

ORAL HEALTH CARE *for people with* HIV INFECTION



HIV CLINICAL GUIDELINES
FOR THE PRIMARY CARE PRACTITIONER

Oral Health Care for People With HIV Infection

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New York State Department of Health**

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TABLE OF CONTENTS

Introductionxi
Chapter 1	General Principles1
Chapter 2	Diagnosis and Management of Soft-Tissue Lesions11
	Illustrations of Oral Lesions Associated With HIV Infection29
Chapter 3	Clinical Manifestations and Management of HIV-Related Periodontal Disease31
	Illustrations of Periodontal Disease Associated With HIV Infection34
Chapter 4	Oral and Maxillofacial Surgery35
Chapter 5	Oral Health Management in Children and Adolescents With HIV Infection41
	Illustrations of Pediatric Oral Lesions Associated With HIV Infection53
Chapter 6	Infection Control55
Chapter 7	Ethical and Legal Considerations67
Appendix I	Selected Agents Used to Treat HIV Infection or Related Conditions69
Appendix II	Authorization for Release of Confidential HIV-Related Information75
Appendix III	Summary of HIV Reporting and Partner Notification ..77
Appendix IV	New York State Department of Health Anonymous HIV Counseling and Testing Program79
Appendix V	Informed Consent Form DOH-255681
Appendix VI	Informed Consent Form DOH-405485
Index89

INTRODUCTION

December 1, 2001

Dear Colleague:

Oral health is an integral component of comprehensive HIV primary care. This basic tenet reflects the important role oral health plays in the evaluation and management of patients with HIV infection. The oral examination can reveal underlying changes in the HIV-infected patient's systemic health. Treatment of oral disease can help control the spread of infection locally and possibly systemically. Most certainly, the control of oral disease improves the patient's quality of life.

The New York State Department of Health AIDS Institute (NYSDOH AI) maintains an ongoing, vigilant effort to support clinical education through the development of state-of-the-art HIV/AIDS clinical practice guidelines. The primary purpose of this new edition of *Oral Health Care for People With HIV Infection* is to assist in providing all members of the primary care team, especially oral health care providers, with important clinical information. These guidelines were developed by the AIDS Institute's Dental Standards of Care Committee, whose members include public and private oral health care professionals who treat children and adults with HIV infection. Since the Committee's establishment in 1992, its members have relied on the best clinical evidence available when making recommendations. When such evidence was not available, the Committee relied on its collective experience and consensus.

The first edition of the manual was published in June 1993. This third edition includes revisions to all existing topic areas with additional references and resources. Specifically, important new material addressing occupational exposure has been added. The guidelines pertaining to soft-tissue lesions now include many new tables and charts to facilitate management of HIV-associated pathology and oral conditions. Finally, throughout the document, the Committee underscores the importance of a strong collaboration between oral health practitioners and medical providers for the purpose of achieving optimal health care outcomes.

The NYSDOH AI has also implemented other oral health performance improvement activities to complement the publication of these guidelines. These activities include the development of an oral health "best practices" booklet, publication of facility-specific dental referral/examination performance data, development of clinical education modules related to oral health care for HIV-infected patients, on-site educational presentations on oral health care, and the dissemination of a statewide directory of oral health service sites serving the HIV community.

In December 2000, the AIDS Institute, in conjunction with the Johns Hopkins University School of Medicine, the contractor responsible for assisting in the development of New York State HIV-related guidelines, launched the website HIV Clinical Resource, which can be accessed at <http://www.hivguidelines.org>.

This site will facilitate the access and use of these guidelines and will enable us to make more timely updates, especially to areas that are particularly time-sensitive.

The AIDS Institute gratefully acknowledges the serious commitment put forth by the members of the Dental Standards of Care Committee in the preparation of this new edition. We would particularly like to recognize the important leadership role of Georgina Zabos, DDS, MPH, Chair of the Dental Standards of Care Committee, under whose tenure this new edition was written.

The response of practitioners who use this manual is vital to our efforts to better understand how these guidelines are used and how we could change this document to make it more useful. Please address any comments or suggestions to: HIV Guidelines Development Program, Office of the Medical Director, AIDS Institute, New York State Department of Health, 5 Penn Plaza, New York, NY 10001, or use the "Contact Us" link at <http://www.hivguidelines.org>.

We sincerely hope this document plays an important role in your efforts to continually improve the quality of oral health care delivered to people with HIV infection in New York State.



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CHAPTER 1

GENERAL PRINCIPLES

I. INTRODUCTION

Oral health care is an important component of the management of patients with HIV infection. A poorly functioning dentition can adversely affect the quality of life, complicate the management of medical conditions, and create or exacerbate nutritional and psychosocial problems.¹ Oral health status also affects antiretroviral (ARV) treatment adherence. When the oral cavity is compromised by the presence of pain or discomfort, maintaining adherence to complicated ARV regimens becomes more difficult.

Through June 2000, a cumulative total of 745,103 AIDS cases in adults and adolescents were reported to the Centers for Disease Control and Prevention (CDC); 8,804 cases were reported in children <13 years of age.² In New York State, 140,218 cumulative AIDS cases in adults and adolescents were reported through June 2000 (113,252 of the reported cases were from New York City); 2,158 cases were reported in children <13 years of age.

The HIV/AIDS epidemic poses enormous challenges for the United States. Increasing numbers of mostly impoverished people of color, including women and children, are becoming infected with HIV.²⁻⁴ Although a cure is not in sight, highly active antiretroviral therapy (HAART) has made HIV/AIDS a chronic, manageable disease.⁵ Most of the new infections occur in populations among which oral health is the poorest in the nation.^{6,7} Unmet oral health needs of people with HIV/AIDS have been consistently documented, and finding new strategies for meeting these needs is urgent.⁶⁻⁹ Although great progress has been achieved in making oral health care services available for people with HIV/AIDS, much remains to be done in oral health professional education to ensure competent and non-judgmental care for all patients.

GENERAL RECOMMENDATIONS:

Comprehensive primary care includes primary oral health care. Oral health should be an integral part of primary health care for all patients with HIV/AIDS.

Asymptomatic HIV-infected patients and clinically stable, fully functional AIDS patients should receive routine, comprehensive oral health care in the same manner as all other patients.

The provision of care should be coordinated between medical and oral health care providers.

The principles of good oral health care are the same for patients infected with HIV as they are for all dental patients. Despite the medical and immunologic problems resulting from HIV infection, few complications resulting from dental treatment have been reported.¹⁰

II. ACCESS TO ORAL HEALTH CARE

RECOMMENDATIONS:

Oral health care services should be fully integrated into other available primary care services for HIV-infected patients.

To ensure adequate access to oral health care services, structural, financial, personal, and cultural barriers should be considered and addressed.^{1,7,11-13}

Due to the changing face of the HIV epidemic, which increasingly affects poor people of color who historically have experienced lack of proper access to oral health care,^{1,13} health care providers should ensure that each patient receiving therapy for HIV infection has a regular, adequate oral health care source. The oral health care source should be located conveniently, open during times when patients can attend, and able to provide referral to culturally appropriate services.

For patients with HIV/AIDS who are clinically unstable, are seriously or terminally ill, or have complicating co-morbid conditions (e.g., homelessness, substance use, mental illness, extreme poverty), special efforts should be made to improve access to comprehensive primary oral health care. These efforts include outreach and culturally competent clinical services for the target population. Efforts to offer dental services should be ongoing through outreach and education.

A. The Role of the Medical Provider

RECOMMENDATIONS:

Oral health care services should be fully integrated with available primary care services for HIV-infected patients.

The medical provider should encourage all patients under his/her care to schedule a semi-annual oral health examination and to adhere to the oral health care provider's recommendations regarding appropriate follow-up.

All medical health care providers should be aware of oral health referral sources for patients under their care.

Documentation that a dental referral was made or that the patient is under the care of a dental provider should be evident within the clinical care plan of the medical record.

The medical provider should forward any requested clinical information to the patient's oral health care provider in a timely fashion.

B. The Role of the Dental Provider

RECOMMENDATIONS:

To ensure adequate access to oral health care services, structural, financial, personal, and cultural barriers should be considered and addressed by the oral health care staff.

The oral health care provider should promptly communicate to the patient's medical provider any clinical findings that may signify a change in the patient's systemic health or any planned, extensive surgical procedures that may impact the patient's systemic health.

III. ORAL HEALTH CARE TREATMENT FOR PATIENTS WITH HIV INFECTION

A. Initial and Periodic Oral Examinations

RECOMMENDATIONS:

Every patient, regardless of HIV status, should receive a comprehensive initial evaluation.

To provide the best oral health care possible, oral health care professionals should perform a medical and social history along with a comprehensive medical systems review at recall visits for stable patients and at each visit for unstable patients. The dental provider should determine and document the patient's chief complaint(s) and health history.

Patients with HIV infection may develop associated skin manifestations and cervical lymphadenopathy; therefore, extraoral head and neck examinations and oral soft-tissue examinations should be performed at each visit. Findings should be discussed with the patient and the patient's primary care provider.

HIV infection results in a spectrum of sequelae, ranging from a clinically asymptomatic or mildly symptomatic phase to a stage of severe immunodeficiency in which life-threatening opportunistic infections and neoplasms occur. Medications used for treatment of HIV and associated diseases or prophylaxis of opportunistic infections may have significant adverse effects or may interact with other prescribed medications. To develop an appropriate treatment plan, the oral health care provider should obtain complete information about the patient's health and medication status.

Many different oral mucosal lesions have been associated with HIV infection. Some, such as candidiasis and hairy leukoplakia, may have a prognostic value in HIV disease progression. A diagnosis should be made for all oral soft-tissue findings either on the basis of distinctive clinical features or by using appropriate laboratory tests (e.g., smear, culture, or biopsy) (see Figure 2-1, page 19). It is important to communicate information concerning oral findings to the

patient and to the patient's primary care provider. Treatment of these conditions may improve the quality of life for patients infected with HIV.

As part of a comprehensive medical-oral health work-up and treatment plan, the oral health care provider should obtain a past and present history of tobacco, alcohol, and other substance use because each of these histories may have a direct impact on the oral and HIV health of the individual. Dentists should be aware of experts and programs in their area that can assist in addressing the treatment of these issues. For in-office consumer and provider materials on tobacco cessation programs, dentists can access <http://www.surgeongeneral.gov/tobacco/default.htm>.

B. Treatment Planning

RECOMMENDATIONS:

A comprehensive treatment plan that includes preventive care and maintenance should be developed and discussed with the patient. Definitive treatment planning should include the incorporation of past and present medical history; past and present history of tobacco, alcohol, and other substance use; assessment of hard and soft intra- and extra-oral tissues; evaluation of existing radiographs; and thorough periodontal evaluation.

As HIV-related medications may affect dental treatment and cause adverse effects, the patient's oral health care provider should review all medications being used by the patient and should understand the potential for these medications to affect oral health care.

Dental treatment modifications for patients with HIV infection should be based on the patient's general medical status rather than his/her HIV infection.

Universal precautions (standard infection control procedures) should be followed for all patients (see Chapter 6: *Infection Control*).

There is no evidence to support modifications in oral health care based solely on the presence of HIV infection. However, such modifications may be indicated on the basis of certain medical problems that occur as a result of HIV infection. Severely or terminally ill patients, for example, will require alterations in care similar to those of patients suffering from other conditions that cause debilitating illness, such as cancer.^{10,14}

Complications associated with dental treatment of patients with HIV infection and AIDS are similar to those of uninfected patients. Increased efforts are needed in oral health promotion and disease prevention due to the high burden of oral disease in this special patient population.^{1,15}

Various treatment options should be discussed and developed in collaboration with the patient. As with all patients, a treatment plan appropriate for the patient's health status, financial status, and individual preference should be chosen.

