PRACTICE GUIDELINES FOR THE TREATMENT OF HIV PATIENTS IN GENERAL DENTISTRY

(5th Edition)

Oral Health Advisory Group of the Pacific AIDS Education and Training Center
formerly the Dental Steering Committee

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Foreword

This document is an update to four previously published versions of guidelines and is intended to supplement the following resource related to the dental treatment of HIV-infected patients:

American Academy of Oral Medicine Clinician's Guide to
Treatment of Patients with HIV & Other Communicable Diseases
Fifth Edition - 2018
Brian C Muzyka, DMD, MS, MBA, Editor
Lauren L Patton, DDS, Editor[1]

The Oral Health Advisory Group of the Pacific AIDS Education and Training Center approved the adoption of this document as general guide for treatment of HIV-infected patients. The field of HIV therapy undergoes constant change. Therefore, the Pacific AIDS Education & Training Center has requested that the Oral Health Advisory Committee regularly update this supplement

Our knowledge of HIV manifestations, diagnosis and treatment will continue to grow and change over time. It is for this reason that dental care providers are encouraged to continually educate themselves about HIV disease and associated oral health treatment considerations.

Disclaimer

This executive summary is not intended to set out any standards of care. It is intended to serve as a helpful source of up-to-date information to assist dental practitioners in making informed decisions about the care they provide. Dentists should always exercise their own professional judgment in any given situation, with any given patient. No information contained in this document should be construed as legal advice. Dentists must consult with their own lawyers for legal advice.

[1] American Academy of Oral Medicine Clinician's Guide to
Treatment of Patients with HIV & Other Communicable Diseases
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Oral Health Advisory Group

These recommendations for treatment were assembled and reviewed by the Pacific AIDS Education & Training Center's Oral Health Advisory Group. The members of this committee are individuals professionally involved with ensuring the best possible dental care for HIV infected patients. This group includes faculty from dental schools, Pacific AIDS Education and Training Center faculty, dental and medical clinic directors, and attorneys all involved in providing service to individuals who are HIV positive.

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With special thanks to **Roseann Mulligan, DDS, MS**, Chair, Oral Health Advisory Group of the Pacific AIDS Education and Training Center, for her help and guidance in collaborating to update all prior revisions of Practice Guidelines for the Treatment of HIV Patients in General Dentistry.

Patient Assessment

A. Medical Assessment

In general, the medical assessment of a patient with HIV infection includes the same elements as any other patient. It is the standard of care to ask about all health conditions and to collect information about the status of each condition at baseline (first visit) and periodically thereafter, especially during annual updates. The patient's medication list should also be completed and updated as well, listing dosages and regimens that are subject to change during the course of HIV disease management.

When to Contact the Patient's Physician? The decision on when to contact the patient's physician is up to the dental care provider, based on his or her assessment of the patient's medical conditions and oral treatment needs, and whether additional information is needed from the patient's physician prior to initiating treatment. This is handled the same way as for any other medical condition. Some examples are:

- To obtain the necessary laboratory test results.

-When there is any doubt about the accuracy of the information provided by the patient (i.e., inconsistent or illogical answers to questions about medical history) and more accurate information is needed to ensure patient's safety in the course of dental treatment.

- If patient reports a change in his/her general health or signs and symptoms and considering the nature and severity of the condition and any impending medical treatments, it is necessary to determine the need for dental treatment modifications.

- The dental health provider should use the medical history and the laboratory test results to decide if treatment should occur in a hospital setting. Such a decision should be made in consultation with the patient's physician.

B. Oral Health Assessment

Oral Health Assessment of patients with HIV is the same as any other dental patient. Every patient must undergo a baseline dental and periodontal assessment even if they do not occur on the same first visit. The dental record must clearly indicate the patient's chief complaint and its history. In addition, the patient's previous dental history, including all past treatments, complications and frequency of recall and hygiene visits, should be obtained. A full mouth series of radiographs is necessary for diagnosis and treatment planning. If the patient is edentulous or impacted teeth are noted, a panoramic radiograph should be taken. A complete head and neck and extra oral examination including the cutaneous tissues, the regional lymph nodes, all major salivary glands, the cranial nerves, the temporomandibular joints and the muscles of mastication should be performed. This should be followed with an intraoral assessment of all oral and pharyngeal mucosal tissues, gingivae and dentition. A full record of decayed and missing teeth as well as all existing restorations and prostheses and their time of placement should be documented. Periodontal charting should include examination and recording of the following: measurements of pocket depths, attachment loss, mobility, bleeding on probing and suppuration.

A comprehensive treatment plan should be formulated based on the collected information and phased in terms of priority of care (addressing pain, eliminating infections, restoration of diseased teeth, replacement of missing teeth, periodontal tissues, and oral hygiene instruction and education). The plan should be reviewed with the patient, presenting different treatment options and signed by both the doctor and the patient. The patient has the right to refuse the dental care provider's recommendations. The risks of non-treatment should be explained, and patient's refusal of any recommended treatment should be documented and signed by the patient. The patient's treatment plan should be updated on an annual basis even if care is still ongoing and the original plan has not been completed.

In the course of dental treatment, the dentist should prescribe all the necessary medications that address the patient's dental and periodontal needs. For oral conditions that require care by a specialist in a particular dental field (i.e., oral and maxillofacial surgery, periodontics, prosthodontics, endodontics, orofacial pain, oral medicine, etc.), the dental care provider should make the necessary referral and follow-up.

If at any point during the dental treatment, the dental care provider notices oral soft tissue lesions or salivary gland conditions that directly or indirectly indicate HIV disease progression, a referral should be made to the oral health specialist who can assist in diagnosing and treating the oral condition and, at the same time, the patient's physician should be notified of the referral, the reasons for the referral, the possible implications related to the HIV infection (if any), and the need for follow-up.

The dental care provider must have a contingency plan for responding to patients with emergencies that occur after office hours, on weekends, during holidays or office vacation schedules.

Diagnostic Tests in the Evaluation of the HIV Infected Patient

The CD4 cell count and the viral load measurement are the two laboratory markers that are used to monitor HIV infection. The CD4 cells are a subset of lymphocytes (synonyms are the T4 or the T-helper cells), which correlates with the patient's immune status. The normal value for adults is 750 – 1000 cells/ml. Patients with values less than 200 cells/mm^3 are considered to have advanced immunosuppression and are defined as having AIDS. Those with a value of less than 50 cells/ml are considered to be in a very advanced stage and are usually symptomatic. Patients with low CD4 cell counts (less than 200 cells/ mm^3 are at risk for developing diseases associated with AIDS (opportunistic infections and cancers.) Those with high counts (greater than 350 cells/ mm^3) usually do not manifest AIDS-related illnesses.

The viral load is a test, which measures the amount of viral RNA in a milliliter of plasma. It represents how much the virus is replicating and the magnitude of the viral burden in the body. The viral load test is also used as a prognostic indicator: the higher the value, the higher the risk of a declining CD4 count and clinical progression. With lower values, one expects slower progression of HIV disease.

Depending on the test kit used, the minimum viral load value is 20 – 50 cells/mm^3. Below this value, the test is usually reported as "undetectable." The goal of therapy with antiviral drugs is to reduce the viral load to an "undetectable" value. The significance of an "undetectable" viral load is that very little viral replication is occurring. This means that there is little risk of the virus being able to mutate which can result in drug resistance and treatment failure. Reduction of the viral load to "undetectable" levels usually results in an improvement in the immune system (the CD4 cell count rises). Many patients are unable to reduce their viral load to undetectable. For these patients, the goal is to reduce the viral load as much as possible.

In interpreting the viral load, it is important to know that patient fluctuation plus lab variation can be as much as three-fold. So, a value of 50,000 cells/mm^3 followed by a value of 70,000 cells/mm^3 may be within the lab variation. However, a value of 5,000 cells/mm^3 followed by a value of 50,000 cells/mm^3 shows a significant increase. This might indicate drug failure or that the patient has stopped taking medications.

For the dentist, the CD4 cell count indicates the immune status of the patient. The magnitude of the viral load is not an indicator to withhold dental treatment for the patient. High viral loads may be present in a patient with early asymptomatic disease, while low viral loads can be seen in very advanced patients on suppressive antiviral therapy. Knowledge of these markers can tell the dentist the general health of the patient and the risk of progression. The dentist can play an important part in reminding patients of the need for regular follow up and monitoring of these markers. Most commonly, the CD4 cell count and viral load determinations are to be performed every three to six months depending on the past history of HIV infection and level of suppression achieved.

A. Laboratory Tests to Track HIV Progression

CD4 Cell Count: Assesses the level of CD4 or T-helper cells, which help the immune system to fight infections. Decreases in this number indicate an increased risk of infection. The CD4 level can be listed as CD4 count or the number may be listed as T4 (CD3+CD4) count. In children under age 5

years, CD4 percentage is preferred for monitoring immune status because of age-related changes in absolute CD4 count in this age group; however, CD4 count can be used in older children.

Viral load (VL) or HIV-1 RNA: This represents the copies/ mm^3 of the virus in the blood plasma. The goal is to reach an undetectable level of copies. Increasing viral load levels while on antiviral therapy can indicate the development of resistance. The level of viral load does not determine dental care treatment modifications. Treatment modifications are based on HIV clinical presentation and laboratory indicators. The CD4 cell count correlates with the immune status of the patient.

Platelets: Platelets are necessary, along with other factors, for blood to clot. If thrombocytopenia occurs, the risk of bleeding may be so severe as to delay elective and even some emergency therapy until the platelets can be replaced. There is a critical value (see below) which, if not reached, places the patient at risk for severe bleeding.

Absolute neutrophils: Neutrophils may be reported as segmented cells, granulocytes, polymorphonuclear cells, polys, or PMNs. Neutrophils are a special class of white cells that are important for fighting infections. If their numbers decrease, the risk of infection increases.

B. Critical Laboratory Test Values

Critical laboratory test values are the values that necessitate a change in dental management. It is essential to monitor the lab values that have a direct impact on the ability to safely treat dental patients. All patients with HIV require monitoring of their neutrophils and platelets for invasive treatment, but comorbidities may require monitoring of other lab values such as those for liver function or diabetes.

Absolute Neutrophil Count (ANC)

Less than 500 cells/mm^3 (Normal values 1,800 – 8,000 cells/mm^3): An ANC below 500 cells/mm^3 (< about 20% neutrophils) represents a risk of infection due to severe neutropenia and necessitates prophylactic antibiotics prior to invasive procedures that will precipitate bacteremia using the AHA (American Heart Association) guidelines. Consider a therapeutic regimen of post-treatment antibiotics concurrent with invasive procedures and after consultation with the physician.

