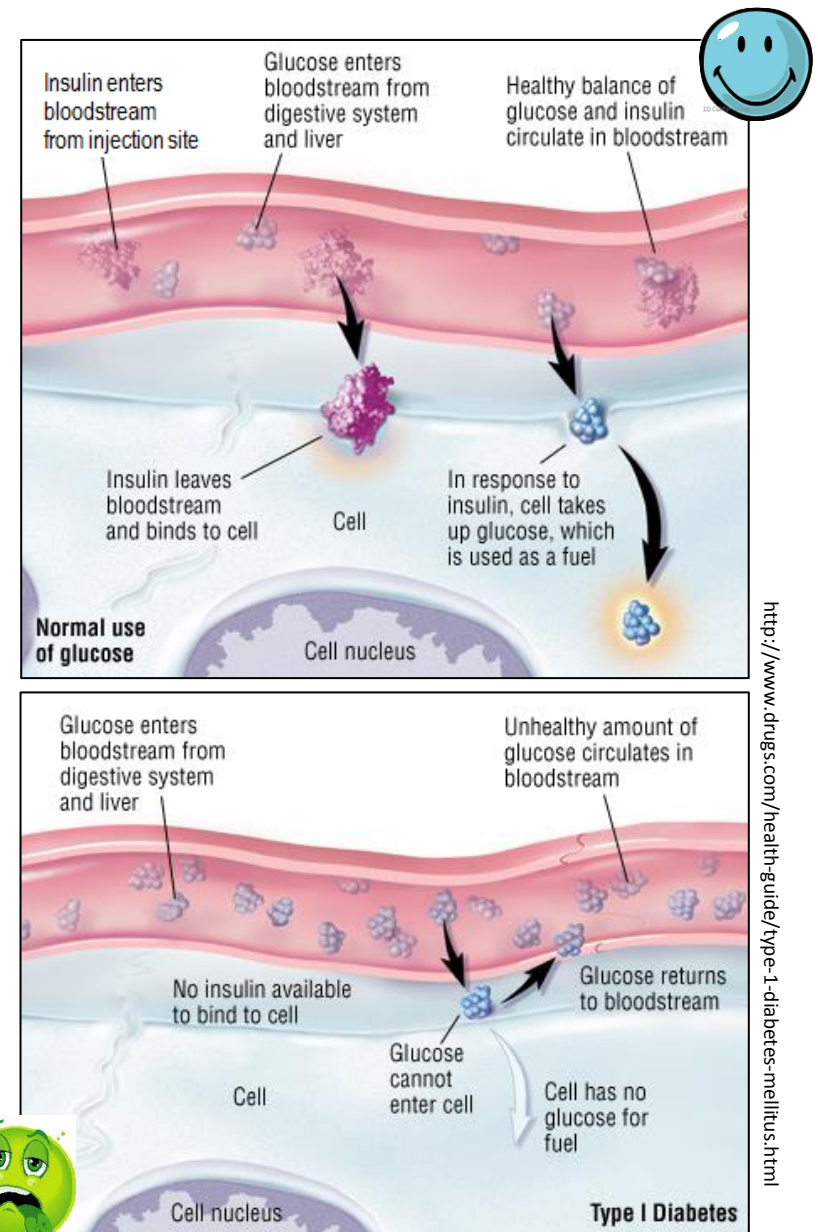
<http://www.sarc.com.au/diabetic-ketoacidosis-dka/>

When you do not have enough insulin:

Your body can no longer use the food you eat for energy anymore because there is not enough insulin to move glucose into the cells.

Your body then breaks down muscle and fat cells into glucose to use as energy. Insulin is not needed since it is already in the cell. One of the by-products of breaking down fat cells, fatty acids, is converted into ketones. These are then secreted into the bloodstream.

Ketones are very acidic and damage your body by decreasing your blood pH. Ketones are removed from the body via urine and your breath. This is why you test your urine and can smell ketones on your breath.



<http://www.drugs.com/health-guide/type-1-diabetes-mellitus.html>





Steps to home treatment of ketones:

1. Test your blood sugar
2. Test your urine or blood for ketones
3. Think about why you could have ketones and correct the problem
 - a. Eg, if you think your insulin overheated, change to a new insulin pen
4. **TAKE FAST ACTING INSULIN!** This is the only thing that will get rid of your ketones
 - a. You will need to take insulin every hour (or two hours) in order for your body to start using glucose as an energy source again
 - i. Take every hour if you are using **Novorapid, Humalog, Apidra**
 - ii. Take every 2 hours if you are using **Humalin R, Actrapid,**
 - iii. **DO NOT USE THIS METHOD** if you only have **Actraphane, Novomix 30/70**
 - b. Calculate the number of units you need by dividing your weight (kg) by 10
 - i. Eg. If Thabo weighs 74kg, he would take 7.4 units, rounded down to 7 units of his Novorapid every hour
 - c. If this dose is very large compared to what you normally give, try taking two thirds of this dose
 - i. Eg, If John weighs 88kg, he would take 8.8 units, rounded up to 9 units of his Humalin R every two hours. However, he normally only gives 3 units of Humalin R at breakfast, lunch and dinner. Therefore, he now decides to reduce this dose: $9 \times \frac{2}{3} = 6$ units.
5. Sip on coke light or regular coke depending on what your blood sugar was
 - a. If your blood sugar is **more than 15mmol/l**, sip on Coke Light
 - i. Coke Light specifically has minerals such as Potassium, Calcium and Sodium, which are depleted from your body when you have ketones
 - ii. If you don't have coke light, try Tab, Coke Zero, Fanta Zero or other non-sugar containing drinks
 - b. If your blood sugar is **less than 15mmol/l**, sip on regular Coke
 - i. You need to prevent your blood sugar from going low, but still need to keep taking insulin until you no longer have ketones
 - ii. You can sip on any sugary drink like fruit juice, Oros, normal Fanta
 - c. Make sure you only take small sips at a time, since you will already be feeling nauseous and do not want to cause vomiting
6. Repeat this process from Step 1 every hour (or two hours) until you no longer have any ketones



Here's a summary to print and keep:



<p>Blood sugar more than 15mmol/l</p>  <ul style="list-style-type: none">• Inject insulin: units = weight \div 10• Sip on 1 glass of Coke Light every hour• Check your blood sugar and ketones every hour or two hours• Continue until no more ketones	<p>Blood sugar less than 15mmol/l</p>  <ul style="list-style-type: none">• Inject insulin: units = weight \div 10• Sip on 1 glass of Coke every hour• Check your blood sugar and ketones every hour or two hours• Continue until no more ketones
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