Guideline-based Quality Indicators for HIV Care

New York Department of Health AIDS Institute

Health Resources and Services Administration HIV/AIDS Bureau

NATIONAL QUALITY CENTER
Guideline-based Quality Indicators for HIV Care

Developed by New York Department of Health AIDS Institute National Quality Center

In Partnership with Health Resources and Services Administration HIV/AIDS Bureau

December 2008

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December 2008

Dear Colleagues,

We are pleased to offer you this new publication that includes eleven sets of performance measures derived from established clinical guidelines that were developed by panels of experts sponsored by the United States Department of Health and Human Services (DHHS) or the New York State Department of Health AIDS Institute (NYSDOH AI) HIV Clinical Guidelines Program. These performance measures, in total, represent not just what constitutes good medical therapeutics, but also reflect the comprehensive package of services that is critical for providing the best possible care to patients with HIV. Therefore, this set of indicators includes not just measures for monitoring CD4 counts and viral load levels, but also measures for assessing prevention counseling, mental health care, oral health care, and substance use services. Most indicators are strongly supported by scientific study.

We believe that this publication is unique in that it follows the methodological guidance recommended by the Agency for Healthcare Research and Quality (AHRQ). The guideline developers participated in selecting the most important recommendations from their respective guidelines, a process that is not routinely undertaken. Their input allowed for the intent of the guidelines to be clarified and attention focused on how they would specifically be offered as indicators of quality. Given the volume of specific recommendations contained within each guideline, providers would be unable to measure each and every one. The collective consideration of the panel members is therefore particularly important for the decisions regarding which recommendations should be prioritized for monitoring quality of care.

Representation of the guidelines panels also ensures that a balanced perspective is obtained when selecting these priorities. Each panel was deliberately chosen by DHHS or the NYSDOH AI to include a diverse group of stakeholders from different geographic and practice communities. Academic and community practitioners participate in these guidelines committees together along with consumers to ensure that the recommendations are both evidence-based and feasible.
The HIV/AIDS Bureau (HAB) of the Health Resources and Services Administration (HRSA), supported by the National Quality Center (NQC), is a unique example of how government can successfully provide technical assistance and support to practitioners. The NQC was designed specifically as part of the Ryan White HIV/AIDS Treatment Modernization Act to provide practical tools and technical guidance to providers of HIV care. These indicators represent an important component of the work of the NQC and are a testament to the commitment of HAB to provide evidence-based information to HIV providers in order to assure that the best possible care is offered to persons living with HIV.

We would like to thank the members of the guidelines panels for their time and effort spent in selecting these priorities for quality measurement. Their contribution has been significant.

We would like to acknowledge the efforts of the three research and editorial assistants who contributed to this work, Bibhav Acharya, Brian McPhee, and Russell Spingarn, all of whom will now begin careers in clinical medicine with a rich understanding of the connection between development of guidelines and evaluation of quality.

We would also like to thank Kathleen Cavolo and Cheryl Smith, M.D. for their technical review of the entire document.

This document is up to date as of April 2009. Please be aware that the indicator definitions in this resource are based on clinical practice guidelines that undergo frequent revision. If questions about the currency of these indicators arise, please refer to the source guidelines. Guidelines from the Department of Health and Human Services can be found at www.aidsinfo.nih.gov. Guidelines from the New York State Department of Health can be found at www.hivguidelines.org.

We hope that these indicators will provide easy-to-use “off the shelf” measures that can be adapted in your HIV programs and will contribute to providing the highest standards of care to persons living with HIV.

Sincerely,

Bruce D. Agins, MD, MPH  
Medical Director  
NYSDOH AIDS Institute

John G. Bartlett, MD  
Johns Hopkins University  
School of Medicine
Methodology

The National Quality Center (NQC) convened a clinical workgroup under the leadership of Dr. John Bartlett to develop quality of care indicators from the United States Department of Health and Human Services (DHHS) HIV Guidelines. The workgroup consisted of chairs of the DHHS Guidelines panels that were previously organized to develop the following guidelines:

- Use of Antiretroviral Agents in HIV-Infected Adults and Adolescents
- Management of Occupational Exposures to HIV and Recommendations for Postexposure Prophylaxis
- Use of Antiretroviral Agents in Pediatric HIV Infection
- Use of Antiretroviral Drugs in Pregnant HIV-Infected Women for Maternal Health and Interventions to Reduce Perinatal HIV Transmission in the United States
- Incorporating HIV Prevention into the Medical Care of Persons Living with HIV
- HIV Primary Care
- Treating Opportunistic Infections Among HIV-Infected Adults and Adolescents
- Treating Opportunistic Infections Among HIV-Exposed and Infected Children
- Treatment of Tuberculosis

For areas not addressed by the DHHS Guidelines, indicators were developed from guidelines formulated by the New York State Department of Health HIV Clinical Guidelines Program. The chairs of these committees participated in the NQC clinical workgroup, representing the following guidelines:

- HIV and Substance Use
- HIV and Oral Health
- HIV and Mental Health
Indicator workgroup members asked their respective guideline panels to identify the five most important aspects of care addressed by their panel. Panel members chose aspects of care that they believed should be translated into performance measures that would become part of a national set of indicators that would be made available to HIV providers. Indicators were then developed for each of the selections based on these guidelines.

Key studies from the literature were reviewed. To collect evidence to support the rationale for each indicator. The selected published studies are identified in the background section for each indicator. After having been approved by respective members of the clinical guidelines workgroup and reviewed by the HIV/AIDS Bureau (HAB), the final set of indicators is now being disseminated for use by HIV health care providers.

**How to Use the Indicator Definitions**

In order to take advantage of this wide portfolio of HIV-specific indicators, HIV providers can follow these steps to measure performance based on the detailed indicator definition:

1. Carefully study the indicator definitions and prioritize which indicator(s) is most appropriate for your clinical setting
2. Identify the eligible population. Example - Eligible Population: All HIV-infected patients. Identify the number of patients who match the eligible population definition in your ambulatory care clinic
3. Identify patients in the denominator. Example - Denominator Description: Number of patients receiving ARV therapy. Based on the list of patients matching the eligible population definition, identify the number of patients whose care was in accordance with the denominator definition
4. Identify patients in the numerator. Example - Numerator Description: Number of patients for whom viral load and CD4 count tests were performed at baseline and within four months of initiating ARV therapy. Identify the number of patients in the denominator whose care was in accordance with the numerator definition
5. Calculate the performance score: Divide the number of patients placed in the numerator (N) by the number of patients placed in the denominator (D) and multiply the result (N/D) by 100 to receive the percentage score
Members of the Clinical Workgroup

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Henry Masur, MD, Prevention and Treatment of Opportunistic Infections, National Institute of Health
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## Glossary

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Description</th>
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<tbody>
<tr>
<td>3TC</td>
<td>lamivudine</td>
</tr>
<tr>
<td>AAP</td>
<td>American Academy of Pediatrics</td>
</tr>
<tr>
<td>ACOG</td>
<td>American College of Obstetrics and Gynecology</td>
</tr>
<tr>
<td>ACTG</td>
<td>AIDS Clinical Trials Group</td>
</tr>
<tr>
<td>AHRQ</td>
<td>Agency for Healthcare Research and Quality</td>
</tr>
<tr>
<td>ARV</td>
<td>antiretroviral therapy</td>
</tr>
<tr>
<td>ATV</td>
<td>atazanavir</td>
</tr>
<tr>
<td>AZT</td>
<td>zidovudine (or ZDV)</td>
</tr>
<tr>
<td>CASE</td>
<td>Center for Adherence Support Evaluation</td>
</tr>
<tr>
<td>CDC</td>
<td>Centers for Disease Control and Prevention</td>
</tr>
<tr>
<td>CHD</td>
<td>coronary heart disease</td>
</tr>
<tr>
<td>CNS</td>
<td>central nervous system</td>
</tr>
<tr>
<td>CYP450</td>
<td>cytochrome P-450</td>
</tr>
<tr>
<td>D4T</td>
<td>stavudine</td>
</tr>
<tr>
<td>ddI</td>
<td>didanosine</td>
</tr>
<tr>
<td>DHHS</td>
<td>Department of Health and Human Services</td>
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<tr>
<td>DOT</td>
<td>directly observed therapy</td>
</tr>
<tr>
<td>FDA</td>
<td>Food and Drug Administration</td>
</tr>
<tr>
<td>FTC</td>
<td>emtricitabine</td>
</tr>
<tr>
<td>GFR</td>
<td>glomerular filtration rate</td>
</tr>
<tr>
<td>HAART</td>
<td>highly active antiretroviral therapy</td>
</tr>
<tr>
<td>HAB</td>
<td>HIV/AIDS Bureau</td>
</tr>
<tr>
<td>HBV</td>
<td>hepatitis B virus</td>
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<tr>
<td>HCW</td>
<td>health care worker</td>
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<tr>
<td>HDL</td>
<td>high-density lipoprotein</td>
</tr>
<tr>
<td>HIV-G</td>
<td>HIV-associated Gingivitis</td>
</tr>
<tr>
<td>HIV-P</td>
<td>HIV-associated Periodontitis</td>
</tr>
<tr>
<td>HRSA</td>
<td>Health Resources and Services Administration</td>
</tr>
<tr>
<td>LDL</td>
<td>low-density lipoprotein</td>
</tr>
<tr>
<td>LGE</td>
<td>Linear Gingival Erythema</td>
</tr>
<tr>
<td>NNRTI</td>
<td>non-nucleoside reverse transcriptase inhibitors</td>
</tr>
</tbody>
</table>
NQC    National Quality Center
NRTI   Nucleoside reverse Transcrip-tase Inhibitors
NUP    Necrotizing Ulcerative Periodontitis
NYSDOH AI New York State Department of Health AIDS Institute
PCP    \textit{Pneumocystis jirovecii} Pneumonia
PCRS   Partner Counseling and Referral Services
PEP    post-exposure prophylaxis
PI     protease inhibitor
RNA    ribonucleic acid
STI    sexually transmitted infection
TB     tuberculosis
TDF    tenofovir
TMP-SMX trimethoprim-sulfamethoxazole
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HIV Medical Care
for Adults and Children
CD4 Count and Viral Load Laboratory Tests

Source


Background
The measurement of plasma viral load and CD4 lymphocyte counts, together with clinical assessment, is a reliable method to monitor disease activity, and to guide both initiation of and response to antiretroviral (ARV) therapy. Monitoring of viral load and CD4 count is the standard method for evaluation of response to ARV therapy.

As part of the primary care approach to HIV care, the provider should monitor CD4 counts as an immunologic indicator and obtain a complete blood count to monitor and prevent serious toxicity. Providers should note that anemia may be a contraindication for the use of zidovudine and should refer to prescribing instructions when other health conditions are present.3
Pregnant Patients
In addition, providers should routinely obtain CD4 count and viral load levels to monitor the health of HIV-infected pregnant patients. As with non-pregnant patients, CD4 cell count and viral load values indicate the stage of HIV infection and the need for prophylaxis against opportunistic pathogens. Viral load and CD4 cell count values also determine whether to initiate or modify ARV treatment.

Pediatric Patients
Because absolute CD4 counts change with age in non-HIV-infected children, the DHHS Guidelines recommend using percentage values to track immunological parameters. Monitoring CD4 counts and HIV RNA levels is useful in making decisions about initiation of ARV therapy and also in monitoring the effectiveness of therapy.

In children with deteriorating immunological and clinical status, monitoring should be more frequent. However, for clinically, immunologically and virologically stable patients, CD4 and viral load should be measured every 3 or 4 months.

Virologic stability is defined as:
• an undetectable viral load, or
• a viral load that has dropped by at least 1 log since the last 4-month review period, or
• a viral load that has increased by less than 1 log from the lowest value in last 12 months on that regimen.

Immunologic stability is defined as:
• immune classification category that remains stable or improves (see Table 1), or
• absolute CD4 count that does not decline by 30% or more in 6 months.

Clinical stability is defined as the absence of HIV-related symptoms or opportunistic infections.
1) Eligible Population
All HIV-infected patients

A) Denominator Description
Number of HIV-infected patients

A) Numerator Description
Number of patients who have a documented baseline CD4 count and viral load test

B) Denominator Description
Number of patients receiving ARV therapy

B) Numerator Description
Number of patients for whom viral load and CD4 count tests were performed at baseline and within four months of initiating ARV therapy

2) Eligible Population
All HIV-infected children

C) Denominator Description
The number of clinically, immunologically, and virologically stable HIV-infected children

C) Numerator Description
Number of HIV-infected children whose CD4 count or (preferably) CD4 percentages and HIV RNA viral load were measured at least every 4 months
TABLE 1: AGE-SPECIFIC IMMUNE CATEGORIES BASED ON CD4 CELL COUNT AND PERCENTAGES

If the clinician deems the child to be stable despite “unstable” virological, immunological and clinical parameters, the patient should be considered to be stable.