Platelets

For most oral health care, the platelet count should be above 50,000 cells/ml^3 (normal adult values: 150,000-450,000 cells/mm^3). **A low value represents thrombocytopenia - less than 50,000/mm^3 for adult patients or less than 75,000/mm3 for pediatric patients.** When an extensive and/or invasive procedure is planned with risk of bleeding, consult with the physician and recommend intervention to boost platelets prior to such procedures. The physician may elect to give a platelet infusion to increase the platelet count. **The dentist must receive laboratory confirmation of the platelet count immediately (1-2 days) before an invasive procedure.** Delay elective dental procedures until the platelet count improves.

CD4 T-Lymphocytes (Helper cells) (absolute)

Less than 50 cells/mm^3 (normal values 590-1120 cells/mm^3) **or less than 15% CD4 percentage for children under 5 years (normal value is CD4 percentage > 25%)**: Evaluate patient for severe opportunistic disease and treatment plan realistically considering degree of disease. Even patients

with severely diminished CD4 levels may tolerate definitive dental care rather than only palliative treatment; this must be individually considered for each patient with close consultation with the physician to determine stage of disease. At or below 200 cells/mm^3: the patient is considered to have AIDS due to the increased risk of opportunistic infections. Emphasize good oral care and have the patient contact you immediately if oral problems start.

Viral Load

The viral load does not have an impact on dental treatment planning. The number of viral copies is indicative of disease, but any modification of dental treatment would be based on the other laboratory test results (discussed previously) and not on the viral load. A significantly high viral load is taken as a predictor of more rapid disease progression and should be correlated with the patient's CD4 count. However, for a very high viral load (e.g., 1 million), medical consultation is warranted, and treatment may be deferred until it improves.

C. Suggested Frequency of Obtaining Lab Reports

Laboratory tests are important to monitor the patient's health. The issue of how frequently laboratory tests need to be obtained is primarily dependent upon the patient's medical stability, CD4 T-helper cell count, whether the patient is on antiretroviral therapy (ART), and the length of time of viral suppression during ART.

According to the U.S. Public Health Service (PHS) recommendations, depending on the time of ART initiation and response to therapy, CD4$^+$ T-cell levels should be monitored every 3 to 6 months and up to one year if the patient is virally suppressed for over 2 years. The frequency of viral load monitoring depends mostly on adherence to prescribed medications.[2] Because ART can affect other blood values regardless of the CD4 count, the patients who are taking this therapy require frequent monitoring: usually every six months or less, depending upon critical values that may need more follow-up. Current laboratory test results are very important for invasive dental procedures. At the same time, clinical judgment is necessary as most dental procedures need not be delayed just because the laboratory results are older than ideal.

D. Blood Tests Based on Clinical Scenario

Like any patient, the clinical scenario may direct the provider to order diagnostic blood tests. The indication and interpretation of these laboratory tests would not differ in HIV infected patients. The following are some examples of labs that may be ordered in specific situations:

- Complete blood count (CBC) including red blood cell count (RBC), white blood cell count (WBC) and differential count (Diff), platelet count (PLT), hemoglobin level (Hb) and hematocrit (Hct) in patients with history of anemia, thrombocytopenia, advanced HIV disease, and prior to surgical procedures to determine if the patient is at risk for post-operative complications such as infection or poor healing,
- Metabolic panel in patients with a history of kidney disease, Hepatitis B/C or other liver diseases should be assessed as the dentist may need to adjust the dosage of analgesics or antibiotics prescribed,

[2] https://www.ncbi.nlm.nih.gov/books/NBK513289/access 06/10/2025

- INR or prothrombin time (PT) and partial thromboplastin time (PTT) for patients with advanced liver disease, those who are taking prescription anticoagulants other than novel oral anticoagulants (NOACs), or when history or physical findings indicate a need to assess bleeding potential,
- Hemoglobin A1c for diabetic patients. These patients should be individually assessed to evaluate their risk for post-operative complications, such as infection or poor healing. Some experts will defer invasive treatment when the HbA1c is above 8%.[3]
- Assessment of tuberculosis status should occur in patients with a history of recent exposure to or symptoms of TB, which may include skin PPD testing, blood Quantiferon Assay, or chest x-ray.

It should be emphasized that, although having access to laboratory tests for HIV positive patients is helpful to the dental provider, it is not always necessary for many routine procedures.

The dentist can also be instrumental in encouraging patients to adhere to their medication regimen. The most common cause of drug failure is the patient taking his/her medications inconsistently. Missing just a few doses a month can result in the virus becoming resistant.

[3] Doucet et al. Management of Glucose-Lowering Therapy in Older Adults with Type 2 Diabetes: Challenges and Opportunities. Clin Interv Aging. 2023 Oct 9;18:1687-1703.

Antibiotic Prophylaxis

For the HIV-infected patient, there are no data supporting the need for routine antibiotic coverage to prevent bacteremia or septicemia arising from dental procedures. In fact, patients with AIDS have shown a higher incidence of allergic reactions to antibiotics and other medications, so it may endanger the patient's health by over-prescribing antibiotics.

Prophylactic antibiotics should not be prescribed routinely for the dental visit when the HIV infection is well controlled. Routine antibiotic coverage prior to procedures may cause bleeding and bacteremia and is not recommended. Many patients at an advanced stage of HIV disease are already taking antibiotics to prevent opportunistic infections, so the dentist should not prescribe additional antibiotic medications without contacting the physician.

- Antibiotic prophylaxis is recommended for patients with a neutrophil count below 500 cells/mm^3 requiring procedures likely to cause bleeding and bacteremia, if the patient is not already taking antibiotics for prophylaxis against opportunistic infections. In these cases, a therapeutic regimen of post-treatment antibiotics concurrent with invasive procedures should be considered. Therefore, it is important to check with the physician for the most current CBC with differential to determine the ANC value (see page 9 for more details).

- The regimen for prevention of bacterial endocarditis is the same in HIV patients as it is for non-infected patients. The American Heart Association guidelines for antibiotic prophylaxis should be followed as with any patient. Consult the patient's physician to determine the need for antibiotic prophylaxis for the patient with multiple co-morbidities and with prosthetic joint replacements or intravascular devices.

- Antibiotic prophylaxis is always recommended for an HIV positive patient with a prosthetic joint if CD4 counts are less than 200/dL, there is a history of a previous deep prosthetic joint infection, and diabetes with HbA1c $\geq$ 8%. For patients with CD4 counts less than 200/mm^3 and a history of a previous deep prosthetic joint infection, antibiotic coverage may be considered.[4]

- As with any patient, it is the standard of care to investigate all possible drug interactions before prescribing antibiotics or any other medications for patients with HIV infections.

[4] Cennimo DJ, AAHIVS; Shoemaker M. Prevention of Opportunistic Infections (OI) in Patients with HIV Infection January 01, 2025 https://emedicine.medscape.com/article/1529727-overview

Treatment Considerations

A. Modifications of Dental Therapy

There is no justification for modifying dental treatment based on the fact that the patient is infected with the HIV virus. However, if the patient's medical status is complex, treatment adjustments may be necessary as would be the case with any medically compromised patient. After performing a thorough assessment, the dentist should determine any treatment modifications needed. **IT IS ESSENTIAL FOR ALL PRACTITIONERS TO UNDERSTAND THAT MOST HIV PATIENTS, EVEN IF SYMPTOMATIC, CAN BE TREATED SAFELY IN A TYPICAL DENTAL OFFICE OR CLINIC.**

- Bleeding tendencies may determine whether or not to recommend full mouth scaling and root planning or multiple extractions in one visit. In conjunction with establishing a history of excessive bleeding and the appropriate laboratory tests, a tooth-by-tooth approach to assess bleeding tendencies could be used as a clinical method to evaluate the patient's risk of hemorrhage.

- In patients who are at risk of increased bleeding, deep block injections should be avoided. In these patients, intraligamentary or local infiltration may be an appropriate alternative.

- When performing dental extractions on patients who are at risk for increased bleeding, local measures such as primary closure after surgery and the use of local thrombotic agents such as gelfoam or topical thrombin are helpful in controlling the bleeding.

- In patients who are taking oral anti-platelet drugs or anticoagulants, the decision to discontinue these agents prior to dental procedures must be made in conjunction with the patient's physician and after careful consideration of the patient's risk of bleeding versus their risk for thromboembolism.

- For patients who are taking antiplatelet agents such as aspirin, clopidogrel (Plavix), ticlopidine (Ticlid), and dipyridamole/aspirin (Aggrenox), there is no need to discontinue the anticoagulant for dental and most surgical procedures. For extensive surgical procedures, consult the patient's physician to see if these agents may be discontinued prior to the planned procedure. Typically, these drugs must be withheld one week before the procedure.

- Restorative and simple tooth extractions may be performed on patients who take warfarin anticoagulant (Coumadin) with INR values of 3.5 or lower. For extensive surgical procedures or when the INR values are higher, consult with the patient's physician to see if warfarin may be discontinued. It should be noted that many patients who take warfarin are at risk for a thromboembolic event and, it may be preferable to discontinue warfarin in conjunction with heparin bridging. This is accomplished by stopping warfarin 5 days before the scheduled surgery and replacing it with low molecular weight heparin (Lovenox). In extreme cases, where the patient's risk of thromboembolism is very high, hospitalization, warfarin reversal, and heparinization may be necessary.

- For patients who are taking the increasingly popular novel anticoagulants (NOACs) such as dabigatran (Pradaxa), rivaroxiban (Xarelto), and apixaban (Eliquis), there is no need to discontinue these agents for dental procedures or routine dental prophylaxis. For extractions and surgical procedures, discontinuation of these agents 24 hours before the planned procedure is adequate to reduce the risk of bleeding.

- In severe cases of profound thrombocytopenia (platelets < 50,000/mm^3) or anemia (Hb < 10 g/dL), depending on the invasiveness and extent of treatment needed, patients may be treated more safely in a hospital environment where blood or platelet transfusions are available.

- The ability to withstand treatment for an extended amount of time should be ascertained.

- The ability to return for sequential visits should be determined when a treatment plan is prepared or when a dental procedure is being initiated.

- A pre-treatment antibacterial mouth rinse will reduce intraoral bacterial load, especially for those patients with periodontal disease.

- A six-month recall schedule should be instituted to monitor any oral changes. If the patient is severely immunosuppressed (i.e., CD-4 count of < 100/mm^3), a shorter recall period such as a three-month interval should be considered.

- Patients exhibiting oral lesions should be assessed in a timely manner.

- When salivary hypofunction is present, the patient should be closely monitored for caries, periodontitis, soft tissue lesions, and salivary gland disease.

