HIV and Aging

Today, more than half of all people living with HIV in the United States are 50 years or older. This is mostly because people are living much longer with HIV thanks to effective antiretroviral (ARV) therapy, and that’s good news.

The bad news is research increasingly shows that diseases that typically strike HIV-negative people in their 60s and 70s are occurring in people with HIV in their 40s and 50s. These concerns have brought the issue of aging with HIV to center stage. One of the biggest unanswered questions is why this is occurring. Whether it’s heart attacks, bone fractures, kidney disease or certain cancers, the rates of these conditions in HIV-positive people are alarming. It’s unclear how much HIV contributes to these conditions and how much is explainable by other factors (such as smoking, HIV drugs and coinfection with other viruses).

But most HIV-positive people can do quite a lot to slow the aging process and guard against the onset of age-related illness. Before first, it’s important to understand how aging works.

What is aging?
When we think of someone as “old,” we tend to think of that person as having lived a certain number of years: 70, 80, 100. For the National Institute on Aging, however, the focus is not on how long someone has been alive, but on the inevitable decline in physical ability and health that occurs once a person reaches later life.

At one time, researchers looked for a central cause of aging, but they’ve since realized that a variety of factors—including our genes, our environment and infections with harmful viruses and bacteria—contribute to the phenomenon of aging in overlapping ways.

Some people win the genetic lottery. They inherit genes that allow them to remain healthy and vital well into their 80s and 90s, whereas others have genes that place them at higher risk for...
developing cancer or cardiovascular disease by the time they reach their 40s.

Some people are able to minimize environmental and behavioral factors known to hasten the aging process. They eat well, exercise and remain socially and intellectually engaged in life. The effects of such environmental and behavioral factors on a person’s health are profound.

Likewise, some people are able to avoid infection with the most harmful viruses and bacteria throughout their lives, or they have immune systems capable of keeping infections in check. Others may have to contend with harmful infections, such as hepatitis B virus (HBV), hepatitis C virus (HCV), human papillomavirus (HPV), cytomegalovirus (CMV)—and HIV—all of which can significantly increase the risk of health problems later in life.

These factors—genetic, environmental and biological—can overlap and cause us to begin the aging process, called “senescence,” which goes all the way down to the cellular level.

The cells in our bodies depend on a short snips of DNA, called telomeres, to reproduce. When we are young, the cells in our body also tend to be young, in that they look and act similarly to the first generation of cells we start out with when we were first developing in the womb. As we get older, however, the cells in our body are many hundreds or thousands of generations removed from the original cells, and the strands of code on the end of the DNA—the telomeres—get shorter. If the telomeres are in good shape, as they are in young people, each new generation of cells functions well. When the telomeres get too short, however, each new generation of cell functions and reproduces more poorly, to the point where the cells sometimes can’t reproduce at all.

Defective cells can lead to real problems. If our muscle and bone cells can’t make new cells that function well—because the telomeres have become too short—this makes it more likely that our muscles and bones will be weak. Weak muscles and bones mean a greater risk of falling and a greater risk that we’ll break a major bone. Defective brain cells can lead to coordination and memory problems. Defective immune cells aren’t as able to keep infections and cancers at bay.

It is this last category of senescence, called immunosenescence, which has particular relevance for people with HIV.

How does HIV affect the aging process?
Educators often explain what happens in the bodies of people with HIV as a battle: a war between the virus and immune cells. HIV isn’t unique in this regard, however. The immune system is constantly “at war” with a host of harmful organisms—viruses and bacteria that get into our bodies—and also with our own cells that become defective and start reproducing too quickly—what we call cancer.

Where HIV differs from many other diseases is that in 99 percent of HIV-positive people, the immune system doesn’t control the virus very well. This constant state of battle, where the virus reproduces and the body fights against it, keeps the immune system chronically in high alert, a syndrome called inflammation.
Inflammation isn’t inherently bad—we need it to fight off infections like the flu, to repair damage to body tissues and to ward off the growth of certain cancers—but unchecked inflammation can wreak utter havoc on the body: causing the buildup of heart attack- and stroke-causing plaques in our arteries, feeding the growth of some types of cancer, and burning out our immune systems.

We’ve known since the early years of the epidemic that the immune systems of people with HIV were chronically inflamed, but before the introduction of potent combination antiretroviral (ARV) therapy in the late 1990s, most people with HIV died too young and too quickly for the long-term consequences of this inflammation to be known. Once potent ARVs became available, and people began living much longer, scientists were finally able to study the long-term effects of inflammation in people living with HIV.

