### HIV INFECTION AND AIDS

(also known as Human Immunodeficiency Virus infection and Acquired Immune Deficiency Syndrome; caused by retroviruses HIV-1 and HIV-2; HIV infection is classified as stage 3 [AIDS] when the immune system of a person infected with HIV becomes severely compromised — i.e., a CD4+ lymphocyte cell count less than 200 cells/μL and/or the person becomes ill with an opportunistic infection)

<table>
<thead>
<tr>
<th>Is the initiation of non-invasive dental hygiene procedures contra-indicated?</th>
<th>No</th>
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</thead>
<tbody>
<tr>
<td>Is medical consult advised?</td>
<td>Possibly (depends on severity and level of control of the underlying infection/disease, including the presence/absence of oral lesions and/or new extra-oral manifestations). Patients/clients with lesions suggestive of HIV infection should be referred for evaluation for possible HIV/AIDS.</td>
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<tr>
<td>Is medical clearance required?</td>
<td>Possibly (e.g., if the HIV infection/disease is unstable and/or there are oral lesions and/or thrombocytopenia and/or neutropenia and/or significant CD4+ lymphocytopenia and/or other evidence of significant immunosuppression). Medical clearance should be sought for symptomatic HIV-infected patients/clients before surgical procedures, including scaling and curettage, are performed; current platelet count and white blood cell counts (including CD4+ lymphocyte count) should be obtained by the patient/client’s physician. Major considerations in the dental treatment of the patient/client with HIV/AIDS are determining the level of immunosuppression and the tendency to excessively bleed.</td>
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<tr>
<td>Is antibiotic prophylaxis required?</td>
<td>Possibly, depending on the level of immunosuppression. Prophylactic antibiotics may be warranted in patients/clients with CD4+ lymphocyte count &lt; 200 cells/μL and/or neutrophil count &lt; 500 cells/μL. Furthermore, significantly immunosuppressed patients/clients may also be candidates for antifungal or antiviral prophylaxis against non-bacterial conditions such as Pneumocystis fungal pneumonia, candidiasis, herpes simplex virus (HSV) or cytomegalovirus (CMV) infection, or other opportunistic disease.</td>
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<tr>
<td>Is postponing treatment advised?</td>
<td>Possibly (depends on severity and level of control of the underlying infection/disease, including presence/absence of oral lesions, as well as medical clearance for patients/clients with potentially significant immunosuppression, low CD4+ lymphocyte count, neutropenia, and/or thrombocytopenia). Patients/clients who are HIV-seropositive but asymptomatic may receive all indicated dental hygiene treatment; generally this is true for patients/clients with a CD4+ lymphocyte count &gt; 350 cells/μL. Patients/clients with AIDS can receive almost any oral healthcare needed and desired once the possibilities of significant immunosuppression, neutropenia, and thrombocytopenia have been addressed.</td>
</tr>
</tbody>
</table>

### Oral management implications

- **Mode of transmission** is person-to-person by exchange of infected bodily fluids from sexual contact and through blood and blood products. Transmission routes include: unprotected penile-vaginal or penile-anal intercourse; the use of HIV-contaminated injecting and skin-piercing equipment (including illicit injection drug use); vertical transmission from mother to infant during pregnancy, delivery, or breastfeeding; and transfusion of infected blood or blood products (risk less than 1 in 1 million from blood transfusion in North America due to current screening measures). Less common routes of transmission include contact of abraded skin or mucosa with infectious body secretions and the transplantation of HIV-infected tissues or organs. The risk of transmission from oral sex is thought to be low. While the virus can occasionally be found in saliva, tears, urine, and bronchial secretions, transmission after contact with these secretions in the absence of blood has not been reported.

- Skillful, non-judgmental questioning should be used during the patient/client interview. The dental hygienist should be sensitive to the many challenges faced by HIV-positive patients/clients, including complex drug regimens and social stigma. There may be reluctance on the part of the patient/client to disclose HIV-positive status.

- The Ontario Human Rights Code provides for equal treatment without discrimination because of disability. AIDS and other medical conditions related to infection by HIV are recognized as disabilities within the meaning of the Code. Healthcare workers must not discriminate against patients/clients with HIV/AIDS by using extraordinary and infection control measures that are not used for other patients/clients. Standard precautions must be used for all patients/clients.

