# Management of HIV

**Federal Bureau of Prisons**
**Clinical Practice Guidelines**

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## What's New in the Document?

The following changes have been made since the February 2004 version of these guidelines.

### General

- Tables of antiretroviral drugs are no longer included in these guidelines because they rapidly become outdated. Clinicians should routinely review updated Department of Health and Human Services (DHHS) guidelines (http://aidsinfo.nih.gov/guidelines).
- Guidelines for post-exposure prophylaxis will be compiled in a separate BOP clinical practice guideline which covers management of exposures to HIV, hepatitis B, hepatitis C and human bites.

### Nomenclature

- *Pneumocystis jiroveci* (pronounced "yee row vet zee") is the correct name for what was previously *Pneumocystis carinii*. "PCP" remains an appropriate abbreviation for pneumocystis pneumonia.

### Treatment

- Recommendations for HIV resistance testing have been updated, including a recommendation for testing prior to initiating treatment and when evaluating treatment failure.
- Preferred treatment regimens for antiretroviral-naive patients have changed (*Appendix 8a* and *Appendix 8b*)
- Recommendations for drugs and drug combinations which should *not* be administered have been updated (*Appendix 9*).
- New recommendations for discontinuing regimens which contain an NNRTI are included.

### New Appendices

- A concise list of HIV diagnosis and treatment guidelines with associated hyperlinks is provided in *Appendix 1*.
- A table showing "Correlation of Complications to CD4+ T Cell Count" is provided in *Appendix 3*.

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# 1. Purpose and Overview

The BOP Clinical Practice Guidelines for the Management of HIV Infection provide guidance on the screening, evaluation, and treatment of federal inmates with HIV infection, with a focus on primary care. The BOP clinical practice guidelines are not intended to replace the more extensive guidelines published by the United States Public Health Services (USPHS), the Department of Health and Human Services (DHHS), the Centers for Disease Control and Prevention (CDC), the Infectious Disease Society of America (IDSA) and the International AIDS Society (IAS). See *Appendix 1* (*Guidelines Regarding Medical Care of HIV-Infected Persons*) for a list of these guidelines and the links for internet access. The DHHS "Guidelines for the Use of Antiretroviral Agents in HIV-1 Infected Adults and Adolescents" are updated regularly and should be consulted at: http://www.AIDSinfo.nih.gov at least every six months.

# 2. Diagnosis and Reporting

## Indications for Testing for HIV

Indications for HIV testing, which are described in detail in *Appendix 2 (Criteria for Testing for HIV Infection),* are summarized in the table below. See also the important points that follow the table.

**Table 1. Summary of Criteria for HIV testing**

**For *all* inmates, regardless of sentencing or duration of stay:**

- signs or symptoms of acute HIV infection
- signs or symptoms of HIV-related condition
- pregnancy
- recent HIV exposure
- active tuberculosis
- positive tuberculin skin test
- or when otherwise clinically indicated

**For *sentenced* (6 months or greater) inmates with the following risk factors:**

- injected illegal drugs and shared equipment
- (for males) sex with another man
- unprotected intercourse with more than one sex partner
- history of gonorrhea or syphilis
- from a high risk country (Sub-Saharan Africa or West Africa)
- received blood products between 1977 and 1985
- hemophilia
- percutaneuous exposure to blood
- or when inmate requests to be tested

- **Many persons with HIV infection are asymptomatic** and are unaware that they are infected.
- **HIV testing of sentenced inmates with HIV risk factors is *mandatory*** per BOP policy and federal law.
- **BOP clinicians should have a very low threshold for testing inmates** for HIV infection, since diagnosed inmates will benefit from counseling and may be candidates for life-prolonging antiretroviral therapy.
- **Asymptomatic inmates with risk factors for HIV infection**, but who are not tested during transient periods of incarceration, should be referred for HIV testing in the community.

## Indications for Testing for HIV-2

Any asymptomatic, sentenced inmates who meet the criteria in the following table should **also** be tested for HIV-2 infection through BOP reference laboratories.

**Table 2. Criteria for Testing for HIV-2**

- All inmates from West Africa where HIV-2 is endemic such as the countries of Benin, Liberia, Mali, Niger, Nigeria, Senegal, Sierra Leone, Togo, Ghana, Burkina Faso, Gambia, and Côte d'Ivoire
- Inmates who are or have been sex partners or needle-sharing partners of persons from West Africa or any person known to have HIV-2 infection
- Inmates who have received transfusions in West Africa

## HIV Prevention Counseling

All inmates tested for HIV infection should receive counseling from qualified health care personnel in accordance with BOP policy, using the appropriate forms for HIV counseling and documentation. Counseling should provide information on HIV transmission, methods for preventing the spread of the virus while in prison and upon release to the community, the importance of obtaining test results, how to get the test results, and the meaning of the HIV test results. HIV prevention counseling should incorporate effective elements recommended by the CDC that include, but are not limited to: using open-ended questioning; carefully assessing personal risk, based on self-reported behaviors and the inmate's medical evaluation; clarifying critical misconceptions; emphasizing risk reduction behaviors; and using clear and direct language when providing test results.

## Antibody Testing and Interpretation of Results

Only FDA-approved HIV tests should be used for diagnostic purposes. The diagnosis of HIV infection is ordinarily determined by a positive EIA for HIV-1 antibodies that is confirmed by immunoblot (Western blot) analysis. Results of HIV Western blots are generally interpreted as outlined in Table 3 below. The standard EIA and Western blot assays are >99% specific and sensitive for detecting HIV infection.

| **Table 3. Interpretation of Western Blot Results** | |
|---|---|
| **Negative** | Nonreactive (no bands on Western blot) |
| **Positive** | Reactivity to: gp41 + gp120/160 OR p24 + gp120/160 |
| **Indeterminant** | Presence of any band patterns not meeting criteria for a positive result |

False negative, false positive, and indeterminant results are uncommon. Reasons for such results are outlined in Table 4 below.

| **Table 4. Reasons for False Negative, False Positive, and Indeterminant HIV Test Results** | |
|---|---|
| **Reasons for false negative results** | |
| **Recent acute HIV infection** | During the "window" period (i.e., the time between new infection and the development of HIV antibodies), HIV EIA tests may be negative. The time delay from recent infection to positive serology averages several weeks. Nearly all infected persons develop HIV antibodies within six months of infection. |
| **Seroreversion** | Persons with documented HIV infection can lose HIV antibodies with late stage disease (AIDS) or with immune reconstitution by effective antiretroviral therapy. |
| **Agamma-globulinemia** | Low antibodies |
| **HIV O and HIV N** | Standard EIA may be falsely negative in persons infected with HIV O subtype or HIV N subtype. O and N subtypes are extremely rare variants of HIV-1. |
| **HIV-2** | HIV-2 infection occurs primarily in West Africa. Standard HIV EIA tests are falsely negative in 20-30% of persons infected with HIV-2. Specific antibody tests for HIV-2 are available through the CDC via BOP reference laboratories. |
| **Reasons for false positive results** | |
| **Autoantibodies (extremely rare)**<br>**Investigational HIV vaccines**<br>**Clerical error** | |
| **Reasons for indeterminant results** | |
| **Recent infection** | HIV antibodies differentially become detectable within weeks after infection, which may result in an indeterminant Western Blot until that time. |
| **Atypical HIV strains** | Infection with unusual strains of HIV such as HIV-2 infection, or HIV-1 subtypes O or N, may not produce typical diagnostic bands on Western blot analysis. |

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|---|---|
| **Cross reactive antibodies** | Autoimmune diseases, certain malignancies, injection drug use, HIV vaccination, and recent immunization may yield antibodies that are detectable on HIV Western blot analysis. |
| **Advanced HIV infection** | Loss of HIV antibodies because of AIDS itself may affect Western blot analysis. |
| *Adapted from:* Bartlett JG, Gallant JE. Medical management of HIV infection. 2005-2006 ed. Baltimore: Johns Hopkins University; 2005. | |

**Inmates with indeterminant HIV test results** should be referred to a physician for further evaluation in accordance with the following guidelines:

- **Physician interview** for HIV infection risk factors, symptoms of HIV infection and AIDS, and causes of indeterminant HIV test results;
- **Physician evaluation** of the inmate for conditions that may result in an indeterminant test result, when clinically indicated based on the inmate's history and examination;
- **Repeat HIV testing**, e.g., in one, two, and six months.
  (If the HIV test result remains indeterminant at six months, and the inmate has no risk factors for HIV infection, the inmate should be reassured that HIV infection is extremely unlikely. If HIV infection is suspected, despite indeterminant HIV test results, BOP Medical Referral Center laboratory personnel should be consulted for further evaluation of the test results. Viral detection methods may be used on an individual basis as an adjunctive diagnostic tool, but should not supplant antibody testing.)

## Acute HIV Infection

Acute HIV Infection is most rapidly diagnosed by detecting plasma HIV RNA in a person before HIV antibodies have developed. Measurement of viremia, however, does not negate the need for HIV antibody testing. Both false negative and false positive quantitative HIV RNA tests can occur when evaluating a patient with suspected acute HIV infection. Acute HIV infection is neither confirmed nor excluded as a diagnosis by measuring HIV antibodies alone. Testing for acute HIV infection should be pursued for inmates with a suggestive clinical presentation or a history of recent exposure to HIV.

## Reporting

All inmates diagnosed with HIV infection should be reported to State health authorities in accordance with State laws and regulations.

# 3. Natural History of HIV Infection

Acute HIV infection leads to marked HIV viremia, with a rapid decline in CD4+ T cells that is usually associated with significant symptomatology—most commonly fever, rash, lymphadenopathy, and fatigue. Acute HIV infection is frequently unsuspected by the evaluating clinician, since signs and symptoms are relatively nonspecific and may not be reported by the patient. Less common manifestations of acute HIV infection include thrush, mucocutaneous ulcerations of the mouth and esophagus, diarrhea, aseptic meningitis, facial palsy, Guillain-Barre syndrome, and cognitive impairment.

The avid immune response following acute HIV infection is associated with HIV antibody development, an increase in CD4+ T cells, and a reduction in HIV viremia with the establishment of a viral load "set point." Over time, the CD4+ T cell count gradually declines in persons chronically infected with HIV, whereas HIV RNA levels gradually increase.

In the absence of antiretroviral therapy, the average time from acute HIV infection to symptomatic HIV infection or AIDS is 8 years. AIDS is associated with marked immunosuppression with a CD4+ T cell count $<200$ cells/mm$^3$, the development of opportunistic infections, neurologic complications, certain malignancies, and wasting syndrome. *Appendix 3* lists complications associated with declining CD4+ T cell counts.

Antiretroviral therapy markedly prolongs life and prevents the development of AIDS. Although antiretroviral therapy can suppress plasma HIV RNA to undetectable levels for years, treatment is not curative since reservoirs of HIV persist, particularly in latent CD4+ T cells. HIV-2 infection causes a cell-mediated immunodeficiency similar to HIV-1 infection; however, CD4+ T cells decline more slowly.

