



close up

Life expectancy with HIV

by Dr. Robert Hogg

“For a long time it had seemed to me that life was about to begin — real life. But there was always some obstacle in the way, something to be gotten through first, some unfinished business, time still to be served, or a debt to be paid. Then life would begin. At last it dawned on me that these obstacles were my life.” — Father Alfred D. Souza

There were a few months back in 1996 when it seemed as though HIV could be cured. Triple combination antiretroviral therapy had just become the standard of care, and a highly publicized mathematical model suggested that three years of therapy could rid the virus from an HIV-infected person. It was really just a matter of time before someone was cured — but the time never came. A few years later, a new mathematical model, published by the same group of researchers, stated that it would actually take over 60 years to rid the virus from the body using the therapies we now have available. No one has yet been cured, and we’re realizing, like Father Alfred D. Souza, that HIV is here to stay.

How long?

So how long does someone with HIV actually live? That was the question recently asked of Dr. Peiperl, the Editor-in-chief of HIV InSite website, by a gay man whose partner was just diagnosed with HIV (see <http://hivinsite.ucsf.edu/insite?page=ask-06-02-07>). Ultimately, our answer is quite similar to Dr. Peiperl’s: we don’t know. But we do know that life expectancy is significantly better now than before therapy.

The best information on the impact of HIV on life expectancy comes from natural history studies of men and women with known dates of HIV infection or seroconversion. These studies, which followed men and women from infection to death, suggested that prior to the general availability of antiretroviral therapy, a person infected with HIV could expect to live a median of 12 years between diagnosis and death. (Median means that half of these people would die before 12 years and the other half

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after that time.) Most people would be dead after 20 years from HIV infection.

The natural history of HIV changed considerably with the availability of effective therapy. People began to live much longer than before. At first, mono antiretroviral therapy, with AZT, ddI, or ddC, had limited effect on survival and two-drug therapy only became more effective with the use of more potent agents like 3TC and ddI. Data published around this time indicated that people with HIV taking two nucleosides would live approximately twice as long as those taking only one nucleoside.

Highly active antiretroviral therapy (HAART), or the use of three or more drugs together, had a greater impact on life expectancy. When these treatments first became available in the mid-1990s, rates of death in British Columbia declined three-fold. Similar decreases were observed around the globe for people receiving these effective treatments.

However, the rates of death from HIV disease could vary considerably as they are affected by a number of factors including age, CD4 cell count and viral load at the time of HIV diagnosis. Life expectancy with HIV can also be affected by socioeconomic status (rich versus poor, in stable housing versus homeless, etc.) and the presence or absence of other medical conditions such as hepatitis B or C, heart disease and diabetes.

While some of these factors can't be changed, other factors are under your control and can be modified. Being under the care of a physician who is experienced at treating HIV has been shown to prolong life expectancy. Taking your HIV medications correctly (in the right doses at the right times) and not missing any doses has clearly been shown in a large number of studies to significantly improve your chances of living longer. Current use of injection drugs has been shown to curtail lifespan in people with HIV. Finally, we know that smoking and abusing drugs and alcohol aren't good for anyone's health, whether HIV positive or not. These may be particularly hard on your system if you're already dealing with the effects of HIV disease.

Current prospects

Life with HIV can be long, but not as long as for people without this virus. The best estimate, based on available data and current demographic models, is that a person aged 20 years could expect to live approximately another 30 years from the date that person first starts antiretroviral therapy. However, this is more an educated guess, extrapolating current estimates into the future, than certainty because no one with HIV has lived that long yet on therapy.

Estimates of life expectancy for a 20-year-old first starting antiretroviral therapy increased from about 12 years during the time of mono- and dual therapy to 30 years during the era of HAART. Life expectancy for a 20-year-old without HIV is 57 years for men and 62 years for women in Canada — approximately double that of a person living with HIV and first starting HAART. However, people who access HAART early (e.g. above a CD4 cell count of 200 cells/ μ L), are adherent to their medications, and don't have a history of injection drug use are likely to live longer. There's no difference by gender in life expectancy for those first starting HAART.

Future prospects

It's likely that in the future, people with HIV will live even longer as therapies improve and we're able to better manage the infection. This is not a certainty, and modelling efforts can come up with the wrong answers if they're based on the wrong assumptions. We must also realize that we're dealing with generalized estimates for a group of people, and a huge variety of factors can influence the outcome for any one individual. Maybe it's just best to say as Mahatma Gandhi said*, "Live as if your were to die tomorrow. Learn as if you were to live forever."

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Notes

*The quotes from Mahatma Gandhi come from a website called "inspirational quotes on life" (http://www.indianchild.com/quotations_on_life.htm). Accessed August 23, 2006.

Canadian life expectancy data were obtained from the WHO country-specific website and life expectancy data for HIV-positive persons are based on unpublished data from the **BC Centre for Excellence in HIV/AIDS**.

Studying survival in the HAART era

A few major research collaborations in the developed world are tracking survival and factors that influence survival in people with HIV who have access to HAART. The Concerted Action on Seroconversion to AIDS and Death in Europe (CASCADE) project pools data from many European research projects. The Antiretroviral Therapy Cohort Collaboration is a collaboration of studies from Europe and North America set up to monitor HIV positive people who are first starting on HAART. In 2006, the group published findings based on studies involving 22,217 people who started HAART between 1995 and 2003.

The characteristics of the population changed a lot over that time, with the proportion of women who acquired HIV through heterosexual contact doubling, and the proportion of men infected through sex with men, and of people infected through intravenous drug use, decreasing. Other changes appeared in which drugs were used in initial therapy: whereas 95% of people were started on a protease inhibitor (PI)-based regimen in 1995, this dropped to 45% by 2003, as more people were started on non-nucleoside reverse transcriptase inhibitor (NNRTI)-based regimens. Researchers are trying to figure out how different factors affect outcomes and survival.

Here are some of the trends noticed in these two collaborations:

- The improvement in virologic response with HAART was greatest in men infected through sex with men. People infected through heterosexual contact saw less improvement. People with a history of injection drug use saw initial improvements followed by worsening virologic response in later years.
 - People starting therapy with a CD4 count less than 200 cells per μL are at higher risk of disease progression and death in the long term than those starting therapy with higher CD4 cell counts.
 - Before the introduction of HAART, the major determinants of HIV disease progression and death in developed countries were age at seroconversion and duration of infection. Median survival after seroconversion was 12.5 years for people aged 15-24 versus only 7.9 years for people aged 45-54; 60% of people infected were expected to be alive 10 years after seroconversion. Age at seroconversion seems to have become a less important factor for progression to AIDS since the introduction of HAART. Whereas pre-1997, the risk of AIDS was higher in people aged 45 years or older at seroconversion than in people aged 16-24, in 1999-2001 there was little evidence of a difference in risk by age.
 - In the 1999-2001 period, among people aged 16-24 at seroconversion, 96% of men who have sex with men and 83% of injection drug users were expected to survive 10 years or more.
 - Injection drug users now seem to have a much shorter survival time after HIV seroconversion compared with men who have sex with men. Liver disease related to hepatitis C infection is likely partly responsible. This group may also have less access to HAART and lower adherence. **R**