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Lactic Acidosis

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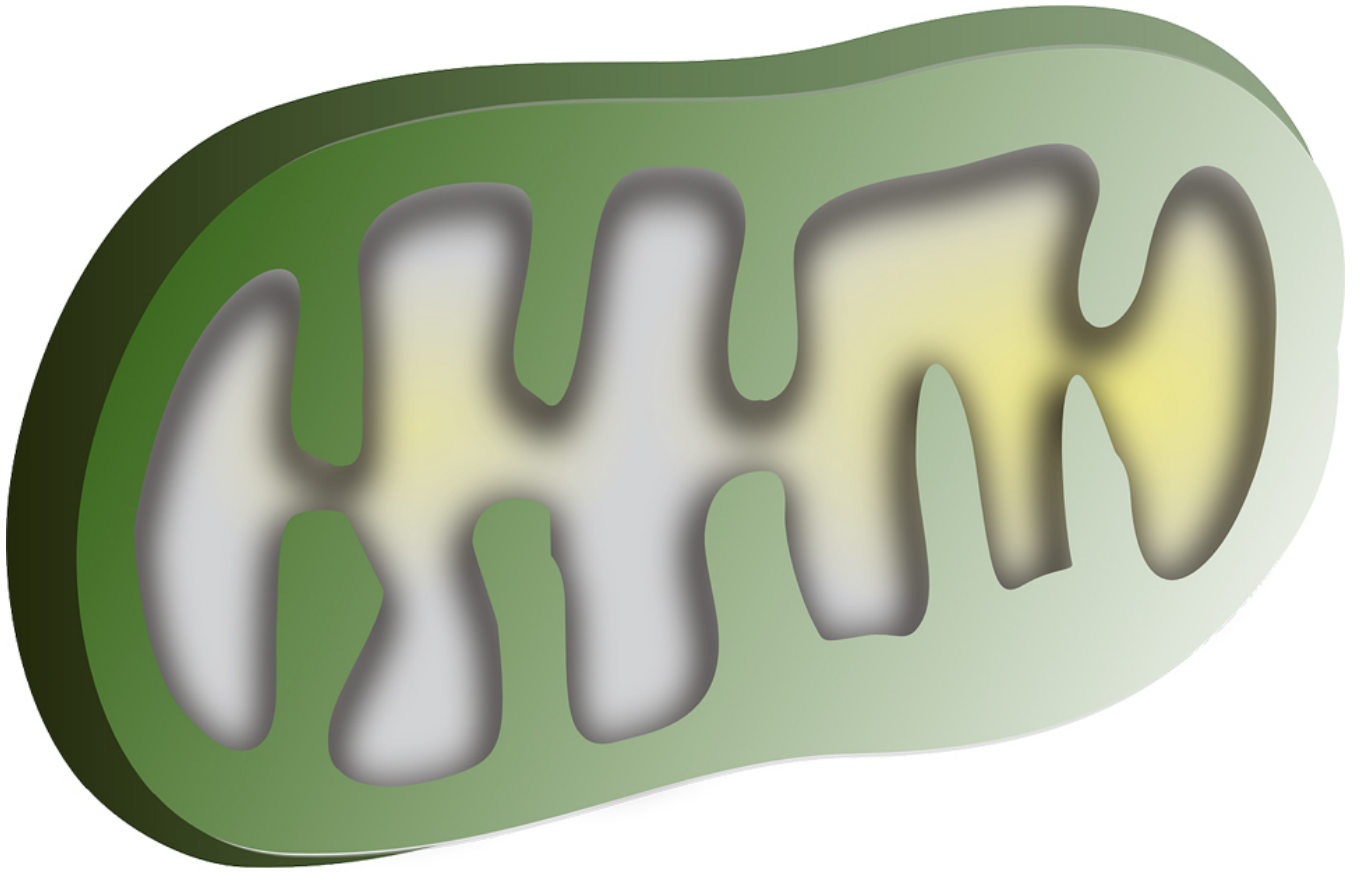


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Understanding Lactic Acidosis

Mitochondria are small organs inside your cells. They help convert energy in the food you eat into energy that your body uses to function. Like solar cells that convert sunlight into electricity, mitochondria are power plants inside your cells that create energy. Your body makes lactic acid as a waste product (unwanted substance) in this process. Normally, the body breaks down lactic acid and gets rid of it.

It is important that you not stop taking any HIV drugs without talking with your health care provider.

Certain HIV drugs in the nucleoside reverse transcriptase inhibitor (NRTI) class sometimes have negative [side effects](#) that may lead to liver and other problems. One such side effect is damage to the mitochondria inside your cells, or mitochondrial toxicity. When mitochondria are damaged, lactic acid production is increased. This can cause levels of lactic acid in your blood to rise. If the levels of lactic acid become too high, a rare, but serious condition called lactic acidosis can occur.