# 4. Baseline Medical Evaluation

The baseline medical evaluation that is indicated for inmates diagnosed with HIV infection ordinarily includes the following components, which are summarized in *Appendix 4*.

## History and Physical Examination

**Medical history:** Obtain a comprehensive medical history, along with an assessment and documentation of HIV risk factors. The history should include the date when HIV infection was diagnosed and, when possible, the estimated date of infection (based on the history of prior negative results, the history of symptoms of acute retroviral infection, or the inmate's recollection of high-risk activities).

**Medication history:** A thorough medication history is critical for patients with prior history of antiretroviral therapy; it should include regimens prescribed, response to each regimen, drug toxicities, adherence, and prior resistance test results. History of prior HIV-related

complications should be ascertained, including opportunistic infections, malignancies, and HIV-related symptoms. If possible, prior medical records should be obtained.

**Complete physical examination:** The examination should include a fundoscopic examination for retinopathy, an oropharyngeal exam for thrush, a careful skin exam for dermatologic conditions, an abdominal exam for hepatosplenomegaly, an assessment of neurologic deficits, and a pelvic examination and PAP smear for women. The incidence of cervical pathology is 10 to 11-fold greater in HIV-infected women than in HIV-uninfected women.

**PAP smears:** Obtain PAP smears in accordance with the guidelines outlined in Table 5 below.

**Table 5. PAP Smear Instructions**

The cervix is scraped circumflexually with an *Ayer* spatula or a curved brush; a sample from the posterior fornix or the "vaginal pool" may also be included. The endocervical sample is taken with a saline-moistened cotton-tipped applicator or straight ectocervical brush that is rolled on a slide and immediately fixed in ethyl ether plus 95% ethyl alcohol, or in 95% ethyl alcohol alone. The yield is 7-fold higher with the brush specimen. Important points for obtaining an adequate sample are below:

- Collect the PAP smear prior to the bimanual exam, to avoid contaminating the sample with lubricant.
- Obtain the PAP before testing for sexually transmitted diseases.
- If large amounts of vaginal discharge are present, carefully remove it with a large swab before collecting the PAP smear.
- Obtain the ectocervical sample before obtaining the endocervical sample.
- Small amounts of blood will not interfere with cytologic sampling; defer PAP if bleeding is heavy.
- Collected material should be applied uniformly to the slide, without clumping, and should be fixed immediately to avoid air-drying.
- If spray fixatives are used, the spray should be held at least 10 inches away from the slide to prevent disruption of cells by the propellant.
- When performing speculum examination, if an ulcerative or exophytic lesion is detected and is suspicious for cancer, a referral for possible biopsy is warranted.

***Note:*** *New liquid-based collection and thin layer processing methods decrease the frequency of inadequate smears and provide more sensitive and specific results.*

Adapted from: Bartlett JG, Gallant JE. Medical management of HIV infection. 2005-2006 ed. Baltimore: Johns Hopkins University; 2005.

**PAP smear results** should be interpreted in accordance with established guidelines (CDC. MMWR 2002;51[RR-6]:57-59), as follows:

- Inmates with evidence of severe inflammation should be evaluated for infection and receive a repeat PAP smear in three months.
- Inmates with PAP smears with cellular atypia or atypical squamous cells of uncertain significance (ASCUS) should have follow-up PAP smears without colposcopy every six months for two years, until three PAP smears in a row are negative. If atypia is noted a second time, the inmate should be referred for colposcopy. HPV testing can also be performed in patients with ASCUS to identify HPV types 16, 18, 31, 33, or 35 that

predispose to cervical cancer and warrant colposcopy.

- Inmates with PAP smears with low-grade cervical intraepithelial neoplasia (CIN I) require careful follow-up with repeat PAP smears every six months and referral for colposcopy if any repeat PAP smear is abnormal.
- Inmates with high-grade cervical intraepithelial neoplasia (CIN II or III), also termed carcinoma in situ, require colposcopy for potential biopsy, and follow-up monitoring.
- Inmates with invasive carcinoma require immediate referral to a specialist for evaluation and treatment.

## Immunologic Staging

**CD4+ T cells:** The measurement of CD4+ T cells is essential for immunologic staging of inmates with HIV infection, and for therapeutic monitoring and initiation of prophylaxis for opportunistic infections associated with HIV infection. A normal CD4+ T cell count ranges from 800 to 1050 cells/$mm^3$. The CD4+ T cell count may decline with concurrent illnesses, major surgery, and particularly with corticosteroid administration. Splenectomy and co-infection with human T-cell leukemia virus (HTLV-1) may increase CD4+ T cell counts. CD4+ T cell counts are subject to significant variability; they can vary up to 30% on repeated measures in the absence of a change in the patient's clinical condition. Diurnal and analytical variations in measuring CD4+ T cells are common.

The following caveats may assist the clinician in determining the inmate's immune status or interpreting the CD4+ T cell results:

- **Any changes in the absolute number of CD4+ T cells should be reviewed** to determine if the percentage of CD4+ T cells has also comparatively changed; a decline in the absolute WBC count that is not related to HIV infection is often reflected in a decline in CD4+ T cells, while the percentage of CD4+ T cells remains nearly constant.
- **The immune status of inmates with HIV infection who refuse CD4+ T cell assays can be roughly assessed by the absolute lymphocyte count.** A total lymphocyte count of $<1{,}200$ cells/$mm^3$ strongly correlates with a CD4+ T cell count of $<200$ cells/$mm^3$.
- **Inmates with HIV infection and unexplained CD4+ T cell count elevations (poor correlation with clinical history/stage of infection) may have HTLV-1 co-infection.** HTLV-1 is a retrovirus that increases the levels of CD4+ T cells and is the cause of adult T-cell leukemia and tropical spastic paraparesis. HTLV-1 infection is associated with injection drug use (with a roughly 10% co-infection rate) and foreign-birth history (particularly high rates of co-infection occur in persons from Haiti and Brazil).
- **CD8+ T-cell ("suppressor cell") counts are not helpful in predicting progression of HIV infection.**

**Quantitative Plasma HIV RNA (Viral Load):** At the time of diagnosis, plasma HIV RNA should be measured, using an FDA-approved method. Because of variability in test results and potential for intercurrent illnesses, consideration should be given to obtaining two baseline viral load determinations, drawn at least one week apart. In accordance with BOP policy, the same laboratory using the same HIV RNA assay should be utilized to minimize test variability. Measuring HIV viral burden within one month of an acute illness or immunization should be avoided, due to the possibility of false elevations.

***Note:*** *The viral load correlates with the rate of CD4+ T cell decline, the risk of opportunistic infections in persons with CD4+ T cell counts < 200 cells/mm$^3$, and the risk of transmitting HIV to others.*

## Laboratory and Diagnostic Studies

Laboratories studies should include the following:

- **Complete blood count** (CBC) with differential and platelet count;
- **Serum chemistries**, e.g., electrolytes, creatinine, and liver transaminases;
- **Viral hepatitis serologies** to screen for infections and immunity, including anti-HAV IgG for hepatitis A viral infection, HBsAg and anti-HBc for hepatitis B viral infection, and anti-HCV for hepatitis C viral infection;
- **Sexually transmitted disease (STD) screening,** including syphilis (an RPR or VDRL with a confirmatory test [FTA] for positive results) and selective screening for other STDs based on patient history;
- ***Toxoplasma gondii* IgG titers**, which identify candidates for prophylaxis and are helpful diagnostically for patients with central nervous system lesions (IgM titers are not clinically useful);
- **Fasting lipid profile and blood glucose prior to initiating antiretroviral therapy,** since certain antiretroviral medications can cause hyperlipidemia and hyperglycemia;
- **Tuberculin skin test/symptom review for TB symptoms** (anergy testing is not routinely recommended due to poor standardization of testing antigens and the failure of anergy testing to predict tuberculin skin test reactivity); and
- **Chest radiograph**, even if patient is asymptomatic, to evaluate for occult TB or other diseases.

### Immunization Status

The immunization status should be assessed, with particular attention to the following:

- **Viral hepatitis prevention:** Inmates with HIV infection who have risk factors for HAV or HBV should receive vaccinations for hepatitis A and/or B. Specific risk factors are outlined in the Clinical Practice Guidelines for Preventive Health Care and include history of injection drug use and males with a history of sex with other males.
- **Bacterial pneumonia:** Inmates with HIV infection should receive a single IM dose of the pneumococcal vaccine if not previously vaccinated. The duration of protection from primary pneumococcal vaccination is unknown. One-time re-vaccination should be considered for inmates who had a CD4+ T cell count $<200$ cells/mm$^3$ at the time of initial vaccination, which has now increased to $>200$ cells/mm$^3$ with effective antiretroviral therapy.
- **Influenza:** Influenza vaccine should be administered in late autumn and repeated annually.

### Referrals and Treatment Plan

All inmates receiving a baseline evaluation for HIV infection should have a treatment plan that is developed by the evaluating clinician and approved by a physician. Subspecialty referrals should be initiated as medically necessary and should include:

- **Referral for examination by a dentist**, for all HIV-infected inmates; and
- **Psychology referral, if clinically indicated** (in addition to the mandatory referral made as part of post-test counseling, in accordance with BOP policy).

## 5. Classification of HIV Infection

All inmates diagnosed with HIV infection should be classified in accordance with the CDC classification system as outlined in *Appendix 5*. HIV risk factors and classification should be documented appropriately. An inmate's reclassification, and updated documentation of the reclassification, are indicated only when the inmate progresses to a more advanced stage of HIV infection, not during each evaluation or with clinical improvement.

# 6. Periodic Medical Evaluations

Periodic medical evaluations of inmates with HIV infection should include obtaining the patient's history, a physical examination, immunological monitoring, and laboratory and diagnostic studies—all briefly described below.

## History and Physical Examination

The frequency of the clinician's physical examinations of an inmate with HIV infection should be based on the inmate's immune status and other relevant clinical factors, as determined by the inmate's physician. Medically complex inmates and inmates with AIDS should be followed closely by a physician. General guidelines regarding periodic medical evaluations are provided in *Appendix 4*. Patient interviews and physical examinations should target the diagnosis of complications of HIV infection, consistent with the inmate's stage of disease (see *Appendix 3*).

## Immunologic Monitoring

The inmate's immunologic status should be monitored by the measurement of CD4+ T cell counts and plasma HIV RNA levels, using FDA-approved testing methods. General guidelines for routine CD4+ T cell counts and HIV plasma RNA testing are provided in *Appendix 4*; frequency of testing should be determined on an individual basis. The indications and frequency of other laboratory monitoring depend on the inmate's antiretroviral treatment regimen and prophylactic regimen for opportunistic infections. The measurement of p24 antigen, neopterin, and β2-microglobulin levels are not routinely indicated. These markers are less reliable than plasma HIV RNA levels and do not add significant prognostic information for the clinician.