- Fluoride supplements in the form of a rinse and/or toothpaste should be encouraged for those with increased caries and salivary hypofunction.

- Oral hygiene is important in a medically compromised patient, as poor hygiene may be responsible for more rapid progression of oral disease. A proactive attitude and an emphasis on prevention should be encouraged. Dental treatment should also be prioritized based on the patient's health and circumstances (e.g., ability to tolerate long appointments, ability to perform oral hygiene, etc.).

B. Nutrition Counseling

Because of certain oral conditions, the HIV patient may have difficulty consuming a balanced diet. The patient may suffer from changes in taste and decreased ability to chew and swallow because of drug-induced salivary hypofunction. Medications can also lead to GI upset and nausea, further inhibiting the intake of a balanced diet. It is the role of the dentist to recognize oral manifestations that are associated with nutritional deficiencies resulting in intraoral manifestations due to low levels of vitamin B-12, folic acid, etc. Nutritional supplements or referral to the patient's physician or a registered dietitian may be necessary. Some areas to be aware of include:

- Poor oral intake of food or fluid,

- Difficulty chewing and swallowing due to continuous mouth sores resulting from candidiasis, herpes simplex, aphthous ulcers, etc.,
- Severe dental caries,
- Changes in perception of taste or smell,
- Patient complaints of economic inability to meet caloric and nutrient needs.

C. Patient Education and Referral for Substance Use Disorder and Tobacco Use

As part of patient education about oral self-care and the importance of regular oral health maintenance visits, the dental care provider should provide information to the patient about the negative impact of smoked and smokeless tobacco, e-cigarettes, marijuana and illicit substances, such as crystal methamphetamine, on oral tissues. As needed, the patient should be provided with the appropriate referrals for recovery, counseling, and risk reduction programs.

HIV Testing

Just like the materials and processes used in dentistry have improved in the past decade, so too has the testing and treatment for HIV. In fact, the field of HIV testing has improved dramatically in recent years. Using the same premise of screening with a sensitive test and reflexing to a more specific test, the HIV tests currently recommended by the CDC are extremely sensitive and specific because these tests ascertain both antibody (IgM and IgG) and antigen (p24). This makes these tests far more accurate and allows detection of HIV earlier in the disease process. The 4th generation tests allow detection at the acute stage of infection, between 2-3 weeks, well before the former standard Western Blot test would detect infection. The 4th generation tests also have a far shorter processing time and can be run in most lab settings in 60 minutes for a preliminary result. For these reasons, the Western Blot is no longer considered a confirmatory test.

It is important to refer to the CDC's website for the most current recommendations:[5]

The current testing recommendations call for the use of a 4th generation test, reflexed if positive to HIV-1/2 antibody differentiation test and an RNA/Nucleic Acid Test (NAT).

If people test positive, it is important to ensure they are linked to medical care. Early detection of HIV infection provides many opportunities for health professionals to intervene and help prevent further transmission to others. Use of antiretroviral medications shortly after infection can reduce the viral load set point, reduce the onset of opportunistic infections, and ensure connection to medical care. Physicians who regularly care for HIV patients will also have access to community resources, including testing for partners, Pre-Exposure Prophylaxis (PrEP) for partners, and medication assistance. The Affordable Care Act has made insurance more widely available, so that more people can get tested for HIV. The US Preventive Services Task Force has given HIV testing a Grade A, which means insurance providers will reimburse it.

[5] https://www.cdc.gov/hivnexus/hcp/diagnosis-testing/index.html#:~:text=CDC%20recommends%20all%20patients%20between,foster%20earlier%20diagnosis%20and%20treatment.Access June 10th, 2025

Hepatitis B and C

Hepatitis B

Hepatitis B is a vaccine-preventable liver infection caused by Hepatitis B virus (HBV). HBV is transmitted when blood, semen, or other body fluid from a person infected with the virus enters the body of someone who is uninfected. Hepatitis B infection can range from a mild, short-term, acute illness lasting a few weeks to a serious, long-term, chronic infection. For a chronically infected person with HBV, infectivity depends on the Hepatitis B e-antigen (HbeAg) status. If this person is both e-antigen positive and surface antigen (HbsAg) positive, he or she will have more virus in the blood and is more likely to transmit HBV. According to the CDC, about 640,000 adults in the US have chronic (long-term) hepatitis B.[6] In 2023, 48% of all acute hepatitis B cases were people ages 40–59 years. Hepatitis B vaccination is recommended for all adults between the ages of 19 to 59 and adults older than 60 with risk factors for hepatitis B. The HBV vaccine is indicated for people who have an occupational risk of exposure to blood or other blood-contaminated body fluids.

The HBV vaccine consists of three doses. The second dose is given 1-2 months after the first; and the third dose is 4-6 months after the first. A blood test to determine antibody titers should be done 30-60 days after the last dose. A person must have an antibody titer >10 mIU/mL to be immune. If a person has a titer level <10 mIU/mL after immunization, the entire series must be repeated. If the person continues to have a low titer level, they are considered primary non-responders. If this person has an occupational exposure, counseling is advised, as the person should get an immunoglobulin injection (HBIG) to help boost immunity. All healthcare providers must be offered the Hepatitis B vaccine by their employer, free of charge, and within 10 days of potentially being exposed to body fluids (Title 8 Cal OSHA).[7] The employee has the right to refuse the Hepatitis B vaccine. A Hepatitis B declination statement must be signed and witnessed.

Hepatitis B is 100 times more infectious than HIV. Prior to the introduction of the HBV vaccine, healthcare providers had a prevalence of HBV infection approximately 10 times higher than the general population. **For an unvaccinated healthcare worker, the risk of hepatitis B virus infection from occupational needle sticks is between 6 and 30%, depending on the absence or presence of HBV e antigen in the source case blood.** After exposure to hepatitis B, the majority of acute infections are resolved spontaneously. For those who do not clear the hepatitis B infection and remain chronically infected, there currently is no cure. However, an individualized approach consisting of supportive care, interferon and antiviral agents such as *entecavir* and *tenofovir* are used to slow down the viral replication in the chronically infected.[8]

Standard Precautions, formerly known as Universal Precautions, are now the minimum infection prevention processes to be followed in the dental operatory as many patients and their healthcare providers may be unaware of their HBV status. It is important to consistently follow routine barrier precautions and safely handle needles and other sharps. Blood contains the highest HBV titer of all body fluids. It is the most important vehicle of transmission in the healthcare setting. In the dental setting, the

[6] https://www.cdc.gov/hepatitis-b/about/index.html
[7] www.dir.ca.gov/title8/5193.
[8] https://www.cdc.gov/hepatitis-b/hcp/clinical-overview/index.html#cdc_clinical_overview_overview-overview

gingival sulcus has the greatest concentration of Hepatitis B. The Hepatitis B virus is also found in other body fluids, including saliva. However, saliva is not an efficient vehicle of transmission because it contains low quantities of infectious HBV. HBV has been demonstrated to survive in dried blood on surfaces for at least one week when at room temperature.

Hepatitis C

Hepatitis C is the most commonly reported blood-borne infection in the United States. According to the CDC, the number of new hepatitis C virus (HCV) infections steadily increased from 2013–2021 (29,700 to 69,800 estimated infections, respectively) and has remained relatively stable from 2021–2023.[8] The number of estimated infections in 2023 was 69,000, well above the annual target of 35,000. Persons aged 30–39 years had the highest rates of acute hepatitis C. The rates of infection are highest among injection drug users (60% of cases), sexual exposure accounts for approximately 15% of cases, whereas an additional 5% of exposures are from a combination of hemodialysis patients, those employed as health care workers (HCW), or infants infected by their mother during birth. Co-infection with HIV and HCV is common. Approximately one-fourth of the HIV-positive individuals in the US are believed to be coinfected with both viruses (i.e., about 250,000-300,000 people). Co-infection is especially common among HIV-infected injection drug users, and people with hemophilia who received clotting factor concentrates before 1987. It is important to note that percutaneous exposure to blood through tattooing, body piercing and acupuncture can transmit HCV.

If untreated, long-term HCV infection can eventually cause chronic liver disease which can range from mild to severe, including cirrhosis and liver cancer. Direct-acting antiviral (DAA) treatment is recommended for nearly all people diagnosed with hepatitis C. An 8–12-week course of oral DAA therapy cures more than 95% of people infected with hepatitis C regardless of HCV genotype. DAAs include protease inhibitors such as *simeprevier*, polymerase inhibitors such as *sofosbuvir* and nonstructural protein 5A (NS5A) inhibitors such as *daclatasvir.* Many of these agents have antiviral activity against all genotypes and some are used in conjunction with ribavirin.[9]

HCV is spread in the dental office by percutaneous or mucosal exposures to infected blood. **For HCV, the risk of infection after a needlestick or cut is approximately 1.8%. The risk following a blood splash is unknown; however, HCV infection from such an exposure has been reported.** According to the CDC guidelines, post-exposure prophylaxis should not be used after occupational exposure to HCV. The guideline recommendations are:[10]

- Serologic testing of source patient,
- Determination of baseline values of HCV for the person exposed (anti-HCV and ALT activity),
- Follow-up testing four-six months after exposure for anti-HCV and ALT,
- Confirmation of all anti-HCV results reported as positive by enzyme immunoassay.

There are no current recommendations to restrict an individual who is infected with HCV from working. Standard Precautions and strict aseptic techniques, which include hand washing, use of personal protective barriers and proper care in the use and disposal of needles and sharps, should be employed.

[9] American Association for the Study of Liver Diseases (AASLD) and the Infectious Diseases Society of America (IDSA). Recommendations for testing, management, and treating hepatitis C: HCV testing and linkage to care. https://www.hcvguidelines.org

[10] https://www.cdc.gov/hepatitis-c/

Sexually Transmitted Infections

Many patients with HIV infection may also experience another sexually transmitted infection (STI). Several STIs have manifestations in the head and neck region and can play a role in transmitting the infection to others. Syphilis has manifestations in the head and neck structures during all its clinical stages. Primary syphilis might be associated with ulcers of chancre in the oral tissues; secondary syphilis may involve mucocutaneous lesions involving oral mucosa and the associated regional lymph nodes; granulomatous lesions in tertiary syphilis may present in the oral tissues; congenital syphilis leads to distinct oral mucosal and dental abnormalities in the fetus. Another major STI, gonorrhea may lead to presentations in the oral tissues either as a primary infection or as secondary involvement with the spread of the infection. Similarly, sexual transmission of herpes may occur through the involved extra and intraoral tissues.