Medications may interfere with dental treatment and cause adverse effects, such as decreased salivary flow, altered liver function, and bone marrow suppression, resulting in anemia, thrombocytopenia, and neutropenia (see Appendix I). Drug-drug interactions also may occur.

C. Preventive Care

1. Dental Caries

RECOMMENDATIONS:

The clinician should practice evidence-based caries management in patients with HIV/AIDS.^{16,17}

The clinician should be aware that salivary gland disease, xerostomia, or HIV-related medications with high sugar content may be associated with increased risk for dental caries.

When there are non-cavitated lesions, remineralization should be performed with fluoride varnishes and home-care fluoride products. When there are cavitated lesions, proper restorative procedures and materials should be used according to the need of the patient.

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

As in all patients, prevention and management of carious lesions in individuals with HIV/AIDS should include diagnosis, caries risk assessment, and behavior modification to reduce caries activity.

Treatment should include remineralization of non-cavitated, smooth-surface lesions and restorative treatment of cavitated lesions. Establishment of recall intervals should be based on caries risk status, with high-risk patients being seen more frequently. Caries risk should be reassessed at each recall visit, and future care should be planned accordingly. In addition to fluoride varnishes, therapy in adults should include pit and fissure sealants and proper use of certain sugarless chewing gums that may provide protection.¹⁸

2. Gingival and Periodontal Disease

RECOMMENDATION:

The clinician should perform a comprehensive gingival and periodontal examination, which includes a periodontal probing depth record.

Conventional as well as atypical gingival and periodontal diseases have been reported in patients with HIV (see Chapter 3: *Clinical Manifestations and Management of HIV-Related Periodontal Disease*). Early recognition of these problems allows treatment that can prevent progression of these conditions, including severe attachment/bone loss.

IV. ORAL HEALTH CARE FOR HIV-INFECTED SUBSTANCE USERS

RECOMMENDATIONS:

Essential treatment and medications, including the use of appropriate analgesics, should be prescribed appropriately for all patients, including those patients who have a history of substance use or are active substance users.

Because a significant number of HIV patients have a history of substance use or are active substance users, the following oral complications, which may be related to drug addiction, should be considered: xerostomia, rampant dental caries (especially cervical caries), poor oral hygiene, gingival and periodontal disease, and occlusal wear as a result of bruxism.

Injection drug users (IDUs) have a high incidence of bacterial endocarditis. Oral health care providers should address this issue with respect to antibiotic prophylaxis before performing dental procedures.^{19,20}

Substance use is associated with behavioral, oral, and systemic changes that can create significant problems in dental treatment. Behavior changes may reflect a drug's effect on the central nervous system, and underlying behavior problems may become more prominent with substance use. Narcotics, sedatives, hypnotics, and antihistamines should be prescribed appropriately as indicated and should not be withheld simply because the patient has a past or present history of substance use.

V. HIV COUNSELING, TESTING, AND REPORTING

RECOMMENDATIONS:

Dentists and dental hygienists should be aware of HIV testing procedures and confidentiality requirements.

Dentists who become aware of a patient's risk for HIV infection or who identify a clinical condition that may be associated with HIV infection should refer the patient for HIV counseling and testing.

When evaluating an oral lesion indicative of immune deficiency in a patient with unknown HIV status, the provider should consider HIV infection, particularly in the absence of other causes of immunodeficiency. HIV counseling and testing should be recommended in these cases.

Early identification of HIV infection in a patient can lead to earlier diagnosis and prophylaxis or treatment of opportunistic infections, as well as determination as to whether patients are candidates for ARV therapy. In addition, early diagnosis may help prevent HIV transmission to others.

Current medical standards encourage voluntary HIV testing for prevention of HIV transmission and early medical intervention. Physicians, dentists, physician assistants, and nurse practitioners have legal authority to obtain HIV tests and are accordingly responsible for 1) providing pre-test and post-test counseling, and 2) obtaining written, informed consent. For information about a one-day training course, "HIV Testing Procedures," and other HIV-related courses offered by the AIDS Institute, call (518) 474-9866. Anonymous testing options are available (see Appendix IV for the New York State Department of Health anonymous testing sites).

As of June 1, 2000, medical providers in New York State are required to report all initial AIDS diagnoses and all initial HIV diagnoses to the New York State Department of Health. Providers are also required to report any known sexual or needle-sharing partners of the reported case (see Appendix III). In addition, all laboratories performing diagnostic tests in New York State are required to report to the New York State Department of Health all cases of confirmed (Western blot positive) HIV antibody positive test results, positive HIV nucleic acid (RNA or DNA) detection test results, and CD4 lymphocyte count <500 cells/mm³ or $<29\%$ of total lymphocytes (unless the test was known to be performed for reasons other than HIV infection or HIV-related illness) (10NYCRR 63.4A4).

New York State Public Health Law defines the required procedures for pre-test and post-test counseling and for obtaining written, informed consent for HIV testing (see Appendix V).²¹ Confidentiality laws regarding testing extend to physicians, physician assistants, nurse practitioners, and to all members of the dental health care team. The provider should ensure that the patient understands the following:

- The nature and procedure of the HIV test
- Issues pertaining to the confidentiality of HIV test results
- Issues pertaining to HIV reporting and partner notification (see Appendix III)
- Disclosure and discrimination issues
- The meaning of the test results
- The benefits of testing
- The possible psychological consequences of testing

Any communication with the patient should be in language that is appropriate to the patient's level of understanding. It is essential that counseling and testing be closely and effectively linked to medical treatment. The New York State Department of Health AIDS Institute's *Clinician's Guide to HIV Pre-test and Post-test Counseling* provides further guidance.²²

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CHAPTER 2

DIAGNOSIS AND MANAGEMENT OF SOFT-TISSUE LESIONS

I. INTRODUCTION

In the era of antiretroviral (ARV) therapy, the incidence of oral lesions has decreased¹; however, it remains important that oral health care providers recognize that certain oral lesions can be an early manifestation of HIV-associated immune deficiency or a clinical marker of disease progression in a patient known to be HIV infected. Studies have consistently shown that certain oral lesions are associated with decreased CD4 lymphocyte counts. Recent studies have also shown a relationship between the presence of some oral lesions and higher HIV viral load.²⁻⁵

Oral manifestations of HIV infection include candidiasis, hairy leukoplakia, Kaposi's sarcoma, and several different types of oral ulcers, such as atypical herpes simplex ulceration, major aphthous-like ulcers, cytomegalovirus (CMV)-related oral ulceration, and ulcers caused by other conditions (e.g., histoplasmosis and lymphoma). HIV-associated mucosal melanin pigmentation, human papillomavirus (HPV) infection, and salivary gland lesions have been described, as have gingival and periodontal disease. Further discussion of gingival and periodontal disease in patients with HIV infection is included in Chapter 3: *Clinical Manifestations and Management of HIV-Related Periodontal Disease*. Because presentation of the lesions described in this chapter can be an early manifestation of HIV, a patient with such lesions should be referred for HIV counseling and testing and, if necessary, for medical care.

GENERAL RECOMMENDATIONS:

Oral lesions in patients infected with HIV should be evaluated and diagnosed in the same manner as lesions in all other dental patients.

An unexplained lesion that does not resolve following appropriate clinical management or empiric therapy warrants consideration of a biopsy and histologic examination of the tissue. If the decision is made not to obtain a biopsy, the reason for the decision should be documented.

As with any procedure, the risks involved in performing a biopsy should be weighed against the benefits. Patients with HIV infection may be at an increased risk for post-operative bleeding.⁶ Prior to biopsy procedures, the need for obtaining the patient's platelet count, prothrombin time and/or international normalized ratio (INR), activated partial thromboplastin time, and bleeding time should be evaluated.

The need for patient referral to a dental or medical specialist for management of oral lesions or for assessment or management of underlying systemic disease should be individualized.

The patient's primary care provider should be informed of the results of diagnostic procedures for all lesions as well as medications prescribed or any change in medications. Management of a patient with HIV infection often requires a multidisciplinary approach coordinated by the patient's primary care provider or case manager.

Any patient not known to be HIV infected should be referred for HIV counseling and testing when he/she presents with an oral lesion that is associated with an immunodeficient status or a sexually transmitted disease and when the presence of the lesion cannot be explained by a confirmed underlying condition or by a medication.

II. ORAL LESIONS

A. Oral Candidiasis

Oral candidiasis is caused by one of the *Candida* species, usually *Candida albicans*, a normal inhabitant of the oral cavity in many healthy individuals. In individuals infected with HIV, the development of oral candidiasis may be an indication of immune deterioration and has prognostic significance for the development of AIDS. Oral candidiasis may precede other signs of immune deficiency and is one of the clinical indicators for initiating and continuing prophylaxis for *Pneumocystis carinii* pneumonia (PCP).^{7,8}

1. Diagnosis

RECOMMENDATION:

Diagnosis of oral candidiasis should be made by identification of clinically distinctive lesions, by microscopic examination of cytologic smears or biopsy tissue, or by response to antifungal therapy.

Oral candidiasis is the most prevalent oral lesion associated with HIV/AIDS. The following forms of oral candidiasis have been frequently associated with HIV infection: pseudomembranous, erythematous, and angular cheilitis. Chronic hyperplastic type has been described, but this finding is rare. The clinical appearance of each form is different, as are the criteria for diagnosis.

- **Pseudomembranous type (thrush)** is generally diagnosed on the basis of its characteristic clinical appearance: white curd-like material that may be easily wiped off and, when removed, reveals an erythematous mucosa. Examination of a cytologic smear of the pseudomembrane revealing hyphal forms confirms the diagnosis. This procedure may

not be necessary if the lesions are clinically consistent with oral candidiasis and resolve with antifungal therapy (see page 29 for photographic example).

- **Erythematous type** presents as flat, clinically red, sometimes painful macules that may first appear on the soft palate and oropharynx. This type of candidiasis can appear as areas of mucosal erythema or on the dorsal tongue as irregular, depapillated, erythematous, sometimes painful areas. It may occur independently of or simultaneously with pseudomembranous candidiasis. Erythematous candidiasis is less well recognized than the pseudomembranous type, and its clinical appearance is not specific to candidiasis. Therefore, the identification of hyphal forms on a mucosal smear or biopsy and/or response to antifungal therapy is important for confirmation of this diagnosis (see page 29 for photographic example).
- **Angular cheilitis** is diagnosed on the basis of its clinical appearance. It appears as erythema or fissures of the labial commissures and frequently accompanies intra-oral candidiasis. In patients with deeply pigmented skin, depigmentation may occur at the site of angular cheilitis. Cytologic smears of angular cheilitis are often negative for fungal hyphae. Angular cheilitis is quite common among dental patients, regardless of HIV status. It has been associated with certain anemias and nutritional deficiencies as well as decreased vertical dimension of occlusion. Observation of the response of the lesions to antifungal therapy is important in confirming the role of *Candida* in the etiology of this lesion (see page 29 for photographic example).

2. Treatment

RECOMMENDATIONS:

Topical and systemic medications outlined in this section should be used to treat HIV-associated candidiasis (see Tables 2-1 through 2-4).

Because significant interactions between systemic antifungal medications and ARV agents occur, the primary care provider and/or pharmacist should be consulted before prescribing these medications concurrently. Any change of medications should be discussed with the patient's health care provider.

Patients should be instructed in proper oral hygiene to prevent caries that may result from the high sugar content in nystatin and clotrimazole. The use of topical fluoride therapy should be considered for patients taking such medication.

When oropharyngeal candidiasis cannot be controlled with topical medication alone, systemic therapy should be initiated. It may be necessary to continue topical medication use in addition to systemic medication use to control oral candidiasis.

A typical antifungal treatment course is 10 to 14 days, with use of the antifungal agent continued even after clinical signs and symptoms of oral candidiasis have been resolved.

Because patients with reduced salivary flow are more susceptible to oral candidiasis, salivary flow should be stimulated to help reduce the incidence and severity of oral candidiasis. Chewing sugarless gum or dissolving sugarless lozenges in the mouth can accomplish salivary flow stimulation.