*cont’d on next page*
### Oral management implications (cont’d)

- In planning invasive dental hygiene procedures, the dental hygienist should focus on preventing infection and excessive bleeding. Patients/clients with severe thrombocytopenia may require measures such as platelet replacement before surgical procedures, including scaling and curettage.

- Any source of oral infection should be addressed in HIV-infected patients/clients, who often require frequent recall appointments (especially in Stages 2 and 3) for maintenance of periodontal health. Daily use of chlorhexidine mouth rinse may be indicated.

- ASA (aspirin) and other NSAIDs should not be taken by patients/clients with thrombocytopenia, because they can worsen bleeding.

- Acetaminophen should be used cautiously in patients/clients treated with zidovudine (AZT), because it may intensify granulocytopenia and anemia.

- A variety of infections, tumours, and other oral lesions occur in HIV-positive patients/clients. The dental hygienist plays an important role in detection via oral examinations, and in subsequent informing of patients/clients and in ensuring referral for diagnosis and treatment.

- Oral lesions are sometimes one of the early signs of HIV infection and risk for progression to AIDS. Thus, the dental hygienist should be aware of oral manifestations of HIV/AIDS. In particular, dental hygienists should be alert to the presence of oral hairy leukoplakia (OHL), given its very high association with HIV infection. Patients/clients not yet diagnosed with HIV infection who present with OHL-like lesions should be referred for definitive diagnosis and management.

- Linear gingival erythema (LGE) may respond to plaque removal, enhanced oral hygiene, and chlorhexidine rinses, although usually not as readily as typical gingivitis.

- Oral Kaposi sarcoma lesions may require surgical excision or systemic antiretroviral therapy. Localized lesions may also respond to laser excision, cryotherapy, radiation treatment, and intralesional injections of a variety of antitumour and sclerosing agents. Dental hygienists play an important role in oral biofilm removal, scaling and root planing to maximize the effects of periodontal therapy; in some cases, these procedures may reduce the size of gingival lesions (which are enlarged by the presence of oral biofilm and calculus) before tumour-specific therapy is initiated.

- Necrotizing ulcerative gingivitis (NUG) is treated by cleaning and debriding affected areas with cotton/gauze soaked in hydrogen peroxide and a topical agent daily or on alternate days for about one week; using 0.12% chlorhexidine gluconate mouth rinses for 30 seconds twice daily; ensuring oral biofilm control; and scaling and root planing after the patient/client has had some improvement in symptomatology and healing. The dentist may also prescribe an oral antibiotic and prophylactic antifungal medication. The patient/client should be advised to avoid alcohol and tobacco products, as well as to optimize nutrition. A consultation with a registered dietician may be indicated for NUG, as well as for other conditions that lead to deficits in mucous membrane and skin integrity.

- Necrotizing ulcerative periodontitis (NUP) and necrotizing ulcerative stomatitis (NUS) is similar to that of NUG. Additionally, a dentist may need to remove affected bone for healing to occur.

- The treatment of necrotizing ulcerative periodontitis (NUP) and necrotizing ulcerative stomatitis (NUS) is similar to that of NUG. Additional precautions may be necessary in collaboration with a dentist and a physician.

- Hydrogen peroxide rinses are contraindicated in immunosuppressed persons.

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In the event of a percutaneous injury, the dental hygienist should seek prompt medical attention for assessment for HIV post-exposure prophylaxis (PEP), which will reduce the rate of HIV transmission. When indicated according to the patient/client HIV transmission risk profile, this consists of an antiretroviral drug regimen, with subsequent follow-up testing for seroconversion. If indicated, PEP should be commenced within hours of percutaneous exposure. The risk of HIV transmission from an infected patient/client to a healthcare worker is very low, occurring in about 0.3% of cases in which needlestick or other sharp instrument transmits blood from the patient/client to the healthcare worker. By contrast, the equivalent risk is about 30% for hepatitis B.
Oral manifestations

