Essential Medical Issues Related to HIV in Dentistry

Arthur H. Moswin, *MD, FACP;* ***Joel B. Epstein,*** *DMD, MSD, FRCD(C), FDS RCSE*

Contact Author

Dr. Epstein
Email: *jepstein@uic.edu*

ABSTRACT

Management of HIV infection has progressed dramatically since the disease was first recognized, to the point that HIV infection is now considered a chronic condition. Some of these new approaches in management are related to the strides that have been made in understanding the pathogenesis of this condition. Such changes in medical care may also affect the provision of oral health care. Dental providers must therefore be aware of current management practices. This paper reviews current approaches to managing HIV-related disease.

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HIV infection is now a chronic manageable illness. Affected patients are living longer and increasingly normal lives, thanks largely to highly active antiretroviral therapy (commonly called HAART). It is estimated that a 21-year-old person infected with HIV today will live to 60 years of age.[1] Regular dental care is an important aspect of the management of HIV infection. Oral lesions can be among the earliest manifestations of this infection and may develop anytime during the course of the illness. This article summarizes medical issues related to HIV infection of which the dentist should be aware.

Overview of Dental Care in the Context of HIV-Related Disease

As many as one-quarter of people infected with HIV are unaware of their condition.[2] In a survey of patients with HIV/AIDS conducted in 2000, the Rand Corporation found that 58% did not see a dentist regularly (i.e., had not seen a dentist in the past 6 months), and 20% reported having had an unmet need for dental care in the previous 6 months.[3] Not surprisingly, dental programs that were affiliated with a comprehensive HIV treatment program were most successful, probably because of greater referrals and greater funding available for care in those settings.

There are various reasons for the disparity between need for and availability of dental care, including lack of dental insurance and competing medical and social needs; however, reticence on the part of the dentist should not be a factor. Although universal precautions should be used for all patients, regardless of HIV status, occupational transmission of HIV in the course of providing dental care is extremely unlikely,[4] despite the fact that some patients will have HIV infection and despite the frequency of accidental skin punctures from instruments. This is probably because HIV is rarely transmitted through saliva and because of the small quantities of blood involved. In fact, it appears that most percutaneous injuries associated with dental care occur during extraoral procedures such as laboratory work

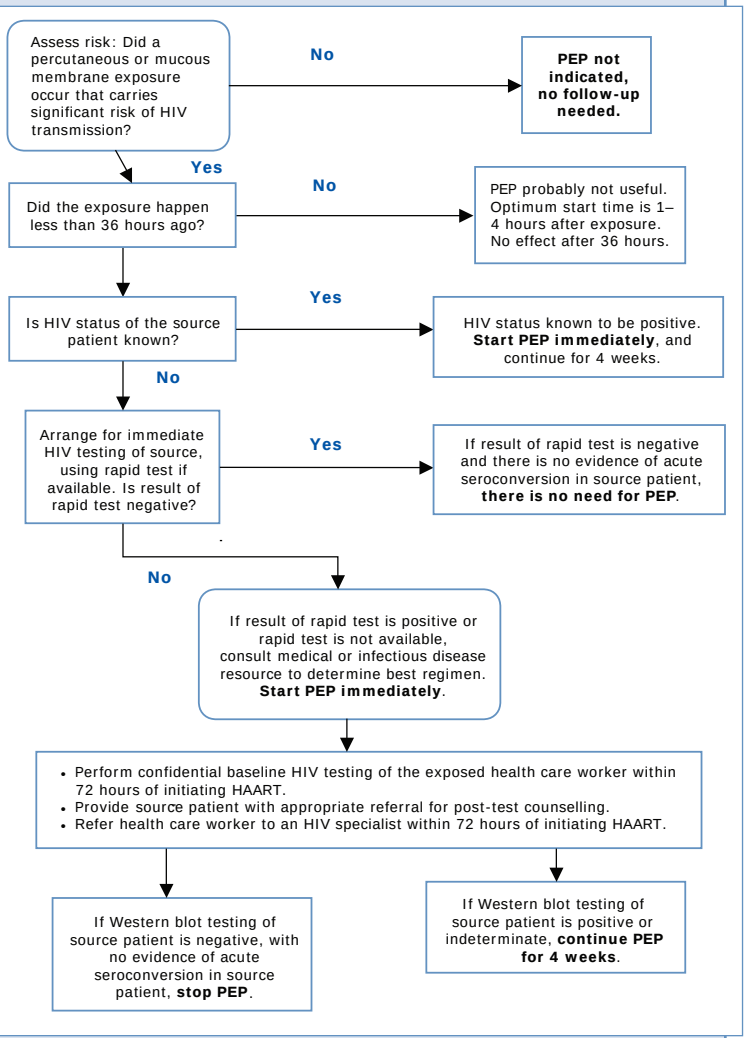

Figure 1: Management of occupational exposure to HIV. PEP = Postexposure prophylaxis. Adapted from reference 6.