TABLE 2-1
TOPICAL MEDICATIONS FOR ORAL CANDIDIASIS

Agent	Dispense	Label
Clotrimazole troches (an imidazole)	2- to 4-week supply	Slowly dissolve one 10-mg troche in mouth 5 times/day for treatment. Slowly dissolve 1 troche in mouth 3 times/day for maintenance therapy.
Nystatin oral suspension (a polyene antifungal agent)*	2- to 4-week supply	Hold 1 teaspoonful (500,000 u) in mouth for 5 minutes, 4 times/day.
Amphotericin B oral suspension (a polyene antifungal agent)†	2- to 4-week supply	Place 1 mL (100 mg) on tongue and swish in mouth for as long as possible before swallowing.
Nystatin vaginal suppositories (a polyene antifungal agent)‡	2- to 4-week supply	Slowly dissolve 1 tablet (100,000 u) in mouth 6 to 8 times/day.

* Adherence to this regimen is often poor because of the time requirement.

† Used for the treatment of oral candidiasis refractory to nystatin and imidazole preparations.

‡ Although this preparation is not designed for oral use, clinicians have found it useful for treatment of oral candidiasis when the sugar content of other topical anticandidal medications is a concern. The prescription can be written as “nystatin vag. tabs.” A sugarless, flavored lozenge may be dissolved simultaneously in the mouth to mask the taste of nystatin. Adherence with this regimen is often poor because of the time requirement.

TABLE 2-2
TOPICAL MEDICATIONS FOR ANGULAR CHEILITIS

Agent	Dispense	Label
Antifungal creams <ul style="list-style-type: none"> - Clotrimazole cream 1% (an imidazole) - Miconazole cream 2% (an imidazole) - Ketoconazole cream 2% (an imidazole) - Nystatin cream 100,000 USP (a polyene antifungal agent) 	2- to 4-week supply	Apply to affected area 4 times/day.
Combination creams* <ul style="list-style-type: none"> - Hydrocortisone-iodoquinol cream (a polyene antifungal agent) - Betamethasone dipropionate-clotrimazole cream - Triamcinolone-nystatin cream 	2- to 4-week supply	Apply to affected area 3 times/day.

* For the treatment of angular cheilitis, some clinicians have found combination creams more effective than antifungal medications alone. These include combination preparations of topical hydrocortisone, antifungal agents, and hydrocortisone-iodoquinol cream, which combines an antifungal-antibacterial medication with an anti-inflammatory antipruritic.

TABLE 2-3
SYSTEMIC ANTIFUNGAL MEDICATIONS

Agent	Use
Ketoconazole (an imidazole), Fluconazole (a triazole), Itraconazole (a triazole)*	Common dosage: ketoconazole 200 mg once daily; fluconazole 100 mg/day; itraconazole 200 mg once daily.
Amphotericin B (a polyene antifungal agent)	An intravenous medication that may be used for candidiasis resistant to other medications. Azole-resistant fungal infections should be treated with amphotericin B and in consultation with an HIV Specialist. (Amphotericin B is also available as a topical preparation.)

* Because these medications are easier for patients to use than topical preparations, adherence often improves.

TABLE 2-4 SPECIAL CONSIDERATIONS FOR SYSTEMIC ANTIFUNGAL MEDICATIONS	
Drug	Considerations
Cisapride	Azole antifungal medications are contraindicated in patients taking cisapride due to the potential for life-threatening cardiac events.
Fluconazole	The absorption of fluconazole is not dependent on gastric pH.
Ketoconazole	<p>Ketoconazole is well absorbed only in persons with normal gastric acidity; medications that decrease gastric output or raise gastric pH will decrease the effectiveness of ketoconazole. Such medications include cimetidine, ranitidine, and antacids.</p> <p>Hepatotoxicity, including some rare cases of fatalities, has been associated with oral ketoconazole. Liver function tests should be measured before starting treatment with ketoconazole and every 2 weeks during treatment.</p>
Phenytoin	Systemic antifungal use with phenytoin may inhibit phenytoin metabolism and cause toxicity.
Rifampin	Rifampin, an antituberculous medication, may decrease the serum concentrations of systemic antifungal medications, rendering them less effective.
Warfarin	Systemic antifungal use in patients who are anticoagulated with warfarin may result in increased anticoagulant effect and bleeding.

3. Prophylaxis of Recurrent Oropharyngeal Candidiasis

Many experts do not recommend routine chronic prophylaxis to prevent recurrent oropharyngeal candidiasis. However, if recurrences are frequent or severe, intermittent or chronic administration of fluconazole, ketoconazole, or itraconazole may be considered. Frequent recurrences of oropharyngeal candidiasis may be a marker of HIV disease progression.

B. Hairy Leukoplakia

1. Presentation

Hairy leukoplakia most commonly presents as a white, ragged, corrugated, or irregular lesion involving the lateral and dorso-lateral tongue. Lesions may be unilateral or bilateral. Hairy leukoplakia involving other mucosal surfaces also has been reported. Hairy leukoplakia is caused by infection of the lesional epithelial cells with Epstein-Barr virus (EBV) and is

associated with immune deterioration (see page 29 for photographic example).

2. Diagnosis

RECOMMENDATIONS:

Diagnosis of oral hairy leukoplakia in patients known to be HIV infected should be confirmed by identification of distinct clinical lesions. If the lesions are clinically consistent with hairy leukoplakia and the patient is known to be HIV infected, no further diagnostic procedure is necessary.

As in all patients, when an HIV-infected patient presents with a white lesion on the lateral border of the tongue, which cannot be diagnosed on the basis of its clinical appearance, biopsy and microscopic examination should be considered.

Histologically, hairy leukoplakia exhibits hyperparakeratosis, often with hair-like projections, epithelial hyperplasia, vacuolated epithelial cells (koilocyte-like), and little or no inflammatory infiltrate in the underlying connective tissue. Changes have been reported in the nuclei of epithelial cells infected with EBV, which can be seen by light microscopic examination.

Hybridization techniques also have been used to identify EBV in biopsy specimens. When a patient's HIV status is unknown, a biopsy and identification of EBV in the epithelial cells of the lesion may be considered before recommending HIV testing.

3. Treatment

RECOMMENDATION:

Hairy leukoplakia generally does not require treatment.

For some patients, hairy leukoplakia lesions may be cosmetically objectionable. Hairy leukoplakia has been treated successfully with systemic acyclovir, although it usually recurs when treatment is discontinued. Hairy leukoplakia also has been reported to resolve with zidovudine, podophyllin, and interferon. Regardless of treatment, the lesions may spontaneously resolve and recur.

C. Oral Ulcers

The most commonly reported oral ulcers seen in patients with HIV are herpes simplex ulcers and aphthous ulcers. Oral ulcers also may develop due to other opportunistic diseases, including CMV infection, histoplasmosis, herpes zoster, and lymphoma. Ulcers associated with zalcitabine (dideoxycytidine or ddC) and foscarnet also have been noted. With accurate diagnosis and appropriate treatment, most oral ulcers resolve in a short time.

1. Evaluation and General Management

RECOMMENDATIONS:

Diagnosis of oral ulcers should be based on characteristic clinical appearance; the results of cytologic smear, viral culture (isolation), and biopsy and microscopic examination; or response to therapy (see Figure 2-1).

If an ulcer does not respond to treatment within 2 weeks, a biopsy and histologic examination should be performed.

If the decision is made not to obtain a biopsy of an ulcer that is non-responsive to treatment, the provider should document the reason for the decision.

2. Herpes Simplex Ulcers

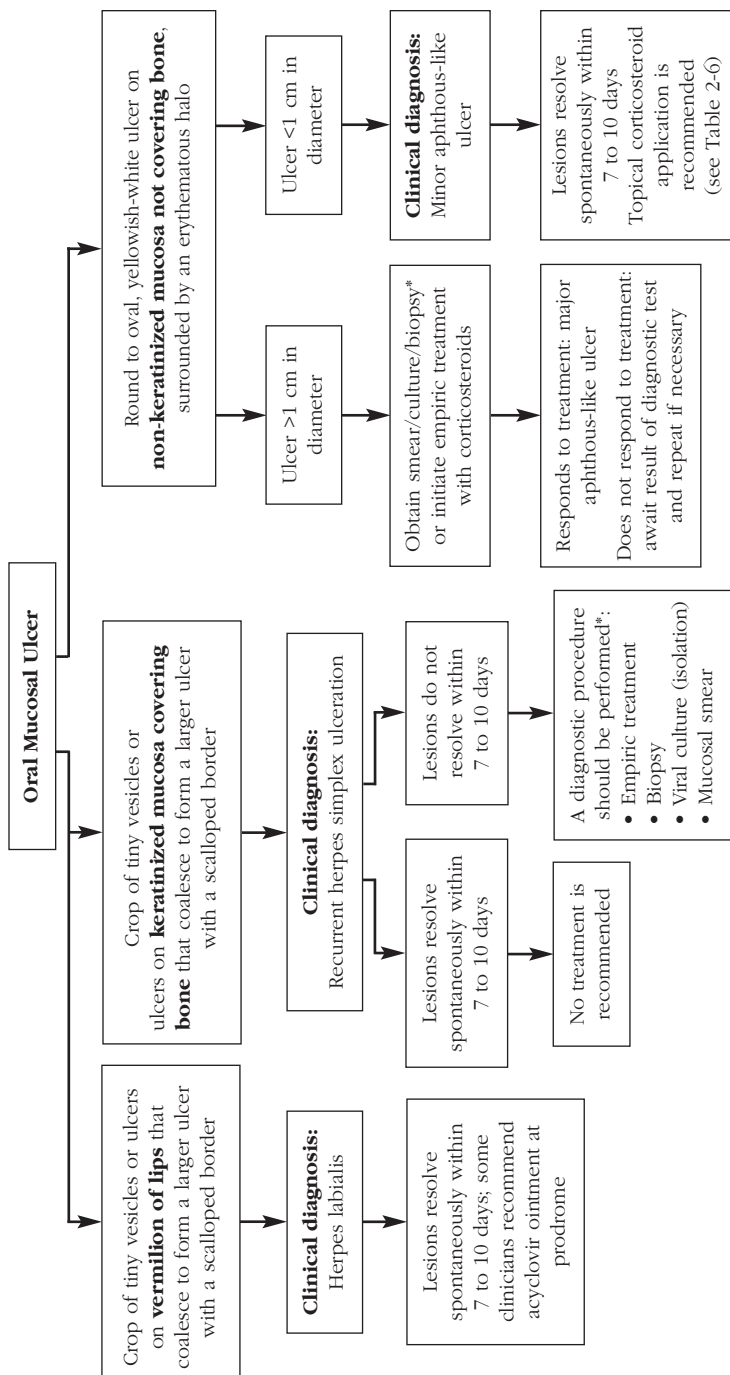
In immunocompetent patients, oral ulcers caused by the herpes simplex virus (HSV) occur in primary infection form (primary herpetic gingivostomatitis) and recurrent forms (herpes labialis and recurrent intra-oral herpes simplex ulceration). The primary infection most commonly occurs in children but also may occur in adults. Recurrent ulcers occur due to reactivation of latent infection.

a. Presentation

Herpes labialis appears as a crop of vesicles that coalesce and form an irregular ulcer on the vermilion of the lips or peri-oral skin. Intra-oral recurrent herpes simplex infection presents as a localized crop of vesicles that characteristically form only on keratinized mucosa. In immunocompetent individuals, these ulcers follow a predictable course and usually resolve spontaneously in 7 to 10 days.