What Causes Lactic Acidosis?

Lactic acidosis can develop when your cells make too much lactic acid or when your liver is not working properly to get rid of it. There are many non-HIV related causes of lactic acidosis, including sepsis, cardiogenic shock, liver disease, carbon monoxide poisoning, severe anemia, drugs, toxins, and medications. However, certain HIV drugs in the NRTI class can also sometimes cause these problems:

- Cells make too much lactic acid: NRTIs can damage the mitochondria, which makes them produce extra lactic acid. This is also known as mitochondrial toxicity.
- The liver is not working properly: NRTIs can cause the liver to become fatty. A fatty liver does not work well and cannot break down lactic acid efficiently.

Lactic acidosis is a rare side effect of NRTIs, especially Zerit (stavudine, d4T) and Videx (didanosine, ddl). These drugs are rarely used in the US today.

Symptoms of Lactic Acidosis

The symptoms of lactic acidosis include:

- Persistent nausea, vomiting, and abdominal (belly) pain
- Unexplained tiredness
- Shortness of breath
- Rapid breathing
- Enlarged or tender liver (area just under the right ribcage)
- Cold or blue hands and feet
- Abnormal heartbeat
- Weight loss

It is important to contact your health care provider right away if you experience these symptoms. Because lactic acidosis can be fatal (cause death), it is best to identify and treat it early.

Treatment

If your health care provider suspects that you have lactic acidosis, she or he will perform a physical exam to check for an enlarged liver and may order a CT scan or ultrasound of your liver. You will probably also have some blood tests done to measure your:

- Liver enzymes
- Electrolyte levels
- Blood pH (the level of acid in your blood)
- Lactic acid, or lactate level

For more information on these tests, see our fact sheet on [Understanding Lab Tests I: Complete Blood Count and Blood Chemistry](#).

There is no proven treatment for lactic acidosis other than stopping the NRTIs or treating the condition (e.g., severe anemia) causing it. In serious cases, hospitalization and supportive care, such as intravenous (IV) fluids and a machine to help you breathe, may also be needed.

Many people on HIV drugs have elevated lactate levels. These usually do not cause any problems.

Some health care providers recommend giving thiamine (vitamin B1), riboflavin (vitamin B2), L-carnitine, coenzyme Q, or vitamins C, E, and K to people with lactic acidosis. While some of these [vitamins and supplements](#) have shown encouraging results in small studies, they have not yet been proven to be effective.

It is important that you not stop taking any HIV drugs without talking with your health care provider. If you are diagnosed with lactic acidosis, your health care provider can help you decide how to stop your HIV drugs, when to restart, and which ones to take when you go back on treatment. If you have only slightly elevated lactic acid levels and no symptoms, you may not need to change your HIV treatment regimen.

Risk Factors

Certain factors put people at higher risk for lactic acidosis. These include:

- Taking Videx and/or Zerit (when used together, the risk is even higher)
- Being coinfecting with [hepatitis B](#) or [hepatitis C](#)
- Taking Glucophage (metformin), which is used to control diabetes
- Being obese
- Being female
- Being pregnant
- Being older (40+ years old)
- Having poor liver function
- Having a low [CD4 count](#)

Taking Care of Yourself

Because there is a connection between liver problems and lactic acidosis, it is important that your health care provider check your liver function while you are taking NRTIs, especially if you have a history of [heavy alcohol use](#) or a [liver problem](#).

Many people on HIV drugs have elevated lactate levels. These usually do not cause any problems. For that reason, regular lactate tests are not recommended. However, if you experience any of the symptoms of lactic acidosis described above, tell your health care provider immediately.

Although lactic acidosis can be life-threatening, it is also very rare. The point of learning about lactic

acidosis is not to scare you. Rather, it is to help you be aware of important signs in your body that may indicate a serious problem. In this way, you will be better able to recognize symptoms of lactic acidosis, tell your health care provider right away, and get treatment if necessary.

Additional Resources

Select the links below for additional material related to lactic acidosis.

- [Lactic Acidosis and Pancreatitis \(i-base\)](#)
- [Less Common Side Effects: Lactic Acidosis \(CATIE\)](#)
- [Lactic Acid Test \(University of Michigan Health\)](#)
- [Mitochondrial Toxicity and Lactic Acidosis Fact Sheet \(Project Inform, via TheB...](#)
- [Lactic Acidosis \(MedlinePlus\)](#)
- [Lactic Acidosis \(Cleveland Clinic\)](#)
- [Lactic Acidosis \(International Association of Providers of AIDS Care\)](#)



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