In the past decade, numerous studies have yielded some important findings. We know that inflammation is greatly reduced in people who are able to get and keep their viral loads undetectable using ARVs. This is one of the reasons that the Department of Health and Human Services (DHHS) treatment guidelines recommend that people start HIV treatment earlier. Unfortunately, we’ve also learned that an undetectable viral load doesn’t mean that inflammation is blocked completely—it can still be detected, and potentially cause problems, in people who are otherwise responding well to ARVs.

While researchers are concerned with how inflammation directly affects major organs such as the heart, liver and kidneys, they’re also interested in how chronic inflammation affects the immune system itself. The longer a person’s immune system continues to battle HIV—even if ARV therapy is being used—the more likely that person is to experience immunosenescence, also sometimes called “immune exhaustion.” This condition means that immune cells can’t react appropriately when confronted with a new challenge. They also don’t reproduce easily or efficiently. In fact, when scientists look at the immune cells of people with HIV, they find that those cells often have the same degree of immune exhaustion as HIV-negative people who are many decades older.

Are people with HIV aging more rapidly?
As mentioned above, any number of factors can make people more likely to have age-related diseases and conditions at higher rates and younger ages. People with HIV are more likely to have some of these risk factors than HIV-negative people thus leading them to have poorer health as they get older. Researchers have also wondered how or whether HIV—all by itself—is a risk factor for age-related diseases and conditions.

There is no dispute that many of the diseases associated with aging occur at much higher rates in people with HIV and at much younger ages than in people not living with the virus. Here are just a few of those conditions:

- **Weakened bones**
- **Loss of muscle mass and redistribution of fat**
- **Cardiovascular disease**
Liver disease

Kidney disease

Some experts believe that a number of factors besides HIV can significantly contribute to these problems. Consider the following:

- People with HIV take ARVs, some of which can contribute to bone loss, kidney damage, fat redistribution and elevated cholesterol and triglycerides.
- People with HIV are far more likely than the general population to be coinfected with either hep B or hep C—or sometimes all three—and these increase the risk of liver cancer, liver failure, kidney disease and diabetes.
- People with HIV are many times more likely to be chronically infected with human papillomavirus (HPV), which causes cervical and anal cancer as well as cancers of the head, neck and throat.
- People with HIV are up to three times as likely to smoke tobacco, which is one of the leading causes of heart attacks, strokes, lung cancer and emphysema.
- People with HIV have rates of mental illness and substance abuse that are many times higher than in people who don’t have HIV, and these illnesses increase the risk of numerous other diseases.
- HIV can directly infect key tissues in the bone, brain, circulatory system and elsewhere, and it can cause inflammation-related damage to the heart, nervous system, liver and kidneys.

These factors likely play major roles in the increased rates of aging-related diseases and conditions seen in people with HIV. What experts haven’t yet agreed upon is how much HIV infection itself might exacerbate underlying risk factors—via inflammation and immunosenescence—known to contribute to aging-related problems.

Researchers are working to try to understand how quickly inflammation and immunosenescence occur in people with HIV after they become infected. There is evidence that it begins to happen very soon after a person contracts HIV, but that good control of the virus (either because a person naturally controls HIV well or because he or she takes ARV therapy) may slow this process down somewhat.
Experts haven’t yet agreed on the best way to measure inflammation and immunosenescence, and we don’t yet know how much they independently contribute to the aging-related diseases either in HIV-negative people or in people with HIV. Research is ongoing, however, to try and answer these questions. In the meantime, there is much that the average person living with HIV can do to reduce the risk of many age-related diseases and conditions.

Is it possible to slow down the aging process?
We’re a long way from discovering a fountain of youth, but a number of factors are consistently associated with reducing the risk for developing age-related diseases and conditions.

Don’t smoke tobacco. Smoking tobacco is one of the most harmful things that people can do to their bodies—and to their chances of living a long and healthy life. Most people know it can cause lung cancer and other lung diseases. Some even know that it can increase the risk for heart attacks and strokes. But it is also associated with numerous other age-related ailments—including bone mineral loss, muscle wasting, problems with memory and concentration—and age-related cancers, such as anal, breast, cervical and prostate cancer. Click here for some tips on quitting smoking.

Minimize alcohol and drug use. Consistent data suggest that moderate alcohol consumption might actually protect the heart and lower blood pressure. However, the American Heart Association recommends that men who drink alcohol should consume no more than two drinks per day and that women should consume no more than one. Studies have found that people who regularly drink more than that are at increased risk of strokes, diabetes, obesity and serious accidents. People with HIV who have liver problems have to take particular care with alcohol.

