



Current Recommendations and Modalities in HIV Testing

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The human immunodeficiency viruses (HIV) types 1 and 2 belong to the Retroviridae family of viruses and cause acquired immunodeficiency syndrome (AIDS). Identified in the United States in 1981, HIV has infected 40,000 individuals in the US annually according to current estimates. There are approximately one million people living with HIV/AIDS in the US at this time, with an estimated one quarter of these patients unaware of their illness. In 2006, the Center for Disease Control (CDC) revised its recommendations on HIV testing for adults, adolescents, and pregnant women in health care settings in order to increase screening efforts. Selected elements of these recommendations include opt-out screening for all patients in a health care setting, with at least annual screening for high-risk patients, and inclusion of HIV testing as part of a routine prenatal screening with possible rescreening of patients in the third trimester.¹

The current recommended screening method is an enzyme linked immunosorbent assay (ELISA) that can detect HIV-1 types M, N, and O, as well as HIV-2. Positive ELISA testing is then confirmed by western blot analysis (WB) or immunofluorescent assay (IFA). This combination of methodologies allows for a high degree of accuracy when testing outside of the window period (up to six months post-exposure). Alternatively, a viral load may also be determined within the window period before antiviral antibodies have appeared utilizing a reverse transcriptase polymerase chain reaction (RT-PCR), nucleic acid sequence-based amplification (NASBA), or Amplicor Monitor assays.² Due to expense, these tests are not normally recommended for screening measures. Secondary testing, such as surgical sampling of lymph nodes, electron microscopy, and culturing of viral particles may also be considered.

Unique situations may also require additional testing. In newborns of HIV positive mothers, maternal anti-HIV antibodies may persist in the offspring for up to nine months, limiting the utility of conventional

serological testing. Under this circumstance, a polymerase chain reaction (PCR) may be used for the detection of inserted proviral HIV DNA. Additionally, specific mutations in the HIV/AIDS virus genome have been implicated in resistance to medications used in highly active antiretroviral therapy (HAART). These mutations can be detected by genotyping the viral DNA or RNA with the results helping to tailor specific treatment regimens. While staging of HIV/AIDS is usually based on the clinical presentation and the presence of opportunistic infections, other laboratory testing can also be used. Serial CD4+ counts by flow cytometry can be helpful in determining the risk of opportunistic infections, with normal levels considered to be between 500–2000 cells/ μ l. CD4+ counts below 200 cells/ μ l increases the overall risk of opportunistic infections and is often considered an AIDS defining criteria.³

The role of the pathologist in HIV/AIDS analysis is to educate clinicians in the usefulness of HIV/AIDS testing as well as to identify any causes of false-positive results. An extensive list of false-positive etiologies includes, but is not limited to, hepatitis B vaccinations, systemic lupus erythematosus, and renal failure.^{4,5} With this knowledge a pathologist plays a critical role in the diagnosis and care of those infected with HIV/AIDS.

References

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