Initial Evaluation

Introduction

Background

Untreated HIV causes significant disease, beginning with an acute, self-limited viral syndrome and ultimately progressing to acquired immunodeficiency syndrome (AIDS), with the time between initial acquisition of HIV and development of AIDS varying widely from a few months to longer than 10 years (Figure 1). Early diagnosis, linkage to care, antiretroviral therapy, and retention in care all play an important role in preserving the health of individuals with HIV as well as preventing forward transmission of HIV to others. The initial medical visit provides an opportunity to have a positive interaction and to reinforce the importance of engagement in care. A similar evaluation can also occur at the time of transfer of care or with reengagement into care after a prolonged absence. At any of these initial encounters, the interaction between the individual with HIV and the medical provider may influence the patient’s likelihood of returning for further medical care.

Goals of Initial Evaluation

The multiple goals of the initial evaluation as outlined in the Adult and Adolescent ARV Guidelines Baseline Evaluation section are to confirm the diagnosis of HIV, obtain a complete medical history and perform a comprehensive physical examination, obtain appropriate baseline and historical laboratory data, assess the individual’s understanding about HIV and transmission of HIV to others, and initiate medical care as recommended in the HIVMA Primary Care Guidelines. If the individual is not already taking antiretroviral therapy, the initial visit should also address starting antiretroviral therapy as soon as possible. During the initial encounter it is important to establish a positive relationship with the patient at this initial encounter. Further, since HIV can have a significant psychosocial impact on the individual with HIV, as well as on his or her partner, family, and community, the clinical care must be culturally sensitive, nonjudgmental, client-centered, and multidisciplinary. This review will explore the initial evaluation and monitoring of persons who are newly diagnosed with HIV.
Staging and Classifying the Patient's HIV Disease

Overview of HIV Surveillance Case Definition

The Centers for Disease Control and Prevention (CDC) HIV/AIDS case definition and classification systems were developed for surveillance purposes and are not intended for clinical purposes. Nevertheless, clinicians frequently use these classification systems as a quick reference when describing the clinical and immune status of persons with HIV. In addition, these classification systems are often referred to when determining eligibility of persons with HIV for social security and disability benefits, medication benefit programs, and housing benefits. The CDC established the first HIV surveillance case definition in 1982, with major revisions in 1987, 1993, 2008, and most recently in 2014. The previously used letters (A, B, C) in the 1993 classification, which represented clinical criteria, were replaced in the 2008 case definition by a 4-stage system based on CD4 count (or percentage) and the presence or absence of AIDS-defining conditions. The staging system was again updated in the 2014 surveillance case definition and consists of a 5-stage system (0, 1, 2, 3, or unknown).

Laboratory Criteria for HIV Diagnosis

The CDC has established the following laboratory criteria to meet the 2014 case definition for HIV (Figure 2).

1. A positive HIV antibody or combination antibody/antigen test, and an accompanying or subsequent positive result from a supplemental HIV test different from the initial test, or
2. A positive result of a multitest HIV antibody algorithm from which only the final result was reported, or
3. A positive result or report of a detectable HIV quantity from any of the following virologic (i.e. non-antibody) tests: qualitative HIV nucleic acid amplification testing (DNA or RNA), quantitative HIV RNA level (viral load assay), HIV-1 p24 antigen test, HIV isolation (viral culture), or HIV nucleotide sequence (genotype).

Obtaining a CD4 cell count as a surrogate marker to indicate HIV infection and the degree of immunosuppression is not recommended since CD4 counts can markedly decline without HIV in the setting of acute illness, bone marrow suppression, or chronic hepatitis C virus (HCV) infection.

Staging

The initial evaluation of a person diagnosed with HIV is an important time to determine the stage, or status, of the HIV disease. In the most recent 2014 case definition, a 5-stage system (0, 1, 2, 3, or unknown) is used (Figure 3).