Dental clinicians should be familiar with the clinical findings of major STIs. When these presentations are noted, prompt referral to a medical provider for clinical management is necessary. Syphilis, at every stage of the disease, is treated with benzathine penicillin G, as intramuscular injections and for those allergic to penicillin a course of oral doxycycline or tetracycline fully treats the infection. Uncomplicated gonorrhea responds well to intramuscular injections of ceftriaxone or oral azithromycin. Herpes simplex infection, especially in HIV positive patients, is managed by oral antivirals such as acyclovir or valaciclovir that shorten the course of the disease.[11]

In addition to treatments of active infections, for patients with HIV infection, chemoprevention has been shown effective in reducing the rates of infection with STIs. Prophylaxis with oral doxycycline (Doxy-PEP) is recommended within 72 hours after a high-risk exposure to reduce the risk of infection with syphilis and gonorrhea.[12]

[11] https://www.cdc.gov/std/treatment-guidelines/default.htm
[12] https://www.cdc.gov/mmwr/volumes/73/rr/rr7302a1.htm

Antiretroviral Drugs

Knowledge of antiretroviral drugs is constantly growing, but it should be emphasized that long-term clinical data on drug interactions does not exist for many of the newer medications. An up-to-date list of these agents and their known side effects and drug interactions are provided in Appendix A. Currently, there are no known drug interactions between antiretroviral agents and local anesthetics used in general dentistry. There are, however, several drugs that are prescribed by dentists or used in the office that may be contraindicated in patients taking antiretroviral medications. It is recommended that the dental care provider consult a reference that thoroughly discusses drug side effects and interactions prior to prescribing any medications or dispensing in the dental office.

Patients taking some of these drugs are likely to suffer from salivary hypofunction. [13] Use of prescription medications such as pilocarpine, cevimeline, and bethanechol as salivary gland stimulants should be considered. Excellent oral hygiene home care, topical fluoride and frequent hygiene recall visits, as well as nutritional counseling and saliva enhancers (sugarless gum, water, saliva substitutes) will be critical for prevention of periodontal disease and dental caries. Patients should also be assessed for consumption of unexpected sources of sugar such as over-the-counter medications including products like antacids (e.g., Tums, Rolaids); cough drops; suspensions (e.g., Nystatin); and fungal troches (e.g., Mycelex). All of these may contribute to dental caries.

[13] https://www.ncbi.nlm.nih.gov/books/NBK513308/ accessed June 11, 2025

Occupational Post-Exposure Prophylaxis (oPEP)

Most occupational HIV exposures do not result in the transmission of HIV. There have been no documented reports of occupational transmission from a patient to a dentist. The risk with percutaneous injury is considered to be about 0.3% per incident and the risk with mucous membrane exposure is about 0.09%. Anti-retroviral medications used in treating the infection are also useful in preventing it, if used soon after exposure occurs as post-exposure prophylaxis (oPEP). Successful oPEP can prevent viral replication and HIV infection.

Documentation of the event and assessment of risk remain important. The person who is exposed should be referred immediately to a physician who can provide counseling, testing and appropriate medications. The interval within which PEP should be initiated for optimal efficacy is not known, however, "as soon as possible" is recommended. This exposure should be treated as a medical emergency.

For updated recommendations: see the October 2014 New York State Department AIDS Institute, www.aidsinstitute.org.

Management of Occupational Blood Exposure

- Wash wounds and skin with soap and water,
- Flush mucous membranes with water or saline,
- The incident should be reported to a supervisor if applicable and should be, documented in an injury/exposure log,
- Report to a medical provider for testing, access to post-exposure protocol and oPEP,
- New testing algorithms include the combo Antibody/Antigen test with confirmation by Multispot,

Basic Overview

Assessing Infection Risk and Source Case Testing

- Important to determining if occupational post-exposure prophylaxis (oPEP) with ART is necessary
- If source case testing is not possible, PEP is recommended for high-risk exposures

Medications

- Start oPEP as soon as possible, preferably within 2 hours of exposure and not longer than 72 hours
- Single or multiple tablet regimen for 28 days

Baseline Labs to Monitor Exposed Person for Adverse Reactions

- Pregnancy test if applicable
- Complete Blood Count with differential and platelets
- Urinalysis
- Renal Function Tests (BUN and Serum Creatinine)

- Liver Function Tests (Aspartate and Alanine Aminotransferase, Alkaline Phosphatase, Total Bilirubin)

Monitoring
- Baseline testing
- Retest at 6 and 16 weeks. (Note: fourth generation testing is generally used now)

A. Assessing Risk of Infection

In assessing the risk, consider the type of injury and review the patient's health history looking for history of HIV infection, hepatitis, sexually transmitted diseases, blood transfusions, and organ transplants. All of these can increase the risk to dental HCW. A potential exposure to HIV will involve an infectious bodily fluid and a portal of entry. In the dental office, blood is the primary agent of concern. Saliva and vomitus do not have the potential for transmitting HIV unless bloody. If source patient's health history indication of no HIV infection cannot be unconditionally accepted as negative. It is estimated that up to 15% of HIV positive persons in the U.S. are unaware of their infection due to the long latent period (up to 10 years) between initial infection and appearance of symptoms. Interview the patient and discuss these issues to get some idea of the personal characteristics of the patient involved that could affect that person's risk potential.

For substantial exposures, consider using the Oraquick Rapid HIV Testing device to determine if the patient who was the source of the exposure is HIV-positive. This is a non-invasive test which can be administered by any HCW. The test device is used to swab the person's gingiva and is then placed in a solution-containing receptacle. The results are available in 20 minutes. This simple test is extremely accurate but note that this is an antibody test and thus will not give a positive result for very recent infections. However, it does give valuable information that assists in a decision whether to start an oPEP medication regimen. A positive rapid HIV test should be preliminarily considered a true positive for the purposes of initial oPEP decision-making. A person receiving a positive result should be referred to medical care and have the result confirmed by more accurate antigen/antibody test or nucleic acid test in a laboratory setting. Most dental offices do not keep an inventory of these devices and the patient could be sent to an urgent care center or other location where HIV testing can occur. It is the responsibility of the dental office to pay for such testing. The source patient cannot be required to have such a test and must consent to it.

B. Making Decision Regarding oPEP[14]

If the source patient is HIV-positive, then post-exposure prophylaxis with antiretroviral medications is recommended. However, the decision to take or not take the medication must be made by the person who sustained the exposure. Decades of records of percutaneous exposures of dental HCW, as well as several studies specifically addressing dental workers, have not identified any dental HCW who contracted HIV infection by an occupational exposure in the United States. Most documented cases of HCWs becoming HIV-infected via occupational exposure occurred in hospital settings during earlier years of the epidemic from major exposures involving very ill patients with advanced AIDS and high viral loads in their blood. Such patients are normally not receiving dental care and dental procedures do not result in the quantity of bleeding which can occur in a hospital operating room. With that, the chance of infection is always there and the use of PEP medication must be seriously considered.

[14] *PEP Quick Guide for Occupational Exposures,* National Clinician Consultation Center, UCSF, Updated: June 18, 2021

A major reason for not using PEP medication following any exposure is the toxicity of these drugs and the length of time they should be taken (recommendation is 28 days, if they can be tolerated). HIV experts agree that 28 days is the best length of treatment to give persons the highest chance of avoiding infection while not developing the serious side effects which can develop with long-term use of the antiretroviral medications. However, ability to tolerate these drugs is a serious consideration. The most common side effects reported are nausea, fatigue, headache, vomiting, diarrhea, and myalgias. Guidelines for PEP indicate that taking PEP medications is not justified when the risk of transmission is negligible.

Taking oPEP Medications

If the exposed person decides to take oPEP medications, it should begin as soon as possible. The best time to start is within 24 hours of exposure. Starting PEP more than 72 hours after exposure is considered ineffective, so the sooner the better. There are many HIV anti-retroviral medications available, and different regimens have been approved over the years. The current recommended regimen calls for three drugs from two different drug classes: one from the Integrase Strand Transfer Inhibitor (INSTI) class and two from the Nucleoside Reverse Transcriptase Inhibitor (NRTI) class.

There are two preferred PEP regimens per current CDC recommendations for otherwise healthy persons: the combination NRTI Truvada (which includes Tenofovir and Emtricitabine) and either Raltegravir or Dolutegravir from the INSTI class. Advantages of using INSTI drugs is that they are generally well-tolerated, have fewer drug-drug interactions, and are less likely to develop resistance to HIV. Other regimens may be considered under special circumstances. Another PEP regimen that may receive CDC recommendation soon is Biktarvy, which is a three-drug regimen in one pill that is taken once a day with or without food. It contains the INSTI Bictegravir and two NRTIs. The CDC recently (May 2025) approved Biktarvy for non-occupational PEP and approval for use as occupational PEP will likely occur soon.

Side effects such as diarrhea, nausea, and headaches can occur with any of these drug regimens and can usually be managed with antimotility, antiemetic, and analgesic agents. Serious side effects are rare but can occur. These are usually associated with long-term use for an established infection, rather than short-term use as PEP to prevent an infection.

<u>Remember that the decision about whether to take the PEP medications must ultimately be made by the exposed person him/herself.</u>

The National Clinicians' Post-Exposure Prophylaxis Hotline is the PEPline. This is an excellent resource for questions regarding exposures and the need for PEP. It is open 24 hours a day, seven days a week. The phone number is (888) 488-4911.

Pre-Exposure Prophylaxis (PrEP)

PrEP (pre-exposure prophylaxis) is the use of antiretroviral medication to prevent HIV. PrEP is for people without HIV who may be exposed to HIV through sex or injection drug use.[15] When taken as prescribed, both oral and injectable PrEP reduce the risk of getting HIV from sex by about 99%. Oral PrEP has also been shown to reduce the risk of getting HIV from injection drug use by at least 74%. Clinicians are encouraged to discuss adherence to the PrEP regimen with all their patients who are at risk for exposure to HIV. PrEP is a part of a more comprehensive HIV prevention program that also consists of proper condom use and screening for other sexually transmitted infections (STIs).

Legal and Privacy Issues

Testing for HIV infection and reporting HIV test results are governed by California statute. Protection of information regarding HIV status, handling of public health records containing information about HIV or AIDS and personal identifying information, and federal and state rules governing protected health information and medical records, all limit disclosure by medical care providers. Additionally, people living with HIV ("PLWH") are entitled to a host of legal protections. Both federal and state constitutions promise a right to privacy which applies to HIV status. These laws, in addition to federal and state laws prohibiting discrimination against PLWH, are key considerations when serving this community.