## Laboratory and Diagnostic Studies

The following additional studies should be considered during periodic evaluations of inmates with HIV infection:

- **Tuberculin skin tests (TST):** Annual TSTs are indicated for *all inmates with prior TST measurements of < 5 millimeters in duration*. Inmates with HIV infection and a tuberculin skin test of 5 millimeters or greater are candidates for treatment of latent TB infection, presuming the evaluation for active TB disease is negative.
- **Periodic chest radiographs:** Periodic CXRs are required *only for inmates with both HIV and latent TB co-infection who do not complete treatment of latent TB infection*. In these cases, CXRs should be obtained semiannually, regardless of symptoms.
- **Glucose-6-phosphate dehydrogenase (G-6-PD) testing:** *Baseline G-6-PD testing is not routinely recommended for inmates with HIV infection. Prior to initiating a potentially offending agent, G-6-PD testing should be initiated on a case-by-case basis (considering both the patient's risk for hemolytic anemia and potential for serious complications from*

*anemia)*. G-6-PD deficient inmates are susceptible to hemolytic anemia when exposed to oxidant drugs such as dapsone, primaquine, and, less commonly, sulfonamides. African Americans, and persons from Mediterranean countries, India, and Southeast Asia are most susceptible. Hemolysis is usually self-limited, involving only the older red blood cells. A small subset of Mediterraneans have a genetic variant that causes severe hemolysis when exposed to oxidant drugs. Affected patients present with severe fatigue, dyspnea, anemia, high bilirubin and LDH, reticulocytosis, methemoglobinemia, and "bite cells" on peripheral smear. During hemolysis, G-6-PD levels may be normal, despite an inherent deficiency, as susceptible cells are destroyed. Testing may not detect G-6-PD deficiency until 30 days after cessation of the offending drug.

- **Serum lipid analysis:** *Inmates with cardiovascular risk factors or elevated baseline fasting triglyceride levels or LDL cholesterol levels should have lipid parameters monitored periodically while on antiretroviral therapy*. The frequency of monitoring and the decision to medically intervene should be made on an individual basis, depending on the inmate's medical history and the severity of any lipid abnormalities. More aggressive monitoring and treatment is indicated for inmates with multiple cardiovascular risk factors, pre-existing heart disease, diabetes, and other relevant complicating conditions.
- **Pap smears:** *Young women with HIV infection are at higher risk of cervical cancer than women without HIV infection.* A pelvic examination and PAP smear should be repeated at six months, if normal at baseline, and then repeated annually thereafter in accordance with guidelines outlined above in *Section 4. Baseline Medical Evaluation*.

# 7. Prophylaxis for Opportunistic Infections (OI's)

## Indications and Prophylaxis Regimens

Primary prophylaxis for opportunistic infections is indicated for inmates with HIV infection and significant immunosuppression (reduction in CD4+ T cells) to prevent acute illnesses that may require hospitalization. Prophylaxis should be prescribed in accordance with the most recent USPHS recommendations. Specific recommendations for prophylaxis for *Pneumocystis jiroveci*[1] pneumonia (PCP), *Toxoplasma gondii*-associated encephalitis, and disseminated infection with *Mycobacterium avium* complex (MAC) are outlined in *Appendix 6*. Primary prophylaxis for other opportunistic infections should be initiated in accordance with the following:

**Latent tuberculosis infection:** Persons with HIV infection who are exposed to *M. tuberculosis* have a high risk of developing active TB disease. Treatment of latent TB infection is indicated for inmates with HIV infection who have tuberculin skin test results of 5 millimeters or greater. In addition, inmates who are close contacts of a contagious TB case require treatment for latent TB, regardless of their tuberculin skin test measurement. The preferred treatment regimen is as follows:

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[1] *Pneumocystis jiroveci* (pronounced "yee row vet zee") is the correct name for what was previously *Pneumocystis carinii*. "PCP" remains an appropriate abbreviation for pneumocystis pneumonia.

- isoniazid (900 mg) twice weekly by mouth (separated by at least two days), administered under direct observation for nine months (a total of 78 doses);
- pyridoxine (usually 50 mg per dose of isoniazid); and
- baseline liver transaminases tests with monthly assessments for clinical signs and symptoms of hepatotoxicity. Regular monitoring is only required if inmate is at high risk for hepatotoxicity (see Clinical Practice Guideline for Management of Tuberculosis).

**Cytomegalovirus (CMV):** Primary prophylaxis for CMV infection with oral gancyclovir is not routinely indicated, despite severe immunosuppression (CD4+ T cell counts $<50$ cells/mm$^3$) and positive CMV IgG titers. Although gancyclovir has efficacy as a prophylactic agent, gancyclovir treatment does not increase survival, may promote CMV resistance, and requires a significant pill burden for the patient. Gancyclovir prophylaxis should be considered on an individual basis for inmates with unique indications. Acyclovir or valacyclovir should not be prescribed for CMV prophylaxis.

**Fungal infections:** Primary prophylaxis for fungal infections is not routinely indicated for patients with AIDS. Although primary prophylaxis with fluconazole for oral candidiasis is effective, long term fluconazole use may promote candidal resistance, is not cost effective, and is less clinically important, since oral candidiasis is usually readily treatable with short term fluconazole therapy. Primary itraconazole prophylaxis for histoplasmosis (CD4+ T cell count $<100$ cells/mm$^3$) may be considered for inmates with unique indications.

## Discontinuation of OI Prophylaxis

Discontinuation of primary and secondary prophylaxis of OI's should be considered on an individual basis, using the following USPHS guidelines:

***Pneumocystis jiroveci* (PCP):** Primary and secondary prophylaxis for PCP can be discontinued for inmates whose CD4+ T cell count increases to $\geq$200 cells/mm$^3$ for at least three months in response to highly active antiretroviral therapy (HAART). Primary or secondary prophylaxis should be reintroduced if the CD4+ T cell count decreases to $<200$ cells/mm$^3$ or if PCP reoccurs at a higher CD4+ T cell count.

***Toxoplasma gondii*:** Primary prophylaxis for toxoplasmosis encephalitis can be discontinued for inmates whose CD4+ T cell count increases to $\geq$200 cells/mm$^3$ for at least three months in response to HAART therapy. Secondary prophylaxis (chronic maintenance) for toxoplasmosis can be discontinued on an individual basis for asymptomatic inmates whose CD4+ T cell count has increased to $\geq$200 cells/mm$^3$ for at least six months in response to HAART. Primary or secondary prophylaxis should be reinitiated if the CD4+ T cell count decreases to $<200$ cells/mm$^3$.

***Mycobacterium avium* complex (MAC):** Primary prophylaxis for disseminated MAC disease can be discontinued for inmates whose CD4+ T cell count increases to $\geq$100 cells/mm$^3$ for at least three months. Secondary prophylaxis (chronic maintenance) for disseminated MAC

disease can be discontinued on a case-by-case basis for asymptomatic inmates who have successfully completed a twelve-month course of MAC treatment, and have a sustained increase in their CD4+ T cell count, i.e., $>100$ cells/mm$^3$ for at least six months on a HAART regimen.

**Cytomegalovirus (CMV):** Secondary prophylaxis (chronic maintenance) for CMV can be discontinued for inmates with a history of CMV retinitis on an individual basis, in consultation with the treating ophthalmologist, if the CD4+ T cell count increases to $\geq$100–150 cells/mm$^3$ for at least six months in response to HAART. Factors to consider before discontinuing secondary prophylaxis include inmate adherence to HAART, the location and extent of retinal disease, and the vision in the contralateral eye. Close follow-up with an ophthalmologist is indicated. Prophylaxis should be reinitiated if the CD4+ T cell count decreases to $<$50-100 cells/mm$^3$.

**Fungal infections:** Guidelines for discontinuation of prophylaxis for fungal infections are outlined below.

- **Cryptococcosis:** Secondary fluconazole prophylaxis (chronic maintenance) for cryptococcosis can be discontinued on an individual basis for asymptomatic inmates whose CD4+ T cell count increases to $>$100–200 cells/mm$^3$ for at least six months in response to HAART. Reinitiate fluconazole if the CD4+ T cell count declines to $<$100–200 cells/mm$^3$.
- **Histoplasmosis:** Inmates with prior histoplasmosis ordinarily require prolonged secondary prophylaxis with oral itraconazole (200 mg twice daily). Consult an expert before discontinuing maintenance therapy in case of sustained immunologic response to HAART.
- **Coccidioidomycosis:** Inmates with prior coccidioidomycosis ordinarily require lifelong secondary prophylaxis with either oral fluconazole (400 mg daily) or oral itraconazole (200-400 mg twice daily).

## Treatment of Opportunistic Infections

Inmates diagnosed with OI's related to HIV infection should be treated and maintained on secondary prophylaxis based upon current USPHS guidelines (http://www.AIDSinfo.nih.gov).

# 8. Treatment: Antiretroviral Therapy

*The Decision to Initiate Antiretroviral Therapy:*

*Given that treatment is most effective with the initial regimen, the decision to initiate antiretroviral therapy should be weighed very carefully, giving consideration to all of the following: immunologic status, potential drug toxicities, length of anticipated incarceration, motivation, and history of previous adherence to medical treatments.*

## Timing and Indications for Therapy

While complete eradication of HIV is not achievable with current medications, HAART can suppress HIV to undetectable levels for sustained periods and thereby prolong life. The optimal time for initiating antiretroviral therapy in asymptomatic patients without AIDS is unknown. The DHHS guidelines recommend a conservative approach to initiating HAART in asymptomatic patients for a number of reasons: the adverse effects of currently available drugs on quality of life, the unknown long term health consequences of antiretroviral therapy, the requirement for strict adherence to drug regimens, and the possibility of limiting future treatment options.

Decisions about initiating antiretroviral therapy should be made in conjunction with inmates, in accordance with DHHS recommendations outlined in *Appendix 7* and summarized below:

- **<200 CD4+ T cell count, AIDS-defining illness, or symptomatic:** HAART is definitely indicated.
- **200–350 CD4+ T cell count:** Most specialists recommend HAART; some defer treatment in patients with low HIV RNA levels (<20,000 cps/mL).
- **>350 CD4+ T cell count and asymptomatic:** Ordinarily should not be treated with HAART. Inmates with significant elevations in HIV RNA, e.g., >100,000 cps/mL, should be monitored closely and considered for HAART on an individual basis.

**Adherence considerations:** Strict adherence to antiretroviral therapy is necessary for drug effectiveness and prevention of drug resistance. Patient adherence should be assessed individually. Adherence cannot be predicted based upon gender, race, prior socioeconomic status, educational level, and prior history of illicit drug use. Known predictors of poor adherence to HIV treatment regimens include poor clinician-patient relationship, depression or other mental illness, active drug or alcohol use, and lack of patient education.