Data are less clear about how various recreational drugs affect the aging process, though chronic amphetamine (“crystal”) and cocaine use have been implicated in thinking and memory problems, bone mineral loss and heart disease. In addition, excessive use of most drugs is associated with shorter life spans, increased risk of depression and suicide, and other serious health consequences.

Exercise. On average, people who exercise regularly are far healthier in numerous respects than people who don’t exercise. Exercise is good for just about every part of the body. Benefits of regular exercise include reductions in the risk of:

- Cardiovascular disease, diabetes and metabolic syndrome
- Age-related cognitive decline
- Bone-mineral and muscle loss

Exercise also reduces inflammation throughout the body, improves symptoms of depression and anxiety, and hastens recovery when illness strikes. Not everyone is equally able to exercise, and a doctor should sign off on any exercise plan, but there are a number of ways to get moving. Click
Eat well. Aside from exercise, diet also helps determine who will live a long and healthy life. Experts are divided on the ideal diet. Some argue against the consumption of almost any fat. Others say that fats (at least healthy fats from nuts and fish) aren’t the problem, but that sugar is. Some argue for a vegetarian way of life, while others say meats are just fine. Fad diets that come and go just confuse matters further. All of this can make it quite difficult to decide on the best diet.

What most reputable diets have in common is watching caloric intake, along with an emphasis on including lots of fruits, vegetables, whole grains and beans, and then enjoying everything else in moderation. Most also stress the importance of eating the healthiest types of fish and limiting meat consumption to the leanest meats, such as from chicken and turkey, whenever possible. When it comes to fats, there is growing consensus that “healthy” fats—for example, from olive oil, nuts and avocados—are actually good for you.

What the most reputable diets also agree on is that too much sugar and too many processed and fried foods are a primary driver of diabetes, cardiovascular disease and a host of health problems in the United States. Switching from an unhealthy to a healthy way of eating is hard for many people—that’s why diets so often fail. For more on nutrition and HIV, click here.

Treat HIV. Current HIV treatment guidelines recommend starting ARV therapy at least as soon as your CD4 count drops below 500. The primary rationale for this advice comes from data showing that untreated HIV, and the resulting high level of inflammation, can greatly increase the risk for cardiovascular disease, liver disease and other conditions. Some experts now recommend treating at even higher CD4 counts for the same reason, especially in those with a high underlying risk for cardiovascular disease, liver disease or other health problems.

Not everyone has the same underlying risks for the kinds of diseases that the panel was most concerned with, however. For instance, people with no family history of heart disease, who have never smoked and who don’t have hepatitis C or B have a low baseline risk for becoming ill with cardiovascular, liver or kidney disease. For such a person, the decision about when to start treatment might be different from that of a person who does have a family history of heart disease, or who smokes or has HCV. In that regard, the guidelines offer some flexibility.

What is clear, however, is that the longer people wait after their CD4s drop below 500, the greater their risk for developing age-related illnesses will likely be. In fact, one of the most potent predictors of a higher risk for the majority of age-related diseases is a CD4 count under 200.

Treat other infections. Current HBV and HIV guidelines recommend that people with both infections should begin HIV therapy (with a backbone of treatments that also fight HBV) as soon as possible. This is because treating HBV early significantly reduces the risk of liver cancer and other liver problems, without significantly increasing the risk of side effects from the medication.

There are a number of highly effective treatments currently approved by the U.S. Food and Drug
Administration (FDA) to treat hepatitis C. Many others are being studied in clinical trials or are awaiting FDA approval. For details on these medications, click here. To check out the AASLD-recommended regimens for those who are coinfected with HIV, click here. (The treatment recommendations are based on your hep C genotype and how well your liver is functioning. If you don’t know your virus genotype or how well your liver is functioning, these are good things to discuss with your doctor.)

Follow disease prevention and screening guidelines Researchers have begun to question whether certain age-related screening guidelines might need to start at a younger age in people with HIV. For instance, some have questioned whether the most popular screening tool to assess heart attack risk, based on data from the long-running Framingham study, should be modified for people with HIV.

Experts also question whether others tools, such as the FRAX score for assessing bone mineral loss, might need to be adjusted for HIV-positive people. In fact, some now recommend that HIV infection alone counts enough as a risk factor that bone screening ought to begin at a younger age, particularly for HIV-positive men, than is typically recommended.