In patients with HIV infection who have marked immune deficiency, ulcers caused by herpes simplex infection tend to be persistent, superficial (infecting the epithelium and not connective tissue), and painful. In HIV-infected patients, persistent herpetic lesions that do not resolve after 4 weeks fulfill the Centers for Disease Control and Prevention (CDC) criteria for a diagnosis of AIDS.⁹ These ulcers do not have a characteristic clinical appearance and may appear to be similar to ulcers caused by other agents or circumstances. These ulcers differ from herpes simplex ulceration in immunocompetent individuals in that they are larger, can occur anywhere in the oral cavity, present for longer periods, and are non-responsive to routine therapy (see page 30 for photographic example). Atypical herpetic ulcers may be the first sign of immunosuppression and may signal a need for HIV counseling and testing in patients not known to be HIV infected.

FIGURE 2-1
DIAGNOSIS AND TREATMENT OF ORAL MUCOSAL ULCERS



* **Possible diagnoses and treatments:** Atypical herpes simplex ulceration (see Table 2-5); major aphthous-like ulcer (see Table 2-6); cytomegalovirus ulceration (see page 22-23); ulceration due to other infectious agents (see page 23); lymphoma (refer to an HIV Specialist for treatment recommendations).

b. Diagnosis

RECOMMENDATIONS:

Diagnosis of typical recurrent herpes simplex ulceration should be made by recognizing the typical clinical appearance on the labial vermilion border or intra-orally on keratinized mucosa attached to bone.

Viral culture, mucosal smear, biopsy, and response to acyclovir are recommended options to accurately diagnose HSV-associated ulcers.

As atypical herpetic ulcers may be the first sign of immunosuppression, patients with these ulcers who are not known to be HIV infected should be referred for HIV counseling and testing.

c. Treatment

RECOMMENDATION:

While awaiting confirmation of the diagnosis, oral health care providers should consider initiation of systemic acyclovir treatment if atypical HSV ulceration is suspected (see Table 2-5). Response to this medication may be helpful in confirming the diagnosis.

TABLE 2-5 TREATMENT REGIMEN FOR ATYPICAL HSV		
Agent	Dispense	Label
Acyclovir 200-mg capsules*†	2- to 4-week supply	Take 1 to 2 capsules 5 times/day for 10 days. Dosage will vary depending on clinical severity and the immunologic status of the patient.

* Valacyclovir is the prodrug of acyclovir and is commonly used.

† Acyclovir-resistant herpes simplex ulcerations should be considered when ulcers with a confirmed diagnosis of HSV infection do not respond to acyclovir. Treatment with foscarnet is recommended for such lesions.

3. Aphthous Ulcers

a. Diagnosis

RECOMMENDATION:

Diagnosis of aphthous ulcers should be based on the characteristic clinical appearance of painful, round-to-oval, yellow-white ulcers surrounded by a halo of erythema (see Figure 2-1). For all ulcers not exhibiting

these characteristic clinical features or when empiric therapy has failed, viral culture (isolation), mucosal smear, or biopsy may be necessary to rule out ulcers caused by opportunistic infections.

Increased frequency and severity of episodes of typical minor aphthous ulcers have been reported in patients with HIV. Major aphthous-like ulcers, also called ulcerative stomatitis, present as persistent, deep, crater-like lesions that extend through the epithelium into the connective tissues.

Although much less common, the herpetiform type of aphthous stomatitis also has been reported in patients with HIV. As in non-HIV-infected patients, these ulcers generally occur on non-keratinized oral mucosa but can present in any location (see page 30 for photographic example).

b. Treatment

RECOMMENDATION:

The management of aphthous ulcers should include the use of topical corticosteroids; however, the provider should be aware that steroid use may result in candidal overgrowth.

The agents listed in Table 2-6 are used to treat aphthous ulcers.

Some clinicians have found systemic corticosteroids useful for the treatment of ulcers not easily accessible for application of topical medications or for patients not able to adhere to topical regimens; however, systemic corticosteroids are usually not necessary in the treatment of localized oral aphthous ulcerations.

Thalidomide has been shown to be effective for the treatment of non-resolving aphthous ulcers in HIV-infected patients¹⁰; however, there are serious documented teratogenic effects associated with thalidomide in pregnant women. Because of these severe side effects, thalidomide should only be used when all other options have been exhausted. In adolescent and adult women capable of bearing children, thalidomide should only be used when the woman is known not to be pregnant and is using effective methods of birth control.

TABLE 2-6 TREATMENT OF APHTHOUS ULCERS		
Agent	Dispense	Label
Fluocinonide ointment 0.05% and hydrocortisone acetate oral paste	2- to 4-week supply; mix equal parts hydrocortisone acetate oral paste with fluocinonide ointment to form a compound.	Apply compound to ulcer(s) 5 to 6 times/day.
Fluocinonide gel 0.05%	2- to 4-week supply	Apply to ulcer(s) 5 to 6 times/day.
Clobetasol propionate ointment 0.05% and hydrocortisone acetate oral paste ¹¹	2- to 4-week supply; mix equal parts hydrocortisone acetate oral paste with clobetasol propionate ointment to form a compound.	Apply compound to ulcer(s) 2 times/day.
Dexamethasone elixir 0.5 mg/5 mL*	2- to 4-week supply	Use as an oral rinse 4 to 6 times/day (swish and expectorate) or apply directly to ulceration by saturating a gauze sponge and applying topically to lesion 5 to 10 minutes 4 times/day.

* Used for multiple ulcers or ulcers not easily accessible for topical application.

4. Cytomegalovirus Oral Ulceration

CMV is a herpes-type virus. Serologic evidence of a history of CMV infection is present in up to 80% of HIV-infected adults studied. Cases of CMV-related oral ulceration have been reported in patients with HIV infection. The presence of CMV suggests immunosuppression.

a. Presentation

Oral ulcers due to CMV may occur anywhere in the oral cavity; characteristic clinical features have not been identified.

b. Diagnosis

RECOMMENDATION:

Diagnosis of an oral ulcer due to CMV should be established by biopsy and histologic examination.

Cells exhibiting characteristic intranuclear and intracytoplasmic inclusions are seen on microscopic examination.

c. Treatment

RECOMMENDATION:

Patients with a diagnosis of CMV oral ulceration should be referred to a physician for further evaluation and treatment.

5. Other Ulcers

a. Diagnosis

RECOMMENDATION:

Diagnosis of oral ulceration due to other infectious agents, such as *Histoplasma capsulatum* (histoplasmosis), *Cryptococcus neoformans* (cryptococcosis), and *Aspergillus* organisms, should be made by biopsy and histologic examination.

Oral lesions due to these organisms are signs of disseminated disease. Once a diagnosis has been made, the patient should be referred to a physician for evaluation and treatment.

b. Treatment

RECOMMENDATION:

Treatment should be based on identification of the causative organism.

D. Kaposi's Sarcoma

Kaposi's sarcoma has been the most common malignant tumor associated with HIV infection. Since the introduction of ARV agents, the occurrence seems to be rare. Herpes virus (HHV-8) has been implicated in the etiology of Kaposi's sarcoma. Kaposi's sarcoma oral lesions may interfere with function, be cosmetically objectionable, and proliferate uncontrollably.

1. Presentation

The palate is by far the most commonly affected oral site, followed by the maxillary gingiva. The lesions are often multifocal and usually present as flat purple plaques or raised nodules (see page 30 for photographic example).

2. Diagnosis

RECOMMENDATION:

The diagnosis of Kaposi's sarcoma should be confirmed by either biopsy or identification of distinct clinical appearance.

Clinical appearance may be sufficient to diagnose Kaposi's sarcoma, especially if the patient has a previous biopsy-confirmed diagnosis of Kaposi's sarcoma at another site.

3. Treatment

There is no *consistently* effective management for Kaposi's sarcoma. Systemic chemotherapy is used, and intralesional injections of vincristine, vinblastine, or interferon- α have been used with some success. Intralesional injections with sodium tetradecyl sulfate, a sclerosing solution, also have been effective. Radiation therapy has been successful for treatment of oral Kaposi's sarcoma lesions. Surgical excision of a portion of the lesion may be helpful to allow restoration of teeth or to prevent interference with function. Patients who are successfully treated with ARV medications usually experience remission of Kaposi's sarcoma lesions. Kaposi's sarcoma should be treated in conjunction with the primary care provider.

E. Lymphoma

Lymphoma is a common malignancy occurring in patients with HIV. Most AIDS patients with lymphoma develop lesions in sites other than the lymph nodes. Most AIDS-related lymphomas are of B-lymphocyte origin, and EBV has been found in the lesions. The development of lymphoma in a patient with HIV is an AIDS-defining event.

1. Presentation

The clinical appearance of oral lymphoma varies from irregular, necrotic, ulcerated masses to non-ulcerated masses covered by normal or erythematous mucosa. The lesions may be painful.

2. Diagnosis

RECOMMENDATION:

Diagnosis of oral mucosal lymphoma should be made by biopsy and histologic examination.

3. Treatment

RECOMMENDATION:

Patients with a diagnosis of oral lymphoma should be referred to a physician for further evaluation and treatment.

F. Salivary Gland Disease Associated With HIV Infection

RECOMMENDATION:

For patients with xerostomia, additional measures should be employed to prevent dental caries and periodontal disease. Such measures include topical fluoride therapy, chlorhexidine oral rinse, decreased sugar consumption, and meticulous oral hygiene. The use of saliva substitutes should also be considered.

Xerostomia has been associated with HIV infection.¹² Although its prevalence and cause are not clear, xerostomia may be due to medications or to HIV-related salivary gland disease. The presence of xerostomia increases the risk of the development of dental caries and periodontal disease. Bilateral parotid gland enlargement can occur in both children and adults who are HIV positive, but the clinical significance is unclear.¹³ In some patients, a complex similar to Sjögren's syndrome has been described, and the histologic appearance of cystic benign lymphoepithelial lesions has been reported.

G. Human Papillomavirus Infection

1. Presentation

Lesions caused by human papillomavirus (HPV) present as papillary lesions that may be of normal mucosal color, slightly erythematous, or hyperkeratotic. In patients with HIV, these lesions may be florid with numerous small papillomas, or they may present with fewer and larger papillary projections.

2. Diagnosis

RECOMMENDATION:

Diagnosis of HPV lesions should be made by routine biopsy and histologic examination.

Immunofluorescence or immunoperoxidase staining for papillomavirus can be performed to determine the strain of HPV infecting the tissue.

3. Treatment

Surgical excision of the lesions is the most widely used treatment for oral papillomas; however, recurrence of HPV lesions is common. Some clinicians believe that cauterization of the base of the lesion following excision helps minimize reinfection from the surgical site. Intralesional interferon and topical application of podophyllin are other approaches to treatment of these lesions.

H. Mucosal Melanin Pigmentation

1. Presentation

Mucosal melanin pigmentation occurs as newly emerging single or multiple oral mucosal melanotic (brown) macules. These macules are attributed to an increase in the amount of melanin pigment in the basal cell layer of the epithelium and the underlying connective tissue. The prevalence of this condition has not been determined. Melanin pigmentation has been associated with zidovudine therapy in some patients.

2. Diagnosis

RECOMMENDATION:

For newly emerging or changing mucosal pigmented lesions, biopsy and histologic examination should be considered. However, most of these lesions can be presumptively diagnosed by appearance and observation over time.

3. Treatment

There is no treatment for mucosal melanin pigmentation at this time.

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ILLUSTRATIONS OF ORAL LESIONS ASSOCIATED WITH HIV INFECTION



Pseudomembranous candidiasis



Erythematous candidiasis



Angular cheilitis



Hairy leukoplakia

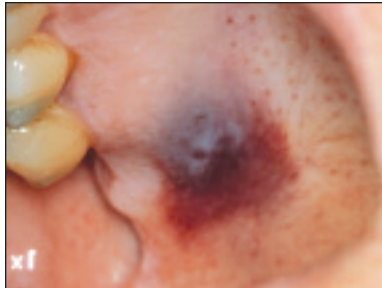
ILLUSTRATIONS OF ORAL LESIONS ASSOCIATED WITH HIV INFECTION



Herpes simplex ulcer



Aphthous ulceration



Kaposi's sarcoma

CHAPTER 3

CLINICAL MANIFESTATIONS AND MANAGEMENT OF HIV-RELATED PERIODONTAL DISEASE

I. INTRODUCTION

RECOMMENDATION:

The most important components in the management of HIV-associated gingival and periodontal disease should be the removal of local irritants from the root surfaces, débridement of necrotic tissues, and appropriate use of antibiotics.

