HIV in Europe
Advances in Diagnosis and Treatment

HIV is a virus that attacks – and if left untreated, can destroy – the human immune system. When an HIV patient’s immune system is weakened to a point where the body is vulnerable to other infections, he or she is said to have Acquired Immune Deficiency Syndrome, or AIDS. HIV and AIDS have been present in Europe since at least the early 1980s, and according to UNAIDS, around 2.3 million people in the European region are now living with HIV, with an estimated 190,000 new infections each year.1 It is estimated that one in three HIV-positive individuals in Europe do not know they are infected.2 Worldwide, an estimated 34 million people are currently infected with HIV.3

Today’s Epidemic
• HIV/AIDS is a major public health issue in Europe, and in recent years rates of HIV transmission have been increasing in a number of countries and regions. Between 2004 and 2009 the rate of new HIV infections in Europe increased by almost 30 per cent, with the highest rates seen in Eastern Europe.4

• In Western and Central Europe, most new infections occur among men who have sex with men (MSM), while in Eastern Europe the primary mode of transmission is heterosexual contact.5 In Russia and Ukraine – which together account for nearly 90 per cent of new infections in Eastern Europe and Central Asia – the epidemic is concentrated among injecting drug users.6

• While infections continue to rise in all parts of the region, AIDS deaths have declined dramatically in Western Europe (by around 80 per cent) largely due to the availability of effective treatments.7 In the region’s low- and middle-income countries, however, fewer than one-fifth of the estimated 610,000 people in need of treatment are currently receiving drug therapy.8

Importance of HIV Testing
The HIV test is an important first step to getting people with HIV into care programmes in order to prevent disease progression and transmission of the virus. Studies show that a positive HIV test result is associated with a 60–80 per cent reduction in risk behaviour – people who know their status are much more likely to take the steps needed to reduce transmission to their partners.

The availability of rapid tests makes it easier for people to learn their HIV status – these tests can give a result in as little as one to three minutes. Nevertheless, across Europe between 15–38 per cent of HIV cases are diagnosed late, when treatment options may be less effective.9

United Kingdom HIV Facts
• An estimated 86,500 people in the UK are living with HIV, a quarter of whom are unaware of their infection. The majority of those affected are MSM and African-born women.

• The UK has the highest number of new annual HIV infections in Western Europe. In 2010, 6,658 people in the UK were newly diagnosed with HIV.

• Current guidelines from the British HIV Association recommend initiating antiretroviral treatment when a patient’s CD4 cell count (a measure of immune system health) falls below 350 cells per microliter. Based on these guidelines, 87 per cent of diagnosed UK HIV patients in need of treatment are currently receiving it.

• Due to earlier diagnosis and less toxic treatment options, a 35-year-old with HIV in the UK today can expect to live for more than 30 additional years.

• However, many people have not been diagnosed or are diagnosed late, when treatment may be less effective. In 2009, an estimated 52 per cent of adult patients were diagnosed late, when their CD4 counts had already fallen below 350 cells per microliter.

**Antiretroviral Treatment**

In the 1980s and 1990s, before effective treatments for HIV/AIDS existed, most patients died within 12 months of diagnosis. Today, potent anti-HIV drug combinations have helped to transform HIV infection into a long-term, chronic disease for many patients. However, the majority of people living with HIV are not currently on treatment. In the European region, more than 460,000 people are currently receiving antiretrovirals, representing only about 20 per cent of the HIV-infected population.

Some 25 antiretroviral drugs are currently approved in Europe for the treatment of HIV. These drugs are grouped into a number of classes based on how they block HIV from replicating in the body (see table). Today’s treatment regimens contain three or more medications selected from at least two different classes of antiretrovirals which aim to fully suppress HIV replication in the body and prevent the development of HIV drug resistance. HIV drug resistance can emerge because HIV replicates very rapidly, and if suboptimally treated can make billions of copies of itself in the body each day. Tiny genetic changes that occur during replication can lead the virus to mutate quickly and become resistant to the effects of HIV drugs.