Inmate education by clinicians, pharmacists, and the nursing staff *before* initiating complicated antiretroviral drug treatment regimens is critical. Counseling should include a discussion of the risks and benefits of HAART, potential drug side effects, methods for managing side effects, instructions for taking scheduled medications by dose and time, and the need to report missed doses. Mental health conditions should be evaluated, treated, and stabilized, *prior* to initiating antiretroviral therapy.

| Table 6. Strategies to Improve Adherence to Antiretroviral Therapy |
|---|
| ▸ Establish readiness to start therapy.<br>▸ Provide education on medication dosing.<br>▸ Review potential side effects.<br>▸ Anticipate and treat side effects.<br>▸ Utilize educational aids, including pictures and calendars.<br>▸ Engage family and friends.<br>▸ Simplify regimens, dosing, and food requirements.<br>▸ Utilize a team approach among nurses, pharmacists, and peer counselors.<br>▸ Provide accessible, trusted health care team. |
| *From:* DHHS. *Guidelines for the Use of Antiretroviral Agents in HIV-1-Infected Adults and Adolescents,* October 6, 2005 (Table 15). |

**Antiretroviral medications should initially be administered by direct observation on a dose-by-dose or daily basis.** Directly observed medication delivery should be maintained or gradually changed to inmate self-administration at the discretion of the treating physician, based on patient adherence and the virologic response to therapy. Soon-to-be-released inmates on directly observed antiretroviral medications should be gradually transitioned to a self-administration regimen prior to release.

## Initial Drug Regimens

The selection of an initial antiretroviral treatment regimen should ordinarily be consistent with one of the two DHHS preferred regimens as described in *Appendix 8a* and indicated below.

**(1) Regimen with non-nucleoside reverse transcriptase inhibitor (NNRTI):**

Efavirenz + (lamivudine or emtricitabine) + (zidovudine or tenofovir DF)

***Note:*** *Efavirenz is contraindicated for use in the first trimester of pregnancy or in women with high pregnancy potential.*

**(2) Regimen with protease inhibitor (PI):**

Kaletra® (lopinavir + ritonavir) + (lamivudine or emtricitabine) + zidovudine

Recommended alternative NNRTI and PI regimens are detailed in *Appendix 8b* and may be indicated for certain inmates. See the DHHS guidelines for a discussion of the advantages and disadvantages of different initial regimens. All antiretroviral medications should be initiated at full dose, with the exception of those that require dose escalation (including nevirapine, and—in certain cases—ritonavir plus saquinavir).

HIV resistance testing should be considered on a case-by case basis prior to initiating HAART in treatment-naive individuals. Resistance to certain drugs may be detected when testing is performed prior to initiating HAART; however, resistance to some drugs may not be detectable in the absence of pressure from antiviral therapy.

**Certain antiretroviral medications which should *not* be prescribed at all, or *not* as an initial regimen, are listed in *Appendix 9*.**

***Note:*** *FDA-approved antiretroviral medications and their dosing recommendations are enumerated in the DHHS guidelines. Clinicians managing inmates with HIV infection should regularly review DHHS guideline to keep abreast of new FDA-approved antiretroviral medications, changes in antiretroviral dosages, drug side effects and adverse reactions, monitoring parameters, and complex drug interactions.*

## Immune Reconstitution

Effective antiretroviral therapy may result in immune reconstitution with paradoxical inflammatory reactions to certain pathogens. These acute reactions can include inflammatory masses or adenitis related to *M. avium* infection, active tuberculosis, viritis associated with CMV infection, cryptococcal meningitis, active hepatitis B and C, and herpes zoster. Illnesses secondary to immune reconstitution ordinarily do not require discontinuation of antiretroviral therapy.

## Monitoring Response to Initial Therapy

Plasma HIV RNA should be measured immediately before starting antiretroviral therapy, and then at two-to-eight weeks *and* three-to-four months after starting therapy. The optimal response to a HAART regimen is maximal viral suppression (< 50 cps/mL).

Two test methods are used in the BOP to detect the quantity of virus in the blood: the standard viral load and the ultra-sensitive viral load. The standard viral load (HIV RNA) test method detects the quantity of HIV that is measurable in the blood between a range of 400-750,000 copies/mL; it is not sensitive enough to detect the quantity of virus in the blood that falls below 400 cps/mL or which is greater than 750,000 cps/mL. The ultrasensitive (UL) viral load test method detects the quantity of HIV virus that is measurable in the blood between a range of 50-75,000 cps/mL. The standard method should be used when the predicted amount of virus exceeds 400 cps/mL and the ultrasensitive method should be used when the predicted amount of virus falls below 400 cps/mL. The goal of therapy is to achieve an HIV-1 viral load < 50 cps/mL or "undetectable." An ultrasensitive HIV RNA test must be specifically ordered when assessing inmates for undetectable plasma HIV RNA.

The rate of HIV RNA decline that follows the initiation of antiretroviral therapy and the subsequent HIV RNA level nadir strongly predict the durability of antiviral suppression and the long term effectiveness of the treatment regimen. A highly effective antiretroviral treatment regimen will result in roughly the following rate of viral suppression:

| **Table 7. Goal for Viral Suppression with HAART** | |
|---|---|
| **Weeks of Treatment:** | **Decline in HIV RNA cps/mL:** |
| 1+ weeks | Close to a 1 log (10-fold) decline |
| 4+ weeks | Close to a 2 log (100-fold) decline |
| 4–6 months | Suppression to <50 cps/mL |

## Assessing and Managing Antiretroviral Treatment Failure

Failure to achieve an adequate viral response following the initiation of therapy should prompt the treating clinician to evaluate potential causes of a poor treatment response, including inadequate adherence, drug interactions that decrease antiretroviral drug levels, malabsorption of medications, or an inadequate regimen. Detectable HIV RNA levels should be confirmed. **Consult with a physician with HIV treatment expertise and/or a BOP HIV Clinical Pharmacist before initiating an alternative regimen.**

**Resistance Testing:** Antiretroviral drug-resistance testing is recommended on an individual basis for treated inmates who have not achieved adequate viral suppression, as outlined in Table 7 above. Both genotypic and phenotypic drug-resistance assays should be ordered selectively and strategically in situations that will most likely benefit the patient. Genotypic resistance tests are generally preferred for evaluation of first or second treatment failures. Phenotypic resistance tests are of most benefit in evaluating patients with multiple regimen failures. **Resistance testing is more reliable in identifying drugs that should be avoided, rather than drugs that are most likely to be effective.**

The need for resistance testing, the type of assay, the timing of testing, and the interpretation of the results should be determined in consultation with a clinical expert in accordance with the following guidance:

- Testing is most clearly indicated for patients who have failed previous antiretroviral therapy or who have suboptimal suppression of viral load after initiating HAART.
- Sufficient plasma HIV RNA must be present for testing (i.e, 1,000 cps/mL); consult with the laboratory that is conducting the testing for borderline levels.
- Testing should be done while the patient is currently taking the antiretroviral agents that are being assessed for drug resistance.
- Testing for patients with acute HIV infection should be considered together with a knowledgeable physician consultant.

**Changing Therapy:** Changing an inmate's antiretroviral drug regimen because of poor viral suppression should be approached cautiously since retreatment options may be limited and are often less effective. Furthermore, undetectable HIV RNA levels are not achievable in certain patients. Changes in antiretroviral medications should be considered on an individual basis for inmates who have not achieved or sustained undetectable HIV RNA levels after a thorough assessment as described below.

**Conduct a thorough assessment that includes the following:**

- Review current DHHS guidelines for changing antiretroviral therapy.
- Repeat HIV RNA levels to confirm sustained elevations in HIV RNA.
- Review antiretroviral treatment history to determine if alternative drug options are feasible.
- Carefully review potential causes of virologic failure, including lack of adherence to medication regimen, drug side effects, drug interactions, poor absorption of medications, and the development of virologic resistance (consult with the pharmacist for pharmacokinetic and adherence concerns).
- If drug toxicity is a factor in treatment failure, and HIV RNA levels were adequately suppressed with the original regimen, consider substitution of an alternative drug in the same class.
- Refrain from changing antiretroviral therapy during periods of transition such as pending release or transfer.
- Discuss treatment options with the inmate, including the benefits and risks of changing antiretroviral therapy, to determine the inmate's preference and motivation. (Acute medical problems, mental health conditions, active substance abuse, and poor institutional adjustment issues should ordinarily be addressed before initiating a new antiretroviral regimen.)

- **Determine the optimal new regimen, as follows:**
  - If it is determined that initiation of a new regimen is warranted, perform drug-resistance testing while the inmate is still taking the failing regimen.
  - Identify susceptible drugs and drug classes.
  - Avoid changing a single drug or adding a single drug to a failing regimen; ordinarily an entirely new regimen is indicated.
  - For drug failure, avoid switching from one NNRTI to another, or from one PI combination to another. That is to say, if the initial regimen was an NNRTI regimen, switch to a PI-containing regimen, and vice versa.
  - Obtain recommendations from a clinical expert and consider drug resistance testing (DHHS-funded HIV expert consultation line: 1-800-933-0440).

## Discontinuing Therapy

Discontinuing HAART may be an appropriate option for certain inmates, but should always be considered on an individual basis.

**Refractory patients:** Antiretroviral therapy ordinarily should not be discontinued solely because of a lack of viral suppression; even suboptimal virologic responses to antiretroviral therapy may increase CD4+ T cells and prevent or delay clinical progression. Continuing antiretroviral medications for terminally ill inmates, however, may provide little clinical benefit and negatively affect quality of life. In such cases, discontinuing antiretroviral therapy should be considered after thoroughly discussing the risks and benefits with the inmate.

**Responding patients:** Inmates who had previously begun taking HAART with CD4+ T cell counts $>350$ cells/mm$^3$, who now have sustained undetectable viral loads and CD4+ T cell counts $>500$/mm$^3$, might consider discontinuing antiretroviral medications to improve quality of life and avoid long term drug toxicities. DHHS guidelines, however, state that the long term risks and benefits of discontinuing HAART in this setting are unknown. Therefore, this decision should be weighed carefully by both the inmate and the treating physician. Inmates taken off HAART should be monitored closely for viral rebound and worsening immunosuppression.

**Discontinuing therapy with NNRTIs:** NNRTIs (efavirenz and nevirapine) have a long half-life, remaining in the blood after other antiretroviral drugs have cleared. For this reason, patients taking regimens containing an NNRTI are at risk of developing resistance to the NNRTI following cessation of the regimen. The optimal strategy for safely stopping an NNRTI-containing regimen is uncertain, but potential options include: (1) Discontinue the NNRTI and substitute a PI for 1–3 weeks, and then stop all drugs together; or (2) Discontinue the NNRTI and continue other drugs for 1 additional week.

## Adverse Drug Reactions

Antiretroviral dosing, side effects, monitoring parameters, and potential drug interactions should be carefully reviewed. See the DHHS guideline, prior to prescribing or changing antiretroviral therapy.