Two types of gingival/periodontal disease associated with HIV infection have been widely reported in the literature. In the past, these have been called HIV-associated gingivitis (HIV-G) and HIV-associated periodontitis (HIV-P). There is now evidence that these diseases also occur in HIV-negative immunocompromised individuals and are not specific to HIV infection, thus making the original terms inappropriate. Therefore, HIV-associated gingivitis has been renamed linear gingival erythema (LGE) and HIV-associated periodontitis has been renamed necrotizing ulcerative periodontitis (NUP).

The prevalence of these two diseases remains unclear,¹⁻³ with estimates of occurrence among HIV-infected individuals ranging from 5% to 50%. It is not yet clear where in the spectrum of HIV disease these conditions occur or which patients are at greatest risk for developing them. There is some evidence that NUP is associated with a low CD4 count (<200 cells/mm³).⁴

II. LINEAR GINGIVAL ERYTHEMA (LGE)

A. Presentation

LGE is limited to the soft tissue of the periodontium and characteristically appears as an erythematous linear band that extends approximately 2 mm to 3 mm from the free gingival margin. There also may be punctate erythema, which extends onto the alveolar mucosa. At times, these areas coalesce, creating broadly diffuse erythematous zones from the gingival margin into the vestibule. Unlike conventional gingivitis, LGE is not significantly associated with plaque. In most cases of LGE, bleeding is seen after gentle probing (see page 34 for photographic example).

B. Diagnosis

RECOMMENDATION:

The diagnosis of LGE is made on the basis of distinctive clinical characteristics (see *Presentation*).

C. Treatment

There is no known treatment for LGE.

III. NECROTIZING ULCERATIVE PERIODONTITIS (NUP)

A. Presentation

NUP affects the osseous structures of the periodontium. Clinical features include pain, interproximal gingival necrosis, and cratered soft tissues (see page 34 for photographic example). Patients frequently complain of spontaneous bleeding and deep-seated pain in the jaws. Destruction of the periodontal attachment and bone can be extremely rapid and extensive and may result in as much as 90% bone loss around isolated teeth in as few as 12 weeks. If left untreated, NUP may extend into the contiguous tissues and expose the alveolar or palatal bone. When this occurs, the condition has been called necrotizing stomatitis.

B. Diagnosis

RECOMMENDATION:

The diagnosis of NUP is made on the basis of distinct clinical characteristics (see *Presentation*).

C. Treatment

RECOMMENDATIONS:

Systemic antibiotics, such as metronidazole, tetracycline, clindamycin, amoxicillin, and amoxicillin-clavulanate potassium, should be combined with débridement of necrotic tissues.

As systemic antibiotics increase the patient's risk of developing candidiasis, concurrent, empiric administration of an antifungal agent should be considered.

Frequent appointments are appropriate and recommended in the acute and healing stages of NUP to perform the necessary periodontal therapies, to assess tissue response, and to monitor the patient's oral hygiene performance.

A thorough periodontal examination should be performed at each recall session for any patient with a history of NUP. Because the periodontal maintenance program for patients with HIV should be individualized, oral health care providers should consider plaque control, past severity of disease, and evidence of case stabilization when determining the frequency of recall visits.

Published reports, supported by clinical experience, suggest that an antibiotic regimen of 250 mg metronidazole 3 times per day for 5 to 7 days, often combined with 250 mg amoxicillin-clavulanate potassium 3 times a day for 5 to 7 days, is effective for management of this disease.

Chlorhexidine oral rinse 15 cc twice daily has been reported to be very useful in the management and control of NUP, and intrasulcular lavage with povidone-iodine has been shown to have a palliative effect for patients with NUP.

Oral health care providers report their most favorable treatment responses when HIV-associated periodontal disease is addressed in the earliest stages. Patients who have been treated for NUP may develop repeated episodes, especially when oral hygiene levels are unsatisfactory. NUP can be insidious, localized, and not necessarily related to plaque. Once clinical stabilization has occurred, recall visits are generally scheduled every 3 months to detect and prevent disease recurrence at an incipient stage.

IV. NECROTIZING ULCERATIVE GINGIVITIS (NUG)

RECOMMENDATION:

Necrotizing ulcerative gingivitis should be treated similarly to NUP.

Necrotizing ulcerative gingivitis (NUG) has been associated with HIV infection. NUG and NUP may represent different stages of the same pathologic process, with NUP being a later stage of NUG.⁵

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ILLUSTRATIONS OF PERIODONTAL DISEASE ASSOCIATED WITH HIV INFECTION



Linear gingival erythema (LGE)



**Necrotizing ulcerative
periodontitis (NUP)**

CHAPTER 4

ORAL AND MAXILLOFACIAL SURGERY

I. TREATMENT PLANNING GUIDELINES

RECOMMENDATIONS:

As part of informed consent, the clinician should carefully explain the risks and benefits of oral and maxillofacial surgery to all patients.

Because of the multiple systemic effects caused by HIV infection and its progression to AIDS, the clinician should perform a complete medical history prior to each surgical encounter and should consult with the patient's medical provider.¹ The medical history should include determination of CD4 counts and viral loads and a review of all drugs that the patient is taking.

All surgical procedures should be performed in a manner that minimizes bleeding and avoids introducing oral pathogens into the deeper fascial planes and oral spaces.

The decision to perform dental extractions and other oral surgical procedures for patients with HIV should be based on the same criteria that are used for all patients. HIV infection in itself is not a contraindication to oral and maxillofacial surgery or to elective surgery (e.g., placement of osseointegrated implants and orthognathic surgery). Most studies on post-extraction complications have shown that results in the HIV-infected population and general population are comparable.²⁻⁴ However, the benefits of improved function and quality of life, together with a review of the patient's general health and oral hygiene, need to be assessed carefully before proceeding with a long and intensive treatment plan.

Treatment planning must be done on an individual basis in therapeutic partnership between providers and patients. For example, teeth with a poor prognosis may be retained if a patient is considered a poor candidate for extractions due to the severity of illness.

II. POST-OPERATIVE COMPLICATIONS AND ANTIBIOTIC PROPHYLAXIS

RECOMMENDATIONS:

The clinical decision to prescribe antibiotic therapy should be made on an individualized basis.

Antibiotics should be used judiciously in patients with HIV disease. Routine antibiotic prophylaxis is contraindicated.

For patients with prosthetic joint replacements, the dentist should consult with the patients' medical provider to determine the need for antibiotic prophylaxis.⁵

If the neutrophil count in a patient is <500 cells/mm³, the oral health care provider should administer antibiotics pre-operatively and post-operatively in consultation with the primary care provider. An individual assessment of risk related to the patient's condition and type of surgery should be performed.

Microbiologic culture and sensitivity testing should be ordered for patients with persistent oral infection who are not responding to antibiotic therapy.

For HIV-infected patients with heart valve abnormalities or other indications for increased risk of bacterial endocarditis, dentists should use the standard protocol established by the American Dental Association and the American Heart Association.⁶

There seem to be no significant differences between the numbers of post-operative complications in patients with HIV infection versus non-infected patients. Data do not currently support the need for routine antibiotic coverage to prevent post-treatment local infection, except in patients who are known to have developed severe neutropenia. If the absolute neutrophil count is <500 cells/mm³, perioperative antibiotics should be prescribed to prevent infection following surgical procedures.⁷⁻¹⁰

A. Extractions

RECOMMENDATION:

All factors associated with post-operative complications should be considered whenever extractions are contemplated.

One of the more common complications associated with an extraction is "dry socket" (localized osteitis), which occurs in 3% to 4% of all extractions among the general population.¹¹ Studies to date suggest that this complication rate is similar in the HIV-infected group.^{3,4,12}

The incidence of post-operative complications in all patients is associated with and affected by many factors, including the type and site of the tooth extracted, the number of teeth to be extracted, high counts of intra-oral aerobic and anaerobic bacteria, age of the patient, whether or not the patient smokes, and the experience of the surgeon. All of these factors must be considered whenever extractions are contemplated.

B. Bleeding Tendencies

RECOMMENDATIONS:

Bleeding abnormalities should be considered when evaluating HIV-infected patients for invasive procedures. Practitioners should keep in mind that, although rare, excessive bleeding could occur even if hemostasis seems normal.

For patients with increased bleeding tendencies, hemostatic function assessment is recommended before extensive surgery.¹³ Consultation with the patient's primary care provider is also recommended.

For patients with a previous history of abnormal bleeding or clinical signs of severe thrombocytopenia, a preoperative platelet count should be obtained for surgical procedures, such as extractions, scaling and curettage, and biopsy.⁹

Even if hemostasis seems normal, practitioners should keep in mind that, although rare, excessive bleeding could occur. Thrombocytopenia that is severe enough to place patients at an elevated risk for post-operative bleeding may occur in up to 0.4% of patients.^{7,9} Dental professionals should also be aware of other bleeding problems, such as those related to liver dysfunction or medication-induced problems.

A careful history will detect the majority of bleeding problems, including HIV-associated thrombocytopenia. A medical history and review of systems should be conducted, with questions directed toward bleeding and coagulation problems. Inquiries should be made regarding easy bruising, bleeding following recent surgery and extractions, and heavy menses. The presence of petechiae, particularly on the palate, should alert the clinician to a bleeding problem.

Elective dental extractions in patients with HIV disease who have platelet counts $<50,000/\text{mm}^3$ should be delayed until the patient's primary care provider can be consulted and appropriate treatment strategies are selected. Oral surgery procedures should be postponed, if possible, when hemoglobin levels decrease to 7.0 g/dL or below. An increased bleeding time (>9 minutes) indicates a need to assess quantitative and qualitative platelet function.

III. IMPLANT SURGERY

RECOMMENDATION:

Implant surgery may be performed successfully in patients with HIV infection. The benefits of such treatment should, however, be assessed carefully in relation to HIV disease stage.

Although there has been relatively little research on the effects of providing dental implants for individuals with HIV, it appears that implant surgery can be successfully provided for many patients. Experts have suggested that there is no difference in the rate of post-operative complications or osseous integration for implant patients with or without HIV infection.

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CHAPTER 5

ORAL HEALTH MANAGEMENT IN CHILDREN AND ADOLESCENTS WITH HIV INFECTION

I. INTRODUCTION

With the introduction of successful antiretroviral therapy (ARV), oral health care providers are now more likely to encounter children and adolescents who live longer with HIV/AIDS. Although some of these children may appear healthy, others may have past or present indicators of HIV infection. Early identification of HIV infection can result in timely access to health care for the child and supportive therapy for the family or caregiver.

HIV disease varies considerably in children. Among those infected perinatally, some experience few or no symptoms for years, whereas others progress rapidly. The sequelae of HIV infection in children include potential chronic progressive illness with acute episodes, hospitalizations, failure to thrive, poor weight gain, multiple and long-term medication regimens, and developmental delay. Poor general health of children and caregivers can interfere with appropriate and consistent oral health behaviors and access to preventive care. Oral function can be impaired by infections of the teeth, mucosa, and gingival and periodontal tissues. Children with untreated or poorly controlled HIV may suffer from poor nutrition because of an inability to chew properly as a result of a decayed and painful dentition or because of untreated soft-tissue problems, such as oral ulcers and gingival and periodontal diseases.

Neurological involvement and developmental delay can be complications found in children with HIV infection.¹ Behavior management of these children can create obstacles to the delivery of dental therapy.