Informed Consent for HIV Testing[16]
Before a medical care provider, including a dentist, may test a patient for HIV infection, the provider must inform the patient that the test is planned. Medical care providers must also provide information about the test, inform the patient that there are numerous treatment options available for a patient who tests positive for HIV and that a person who tests negative for HIV should continue to be routinely tested. The medical care provider must also inform the patient that he or she has the right to decline the test. If a patient declines the test, the medical care provider shall note that fact in the patient's medical file.

HIV Testing for Occupational Exposure[17]
In some limited instances, healthcare workers, including dentists, may be exposed to blood borne pathogens as part of their occupation. Thus, occupational exposure may give rise to HIV testing. In these cases, the law requires following strict protocols that balance the needs of the healthcare workers with the privacy interests of PLWH. Even in the context of occupational exposure, HIV testing of a patient cannot be mandated by a healthcare worker. Post-exposure prophylaxis for HIV exposure is available for occupational exposure and should be considered where appropriate.

Notification of HIV Test Results[18]
A patient who is tested for HIV infection should receive timely information and counseling from the medical care provider. An explanation of the results as well as the implications of those results to the patient's health should be explained.

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[15] https://www.cdc.gov/hivnexus/hcp/prep/index.html
[16] California Health and Safety Code § 120990.accessed June 11, 2025
[17] California Health and Safety Code § 120262.accessed June 11, 2025
[18] California Health and Safety Code § 120990(h).accessed June 11, 2025

If the patient tests positive for HIV infection, the medical care provider shall inform the patient that there are numerous treatment options available and identify follow-up testing and care that may be recommended. That information must also include contact information for medical and psychological services to ensure proper linkages to HIV care. If the patient tests negative for HIV infection and is known to be at high risk for HIV infection, the medical care provider shall advise the patient of the need for periodic retesting due to limitations of testing technology and the six month "window period" for verification of results.[19] Medical care providers may also offer prevention counseling or a referral to prevention counseling to the patient.

Electronic notification of test results for HIV infection is only permitted if requested by the patient and the medical care provider considers such notification "most appropriate."[20] Prior consent from the patient must be obtained for any electronic notification and the medical care provider must view the results prior to the patient accessing such results. Telephone communication is not considered electronic communication. Regardless of the type of notification, protocol with regard to dispensing post-test information, as described above, still applies.

HIV Reporting[21]

In 2006, California, along with a number of other states, moved from codes-based reporting to names-based reporting for HIV/AIDS. This was in response to new funding requirements of the Ryan White CARE Act, requiring federal funding allocations to states be calculated according to the number of HIV-positive individuals identified by name. Surveillance data from previously identified individuals living with HIV could not be imported to the new system and had to be re-identified and validated under the new system.

Dentists, as health care providers, after ordering an HIV test, are required to report cases of HIV infection to the local health officer using patient names on a form developed by the state Department of Public Health. Laboratories are also required to submit HIV case report forms to the local health officer. Once the local health officer is able to eliminate duplicate reports, they are submitted to the state Department of Public Health. The state, in turn, removes any personally identifying information and submits required reporting to the federal Centers for Disease Control.

Confidential Public Health Records[22]

Because HIV reporting has shifted to a names-based reporting system, there are legal protections that generally prohibit disclosure of public health records containing information regarding HIV or AIDS and personal identifying information, either developed or acquired by the local public health agency, the state, or an agent thereof. A few exceptions do apply, including written authorization of the person who is the subject of the record or a guardian or conservator of that person or use of public health records containing such information by state and local health officers in conducting research in the investigation,

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[19] *See* California Department of Public Health, *HIV Testing Information and Resources for California Clinicians*, http://www.cdph.ca.gov/programs/aids/documents/ctthivtestinfoforclinicians.pdf (last accessed June 11, 2025) (explaining "window period").

[20] California Health and Safety Code § 123148.Accessed June 11th, 2025

[21] California Health and Safety Code § 121022(a). Accessed June 11, 2025

[22] California Health and Safety Code § 121025. Accessed June 11, 2025

control and surveillance of the disease.[23] Unauthorized disclosure, ranging from negligent to willful, may result in civil penalties up to $25,000 per actionable offense.[24]

Disclosure of HIV Test Results[25]

Unauthorized disclosure of HIV test results linked to individual identifying information is generally prohibited from disclosure. Including the results of an HIV test in a patient's medical records is not considered disclosure. Written authorization is required for each separate disclosure of HIV test results and must identify to whom such disclosure can be made. Unauthorized disclosure, ranging from negligent or willful, may result in civil penalties up to $25,000 per actionable offense.

Privacy and Confidentiality of Medical Records[26]

Federal law governing protected health information under the Health Insurance Portability and Accountability Act also protects records containing information regarding HIV or AIDS and personal identifying information. Unauthorized disclosure is generally prohibited unless it falls within specific permitted use such as coordinating care and treatment of the patient, as part of administrative processes to obtain payment for care provided, for public health purposes, and in response to criminal justice processes, including specific circumstances where court orders or warrants demand disclosure. Unauthorized disclosure is subject to administrative penalties and criminal penalties for anyone who knowingly obtains or discloses individually identifiable personal health information. This law offers individuals no private right to legal action.

State law governing confidential medical information under the Confidentiality of Medical Information Act applies to any licensed or certified health care provider, which includes dentists. Medical records include charts, records, notes, laboratory results, and pharmacy and prescription histories. Unauthorized disclosure is generally prohibited unless it falls within specific exceptions such as coordinating care, treatment, payment of services for the patient, for public health purposes, and in response to legal processes, including specific circumstances where court orders or warrants demand disclosure. Unauthorized disclosure is subject to a private right of action including provisions for civil penalties (including nominal damages and actual damages) as well as administrative fines up to $250,000 per violation.

Legal Standards for Treating PLWH[27]

Federal and state constitutions protect the fundamental right to privacy. In California, that fundamental right extends to HIV status.[28] In addition to these constitutional rights, PLWH are protected by non-discrimination mandates which can be found in the federal Americans with Disabilities Act[29], Section 504 of the federal Rehabilitation Act, and California's Unruh Civil Rights Act and Disabled Person's Act.[30] These laws prohibit discrimination against all PLWH in public accommodations.

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[23] California Health and Safety Code § 121025 (a)-(b).Accessed June 11, 2025
[24] California Health and Safety Code § 121025 (e).Accessed June 11, 2025
[25] California Health and Safety Code § 120980.Accessed June 11, 2025
[26] https://law.justia.com/codes/california/code-civ/division-1/part-2-6/chapter-2/section-56-10/ Accessed June 11, 2025
[27] https://constitution.congress.gov/constitution/amendment-4/ accessed June 11, 2025
[28] CA Const. art. I, § 1.
[29] *Bragdon v. Abbott*, 524 U.S. 624 (1998) (finding that the Americans with Disabilities Act applies to all people living with HIV, regardless of their stage of infection).
[30] https://www.ada.gov/law-and-regs/ada/ Accessed June 11, 2025

Dentists, as medical care providers providing health services to the public, are required to comply with non-discrimination provisions applying to public accommodations. This means dentists must serve PLWH and any considerations when making exceptions to serving a patient living with HIV must be based on reasonable judgments informed by current medical knowledge and not based on stereotypes or irrational fears. Given that the risk of HIV infection to dental staff or other patients is remote and can be further reduced by implementing already required universal safety precautions applying to all blood borne pathogens, any argument which relies on this particular risk will be legally insufficient.[31]

The community standard of practice requires that dentists be as familiar with basic HIV medical care as they are with other common medical conditions. A referral to other general practitioners because the dentist is ignorant about basic HIV medical care is a violation of community dental practice norms. Referrals to a specialist or to a hospital setting must always be based on the clinical needs of the patient, not the ignorance or fear of the dentist, staff or other patients. The legal obligation of the dental provider is to refer patients for testing and follow-up. For example, a dentist may be held legally liable if a patient who has a lesion with unknown etiology needs a referral in order to rule out possible HIV etiology, and the referral for testing and counseling is not done.

Ethical Standards for Treating PLWH

Ethical standards of the California Dental Association, American Dental Association, and World Dental Federation also make clear that it is unethical to refuse to care for PLWH because of fear of the risk of infection.

Best Practices for Treating PLWH

Any decision to deny dental services to PLWH should be made with an abundance of caution. Typically, any policies and practices that result in differential treatment and care of HIV-positive patients, including blanket refusals to treat HIV-positive patients and blanket referrals of all HIV-positive patients to "specialists" have been found to be scientifically unwarranted, and courts have found such blanket practices and policies to constitute unlawful discrimination against PLWH.

PLWH have reported facing discrimination in accessing dental services.[32] Given this particular history, dentists must understand that some PLWH may choose not to disclose their HIV status. For this reason, any effort to help patients feel comfortable and confident in disclosing their HIV status is vital to serving this vulnerable population.

Staff must receive appropriate training on the specific protections which apply to the privacy and confidentiality of HIV status. Because patient information must be kept confidential to the extent possible, unauthorized disclosures of HIV or AIDS-related information coupled with personally identifiable information, or medical records of patients living with HIV, should be monitored. Given that unauthorized disclosures can lead to significant awards for damages, utilizing a uniform written authorization form that includes specific mention of HIV/AIDS-related information, the party with whom such information can be shared, and the patient's signed consent would help to safely facilitate any necessary exchange in information.

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[31] https://archive.ada.gov/hiv/ada_hiv_enforcement.htm accessed June 11, 2025

[32] *See* Brad Sears, Christian Cooper, Fariba S. Younai, and Tom Donohoe. HIV Discrimination in Dental Care: Results of a Discrimination Testing Study In Los Angeles County (2012), http://williamsinstitute.law.ucla.edu/wp-content/uploads/Sears-HIV-Discrimination-Dental-Care-Dec-2011.pdf (last accessed June 11, 2025).