- While periodontal disease is common in patients/clients with HIV/AIDS, most periodontal disease in HIV-positive persons is similar to disease patterns in HIV negative persons.
- More than a third of persons living with HIV/AIDS have oral health problems that arise because of immunosuppression caused by the virus. These manifestations include oral candidiasis (which is the most common HIV-associated oral lesion in its various manifestations); angular cheilitis; oral warts (which can be large and multifocal, with a tendency to recur after treatment); recurrent herpes simplex infection (which can become secondarily infected with bacteria or fungi); shingles; oral hairy leukoplakia; and aphthous ulcers. The appearance of pseudomembranous or erythematous candidiasis in an HIV-infected person often indicates progression toward AIDS.
- Persistent lymphadenopathy in the submandibular and neck locations is often an early sign in persons infected with HIV.
- Xerostomia may occur, either primarily and/or as a result of medications used to treat HIV/AIDS. Other conditions associated with HIV infection include facial palsy, trigeminal neuropathy, salivary gland enlargement, and melanotic pigmentation. HIV infection accelerates the onset of oral cancer (i.e., squamous cell carcinoma).
- Oral hairy leukoplakia (OHL) manifests as a collection of thick, corrugated, painless white lesions, which is usually seen along the lateral borders of the tongue. The lesions can be bilateral or unilateral with fingerlike projections, or they may be corrugated in appearance. OHL is found almost exclusively in persons with HIV/AIDS, and is due to the reactivation and replication of Epstein-Barr virus (EBV).
- Kaposi sarcoma (KS) is a slow-growing cancer seen in some persons with AIDS. Intraorally, it may present as flat red, blue, purple, or brown lesions of varying sizes, including large nodular lesions. The lesions may appear anywhere in the oral cavity; depending on their position, they may cause problems with speech, swallowing, or breathing.
- HIV-positive patients/clients are at increased risk for linear gingival erythema (LGE) and various forms of necrotizing periodontal disease. LGE manifests as a localized or generalized fiery-red line along the gingival margin, and may be accompanied by bright red alveolar mucosa or petechiae-like alveolar mucosal patches. LGE is characterized by spontaneous bleeding unrelated to thrombocytopenia.
- Necrotizing ulcerative gingivitis (NUG), while not specific to persons with HIV/AIDS, is a bacterial infection of the gingiva. It is characterized by inflammation, pain, bleeding, fever, and halitosis. NUG in the presence of rapid attachment and interproximal bone loss is diagnosed as necrotizing ulcerative periodontitis (NUP), which is very painful. Extreme cases of exposed bone and tissue sloughing are referred to as necrotizing ulcerative stomatitis (NUS; also known as cancrum oris or noma).
- Bleeding gums and/or mucosal petechiae can be seen in patients/clients with thrombocytopenia (low platelet count).
- Bilateral parotid gland enlargement may occur in some patients/clients with HIV infection.
- HIV-positive persons often take combinations (known as ART – antiretroviral therapy – or HAART – highly active antiretroviral therapy) of the following antiviral drugs:
  - protease inhibitors (PIs), including amprenavir, atazanavir, darunavir, fosamprenavir, indinavir, lopinavir, ritonavir, saquinavir, and tipranavir (side-effects include altered taste, nausea, and vomiting);
  - pharmacokinetic enhancers of PIs, including cobicistat;
  - nucleoside reverse transcriptase inhibitors (NRTIs) and nucleotide reverse transcriptase inhibitors (NtRTIs) [also known as “nukes”, and including nucleoside analogues], including abacavir (ABC), emtricitabine (FTC), didanosine, lamivudine (3TC), stavudine, zalcitabine, tenofovir, adeovir, and zidovudine (ZDV or AZT) (side-effects include xerostomia, nausea, headache, dizziness, weakness, and peripheral neuropathy);
  - non-nucleoside reverse transcriptase inhibitors (NNRTIs), including delavirdine, efavirenz, etravirine, and nevirapine (side-effects include xerostomia, altered taste, dizziness, nausea, and vomiting);
  - entry (fusion) inhibitors, including enfuvirtide and maraviroc (side-effects include xerostomia, altered taste, nausea, and vomiting); and
  - integrase inhibitors (IIs), including raltegravir, elvitegravir, and dolutegravir (side-effects include nausea and headache).
- Combination (i.e., co-formulation) pills are increasingly being used in Canada to improve patient/client compliance with treatment by reducing the number of total daily pills.
Disease/Medical Condition