- Stage 0 indicates early HIV infection, inferred from a negative or indeterminate HIV test result within 6 months of a confirmed positive result.
- Stage 1 is defined by CD4 count equal to or greater than 500 cells/mm$^3$, or percentage equal to or greater than 26%, without the presence of an AIDS-defining clinical condition.
- Stage 2 is defined by CD4 count equal to or greater than 200 cells/mm$^3$ and less than 500 cells/mm$^3$, or a percentage between 14 and 25%, without an AIDS-defining clinical condition.
- Stage 3 is defined by a CD4 count less than 200 cells/mm$^3$, or a percentage less than 14%, or the presence of an AIDS-defining illness. The absolute CD4 count takes precedence over the CD4 percentage, and the percentage is only considered if the corresponding CD4 count is unknown.
- Stage unknown refers to a person with laboratory confirmation of HIV infection, but no information about CD4 cell count or percentage (and no information about the presence of AIDS-defining clinical conditions).
**Changes in Stage**

In previous case definitions, a person’s stage of HIV was based on the most advanced stage ever experienced, or the “life-time stage”. Once an individual progressed to a more advanced stage, the designated stage would not revert to any earlier stage. The updated 2014 staging system is more flexible, allowing for a patient’s status to change in either direction after diagnosis; this is helpful in describing a patient’s “real-time stage”, or the status of HIV disease in the present moment. Admittedly, this new staging system is somewhat vague and it remains unclear how clinicians will utilize this more flexible component of staging for surveillance purposes.

**Clinical Criteria for HIV Diagnosis**

According to the 2014 case definition, clinical criteria for a confirmed case is met when there is a note in a medical record by a physician or other qualified medical provider that states that the person has HIV, followed by either laboratory criteria meeting the case definition, presumptive evidence of HIV (i.e. receipt of HIV antiretroviral therapy or prophylaxis for an opportunistic infection), an otherwise unexplained low CD4 count, or an otherwise unexplained diagnosis of an opportunistic illness.

**AIDS-Defining Clinical Conditions**

In persons with laboratory-confirmed HIV infection, stage 3 (AIDS) is defined based on laboratory criteria (CD4 cell count) or clinical conditions. The list of AIDS-defining clinical conditions is extensive ([Figure 4]).[6]
Initial Assessment: History Taking

The initial evaluation and the focus of the first visit should take into account whether the client is newly diagnosed with HIV or has established HIV and is new to the clinic. For some initial visits, the client may have active HIV-related issues that need to be immediately addressed and these issues may take priority and dominate the visit. In general, the interaction that occurs while obtaining the initial history can have a major impact on the subsequent client-provider relationship. Thus, the initial intake should take a client-centered, multidisciplinary approach with the interview performed in an open and nonjudgmental manner. The initial encounter is an opportunity for the clinician to assess the client’s support network and readiness for antiretroviral therapy, or adherence to antiretroviral therapy if already initiated. The HIVMA Primary Care Guidelines provide detailed guidance for the elements to include in a comprehensive patient history at the initial visit, and the key points are summarized below.[3]

- **HIV-Related History**
  - Date of diagnosis of HIV and, if known, the approximate date of initial HIV acquisition
  - Identified risk factors related to HIV acquisition
  - Prior HIV-associated complications and comorbidities, including opportunistic infections, malignancies, and other HIV-related conditions

- **Past Medical, Surgical, and Psychiatric History**
  - Past medical history, including chronic medical conditions
  - Past surgical history, including complications with or from surgery
  - Psychiatric history, especially any history of depression, bipolar disorder, post-traumatic stress disorder, and domestic violence

- **Medication and Allergy History**
  - Medication history (including historical antiretroviral therapy past to present, over-the-counter drugs, pain medications, and dietary or herbal supplements)
  - Allergies and intolerances to medications, including hypersensitivity reactions to antibiotics and antiretroviral medications

- **Sexual History**
  - Sexual practices, including gender of partners, exposure sites with sex, condom use, and contraceptive use (if needed)
  - History of prior sexually transmitted infections and treatment for these infections
  - HIV status of their partners, and whether the individual has disclosed their HIV status to their partners

- **Substance Use History**
  - Assess for current or past tobacco, alcohol, and illicit drug use
  - If substance use present, address impact on daily activities
  - Review current and past treatment for any substance use disorders

- **Social, Family, and Travel History**
  - Social support, coping strategies (including how the individual is dealing with a new HIV diagnosis or established HIV), employment status and history, financial status, housing, marital status, and desires related to family planning/reproduction
  - Family history, including history of cardiovascular disease and/or cancer
  - Residence and travel history (to determine if patient has lived in or traveled to regions endemic for certain diseases, such as histoplasmosis or coccidioidomycosis)

- **Comprehensive Medical Review of Symptoms**
Initial Evaluation: Physical Examination

A complete physical examination should be performed at the initial encounter, with particular attention given to the oral, integumentary, and lymph node examinations. The key components of the physical examination as outlined in the HIVMA Primary Care Guidelines include:[3]