Selected Websites for HIV/AIDS Information for Dentists

General Sites of Particular Interest to Dentists:

- American Dental Association – legal, regulatory, ethical issues, evidence-based dentistry http://www.ada.org/

- California Dental Association – extensive resources on practice management http://www.cda.org

- HIVdent – extensive information on oral manifestations, infection control, medications, picture gallery, and other resources: http://www.hivdent.org

Federal Government-Sponsored Websites:

- Aids.gov – overview of federal resources -- http://www.aids.gov/

- Centers for Disease Control and Prevention (CDC) (www.cdc.gov):
  National Center for HIV/AIDS, Viral Hepatitis, STD and TB Prevention
  http://www.cdc.gov/nchstp/hiv-aids/dhap.htm
  CDC National Prevention Information Network (NPIN)-- http://cdcnpin.org

- Health Resources and Services Administration (HRSA):
  HRSA Target Center – Tools for the Ryan White Community
  http://careacttarget.org/library/guide-hivaids-clinical-care-oral health/

  AIDS Education Training Centers (AETCs) – HIV Education for Healthcare Professionals, with listing of regional AETC's resources and training opportunities -- http://aidsetc.org/

- National Institutes of Health (NIH)
  AIDS Info – Guidelines in use of antiretroviral agent -- http://aidsinfo.nih.gov
  National Institute for Dental and Craniofacial Research -- http://www.nidcr.nih.gov/

Clinical Resources for Dentists:

- HIVdent – Comprehensive site with resources for oral healthcare -- http://www.hivdent.org/

- American Academy of Oral Medicine – Publisher of Clinicians Guides Series, which includes "Clinician's Guide to Treatment of Patients with HIV & Other Communicable Diseases, 4th ed, 2013." https://maaom.memberclicks.net/clinicians-guides

- Mountain Plains AETC – publications include "Oral Health Care for the HIV-Infected Patient" http://www.mpaetc.org/Products

General Clinical Resources:

- HIV Insite (UCSF) – comprehensive up-to-date information on HIV/AIDS
  http://hivinsite.ucsf.edu/

- John Hopkins AIDS Guide – available for mobile devices and web
  http://www.hopkinsguides.com/Hopkins.up

- University of Liverpool –free drug interaction apps for HIV and Hepatitis C
  https://www.hiv-druginteractions.org/
  http://www.hep-druginteractions.org/

- Infectious Disease Society of America - HIVMA/IDSA Primary Care Guidelines for the Management of Persons Infected with Human Immunodeficiency Virus
  https://www.idsociety.org/practice-guideline/primary-care-management-of-people-with-hiv/
  accessed June 11, 2025

- DrugBank – comprehensive database with over 6,800 drug entries -- http://www.drugbank.ca/
  accessed June 11, 2025

Infection Control:

- Organization for Safety, Asepsis and Prevention (OSAP) – mission is safe and infection-free delivery of oral healthcare – http://www.osap.org accessed June 11, 2025

- American Nursing Association Safe Needles Save Lives – many resources on needlestick safety and prevention-- www.needlestick.org/ accessed June 11, 2025

Post-Exposure Prophylaxis:

- The National Clinician's Hotlines:
  Post-Exposure Prophylaxis Hotline – http://www.nccc.ucsf.edu/about_nccc/pepline/
  HIV/AIDS Care Consultation
  (800) 933-3413
  Perinatal HIV Consultation
  (888) 448-8765
  Hepatitis C Consultation
  (844) 437-4636
  Substance Use Consultation
  (855) 300-3595
  Pre-Exposure/PrEP Consultation
  (855) 448-7737
  Post-Exposure/PEP Consultation
  (888) 448-4911

- Florida Caribbean AETC – resources include printed summary guidelines for PEP and many other topics, http://fcaetc.org/treatment-guidelines.php accessed June 11, 2025

International Issues in HIV/AIDS:

- AIDS Education Global Information System (AEGIS) – information and resources for global AIDS epidemic – http://www.aegis.com/ accessed June 11, 2025

- World Dental Federation (FDI) http://www.fdiworlddental.org accessed June 11, 2025

APPENDIX A

Known Antiretroviral Drug Interactions In General Dentistry

NOTE: The information here may serve as a guideline, but it only represents some of the known drugs and the adverse drug reactions *at this time* (2025). https://clinicalinfo.hiv.gov/en/guidelines/hiv-clinical-guidelines-adult-and-adolescent-arv/drug-interactions-overview.
New drugs and drug interactions are being discovered constantly, so dentists are encouraged to check the latest information before prescribing drugs. For more complete information about all drug interactions and contraindications, please consult information provided by the drug manufacturer or a recently published drug reference. **Some good sources include**: **American Academy of Oral Medicine 2018, and Medical Management of HIV Infection 2018. Latest updates can also be found on various websites-see Selected Websites for HIV/AIDS information as a guide. Summary information on antiretroviral drug interactions is available in a free app for Apple and Android devices from the University of Liverpool. https://www.hiv-druginteractions.org/**

The human immunodeficiency virus (HIV) must insert its genetic material into a susceptible cell to replicate and release more virions. This process involves a number of steps that present opportunities for therapeutic intervention. HIV mutates rapidly in response to single drug therapy and quickly develops resistance to individual drugs. Antiretroviral (ARV) drugs delivered in combination therapy were found to be far more effective in suppressing HIV replication. This is now the standard of care for anti-HIV drug therapy and it allows those who respond favorably to therapy to have a more normal life span. However, this comes with a price. There is direct toxicity from the drugs themselves and drug-drug interactions are frequent. These effects can have serious consequences, and can be difficult to predict. The current ARV drugs are far more effective and easier to tolerate than earlier drugs, but they are all toxic to varying degrees. Clinicians prescribing these drugs always have to weigh hoped-for benefits against potential negative consequences from adverse effects of the individual drugs and unintended interactions between all the medications a given patient is taking.

At least eight major classes of ARV drugs have been developed to treat HIV/AIDS, however no drugs have been developed to date that cure the HIV infection. Currently, 5 agents are approved for HIV prevention as PrEP (Truvada, Descovy, Vocabria, Apretude, Yeztugo) . All the currently approved classes of drugs for HIV treatment and prevention are discussed below. ARV drugs may be cited by an abbreviation, a pharmaceutical name, and/or a brand name, so all these names are presented. Many drugs, including a number of ARVs and other commonly prescribed drugs, interact with the Cytochrome P450 (CYP450) enzyme system in the liver and intestine that is responsible for much drug metabolism. An individual drug may be a substrate (i.e., be metabolized by) these enzymes; it may also inhibit or induce the metabolism of another drug. An individual drug may be a substrate, inhibitor, and/or inducer all at the same time depending on the individual CYP450 enzymes it interacts with and how these affect other involved drugs. This can greatly complicate the spectrum of drug-drug interactions and make them difficult to predict.

Drug interactions in dental practice are not as voluminous as they are in medical practice because most dental-related drug therapy is short-term, and the number of drug classes is small in comparison. Dentists do need to be aware of the potential for interaction between drugs they may prescribe and the ARV and other drugs that patients are taking concurrently. There may be interactions involving drugs not prescribed by the dentist that can have clinical consequences for dental practice. As an example, drugs that inhibit the metabolism of warfarin could increase bleeding tendency and dentists should have recent INR values for such patients before performing invasive procedures. The app for mobile devices from the University of Liverpool that gives information on potential ARV drug interactions with other drugs is particularly easy to access and understand. This app is a free download from the website: https://www.hiv-druginteractions.org/

Fortunately for dentists, their most commonly used drugs are local anesthetics, which have very low potential for drug-drug interactions with ARVs. Commonly used amide anesthetics are metabolized by the CYP450 system but adverse drug-drug interactions with ARVs have not been noted. Systemic toxicity from local anesthetics can occur from excessive dosage or inadvertent intravascular injections. Care should be taken when administering local anesthetics to patients with compromised liver function because toxic dose levels may be lower in such persons. Other drugs that dentists may prescribe, including some antibiotics, antifungals, anxiolytics, sedatives and topical steroids, have the potential for interactions with certain ARVs. **Please refer to the tables at the end of this appendix** for a complete list of currently-approved ARVs (with FDA approval dates), each drug has a section on contraindications with potential drug-drug interaction concerns for general dentists listed first, followed by other potential interactions that dentists should be aware of, and then a summary of adverse reactions to the drugs themselves.

1. NUCLEOSIDE REVERSE TRANSCRIPTASE INHIBITORS (NRTI)

NRTIs prevent the conversion of viral RNA into double-stranded DNA so it can insert into the genome of the cell. This was the first class of ARV medications discovered. These drugs are the backbone of antiretroviral therapy and are commonly prescribed in three-drug regimens that contain two NRTIs and a third drug chosen from one of the NNRTI, PI, or INSTI classes. NRTIs are not extensively metabolized before being eliminated by the kidneys. Therefore, significant interaction with enzymes involved in drug metabolism is unlikely. However, drug-drug interactions from other causes can occur. Adverse effects from NRTI drugs themselves are common and can be severe. These include mitochondrial toxicity, lactic acidosis, hepatic steatosis, myelosuppression with cytopenia, cardiomyopathy, and many others.

2. NON-NUCLEOSIDE REVERSE TRANSCRIPTASE INHIBITORS (NNRTI)

NNRTIs prevent the conversion of viral RNA into DNA similar to the NRTIs, but they have a different mechanism of action. These drugs have an affinity for the CYP450 enzyme system. NNRTIs may be metabolized by these enzymes as well as inhibit or induce them whether or not they are a substrate for metabolism. These properties greatly increase the potential of NNRTIs for serious drug-drug interactions. Serious adverse effects of the drugs themselves include drug hypersensitivity (including Stevens-Johnson Syndrome), lipid disorders, serious skin rash, and liver toxicity.

3. PROTEASE INHIBITORS (PI)

PIs block the enzyme necessary to produce mature virions that propagate the HIV infection. PIs have a high barrier to development of drug resistance, but also have a propensity to bad metabolic effects, including GI disturbances, dyslipidemia, insulin resistance, and changes in fat distribution in the body (lipodystrophy). Similar to NNRTIs, PIs have a strong affinity to CYP450 enzymes and consequently a strong potential for serious drug-drug interactions. All PIs inhibit the most prominent CYP enzyme. The strong inhibitory properties of ritonavir are actually exploited by combining it with other PIs so that the other PI drug can be effective when administered in smaller doses.

4. INTEGRASE STRAND TRANSFER INHIBITORS (INSTI)

Integrase strand transfer inhibitors (INSTI) block the enzyme necessary to integrate the viral DNA into the DNA of the cell. They are generally well tolerated, although they are also prone to development of drug resistance and cause insomnia and headaches.

5. FUSION AND ENTRY INHIBITORS

Entry inhibitors interfere with HIV attachment, co-receptor binding and entering healthy CD4 T-lymphocytes. The two currently available entry inhibitors are in different drug classes and have markedly different metabolic profiles.

6. GP120 ATTACHMENT INHIBITORS

This class binds directly to the viral gp120 protein and blocks its initial connection to the CD4 receptor. This class is used in heavily treatment-experienced adults with multidrug-resistant HIV-1 infection whose current regimen is failing due to resistance, intolerance, or safety issues, and who have very few other treatment options available.

7. POST-ATTACHMENT INHIBITORS

This class binds to the CD4 receptor domain to prevent conformational changes after initial attachment, blocking co-receptor interaction. Currently, one formulation is available in this class and is used a once every 2 weeks IV infusion for multi-drug resistant HIV.