**"Black Box" warnings and other potential serious adverse reactions** to antiretroviral medications include the following:

- **NRTIs:** lactic acidosis and severe hepatomegaly with steatosis
- **Abacavir:** fatal hypersensitivity reactions with rechallenge
- **Amprenavir:** propylene glycol toxicity with oral solution particularly if given to persons with renal/hepatic disease or pregnancy
- **Didanosine (ddI) +/- stavudine (d4T):** pancreatitis
- **Didanosine (ddI) + stavudine (d4T):** lactic acidosis

- **Efavirenz:** teratogenic; nightmares; abuse potential ("street value")
- **Nevirapine:** life-threatening hepatotoxicity (particularly when given to treatment-naive women with CD4+ T cell counts ≥ 250/mm$^3$ or men ≥ 400/mm$^3$); life-threatening exfoliative dermatitis; requires dose escalation required after initial 14 days of introductory dose of 200 mg daily
- **Ritonavir:** marked potential for serious drug interactions
- **Tipranavir:** co-administered with ritonavir has been associated with clinical hepatitis and hepatic decompensation
- **Zalcitabine (ddC):** severe peripheral neuropathy; hematologic toxicities, e.g., severe anemia

**Significant adverse drug reactions** are discussed in more detail below:

- **PIs and hyperglycemia:** New onset diabetes and insulin resistance have been associated with the PIs. Baseline and periodic fasting blood glucoses should be obtained to monitor inmates taking PIs. Further diagnostic studies, such as a glucose tolerance test, should be pursued for inmates with borderline fasting blood glucoses. Other cardiac risk factors should be carefully assessed to gauge the risk of diabetes to the inmate's overall health. Hyperglycemia should be treated in accordance with current treatment guidelines for diabetes management. If metformin is prescribed, inmates should be monitored closely for lactic acidosis, particularly if they are taking an NRTI. The decision to switch to a non-PI-containing antiretroviral regimen for inmates who develop diabetes should be made on an individual basis, after weighing the severity of diabetes and the overall health risks to the inmate, as well as the potential for other effective antiretroviral treatments options.
- **HAART and hyperlipidemia:** Hyperlipidemia with elevations in triglycerides and cholesterol, is associated with HAART, particularly PI-based regimens (except atazanavir). A fasting lipid analysis should be performed prior to initiating HAART, and periodically thereafter, for inmates who have elevated cholesterol or triglyceride levels or who have multiple cardiac risk factors. Inmates with normal lipid studies should have a fasting lipid analysis repeated annually. Elevations in LDL-cholesterol and triglycerides should be treated in accordance with current treatment guidelines from the National Cholesterol Education Program (NCEP), the BOP Clinical Practice Guidelines for Management of Lipid Disorders, and the BOP National Formulary. Fluvastatin or pravastatin are usually the drugs of choice for treating patients on HAART who have elevated LDL cholesterol levels. These two drugs have shown no serious interactions with antiretroviral medications.
- **NRTIs and lactic acidosis:** Lactic acidosis with hepatic steatosis and mitochondrial toxicity is a potentially life-threatening complication associated with NRTIs, particularly didanosine and stavudine. Affected patients may be asymptomatic, or they may present with nausea, vomiting, weight loss, or dyspnea. Venous lactate levels are elevated (>2 mmol/L) in these patients. The degree of hyperlactatemia correlates with prognosis. Elevations in ALT, CPK, and amylase may also be observed. Treatment is discontinuation of the NRTI. Didanosine and stavudine should *never* be prescribed together due to the increased risk of lactic acidosis with this NRTI combination.

- **Didanosine and pancreatitis:** Pancreatitis is a potentially life-threatening complication associated with didanosine therapy alone or in combination with stavudine.
- **Abacavir hypersensitivity:** A hypersensitivity reaction is associated with abacavir and is characterized by a nonspecific syndrome of fever, rash, arthralgias, cough, dyspnea, nausea, and vomiting. The hypersensitivity reaction usually occurs within six weeks of initiating abacavir. Restarting patients with a history of a hypersensitivity reaction on abacavir can result in a life-threatening anaphylactic reaction.
- **Indinavir and nephrolithiasis/renal insufficiency:** Both nephrolithiasis and renal insufficiency are independently associated with the PI, indinavir. Toxicity is reduced by increasing fluid intake for the three hours following each dose of the medication.

## Complicating Co-morbid Conditions

**Pregnancy:** All pregnant women, with or without known risk factors, should be tested for HIV infection. In treating pregnant women with HIV infection, the primary objectives are to prevent clinical progression of HIV infection in the mother *and* reduce the risk of perinatal transmission to the fetus. Patient-specific antiretroviral drug therapy ordinarily is indicated for all pregnant women regardless of the CD4+ T cell count and viral load, in accordance with the most recent U.S. Public Health Service treatment guidelines (accessible at http://www.AIDSinfo.nih.gov). Consultation with a physician who has expertise in treating pregnant women with HIV infection is warranted by the complexities of the treatment decisions about antiretroviral selection and timing, the mode of delivery, and intrapartum care. Treatment decisions should be made on an individual basis after carefully reviewing with the inmate the known risks and benefits. The following general information should be considered:

- Pregnancy, itself, does not affect progression of HIV infection.
- The risk of perinatal HIV transmission is markedly reduced with HAART therapy.
- HAART is recommended for pregnant patients with an elevated HIV RNA level of >1,000 cps/mL. Zidovudine should be included in the HAART regimen whenever clinically feasible. Monotherapy with zidovudine, rather than HAART, is recommended by some experts for pregnant inmates with a viral load <1,000 cps/mL. Women in the first trimester of pregnancy may consider delaying antiretroviral therapy until after 10–12 weeks of gestation.
- USPHS recommendations indicate the use of intravenous zidovudine during the intrapartum period whenever possible, regardless of the prenatal antiretroviral regimen.
- Cesarean section should be considered for patients with a viral load >1,000 cps/mL at the time of delivery.
- Hydroxyurea, efavirenz, tenofovir or didanosine + stavudine should not be prescribed to pregnant women. Indinavir should be avoided during the third trimester due to the risk of hyperbilirubinemia in the newborn. Nevirapine should be avoided in pregnant women with a CD4+ T cell count of >250/mm$^3$ due to the increase risk of hepatic necrosis.
- Breast feeding is not generally recommended because of the risk of HIV transmission from mother to child.

**Tuberculosis co-infection:** All inmates with HIV infection who have unexplained pulmonary infiltrates or TB signs or symptoms should be aggressively evaluated for TB disease. Inmates with TB disease and HIV infection may present with atypical presentations of TB such as noncavitary pulmonary infiltrates or normal chest radiographs.

The drug treatment regimen for TB disease for persons with HIV infection is similar to the regimen for persons without HIV infection. Persons with HIV infection and a CD4+ T cell count $< 100$ cells/$mm^3$, however, do require a more intensive TB medication dosage schedule: daily directly observed therapy for the 8-week initial phase, and either daily or thrice weekly directly observed therapy for the 18-week continuation phase of TB medications. If the inmate with TB disease is receiving antiretroviral medications, the specific TB and antiretroviral drug regimens should be determined in consultation with a knowledgeable physician and the most recent USPHS treatment recommendations for both HIV and TB. Rifampin interacts with many antiretroviral medications; therefore, TB and HIV medications and/or dosages often require adjustments. Consult updated CDC guidelines regarding HIV/TB treatment (accessible at http://www.AIDSinfo.nih.gov).

**Hepatitis C co-infection:** The preferred antiretroviral drug regimens for initiating therapy for HIV infection are the same for inmates with and without concurrent HCV infection. Liver transaminases should be monitored closely in inmates with HCV infection who are prescribed antiretroviral medications.

The initiation of antiviral therapy for chronic hepatitis C in persons with HIV infection should be considered on an individual basis, by assessing the stages of both the HIV and the HCV infections and weighing the potential risks and benefits of treatment. (See BOP Clinical Practice Guidelines for Management of Viral Hepatitis.)

**Wasting syndrome:** The CDC defines the HIV wasting syndrome as progressive, involuntary weight loss (10% reduction in baseline body weight) plus chronic diarrhea, chronic weakness, or documented fever in the absence of an explanatory concurrent illness or condition. Smaller reductions in weight (5-10%) without associated symptoms, however, may be clinically significant in persons with HIV infection, particularly when complicated by AIDS. Other potential causes of weight loss such as active TB, malignancies, drug side effects, depression, and opportunistic infections associated with AIDS should be actively identified and treated. Effective antiretroviral therapy should be initiated or improved in order to maximize HIV RNA suppression. Oral nutritional supplements ordinarily do not provide any additional benefit to a healthy diet. Other treatments, such as appetite stimulants or anabolic steroids, should be considered on a case-by-case basis.

# 9. Documentation

Documentation of medical care for inmates with HIV infection should be maintained in accordance with the following:

- CDC initial and updated HIV classifications should be documented appropriately on the problem list.
- The BOP HIV Chronic Care Clinic Flowsheet is strongly recommended for tracking treatment and laboratory parameters for sentenced inmates who have anticipated incarcerations of greater than one year.
- Treatment plans for baseline and periodic clinician evaluations should be documented in medical record progress notes.

# 10. Transition to the Community

Continuity of prescribed treatments, particularly antiretroviral medications, is medically critical for inmates who are released directly to the community or to community placement facilities such as halfway houses. Preparation for transitional medical needs should be initiated well in advance of anticipated release, in accordance with the following guidelines:

- Release planning should be coordinated with the inmate's case manager and community corrections staff, in accordance with BOP policy.
- The inmate's primary provider or other knowledgeable health care provider should meet with the inmate to finalize the treatment plan and ensure that the inmate understands the importance of adherence to prescribed treatments and specific follow-up instructions.
- Specific efforts should be made by BOP staff to coordinate access to federally funded drug assistance programs such as ADAP (AIDS Drug Assistance Program), as well as other recommended treatments such as mental health care and substance abuse programs. Consultation with BOP social workers should be pursued on a case-by-case basis to assist with release planning efforts.
- A consent for release of medical information should be obtained from the inmate in accordance with BOP policy so that the inmate's treatment plan can be discussed with the community health care provider.
- An adequate supply of medications should be provided to the inmate prior to release or during community placement, in accordance with BOP policy.

# 11. Infection Control

## Transmission

HIV is spread primarily through percutaneuous blood exposures such as injection drug use, unprotected vaginal and anal intercourse, and transfusion of contaminated blood products (received prior to 1985). HIV is also transmitted from mother to child perinatally during pregnancy and through breastfeeding. HIV is not spread by sneezing, hugging, coughing, sharing eating utensils and drinking glasses, or casual contact; nor is it spread in food or water.

All inmates should be counseled during orientation to the institution, and when appropriate during clinical evaluations, of the importance of preventing blood exposures to others during activities of daily living. The counseling message should include the following guidance:

- Do not have sex while in prison; do not have unprotected sex upon release to the community.
- Do not shoot drugs.
- Do not share tattooing or body piercing equipment.
- Do not share personal items that might have your blood on them such as toothbrushes, dental appliances, nail clippers or other nail-grooming equipment, or razors.
- Cover your cuts and skin sores to keep your blood from contacting other persons, and report to your health care provider should you have an open, draining wound.

These messages should be reinforced for all inmates diagnosed with HIV infection. Additionally, inmates with HIV infection should be given the following guidance:

- Do not donate blood, body organs or other tissue, or semen.
- Always wash hands before eating, after touching contaminated clothing/bedding, after attending to personal hygiene, after gardening or other outdoor activities, after touching animals, or after touching any other contaminated items.
- Wash fresh fruits and vegetables thoroughly before eating.
- Avoid eating undercooked or raw meats.
- Stop smoking, and do not begin smoking again upon release.
- Avoid touching stray animals.