II. THE ORAL HEALTH CARE PROVIDER'S ROLE IN THE PRIMARY CARE TEAM

RECOMMENDATIONS:

Because of the variety of oral health problems associated with HIV disease, the oral health care provider should be involved in the initial management and be a participant of the primary care team for pediatric patients.

The oral health care provider should inform the appropriate primary care team members of the patient's oral health needs and concerns, the patient's role in oral health maintenance, and the oral health care provider's ability to deliver specialized preventive and restorative treatment and recall care.

Because of the unpredictable nature of acute and chronic illnesses associated with HIV infection, the oral health care provider should always strive to prevent oral problems. Understanding the psychosocial, medical, and family issues that can be associated with HIV illness, obtaining a detailed medical and social history of the child, performing an oral-facial-dental evaluation at each visit, and establishing an appropriate recall interval for assessment of the patient's oral health status are key to the preventive strategy. Recall intervals should be based on each patient's caries history, plaque and debris index, and treatment adherence.

As part of the primary care team, the oral health care provider should discuss with the pediatrician dental preventive and restorative strategies for the child, work collaboratively to resolve questions of contraindications to dental procedures, and coordinate medical procedure appointments with dental procedure appointments.

Oral health care providers should request that the pediatrician or team members keep them informed of important changes in the patient's status. The oral health care provider should be furnished with current information that may influence dental treatment, including staging of the patient's disease, medications, nutritional status, and blood serum laboratory tests (e.g., recent CD4/CD8 counts, viral load, and platelet count).

As the oral health care provider may be the first health professional to suspect HIV infection in the pediatric patient, the oral health care provider should know the findings suggestive of HIV infection (see Table 5-1). Identified findings should be reported to the child's pediatrician.

The oral health care provider should understand the psychosocial issues that confront HIV-infected children and adolescents.

Oral health care providers should make every effort to avoid disruption or discontinuation of a patient's treatment that may result from family-related problems. Problems related to treatment adherence should be discussed with the primary care team to solve what may be a complicated issue(s).

TABLE 5-1
FINDINGS SUGGESTIVE OF HIV INFECTION IN PEDIATRIC PATIENTS

- Uncommon, unusual, or frequent oral infections or lesions
- Delay in age-appropriate neurological development (e.g., speech, fine and gross motor skills)
- Delay in age-appropriate weight and height gain
- Respiratory distress (past and present)
- Recurrent infections (e.g., pneumonia) or hospitalizations
- Chronic low-grade fevers, chronic diarrhea (i.e., more than 3 stools per day for 2 weeks)

The oral health care provider should teach and empower patients and caregivers by giving them the knowledge necessary to provide consistent and appropriate oral, dietary, or medication guidance. For example, prolonged and unsupervised use of a bottle for feeding or pacification, improper delivery of medications, or failure to give medications are significant concerns.

Social workers, nurses, and other auxiliaries should be involved in the care plan to help patients who have trouble keeping appointments. They can also help the family by making referrals to the medical-dental team or the primary care team. This collaborative effort offers the child and the family the most comprehensive and compassionate support.

III. FAMILY ISSUES

RECOMMENDATION:

Oral health care providers should make every effort to avoid disruption or discontinuation of a patient's treatment as a result of family-related problems.

Families may present with problems that affect dental treatment and outcomes. Problems related to poverty, substance use, physical or sexual abuse, homelessness, mental illness, and parental HIV infection can contribute to missed appointments, non-adherence with routine personal dental care, and discontinuation of treatment.

Every effort should be made to avoid disruption or discontinuation of treatment. Social workers, nurses, and child development staff can help address family issues. For example, if parents or caregivers report that they are changing dentists, the oral health care provider should follow up with a call to the new clinician or ask an assistant, social worker, or nurse to do so. Willful failure of a parent or guardian to seek and follow through with treatment may be reported as neglect. If necessary, parents may be legally forced to bring a child for treatment, and intervention by child protective services may be required.

IV. INITIAL INTAKE VISIT

RECOMMENDATIONS:

The oral health care provider should consider HIV counseling and testing of children whose birth parents' medical or social histories are suggestive of HIV.

If the child's HIV status has not been disclosed or if HIV infection is strongly suspected:

- **The medical history should be re-evaluated with questions about risk factors for HIV infection in the family.**
- **The patient's or caregiver's consent should be obtained in order to attain the patient's HIV medical information.**

The dental provider should be sensitive to and respect the caregiver's willingness to discuss HIV status with the child and should try to ascertain whether the child has been informed of his/her HIV status, even if the subject has not been discussed.

When information regarding the birth parents' health status, medical and psychosocial history, history of drug and/or alcohol use, information concerning adoption or foster care, or history of blood transfusions are suggestive of HIV, the oral health care provider should consider HIV counseling and testing.

If a caregiver resists discussing specific issues and the dental provider suspects that the patient is HIV infected, the dental provider should ask the caregiver general questions, such as:

- Does the child go to any clinic or doctor other than his/her usual pediatrician?
- Has the child or any family member had any unusual or persistent infections? How have they been treated?

V. CONSIDERATIONS FOR PREVENTION AND TREATMENT PLANNING

RECOMMENDATIONS:

The oral health care provider should follow the American Association of Pediatric Dentistry (AAPD) guidelines for anticipatory guidance.²

Treatment modifications for children and adolescents should be based on the patient's medical status rather than HIV status.

Oral health care providers should be aware that children with HIV infection might experience an increased risk of oral disease, including soft-tissue and hard-tissue pathology.

The oral health care provider should let the caregiver know that all health-related information is essential for the safe treatment of the child and will be kept confidential.

The oral health care provider should review the treatment plan with the family or caregivers and set dates of treatment. It is important that families are provided with a clear idea of what is expected regarding their involvement in the care plan. The oral health care provider should supply caregivers with necessary oral, dietary, or medication knowledge.

The following indicators should be considered in devising the best treatment strategy for each patient:

- **Medical status**—The patient’s medical status should be updated at each visit to accurately track progression of disease and changes in medication protocols.
- **Frequency of visits**—Visits should be scheduled according to the needs and caries risk factors of each patient.
- **Preventive strategy**—Early and aggressive preventive therapy (e.g., sealants) and reinforcement of good oral hygiene at home can help avoid or minimize caries (see Table 5-2).

TABLE 5-2 ORAL HEALTH PREVENTIVE STRATEGIES BY AGE	
Age Group	Preventive Strategies
Infants	Supervised use of bottles for feeding or pacification, management of cariogenic medication
Children	Dental sealants, optimal systemic and topical fluoride, fluoride varnish supplementation, management of nutrition and medication, low frequency and chronicity of fermentable carbohydrate intake (e.g., juices, milk, dietary supplements)
Adolescents	Removing residue of food and medicine through rinsing with water or mechanical cleansing, management of nutrition and medication, addressing barriers that prevent adolescents from accessing care

HIV infection does not necessitate changes in the treatment plan for a child or adolescent. However, effects of HIV infection on the pediatric patient and the patient’s family may alter the oral health care provider’s approach to treatment. Updating of medical and psychosocial summaries is an important part of treatment of chronically ill patients and should be performed at recall visits.

Preventive measures provided by the child’s caregiver and the medical-dental team are especially critical for the child with HIV infection. Dental sealants, optimal systemic and topical fluoride, and fluoride varnish supplementation are keys to preventive strategy. Dental therapy based on effective home care and management of nutrition and medication can give a sense of accomplishment to caregivers who may feel ineffective in com-

bating the child's illness. The patient's oral hygiene and the condition of the soft tissues usually reflect the degree of the caregiver's and the patient's ability to adhere to the specified home care regimen.

In the overall health care management of the patient, the oral health care provider should give restorative care and develop a suitable prevention program tailored to the profile of the individual child. HIV status in itself is not a reason to alter a treatment plan.

VI. ORAL LESIONS AND PERIODONTAL DISEASE IN THE PEDIATRIC PATIENT

RECOMMENDATION:

Oral health care providers should be prepared to recognize, identify, and manage oral lesions in children with HIV infection.

Oral health care providers should refer to the primary medical care provider for diagnoses, observation, and management of any lesions that disrupt the integrity of the oral mucosa in children.

Several studies have described oral lesions in the pediatric population with HIV infection. In 1994, the Centers for Disease Control and Prevention (CDC) revised the classification system for HIV infection in children <13 years of age to include oral lesions as markers of severity of HIV infection.³ Oral health care providers should review this information.

Although it is common for children to present with palpable lymph nodes of the cervical and submandibular chain, the oral health care provider should interpret these findings in the context of the patient's total profile (see Chapter 2: *Diagnosis and Management of Soft-Tissue Lesions*). HIV-infected children whose disease is well controlled by medications will commonly show no signs of oral lesions. Untreated or undiagnosed children will be more likely to develop lesions.

Oral lesions associated with HIV infection cause pain and discomfort, compromise function, interfere with oral hygiene, and may negatively influence the patient's general health. Potential causes of lesions include herpes simplex, coxsackievirus, and ARV drugs. Fluocinonide ointment 0.05% and hydrocortisone acetate oral paste can be used to provide pain relief. Because nutrition often plays a role in the prevention of these lesions, maintaining and increasing caloric intake is very important.

A. Oral Candidiasis

RECOMMENDATIONS:

Oral rinsing, nutritional and medication management, and cleansing the entire mucosal and gingival tissue area beginning at birth may help control oral *Candida* and delay the progression of oral candidiasis.

Oral hygiene instructions should be given to patients and caregivers, and, for young children, the caregiver's role in the oral hygiene process should be stressed. Residue of food and medi-

cine on the oral tissues (mucosa, gingiva) and on the teeth should be removed by the caregivers of young children and independently by older children through rinsing with water or mechanical cleansing.

The most common soft-tissue lesion in children with HIV infection is pseudomembranous oral candidiasis (reported in approximately 75% of cases).⁴ Erythematous candidiasis and angular cheilitis are also commonly observed in children with HIV infection (see page 53 for photographic examples). A number of factors may influence the risk for candidiasis in children. Feeding behaviors and nutritional requirements that increase the frequency of fermentable carbohydrates intake (e.g., formula, juices, milk, dietary supplements), especially when delivered with bottles, support the growth of candidiasis.

Oral rinsing, nutritional and medication management, and cleansing the entire mucosal and gingival tissue area beginning at birth may help control oral *Candida* and delay the progression of oral candidiasis. In infants and small children, candidal lesions can be treated by swabbing with nystatin. Antifungal medications may also be required (see Table 5-3 for topical and systemic medications).

Evidence is growing that prolonged and chronic use of antifungal medications has limitations, such as resistant strains, toxicity, and deleterious effects on immature organ systems. Furthermore, both the sucrose in some antifungal preparations and the juice or milk that may be added to ensure adherence will increase the risk of caries. Elimination of the feeding bottle by weaning to a cup as early as possible may reduce candidiasis risk and frequency.

TABLE 5-3 TOPICAL AND SYSTEMIC ANTIFUNGAL MEDICATIONS FOR PEDIATRIC POPULATIONS WITH ORAL CANDIDIASIS*	
Agent	Dosage
<u>Topical</u>	
Oral nystatin suspension	2 to 5 mL, 4 to 6 times/day
Clotrimazole troches	10-mg tablet, 3 to 5 times/day
<u>Systemic</u>	
Fluconazole	3 to 5 mg/kg once daily
Itraconazole	100 mg/day orally for children >3 years of age
Ketoconazole	5 to 10 mg/kg/day

* Five to 7 days of therapy is often sufficient to clear oral candidiasis.

B. Angular Cheilitis

RECOMMENDATION:

As angular cheilitis may represent poor diet and poor feeding in addition to fungal infection, the oral health care provider should assess the diet, oral habits, and/or HIV status of a child with angular cheilitis.⁵ Consultation should occur with the primary care team regarding nutritional support and vitamin supplementation, which may improve this condition in children.

Angular cheilitis appears as cracks or fissures at the commissures of the lips. This oral environment frequently accompanies intra-oral candidiasis (see page 53 for photographic example).

