

# Diabetes and HIV

Diabetes mellitus is a disease where the body cannot process sugars (**glucose**) well and the sugar levels get very high in the blood. This is due to problems with a hormone called **insulin**, which pushes sugar from the blood into cells to be used for energy or stored for future use. Insulin is produced by the pancreas. When someone has diabetes, the problem can be a low insulin level (**Type 1 or Insulin Deficient**) or high insulin levels but the cells do not respond (**Type II or Insulin Resistant**). Uncontrolled sugars can cause problems with the nerves, eyes, heart, blood supply to arms or legs, and feet. It can also cause the blood to have a build-up of acid and lead to coma. There are many ways that HIV can interact with diabetes.

## HIV medications

The protease inhibitors (PIs) can worsen diabetes by either causing the cells that produce insulin to die off (**apoptosis**) or the cells to become more insulin resistant, therefore increasing the blood glucose or sugar levels. PIs can also cause the levels of fats (**triglycerides**) to go up in the blood which can cause the pancreas to become inflamed (**pancreatitis**); stavudine (Zerit or d4T) and efavirenz (Sustiva / Atripla or EFV) can also cause the levels of the fats to go up. If the pancreas is damaged from the pancreatitis, the pancreas may not be able to produce enough insulin anymore. Didanosine (Videx or ddi) and pentamidine can also cause pancreatitis but in another way.

## Hepatitis C

About 1 out of every 3 people with HIV also have chronic hepatitis C, an infection of the liver. People with chronic hepatitis C have a higher chance of having diabetes also.

## Acidosis

The class of HIV medicines called nucleoside reverse transcriptase inhibitors (nRTIs) have been shown to sometimes cause a build-up of acid in the blood. Unfortunately a medicine often used to treat diabetes called metformin (Glucophage) can also cause this same build-up of acid called **lactic acidosis**. Because of this, metformin must be used carefully in someone on HIV therapy. Diabetes itself can cause a build-up of acid called **diabetic ketoacidosis** when the sugar levels get too high.

## Complications of diabetes similar to HIV complications

Diabetes can cause a person to have bleeds in the retinas (the lining at the back of the eyes that sees light) and can even lead to detachment of the retina, causing blindness. Sometimes when a patient with HIV gets a very low CD4 count (less than 50), they can get an infection of the retina called CMV that causes similar problems.

Diabetes can also cause damage to the kidneys, the organs that produce urine. Protein is lost in the urine when this happens. HIV causes a similar problem also so a diabetic with HIV is more likely to develop kidney failure and need dialysis.

Diabetes can also cause numbness or tingling of the feet or hands called **peripheral neuropathy**. HIV itself can also cause this same problem and two medicines used to treat HIV can cause this (didanosine and stavudine). This can be very painful for the person with this condition.

**If you have further questions, be sure to talk to your primary care provider or your health educator or nurse.**



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