## Inmate Management

Staff should use the following infection control guidelines when managing inmates:

- Use correctional standard precautions (see Definitions) when in contact with any inmate's blood or other potentially infectious materials, whether or not the inmate is known to have HIV infection.
- Use infection control practices in which non-disposable patient-care items are appropriately cleaned, disinfected, or sterilized, based on the use. Take measures to prevent cross-contamination during patient care (for example, dialysis, vascular access, cauterizing, or dental procedures), in accordance with the Centers for Disease Control Guidelines on Hand Washing and Hospital Environmental Control.
- Use the appropriate airborne, droplet, and/or contact transmission precautions when indicated for immunosuppressed inmates with HIV infection who have or may have acute secondary infections that are transmissible by respiratory contact, or by direct hand or skin-to-skin contact.

# Definitions

**CD4+ T cell** is a T-cell lymphocyte that is essential for human cellular immunity. HIV infection results in a decline of CD4+ T cells, immunosuppression, and susceptibility to opportunistic infections.

**Clinician** is a physician or mid-level provider.

**Directly observed therapy (DOT)** for HIV infection is the unit dose administration of antiretroviral medications to an inmate by a clinician, nurse, pharmacist, or specially trained staff person who directly observes ingestion.

**EIA** is Enzyme Immunoassay, a laboratory test for detecting antibodies.

**HAART** is highly active, antiretroviral therapy that can achieve sustained, undetectable HIV RNA levels in infected persons.

**HIV RNA test** is a laboratory assay used to quantitatively measure the presence of HIV viral particles in serum, which is expressed as copies per milliliter (cps/mL) and referred to as "viral load" or "viral burden." HIV RNA levels are measured for the staging of HIV infection and therapeutic monitoring. Standard and ultrasensitive assays are available.

**Immune reconstitution** is the regaining of functional CD4+ T cells (host cellular immunity) following treatment of a previously immunocompromised condition such as AIDS. Immune reconstitution in the context of HIV infection results from effective antiretroviral therapy and may paradoxically be associated with inflammatory reactions to certain pathogens such as *M. tuberculosis*, cytomegalovirus, and *M. avium* complex.

**Infection control precautions** include the following categories of precautions relevant to the correctional setting:

- **Standard precautions** apply to blood and all other body fluids, secretions, and excretions (except sweat), whether or not they contain visible blood; nonintact skin; and mucous membranes. Standard precautions include:
  - adequate hand hygiene measures in accordance with CDC guidelines after touching blood, body fluids, secretions, excretions (including wound drainage), and contaminated items, whether or not gloves are worn;
  - routine use of personal protective equipment such as gloves, masks, eye protection or face shields, and gowns whenever contact with blood, body fluids, secretions, excretions (including wound drainage) is anticipated;
  - ensuring that environmental surfaces in the health care setting are routinely cleaned and disinfected;
  - ensuring that linens are handled and cleaned in a manner that prevents staff exposure to contaminated laundry and that avoids the transfer of microorganisms from person to person or from place to place;

  - safe disposal of needles and other sharp instruments and devices in appropriate leakproof and puncture-resistant containers; and
  - placing in a private room those patients who may contaminate the environment or cannot be expected to maintain adequate hygiene or a sanitary environment.

- **Hospital standard precautions** are infection control practices used in the hospital setting to reduce the risk of transmission of microorganisms from both recognized and unrecognized sources of infection.
- **Correctional standard precautions** are hospital standard precautions that have been adapted to the correctional setting by taking into account security issues, inmate housing factors, and infection control concerns inherent in jails and prisons. See BOP Clinical Practice Guidelines for Methicillin Resistant *Staphylococcus aureus,* Appendix 6a and Appendix 7a.
- **Contact transmission precautions** are indicated for inmates with pediculosis, scabies, impetigo, and noncontained skin infections such as abscesses, cellulitis, and decubiti; viral conjunctivitis; certain highly contagious enteric infections such as *Clostridium difficile* or diarrhea combined with infection with hepatitis A virus, Shigella, or *Escherichia coli* O157:H7; and gastrointestinal, respiratory, skin, or wound infections or colonization with certain multi-drug resistant bacteria such as methicillin-resistant Staphylococcus aureus (MRSA). Contact precautions include routine standard precautions, as well as the following additional measures:
  - The inmate should be placed in a private cell. Inmates with the same infection can be housed together if single-cell status is not feasible.
  - Clean, nonsterile gloves should be worn when entering the cell. Gloves should be changed when grossly contaminated with potentially infectious material such as fecal material and wound drainage. Gloves must be removed and hands cleaned immediately (by washing with an antimicrobial agent or using a waterless antiseptic agent) before leaving the inmate's cell. Once hands have been cleaned, care must be taken not to touch potentially contaminated environmental surfaces or items.
  - A clean, nonsterile gown should be worn when entering the inmate's cell whenever direct contact with the inmate or with environmental surfaces or items in the cell is anticipated. The gown should be removed before leaving the inmate's cell, taking care not to have one's clothing contact potentially contaminated environmental surfaces.
  - The inmate should leave his or her cell for essential purposes only. If the inmate leaves the cell, precautions should be taken to minimize the risk of transmitting microorganisms to other persons and to avoid contamination of environmental surfaces or items.

- Noncritical patient care equipment should be dedicated to a single inmate. Common medical equipment that must be shared between patients must be adequately cleaned and disinfected before use by another inmate.
- No special requirements are indicated for eating utensils. Disposable or reusable utensils may be used. The use of detergent and washing procedures for decontamination are sufficient.

- **Droplet transmission precautions** are indicated for inmates with illnesses such as influenza, mumps, rubella, streptococcal pharyngitis or pneumonia, invasive *Haemophilus influenzae* type b disease such as pneumonia and epiglottitis, or invasive *Neisseria meningitidis* disease such as meningitis and pneumonia, as well as MRSA pneumonia.

  ***Note:*** *Inmates with an unknown respiratory illness compatible with tuberculosis should be managed with airborne precautions.*

  Illnesses requiring droplet precautions are caused by infectious agents that are transmitted in large-particle droplets (>5 m in size) when an infectious patient coughs, sneezes, talks, or has certain procedures performed such as suctioning and bronchoscopy. Transmission of infection occurs when droplets containing the microorganism are propelled a short distance in the air and then deposited on the host's mouth, nasal mucosa, or conjunctivae. Large-particle droplets do not remain suspended in the air. Droplet precautions include routine standard precautions, as well as the following measures:

  - The inmate should be placed in a private cell (it does not require negative pressure or a special air handling system). The door of the cell may be opened without concern that the infectious agent will be transmitted to others. Inmates with the same infection may be housed together if single-cell housing status is not feasible.
  - A mask, eye protection, or a face shield should be worn to protect mucous membranes of the eyes, nose, and mouth during procedures and patient care activities that are likely to generate splashes or sprays. Masks should be worn when entering the cell or when within three feet of the inmate. An N95 respirator is not required.
  - Isolated inmates must wear a surgical mask if they must leave their cell. Inmate movement outside the cell should be limited to essential purposes.

- **Airborne transmission precautions** are protective measures used to prevent the spread of infections such as tuberculosis, varicella (chicken pox), and rubeola (measles) that are transmitted by inhalation of microorganisms, 5 μm or smaller in size. These tiny germs can remain suspended in airborne nuclei in poorly circulated air and can be potentially transmitted over long distances from the source patient.

  Infection control airborne precautions include the isolation of contagious inmates in a cell with monitored, negative air pressure in accordance with CDC guidelines and BOP policy. Inmates infected with the same microorganism can be cohorted together in the same cell. If a negative pressure cell is not available, the optimal management of the inmate should be determined on a case-by-case basis in consultation with a knowledgeable infection control practitioner.

  Staff entering the cell of an inmate with pulmonary tuberculosis should wear appropriate

respiratory protection (i.e., HEPA or N-95 respirators). Susceptible staff should not enter the cell of an inmate who has varicella or measles unless it is absolutely essential, and then only with respiratory protection. Staff who are immune to varicella or measles do not require respiratory protection when entering the cell of an isolated inmate with varicella or measles. Contagious inmates infected with pathogens transmitted by airborne microorganisms should wear a surgical mask whenever medical or security measures require them to leave negative-pressure isolation cell.

- **Correctional transmission-based precautions** are contact, droplet, and airborne precautions that have been adapted to the correctional setting, taking into account relevant security concerns, inmate housing factors, and infection control issues inherent in jails and prisons. See BOP Clinical Practice Guidelines for Methicillin Resistant *Staphylococcus aureus,* Appendix 6b and Appendix 7b.

**Resistance testing** for HIV refers to genotypic and phenotypic assays that assess HIV resistance to specific antiretroviral drugs. Genotypic assays measure specific mutations to viral enzymes (reverse transcriptase/protease). Phenotypic assays measure the ability of HIV to grow in various concentrations of antiretroviral drugs.

**Undetectable HIV** is the measurement of HIV RNA at levels that are below the level of detectability of specific assays, $<50$ cps/mL.

# Appendix 1. Guidelines Regarding Medical Care of HIV-Infected Persons

| | | | |
|---|---|---|---|
| **HIV testing and counseling** | Revised Guidelines for HIV Counseling, Testing, and Referral | http://www.cdc.gov/mmwr/pdf/rr/rr5019.pdf or http://aidsinfo.nih.gov/guidelines | CDC |
| **Risk assessment** | Incorporating HIV Prevention into the Medical Care of Persons Living with HIV | http://www.cdc.gov/mmwr/preview/mmwrhtml/rr5212a1.htm or http://aidsinfo.nih.gov/guidelines | CDC<br>HRSA<br>NIH<br>IDSA |
| **Antiretroviral therapy** | Guidelines for the Use of Antiretroviral Agents in HIV-Infected Adults and Adolescents | http://aidsinfo.nih.gov/guidelines | DHHS |
| **Antiretroviral therapy – pregnant women** | Recommendations for the Use of Antiretroviral Drugs in Pregnant HIV-1 Infected Women for Maternal Health and Interventions to Reduce Perinatal HIV-1 Transmission in the United States | http://aidsinfo.nih.gov/guidelines | USPHS |
| **Resistance testing** | Antiretroviral Drug Resistance Testing in Adults Infected with Human Immunodeficiency Virus Type 1 (2005) | http://www.iasusa.org/pub/2005.html | IAS-USA |
| **Opportunistic infections** | Guidelines for Preventing Opportunistic Infections among HIV-Infected Persons | http://www.cdc.gov/mmwr/PDF/rr/rr5108.pdf or http://aidsinfo.nih.gov/guidelines | USPHS<br>IDSA |
| **Sexually transmitted diseases** | Sexually Transmitted Diseases Treatment Guidelines, 2002 | http://www.cdc.gov/std/treatment/rr5106.pdf | CDC |
| **Immunizations** | Adult Immunization Schedule | http://www.cdc.gov/nip/recs/adult-schedule.htm | CDC<br>ACIP |
| **Occupational exposures** | Updated U.S. Public Health Service Guidelines for the Management of Occupational Exposures to HIV and Recommendations for Postexposure Prophylaxis | http://www.cdc.gov/mmwr/preview/mmwrhtml/rr5409a1.htm or http://aidsinfo.nih.gov/guidelines | CDC |
| **Non-occupational exposures** | Antiretroviral Postexposure Prophylaxis After Sexual, Injection-Drug Use, or Other Nonoccupational Exposure to HIV in the United States | http://www.cdc.gov/mmwr/preview/mmwrhtml/rr5402a1.htm or http://aidsinfo.nih.gov/guidelines | DHHS<br>CDC |