8. CAPSID INHIBITORS

These drugs target the viral capsid. By binding to the capsid protein and disrupting its structure, these medications block multiple stages of the viral life cycle. Agents in this class are formulated as long-acting, prescribed as one injection every six months for HIV prevention and treatment of heavily treatment-experienced adults who have multidrug-resistant HIV-1.

OTHER:

- Fixed Dose Combination with NRTI And INSTI ARVS

- Pharmacokinetic Enhancers

Pharmacokinetic enhancers have no activity against HIV but they enhance the activity of ARV medications that are given concurrently.

- Fixed Dose Combination with ARV Inhibitors and Drug Metabolism Inhibitor:
    - For drug-drug interaction potential and adverse reactions, see discussion of individual drugs

It is best to consult a drug reference before prescribing any medications to determine if there are any contraindications.

A NOTE ON HEPATITIS C:

Hepatitis C (HCV) is a viral infection that has many of the same risk factors as HIV. Older HCV drug regimens did not have high cure rates and did not contain direct acting antiretroviral drugs. Direct-Acting Antiviral agents (termed DAAs) for HCV were introduced in 2011 and are much more effective at curing the disease in shorter time frames. However, drug interactions in the coinfected are very complex and will become more so as more HCV drugs are released. The current hope is that the advent of DAAs for HCV will result in an effective oPEP for HCV to be developed in the near future. The University of Liverpool has also developed an app for mobile devices that identifies drug interactions with HCV drugs. It can be downloaded at http://hep-druginteractions.org/

Nucleoside Reverse Transcriptase Inhibitors (NRTIs)	Common Side Effects	Special Precautions
Abacavir (Ziagen; also included in Epzicom, Triumeq, Trizivir)	Common side effects include nausea and vomiting; headache; sleep problems; skin rashes; fever and chills; infection in the nose, throat, or ear; general feeling of being unwell, tired, or not having your usual energy (Hypersensitivity reaction, increase in cholesterol, possible risk of heart disease)	**Dental: interactions unlikely.** General: Prior hypersensitivity reaction to abacavir; HLA-B*5701-positive patients; Patients with previously demonstrated hypersensitivity to abacavir or any other component of the products; Patients testing positive for the presence of the HLA-B*5701 allele; Moderate to severe hepatic impairment(Get genetic testing done before you start on this medication.
Emtricitabine (Emtriva; also included in Biktarvy, Complera, Descovy, Genvoya, Odefsey, Stribild, Symtuza, Truvada)	The most common side effects reported during clinical trials in adults were headache, diarrhea, elevated creatine kinase, nausea, fatigue, dizziness, depression, insomnia, abnormal dreams, rash, abdominal pain, asthenia, increased cough, and rhinitis. The most common side effects reported during clinical trials in children were anemia and skin discoloration/hyperpigmentation.(Rash and skin darkening of palms or soles)	**Dental: interactions unlikely.** General:Do not use this medicine if you or your child are also taking lamivudine, Atripla®, Combivir®, Complera®, Epivir®, Epivir-HBV®, Epzicom®, Odefsey®, Stribild®, Triumeq®, Trizivir®, or Truvada®. Tell your doctor right away if you or your child are using any of these medicines.
Lamivudine (Epivir; also included in Cimduo, Combivir, Delstrigo, Dovato, Epzicom, Triumeq, Trizivir)	The most common side effects reported with this drug have included headache, nausea, malaise, fatigue, nasal signs and symptoms, respiratory tract infections, throat and tonsil discomfort, abdominal discomfort and pain, vomiting, diarrhea, and cough. (Skin rash)	**Dental: interactions unlikely.** General:Do not use this medicine if you or your child is also taking zalcitabine or medicines containing emtricitabine or lamivudine (eg, Atripla®, Combivir®, Complera®, Emtriva®, Epzicom®, Stribild®, Trizivir®, Truvada®).

Tenofovir Disoproxil Fumarate, also known as TDF (Viread; also included in Atripla, Cimduo, Complera, Delstrigo, Stribild, Truvada)	The most common side effects reported with tenofovir disoproxil fumarate (DF) in HIV-1-infected patients included rash, diarrhea, headache, pain, depression, asthenia, and nausea. The most common side effects associated with this drug in combination with otherAntiretrovirals have included mild to moderate gastrointestinal events (e.g., nausea, diarrhea, vomiting, and flatulence) Long term adverse effects include decreases in kidney function and bone mineral density. (Kidney and bone damage)	**Dental: interactions unlikely**. General: Tenofovir can harm your kidneys, especially if you also use certain medicines for infections, cancer, osteoporosis, organ transplant rejection, high blood pressure, or pain or arthritis (including Advil, Motrin, and Aleve).Do not take tenofovir together with adefovir (Hepsera), or with combination medicines that contain tenofovir (Atripla, Biktarvy, Cimduo, Complera, Descovy, Genvoya, Odefsey, Stribild, Symfi, or Truvada).(Don't use if you have kidney disease)
Tenofovir Alafenamide, also known as TAF (Vemlidy; also included in Biktarvy, Descovy, Genvoya, Odefsey, Symtuza)	Increase in LDL ("bad") cholesterol, weight gain	**Dental: interactions unlikely**. General:This medicine should not be used together with dexamethasone (Decadron®), certain seizure medicines (eg, carbamazepine, oxcarbazepine, phenobarbital, phenytoin, Dilantin®, Tegretol®, Trileptal®), medicines for tuberculosis (eg, rifampin, rifapentine, Priftin®, Rifadin®, Rimactane®), certain stomach medicines (eg, dexlansoprazole, esomeprazole, lansoprazole, omeprazole, pantoprazole, rabeprazole, Aciphex®, Dexilant®, Nexium®, Prevacid®, Prilosec®), or St. John's wort. This medicine may cause serious types of allergic reactions, including skin reactions and drug reaction with eosinophilia and systemic symptoms (DRESS syndrome).
Zidovudine, also known as AZT (Retrovir; also included in Combivir, Trizivir)	Anemia; nausea; vomiting; lactic acidosis; increase in cholesterol; fat loss in arms, legs or face; fatty liver	**Dental: Fluconazole increases AZT serum levels.** General: not to be prescribed with any meds that cause bone marrow suppression. Zidovudine has serious interactions with the following drugs: cabotegravir; cidofovir; clozapine; deferiprone; ganciclovir; pretomanid; ribavirin; ropeginterferon alfa 2b; stavudine; valganciclovir. Zidovudine has severe interactions with the following drug: elvitegravir/cobicistat/emtricitabine/tenofovir DF

Non-Nucleoside Reverse Transcriptase Inhibitors (NNRTIs)	**Common Side Effects**	**Special Precautions**

Doravirine (Pifeltro; also included in Delstrigo)	Skin rash, weight gain	**Dental: interactions unlikely** Do not use this medicine together with carbamazepine (Tegretol®), enzalutamide (Xtandi®), mitotane (Lysodren®), oxcarbazepine (Trileptal®), phenobar bital (Luminal®), phenytoin (Dilantin®), rifampin (Rifadine®), rifapentine (Priftin®), or St John's wort.
Efavirenz (Sustiva; also included in Atripla)	Vivid dreams, anxiety, depression, insomnia, skin rash, liver damage, suicidal ideation	**Dental: increases plasma concentrations of midazolam and triazolam. Serum levels of EFV are increased by fluconazole. EFV interacts with CYP450 enzymes, affecting the hepatic metabolism of many co-administered drugs, including antiretrovirals**. General: Do not take with voriconazole, elbasvir/grazoprevir, or St. John's wort, as these combinations can reduce the effectiveness of Atripla or lead to serious side effects. Do not use with other medications containing efavirenz, emtricitabine, or tenofovir disoproxil fumarate, unless directed by a healthcare professional.(Should not be used in people with depression or other mental illnesses)
Etravirine (Intelence)	Skin rash	**Dental: Antifungal agents increase ETV concentrations. ETV decreases itraconazole and ketoconazole concentrations. It increases serum levels of alprazolam, diazapam and warfarin which may in turn increase INR. Erythromycin also increases ETV concentration**. General: Serious skin reactions can occur with this medicine. This medicine may cause you to have excess body fat.

Nevirapine (Viramune)	Skin rash, liver damage	**Dental: NVP induces CYP450 enzymes and affects the levels of many co-administered drugs. Drugs that inhibit CYP3A activity (ketoconazole, cimetidine and macrolide antibiotics can increase NVP levels. Risk of hepatotoxicity exists with fluconazle.** *General: Serious side effec* ts have occurred with this drug. The most serious side effects have included hepatitis, hepatic failure, Stevens-Johnson syndrome, toxic epidermal necrolysis, drug reaction with eosinophilia and systemic symptoms, and hypersensitivity reactions. Hepatitis/hepatic failure have been isolated or associated with signs of hypersensitivity which have included severe rash or rash accompanied by fever, general malaise, fatigue, muscle/joint aches, blisters, oral lesions, conjunctivitis, facial edema, eosinophilia, granulocytopenia, lymphadenopathy , or renal dysfunction.(Should not be used in people with liver problems, or in women with CD4 greater than 250 or in men with CD4 greater than 400)

Rilpivirine (Edurant; also included in Complera, Juluca, Odefsey)	Depression, trouble sleeping, skin rash, suicidal ideation	**Dental: macrolide anibiotics and azole antifungals may increase RVP levels. RPV decreases serum levels of ketoconazole**. General: Do not use rilpivirine (the active ingredient contained in Edurant Ped) if you are also taking dexamethasone (Decadron®), St. John's wort, medicine to treat tuberculosis (eg, rifampin, rifapentine, Priftin®, Rifadin®, or Rimactane®), seizure medicine (eg, carbamazepine, oxcarbazepine, phenobarbital, phenytoin, Dilantin®, Tegretol®, or Trileptal®), or certain stomach medicines (eg, esomeprazole, lansoprazole, omeprazole, pantoprazole, rabeprazole, Aciphex®, Nexium®, Prevacid®, Prilosec®, or Protonix®).This medicine may cause serious types of allergic reactions, including anaphylaxis and drug reaction with eosinophilia and systemic symptoms (DRESS syndrome)(Take with food. Should not be used in people with CD4 less than 200 or HIV viral load greater than 100,000
Rilpivirine for intramuscular injection (combined with cabotegravir as Cabenuva)	Injection site reactions (pain, swelling)	**Dental: interactions unlikely**. General: Do not use CABENUVA in patients receiving carbamazepine, oxcarbazepine, phenobarbital, phenytoin, rifabutin, rifampin, rifapentine, systemic dexamethasone (>1 dose), and St John’s wort. Because CABENUVA is a complete regimen, coadministration with other antiretroviral medications for the treatment of HIV-1 infection is not recommended(Should not be used in people with CD4 less than 200 or HIV viral load greater than 100,000