<table>
<thead>
<tr>
<th>Immune Category</th>
<th>&lt; 12 mos</th>
<th>(%)</th>
<th>1-5 yrs</th>
<th>(%)</th>
<th>6-12 yrs</th>
<th>(%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Category 1: No suppression</td>
<td>≥1,500</td>
<td>(≥25%)</td>
<td>≥100</td>
<td>(≥25%)</td>
<td>≥500</td>
<td>(≥25%)</td>
</tr>
<tr>
<td>Category 2: Moderate suppression</td>
<td>750-1,499</td>
<td>(15%-24%)</td>
<td>500-999</td>
<td>(15%-24%)</td>
<td>200-499</td>
<td>(15%-24%)</td>
</tr>
<tr>
<td>Category 3: Severe suppression</td>
<td>&lt;750</td>
<td>(&lt;15%)</td>
<td>&lt;500</td>
<td>(&lt;15%)</td>
<td>&lt;200</td>
<td>(&lt;15%)</td>
</tr>
</tbody>
</table>
Appropriate Antiretroviral Therapy

Source
Panel on Antiretroviral Guidelines for Adults and Adolescents, Guidelines for the Use of Antiretroviral Agents in HIV-1-Infected Adults and Adolescents. Department of Health and Human Services; January 2008.

Background
The aim of antiretroviral (ARV) therapy is to achieve maximum possible suppression of viral replication. Three or more agents should be prescribed to achieve desired outcomes. In ARV therapy-naïve patients, at least two agents are usually nucleoside reverse transcriptase inhibitors (NRTIs). The third may be a protease inhibitor (PI) or a non-nucleoside reverse transcriptase inhibitor (NNRTI). Regimens that are recommended and those that are not recommended for treatment-naïve patients are listed in the DHHS Guidelines.7

Individualized regimens are selected based on the patient’s treatment history, patterns of drug toxicity and the resistance profile of their viral strain. Certain medications may be chosen or avoided because of underlying medical conditions and based on known interactions with other medications the patient is taking.
Eligible Population
All HIV-infected patients

Denominator Description
Number of patients receiving ARV therapy

Numerator Description
Number of patients prescribed at least three ARV agents
Initiation of Antiretroviral Therapy for Pediatric Patients

Source

Background
The Guidelines recommend initiation of antiretroviral (ARV) therapy for children according to age, based on the following criteria:

1. All HIV-infected infants <12 months of age.
2. All HIV-infected children 1-5 years of age who
   a. have AIDS or significant symptoms (all CDC Clinical Category C conditions and all Clinical Category B conditions except a single episode of serious bacterial infection and lymphoid interstitial pneumonitis) OR
   b. have a CD4 percentage <25%, regardless of symptoms or viral load.
3. All HIV-infected children ≥5 years of age who
   a. have AIDS or significant symptoms (see above) OR
   b. have a CD4 cell count <350 cells/mm³

When HIV infection is identified in an infant, treatment is most reasonably delayed until resistance testing and adherence evaluation/education are complete. Treatment adherence is an important determinant of the success of ARV therapy. Incomplete adherence may be more harmful than not starting medication at all. Strategies to improve adherence to ARV therapy are listed in the Guidelines. Clinicians should discuss the importance of consistent adherence to ARV regimen and document this discussion.
After a decision to initiate ARV therapy is made, the Guidelines recommend consideration of safety and efficacy, and ease of administration when choosing drugs for the ARV regimen. The choice of a particular regimen should be made on a case-by-case basis but the initial regimen should include at least 3 drugs, including two nucleoside reverse transcriptase inhibitors (NRTIs) in combination with a protease inhibitor (PI) or a non-nucleoside reverse transcriptase inhibitor (NNRTI) as specified in the Guidelines.\textsuperscript{10}

**Eligible Population**

All HIV-infected children

**A) Denominator Description**

Number of HIV-infected children who

- are <12 months of age OR
- have AIDS or significant symptoms (all CDC Clinical Category C symptoms and all Clinical Category B symptoms except a single episode of serious bacterial infection and lymphoid interstitial pneumonitis) OR
- meet the CD4 criteria for their age group (1-5 years of age: CD4 percentage <25%; ≥5 years of age: CD4 cell count <350 cells/mm\textsuperscript{3})

**A) Numerator Description**

Number of children from the denominator who are treated with ARV therapy

**B) Denominator Description**

Number of children who are treated with ARV therapy

**B1) Numerator Description**

Number of children from the denominator who have documentation of discussion about adherence in the visit before initiation of ARV therapy

**B2) Numerator Description**

Number of children from the denominator who are initially treated with ARV therapy using at least 3 ARV agents
Contraindications of Antiretroviral Regimen

Source
Panel on Antiretroviral Guidelines for Adults and Adolescents, Guidelines for the Use of Antiretroviral Agents in HIV-1-Infected Adults and Adolescents. Department of Health and Human Services; January 2008.

Background
Certain antiretroviral (ARV) combinations are not recommended because of toxicity or lack of efficacy:

1. Stavudine (d4T) + zidovudine (AZT) has been shown to be antagonistic in vivo\textsuperscript{11} and in vitro.\textsuperscript{12}
2. Didanosine (ddl) + stavudine (d4T) results in peripheral neuropathy, lactic acidosis, and pancreatitis.\textsuperscript{13, 14, 15} This combination has been responsible for three cases of fatal lactic acidosis in pregnant women.\textsuperscript{16}
3. Lamivudine (3TC) + emtricitabine (FTC) has little additive antiretroviral activity and the single mutation M184V in reverse transcriptase is resistant to both drugs.\textsuperscript{17}
4. Atazanavir (ATV) and tenofovir (TDF) should not be combined without ritonavir (RTV) boosting.\textsuperscript{18, 19}
Eligible Population
All HIV-infected patients

Denominator Description
Number of patients receiving ARV therapy

Numerator Description
Number of patients who received any of the following combinations:

1. stavudine + zidovudine (d4T + AZT)
2. didanosine + stavudine (ddI + d4T)
3. lamivudine + emtricitabine (3TC + FTC)
4. atazanavir + tenofovir (ATV + TDF) without RTV
Appropriate Treatment for Patients Co-Infected with HBV and HIV

Source
Panel on Antiretroviral Guidelines for Adults and Adolescents, Guidelines for the Use of Antiretroviral Agents in HIV-1-Infected Adults and Adolescents. Department of Health and Human Services; January 2008.

Background
Lamivudine has been shown to be effective against HBV. However, using interferon together with either lamivudine or emtricitabine has shown to be more effective than using interferon alone. Patients with active HBV who are receiving antiretroviral (ARV) therapy should not be prescribed lamivudine or emtricitabine unless in combination with another agent that is active against HBV.

Eligible Population
All HIV-infected patients co-infected with HBV

Denominator Description
Number of patients who are receiving ARV therapy and are treated for HBV

Numerator Description
Number of patients who are prescribed lamivudine or emtricitabine without another agent active against HBV
Resistance Testing when Antiretroviral Therapy Is Initiated or Changed for Virologic Failure

Source
Panel on Antiretroviral Guidelines for Adults and Adolescents, Guidelines for the Use of Antiretroviral Agents in HIV-1-Infected Adults and Adolescents. Department of Health and Human Services; January 2008.


Background
The following reasons may warrant a change in antiretroviral (ARV) therapy:

- Toxicity or intolerance to the current regimen
- New data showing superiority of a different regimen
- Immunological, virological, or clinical parameters showing failure of current regimen

Resistance testing should be performed when virologic failure is suspected. The results of resistance tests are most predictable for agents that the patient is receiving at the time of testing. Once the patient stops taking the medication, the lack of selective pressure causes the resistance mutations to decrease to below the threshold of detection, so that the wild-type virus emerges and obscures the presence of the resistant virus.
The Guidelines list the following situations that may require a change in therapy due to virologic failure:

- Less than a minimally acceptable virologic response after 8–12 weeks of therapy
- HIV RNA not suppressed to undetectable levels after 4–6 months of ARV therapy
- Repeated detection of HIV RNA after initially having undetectable levels in response to ARV therapy
- A reproducible increase in HIV RNA copy number after having had a substantial HIV RNA response but still have low levels of detectable HIV RNA.

The likelihood that a patient will acquire drug-resistant virus is related to the prevalence of drug resistance in persons engaging in high-risk behaviors in the community. In the United States, recent studies suggest that the risk of transmitted virus being resistant to at least one ARV drug ranges from 6%–16%. Resistance testing when initiating ARV therapy in acutely infected patients is recommended.

The rate at which transmitted resistance-associated mutations revert to wild-type virus is not fully known. Research shows that mutations present at the time of HIV transmission are more stable than those selected under drug pressure. It is often possible to detect resistance-associated mutations in HIV-infected patients years after HIV transmission occurred. Limited data from several, but not all, studies suggest suboptimal virologic responses in persons with baseline mutations. Resistance testing when initiating ARV therapy in chronically infected patients is recommended. Resistance testing for pregnant women who are treatment naïve or experience virologic failure is also recommended.

Resistance testing permits rationally directing therapy for treatment-experienced patients with virologic failure and viral load >1000 copies/mL. Knowledge of genotypic and phenotypic test results have led to selection of regimens that have, in turn, resulted in better virologic outcomes in patients who are failing ARV therapy.

Virologic failure in patients receiving combination therapy can sometimes be associated with resistance to only one component of the regimen. In such cases, individual drugs can be substituted instead of a complete regimen change.
1) Eligible Population
All HIV-infected patients

A) Denominator Description
Number of patients for whom ARV therapy was initiated for the first time

A) Numerator Description
Number of patients who received a resistance test before initiation of ARV therapy

B) Denominator Description
Number of patients for whom therapy was changed because of virologic failure and viral load was >1,000 copies/mL

B) Numerator Description
Number of patients who received a resistance test either during treatment or within 4 weeks of regimen discontinuation

2) Eligible Population
All HIV-infected children receiving ARV therapy

C) Denominator Description
Number of HIV-infected children who initiated ARV therapy during the review period or started therapy in 2007 or later

C) Numerator Description
Number of HIV-infected children who initiated ARV therapy during the review period or started therapy in 2007 or later in whom a resistance test was performed

D) Denominator Description
Number of HIV-infected children whose ARV therapy is changed during the review period due to virologic failure, as defined in the Guidelines

D) Numerator Description
Number of children from the denominator in whom a resistance test was performed while taking the failing regimen or within 1 month of stopping the failing regimen
Appropriate Antiretroviral Therapy for Patients with 103N Mutation

Source
Panel on Antiretroviral Guidelines for Adults and Adolescents, Guidelines for the Use of Antiretroviral Agents in HIV-1-Infected Adults and Adolescents. Department of Health and Human Services; January 2008.


Background
Mutations 103N and 188L confer resistance to non-nucleoside reverse transcriptase inhibitors (NNRTIs). Since NNRTIs are not effective against these mutations, patients infected with these resistant strains should not be prescribed these medications. The use of protease inhibitors and/or NRTIs combination is recommended based on resistance test results available.
Eligible Population
All HIV-infected patients who were prescribed antiretroviral (ARV) therapy and who have resistance test results available

Denominator Description
Number of patients who are infected with viral strains that have 103N mutation

Numerator Description
Number of patients who are infected with viral strains that have 103N mutation and who are prescribed NNRTIs
Antiretroviral Therapy Adherence Assessment

Source
Panel on Antiretroviral Guidelines for Adults and Adolescents, Guidelines for the Use of Antiretroviral Agents in HIV-1-Infected Adults and Adolescents. Department of Health and Human Services; January 2008.

Background
Strict adherence to HAART is essential for maintaining treatment benefits and preventing the development of HIV resistance. An adherence level of 95% with protease inhibitors has been correlated with sustained viral suppression in several studies. In one study, patients with adherence of 95% or greater had fewer days in the hospital than those with less than 95% adherence and were less likely to experience virologic failure.

Studies have shown that poor adherence to a regimen can lead to resistance to specific medications or entire classes of antiretroviral (ARV) therapy, especially to non-nucleoside reverse transcriptase inhibitors (NNRTIs) if adherence is less than 50%.

Although patient self reporting of medication adherence has been shown to be an unreliable predictor of adherence, a patient’s report of suboptimal adherence is a strong predictor of nonadherence and should be taken seriously. The providers’ estimate of a patients’ adherence has also been proven to be unreliable predictor of patients’ adherence.

Consistent adherence is also important during pregnancy to avoid perinatal HIV transmission. Lower viral load levels at the time of birth have been correlated with decreased likelihood of HIV transmission.
Adherence frequently wanes over time, and patients may need support as the duration of therapy lengthens. To ensure adherence, clinicians should counsel patients on the importance of adherence and assess the level of adherence at every visit.