*ACIP=Advisory Committee on Immunization Practices; CDC=Centers for Disease Control and Prevention; DHHS=Department of Health and Human Services; IDSA=Infectious Disease Society of America; IAS-USA=International AIDS Society-USA; NIH=National Institutes of Health; USPHS=U.S. Public Health Service*

## Appendix 2. Criteria for Testing for HIV Infection

| Condition | Comments |
|---|---|
| ***All* inmates with the following (regardless of sentencing or duration of stay):** | |
| **Unexplained signs/symptoms compatible with acute HIV infection** | Including, but not limited to: fever, adenopathy, pharyngitis, rash, myalgias, and headache. |
| **Signs/symptoms of HIV-related condition** | Including, but not limited to: thrush, herpes zoster, oral hairy leukoplakia, severe seborrhea, unexplained lymphadenopathy, and opportunistic infections. |
| **Pregnant women** | Testing is recommended for all pregnant women as early as possible during pregnancy. Current antiretroviral therapy and obstetrical interventions markedly reduce the risk of transmitting HIV from infected mothers to their infants. |
| **Recent exposures to HIV** | Follow-up HIV-antibody testing should be performed at the following intervals after the exposure date: 6 weeks, 12 weeks, and 6 months (and 12 months for those who become infected with HCV after exposure to a source co-infected with HIV and HCV). |
| **Active tuberculosis** | HIV infection is a potent risk factor for developing active tuberculosis**.** |
| **Positive tuberculin skin test** | Persons who are co-infected with HIV and TB are high priority candidates for treatment of latent TB infection. |
| **Otherwise clinically indicated** | On a case-by-case basis. |
| ***Sentenced (6 months or more)* inmates with the following risk factors:** | |
| ▸ Injected illegal drugs and shared equipment<br>▸ (For males) sex with another man<br>▸ Had unprotected intercourse with a person with known or suspected HIV infection<br>▸ History of gonorrhea or syphilis<br>▸ Had unprotected intercourse with more than one sex partner<br>▸ From a high risk country (Sub-Saharan Africa or West Africa).<br>▸ Received blood products between 1977 and May 1985<br>▸ Hemophilia<br>▸ Percutaneous exposure to blood<br>▸ Or when the inmate requests to be tested | |

## Appendix 3. Correlation of Complications with CD4+ T Cell Count*

| CD4 + T cells/mm$^3$ | Infectious Complications | Noninfectious† Complications |
|---|---|---|
| **> 500** | ▸ Acute retroviral syndrome<br>▸ Candidal vaginitis | ▸ Persistent generalized lymphadenopathy (PGL)<br>▸ Guillain-Barré syndrome<br>▸ Myopathy<br>▸ Aseptic meningitis |
| **200-500** | ▸ Pneumococcal and other bacterial pneumonia<br>▸ Pulmonary tuberculosis<br>▸ Herpes zoster<br>▸ Oropharyngeal candidiasis (thrush)<br>▸ Cryptosporidiosis, self-limited<br>▸ Kaposi's sarcoma<br>▸ Oral hairy leukoplakia | ▸ Cervical intraepithelial neoplasia<br>▸ Cervical cancer<br>▸ B-cell lymphoma<br>▸ Anemia<br>▸ Mononeuronal multiplex<br>▸ Idiopathic thrombocytopenic purpura<br>▸ Hodgkin's lymphoma<br>▸ Lymphocytic interstitial pneumonitis |
| **< 200** | ▸ Pneumocystis pneumonia<br>▸ Disseminated histoplasmosis<br>▸ Coccidioidomycosis<br>▸ Miliary/extrapulmonary TB<br>▸ Progressive multifocal leukoencephalopathy (PML) | ▸ Wasting<br>▸ Peripheral neuropathy<br>▸ HIV-associated dementia<br>▸ Cardiomyopathy<br>▸ Vacuolar myelopathy<br>▸ Progressive polyradiculopathy<br>▸ Non-Hodgkin's lymphoma |
| **< 100** | ▸ Disseminated herpes simplex<br>▸ Toxoplasmosis<br>▸ Cryptococcosis<br>▸ Cryptosporidiosis, chronic<br>▸ Microsporidiosis<br>▸ Candidal esophagitis | |
| **< 50** | ▸ Disseminated cytomegalovirus (CMV)<br>▸ Disseminated *Mycobacterium avium* complex | ▸ Central nervous system (CNS) lymphoma |

* Most complications occur with increasing frequency at lower CD4+ T cell counts.

† Some conditions listed as "non-infectious" are probably associated with transmissible microbes. Examples include lymphoma (Epstein-Barr virus [EBV]) and cervical cancer (human papilloma virus [HPV]).

Source: Bartlett JG, Gallant JE. Medical management of HIV infection. 2005-2006 ed. Baltimore: Johns Hopkins University; 2005.

# Appendix 4. Baseline and Periodic Medical Evaluations for Inmates With HIV Infection

| Baseline | | Periodic |
|---|---|---|
| ▸ History/Physical<br>▸ Fundoscopic exam<br>▸ PAP smear (women)<br>▸ CD4+T cell count (absolute and %)<br>▸ HIV RNA (viral load)<br>▸ CBC, platelets, differential<br>▸ Serum chemistries, transaminase levels, BUN, creatinine, urinalysis | ▸ RPR/FTA<br>▸ TST/TB symptom review<br>▸ Chest radiograph<br>▸ *Toxoplasma gondii* IgG<br>▸ Hepatitis A & B serologies<br>▸ Influenza vaccine<br>▸ Pneumococcal vaccine<br>▸ Hepatitis B vaccine (if at risk)<br>▸ Fasting lipid profile & glucose (prior to HAART) | ▸ CBC, platelets, differential (q 3 to 6 months while on antiretroviral therapy)<br>▸ Periodic RPR (as clinically indicated)<br>▸ PAP smear within 6 months; then annually (refer to gynecologist as indicated for colposcopy)<br>▸ Influenza vaccine annually<br>▸ Other laboratory tests as indicated |

**Periodic Exams Based upon CD4+ T Cell Count**

| CD4+ T cells/ $mm^3$ | CD4+ T-Cell Count | Viral load | Clinician exam | Special Evaluations/Treatments |
|---|---|---|---|---|
| **>350** | q 3-6 months | Off treatment: q 6 months<br><br>On treatment: q 3-4 months | q 3-6 months | ▸ Observe most inmates off therapy.<br>▸ Consider antiretroviral therapy only if viral load is markedly elevated.<br>▸ Carefully weigh adherence issues and patient motivation prior to treating. |
| **200-350** | q 3-6 months | q 3-4 months | q 3 months | ▸ Initiate antiretroviral therapy for most inmates. |
| **100-199** | q 3-6 months | q 3-4 months | q 2 months | ▸ Initiate antiretroviral therapy regardless of plasma HIV RNA levels.<br>▸ Initiate PCP prophylaxis. |
| **50-99** | q 3-6 months | q 3-4 months | monthly | ▸ Initiate antiretroviral therapy regardless of plasma HIV RNA levels.<br>▸ Initiate toxoplasmosis prophylaxis/ maintain PCP prophylaxis.<br>▸ Arrange baseline fundoscopic exam by eye doctor to screen for CMV. |
| **0-49** | q 6 months | q 3-4 months | monthly | ▸ Initiate antiretroviral therapy regardless of plasma HIV RNA levels.<br>▸ Maintain PCP/toxoplasmosis prophylaxis.<br>▸ Initiate MAC prophylaxis.<br>▸ Arrange fundoscopic exam q 6 months by eye doctor to screen for CMV. |

## Appendix 5. HIV Classification System*

| CD4+ T cells/ $mm^3$ | CD4+ T cell Percent | A Asymptomatic | B Symptomatic Disease | C AIDS Indicator Conditions |
|---|---|---|---|---|
| ≥500 | ≥29 | A1 | B1 | C1 |
| 200-499 | 14-28 | A2 | B2 | C2 |
| <200 | <14 | A3 | B3 | C3 |

*1993 CDC Classification System: Categories A3, B3, and C1, C2, and C3 are AIDS reportable.

### A – Asymptomatic

- Acute (primary) HIV infection
- Persistent generalized lymphadenopathy (PGL)

### B – Symptomatic Disease

Symptomatic conditions that are attributed to HIV infection; or conditions that have a clinical course complicated by HIV. Conditions include, but are not limited to:

- Bacillary angiomatosis
- Oral candidiasis
- Vulvovaginal candidiasis: persistent (>1 month or poorly responsive to therapy)
- Cervical dysplasia (moderate–severe or CIS)
- Idiopathic thrombocytic purpura (ITP)
- Oral hairy leukoplakia
- Listeriosis
- Herpes zoster (involving more than 1 dermatome or 2 separate episodes)

### C – AIDS Indicator Conditions

- Candidiasis: esophagus, trachea, bronchi or lungs
- Cervical cancer (invasive)
- Coccidioidomycosis (extrapulmonary)
- Cryptococcosis (extrapulmonary)
- Cryptosporidiosis with diarrhea (>1 month)
- Cytomegalovirus of any organ other than liver, spleen, or lymph nodes; eye
- Herpes simplex with genital/oral ulcers >1 month or bronchitis, pneumonitis, esophagitis
- Histoplasmosis (extrapulmonary)
- HIV-associated dementia
- HIV-associated wasting syndrome
- Isoporosis with diarrhea (>1 month)
- Kaposi's sarcoma in patient under 60 years
- Lymphoma (Burkitt's, immunoblastic, or primary CNS)
- *Mycobacterium avium* (disseminated)
- *M. tuberculosis* (pulmonary or extrapulmonary)
- Pneumocystis pneumonia (PCP)
- Pneumonia (recurrent): ≥2 episodes within 12 months
- Progressive multifocal leukoencephalopathy
- Salmonella septicemia (nontyphoid), recurrent
- Toxoplasmosis of internal organ

*NOTE: Category B conditions take precedence over those in Category A; and Category C conditions take precedence over those in Category B. For classification purposes, the lowest accurate CD4+ T cell count or percentage (not necessarily the most recent) should be used.*