Protease Inhibitors (PIs)	**Common Side Effects**	**Special Precautions**

Atazanavir (Reyataz; also included in Evotaz)	Nausea, vomiting, diarrhea, jaundice, gall bladder and kidney stones, liver damage, skin rash, increase in cholesterol, changes in heart rhythm	**Dental: co-administration with azoles could increase ATV and also increase itraconazole and ketoconazole. Efficacy of codiene could be reduced. Serum levels of alprazolam, diazapam midzolam could be increased**. General:Some medicines can cause unwanted or dangerous effects when used with atazanavir: alfuzosin;cisapride;irinotecan;rifampin;sildenafil (Revatio, for treating pulmonary arterial hypertension);St. John's wort;antipsychotic medicine--lurasidone, pimozide;antiviral medicine--elbasvir/grazoprevir, glecaprevir/pibrentasvir, indinavir, nevirapine;ergot medicines--dihydroergotamine, ergotamine, ergonovine, methylergonovine;heart rhythm medication--amiodarone, quinidine;medicine to lower cholesterol--lomitapide, lovastatin, simvastatin;sedative medicines--triazolam, oral midazolam(Take with food; may increase opioid & benzodiazepine levels by inhibiting metabolism
Darunavir (Prezista; also included in Prezcobix, Symtuza)	Nausea, vomiting, diarrhea, skin rash, increase in bad cholesterol, liver damage	**Dental: Symtuza might increase the risk of bleeding if taken with certain blood thinners.** General: Sulfa Allergy: Darunavir contains a sulfonamide moiety. The incidence and severity of rash were similar in subjects with or without a history of sulfonamide allergy. Patients with hemophilia may develop an increase in bleeding events. (Take with food; may increase opioid & benzodiazepine levels by inhibiting metabolism

Lopinavir/Ritonavir (Kaletra)	Nausea, vomiting, diarrhea, skin rash, increase in cholesterol, liver damage	**Dental: may increase metabolism of warfarin and therby increase INR.** General: Do not use this medicine if you or your child are also using alfuzosin (Uroxatral®), apalutamide (Erleada®), cisapride (Propulsid®), colchicine (Colcrys®), dronedarone (Multaq®), elbasvir/grazoprevir (Zepatier®), ergot medicines (eg, dihydroergotamine, ergotamine, methylergonovine, Cafergot®, Ergomar®, Methergine®, or Migranal®), lomitapide (Juxtapid®), lovastatin (Advicor®, Altoprev®, Mevacor®), lurasidone (Latuda®), oral midazolam (Versed®), pimozide (Orap®), ranolazine (Ranexa®), rifampin (Rifadin®), sildenafil (Revatio®), simvastatin (Simcor®, Vytorin®, Zocor®), or triazolam (Halcion®). Pancreatitis may occur while you are using this medicine. This medicine may increase blood sugar levels. This medicine may cause heart rhythm problems, including PR or QT prolongation. This medicine may increase the amount of cholesterol and fats in your blood. This medicine may cause you to have excess body fat. (Take with food; may increase opioid & benzodiazepine levels by inhibiting metabolism

Ritonavir (Norvir; also included in low doses to “boost” other PI drugs)	Nausea, vomiting, taste changes	**Dental: contraindicated with sedative hypnotics (alpazolam, diazapam, midazolam), meperidine, propoxyphene.Increases plama levels of clarithromycin and fluconazle. Changes levels of NSAIDS, antihistamines and antifungals.** General: Do not use this medicine if you or your child are also using alfuzosin (Uroxatral®), apalutamide (Erleada®), cisapride (Propulsid®), colchicine (Colcrys®), dronedarone (Multaq®), elbasvir/grazoprevir (Zepatier®), ergot medicines (eg, dihydroergotamine, ergotamine, methylergonovine, Cafergot®, Ergomar®, Methergine®, or Migranal®), lomitapide (Juxtapid®), lovastatin (Advicor®, Altoprev®, Mevacor®), lurasidone (Latuda®), oral midazolam (Versed®), pimozide (Orap®), ranolazine (Ranexa®), rifampin (Rifadin®), sildenafil (Revatio®), simvastatin (Simcor®, Vytorin®, Zocor®), or triazolam (Halcion®). Pancreatitis may occur while you are using this medicine. This medicine may increase blood sugar levels. This medicine may cause heart rhythm problems, including PR or QT prolongation. This medicine may increase the amount of cholesterol and fats in your blood. This medicine may cause you to have excess body fat. (Take with food. Generally doesn't cause these

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Fusion Inhibitor (FI)	Common Side Effects	Special Precautions
Enfuvirtide (Fuzeon)	"Most common adverse reactions are local injection site reactions, diarrhea, nausea, and fatigue. An increased rate of bacterial pneumonia was observed in subjects treated with FUZEON in clinical trials." (Redness, itching, swelling, pain, or hard lumps at injection site)	**Dental: interactions unlikely.** Hypersensitivity to FUZEON or any of its components (Given by injection)

Entry Inhibitor	Common Side Effects	Special Precautions

Maraviroc (Selzentry)	Skin rash, hypersensitivity reaction, liver damage	**Dental: concurrent azole antifungals (itraconazole and ketoconazole) and erythromycin may increase MVC serum concentrations.** General: Not recommended in patients with dual/mixed- or CXCR4-tropic HIV-1. Only indicated for patients with CCR5-tropic HIV-1 infection. St John's Wort will decrease the level or effect of maraviroc by affecting hepatic/intestinal enzyme CYP3A4 metabolism.

Integrase Inhibitors	Common Side Effects	Special Precautions
Bictegravir (included in Biktarvy)	Skin rash, weight gain	**Dental: interactions unlikely.** General: If you've ever had hepatitis B, it may become active or get worse after you stop using this medicine. Biktarvy is not recommended in patients with severe renal impairment or patients with end-stage renal disease who are not receiving chronic hemodialysis, or patients with no antiretroviral treatment history and end-stage renal disease (ESRD) who are receiving chronic hemodialysis. Do not take Biktarvy if you also take a medicine that contains Dofetilide or Rifampin.
Cabotegravir (Vocabria)	Fever, fatigue, blisters, muscle or joint ache; swelling in eyes, mouth, and face	**Dental: interactions unlikely.** General: You should not use this medicine together with a seizure medicine (eg, carbamazepine, oxcarbazepine, phenobarbital, phenytoin, Dilantin®, Tegretol®, Trileptal®) or medicine to treat tuberculosis (eg, rifampin, rifapentine, Priftin®, Rifadin®, Rimactane®). Using these medicines together may make cabotegravir (the active ingredient contained in Vocabria) less effective.(People with a history of hepatitis B or C virus or people who have certain liver function test changes may be more likely to develop new or worsening changes.)

Cabotegravir and Rilpivirine (Cabenuva)	Injection site reactions, fever, fatigue, headache, musculoskeletal pain, nausea, sleep disorders, dizziness, rash	**Dental: interactions unlikely.** General: Do not use CABENUVA in patients receiving carbamazepine, oxcarbazepine, phenobarbital, phenytoin, rifabutin, rifampin, rifapentine, systemic dexamethasone (>1 dose), and St John's wort. Because CABENUVA is a complete regimen, coadministration with other antiretroviral medications for the treatment of HIV-1 infection is not recommended
Dolutegravir (Tivicay; also included in Dovato, Juluca, Triumeq)	Insomnia, depression, skin rash, suicidal ideation, weight gain	**Dental: interactions unlikely**. Using this medicine while you are pregnant can harm your unborn baby. You should not use this medicine together with dofetilide (Tikosyn®). Using these medicines together may cause serious or life-threatening side effects.
Elvitegravir (Vitekta; also included in Genvoya, Stribild)	Insomnia, nausea, diarrhea, depression, skin rash, suicidal ideation, increase in cholesterol, weight gain	**Dental: Genvoya can interact with sedatives used in dental procedures, particularly those containing diazepam**. This medicine should not be used together with alfuzosin (Uroxatral®), carbamazepine (Tegretol®), lamivudine (Combivir®, Epivir®, Epivir-HBV®, Epzicom®, Triumeq®, Trizivir®), lomitapide (Juxtapid®), lovastatin (Mevacor®), lurasidone (Latuda®), midazolam (Versed®), phenobarbital (Luminal®), phenytoin (Dilantin®), pimozide (Orap®), rifampin (Rifadin®, Rimactane®), sildenafil (Revatio®), simvastatin (Zocor®), triazolam (Halcion®), St John's wort, or ergotamine medicines (eg, dihydroergotamine, ergotamine, methylergonovine, Cafergot®, Ergomar®, Wigraine®).

Raltegravir (Isentress)	The most common side effects of moderate to severe intensity were insomnia, headache, nausea, dizziness, and fatigue. The most commonly reported side effects of all intensities and regardless of causality included diarrhea, nausea, headache, nasopharyngitis, fatigue, upper respiratory tract infection, pyrexia, abdominal pain, and vomiting. (Insomnia, depression, skin rash, hypersensitivity reaction, suicidal ideation, weight gain)	**Dental: interactions unlikely**. General: Serious skin and allergic reactions (eg, Stevens-Johnson Syndrome, toxic epidermal necrosis) can occur with this medicine.

gp120 Attachment Inhibitor	Common Side Effects	Special Precautions
Fostemsavir (Rukobia)	The most common side effect of RUKOBIA is nausea. Concerns of QT prolongations and elevated liver enzymes in patients with co-existing hepatitis are also known.(Nausea, diarrhea, stomach pain, headache, skin rash, fatigue)	**Dental: Changes in taste have been reported as a less common side effect of Rukobia**. General: Do not take RUKOBIA if you take certain medicines, including enzalutamide, carbamazepine, phenytoin, rifampin, mitotane, St. John's wort (Hypericum perforatum).RUKOBIA may cause a heart rhythm problem called QTc prolongation. QTc prolongation causes an irregular heartbeat. (Has not been tested in children)

Post attachment inhibitor	Common Side Effects	Special Precautions
Ibalizumab (Trogarzo)	Diarrhea, skin rash, kidney damage	**Dental: interactions unlikely.** General: Using this medicine could harm unborn baby while you are pregnant.(Given by intravenous infusion

Capsid inhibitor	Common Side Effects	Special Precautions
Lenacapavir (Sunlenca)	Injection site reactions (pain, swelling)	**Dental: interactions unlikely**. Concomitant administration of SUNLENCA is contraindicated with strong CYP3A inducers (first given as pills as well as injection)