I am concerned about the way HIV becomes resistant to drugs. How long can an individual expect to be treated before resistance develops?

We have written about HIV before, but your question throws light on a very important area of concern. HIV is one of those viruses that constantly varies and, consequently, shows multiple genetic expressions of itself. This process, called mutation, allows for changes in sensitivity to the agents used in its control.

Up to now two main groups of agents have been used against the virus. These agents were developed to act at key spots in the process of virus multiplication. HIV does many things in its entrance to the special lymphocytes, called CD4 cells, that it targets. First, it binds to the CD4 cell. Then it enters the cell. Then its RNA (ribonucleic acid) is “written” into the DNA (deoxyribonucleic acid) by an enzyme called “reverse transcriptase.” Once the DNA mirror of the RNA has been written, it has to be “integrated” into the nucleus. The altered nucleus now begins to produce messenger RNA, which goes to a subunit in the cell, which makes a stream of new HIV in a long strand. The strand is cut into individual virus particles by an enzyme called “protease.”

The reason we give you this complex trail is so you can appreciate how tailor-made the medicines are.

The two current groups of anti-HIV medications have been agents that block either the reverse transcription or the protease enzymes. The medications are used at least three at a time. This is so they can, hopefully, combat a given strain of HIV even should it develop resistance to one of the medications. Of course, the medications have to be taken faithfully, at the times and in the combinations ordered. To fail to do this results in the virus escaping from control and developing resistance. Persons who take medicine as directed have been seeing great success in their treatment, and many are living more than 20 years without developing AIDS.
Why don’t they treat a person with HIV with the medications as soon as they are diagnosed?

A person may successfully withstand HIV for many years, using their natural immunity. Because HIV is so readily able to develop resistance, holding medication until the person really needs it means that several years go by without the virus having a chance to develop resistance. When the antivirals are started, they are given in combinations, and actually are so effective they sometimes lower the viral load to scarcely detectable levels.

Is there any new hope for people who are on antiviral treatment and starting to have problems with viral resistance?

Actually, although two main groups of antiretrovirals exist (the reverse transcriptase inhibitors and the protease inhibitors), two classes of medications make up each group. Resistance is usually not to the whole group, but to individual medications.

Then, too, research is ongoing. An article in The Journal of the American Medical Association (April 11, 2007, vol. 297, No. 14, pp. 1535, 1536) by Joan Stephenson, reports on new HIV drugs currently being tested. These medications differ from the drugs in the other two groups and classes, and actually represent breakthroughs. They are being tested in large studies, and represent two new strategies. The one medication aims at blocking an enzyme called “integrase,” which plugs the viral DNA into the cell’s DNA. By doing this, the DNA made from viral RNA does not get incorporated into the cell nucleus.

The second group of drugs is called “entry inhibitors.” They act like “locks” on the cell “doors” through which the virus enters the lymphocytes. By doing this, the drug acts to reduce the number of infected cells. So far, the results are very encouraging, though—once again—these medications do not stop the process completely, and are not by any means a cure. The more sites at which the virus can be attacked, the less powerful its assault—but so far the battle promises to be a lifelong process.

Allan R. Handysides, M.B., Ch.B., F.R.C.P. (C) is director of the General Conference Health Ministries Department; Peter N. Landless, M.B., B.Ch., M.Med., F.C.P.(SA), F.A.C.C., is ICPA executive director and associate director of Health Ministries.

While this column is provided as a service to our readers, Drs. Landless and Handysides unfortunately cannot enter into personal and private communication with our readers. We recommend that you consult with your personal physician on all matters of your health.