# Appendix 6. Prophylaxis for HIV-Related Opportunistic Infections

| Drug/Dosages | Toxicities | Comments |
|---|---|---|
| ***Pneumocystis*** | | |
| **Indications:** (1) CD4+ T cells $<200$ /mm$^3$ or $<14\%$; (2) prior PCP; (3) oral candidiasis. Can stop primary and secondary PCP prophy if CD4+ T cells $>200$/mm$^3$ for 3 months. | | |
| **TMP-SMX (Bactrim, Septra)**<br>1 SS/day **(1st choice)**<br>1 DS/day<br>1 DS 3x/week | rash, fever, nausea, leukopenia, hepatitis | ▸ Prevents toxoplasmosis and bacterial infections.<br>▸ Use 1 DS/day if toxo IgG+. |
| **Dapsone**<br>100 mg/day; or<br>50 mg BID | hemolysis, methemoglobinemia | |
| **Pentamidine**<br>300 mg q month aerosolized | bronchospasm/ cough (responds to bronchodilator tx) | ▸ Obtain screening chest x-ray for TB.<br>▸ Administer pentamadine by Respirgard II nebulizer. |
| ***Toxoplasmosis*** | | |
| **Indication:** Toxo IgG+ and CD4+ T cells $<100$ cells/mm$^3$. Can stop primary toxoplasmosis prophy if CD4+ T cell count is $>200$/mm$^3$ for 3 months; can stop secondary prophy if CD4+ T cell count is $>200$/mm$^3$ for 6 months. | | |
| **TMP-SMX**<br>(Bactrim, Septra)<br>1 DS/day **(1st choice)**<br>1 SS/day | rash, fever, nausea, leukopenia, hepatitis | ▸ Repeat toxo IgG if titer was negative when CD4+ T cells were $<100$/mm$^3$. |
| **Dapsone** 50 mg/day +<br>**Pyrimethamine** 50 mg/wk+<br>**Leucovorin** 25 mg/wk | hemolysis, anemia | ▸ Monitor for anemia/leukopenia with either regimen – CBC q 3–4 months. |
| ***Mycobacterium avium*** * | | |
| **Indication:** CD4+ T cell count $<50$ cells/mm$^3$. Can stop primary prophy if CD4+ T cell count is $>100$/mm$^3$ for 3 months; can stop secondary prophy if CD4+ T cell count is $>100$/mm$^3$ for 6 months. | | |
| **Azithromycin (1st choice)**<br>1200 mg/week | nausea/vomiting | |
| **Clarithromycin**<br>500 mg BID | nausea/vomiting | |
| **Rifabutin**<br>300 mg/day | uveitis,arthralgias, hepatitis | ▸ Rifabutin: uveitis when given with fluconazole; creates rifampin resistance; review drug interactions. |
| *Rule out disseminated MAC infection with blood culture before giving prophylaxis. | | |

# Appendix 7. Antiretroviral Treatment Indications for HIV

| Immune Status | Treatment Options | Comments |
|---|---|---|
| **Asymptomatic & CD4+T cell count >350 cells/mm³** | ▸ Defer antiretroviral therapy for most inmates with HIV RNA <100,000 cps/mL by (RT-PCR) or (bDNA).<br>▸ Initiate treatment on case-by-case basis only for inmates with HIV RNA >100,000 cps/mL. | ▸ Monitor HIV RNA, CD4+ T cell count, along with signs and symptoms for disease progression.<br>▸ Inmates with CD4+ T cells between 350-500/mm³ or significant elevations in HIV RNA, e.g., >100,000 cps/mL (RT-PCR) , should be monitored more closely. |
| **Asymptomatic & CD4+ T cell count 200-350 cells/mm³** | ▸ Give antiretroviral drug therapy per DHHS guidelines for most patients.<br>▸ Some experts recommend deferring drug therapy with careful monitoring for patients with low HIV RNA, e.g., <20,000 cps/mL<br>▸ Confirm depressed CD4+ T cell count with second test before treating. | ▸ When treating, initiate HAART in accordance with current DHHS guidelines.<br>▸ The goal of therapy is to reduce plasma HIV RNA to undetectable levels (<50 cps/mL) within 4-6 months of initiating antiretroviral treatment.<br>▸ Effective treatment is roughly predicted by a 1 log (10-fold) decline in HIV RNA levels within 1 week, and a 2 log (100-fold) decline within 4 weeks of initiating therapy.<br>▸ Inmates who fail to attain undetectable plasma HIV RNA after 6 months of therapy should be reevaluated.<br>▸ The HIV RNA level nadir strongly predicts the durability of antiviral suppression.<br>▸ Adherence: Strict adherence to the antiretroviral regimen is necessary to achieve optimal viral suppression. Adherence improves with inmate education, simplifying pill burden/treatment regimen, and effectively treating drug side effects.<br>▸ If the inmate has been on antiretroviral therapy in the past or requires a change in antiretroviral medications, consult with a physician with expertise in managing antiretroviral therapy.<br><br>**DHHS-funded expert consultation line: 1-800-933-3413** |
| **AIDS or severe symptoms regardless of CD4+ T cell count<br><br>or<br><br>Asymptomatic & CD4+ T cell count <200 cells/mm³<br><br>(HIV RNA of any value)** | ▸ Give antiretroviral therapy per DHHS guidelines for all inmates | |

## Appendix 8a. Preferred Treatment Regimens for Antiretroviral-Naïve Patients

Regimens should be individualized, based on the advantages and disadvantages of each combination, including: pill burden, dosing frequency, toxicities, drug-drug interaction potential, co-morbid conditions, and level of plasma HIV-RNA.

Clinicians should refer to the DHHS Guidelines for the Use of Antiretroviral Agents in HIV-1-Infected Adults and Adolescents to review the pros and cons of different components of a regimen and adverse effects and dosages of individual antiretroviral agents.

**Preferred Regimens** are designated for use in treating naïve patients when clinical trial data suggest optimal and durable efficacy with acceptable tolerability and ease of use.

**Alternative regimens** listed in *Appendix 8b* in these guidelines are those where clinical trial data show efficacy, but the regimen is considered alternative because of its disadvantages when compared to the preferred agent: antiviral activity, durability, tolerability, drug interaction potential, or ease of use. In some cases, a regimen listed as alternative in this table may actually be the preferred regimen for a particular patient.

Clinicians initiating antiretroviral regimens in the HIV-1-infected pregnant patient should refer to "Recommendations for Use of Antiretroviral Drugs in Pregnant HIV-1-Infected Women for Maternal Health and Interventions to Reduce Perinatal HIV-1 Transmission in the United States" at http://aidsinfo.nih.gov/guidelines/.

**Preferred Regimens**

| Regimen Type | I + II + III | | | # pills |
|---|---|---|---|---|
| **NNRTI Based** | **efavirenz** | **lamivudine or emtricitabine** | **zidovudine or tenofovir DF** | 2-3 |
| | Efavirenz contraindicated if pregnancy or high pregnancy potential* | | | |
| **PI Based** | **lopinavir/ ritonavir** (co-formulation) | **lamivudine or emtricitabine** | **zidovudine** | 8-9 |

* A "high pregnancy potential" implies that the woman wants to conceive or is not using effective contraception.

Source: DHHS Panel on Clinical Practices for Treatment of HIV infection. Guidelines for the use of antiretroviral agents in HIV-1infected adults and adolescents (October 6, 2005). Available from: http://aidsinfo.nih.gov/guidelines

## Appendix 8b. Alternative Treatment Regimens for Antiretroviral-Naïve Patients

| Regimen Type | I | + II | + III | # pills |
|---|---|---|---|---|
| **NNRTI Based** | **efavirenz** | lamivudine or emtricitabine | abacavir or didanosine or stavudine | 2-4 |
| | *Efavirenz contraindicated if pregnancy or high pregnancy potential** | | | |
| | **nevirapine** | lamivudine or emtricitabine | zidovudine or stavudine or didanosine or abacavir or tenofovir | 3-6 |
| | *High incidence of symptomatic hepatic events in women (pre-nevirapine CD4+ T cell counts > 250 cells/mm$^3$) and men (CD4+ T cell counts > 400 cells/mm$^3$). Nevirapine should not be initiated in these patients unless the benefit clearly outweighs the risk.* | | | |
| **PI Based** | **atazanavir** | lamivudine or emtricitabine | zidovudine or stavudine or abacavir or didanosine or tenofovir plus ritonavir 100 mg/d | 3-6 |
| | **fosamprenavir** | lamivudine or emtricitabine | zidovudine or stavudine or abacavir or tenofovir or didanosine | 5-8 |
| | **fosamprenavir/ ritonavir†** | | | 5-8 |
| | **indinavir/ ritonavir†** | | | 7-12 |
| | **nelfinavir** | | | 5-8 |
| | **saquinavir (sgc, hgc, or tablets)§ /ritonavir†** | | | 7-15 |
| | **lopinavir/ ritonavir** | lamivudine or emtricitabine | stavudine or abacavir or tenofovir or didanosine | 7-10 |
| **3-NRTI Based** | **abacavir** | **zidovudine** | **lamivudine** | 2 |
| | *Use only when a preferred or an alternative NNRTI- or a PI-based regimen cannot or should not be used.* | | | |

* A "high pregnancy potential" implies that the woman wants to conceive or is not using effective contraception.
† Low-dose (100–400 mg) ritonavir per day. For specific dosage regimens see DHHS appendices.
§ sgc = soft gel capsule; hgc = hard gel capsule
Source: DHHS. Guidelines for the use of antiretroviral agents in HIV-1 infected adults and adolescents (October 6, 2005). Available from: http://aidsinfo.nih.gov/guidelines

## Appendix 9. Antiretroviral Drugs and Components *Not* Recommended

| Do not offer *at any time* | Do not offer *as initial therapy* |
|---|---|
| ▸ Monotherapy<br>▸ Dual therapy NRTI regimens<br>▸ Abacavir + tenofovir + lamivudine (or emtricitabine) as a triple-NRTI regimen<br>▸ Tenofovir + didanosine + lamivudine (or emtricitabine) combination as a triple-NRTI regimen<br><br>▸ Amprenavir + fosamprenavir<br>▸ Atazanavir + indinavir<br>▸ Didanosine + stavudine<br>▸ Didanosine + zalcitabine<br>▸ Emtricitabine + lamivudine<br>▸ Lamivudine + zalcitabine<br>▸ Saquinavir + zalcitabine<br>▸ Stavudine + zidovudine<br><br>▸ Evavirenz (in first trimester of pregnancy or in women with significant child-bearing potential)<br>▸ Nevirapine (initiation with CD4+ T cell counts >250 cells/mm$^3$ for women or >400 cells/mm$^3$ for men<br><br>▸ Amprenavir oral solution in:<br>• pregnant women<br>• children <4 years<br>• renal or hepatic failure<br>• on metronidazole or disulfiram<br>▸ Amprenavir oral solution + ritonavir oral solution | ▸ Amprenavir (unboosted or ritonavir boosted)<br>▸ Delavirdine<br>▸ Didanosine + tenofovir + NNRTI<br>▸ Enfuvirtide<br>▸ Indinavir (unboosted)<br>▸ Ritonavir (as sole PI)<br>▸ Saquinavir soft gel capsule (unboosted)<br>▸ Tipranavir (boosted with ritonavir)<br>▸ Zalcitabine + zidovudine |

Source: DHHS. Guidelines for the Use of Antiretroviral Agents in HIV-1-Infected Adults and Adolescents, October 6, 2005 (Tables 8 and 9). Available from: http://aidsinfo.nih.gov/guidelines