Examples of assessment include: patient self-report, pill count, prescription refill, electronic monitoring, diaries, directly observed therapy (DOT) and family reporting for individuals who cannot self-report. Providers can utilize the recently developed Center for Adherence Support Evaluation (CASE) Adherence Index, a composite of three self-reported measures of adherence, or other validated measures.

**Eligible Population**
All HIV-infected patients

**Denominator Description**
Number of HIV-infected patients prescribed ARV therapy

**Numerator Description**
Number of patients for whom adherence was assessed at last visit
Screening for Changes in Glucose Metabolism during Antiretroviral Therapy

Source


Background
Metabolic changes occur with frequency among HIV-infected patients, particularly those on HAART. Some metabolic changes that have been observed include insulin resistance and hyperinsulinemia. One study has found the rate of prevalence of insulin resistance among HIV-infected patients to be 47%. The same study claims that HAART increases the likelihood of insulin resistance. Studies have shown that protease inhibitors (PIs) have a direct effect on glucose metabolism leading to insulin resistance and potentially diabetes, in both HIV-infected and non-infected cohorts. Cumulative exposure to nucleoside reverse transcriptase inhibitors (NRTIs) has been shown to be independently associated with fasting markers of insulin resistance. Predisposition to diabetes is a contributing host factor.
The health consequences of antiretroviral (ARV)-induced insulin resistance and hyperinsulinemia are still not fully understood. In other patient populations, insulin resistance dramatically increases the risk for diabetes.\textsuperscript{\textsection 51} Hyperinsulinemia, which almost always indicates underlying insulin resistance, has been associated with other medical conditions, including hypertension and coronary heart disease.\textsuperscript{\textsection 52}

Providers should screen for abnormalities in glucose metabolism starting with a random glucose test or a fasting glucose test. If results are abnormal, further evaluation is needed, and oral glucose tolerance testing should be performed to exclude diabetes.\textsuperscript{\textsection 53}

**Eligible Population**

All HIV-infected patients

**Denominator Description**

Number of HIV-infected patients prescribed a HAART regimen

**Numerator Description**

Number of patients with documented fasting glucose test administered annually
Screening for Renal Dysfunction

Source


Background
HIV infection has been associated with renal complications that may lead to renal insufficiency or failure. Renal dysfunction has been caused by adverse drug reactions, and HIV-associated nephropathy.\textsuperscript{54} Indinavir has been shown to cause crystal-induced nephropathy in some cases. Specifically, tenofovir and indinavir, especially when used with ritonavir, as well as other agents used to prevent or treat opportunistic infections may cause drug-specific renal abnormalities.\textsuperscript{55}

Renal impairment has also been reported in patients receiving tenofovir, but occurs rarely. It has been shown that tenofovir is excreted by glomerular filtration and tubular secretion; a preliminary study suggested that persons with low estimated glomerular filtration rates (GFR) are at greater risk for tenofovir-associated renal toxicity even when baseline
serum creatinine is normal. More studies are needed to define the role of baseline GFR in predicting renal toxicity with tenofovir. Renal impairment requires changes in dosage or discontinuation of many antiretroviral (ARV) agents.

It is recommended that all patients at the time of HIV diagnosis should be assessed for existing kidney disease with a screening urine analysis for proteinuria and a calculated estimate of renal function. If there is no evidence of proteinuria at initial evaluation, patients at high risk for the development of proteinuric renal disease (i.e., African Americans, those with CD4+ cell counts <200 mL or HIV RNA levels >4000 copies/mL, diabetes mellitus or hypertension) should undergo annual screening. Renal function should be screened on a yearly basis to assess for changes over time. Additional evaluations (including quantification of proteinuria, renal ultrasound, and potentially renal biopsy) and referral to a nephrologist are recommended for patients with proteinuria.

**Eligible Population**

All HIV-infected patients

**Denominator Description**

Number of HIV-infected patients prescribed ARV therapy

**A) Numerator Description**

Number of patients with documented serum creatinine testing with calculated creatinine clearance at least every 4 months

**B) Numerator Description**

Number of patients with annual documented urinalysis
Coronary Heart Disease Screening in Patients Prescribed Antiretroviral Therapy

Source


Background
Clinical and statistical studies have revealed several factors that augment the risk of coronary heart disease (CHD) and heart attack. The individual significance of the major factors has not yet been exactly determined. According to the American Heart Association, major risk factors include: tobacco use, high blood pressure, high cholesterol, physical inactivity, obesity, diabetes, and excessive alcohol use.

Metabolic complications such as HIV-associated lipodystrophy syndrome are common in HIV-infected patients who are receiving HAART. Changes in morphology can lead to central fat accumulation and subcutaneous fat depletion. Although these manifestations have been collectively grouped under the umbrella of “HIV-associated lipodystrophy syndrome,” central fat accumulation and subcutaneous fat depletion are not redistributions per se and have been shown to occur independently. The association between exposure to HAART and increased risk of myocardial infarction has been confirmed in several but not all studies. Abnormal lipid levels should be monitored and pose the same risks over a long-term period as they do for those who are not infected with HIV.
HAART has been shown to be independently associated with a relative increase of myocardial infarction per year of exposure during the first 4 to 6 years of treatment.\(^6^4\) However, research has also shown that CHD risk increases in patients prescribed HAART from changes in conventional cardiovascular risk factors as well.\(^6^5\) Given the possible effect of HAART on CHD risk, as well as the effects of conventional risk factors, clinicians should screen patients on ARV therapy for CHD risk factors.

**Eligible Population**
All HIV-infected patients

**Denominator Description**
Number of HIV-infected patients prescribed HAART

**Numerator Description**
Number of patients who were evaluated for major risk factors for coronary heart disease, including tobacco use, hypertension, hypercholesterolemia, physical inactivity, obesity, and diabetes annually
Lipid Screening

Source
Panel on Antiretroviral Guidelines for Adults and Adolescents, Guidelines for the Use of Antiretroviral Agents in HIV-1-Infected Adults and Adolescents. Department of Health and Human Services; January 2008.


Background
Changes in body shape, fat distribution, and metabolism occur with frequency among HIV-infected patients, particularly those prescribed HAART. Metabolic changes that have been observed include lipoatrophy, lipohypertrophy, hypertriglyceridemia, low high-density lipoprotein (HDL) cholesterol, and changes in low-density lipoprotein (LDL) cholesterol.

Although rates of prevalence vary depending on the definition of metabolic changes, studies have found the rate of prevalence for metabolic syndrome to be almost 25% in a population of patients receiving HAART, where metabolic syndrome is defined as the presence of at least three of the following: hypertriglyceridemia, low HDL cholesterol, hypertension,
abdominal obesity, or high serum glucose.\textsuperscript{1} Co-occurring visceral fat accumulation, hyperlipidemia, and insulin resistance dramatically increase the risk for diabetes, coronary heart disease (CHD), and stroke.\textsuperscript{71}

As part of HIV primary care, clinicians should obtain a lipid profile for all patients at least annually. For patients receiving HAART, lipid level monitoring is important to detect side effects and to identify patients who may require pharmacotherapy.

**Eligible Population**
All HIV-infected patients

**Denominator Description**
Number of HIV-infected patients on ARV therapy

**Numerator Description**
Number of patients who received testing of fasting serum cholesterol, serum HDL, and triglyceride levels annually
Contraindicated Statin Use with Antiretroviral Therapy

Source
Panel on Antiretroviral Guidelines for Adults and Adolescents, Guidelines for the Use of Antiretroviral Agents in HIV-1-Infected Adults and Adolescents. Department of Health and Human Services; January 2008.

Background
Dyslipidemia occurs in approximately 70% of patients taking protease inhibitors (PIs). Treatment with HMG Co-A reductase inhibitors is recommended for dyslipidemia. During concurrent use of ritonavir/saquinavir, the AUC of simvastatin increased by a factor of 32 and atorvastatin by a factor of 4.5, whereas the AUC for pravastatin was reduced by a factor of 0.5. Significant drug interactions have also been reported with lopinavir/ritonavir when given concurrently with simvastatin or atorvastatin. After co-administration, the AUC increased by 5.9-fold for atorvastatin, whereas the pravastatin levels increased 0.3-fold. Similar results have also been reported with coadministration of nelfinavir with either atorvastatin or simvastatin. Simvastatin is not recommended for concomitant use with PIs.

Eligible Population
All HIV-infected patients receiving antiretroviral (ARV) therapy

Denominator Description
Number of patients receiving any PI

Numerator Description
Number of patients who received simvastatin or lovastatin
Obstetrics/Gynecological Care
Cervical Pap Test

Source


Background
Women living with HIV/AIDS should receive routine gynecologic care. While cervical cancer is an important AIDS-defining illness and may be the most common AIDS-related malignancy in women, its relationship to HIV is not clearly understood and still remains under investigation. Nonetheless, HIV-infected women have much higher rates of persistent infection with human papillomavirus (HPV), particularly those types most strongly linked to the development of invasive cervical cancer. HIV-infected women also have significantly higher rates of cervical intraepithelial neoplasia (CIN) with increasing prevalence as immunodeficiency increases. Providers should perform annual Pap tests for HIV-infected women to monitor abnormal cervical cell development and treat disease, if indicated.
Eligible Population
All HIV-infected female patients

Denominator Description
Number of HIV-infected female patients

Numerator Description
Number of patients who received a Pap test in the past year
Preconception Care and Counseling

Source


Background
In 2002, 35% of US births were unintended with pregnancies often not detected until late in the first trimester. Both the American College of Obstetrics and Gynecology and the Centers for Disease Control (CDC) advocate the provision of preconception counseling and care to all women to identify health conditions that may increase maternal and fetal risks, such as age, diabetes, or hypertension. Women with HIV infection should be educated regarding the risk of perinatal transmission and evaluated with viral load and CD4 count tests. Without appropriate therapeutic intervention for HIV-infected pregnant women, the risk of HIV perinatal transmission is high.
Preconception counseling and care allows for discussion, pregnancy planning, and provision of appropriate care prior to conception to reduce the likelihood of adverse outcomes for mother and fetus. The American Academy of Pediatrics (AAP) and the American College of Obstetricians and Gynecologists (ACOG) have classified preconception care into four categories of interventions: physical assessment, risk screening, vaccinations, and counseling. Risk screening areas are as follows:

- reproductive awareness
- environmental toxins and teratogens
- nutrition and folic acid
- genetics
- substance use, including tobacco and alcohol
- medical conditions and medications
- infectious diseases, including HIV, and vaccination
- psychosocial concerns (e.g., depression, violence)

The goals of preconception counseling and care are as follows:

- to prevent unintended pregnancy
- if pregnancy is desired, to help the woman have a healthy pregnancy for herself and her child
- to prevent transmission of HIV to an uninfected partner

Sexually active HIV-infected women of childbearing age should be questioned during routine visits about interval menstrual history, use of contraception and condoms and symptoms that may indicate the possibility of pregnancy. Providers should assess whether HIV-infected women of childbearing age are pregnant or interested in becoming pregnant, and identify those who express uncertainty or ambivalence about conceiving or those who are not specifically considering pregnancy but are sexually active and not using reliable contraception. Pregnancy testing should be performed when indicated.
During preconception care, an HIV-infected woman should be evaluated for clinical status, viral load, immune status, medications, including antiretroviral (ARV) therapy, and the potential effects of these medications on pregnancy. She should receive education and counseling regarding perinatal transmission and prevention strategies, including use of ARV prophylaxis. Discussions should include issues that may arise should she become pregnant, including expectations for the child’s future and care for the child should the mother become ill.

Providers should also communicate and discuss safer sexual practices, including the used male and female condoms, with sexually active HIV-infected individuals to prevent transmission of HIV and acquisition of other STDs. Condoms and other contraception can prevent unwanted pregnancies that might result in perinatal transmission. When appropriate, providers should discuss effective contraception if deferral of pregnancy is recommended until medical and/or psychosocial conditions are optimized or if pregnancy is not desired at that time.
Eligible Population
All HIV-infected women

A) Denominator Description
Number of HIV-infected women between menarche and menopause

A) Numerator Description
Number of women who were asked if they wanted to become pregnant

B) Denominator Description
Number of sexually active HIV-infected women

B) Numerator Description
Number of women who received counseling about importance and use of male or female condoms

C) Denominator Description
Number of sexually active women stating they do not want to become pregnant

C) Numerator Description
Number of women with documented use or discussion/counseling about contraception

D) Denominator Description
Number of sexually active women contemplating pregnancy

D) Numerator Description
Number of women receiving preconception counseling

E) Denominator Description
Number of sexually active women

E) Numerator Description
Number of sexually active women with documented interval menstrual history and condom/contraceptive history
Antenatal Care
HIV RNA Measurement at 34-36 Weeks’ Gestation

Source

Background
To help make a decision about mode of delivery with the least likelihood of perinatal HIV transmission and maternal harm, a viral load test should be obtained shortly before the likely time of delivery, at 34-36 weeks. At this time, the level of HIV RNA in the mother’s plasma and an assessment of the clinical situation will help determine whether a cesarean section or vaginal birth is indicated. In general, if the HIV RNA viral load is below 1,000 copies/mL at 34-36 weeks, providers should not routinely offer cesarean sections.
Eligible Population
All HIV-infected pregnant women

A) Denominator Description
Number of HIV-infected pregnant women

A) Numerator Description
Number of patients for whom CD4 count and viral load were measured each trimester of pregnancy

B) Denominator Description
Number of patients for whom CD4 count and viral load were measured each trimester of pregnancy

B) Numerator Description
Number of patients who had HIV RNA measured at 34-36 weeks for mode of delivery assessment
Prescription of Antiretroviral Prophylaxis during Pregnancy

Source

Background
In 1994, the results of ACTG 076 were published, which proved that a three-part regimen of zidovudine could reduce perinatal transmission by 68%. Since that time, epidemiologic studies in the United States and France have shown impressive decreases in perinatal transmission with the use of a zidovudine regimen. Data from the Antiretroviral Pregnancy Registry have shown no increased risk for congenital abnormalities among infants born to women who receive zidovudine antenatally as compared to the general population.