- **Vital signs and General Appearance:** including height and weight, evidence of obesity, wasting, or lipodystrophy
- **Skin:** rashes, bruising, inflammatory dermatoses, cutaneous lesions, and cutaneous manifestations of systemic disease (e.g. spider angiomata, caput medusa suggestive of liver disease)
- **Lymph nodes:** generalized or localized lymphadenopathy (cervical, axillary, inguinal)
- **Eye:** retinal exudates or cotton wool spots, hemorrhages, pallor, icterus
- **Oropharynx:** abnormalities of dentition, gingiva, or mucosa including ulcers, candidiasis, and oral hairy leukoplakia
- **Cardiovascular:** peripheral pulses, auscultation, and presence/absence of edema
- **Chest:** auscultation for breath sounds, airway movement, and wheezing
- **Breast:** nodules, nipple discharge
- **Abdomen:** masses, tenderness, hepatosplenomegaly
- **Genitourinary:** ulcers, warts, discharge, and appearance of cervix on gynecologic examination
- **Anorectal:** ulcers, warts, fissures, hemorrhoids, masses
- **Neuropsychiatric:** speech problems, gait abnormalities, focal deficits (motor or sensory), headaches, seizures, signs of dementia or memory impairments, depression and anxiety inventory, signs of drug or alcohol intoxication
Baseline Laboratory Studies

As part of the initial evaluation for persons with HIV, a number of routine laboratory analyses are recommended in addition to HIV-related tests.[3,4,7] Recommendations from the Adult and Adolescent ARV Guidelines and the HIVMA Primary Care Guidelines are outlined below.[3,4,7] Where noted, recommendations are also included from the 2015 CDC STD Treatment Guidelines.[8]

HIV Disease-Related Tests

- **Laboratory Confirmation of HIV Diagnosis**: Most individuals seen for an initial HIV evaluation have laboratory documentation of their HIV diagnosis. If, however, documentation of the HIV diagnosis is not available, appropriate confirmatory HIV diagnostic testing should be performed, with the logic that individuals may have undergone referral based only on a preliminary positive HIV test, or, in rare cases, individuals have factitiously claimed to have HIV.[7,9]

- **CD4 Cell Count with Percentage**: This test helps to establish the risk of specific HIV-associated complications and the need for prophylaxis against opportunistic infections. For persons with HIV, measurement of CD4 cell count serves as the best laboratory indicator of immune function. Of note, CD4 counts can vary, especially during an acute illness, and may be impacted by certain medications and intercurrent illnesses. The absolute cell count is the number most often used in clinical practice, but the percentage can also be used to assess immune function and is somewhat less variable than the absolute count. A significant change between two CD4 count readings is an approximate 30% change in the absolute count, or an increase or decrease of 3 percentage points.[10] Falsely elevated CD4 counts may occur in patients with anatomical or functional asplenia.[11]

- **Quantitative Plasma HIV RNA Level (viral load)**: The plasma HIV RNA level defines a baseline viral load, which can predict rapidity of disease, with higher HIV RNA levels clearly correlating with more rapid progression of disease and greater risk of developing AIDS (Figure 5).[12,13] In addition, HIV RNA levels, particularly when greater than 100,000 copies/mL can impact the efficacy of some regimens and thus impact the initial choice of antiretroviral therapy. The U.S. Food and Drug Administration (FDA) has approved several HIV RNA assays and the lower limits of detection threshold for the most commonly used assays range from 20 to 50 copies/mL.

- **HIV Drug-Resistance Testing**: In the United States, transmission of HIV that is resistant to at least one antiretroviral medication occurs in approximately 10 to 15% of persons; these resistance mutations usually are to a nucleoside reverse transcriptase inhibitor (NRTI), a non-nucleoside reverse transcriptase inhibitor (NNRTI), or a protease inhibitor (PI).[14] A baseline genotypic resistance test is recommended to detect for mutations in the reverse transcriptase and protease gene.[14] Routine baseline resistance testing of the integrase gene is not routinely recommended in antiretroviral-naïve individuals, unless there is concern for transmitted integrase strand transfer (INSTI) drug resistance.[7,14,15]

- **HLA-B*5701**: Routine baseline screening for this haplotype is not recommended at the initial visit, unless the patient is being considered for an antiretroviral regimen that contains abacavir.[7] The HLA-B*5701 is used to identify individuals at high risk for abacavir hypersensitivity reaction.[16] A negative test does not rule out the possibility of a hypersensitivity reaction but makes it extremely unlikely.