C. Parotid Swelling

Parotid swelling is the second most commonly reported oral lesion, with a prevalence of up to 30%. It is usually asymptomatic and bilateral and spontaneously resolves and recurs. The reason for the swelling is not well understood, and medication side effects have been offered as a possible explanation. In contrast to candidiasis, parotid swelling does not seem to be a marker of poor outcome (see page 53 for photographic example).

D. Caries and Gingivitis

RECOMMENDATION:

Extensive caries or chronic demineralization should be treated definitively with comprehensive restorative care.

The dental literature suggests that children with HIV infection are at greater risk for dental caries and gingivitis than children without HIV infection. The increased risk is due, in part, to baby-bottle tooth decay, progressive immunodeficiency, effects of medications on salivary flow and oral flora, developmental delay, and/or failure to thrive. Extrinsic factors such as diet, inadequate oral hygiene, socioeconomic status, lack of caregiver knowledge, and frequent use of the bottle while going to sleep may be additional risk factors. HIV infection, changes in saliva, and xerostomia contribute to the severity of plaque-related diseases.

E. Xerostomia

RECOMMENDATION:

Sugarless gum and frequent consumption of water or highly diluted fruit juices should be used to alleviate xerostomia.

Xerostomia has been observed in pediatric patients. The frequency is unknown, and the etiology is not clear. The administration of gamma globulin and didanosine (ddI) has been suggested as a possible cause for xerostomia in some children. Although increased caries

have been observed in some children with HIV infection, the relationship between xerostomia and dental caries has not been demonstrated in clinical studies of children with HIV infection. Symptoms include dry stools, low urine volume, high fluid consumption, eating of “watery, loose” foods, and complaints of dry mouth.

F. Aphthous Ulcers

RECOMMENDATION:

Topical corticosteroids should be used to manage aphthous ulcers (see Chapter 2: *Diagnosis and Management of Soft-Tissue Lesions*).

Aphthous ulcers in children with HIV (estimated prevalence, <10%) can present serious problems, such as pain and impaired ability to eat. In addition to prolonged course, size and location may be atypical. ARV therapy with zalcitabine (ddC) has been suggested as an etiologic factor (see page 53 for photographic example).

G. Herpetic Stomatitis

RECOMMENDATION:

Supportive therapies, such as topical applications of medications, should be used to encourage hydration and the intake of food (see Chapter 2: *Diagnosis and Management of Soft-Tissue Lesions*).

Herpetic stomatitis is a common viral infection in the pediatric population, regardless of HIV status (see page 54 for photographic example). This lesion, however, can be especially severe in children with HIV infection. The course of an infection may be longer than normally observed (10-14 days); the lesions may be more aggressive and may recur more frequently.

H. Hairy Leukoplakia

Hairy leukoplakia has been reported in HIV-infected children, but it is rare.^{6,7} It appears to resolve spontaneously, and its prognostic significance is unknown (see page 54 for photographic example).

I. Kaposi's Sarcoma

Kaposi's sarcoma and other neoplasms are rarely found in children who have AIDS.

J. Linear Gingival Erythema

Linear gingival erythema (LGE), most commonly associated with the upper and lower anterior dentition, has been observed in pediatric patients (see page 54 for photographic example). Based on clinical experience, it has been determined that approximately 10% of children have this condition. These lesions usually do not cause clinical problems or interfere with nutrition. Necrotizing ulcerative

periodontitis (NUP) and other destructive diseases of the periodontium [e.g., atypical necrotizing ulcerative gingivitis (ANUG)] are rarely described in studies of children in the United States. There may be a higher risk of these diseases in adolescents with HIV infection (see Chapter 3: *Clinical Manifestations and Management of HIV-Related Periodontal Disease*).

VII. ADOLESCENCE AND HIV INFECTION

RECOMMENDATIONS:

Oral health care providers should be aware of the direct and indirect factors that place adolescents at risk for acquiring HIV infection.⁸

Oral health care providers should strive to gain the trust of adolescent patients at the outset of the professional relationship.

To care adequately for adolescents with HIV infection, oral health care providers should first address the barriers that prevent adolescents from accessing care, including payment, consent, and confidentiality.

Adolescents with HIV infection not already in care should be referred for immediate consultation with an appropriate health care center AIDS team or HIV Specialist.

Adolescence is defined not only by chronological age but also by hormonal changes of puberty, rapid somatic growth, development of personal autonomy and identity, feelings of immortality, and exploration of sexual activity and substance use. Certain behaviors and circumstances, including history of substance use and alcohol use, sexual orientation, history of mental illness, and trading sex for food, shelter, or money, are recognized as predictors for risk of HIV infection among adolescents.

Adolescents with early HIV infection present unique treatment issues for any clinician. These include differences in the epidemiology of HIV infection among youth, barriers to HIV care, and specific features of the progression of HIV infection during adolescence. Additional pediatric and adolescent clinical guidelines developed by the New York State Department of Health AIDS Institute can be reviewed and downloaded at <http://www.hivguidelines.org>.⁹

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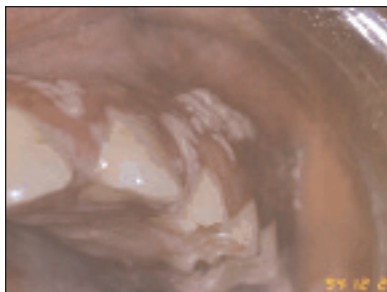
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ILLUSTRATIONS OF PEDIATRIC ORAL LESIONS ASSOCIATED WITH HIV INFECTION



Pseudomembranous candidiasis



Angular cheilitis



Bilateral parotid swelling



Aphthous ulcer

ILLUSTRATIONS OF PEDIATRIC ORAL LESIONS ASSOCIATED WITH HIV INFECTION



Herpes simplex



Hairy leukoplakia



Linear gingival erythema (LGE)

CHAPTER 6

INFECTION CONTROL

A supplement to Volume 52 (2003) MMWR Recommendations and Report, “*Guidelines for Infection Control in Dental Health-Care Settings - 2003*” consolidates and updates previous recommendations on preventing and controlling infectious diseases and managing personnel health and safety concerns related to infection control in dental settings. These new recommendations can be accessed at: <http://www.cdc.gov/mmwr/preview/mmwrhtml/rr5217a1.htm>

I. GENERAL INFECTION CONTROL PRACTICES

RECOMMENDATIONS:

Dental providers and dental office staff should be trained in the principles and practices of infection control.

The clinician should consult infection control guidelines for dentistry recommended by any of the following: the Centers for Disease Control and Prevention (CDC),¹ the American Dental Association (ADA),² or the Organization for Safety and Asepsis Procedures (OSAP).³ In addition, the clinician should comply with the bloodborne standards set by the Occupational Safety and Health Administration (OSHA)⁴ and the mandatory infection control training set by the New York State Board of Regents.⁵

Universal or standard infection control precautions should be carried out for all dental patients and all dental procedures.⁶ Special precautions are not necessary for patients with HIV because all patients are considered to be potentially infected with a bloodborne pathogen.

Workplace and engineering controls, including hand-washing, effective barrier precautions, proper use of personal protective equipment and safety devices, appropriate cleansing and sterilization of instruments and dental equipment/environmental surfaces, and both the safe handling and disposal of sharps, should be emphasized.

OSHA mandates that employers must offer employees free-of-charge immunization against hepatitis B. Employees who choose not to be immunized must sign a declination statement.⁴

Because adult chicken pox is associated with high morbidity, employees who are not immune should be encouraged to be immunized against the varicella zoster virus (VZV). For information about immunization against other pathogens, refer to CDC's Immunization of Health Care Workers recommendations.⁷

New York State requires that dentists and dental hygienists receive explicit training in infection control every 4 years, with particular emphasis on the modes and risks of HIV transmission in the dental

environment.⁵ In addition, OSHA mandates annual employee training about bloodborne pathogen transmission and an annual update of the clinic occupational exposure control plan.⁴ Oral health care providers must follow practice regulations as defined by the Americans with Disabilities Act.⁸ Those citing infection control concerns as grounds for not treating HIV-infected patients are subject to censure or prosecution (see Chapter 7: *Ethical and Legal Considerations*).

A number of pathogenic microorganisms may be transmitted in the dental setting. These include airborne pathogens, such as tuberculosis (TB); bloodborne pathogens, such as HIV, hepatitis B virus (HBV), and hepatitis C virus (HCV); waterborne pathogens; and mucosa/skinborne pathogens, such as VZV or herpes simplex virus (HSV).

II. AIRBORNE INFECTION CONTROL (TUBERCULOSIS)

RECOMMENDATIONS:

The risk for transmission of *Mycobacterium tuberculosis* in most dental settings is quite low. Oral health care providers should conduct a periodic risk assessment, and TB infection control policies for each dental setting should be based on this risk assessment.⁹

Oral health care providers should defer all non-emergency dental treatment in patients with suspected pulmonary or laryngeal TB disease until they are confirmed by a physician to be non-infectious. Emergency dental treatment for infectious patients should be performed in an isolation room with appropriate ventilation, and providers should wear appropriate personal respiratory protection. Appropriate respiratory equipment has been defined by CDC.⁹

Routine dental treatment should not be deferred for patients with the following conditions: extrapulmonary TB, latent TB infection in the absence of clinical disease, or MAC disease. Routine dental treatment also should not be deferred for patients with tuberculosis who are currently receiving treatment and are no longer infectious.

All untested oral health care providers should receive a baseline tuberculin skin test, unless they are already PPD+ or recent exposure dictates testing sooner. The frequency of retesting of oral health care providers is based on the risk assessment of the facility in which they practice.⁹

Throughout the 1980s and early 1990s, tuberculosis infection with *M tuberculosis* resurged as a significant public health problem. Tuberculosis is once again a significant public health problem in the United States. New York State had the second highest incidence rate of TB in the United States in 1998.¹⁰ The HIV epidemic explains part of the resurgence, and TB has been reported in 5% to 21% of persons with HIV infection. Strains of *M tuberculosis* that are resistant to anti-tuberculosis

medications have been reported with greater frequency in New York State than elsewhere, and transmission has been documented in health-related settings.⁹ Multidrug-resistant (MDR) isolates—those resistant to both isoniazid and rifampin—are of particular concern. Resistance to these drugs, which are the two most potent anti-tuberculosis medications, significantly confounds TB treatment and preventive therapy.

Oral health care providers should be aware that the rate of TB disease among HIV-infected persons with a reactive tuberculin skin test (PPD+) is approximately 4 to 26 times higher than the rate among comparable HIV-infected persons with a non-reactive tuberculin skin test (PPD-). This rate is approximately 200 to 800 times higher than the rate of TB estimated for the United States population overall (0.01%).¹¹

TB is transmitted via airborne droplets, especially from the coughing and sneezing of patients with active pulmonary or laryngeal TB. TB “infection” is synonymous with a latent infection in which patients have been exposed to TB and have a reactive tuberculin skin test, yet they are asymptomatic and non-infectious. *Bacillus Calmette Guerin* (BCG) immunization may produce a reaction that cannot be distinguished reliably from a reaction caused by exposure to TB, although most positive reactions in persons with a history of BCG immunization indicate TB infection. TB “disease” is synonymous with symptoms of active infection, and these patients are considered potentially infectious. HIV-infected patients with TB infection have a higher rate of reactivation to TB disease. Extrapulmonary TB also may be present in a small percentage of patients.