Regardless of antenatal HIV RNA viral load levels or maternal status of infection, three-part zidovudine prophylaxis initiated after the first trimester is recommended to reduce risk of perinatal transmission. Among women whose immunologic, virologic, or clinical status requires treatment, or whose viral load is greater than 1,000 copies/mL, providers should prescribe effective combination therapy; this should include zidovudine, unless it would result in toxicity or is otherwise contraindicated. Clinical trials have shown that among women prescribed HAART, the reduction of HIV-1 RNA levels to less than 1,000 copies/mL results in very low rates of perinatal transmission. Women who are initiating antiretroviral (ARV) therapy for the first time may consult the provider and carefully consider waiting until after 10-12 weeks of gestation, when fetal organogenesis is complete.
Eligible Population
All patients who are both HIV-infected and pregnant and are receiving antiretroviral (ARV) therapy

A) Denominator Description
Number of HIV-infected pregnant women

A) Numerator Description
Number of patients prescribed ARV prophylaxis, regardless of clinical, immunologic, or virologic status

B) Denominator Description
Number of patients with HIV RNA level >1,000 copies/mL

B) Numerator Description
Number of patients prescribed HAART
Avoidance of Certain Antiretroviral Regimens during Pregnancy

Source

Background
Avoidance of nevirapine for pregnant women with CD4 >250 cells/mm³
Severe and life-threatening nevirapine-related hepatotoxicity has occurred in pregnant women prescribed nevirapine during pregnancy with CD4 counts >250 cells/mL. Providers should not prescribe nevirapine to pregnant women with CD4 counts >250 cells/mL, unless the provider determines that treatment benefits clearly outweigh the risks. In addition, providers should not administer nevirapine during labor to women in the United States who have already been prescribed ARV therapy during pregnancy, since it has not been shown to further reduce perinatal transmission in the developed world and may lead to future resistance.

Avoidance of efavirenz during first trimester
The FDA has changed the pregnancy category for efavirenz from Category C (Risk of Fetal Harm Cannot be Ruled Out) to Category D (Positive Evidence of Fetal Risk). This change followed the release of results from four retrospective reports of neural tube defects in infants born to women with first trimester exposure to efavirenz. One case reported myelomeningocele, a hernial protrusion of the spinal cord, in an infant exposed to efa-
virenz in the first 16 weeks of gestation. Providers should not prescribe efavirenz during the first trimester of pregnancy. Efavirenz should be avoided in women of child bearing potential not using contraceptive methods to protect against pregnancy.

**Eligible Population**
All HIV-infected pregnant women prescribed ARV therapy

A) **Denominator Description**
Number of HIV-infected pregnant women prescribed ARV therapy with CD4 counts >250 cells/mm$^3$

A) **Numerator Description**
Number of patients prescribed nevirapine

B) **Denominator Description**
Number of HIV-infected pregnant women prescribed ARV therapy

B) **Numerator Description**
Number of patients prescribed efavirenz during the first trimester

*Note that the desired outcome is zero and not 100%.  

Counseling Women with HIV Infection to Avoid Breastfeeding

Source


Background
Research has conclusively demonstrated that breastfeeding can transmit HIV from mother to child. The risk of transmission is well-understood, and contributing factors have been identified. The American Academy of Pediatrics and the Centers for Disease Control and Prevention have recommended complete avoidance of breastfeeding by HIV-1-infected women in the United States as the only manner through which transmission can be absolutely prevented in the postpartum period. Providers should counsel pregnant women with HIV infection not to breastfeed newborn infants.*

* In developed countries such as the United States, breastfeeding is not recommended for babies of HIV-infected women. However, breastfeeding is recommended in resource-limited settings where its benefits outweigh its risks.
**Eligible Population**
All HIV-infected pregnant women

**Denominator Description**
Number of HIV-infected pregnant women who have delivered a live-born infant within the time period of study

**Numerator Description**
Number of women who received counseling to avoid breastfeeding

NOTE: This indicator measures whether clinicians consistently discuss breastfeeding with HIV-infected expectant mothers. Please see the related “Neonatal Care and Prophylaxis” indicator on page 67, which measures whether infants of HIV-infected women were breastfed.
Cesarean Section Offered if HIV RNA >1,000 copies/mL

Source

Background
Providers should evaluate delivery options based on minimizing the risk for both perinatal transmission of HIV-1 and for maternal and neonatal complications. Providers should discuss the role of cesarean delivery to prevent perinatal transmission with their patients. Before HAART and viral load testing became routine, studies showed that either elective or scheduled cesarean delivery before the onset of labor and rupture of membranes resulted in decreased perinatal transmission, with reductions ranging from 55% to 80% compared to other forms of delivery.92

With administration of highly active antiretroviral (ARV) regimens and optimal suppression of viral load, perinatal transmission rates can be reduced to below 1%, regardless of mode of delivery.93 Low perinatal transmission rates among women receiving HAART have rendered the benefits of elective cesarean delivery inconclusive. Until further data are available, providers should continue to recommend elective cesarean delivery for women who have HIV RNA levels >1,000 copies/mL at 34-36 weeks. Providers should not routinely recommend cesarean deliveries to women receiving ARV therapy who have HIV RNA levels below 1,000 copies/mL, unless they choose this procedure after thorough counseling regarding uncertain benefits and known risks.
Eligible Population
All HIV-infected pregnant women

Denominator Description
Number of HIV-infected pregnant women with HIV RNA viral load >1,000 copies/mL at 36 weeks of pregnancy

Numerator Description
Number of patients for whom cesarean section was recommended
Intrapartum Care
Intrapartum Zidovudine Delivery: Administration of Intrapartum Regimen for Pregnant Women Who Have Never Received ARV Therapy

Source

Background
The AIDS Clinical Trials Group (ACTG) Protocol 076 of February 1994 clearly showed that a three-part regimen of zidovudine significantly reduces the risk for mother-to-child perinatal HIV-1 transmission. The three-part regimen includes intravenous zidovudine during labor as an important prophylaxis during childbirth, because most perinatal transmission likely occurs close to or during delivery. Providers should administer intravenous zidovudine therapy to women during labor. Intravenous zidovudine should begin 3 hours before a scheduled cesarean delivery.

Even though a woman may enter labor never having taken antiretroviral (ARV) therapy, drug administration during labor has been shown to reduce risk of transmission. Although the administration of medication during labor will not prevent antepartum perinatal transmission, it can protect the fetus from infection during exposure to HIV through maternal genital secretions and blood during delivery. The Guidelines recommend intrapartum zidovudine, alone or in combination with other ARV drugs, for women with no previous ARV therapy. Some experts suggest a zidovudine/lamivudine or zidovudine/ nevirapine regimen, although the efficacy of these compared to zidovudine alone is not
yet determined. The clinician should decide which regimen to use based on the clinical situation. If single-dose nevirapine is used, the clinician should consider adding maternal lamivudine starting as soon as possible (intrapartum or immediately postpartum) and continuing lamivudine and zidovudine for 3-7 days, which may reduce development of nevirapine resistance.

**Eligible Population**
All HIV-infected pregnant women

**Denominator Description**
Number of all HIV-infected pregnant women within the time of the study period who have delivered a live-born

**Numerator Description**
Number of patients who received administration of IV zidovudine during labor or prior to scheduled cesarean delivery alone or in combination with other ARV drugs
Postpartum Care
Maternal Postpartum Follow-Up Linkage to HIV Primary Care Provider after Delivery

Source

Background
Providers should perform postpartum follow-up care to women who have recently given birth. Providers should monitor important aspects of HIV infection as in any other HIV-infected individual. Demands of caring for a baby and the impact on adherence should be discussed. As part of the maternal follow-up care, providers should screen for depression, which should be treated if present. Obstetric providers should perform or refer patients for maternal postpartum follow-up care.

After giving birth, maternal medical services should be coordinated between obstetric care providers and HIV-1 primary care specialists. HIV primary care providers should provide HIV-specific care to maintain the patient’s health. Obstetricians should refer the patient to an HIV Specialist if she does not have one already.
Eligible Population
All HIV-infected postpartum women

A) Denominator Description
Number of HIV-infected postpartum women

A) Numerator Description
Number of patients who received documented maternal postpartum follow-up including monitoring of HIV infection with CD4 counts and viral load tests

B) Denominator Description
Number of HIV-infected postpartum women without a current primary care provider

B) Numerator Description
Number of patients who received referral to their own or a new HIV primary care provider after delivery
Neonatal and Infant Care
HIV Testing in Infants

Source

Background
HIV-antibody tests fail to establish the presence of HIV infection in infants because of transfer of maternal antibodies. For this reason, virologic nucleic acid amplification tests should be used to establish the diagnosis. Zidovudine monotherapy, which is often used for HIV-exposed infants, does not delay the detection of HIV culture and does not decrease the sensitivity and predictive values of many virologic assays. The Guidelines recommend virologic testing (HIV DNA PCR or HIV RNA tests: nucleic acid amplification tests, or NAAT) at 14-21 days of age, 1-2 months of age, and again at 4-6 months of age. Any positive result should be confirmed promptly with a second test. If the first two HIV NAAT tests (at 14-21 days and at 1-2 months of age) are negative, HIV infection can only be presumptively excluded. A later test at 4-6 months of age is needed to verify this conclusion. HIV infection is definitively excluded in infants who have not been breastfed or re-exposed to HIV by two negative virologic test results, one at ≥1 month of age, and the other at ≥4 months of age.

Eligible Population
All perinatally HIV-exposed infants < 18 months of age

Denominator Description
Number of infants, >6 months of age and <18 months of age, who have been perinatally exposed to HIV and have not been breastfed

Numerator Description
Number of infants from the denominator who had
- at least 2 negative HIV DNA PCR or HIV RNA assays performed, with one at ≥1 month of age and another at ≥4 months of age, and no positive virologic tests OR
- two positive HIV viral tests on separate specimens at any age
Neonatal Care and Prophylaxis

Source

Background
A 6-week course of zidovudine chemoprophylaxis is recommended for all HIV-exposed infants. Prophylaxis should be started at 6 to 8 hours of age, and definitely before 12 hours of age. Anemia is a primary complication of the regimen, and in some cases hematological values should be monitored. The anemia usually resolves within 12 weeks of age. Breastfeeding poses a significant risk of HIV transmission to the infant. The Committee on Pediatric AIDS recommends that providers counsel all HIV-infected mothers not to breastfeed their children.*

HIV-exposed infants in whom HIV infection is presumptively excluded by 4-6 weeks of age do not require prophylaxis for Pneumocystis jirovecii pneumonia (PCP). In this context, HIV infection is presumptively excluded based on demonstrating 2 negative virologic tests (HIV NAAT), one at ≥2 weeks of age and one at ≥4 weeks of age. If HIV NAAT testing at 2 and 4 weeks of age has not been completed, or the results on both tests have not been negative, then in those HIV-exposed infants, providers should begin trimethoprim-sulfamethoxazole treatment at between 4-6 weeks of age, usually after completing zidovudine prophylaxis. All HIV-exposed infants who have started PCP prophylaxis should continue PCP prophylaxis until HIV infection is presumptively excluded†, in which case prophylaxis is not recommended. Presumptive exclusion is based on

- 2 negative virologic tests, one ≥2 weeks of age and one ≥4 weeks of age, OR
- 1 negative virologic test ≥8 weeks of age, OR
- 1 negative HIV-1 antibody test result ≥6 months of age.

PCP prophylaxis should continue until 1 year of age in infected infants, when the advisability of prophylaxis treatment is reassessed.