- **Coreceptor Tropism Testing**: Tropism testing is not recommended as a routine test for the initial visit; this test is recommended when considering the use of the CCR5 antagonist maraviroc as a component of an antiretroviral regimen. Maraviroc is not recommended as a preferred agent in treatment-naïve individuals.[17,18]

- **Pregnancy Test**: Pregnancy testing should be performed in women at initiation or modification of antiretroviral therapy, since certain medications may be teratogenic.

- **Glucose-6-Phosphate Dehydrogenase (G6PD) Deficiency Screening**: Routine baseline screening for G6PD deficiency is not recommended, but is indicated before use of oxidant drugs, such as dapsone, nitrofurantoin, and primaquine, or sulfamethoxazole, in persons with a predisposing racial or ethnic background. Individuals at higher genetic predisposition for G6PD include black men and...
women, as well as men from the Mediterranean, Middle East, India, and Southeast Asia.\[^{19}\] Persons with G6PD deficiency who have exposure to oxidant drugs have increased risk of developing acute hemolysis.

### Routine Laboratory Tests

- **Complete Blood Count (CBC) with Differential:** Obtaining a baseline CBC is important since anemia, leukopenia, and thrombocytopenia are common among persons with HIV infection. Also, the CBC is used to calculate the total CD4 count.
- **Basic Chemistry Panel and Calculated Creatinine Clearance:** This panel should include serum sodium, potassium, bicarbonate, chloride, blood urea nitrogen, glucose (preferably fasting), creatinine. As part of the basic chemistry panel, the test should determine creatinine-based estimated glomerular filtration rate.
- **Hepatic Aminotransferase Levels:** This should include alanine aminotransferase (ALT) and aspartate aminotransferase (AST) levels.
- **Urinalysis:** Individuals with HIV have an increased risk of developing HIV-associated nephropathy and chronic kidney disease. This risk is disproportionately higher among African Americans. The presence of proteinuria may be an early marker of disease in patients with normal renal function.
- **Fasting Lipid Panel (Total cholesterol, HDL, LDL, Triglycerides):** Antiretroviral drugs, HIV itself, and host factors are all associated with increased risk of cardiovascular disease and dyslipidemia. Fasting lipids should be checked at baseline.
- **Fasting Plasma Glucose or Hemoglobin A1c:** These tests screen for glucose intolerance and diabetes, which are more prevalent in people with HIV.
- **Serum Testosterone:** Men with HIV, particularly those with advanced immunosuppression, have increased risk of developing hypogonadism. Serum testosterone testing should be considered in males with fatigue, weight loss, loss of libido, erectile dysfunction, depression, or with evidence of reduced bone mineral density. An early-morning (fasting) free testosterone test is preferred.

### Coinfection and Comorbidity Screening

- **Bartonella Screening:** Routine serologic screening for *Bartonella* infection in persons with HIV is not recommended. In addition, routine screening of pets for *Bartonella* infection is not recommended.\[^{20}\]
- **Cryptococcal Screening:** The Adult and Adolescent Opportunistic Infection Guidelines state that some experts recommend routine screening for cryptococcal antigen in individuals newly diagnosed with HIV and a CD4 count less than 100 cells/mm\(^3\) (and particularly when the CD4 count is less than 50 cells/mm\(^3\)).\[^{21}\]
- **Cytomegalovirus (CMV):** Routine serologic testing (anti-CMV antibody) for evidence of established CMV infection is recommended only for persons with HIV who have a lower risk of acquiring CMV infection; routine CMV antibody screening is not recommended for men who have sex with men or persons who inject drugs, since these individuals can be assumed to be CMV seropositive. Individuals with CD4 count less than 50 cells/mm\(^3\) should receive education to report symptoms that may indicate CMV retinitis, particularly floaters, flashing lights, or change in visual acuity.\[^{22}\] In addition, some specialists recommend routine referral of patients with a CD4 count less than 50 cells/mm\(^3\) to an ophthalmologist for a dilated ophthalmologic examination to screen for CMV retinitis.
- **Hepatitis A Virus (HAV):** Screen with hepatitis A antibody to evaluate for evidence of prior HAV infection or immunity.
- **Hepatitis B Virus (HBV):** All persons diagnosed with HIV should undergo testing for HBV with hepatitis B surface antigen (HBsAg), hepatitis B surface antibody (HBsAb), and hepatitis B core antibody (anti-HBc total).\[^{23}\]
- **Hepatitis C Virus (HCV):** At entry into care, all persons with HIV infection should undergo routine testing for HCV infection with HCV antibody; confirmatory testing of all positive HCV antibody tests with HCV RNA testing is recommended.\[^{24}\] Repeat annual testing is recommended for those individuals who test negative and have ongoing risk of HCV acquisition.\[^{24}\] Due to possible
seronegative HCV infection among individuals with HIV infection, HCV RNA testing should be considered in some individuals who have a negative HCV antibody, particularly those with a history of injection drug use, a CD4 less than 200 cells/mm$^3$, or an abnormal ALT.[25]

