



# Highly resistant HIV: If not a super strain, at least a wake-up call

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**R**ECENTLY, the New York City Department of Health and Mental Hygiene reported detecting a rapidly progressive, highly resistant strain of human immunodeficiency virus (HIV).<sup>1</sup>

The virus, dubbed “three-drug-class resistant” (3-DCR) because it is resistant to three of the four classes of antiretroviral drugs currently available to treat HIV, was isolated in a man thought to have been infected in October 2004. Since then, he has progressed to develop acquired immune deficiency syndrome (AIDS), a process that typically takes 8 to 10 years. He has admitted to unsafe sexual practices with numerous partners while using crystal methamphetamine.

This report has alarmed both physicians and the public. Many have suggested that this virus may represent a new “super strain” of HIV.

## ■ MUCH TO BE LEARNED

In fact, much must yet be learned about this virus and its implications.

### Is highly resistant HIV inevitable?

As more individuals are treated with antiretroviral drugs, viral resistance to these medications has emerged. Individuals with resistant virus can then transmit this virus to oth-

ers. In fact, this has become more common in recent years. In some studies, up to 12% of transmitted HIV may show resistance to at least one class of medications, limiting the treatment options for the newly infected.<sup>2</sup> For this reason, transmission of a highly resistant virus, as has presumably occurred in this case, was likely inevitable.

### Why is it so virulent?

More surprising is the evidence of rapid progression to severe immunosuppression. A virus that is resistant to antiretroviral medications is not necessarily more virulent; in fact, many resistance mutations impair the replication capacity of the virus, leaving it “less fit” or less able to reproduce efficiently.

Importantly, however, the rate of progression to AIDS depends on both viral and host factors. Disease may progress at very different rates in two different people infected with the identical virus because host immune factors, partially determined by inherited human leukocyte antigen (HLA) types, affect the ability of the immune system to control viral replication.

In the case of the New York man with progressive resistant HIV infection, additional studies on the virus will help explain the patient’s clinical course but have not yet been completed.

### How common is it?

The prevalence of the 3-DCR virus is also unknown at this time; however, contact trac-

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ing and testing are under way. Ultimately, this may prove to be an isolated case—or it may be only the tip of the iceberg, with significant public health implications. Nevertheless, it remains too early to sound the alarm about a new “super strain” of HIV.

### ■ BETTER HIV PREVENTION NEEDED

What is clear from this report is the continued need to emphasize prevention of infection. Recent trends indicate that our current public education efforts are not adequate and may not reach the populations at greatest risk. For example:

- Rates of infection with syphilis and other sexually transmitted diseases—a marker of unsafe sexual practices—have soared nationwide.
- HIV infection rates continue to rise dramatically in minority populations.
- HIV has become more common in non-traditional risk groups.
- Heterosexual sexual activity has now surpassed intravenous drug use as a risk factor for acquiring a new HIV infection in the United States.<sup>3</sup>
- The use of crystal methamphetamine has reached epidemic levels in some areas. Use of this drug is known to be associated with an increased

### ■ REFERENCES

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2. **Little SJ, Holte S, Routy JP, et al.** Antiretroviral-drug resistance among patients recently infected with HIV. *N Engl J Med* 2002; 347:385–394.
3. **Centers for Disease Control and Prevention.** HIV/AIDS Surveillance Report, 2003 (Vol. 15). Atlanta: US

number of sexual encounters and an increased likelihood of having unprotected sex and, therefore, an increased risk of contracting HIV.


- Some groups harbor a widespread notion that HIV infection is now easily treatable and that safer sexual practices are therefore unnecessary, which must be debunked with effective educational programs.

### ■ A REMINDER AND WAKE-UP CALL

Although we have made amazing strides in the treatment of HIV infection, the risk is real that a strain will develop that currently available therapies cannot treat.

This report should remind all health care providers to redouble their efforts at prevention education and to support efforts to study optimal interventions in order to reach the broadest audience. Studies suggest that no single prevention message is appropriate to reach all populations at risk and that culturally sensitive approaches are required.

In addition, this information must be seen as a wake-up call to those at risk to strictly adhere to safer sexual practices.

HIV has been, still is, and will continue to be a dangerous foe until we have a cure for it. 

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