* In developed countries such as the United States, breastfeeding is not recommended for babies of HIV-infected women. However, breastfeeding is recommended in resource-limited settings where its benefits outweigh its risks.

† A further negative test after 4 months of age is required to definitively exclude HIV infection.
Eligible Population
All infants born to HIV-infected pregnant women

A) Denominator Description
Number of infants born to HIV-infected women

A) Numerator Description
Number of infants who were initiated on zidovudine prophylaxis within 12 hours of birth

B) Denominator Description
Number of infants born to HIV-infected women

B) Numerator Description
Number of infants born to HIV-infected women who were not breastfed

C) Denominator Description
Number of infants who were born to HIV-infected women and who have not had two negative virologic tests, one ≥2 weeks of age and one ≥4 weeks of age

C) Numerator Description
Number of infants who initiated trimethoprim-sulfamethoxazole treatment by 6 weeks of age
TB, STI, and Hepatitis
Tuberculosis Screening

Source


Background
Rates of incidence of tuberculosis have increased in the United States resulting in the reemergence of tuberculosis (TB) as an important public health concern. HIV has affected the epidemiology, natural history, and clinical presentation of TB. Factors that have also contributed to the resurgence of TB in the United States include homelessness, nosocomial transmission resulting from poor infection control programs in hospitals, and diminished support for TB control programs.112

The profound immunodeficiency caused by HIV, however, has been the most significant factor responsible for the increase in tuberculosis. HIV-infected individuals who have been infected with M. tuberculosis are more likely to develop active TB than those who are HIV-seronegative. The risk of primary progressive TB in HIV-infected persons is as
high as 40% compared with approximately 5% in non-HIV-infected populations. Immunologic and virologic evidence now indicates that the host immune response to M. tuberculosis enhances HIV replication and might accelerate the natural progression of HIV infection.

TB screening effectively identifies individuals who are appropriate candidates for isoniazid (INH) prophylaxis to prevent the acceleration of disease progression. Providers should screen all HIV-infected patients for TB as soon as possible after HIV diagnosis and repeat screening annually.

### Eligible Population

All HIV-infected patients

### Denominator Description

Number of HIV-infected patients not known to be infected with TB

### Numerator Description

Number of HIV-infected patients who have received documented screening for TB infection with any approved test
Clinical Evaluation of TB Infection and Assessment of Symptomatic Patients

Source


Background
A clinical evaluation of patients with tuberculosis (TB) infection should occur to identify individuals with active TB disease. Providers should identify individuals with active TB disease to begin treatment and to prevent the progression of disease and the further transmission of TB. Providers should obtain a medical history, chest x-ray, and laboratory tests to properly identify an active infection.

In HIV-infected patients, providers should be aware of the possibility of tuberculosis, especially among populations at risk for TB infections. An unexplained cough of longer than 3 weeks’ duration strongly suggests a diagnosis of TB. For patients presenting with these symptoms, providers should conduct a clinical evaluation and obtain chest x-rays and sputum cultures to confirm the diagnosis.

The medical evaluation should include the following questions and assessments recommended by the Centers for Disease Control and Prevention1:
Medical History
Ask all patients about their history of TB treatment. If the patient previously received treatment, care providers should determine the antituberculosis drugs used, duration of treatment, history of adverse reactions, reasons for discontinuation of treatment, history of adherence with treatment, and previous antituberculosis drug-susceptibility test results.

Question all patients about the following risk factors for drug-resistant TB: a) previous treatment for TB, especially if it was incomplete; b) previous residence in a country outside the United States where drug-resistant TB is common; c) close contact with a person who has drug-resistant TB or multidrug-resistant TB; and d) previous residence in an institution (i.e., hospital, prison, homeless shelter) with documented transmission of a drug-resistant strain of TB.

When clinical specimens for culture and susceptibility testing cannot be obtained from patients (e.g., young children, patients with skeletal or meningeal TB), the culture and drug-susceptibility results of the Mycobacterium tuberculosis strain isolated from the infecting source-patient should be investigated and reviewed if available so that TB treatment for the current patient can be tailored appropriately.

Chest X-Ray Examination
Perform a chest x-ray examination. HIV-related immunosuppression reduces the inflammatory reaction and cavitation of pulmonary lesions, and therefore HIV-infected patients with pulmonary TB can have atypical findings or normal chest x-rays. Pregnant women who are being evaluated for active TB disease should undergo a chest x-ray (with the appropriate shielding) without delay, even during the first trimester of pregnancy. Patients suspected of having extrapulmonary TB should undergo a chest x-ray to rule out pulmonary TB.
Eligible Population
All patients with HIV infection

A) Denominator Description
Number of HIV-infected patients with unexplained cough lasting 3 or more weeks

A) Numerator Description
Number of HIV-infected patients who have undergone clinical evaluation, including medical history and chest x-ray within 3 days following confirmation that cough has persisted for 3 weeks

B) Denominator Description
Number of HIV-infected patients who are diagnosed with latent TB infection

B) Numerator Description
Number of HIV-infected patients with latent TB infection who have undergone clinical evaluation within 4 weeks following confirmation of latent TB infection diagnosis, including medical history and chest x-ray
Treatment of Latent TB Infection

Source


Background
HIV-infected patients with latent tuberculosis (TB) infections should receive preventive TB therapy to prevent serious complications of active TB disease. Preventive therapy among patients with latent TB infection is essential to control and eliminate TB in the United States. All HIV-infected persons identified with latent TB infection should complete a full recommended course of preventive therapy unless medically contraindicated. After clinical evaluation excludes active TB infection, the provider should prescribe treatment for latent TB.
Eligible Population
All HIV-infected patients

Denominator Description
Number of HIV-infected patients with latent TB

Numerator Description
Number of HIV-infected patients with latent TB who were prescribed treatment
Inappropriate Use of Rifamycins with Antiretroviral Therapy

Source


Background
Pharmacologic interactions may occur when physicians prescribe rifamycins for the treatment of tuberculosis in patients who are concomitantly taking protease inhibitors and nonnucleoside reverse transcriptase inhibitors (NNRTIs) for the treatment of HIV infection. Protease inhibitors (PIs) and NNRTIs are antiretroviral (ARV) agents that act as substrates that may inhibit or induce cytochrome P-450 isoenzymes (CYP450). Rifamycins are antituberculosis agents that induce CYP450 and may substantially decrease serum levels of ARV drugs.\(^\text{117}\) The pharmacologic interactions mutually reduce pharmacologic efficiency, because ARV agents may also decrease serum levels of rifamycins. Providers should not concomitantly prescribe protease inhibitors to patients prescribed rifampin, with the exception of ritonavir.\(^\text{1}\)
Eligible Population
All HIV-infected patients on ARV therapy

Denominator Description
Number of HIV-infected patients with TB infection who are treated with rifampin concomitantly with ARV therapy

Numerator Description
Number of patients who were treated for TB with a regimen that includes rifampin plus a PI other than ritonavir
Directly Observed Therapy for Tuberculosis

Source


Background
Tuberculosis (TB) is a public health concern of the highest order. Individuals with HIV infection who have been infected with M. tuberculosis are more likely to develop active tuberculosis than those who are HIV-seronegative. Patients need to adhere to TB therapy in order to prevent the progression of disease and the transmission of infection. Directly observed therapy (DOT) is the practice of observing patients as they take each dose of anti-TB medication and has become the standard of care for patients infected with TB in many parts of the United States. Providers should utilize DOT for all patients being treated for HIV-associated TB.
Eligible Population
All HIV-infected patients

Denominator Description
Number of patients with HIV-associated TB

A) Numerator Description
Number of patients with HIV-associated TB who are offered treatment in a DOT program

B) Numerator Description
Number of patients with HIV-associated TB who are receiving treatment in a DOT program
STI Testing and Screening

Source

Centers for Disease Control and Prevention, the Health Resources and Services Administration, the National Institutes of Health, and the HIV Medicine Association of the Infectious Diseases Society of America. Incorporating HIV prevention into the medical care of persons living with HIV. *MMWR Recomm Rep* 2003;52(RR-12):1-24.

Background
Early detection and treatment of STIs may reduce the risk for STI and HIV transmission. Providers should screen for STIs to treat infections and decrease HIV transmission to sexual partners. The presence of STIs often suggests recent or ongoing sexual behaviors that may result in HIV transmission. Providers can use STI screenings as opportunities to discuss risk reduction.  

Many STIs increase the number of HIV-infected white blood cells in the genital area and increase the risk of transmitting HIV infection. STIs can also enhance the risk of transmitting HIV by increasing the viral burden in genital secretions.

STI infections in seronegative partners increase the risk for acquiring HIV because they increase the volume of white blood cells, including those that are targeted by HIV, in the genital region, and may cause ulcerative lesions, increasing the likelihood of infection. Susceptibility to transmission may therefore be enhanced.
Despite the prior decrease in rates of syphilis infection, diagnoses of both primary and secondary syphilis are again increasing in the United States. HIV-infected men who have sex with men are disproportionately affected by increasing rates of syphilis. Providers should test for syphilis annually to treat the infection and to decrease HIV transmission risk.

Chlamydia infection in women may often be asymptomatic but like other STIs can also increase the risk for HIV transmission and enhance transmission susceptibility. Providers should test women for cervical chlamydia infection at least annually to treat infections and to decrease the risk of chlamydia and HIV transmission.

1) Eligible Population
All HIV-infected patients

A) Denominator Description
Number of sexually active HIV-infected patients

A) Numerator Description
Number of patients who were tested for syphilis in the past year

2) Eligible Population
All HIV-infected women

B) Denominator Description
Number of sexually active HIV-infected women

B) Numerator Description
Number of women who were tested for cervical chlamydia infection in the past year
Hepatitis C Screening

Background
Liver disease due to hepatitis C has become a leading cause of death in many HIV-infected patient populations. The prevalence of HIV/HCV co-infection is high. A cross-sectional analysis of HIV-infected adults in the United States found that 16.1% were co-infected with HCV. Knowledge of HCV status is important in order to counsel patients about strategies to reduce the risk of transmission to their sexual partners and individuals with whom they share needles. Knowledge of HCV status is also necessary in order to initiate anti-HCV therapy in certain co-infected individuals.

Eligible Population
All HIV-infected patients

Denominator Description
Number of HIV-infected patients

Numerator Description
Number of HIV-infected patients who have ever been tested for HCV at least once by either an antibody or a nucleic acid amplification test
Prevention and Treatment of Opportunistic Infections
**Pneumocystis jirovecii Pneumonia (PCP) Prophylaxis**

**Source**

**Background**
The risk of *Pneumocystis jirovecii* pneumonia (PCP) increases as the CD4 count decreases in patients with HIV infection: at levels <200 cells/mm$^3$ (or <14% of total mononuclear cells), the risk is high enough to warrant chemoprophylaxis.\textsuperscript{127, 128} Patients who have had oral candidiasis, or patients who have had a prior episode of PCP, are also at substantial risk.\textsuperscript{1, 2} Trimethoprim-sulfamethoxazole is the drug of choice for all patients who can tolerate this combination.\textsuperscript{129} Several different dose regimens have been carefully studied and can be used with a high degree of efficacy.\textsuperscript{130, 131, 132, 133, 134} Dapsone,\textsuperscript{4} dapsone-pyrimethamine\textsuperscript{135, 136}, aerosol pentamidine,\textsuperscript{137} and atovaquone,\textsuperscript{138, 139} can be used for patients who cannot tolerate TMP-SMX.
Eligible Population
All HIV-infected patients

Denominator Description
Number of HIV-infected patients with CD4 <200 cells/mm³ (or <14%), OR a history of oropharyngeal candidiasis, OR a prior episode of PCP, AND a CD4 count of >200 cells/mm³ for a period of at least 3 months

Numerator Description
Number of patients who are prescribed one of the listed agents above for PCP prophylaxis
Treatment of *Pneumocystis jirovecii* Pneumonia (PCP)

**Source**

**Background**
A 21-day course of trimethoprim-sulfamethoxazole (TMP-SMX) is the treatment of choice for PCP in patients able to tolerate this drug. A 21-day course is the regimen most often studied in the HIV-infected patient population.

**Eligible Population**
All HIV-infected patients

**Denominator Description**
Number of HIV-infected patients with acute PCP

**Numerator Description**
Number of patients with acute PCP who receive treatment for at least 21 days; for patients who do not tolerate this regimen, dapsone/trimethoprim or clindamycin/primaquine was prescribed
Treatment of Cryptococcal Meningitis

Source

Background
Cryptococcal disease is a common and life-threatening complication for patients with HIV infection. Most patients with cryptococcal meningitis have CD4 counts <100 cells/mm$^3$. Therapy is highly effective, especially if initiated before neurologic impairment is profound or prolonged.