- **Mycobacterium avium Complex (MAC) Screening**: Routine screening for MAC infection is not recommended. Obtaining a blood culture for acid-fast bacilli (AFB) to screen for disseminated MAC infection may be considered in persons with a CD4 count less than 50 cells/mm$^3$ if they are initiating MAC prophylaxis.[26] The need for MAC screening in persons with a CD4 count less than 50 cells/mm$^3$ has taken on less importance since routine MAC prophylaxis is no longer recommended in this setting if the individual is starting antiretroviral therapy.[26]

- **Mycobacterium tuberculosis**: All individuals with HIV entering care should undergo screening for tuberculosis with tuberculin skin testing (TST) or interferon-gamma release assay (IGRA).[27] Individuals with a positive tuberculosis test result should receive treatment for latent *M. tuberculosis* infection after active tuberculosis has been excluded by a thorough history and chest radiographic imaging. Repeat TST or IGRA testing is recommended in persons with advanced HIV disease who initially had negative results but subsequently experienced an increase in the CD4 cell count to greater than 200 cells/mm$^3$ after receiving antiretroviral therapy; in this situation, these individuals may have developed sufficient immune reconstitution to mount a positive TST or IGRA reaction.

- **Toxoplasma gondii**: Screen for toxoplasmosis with anti-*Toxoplasma* IgG. If *Toxoplasma* serology is negative, patients should be counseled about methods to avoid exposure.[28] To minimize exposure risk, individuals with HIV who are *Toxoplasma*-seronegative should avoid eating raw or undercooked meat and shellfish; they should wash their hands after handling raw meat or after gardening or contact with soil; and if they own cats, they should not change the litter box and should be encouraged to keep their cats inside.[28] If a person with HIV has a negative *Toxoplasma* serology at baseline, but then has a CD4 count decline to less than 100 cells/mm$^3$ (or they have high risk for *Toxoplasma* exposure), the *Toxoplasma* serology should be repeated.

### Screening for Sexually Transmitted Diseases

- **Syphilis**: All persons with HIV should undergo screening for syphilis at the initial visit and periodically thereafter if ongoing risk factors exist. In recent years, there have been high rates of syphilis in persons with HIV, especially among men with HIV who have sex with men.[8] A lumbar puncture should always be performed for individuals with a reactive syphilis serology who have neurologic, ocular, or otic symptoms or signs, irrespective of past syphilis treatment history. The CDC recommends screening for syphilis with a nontreponemal test (RPR or VDRL) though many laboratories have transitioned to a reverse screening sequence using a treponemal test first; the reverse sequence screening has led to cases of discordant results.[29]

- **Herpes Simplex Virus (HSV)**: HSV-1 and HSV-2 type-specific antibody tests are available but not routinely recommended by the HIVMA Primary Care Guidelines. The Adult and Adolescent Opportunistic Infection Guidelines recommend consideration of screening for HSV-2 due to the extensive interactions between HIV and HSV-2, and the availability of effective therapy for HSV-2.[30]

- **Routine STD Screening in Women**: All women should be screened for *Neisseria gonorrhoeae*, *Chlamydia trachomatis*, and *Trichomonas vaginalis* at baseline and periodically thereafter, depending on risk and the prevalence of sexually transmitted infections in the community. Retesting in 3 months is indicated for women found to be positive for any of these infections on initial screening because of high reinfection rates. Nucleic acid amplification testing (NAAT) or PCR of urine is the preferred method of screening, but for clinics that do not have urine PCR testing for trichomoniasis, screening should utilize a wet mount or culture for *T. vaginalis*.

- **Routine STD Screening in Men**: All men should be screened for gonorrhea and chlamydia at baseline and at least annually thereafter, depending on risk and the prevalence of sexually transmitted infections in the community. Retesting in 3 months is indicated for men found to be positive for gonorrhea or chlamydia infection because of high reinfection rates. Further, all men who have sex with men should have testing for urethral and rectal gonorrhea and chlamydia, as well as testing for oral gonorrhea—if they report receptive sex at these sites.[8] The NAAT is the preferred
method for these screening tests at urethral, rectal, and pharyngeal sites. Routine screening for oropharyngeal chlamydia is not recommended. When testing for urethral infection, testing of a urine sample (not a urethral swab) with a NAAT is the preferred approach and is FDA-approved. There are no guidelines for screening men for *T. vaginalis*.