Studies are being conducted to help identify whether current disease screening guidelines for people older than 50 are sufficient for people with HIV. While we wait for the results of those studies, however, it is important to ask your doctor what types of disease prevention and screening guidelines are in place for a person of your age and medical background and to insist on following those guidelines in your own care. The U.S. Preventive Services Task Force produces disease screening and management guidelines may be found here.

Stay socially and mentally connected. Numerous studies have found that people who maintain social connections with their family, friends and colleagues and who engage in activities that they feel add meaning to their lives not only live longer, but also remain healthier than people who are socially isolated and who do not engage in meaningful activities. There are a variety of ways to get connected socially if you aren’t close to family and don’t have many friends. Many local AIDS service organizations (ASOs) have support groups for people with HIV to connect with one another.

Volunteering with a charity that works on causes you believe in, or with a political campaign, can also help you connect socially. Finding local groups of people to exercise with would accomplish two goals: social connection and fitness.

If you are unable to get out of your house easily, or if you live in a rural area without many opportunities meet like-minded folks, it is possible to connect with others online in forums. Check the POZ Forums for topics that interest you, and begin connecting with others today.

If you’re looking for a more personal connection such as a friend, date or significant other, you might consider joining an online dating site like POZ Personals.
Are there experimental treatments to slow aging in people with HIV?
Many research teams are looking at ways to slow the aging process, both in HIV-positive and HIV-negative individuals. So far there are no proven methods for actually reversing aging. Here’s a sample of some of the more promising examples of research to slow aging, and a few examples of those that are more risky and require caution.

Reducing inflammation. As already explained, a chronically over-active immune system is harmful in many ways. Not only can it directly damage our blood vessels and vital organs, but it can also hasten the turnover of our immune cells, leading to immunosenescence.

A variety of compounds—some currently available for other conditions, and others experimental—are being tried in people with HIV to calm the immune system. Available drugs under study include aspirin, HMG-CoA reductase inhibitors (commonly called “statins” and used to lower cholesterol), the entry inhibitor Selzentry (maraviroc) and drugs that are typically used to treat malaria. Experimental drugs include those that have been designed to treat arthritis and other inflammatory diseases.

Lengthening and repairing telomeres. If damaged or shortened telomeres lead to immune exhaustion, then we should be striving to repair or lengthen them, right? The best answer to that question is yes, but only if we can do it safely. There’s a good reason that we’ve evolved in such a way that our telomeres break down if a cell reproduces too much: cells that can’t stop replicating turn cancerous. Drugs that stimulate the enzyme telomerase, which helps maintain telomeres, could hypothetically increase the risk for certain types of cancers. There are some promising drugs in early animal studies, but a lot of research will be required before they are ready for humans.

Riskier alternatives. One of the most written-about methods for lengthening the life spans of animals and (hopefully) people is extreme calorie restriction. Studies have progressed from insects to small mammals, and thus far it does seem that a diet containing about half of the “ideal” amount of calories for an individual animal can significantly lengthen that animal’s life span and increase its health and vitality during those extra years of life. We’re a long way from being able to study this method in humans, however, and most researchers and health care providers would not recommend that people with HIV initiate a super-low calorie diet.

Another treatment common in “longevity” clinics around the United States is the use of hormones, such as testosterone, human growth hormone and anabolic steroids. While each of these has been approved to treat the loss of fat and muscle common in people with advanced HIV disease (wasting), none is approved to slow or reverse the aging process and all come with side effects that can actually increase some age-related conditions, such as cardiovascular disease, liver problems and diabetes.

Conclusion
Potent combination ARV therapy is not perfect—all of the available treatments can cause some side effects; the drugs must currently be taken with almost perfect regularity and for the rest of one’s life; and all can stop working. That said, many experts now agree that a person who starts
ARVs early has a great shot at living a nearly normal life span.

Though rates of age-related diseases are much higher in people with HIV, this doesn’t mean that everyone who is HIV positive will have multiple illnesses by the time they reach their 50s. In fact, the actual rates of some age-related diseases remain well under 10 percent in people with HIV. What isn’t yet clear is who will be most at risk of which diseases, how vigilant we need to be in screening for various diseases and whether treatment for any diseases will need to be different in people with HIV.

Researchers are actively working on these issues. In the meantime, the best available methods for preventing age-related physical and mental decline are the old standbys: dieting, exercising, maintaining social connections and abstaining from harmful behaviors.

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