While the number of available antifungal agents is expanding, the best-studied regimen for HIV-infected patients with cryptococcal meningitis is amphotericin B for 2 weeks, followed by fluconazole 400 mg qd for 8 weeks, followed by at least 14 weeks of fluconazole 200 mg qd. Amphotericin has been most extensively studied as amphotericin B 0.6 mg/kg qd, although liposomal amphotericin regimens have also been used and are acceptable alternatives to amphotericin B.
Eligible Population
All HIV-infected patients

Denominator Description
Number of HIV-infected patients with cryptococcal meningitis

Numerator Description
Number of patients with cryptococcal meningitis who received therapy with at least 2 weeks of an amphotericin B preparation, followed by at least 22 weeks of fluconazole
Mental Health
Depression Screening

Source


Background
Up to 20% of HIV-infected patients suffer from clinical depression, making it the most commonly observed mental health disorder in the HIV-infected population. Among HIV-infected substance users, the prevalence of depression may be even higher. Studies have linked depression in HIV-infected patients to risk behaviors, non-adherence to medications, and shortened survival. Clinical depression differs from the sadness and grief which often accompany the knowledge of a positive HIV diagnosis. Failure to recognize depression may endanger both the patient and others in the community. Studies suggest that patients with depression are at higher risk for comorbidities such as psychiatric, and substance use-related disorders, particularly alcohol, cannabis, and cocaine use.

To provide proper mental health care, clinicians should screen for depression as part of an annual mental health assessment and whenever symptoms suggest. Recognition of depression permits diagnosis and appropriate management in the primary care setting, with referral for psychiatric consultation if necessary. According to the National Institute of Mental Health, symptoms of depression include:
• Persistent sad, anxious, or “empty” mood
• Feelings of hopelessness, pessimism
• Feelings of guilt, worthlessness, helplessness
• Loss of interest or pleasure in hobbies and activities that were once enjoyed, including sex
• Decreased energy, fatigue, being “slowed down”
• Difficulty concentrating, remembering, making decisions
• Insomnia, early-morning awakening, or oversleeping
• Appetite and/or weight loss or overeating and weight gain
• Thoughts of death or suicide; suicide attempts
• Restlessness, irritability
• Persistent physical symptoms that do not respond to treatment, such as headaches, digestive disorders, and chronic pain

The presence of any of these symptoms warrants screening for depression.

Simple screening techniques tested in a general primary care setting are effective in detecting unrecognized depression.\textsuperscript{153, 154} Simply asking patients if they are depressed is effective because the answer to this direct question often provides enough information for the clinician to make a presumptive diagnosis. Other screening tools for diagnosis include asking questions such as:

1. \textit{During the past month, have you often been bothered by feeling down, depressed, or hopeless?}
2. \textit{During the past month have you often been bothered by little interest or pleasure in doing things?}

If a patient answers yes to either of these questions, further evaluation is indicated.\textsuperscript{155}

Further screening tools, such as the BDI-II, HANDS, CDQ, Duke AD tools can be used to evaluate depression.\textsuperscript{1} To diagnose depression, consult the \textit{Diagnostic and Statistical Manual of Mental Disorders-Fourth Edition}, Text Revision (American Psychiatric Association, 2004).
Eligible Population
All HIV-infected patients

Denominator Description
Number of patients who are HIV-infected

Numerator Description
Number of patients who have received annual screening for depression
Substance Use Screening in Patients with Documented Mental Health Disorder

Source


Background

In 2004, 19,929,000 people in the United States had comorbidities of substance dependence or abuse and serious psychological distress, as defined by the DSM-IV. The population of persons with the dual diagnoses of serious mental illness and substance use has a high HIV prevalence rate. Reported data on prevalence rates of comorbid mental illness, substance abuse and HIV varies based on the type of substance and mental illness investigated. However, one study found the prevalence of depressive disorders among male HIV-infected injection drug users to be 33%. Alcohol/substance use and mental health disorders may create multiple difficulties in providing health care and achieving desired health outcomes because of erratic patient behaviors. Providers should screen patients with mental health disorders for alcohol and other substance use to provide appropriate health care services specific to each patient. Research suggests that providing behavioral treatment for mental health and substance use disorders among HIV-infected individuals improves health outcomes among patients. Addressing problems associated with substance use can help patients adopt harm reduction
behaviors, such as using clean syringes and practicing safer sex.\textsuperscript{161} HIV infected adults who depend on alcohol and drugs often have lower levels of adherence to antiretroviral medications.\textsuperscript{162} Harm reduction education and counseling can reduce substance use\textsuperscript{163} which may improve adherence to HIV medications. Increased adherence often improves HIV-related health outcomes.\textsuperscript{164}

For patients with no past history of substance use, providers should screen for substance use annually. For patients with a presently identified or past history of substance use, providers should screen for substance use quarterly. In all cases, providers should ask patients about use of alcohol, marijuana, cocaine, crack cocaine, amphetamines, opiates, and benzodiazepines.

**Eligible Population**
All HIV-infected patients

**A) Denominator Description**
Number of HIV-infected patients with documented mental health disorder and no current or past history of alcohol/substance use

**A) Numerator Description**
Number of patients who were asked about their use of alcohol, marijuana, cocaine, crack cocaine, amphetamines, opiates, and benzodiazepines in the past year

**B) Denominator Description**
Number of HIV-infected patients with documented mental health disorder and current or past history of substance use

**B) Numerator Description**
Number of patients who were asked about their use of alcohol, marijuana, cocaine, crack cocaine, amphetamines, opiates, and benzodiazepines in the last quarter
Management of Depression

Source

Background
After initiation of treatment for depression, healthcare providers should evaluate patients frequently since it may take 3 weeks or longer for treatment to affect patients’ mood. During initiation of antidepressant medication, providers should schedule a brief visit or phone conversation every 1 or 2 weeks. The Food and Drug Administration (FDA) has recently issued warning labels on antidepressant medications about associated suicide risk, mainly in children and adolescents. The FDA recommends weekly mental health visits for 4 weeks following initiation of treatment with antidepressant medication in this age group.

After 3 or 4 weeks, a qualified healthcare worker should perform an in-person assessment of the patient’s symptoms and response to treatment. Documented response to treatment should include whether the patient has experienced complete symptom improvement, partial improvement, no improvement, or worsening of symptoms. If there is little or no improvement after 3 weeks, then the medical provider should modify treatment.

If side effects are not an issue, an increase in dose is most often the first option. If a several-week trial at a maximal dose is not effective, the provider should change medication, augment it with another agent, or refer the patient to a specialist.
Depression can be a chronic condition with periodic relapse. After resolution of the first occurrence of depression, treatment for the following 6 months to 1 year is recommended to prevent relapse.\textsuperscript{167} Repeated episodes of depression suggest the need for lifelong treatment.\textsuperscript{17} Clinicians should encourage patients who experience recurrent depression to continue therapy and/or medication indefinitely.


**Eligible Population**
All HIV-infected patients with documented depression meeting DSM criteria

**Denominator Description**
Number of patients treated for depression

**Numerator Description**
Number of patients with depression with documented response to treatment within 4 weeks of treatment initiation
Coordination of Care Between Medical and Psychiatric Providers

Source

Background
Medical and psychiatric providers should collaborate effectively to manage the mental health of their HIV-infected patients. Mental health care should include primary care practitioners, patients, mental health clinicians, case managers, and also, when appropriate, substance abuse counselors or domestic violence service providers. To determine whether the medical practitioner or the psychiatrist should be the primary care practitioner, both the stage of HIV infection and the severity of the psychiatric disorder should be assessed. Care should be coordinated between both medical and psychiatric practitioners. When providers refer patients to a mental health treatment program, primary care practitioners should assist mental health clinicians with coordination of care. The benefits of coordinating management include consistent and proper management of medications, treatment adherence planning, and the efficient delivery of services and patient care.
Eligible Population
All HIV-infected patients

Denominator Description
Number of HIV-infected patients receiving mental health services

Numerator Description
Number of patients whose records have specific documentation of communication or exchange of data between mental health and medical providers
Psychotropic Medication Side Effect Screening

Source

Background
To provide comprehensive care, primary care professionals should be familiar with the commonly prescribed psychotropic medications, their general indications, and their potential side effects. Providers should ask patients if they are experiencing any side effects from psychotropic medications. Providers should also monitor the psychiatric (CNS) side effects of HIV medications. Psychotropic drugs may interact with HIV-related medications and raise blood levels of psychotropics, which may increase toxicity and side effects. In general, most patients tolerate HIV-related medications and psychotropic medications without psychiatric or central nervous system side effects. However, providers should ask patients about any side effects they may be experiencing. Common side effects from psychotropic medications include sexual problems, nervousness, headaches, dry mouth, blurred vision, increased heart rate, appetite changes, constipation and other intestinal disturbances.
Eligible Population
All HIV-infected patients

Denominator Description
Number of HIV-infected patients receiving psychotropic medications

Numerator Description
Number of patients who were questioned about psychotropic medication side effects at baseline and annually
Substance Use
Substance Use Screening in Patients with Documented Mental Health Disorder

Source


Background
In 2004, 19,929,000 people in the United States had comorbidities of substance dependence or abuse and serious psychological distress, as defined by the DSM-IV. The population of persons with the dual diagnoses of serious mental illness and substance use has a high HIV prevalence rate. Reported data on prevalence rates of comorbid mental illness, substance abuse and HIV varies based on the type of substance and mental illness investigated. However, one study found the prevalence of depressive disorders among male HIV-infected injection drug users to be 33%. Alcohol/substance use and mental health disorders may create multiple difficulties in providing health care and achieving desired health outcomes because of erratic patient behaviors. Providers should screen patients with mental health disorders for alcohol and other substance use to provide appropriate health care services specific to each patient.

Research suggests that providing behavioral treatment for mental health and substance use disorders among HIV-infected individuals improves health outcomes among patients. Addressing problems associated with substance use can help patients adopt harm reduction strategies.
behaviors, such as using clean syringes and practicing safer sex.\textsuperscript{175} HIV infected adults who depend on alcohol and drugs often have lower levels of adherence to antiretroviral medications.\textsuperscript{176} Harm reduction education and counseling can reduce substance use\textsuperscript{177} which may improve adherence to HIV medications. Increased adherence often improves HIV-related health outcomes.\textsuperscript{178}

For patients with no past history of substance use, providers should screen for substance use annually. For patients with a presently identified or past history of substance use, providers should screen for substance use quarterly. In all cases, providers should ask patients about use of alcohol, marijuana, cocaine, crack cocaine, amphetamines, opiates, and benzodiazepines.

**Eligible Population**

All HIV-infected patients

**A) Denominator Description**

Number of HIV-infected patients with documented mental health disorder and no current or past history of alcohol/substance use

**A) Numerator Description**

Number of patients who were asked about their use of alcohol, marijuana, cocaine, crack cocaine, amphetamines, opiates, and benzodiazepines in the past year

**B) Denominator Description**

Number of HIV-infected patients with documented mental health disorder and current or past history of substance use

**B) Numerator Description**

Number of patients who were asked about their use of alcohol, marijuana, cocaine, crack cocaine, amphetamines, opiates, and benzodiazepines in the last quarter
Discussion of Substance Use with HIV-Infected Patients

Source

Background
In 2005, rate of use of illicit drugs among people aged 18 to 25 was 20%. For youths aged 12 to 17, the rate was 9.9%, and for adults aged 26 or older, the rate was 5.8%. Substance use directly affects patients’ health, adherence to therapy, and retention in care. Through needle-sharing behaviors, exchange of sex for drugs or money, and disinhibition resulting in risky sexual behaviors, substance use remains an important risk factor for HIV acquisition and transmission.

Discussion of substance use allows the clinician to either provide counseling or make referrals to substance and alcohol treatment centers. A study of HIV-infected veterans showed that hazardous drinking and alcohol diagnoses were associated with HIV disease progression and/or hepatic comorbidity and anemia. Alcohol problems were also often missed by providers, thus increasing the need for routine screening.

A wide range of therapeutic options are available to substance users to reduce harm and risk of HIV, including substitution therapy, syringe exchange programs, behavioral interventions, and counseling.
Eligible Population
All HIV-infected patients

Denominator Description
Number of HIV-infected patients

Numerator Description
Number of HIV-infected patients who have documentation of annual screening for or discussion of substance use
Harm Reduction Counseling and Referral for Drug Injectors

Source

Background
For injecting drug users, clinicians should discuss safer injection practices, refer to sources of sterile injection equipment, and provide instructions on how to safely dispose of syringes. Studies show that participation in harm-reduction programs, such as syringe exchange, does not increase the frequency of drug use, and results in a decrease in risky behavior for transmission of HIV. Drug users who enroll in harm reduction programs and receive counseling are also more likely to enter into and stay engaged in drug treatment programs.

