

# Lactic acidosis

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Lactic acidosis is a serious side-effect of the nucleoside reverse transcriptase inhibitor (NRTI) class of anti-HIV drugs. This class includes AZT (zidovudine, *Retrovir*), 3TC (lamivudine, *Epivir*), d4T (stavudine, *Zerit*), ddI (didanosine, *Videx*), abacavir (*Ziagen*) and FTC (emtricitabine, *Emtriva*).

The drugs most linked with lactic acidosis are d4T and ddI. However, neither of these drugs is now used if other treatment options are available, mainly because of the side-effects they can cause.

Lactic acidosis is very rare. Nevertheless, it is an important subject to understand because people who develop the condition can become dangerously ill.

The term lactic acidosis is used to describe high levels of a substance called lactate in the blood. Lactate is a by-product of the processing of sugar within the body.

## Causes

Lactic acidosis is one of several conditions which are believed to be caused by damage to mitochondria.

Mitochondria are found in all human cells and are involved in the production of energy. Other possible side-effects of NRTIs which may also be associated with damage to mitochondria include peripheral neuropathy (numbness or pain in the feet and hands); bone marrow suppression; pancreatitis (inflammation of the pancreas); hepatic steatosis (accumulation of fat in the liver); and myopathy (muscle damage).

As well as attacking HIV, NRTIs disrupt an enzyme (polymerase gamma) which mitochondria need to reproduce. This reduces the number of functioning mitochondria. Long-term usage of NRTIs therefore increases some people's risk of developing lactic acidosis. Obesity is another risk factor. In addition, women may be at greater risk than men, and there is some evidence of a link with severe infection and malnutrition.

Lactic acidosis may occur at any time during HIV treatment, but it tends to develop after several months of treatment. It is rare – fewer than one person in a hundred develops it.

## Signs and symptoms

Initial signs and symptoms of lactic acidosis include general stomach symptoms such as nausea (feeling sick), vomiting, bloating, abdominal pain and lack of appetite, as well as malaise (feeling generally unwell), and difficulty in breathing. Of course, these symptoms can also occur for many other reasons. In people who have lactic acidosis, the liver may be swollen and tender (hepatomegaly), and liver enzymes, which are measured by a [liver function test](#), may be abnormally high. Other signs which may be detected on laboratory tests include low bicarbonate, raised lactate, and deteriorating kidney function.

## Monitoring

You will be monitored at your HIV clinic to see if you have a risk of lactic acidosis. A number of tests are used, such as measuring lactate, the ratio of lactate to pyruvate, monitoring serum bicarbonate, anion gap, and measuring liver function.

## Potential treatments

If you have other treatment options available to you, the best treatment for raised lactate levels might be to switch from the drugs causing the problem (drugs in the nucleoside reverse transcriptase inhibitor [NRTI] class).