Recommendations for Laboratory Testing for the Diagnosis of HIV Infection

CDC and APHL recommend that laboratories conduct the following sequence of assays with serum or plasma specimens for the accurate diagnosis of HIV infection. These updated recommendations for testing of serum or plasma specimens supersede the 1989 recommendations for interpretation and use of the HIV-1 Western blot in the serologic diagnosis of HIV Type 1 infections, the 1992 recommendations for testing for antibodies to HIV Type 2 in the United States, and the 2004 recommended protocol for confirmation of rapid HIV tests. Because none of the assays in the recommended algorithm are FDA-approved for use with oral fluid or dried blood spot specimens, these updated recommendations do not supersede previous recommendations for testing of dried blood spots or oral fluid for HIV-1 using the FDA-approved immunoassay and HIV-1 Western blot for these specimen types.

1. Laboratories should conduct initial testing for HIV with an FDA-approved antigen/antibody combination (4th generation) immunoassay that detects HIV-1 and HIV-2 antibodies and HIV-1 p24 antigen to screen for established infection with HIV-1 or HIV-2 and for acute HIV-1 infection. No further testing is required for specimens that are nonreactive on the initial immunoassay.
2. Specimens with a reactive antigen/antibody combination immunoassay result (or repeatedly reactive, if repeat testing is recommended by the manufacturer or required by regulatory authorities) should be tested with an FDA-approved antibody immunoassay that differentiates HIV-1 antibodies from HIV-2 antibodies. Reactive results on the initial antigen/antibody combination immunoassay and the HIV-1/HIV-2 antibody differentiation immunoassay should be interpreted as positive for HIV-1 antibodies, HIV- 2 antibodies, or HIV-1 and HIV-2 antibodies, undifferentiated.
3. Specimens that are reactive on the initial antigen/antibody combination immunoassay and nonreactive or indeterminate on the HIV-1/HIV-2 antibody differentiation immunoassay should be tested with an FDA-approved HIV-1 NAT.

- A reactive HIV-1 NAT result and nonreactive HIV-1/HIV-2 antibody differentiation immunoassay result indicates laboratory evidence for acute HIV-1 infection.
- A reactive HIV-1 NAT result and indeterminate HIV-1/HIV-2 antibody differentiation immunoassay result indicates the presence of HIV-1 antibodies confirmed by HIV-1 NAT.
- A negative HIV-1 NAT result and nonreactive or indeterminate HIV-1/HIV-2 antibody differentiation assay result indicates a false-positive result on the initial immunoassay.[†]

4. Laboratories should use this same testing algorithm, beginning with a laboratory-based antigen/antibody combination immunoassay, with serum or plasma specimens submitted for testing after a reactive (preliminary positive) result from any rapid HIV test.