or clean-up.[5] *Any* patient in the dental chair could be among those with HIV who do not know they are HIV-positive. Therefore, every office should have a plan in case of needlestick injury or other exposure to blood or body fluids (**Fig. 1**; see also **Appendix 1**, Recommendations on managing occupational HIV exposure, at www.cda-adc.ca/jcda/vol-73/issue-10/945.html). Studies suggest that the risk of contracting HIV from a needlestick injury is 1 in 200 (0.3%) overall.[7] Stated another way, 99.7% of exposures through needlestick injuries and cuts do not lead to HIV infection. In contrast, the risk of contracting hepatitis B from a needlestick injury (which has always been a risk in medical and dental care) during care of an infected patient may be as high as 30%.[7] The risks of some other modes of HIV transmission are shown in **Table 1**. Certain types of needlestick exposure are more risky than others, as outlined in **Table 2**. Wearing gloves may reduce the volume of blood transmitted by 50%, even if a puncture through the glove does occur. Starting antiretroviral therapy within 1–4 hours of an exposure can drastically reduce (by more than 80%) the incidence of HIV transmission.[9] A procedure should be in place for testing the source patient, should a sharps injury occur. It is important to determine, in consultation with medical personnel familiar with HIV exposure, the severity of the exposure and, if indicated, to start prophylactic antiretroviral therapy within 1 or 2 hours. HAART should be continued for 4 weeks if the source patient is positive. It may be discontinued if the patient's status is found to be negative.

Preoperative Management

When undertaking dental care of an HIV-positive patient, communication with the primary treating physician is imperative and should cover more than the usual (though still important) questions about bleeding, allergies, cardiac history and antibiotic prophylaxis. Such communication should also include information about recent CD4 (T cell) count, HIV viral load, any other medical issues (e.g., hepatitis, cardiac problems) and the patient's current medication list (to allow identification of potential drug–drug interactions). As patients with HIV age, the incidence of renal disease, liver disease (often from concomitant hepatitis), cardiomyopathy and lipid abnormalities such as high cholesterol tends to increase. There may also be a higher incidence of coronary artery disease (although this is controversial because of the conflicting evidence) and a higher incidence of osteoporosis, especially among men; these latter patients may be taking bisphosphonates, such as alendronate (Fosamax). In light of recent cases of jaw osteonecrosis in non-HIV patients taking these drugs, vigilance is advised.[10] An otherwise fit HIV-positive person with good muscle mass probably has the same risk of wound complications as an HIV-negative person.[11]

Minor laboratory abnormalities are common in HIV-positive patients, whether or not they are receiving antiretroviral therapy. Abnormalities in the complete blood count, such as mild anemia, neutropenia and, less often, thrombocytopenia, are common; unless these problems are severe, they should not delay delivery of care. Usually, no further work-up is required, as long as the primary medical provider is experienced in the care of HIV-infected patients, is aware of the issues and agrees that there is no contraindication to surgery. However, a hemoglobin level less than 0.007 g/dL (0.07 g/L), an

Table 1 Risk of HIV transmission for various modes of transmission[a]

Mode of transmission	Risk per 10,000 exposures[b]
Percutaneous (blood)	30
Mucocutaneous (blood)	< 1
Receptive anal intercourse	50
Receptive vaginal intercourse	10
Insertive vaginal intercourse	5

[a]*Adapted from reference 8*
[b]*Assuming an infected source and, for intercourse-related modes of transmission, no condom use.*

Table 2 Risk of HIV transmission after percutaneous (needlestick) exposure[a]

Risk factor	Odds ratio
Deep injury	16.1
Visible blood on needle	5.2
Device in artery or vein (vs. subcutaneous or intramuscular injection)	5.1
Source patient with high viral load	5.4
Use of zidovudine after exposure	0.2

[a]*Adapted from reference 9*

absolute neutrophil count (total leukocytes × % polymorphonuclear leukocytes + bands) of less than $1.5 \times 10^3/\mu L$ ($1.5 \times 10^9/L$) or a platelet count less than $100 \times 10^3/\mu L$ ($100 \times 10^9/L$) may require special attention by the primary provider before surgical procedures[12] but usually not before routine dental care.