Eligible Population
All HIV-infected patients

Denominator Description
Number of HIV-infected current injecting drug users

Numerator Description
Number of HIV-infected current injecting drug users who are receiving or have been referred to harm reduction counseling
Screening for HIV Transmission Risk via Shared Intravenous Drug Equipment and Referral to Drug Treatment Program

Source
Centers for Disease Control and Prevention, the Health Resources and Services Administration, the National Institutes of Health, and the HIV Medicine Association of the Infectious Diseases Society of America. Incorporating HIV prevention into the medical care of persons living with HIV. *MMWR Recomm Rep* 2003;52(RR-12):1-24.

Background
In 2002 and 2003, an annual average of 354,000 (0.2% of US population) persons aged 12 or older had used a needle to inject heroin, cocaine, methamphetamines, or other stimulants during the past year.\(^1\) Injection drug use continues to play a key role in the spread of HIV. In 2000, 28% of AIDS cases among adults and adolescents with a known HIV risk category reported to CDC were related to injection drug use.\(^2\) In New York City between 1999 and 2002, the rate of HIV incidence among IV drug users was 0.77 per every 100 person-years at risk.\(^3\)

To prevent transmission of HIV through the sharing of recreational drug injection equipment, medical providers should screen, communicate, and discuss the risks of sharing paraphernalia with injection drug users. In the year 2003, more than one half (51.4%) of past-year injection drug users reused a needle the last time they injected drugs. Approximately 13.1% used a needle that they knew or suspected someone else had used before them, and 18.1% used a needle that someone else used after them. An estimated 64.4% of past-year injection drug users did not clean the needle with bleach before the last time they had used one to inject drugs.\(^1\)
Medical providers should assess patients for drug use to identify possible routes of HIV transmission. Assessment allows providers to refer injecting drug users to drug treatment and rehabilitation. Research conducted over the last 20 years has found associations between substance use screening and enrollment in substance use treatment programs.\textsuperscript{194,195}

Providers should also ask injection drug users whether or not they share paraphernalia to assess the level of risk. If patients are sharing syringes, needles, or other drug paraphernalia, harm-reduction education can reduce both harm to patients and the risk of HIV transmission to others.

Many studies have been conducted that examine how drug treatment, and specifically methadone maintenance treatment, can modulate HIV risk behaviors among intravenous drug users.\textsuperscript{196} Collectively, they have shown that methadone maintenance treatment reduces risky injection, sexual behaviors, and ultimately HIV transmission.\textsuperscript{197,198} Enrollment and maintenance in substance abuse treatment programs and abstaining from injecting reduces the risk of HIV transmission.\textsuperscript{199,200,201}Providers should counsel injecting drug users to cease injecting and refer them to a drug treatment program.
1) Eligible Population
All HIV-infected patients

A) Denominator Description
Number of HIV-infected patients

A) Numerator Description
Number of patients who were asked at least once if they have injected any non-prescribed drugs since their last visit

B) Denominator Description
Number of HIV-infected patients who have reported injecting any non-prescribed drugs

B1) Numerator Description
Number of patients who have been asked if they are sharing needles and drug injection paraphernalia

B2) Numerator Description
Number of patients who have been referred for substance abuse treatment or harm reduction interventions (e.g., needle exchange programs)

2) Eligible Population
All HIV-infected injecting drug users

C) Denominator Description
Number of HIV-infected patients who report injecting non-prescribed drugs

C) Numerator Description
Number of patients who are referred to a substance use treatment program
Opioid Agonist Therapy for Opioid-Dependent Patients

Source

Background
Treatment of comorbid opioid dependence is an important aspect of HIV-related care. Opioid agonist pharmacotherapy with methadone\textsuperscript{202} and buprenorphine\textsuperscript{203} is effective treatment for opioid dependence. Opioid agonist maintenance treatment has been shown to reduce HIV risk behavior and is therefore an important prevention strategy. For example, patients enrolled in methadone treatment report lower frequency of injection, sharing needles,\textsuperscript{204, 205, 206} and engaging in risky sexual practices.\textsuperscript{4, 207} Opioid agonist treatment also reduces the risk of overdose\textsuperscript{208} and is associated with overall reductions in morbidity\textsuperscript{209} and mortality.\textsuperscript{210}

Eligible Population
All HIV-infected patients

Denominator Description
Number of HIV-infected patients with a current diagnosis of opioid dependence

Numerator Description
Number of opioid-dependent patients who are receiving opioid agonist therapy
Discussion of Tobacco Use in the Past Year with All HIV-Infected Patients

Source

Background
Over 50% of HIV-infected patients and 75% of substance users are estimated to be current smokers.\textsuperscript{211, 212, 213} In patients previously treated for alcoholism or other non-nicotine drug dependence, smoking-related diseases are the leading cause of death.\textsuperscript{214} HIV-infected patients are at increased risk of HIV-associated pulmonary infections and oropharyngeal lesions.\textsuperscript{215} Smoking causes higher incidence rates of AIDS-defining and non-AIDS-defining malignancies.\textsuperscript{216} Smoking is also a risk factor for atherosclerosis and is associated with coronary events in patients receiving protease inhibitor therapy.\textsuperscript{217}

Discussion of tobacco use should highlight the harmful effects of tobacco on the health of the HIV-infected patient, and the effectiveness and availability, on-site or by referral, of treatment for smoking.
Eligible Population
All HIV-infected patients

Denominator Description
Number of HIV-infected patients

Numerator Description
Number of patients whose smoking status was assessed in the past year
Offering Tobacco Cessation Programs to Tobacco-Dependent Patients

Source

Background
Because tobacco use among HIV-infected patients poses significant health risks, tobacco-dependent patients should be offered assistance to stop smoking. Various studies have shown that brief interventions by the clinician to encourage tobacco cessation and offer pharmacotherapy (e.g., nicotine replacement therapy) can decrease rates of smoking and other tobacco use. Cessation reduces the incidence and progression of tobacco-related diseases and increases life expectancy. HIV care providers should provide cessation assistance in the form of counseling, pharmacotherapy, or referral to cessation programs.

Discussion of tobacco use should highlight the harmful effects of tobacco on the health of the HIV-infected patient, and the effectiveness and availability, on-site or by referral, of treatment for smoking.
Eligible Population
All HIV-infected patients

Denominator Description
Number of HIV-infected patients who are current smokers or users of other tobacco products

Numerator Description
Number of current smokers or users of other tobacco products who received assistance with cessation
HIV Prevention
Screening for Partner Counseling and Referral Services (PCRS) Referral, Screening for HIV Status Disclosure to Partners, and Screening for Condom Use

Source
Centers for Disease Control and Prevention, the Health Resources and Services Administration, the National Institutes of Health, and the HIV Medicine Association of the Infectious Diseases Society of America. Incorporating HIV prevention into the medical care of persons living with HIV. MMWR Recomm Rep 2003;52(RR-12):1-24.

Background
Research has shown that most new HIV infections are transmitted from HIV-infected persons not yet aware of their infection. In one study, the rate of transmission from a cohort of persons unaware of their status was 3.5 times greater than from a cohort of persons who were aware of their HIV-infected status. HIV-infected persons should be identified and linked to medical, prevention and other services after they become infected. At the initial visit, patients should be asked if all their sex and needle-sharing partners have been informed of their exposure to HIV. At routine follow-up visits, patients should be asked if they have had any new sex or needle-sharing partners who have not been informed of their exposure to HIV. Providers should refer patients to the appropriate health department Partner Counseling and Referral Services (PCRS) program to discuss sex and needle-sharing partners who have not been informed of their exposure and to arrange for their notification and referral for HIV testing.
PCRS notifies partners of their exposure to HIV. Notified partners can choose to be tested for HIV, and if HIV-infected, receive medical evaluation, treatment, and prevention services, including risk-reduction counseling. Among sex partners, close partners are more likely to be notified. Partner notification is confidential and voluntary; partners are not told who reported their name or when the possible exposure occurred, nor do patients have to report partners.

A recent survey has shown that 32% of persons infected with HIV in areas of high prevalence were interviewed for PCRS. PCRS can effectively reach individuals at high risk for HIV. PCRS has been found to be cost-effective. Surveys of patients have indicated acceptability of PCRS.

Many states and some cities or localities have laws and regulations about informing partners of their exposure to HIV. Some health departments require clinicians to report known partners even if a patient refuses to report. Some states require clinicians to disclose potential exposure to third parties known to be at significant risk for future HIV transmission.

Encouraging disclosure of HIV status may increase the likelihood that partners will be tested and will take greater precautions. If the provider has determined that a patient is engaging in sex with HIV-negative partners or partners of unknown HIV status, the provider should ask if the patient discloses HIV status or uses condoms to reduce the sexual transmission of HIV. Assessing a patient’s sexual risk of transmission provides an opportunity for targeted prevention education and can lead to behavior modification.

If the provider has determined that a patient engages in risky sexual behavior with partners who are either HIV-negative or of unknown HIV status, and the provider has determined that the patient does not disclose HIV status or use condoms, then the provider should counsel the patient with intent to encourage HIV disclosure behavior. Individual or group disclosure counseling may be effective. Individual disclosure counseling may be provided by any member of the health care team.
1) Eligible Population
All HIV-infected patients

A) Denominator Description
Number of patients seen for an initial visit

A) Numerator Description
Number of patients who were asked at their initial visit if all of their sex and needle-sharing partners have been informed of their exposure to HIV

2) Eligible Population
All HIV-infected patients who have sex or needle-sharing partners

B) Denominator Description
Number of patients who report having sex or needle-sharing partners who have not been informed of their exposure to HIV

B) Numerator Description
Number of patients who have been referred to appropriate health department to discuss and arrange for notification of such partners

C) Denominator Description
Number of HIV-infected patients who report engaging in sex with partners who are either HIV-negative or of unknown HIV status
C1) Numerator Description
Number of patients who were asked whether they have disclosed their serostatus to such partners

C2) Numerator Description
Number of patients who were asked whether they have always used condoms with such partners

D) Denominator Description
Number of HIV-infected patients who report engaging in high-risk sexual behavior with partners who are HIV-negative or of unknown status and have not disclosed their HIV status

D) Numerator Description
Number of patients who are counseled with intent to change behavior regarding disclosure of HIV status to sex partners
<table>
<thead>
<tr>
<th>INDICATOR</th>
<th>DENOMINATOR</th>
<th>NUMERATOR</th>
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<tbody>
<tr>
<td>PARTNER DISCLOSURE</td>
<td>Number of patients seen for initial visit</td>
<td>Number of patients who have been asked at their initial visit if all of their sex and needle-sharing partners have been informed of their exposure to HIV</td>
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<tr>
<td>DISCLOSURE SCREENING</td>
<td>Number of HIV-infected patients who report engaging in sex with partners who are either HIV-negative or of unknown HIV status</td>
<td>Number of patients who were asked whether they have disclosed their serostatus to such partners</td>
</tr>
<tr>
<td>DISCLOSURE COUNSELING</td>
<td>Number of HIV-infected patients who report engaging in high-risk sexual behavior with partners who are HIV-negative or of unknown status and have not disclosed their HIV status</td>
<td>Number of patients who are counseled with intent to change behavior regarding disclosure of HIV status to sex partners</td>
</tr>
<tr>
<td>REFERRAL TO HEALTH DEPARTMENT</td>
<td>Number of patients who report having sex or needle-sharing partners who have not been informed of their exposure to HIV</td>
<td>Number of patients who have been referred to appropriate health department to discuss and arrange for notification of such partners</td>
</tr>
<tr>
<td>CONDOM USE SCREENING</td>
<td>Number of HIV-infected patients who report engaging in sex with partners who are either HIV-negative or of unknown HIV status</td>
<td>Number of patients who were asked whether they have always used condoms with such partners</td>
</tr>
</tbody>
</table>
Referral for Prevention Counseling

Source
Centers for Disease Control and Prevention, the Health Resources and Services Administration, the National Institutes of Health, and the HIV Medicine Association of the Infectious Diseases Society of America. Incorporating HIV prevention into the medical care of persons living with HIV. 2003;52(RR-12):1-24.

Background
In some cases, risk behavior counseling cannot be effectively delivered in clinical settings. Some patients require more focused and ongoing behavioral counseling, including those with problems such as substance use, mental illness, and homelessness. These issues often need to be addressed in another setting where more resources can be allocated to focus on these problems.

Patients who cannot easily sustain behaviors that reduce or prevent HIV transmission may benefit from intensified prevention counseling services. In such cases, referrals to HIV prevention counseling groups, family planning, substance abuse treatment, mental health services, and social services may be appropriate. Providers should refer HIV-infected patients to appropriate services for issues related to HIV transmission that cannot be adequately addressed during the clinic visit.