FIGURE 1. HIV 1/2 Testing Algorithm

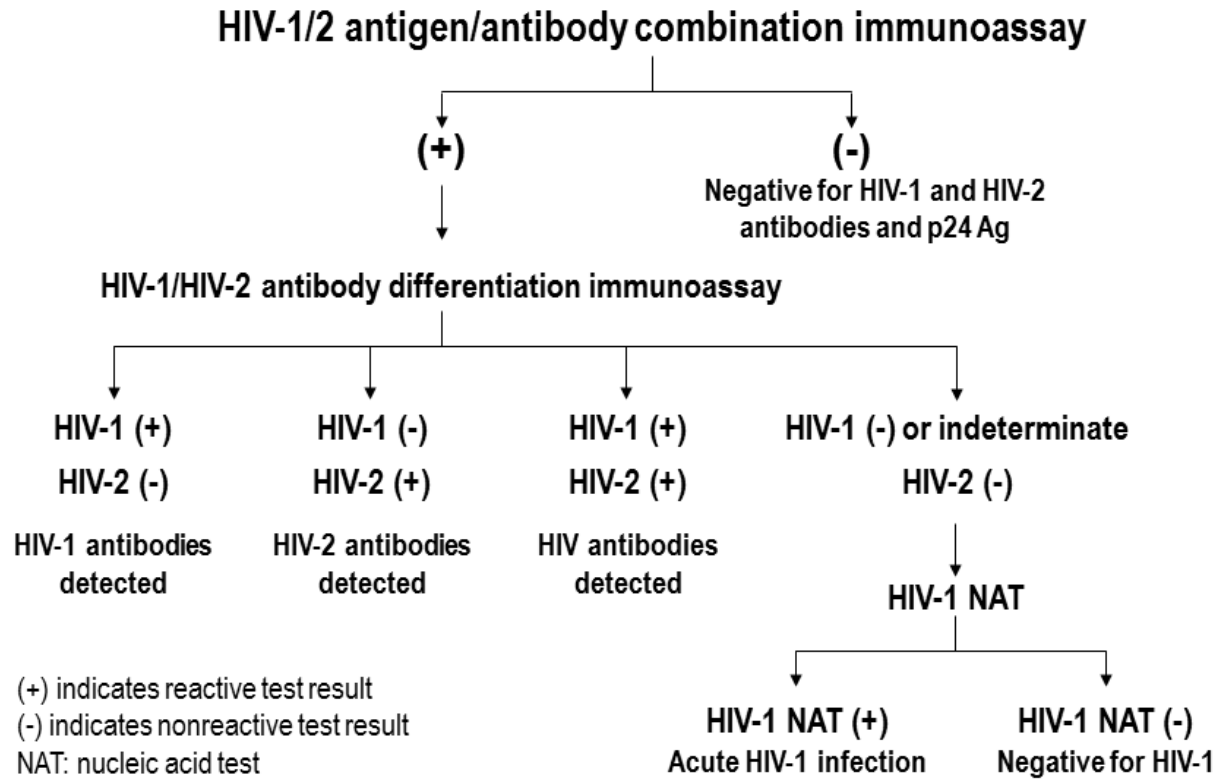
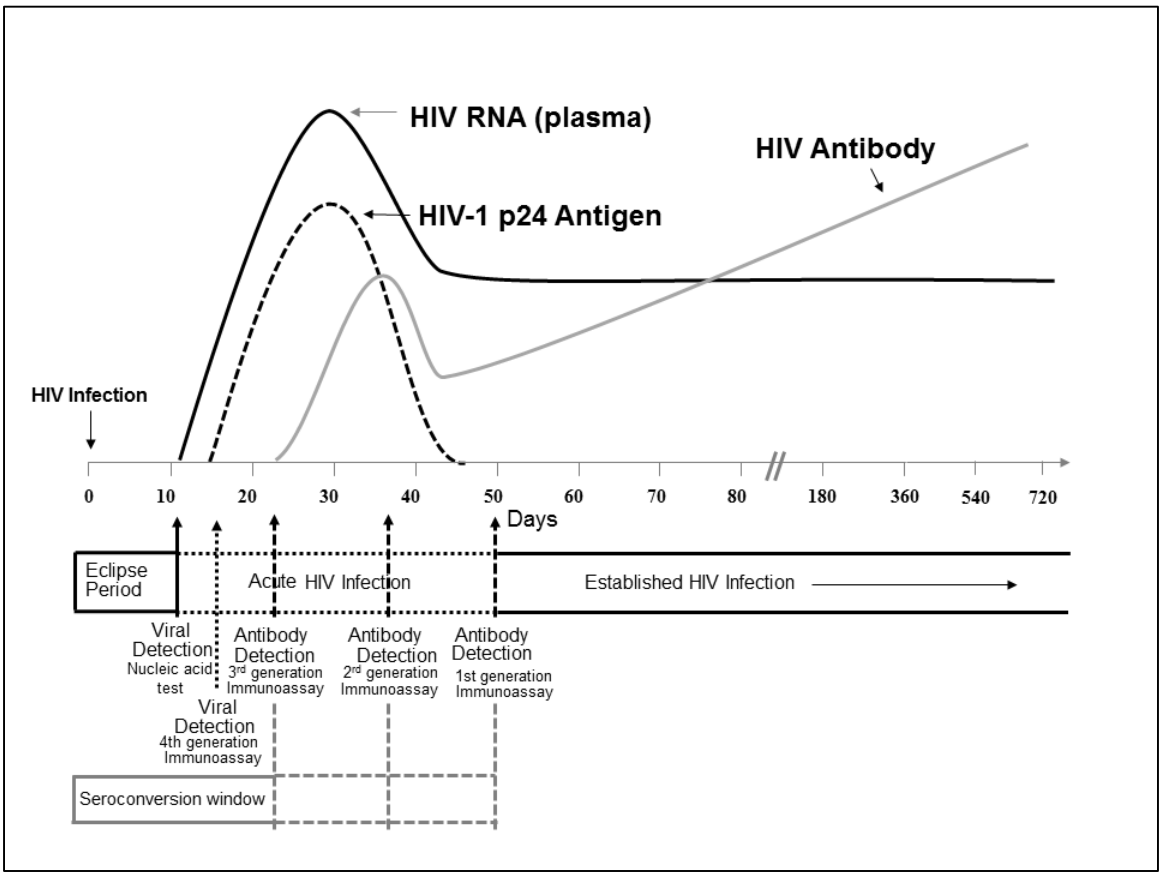


Figure 2. Sequence of appearance of laboratory markers for HIV-1 infection



***Note*. Units for vertical axis are not noted because their magnitude differs for RNA, p24 antigen, and antibody. Modified from MP Busch, GA Satten (1997)[50] with updated data from Fiebig (2003),[48] Owen (2008),[49] and Masciotra (2011, 2013).[46,66]**