- **Cervical Cancer Screening**: Sexually active women with HIV should undergo cervical cancer screening at initial entry to HIV care and again 12 months later if the initial test was normal; some experts repeat cervical cancer screening after 6 months, consistent with previous guidelines.
- **Anal Cancer Screening**: No clear recommendations exist regarding screening for anal cancer in persons with HIV; this topic remains highly controversial. The HIVMA Primary Care Guidelines recommend anal Pap screening in men who have sex with men, women with a history of receptive anal intercourse (or abnormal cervical Pap test results), and all persons with HIV who also have genital warts. This recommendation is considered a weak recommendation based on limited, moderate quality evidence. Stronger evidence-based guidelines are likely in the future since studies are ongoing.
Immunizations

Providing appropriate immunizations is an important component of comprehensive HIV clinical care and should be addressed at the first visit. In general, response to any vaccine will be greatest in patients with higher CD4 cell counts and in those receiving suppressive antiretroviral therapy.[3] Some routine immunizations, such as hepatitis A and hepatitis B, require baseline serologic testing first to determine whether the patient has immunity. The Advisory Committee on Immunization Practices (ACIP) provides annual recommendations for routine immunizations of adults, including specific recommendations for adults with HIV infection.[32] For a full discussion of the topic of immunizations in Adults with HIV, please refer to the review of Immunizations in Adults Module 2, Lesson 4.
Summary Points

- The goals of the initial evaluation are to confirm the HIV diagnosis, obtain a complete medical history and physical examination, obtain appropriate baseline and historical laboratory data, provide basic education regarding HIV and its transmission, and to initiate antiretroviral therapy.
- Medical care for persons with HIV should be culturally sensitive and nonjudgmental, client-centered, and multidisciplinary.
- The 2014 CDC case definition for HIV is divided into 5 stages based on CD4 count (or percentage) and the presence or absence of AIDS-defining conditions. The previously used letters (A, B, C) in the 1993 classification are not used in the new HIV case definition, and absolute CD4 count takes precedence over CD4 percentage.
- Acceptable diagnostic tests to meet the HIV case definition include HIV antibody tests, combination antibody-antigen tests, and virologic tests.
- The initial history intake should be comprehensive and cover medical, surgical, past HIV treatment, and psychiatric history, as well as address sexual behaviors, substance use, financial issues, interpersonal/family issues, and cultural influences that may impact care.
- A complete physical examination should be performed at the first visit, with special attention given to the oral, skin, and lymph node examinations.
- Baseline laboratory evaluation includes HIV disease tests, antiretroviral-specific tests, basic blood counts and chemistry panels, and comorbidity and coinfection tests.
- Providing appropriate immunizations is an important component of comprehensive HIV clinical care and should be addressed at the first visit.
Citations


Panel on Opportunistic Infections in Adults and Adolescents with HIV. Guidelines for the prevention and treatment of opportunistic infections in adults and adolescents with HIV: recommendations from the Centers for Disease Control and Prevention, the National Institutes of Health, and the HIV Medicine Association of the Infectious Diseases Society of America. Hepatitis B virus infection. Last Updated: November 13, 2018.


FDA clears first diagnostic tests for extragenital testing for chlamydia and gonorrhea. FDA news release. May 23, 2019.

Advisory Committee on Immunization Practices (ACIP). Recommended Adult Immunization Schedule by Medical Condition and Other Indications, United States, 2020.

References


- McGee KS, Okeke NL, Hurt CB, McKellar MS. Canary in the Coal Mine? Transmitted Mutations
[PubMed Abstract] -

[PubMed Abstract] -
**Figures**

**Figure 1 Natural of History of Untreated HIV**

Following acquisition of HIV, persons with untreated HIV typically develop a steady decline in CD4 cell count, usually progressing to AIDS within 10 years of the initial infection.

Illustration: David H. Spach, MD
Figure 2 Laboratory Criteria for HIV Diagnosis

Figure 3 2014 CDC Case Definition for HIV Infection for Adolescents and Adults

Figure 4 Stage 3-Defining Opportunistic Illnesses in Persons with HIV

Figure 5 HIV RNA Levels and CD4 Cell Counts and Risk of Developing AIDS