For HIV-infected persons, efficacy studies of such interventions are limited to a few randomized controlled trials, only one of which documented change in risk-related behavior. The majority of other studies have not assessed behavioral outcomes. However, among HIV-seronegative persons, randomized controlled trials have shown the efficacy of HIV prevention interventions.
**Eligible Population**
All HIV-infected patients

**Denominator Description**
Number of HIV-infected patients who need additional services related to HIV transmission prevention that cannot be adequately addressed during clinic visit

**Numerator Description**
Number of patients who are referred to HIV prevention counseling services
Occupational Post-Exposure Prophylaxis (PEP)
Exposure History

Source


Background
When PEP is initiated, the provider should collect and document the source patient’s antiretroviral (ARV) treatment history as well as information about the source patient’s adherence with his/her current regimen and current CD4 count and viral load measurement. If such information is not available, its lack of availability should be documented. When the source person’s virus is suspected to be resistant to one or more of the drugs considered for the PEP regimen, the selection of drugs to which the source person’s virus is unlikely to be resistant is recommended.
Eligible Population
All health care workers for whom PEP was prescribed

Denominator Description
Number of times PEP was prescribed when the source was known

Numerator Description
Number of times when PEP was prescribed and the following information was also documented: history of source patient’s ARV history, adherence with regimen, current HIV viral burden and CD-4 count; if all of these components cannot be obtained, unavailability should be documented
Risk Exposure

Source

Background
When PEP is administered, providers should document that the exposure meets standards for significant risk exposure. Significant risk exposures can potentially result in infection following occupational exposure to bloodborne pathogens. Exposure of this nature includes percutaneous injury (e.g., following needlestick or cut with a sharp object), or contact of mucous membrane or nonintact skin (e.g., exposed skin that is chapped, abraded, or afflicted with dermatitis) with blood, tissue, or other body fluids that are potentially infectious. Fluids such as cerebrospinal fluid, synovial fluid, pleural fluid, peritoneal fluid, pericardial fluid and amniotic fluid are also potentially infectious. Feces, nasal secretions, saliva, sputum, sweat, tears, urine, and vomitus are not considered potentially infectious unless they are visibly bloody. Semen and vaginal secretions are responsible for sexual transmission of HIV but their role in occupational transmission from patients to Health Care Worker (HCW) has not been established. Any contact without barrier protection to concentrated virus in occupational settings requires clinical evaluation. Transmission of HIV infection by human bite has been reported rarely, but not in the occupational setting.
Eligible Population
All HCWs for whom PEP was prescribed

Denominator Description
Number of HCWs for whom PEP was prescribed

Numerator Description
Number of times that criteria for risk of exposure were documented
Pregnancy Status of the Health Care Worker (HCW) for whom PEP Is Prescribed

Source

Background
In addition to the risk of seroconversion for the patient, there is a high risk of transmission to the fetus or breastfeeding infant, should the pregnant health care worker develop the acute retroviral syndrome. Although birth defects and adverse effects on human fetuses have generally not been associated with the currently available ARV agents, exposure of a fetus to ARV agents during pregnancy carries a theoretical risk of teratogenicity.240 Pregnancy test should be obtained in female HCWs of childbearing age who receive PEP.

Eligible Population
All female HCWs of childbearing age for whom PEP is prescribed

Denominator Description
Number of female HCWs between menarche and menopause for whom PEP is prescribed

Numerator Description
Number of female HCWs for whom PEP is prescribed and in which clinical or laboratory proof of a pregnancy test is documented in the health record


Appropriateness of PEP Regimen

Source

Background
CDC guidelines recommend a two-tiered hierarchy to guide choice of PEP regimens based on the type and severity of occupational exposure. For HCWs with clear evidence of exposure, a 3-drug regimen is advised. In other situations, a 2-drug regimen is considered sufficient. Other PEP guidelines adopted by state health departments recommend uniform prescription of a 3-drug regimen. Regimen selection will vary depending on the state in which the exposure occurred and may change based on availability of new antiretroviral (ARV) agents, community HIV resistance profiles, and according to the exposure history. State and federal guidelines may diverge with reference to specific medications recommended but adhere to the same treatment principles.

Recommended agents for PEP regimens include zidovudine, lamivudine or emtricitabine, and tenofovir. In circumstances where the source has possible resistance to ARV, the use of other medications or addition of a fourth drug should be considered. Lopinavir/ritonavir (Kaletra) is the preferred protease inhibitor in expanded PEP regimens. Alternate regimens are described in the CDC guidelines.
ARV drugs not recommended for PEP, primarily because of the higher risk for potentially serious or life-threatening adverse events, include abacavir, delavirdine, zalcitabine, and the combination of didanosine and stavudine.\(^2\)

Clinicians should familiarize themselves with the side-effects associated with and contraindications for use of ARV agents selected for PEP.

**Eligible Population**
All HCMs for whom PEP was prescribed

**Denominator Description**
Number of HCWs for whom PEP was prescribed

**Numerator Description**
Number of HCWs for whom the prescribed regimen matched the recommendations in state or CDC guidelines
Initiation of PEP 2 Hours after Occupational Exposure

Source

Background
Initiation of PEP within 2 hours of exposure is recommended; animal studies have shown that effectiveness of PEP diminishes as a function of delayed initiation.\(^2\)\(^4\),\(\text{3}\),\(\text{4}\),\(\text{5}\),\(\text{6}\) Thus, PEP should be initiated as soon as possible. If the clinician does not have enough information to decide whether to use a basic or an expanded regimen, the basic regimen should be started immediately.

Eligible Population
All Health Care Workers (HCW) receiving PEP

Denominator Description
Number of HCWs for whom PEP was prescribed

Numerator Description
Number of HCWs for whom PEP was prescribed within 2 hours of exposure
Monitoring Adherence to PEP

Source

Background
Approximately 50% of HCWs for whom PEP is initiated do not complete therapy because of side effects or non-adherence. When Health Care Workers (HCW) are occupationally exposed to HIV, longitudinal medical follow-up of the HCW should be performed. Weekly clinical evaluations should be carried out to monitor adherence to the prescribed regimen. In instances where the exposed worker is nonadherent, the practitioner should document the reasons for nonadherence and intervene to improve adherence through prescribing medications to manage side effects, dosing adjustments, and regimen changes, if needed.

Eligible Population
All HCWs receiving PEP

Denominator Description
Number of HCWs receiving PEP

Numerator Description
Number of HCWs receiving PEP who have documentation of adherence monitoring at a clinical visit 48-72 hours after the exposure and weekly for 4 weeks
Monitoring Toxicity of PEP

Source

Background
Since ARV agents are associated with toxicity and side effects, completion of the 4-week PEP regimen is often difficult for Health Care Workers (HCW). Commonly reported symptoms have included nausea, headache, malaise, and fatigue. In addition, drug interactions should be carefully considered while administering PEP. Regular monitoring of drug toxicity allows clinicians to change regimens if adverse effects are undermining the ability of HCWs to adhere to PEP.

Eligible Population
All HCWs receiving PEP

Denominator Description
Number of HCWs receiving PEP

Numerator Description
Number of HCWs receiving PEP who were evaluated for medication toxicity at least once every other week
Expert Consultation for Management of PEP

Source

Background
When the following situations arise from occupational exposure, advice should be sought from local or national HIV experts:
- Delayed reporting of occupational exposure (later than 24-36 hours)
- Source of exposure is unknown (e.g. needle in sharps disposal or laundry)
- Known or suspected pregnancy in the exposed person
- Exposed Health Care Workers (HCW) is breastfeeding
- Known or suspected resistance of the source virus to ARV agents
- Toxicity of the postexposure prophylaxis regimen

Eligible Population
All HCWs receiving PEP

Denominator Description
Number of HCWs receiving PEP

Numerator Description
Number of HCWs receiving PEP who were evaluated for medication toxicity at least once every other week
Oral Health
Annual Intra-Oral Exam Inclusive of Dental Caries and Soft Tissue Assessment

Source

Background
Oral health is an important component of care for patients with HIV infection. A poorly functioning dentition can adversely affect quality of life, complicate the management of medical conditions, and create or exacerbate nutritional and psychosocial problems. Oral health status also affects antiretroviral (ARV) treatment adherence. When the oral cavity is compromised by the presence of pain or discomfort, maintaining adherence to complicated ARV regimens becomes more difficult.255 Every HIV-infected patient should receive a dental caries examination and a soft tissue examination annually.

Eligible Population
All HIV-infected patients

Denominator Description
Number of HIV-infected patients

Numerator Description
Number of patients who received an annual intra-oral exam with a dental caries and soft tissue exam
Annual Health History by Oral Health Provider

Source

Background
Many different oral mucosal lesions have been associated with HIV infection. Some, such as candidiasis and hairy leukoplakia, may indicate HIV disease progression. Medications used for treatment of HIV and associated diseases or prophylaxis of opportunistic infections may have significant adverse effects or may interact with other prescribed medications. To develop an appropriate treatment plan, the oral health care provider should obtain complete information about the patient’s health and medication status. Past and present history of tobacco, alcohol, and other substance use affect oral health and such information should be collected during the annual health history.\(^{256}\)
Eligible Population
All HIV-infected patients

Denominator Description
Number of HIV-infected patients

Numerator Description
Number of patients who had an annual health history that included:

- Contact information for primary care provider
- Information about whether patient is receiving HIV medical care
- Current HIV treatment medication and changes in regimen Allergies (baseline)
- Laboratory data
- Hepatitis B status
- Hepatitis C status
- CD4 count
- HIV viral load
**Annual Periodontal Examination**

**Source**

**Background**
Gingival/periodontal disease have been associated with HIV infection have been widely reported in the literature. In the past, these have been called HIV-associated gingivitis (HIV-G) and HIV-associated periodontitis (HIV-P). There is now evidence that these diseases also occur in HIV-negative immunocompromised individuals and are not specific to HIV infection, thus making the original terms inappropriate. Therefore, HIV-associated gingivitis has been renamed linear gingival erythema (LGE) and HIV-associated periodontitis has been renamed necrotizing ulcerative periodontitis (NUP). The prevalence of these two diseases remains unclear with current estimates of occurrence among HIV-infected individuals in the 5-10% range. There is some evidence that NUP is associated with a low CD4 count (<200 cells/mm³). Early recognition of periodontal problems allows treatment that can prevent progression of these conditions, including severe attachment/bone loss.
Eligible Population
All HIV-infected patients

Denominator Description
Number of HIV-infected patients

Numerator Description
Number of patients who received an annual periodontal exam
Annual Extra-Oral (Head and Neck) Examination

Source

Background
Patients with HIV infection may develop associated skin manifestations and cervical lymphadenopathy along with bilateral salivary gland enlargement. Therefore, in addition to oral soft-tissue examinations, extra-oral head and neck examinations should be performed routinely.

Eligible Population
All HIV-infected patients

Denominator Description
Number of HIV-infected patients

Numerator Description
Number of patients who had an annual extra-oral (head and neck) exam
Annual Updated Treatment Plan

Source

Background
There is no evidence to support modifications in oral health care based solely on the presence of HIV infection. However, such modifications may be indicated on the basis of certain medical problems that occur as a result of HIV infection. Severely or terminally ill patients, for example, will require alterations in care similar to those in patients suffering from other conditions that cause debilitating illness, such as cancer or mental health impairment.²⁶²,²⁶³

A comprehensive treatment plan that includes preventive care and maintenance should be developed and discussed with the patient. Various treatment options should be discussed and developed in collaboration with the patient. As with all patients, a treatment plan appropriate for the patient’s health status, financial status, and individual preference should be chosen. Medications may interfere with dental treatment and cause adverse effects, such as decreased salivary flow, altered liver function, and bone marrow suppression, resulting in anemia, thrombocytopenia, and neutropenia.
Eligible Population
All HIV-infected patients

Denominator Description
Number of HIV-infected patients

Numerator Description
Number of patients who have a written treatment plan that is updated annually
Oral Health Education: Caries Prevention and Smoking

Source

Background
A higher risk of dental caries in patients with HIV may be caused by decreased salivary flow, which may occur as a result of salivary gland disease or as a side effect of a number of medications. Also, some topical antifungal medications have high sugar content, possibly resulting in increased caries susceptibility.

The adverse effects of using tobacco should be discussed with the patients. If the patient is a tobacco user, cessation should also be discussed. For in-office consumer and provider materials on tobacco cessation programs, dentists can access [http://www.surgeongeneral.gov/tobacco/default.htm](http://www.surgeongeneral.gov/tobacco/default.htm).264
Eligible Population
All HIV-infected patients

Denominator Description
Number of HIV-infected patients

Numerator Description
Number of patients with documentation of having received oral health education about both caries prevention and smoking cessation at the initial and subsequent recall visits
ENDNOTES


6 Adapted from Table 1, Working Group on Antiretroviral Therapy and Medical Management of HIV-Infected Children. Guidelines for the use of antiretroviral agents in pediatric HIV infection. U.S. Department of Health and Human Services, Nov 2005 Nov: p 33.


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Guideline-based Quality Indicators for HIV Care

New York Department of Health AIDS Institute

Health Resources and Services Administration HIV/AIDS Bureau