Another laboratory abnormality in patients who are receiving HAART is an isolated increase in bilirubin in association with *normal* levels of aspartate aminotransferase and alanine aminotransferase, a phenomenon that may be seen in patients taking atazanavir (Reyataz); however, this abnormality is of no medical consequence. It (and, though more rarely, frank jaundice) is being seen more frequently as use of HAART increases. Patients with concomitant hepatic or renal dysfunction may be at higher risk of bleeding and other complications, but the usual caveats apply; there is no increase in risk due solely to HIV status.

Another important test for patients with HIV is the purified protein derivative (PPD) test, also known as the Mantoux skin test, for tuberculosis (TB). Patients with HIV are at higher risk for active TB if the PPD test result is positive; therefore, they should undergo PPD testing annually. The patient's TB status and most recent PPD test result should be ascertained from the primary provider; if the test result is positive, the dental care provider should confirm that the results of chest radiography are normal (i.e., that the patient does not have active TB) and that prophylaxis with isoniazid has been started before initiating dental care.

Medication-Related Issues

The continued success of a patient's HIV therapy depends on strict adherence to the medication regimen, with no missed doses. Missing 10% of doses (essentially 1 or 2 doses a month) or more can cause selection of resistant virus and lead to regimen failure. Adherence is one of the guiding principles of HIV therapy, and every attempt should be made to minimize missed doses and to encourage patients to take all scheduled medication doses. Patients who are receiving therapy and who must fast in preparation for laboratory testing or who must take nothing by mouth in advance of surgery should be allowed to take their HIV medications with sips of water, if at all possible. In cases where the patient must miss one or more doses, as when the jaw has been wired after fracture, consultation with the treating physician is important. Standard antibiotics and pain medications usually pose no additional concerns for patients with HIV. However, the dental care provider must be aware of the possibility of current or prior drug abuse, which may affect the choice of pain medication. Although the combination drug trimethoprim–sulfamethoxazole (Bactrim) is not frequently used by dentists, up to 50% of patients with HIV may be allergic to this drug, a problem that may be discovered by the dentist if he or she unknowingly prescribes it for an allergic patient. The allergic reaction usually resolves on its own once the drug is discontinued.

The most important drug with potential for drug–drug interactions is ritonavir (Norvir), which may be administered alone or combined with lopinavir in the drug Kaletra. This agent is involved in many known drug–drug interactions and has many contraindications. The full list of potential problems is given in the package insert available online (www.norvir.com) or in various drug references. Among drugs that may be used in dentistry and that can interact with ritonavir or lopinavir–ritonavir, meperidine (Demerol) should not be used at all, whereas acetaminophen, ibuprofen, tramadol and oxycodone all seem to be minimally affected. Proxyphene levels may be increased by ritonavir or lopinavir–ritonavir, and this drug should therefore be used with caution in patients taking either of these HIV drugs. Antibiotics require no dose adjustments, although levels of clarithromycin (Biaxin) are increased. All ergot derivatives and the sedatives midazolam (Versed) and triazolam (Halcion) are contraindicated for patients taking ritonavir or lopinavir–ritonavir and should be used with extreme caution or avoided altogether.

The Road Ahead

There are many new and promising drugs in the pharmaceutical "pipeline." These drugs, combined with ongoing vaccine research, may further revolutionize the care of patients with HIV and prolong their life expectancies. These include entirely new classes of drugs such as fusion inhibitors (e.g., the recently approved enfuvirtide [Fuzeon]), integrase inhibitors (e.g., raltegravir [Isenstress]), HIV receptor antagonists (e.g., maraviroc [Selzentry]) and others[13] that are coming to market. As the number of people living with HIV infection and AIDS continues to increase, we must work to reduce their unmet needs for dental care.