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Related signs and symptoms

- HIV infection is a disease that can severely suppress the host’s immune system, particularly by reducing T-helper lymphocytes. While currently incurable, HIV infection is a chronic, treatable condition, and progression to AIDS or life-threatening opportunistic infections may be deferred indefinitely with the use of highly active antiretroviral therapy (HAART).
- In 2016, 63,110 persons were estimated to be living with HIV (including AIDS) in Canada, for a population prevalence rate of 0.17%. The estimated number of new HIV infections was 2,165. About 14% of persons living with HIV were unaware of their infection. 81% of those who were diagnosed were on treatment, and 89% of those on treatment had achieved viral suppression.
- During the acute seroconversion stage (Stage 1) of HIV infection (about 1 to 3 weeks after infection), about 70% of infected patients/clients show signs/symptoms, which may include fever, weakness, diarrhea, nausea, vomiting, headache, myalgia, arthralgia, pharyngitis, skin rash, and lymphadenopathy (particularly swollen neck nodes). These signs/symptoms usually resolve in 1 to 2 weeks. In the 30% of patients/clients without acute symptoms, the period for seroconversion (i.e., onset of HIV antibody positivity) can be 1 to 6 months or longer.
- During the Stage 2 latent (asymptomatic) period, 50 to 70% of patients/clients develop persistent generalized lymphadenopathy (PGL). The median time from initial infection to onset of persistent clinical symptoms is 8 to 10 years. This period is associated with progressive viral replication and, in most persons, a steady decline in CD4+ cell counts.
- The Stage 2 early symptomatic stage lasts for 1 to 3 years in patients/clients who are untreated. Manifestations include PGL, fungal infections (including oral candidiasis), vaginal yeast and trichomonal infections, shingles, herpes simplex, and HIV retinopathy. Constitutional signs/symptoms include fever, night sweats, dry cough, fatigue, diarrhea, weight loss, and weakness.
- Stage 3 (AIDS) is associated with opportunistic infections (including Pneumocystis pneumonia, cryptococcosis, tuberculosis, toxoplasmosis, and histoplasmosis); malignancies (including Kaposi sarcoma, Burkitt’s lymphoma, non-Hodgkin’s lymphoma, cervical cancer, and rectal carcinoma); wasting disease; and progressive dementia. Kaposi sarcoma usually presents as painless purple or brown-red nodules on the skin of the extremities; it often disseminates throughout the body and runs a fulminant course in the absence of HAART. Persistent numerous molluscum contagiosum lesions may occur. Patients/clients may also become confused and disoriented, or develop short-term memory deficits. Depression is common. A CD4+ cell count below 50/μL portends high risk of death.
- Some HAART/ART drugs can increase the risk of cardiovascular disease.
- In the absence of specific treatment, about half of people infected with HIV develop AIDS within 10 years. Long-term survival with HIV infection (i.e., beyond 15 years) is associated with less virulent strains of HIV, low level viremia, HAART, and robust immune responses.

References and sources of more detailed information

- College of Dental Hygienists of Ontario
  http://www.cdho.org/Advisories/CDHO_Advisory_HIV_AIDS.pdf
- Ontario Human Rights Commission: HIV/AIDS as a Disability
  http://www.ohrc.on.ca/en/policy-hivaids-related-discrimination/relevant-sections-code
- Ontario HIV Treatment Network
- Public Health Agency of Canada
Disease/Medical Condition

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## References and sources of more detailed information (cont’d)

- **CATIE:** Canada’s source for HIV and Hepatitis C information  

- **British Columbia Centre for Excellence in HIV/AIDS**  

- **National Institute of Dental and Craniofacial Research**  

- **U.S. Department of Health & Human Services**  
  [https://aidsinfo.nih.gov/drugs/536/cobicistat/0/patient](https://aidsinfo.nih.gov/drugs/536/cobicistat/0/patient)

- **Centers for Disease Control and Prevention**  

- **Medscape (re. HIV entry/fusion inhibitors)**  

- **World Health Organization**  
  [https://www.who.int/news-room/fact-sheets/detail/hiv-aids](https://www.who.int/news-room/fact-sheets/detail/hiv-aids)


* Includes oral hygiene instruction, fitting a mouth guard, taking an impression, etc.

** Ontario Regulation 501/07 made under the Dental Hygiene Act, 1991. Invasive dental hygiene procedures are scaling teeth and root planing, including curetting surrounding tissue.

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