<table>
<thead>
<tr>
<th>Drug Class</th>
<th>Year Introduced</th>
<th>How They Work</th>
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<tbody>
<tr>
<td>Nucleoside reverse transcriptase inhibitors (NRTIs)</td>
<td>1987</td>
<td>Block the action of HIV reverse transcriptase, a key enzyme necessary for viral replication and the initial infection of CD4 cells.</td>
</tr>
<tr>
<td>Protease inhibitors</td>
<td>1995</td>
<td>Target the HIV protease enzyme, which breaks HIV protein chains into smaller pieces to complete viral replication.</td>
</tr>
<tr>
<td>Non-nucleoside reverse transcriptase inhibitors (NNRTIs)</td>
<td>1996</td>
<td>Stop the action of HIV reverse transcriptase enzyme by slowing the rate of important chemical reactions involved in DNA synthesis. Similar to NRTIs.</td>
</tr>
<tr>
<td>Entry inhibitors</td>
<td>2003</td>
<td>Prevent the virus from entering and infecting healthy CD4 cells by blocking binding or fusion mechanisms.</td>
</tr>
<tr>
<td>Integrase inhibitors</td>
<td>2007</td>
<td>Block the integrase enzyme that HIV uses to integrate its genetic material with the DNA of human cells.</td>
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**Simplifying HIV Therapy**

For HIV therapy to be effective, patients should remain on combination therapy and adhere to the dosing schedule to keep viral replication suppressed. Clinical research has shown that patients must adhere to their regimens at least 95 per cent of the time for optimal outcomes. Adherence used to be a constant challenge, with early treatment regimens involving 20 or more pills dosed throughout the day. Early HIV medications were also associated with severe side effects, such as the body disfiguring metabolic syndrome called lipodystrophy, which could discourage adherence.

Today’s simpler, less toxic regimens have been shown to improve patient adherence. Over the past decade, a number of medications have been introduced that can be taken once a day, and newer drugs are generally easier to tolerate in terms of side effects. Additionally, medications from different classes have been combined into fixed-dose combination tablets, helping to reduce daily pill burden. In fact, today it is possible to take a complete treatment regimen in a single once-daily tablet. Simplified treatment options are more convenient for patients, and by helping patients adhere to their treatment regimen on a more consistent basis, they may help to improve treatment outcomes.
When to Start Treatment

An HIV-positive individual is diagnosed with AIDS when severe infections or cancers are present or the patient’s CD4 cell count drops below 200 cells per microliter of blood. By comparison, a healthy, HIV-negative person normally has 500–1,600 CD4 cells per microliter.

Europe’s leading medical authority on HIV/AIDS care, the European AIDS Clinical Society, now recommends that antiretroviral treatment be initiated when a patient’s CD4 cell count is 350 cells per microliter or less, and (as of new guidelines published in 2011) recommends that HIV therapy be considered for patients with CD4 counts of 350 – 500 cells per microliter. This shift toward earlier initiation of treatment is based on studies showing that starting HIV therapy at CD4 counts of 350 cells per microliter or above may improve survival rates for patients, lower the risk of disease progression, reduce treatment-related side effects and help to prevent the development of co-morbidities such as cardiovascular disease and cancer.

Treatment as Prevention

A growing body of evidence suggests that antiretroviral treatment may help individuals with HIV avoid transmitting the virus to others. By lowering viral load (the amount of HIV in the blood), HIV therapy can make patients less infectious. In May 2011, a large, randomised clinical trial showed that early initiation of antiretroviral therapy by HIV-infected individuals reduced their risk of sexually transmitting HIV to an uninfected partner by 96 per cent. This and similar findings from other clinical studies suggest that expanding testing and treatment programmes could reduce the incidence of new HIV infections.

New research also suggests that antiretroviral medications may have a role in helping to prevent HIV-negative individuals from becoming infected. This investigational strategy, called pre-exposure prophylaxis (PrEP), involves uninfected individuals taking HIV medications on a daily basis and has demonstrated efficacy in a number of large-scale clinical trials. However, public health authorities have not yet approved the use of antiretroviral drugs for risk reduction among uninfected individuals.

A Cure?

Scientists are also renewing efforts to find a cure for HIV infection. The search for a cure was boosted when doctors in Berlin reported in 2008 that they had eliminated HIV from an American patient’s CD4 cells. The patient underwent a stem cell transplant to treat leukaemia, receiving stem cells from a donor who had a rare genetic resistance to HIV infection. Today, the patient still has no detectable HIV infection and is considered to be cured of AIDS.

While stem cell transplants are too costly and risky to be conducted on a large scale, the Berlin case reinvigorated global interest in HIV cure research. Current scientific efforts focus on finding ways to clear the virus from “reservoirs” in the body where current drugs cannot reach, or on modifying patients’ immune systems so that HIV cannot replicate in their bodies. While much more research is needed, many scientists are optimistic that a cure for HIV/AIDS will eventually be found.
References

4. European Centre for Disease Prevention and Control (ECDC) and WHO. *HIV/AIDS Surveillance in Europe 2009*.
5. ECDC and WHO. *HIV/AIDS Surveillance in Europe 2009*.

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