THE AUTHORS

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Dr. Moswin *is medical director, HIV Program, Provident Hospital of Cook County, Chicago, Illinois, and medical director, HIV Care Program, Michael Reese Hospital, Chicago, Illinois.*

Dr. Epstein *is professor and head, department of oral medicine and diagnostic sciences, College of Dentistry, and director, interdisciplinary program in oral cancer, College of Medicine, Chicago Cancer Center, University of Illinois at Chicago, Chicago, Illinois.*

Correspondence to: *Dr. Joel Epstein, UIC College of Dentistry, Oral Medicine, MC-838, 801 South Paulina St., Chicago, IL 60091, USA.*

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Appendix 1 Recommendations on managing occupational HIV exposure

Wound and skin sites should be cleansed with soap and water immediately. Exposed mucous membranes should be flushed with water.

Postexposure prophylaxis (PEP) is recommended if there has been exposure to blood, visibly bloody fluid or other potentially infectious material (e.g., semen, vaginal secretions, or cerebrospinal, synovial, pleural, peritoneal, pericardial or amniotic fluid) associated with potential HIV transmission and in any of the following exposure situations:

- break in the skin caused by a sharp object (including both hollow-bore and cutting needles or broken glassware) that is contaminated with blood, visibly bloody fluid or other potentially infectious material or that has been in the source patient's blood vessel
- bite from an HIV-infected patient with visible bleeding in the mouth that causes bleeding in the health care worker
- splash of blood, visibly bloody fluid or other potentially infectious material onto a mucosal surface (mouth, nose or eyes)
- exposure to blood, visibly bloody fluid or other potentially infectious material through nonintact skin (e.g., dermatitis, chapped skin, abrasion or open wound)

If the HIV serostatus of the source is unknown, HIV testing of the source should be sought. If the rapid HIV test is available on site (or at another site nearby), it should be used to determine the HIV status of the source patient. Results are usually available within 30 minutes of testing. If the result of a rapid HIV test is negative, and there is no evidence of acute symptoms of seroconversion, PEP is not necessary.

If the preliminary rapid test result is positive, the health care worker should start PEP immediately. Posttest counselling should be given to the source patient. To establish a diagnosis of HIV infection, the test must be confirmed by a Western blot assay, which should be performed as soon as possible. PEP should be continued for 4 weeks.

If the result from testing the source patient is not immediately available and PEP is indicated on the basis of an initial assessment, PEP should not be delayed pending receipt of the test result.

If the source patient's HIV test result is negative and the source patient was infected recently, the health care worker should be informed of the small chance that it is a false-negative result. PEP should be recommended in situations when an exposure with significant risk has occurred and the clinician suspects a strong likelihood that the source patient acquired the HIV infection recently.

The critical decision point should be based on whether the health care worker has had a percutaneous, mucocutaneous or nonintact skin exposure to potentially HIV-infected blood, visibly bloody fluid or other potentially infectious material. For these exposures, prompt initiation of PEP, followed by telephone or in-person consultation with a clinician experienced in HIV PEP, is recommended.

Implementing PEP

PEP should be initiated as soon as possible, ideally within 2 hours and no later than 36 hours after exposure, after which there is little efficacy. The prescribing provider should ensure that the patient has access to the full course of antiretroviral medications.

PEP medications should be readily available to health care workers who sustain a known or highly suspect occupational exposure to HIV. In establishing plans for providing PEP, employers should determine the following:

- how PEP will be made available within 1 to 2 hours of an exposure
- how a 24- to 48-hour supply of PEP will be made available for urgent use
- how the health care worker will obtain PEP drugs to complete the 4-week regimen (given that some individuals may be reluctant to go to their local pharmacy)

Confidential baseline HIV antibody testing of the health care worker should be obtained at the time the occupational exposure is reported or within 72 hours of initiating PEP.

If a recommendation to begin PEP is declined, this decision should be documented in the health care worker's medical record.

All patients who start receiving PEP should be reevaluated within 72 hours of their exposure. This allows further clarification of the nature of the exposure, review of available serologic test results from the source patient and evaluation of adherence to and toxicities associated with the PEP regimen.

If a health care worker presents for evaluation of a high-risk exposure more than 36 hours after the incident, close monitoring for signs and symptoms of acute HIV infection is recommended, with subsequent introduction of highly active antiretroviral therapy (HAART) if acute seroconversion occurs.

Adapted from: HIV Clinical Resource. Office of the Medical Director, New York State Department of Health AIDS Institute in collaboration with the Johns Hopkins University Division of Infectious Diseases. HIV prophylaxis following occupational exposure. December 2005. Available: www.hivguidelines.org.