Before dental care is performed, prompt medical consultation is advisable for patients with suspected TB disease or with an unclear TB history. Signs and symptoms of TB disease include a persistent productive cough, fatigue, fever, night sweats and chills, loss of appetite, weight loss, chest radiograph abnormalities, and positive sputum smear and/or culture. Tuberculosis infectivity diminishes rapidly when patients receive effective therapy. The resolution of cough and fever suggests a good response to therapy and a reduced potential for contagion. Sputum smears that are negative for acid-fast bacilli (AFB) are also strong evidence of diminished potential infectivity. Precise determination of when an individual with TB becomes “non-infectious” can be difficult and may best be made on a case-by-case basis in conjunction with the treating clinicians, evaluating both the clinical picture and AFB smear status. Pulmonary multidrug-resistant tuberculosis (MDR-TB) is neither more nor less infectious than drug-susceptible TB, but it is more difficult to treat. Patients with HIV infection who have pulmonary TB are no more infectious than non-HIV-infected persons with pulmonary TB. Hence, the same clinical and infection control principles apply to all patients with pulmonary TB. Knowledge of HIV status is not required for determination of an individual patient’s potential TB infectivity.

Routine dental treatment **should not** be deferred for patients with the following conditions:

- Patients with reactive tuberculin skin test (PPD+) who have neither signs nor symptoms of TB disease.
- Patients with TB limited to extrapulmonary sites.
- Patients with active TB who are currently receiving treatment and are no longer infectious (symptoms resolved and AFB smear or culture negative).
- Patients with *Mycobacterium avium* complex (MAC) disease who are sputum AFB positive, unless pulmonary TB remains a clinical possibility. Concomitant pulmonary TB can be present with MAC disease.

Extrapulmonary TB is not infectious via the respiratory route, although isolated cases of transmission from ulcerating lesions have occurred through percutaneous injury.^{12,13} Persons with reactive tuberculin skin tests who do not have active pulmonary TB are not infectious. MAC disease is a major opportunistic infection in patients with HIV infection who have advanced immunosuppression.⁹ MAC is common in the environment, is of limited pathogenic potential to immunocompetent persons, and does not require special infection control precautions.

To protect other patients and staff (especially those who are HIV infected), all patients with a cough should be asked to cover their mouth and nose. Oral health care workers treating patients in an isolation room must follow strict respiratory precautions. Routine surgical masks are not adequate personal protective devices. Oral health care providers must wear NIOSH-certified submicron particulate respirator masks, requiring fit-testing by trained personnel.¹⁴

Reviews of TB management in a dental practice are available for further reading.¹⁵ Further information on TB control is available from the CDC at <http://www.cdc.gov/nchstp/tb/>.^{9,16}

III. BLOODBORNE INFECTION CONTROL (OCCUPATIONAL EXPOSURE)

RECOMMENDATIONS:

Employers are mandated by OSHA to have an exposure control plan.⁴ The plan must be reviewed and revised annually and updated regularly, and it should include consideration and use of commercially available safer devices shown to reduce the risk of occupational exposure.^{17,18}

Following any occupational exposure (either percutaneous or mucocutaneous), risk assessment for transmission of bloodborne pathogens (HBV, HCV, and HIV), indication for post-exposure prophylaxis (PEP) for HIV, and appropriate follow-up of the exposed individual should be based on the New York State Department of Health AIDS Institute guidelines, *HIV Prophylaxis Following*

Occupational Exposure, which can be downloaded and reviewed at <http://www.hivguidelines.org>.¹⁹

A procedure should be in place in the event that an occupational exposure occurs. Dental worker education about preventing and treating occupational injuries should be ongoing.

The risk of transmission of HIV to oral health care providers following occupational exposure is low. Through June 2000, 56 cases of documented seroconversion following occupational HIV exposure were reported to the CDC.²⁰ None of these documented cases occurred among oral health care providers. Six instances of *possible* HIV transmission to oral health care providers were reported among 138 cases of occupational exposure reported to the CDC. These 6 cases were identified after exclusion of other behavioral or transfusion risks; each reported percutaneous or mucocutaneous exposure to HIV, but seroconversion was not documented. Excellent reviews on the management of health care workers infected with bloodborne pathogens are available.²¹

Injury data specific to oral health care providers reveal a 3-fold decrease in the number of reported/observed injuries with a current average of 3 to 4 per year. The risk of bloodborne pathogen transmission associated with these injuries is very low, because most are not deep and have low volumes of blood (only 45% with visible blood in CDC surveillance study), and many are preventable with appropriate devices and work practices. Health care workers are not over-represented among AIDS cases reported to the CDC.

HIV-infected patients have an increased risk of co-infection with other bloodborne pathogens (e.g., HBV or HCV). The potential for contracting these pathogens exists independently of HIV status. Seroconversion rates following exposure to HBV and HCV (ranging from 6% to 30% and 0% to 7%, respectively) are significantly higher than for HIV.²² Hepatitis B carriers who are HBeAg positive have a higher likelihood of transmission than those who are only HBsAg positive. Occupational exposure protocols should include testing for these pathogens.

HBV infection can be prevented by receiving a full course of one of several approved recombinant hepatitis B vaccines and by ensuring an adequate serologic response [i.e., developing antibodies to the hepatitis B surface antigen (HBsAg)].²³ Occupational exposure protocols should indicate circumstances for the administration of hepatitis B immunoglobulin (HBIG) to oral health care workers not immunized against HBV. There is presently no available vaccine or post-exposure prophylaxis medication for HCV.

HIV PEP is recommended for transcutaneous or mucous membrane exposure to blood or visibly bloody oral secretions associated with potential HIV transmission. The basis for PEP is derived from the results of a case-control study demonstrating a reduction of 81% in HIV transmission among health care workers who received zidovudine prophylaxis.²⁴ With new antiretroviral drugs and classes, highly active antiretroviral therapy (HAART) is

currently recommended for PEP.^{19,25,26} PEP should be initiated ideally within 2 hours (but up to 36 hours) after exposure occurs to optimize effectiveness (see Figure 6-1). For specific recommendations on PEP following occupational exposure, refer to the New York State Department of Health AIDS Institute's *HIV Prophylaxis Following Occupational Exposure* guidelines,¹⁹ which can be obtained at <http://www.hivguidelines.org>.

All individuals placed on PEP should be re-evaluated within 72 hours of their exposure. This allows for further clarification of the nature of the exposure, review of available source patient serologies, and evaluation of adherence to and toxicities associated with the PEP regimen. A special consent form is available for testing the source patient (see Appendix VI). The worker should have baseline HIV antibody testing with follow-up testing at 4, 12, and 26 weeks post-exposure to document possible seroconversion. The dental worker should be educated to report any symptoms that might indicate primary HIV infection (e.g., fever, lymphadenopathy, rash, flu-like syndrome). The worker should practice risk-reduction behaviors until HIV infection is ruled out. When the source is co-infected with HBV or HCV, exposed individuals should follow recommended New York State Department of Health and CDC protocols for post-exposure management of HBV/HCV.²⁷⁻²⁹

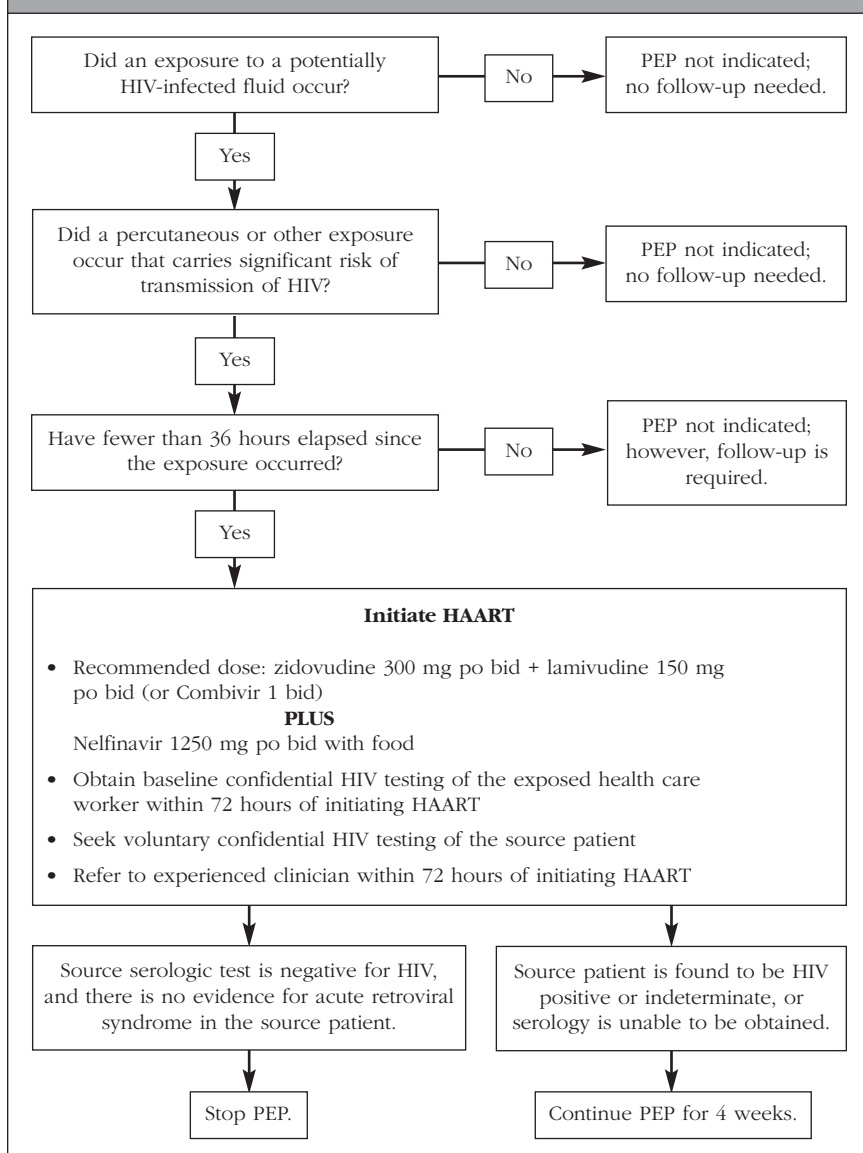
IV. WATERBORNE INFECTION CONTROL

RECOMMENDATION:

Oral health care providers should be aware of the potential for dental unit waterline contamination.

Dental unit waterline contamination is an emerging infection control issue but not a public health crisis.³⁰ Pathogenic microorganisms, including *Legionella* and *Pseudomonas* species, have been cultured from dental unit water, although studies demonstrating infections caused by such microorganisms are equivocal. When a boil-water advisory or other drinking water advisory has been made public, water from the public water supply should not be used.³¹ The oral health care provider may want to consider provision of only urgent care. Oral health care workers who wish to monitor or improve dental unit water are encouraged to learn more about new products by contacting equipment manufacturers or infection control resources such as CDC,³² Office Sterilization and Asepsis Procedures (OSAP) Research Foundation,^{3,31} or the New York State Department of Health Bureau of Public Water Supply Protection at the Center for Environmental Health (phone: 1-800-458-1158, extension 27650).

FIGURE 6-1
PEP FOLLOWING OCCUPATIONAL EXPOSURE



Reprinted from *HIV Prophylaxis Following Occupational Exposure*. New York State Department of Health AIDS Institute, 2001.

V. HEALTH CARE WORKERS WITH HIV OR OTHER INFECTIOUS DISEASES

RECOMMENDATIONS:

Health care workers should be counseled about the importance of learning their HIV and hepatitis B virus (HBV) status if they potentially have been infected through personal behavior or occupational exposure.

Courts have interpreted the State's Human Rights Law³³ and federal law (the Americans with Disabilities Act³⁴) to hold that HIV infection alone is not sufficient justification to limit the professional duties of health care professionals unless specific factors compromise a worker's ability to meet infection control standards or to provide appropriate patient care.

Health care workers with HIV infection who are exposed to TB should be aware of their increased risk for developing active tuberculosis and should therefore observe appropriate precautions.

HIV-infected health care workers with patient contact should practice standard infection control procedures.

The New York State Department of Health has developed guidelines indicating that the theoretical risk of transmission posed by health care workers with HIV is infinitesimally small.³⁵ HIV-infected health care workers should only be restricted in their practice if they are not competent to perform their duties. Health care facilities are responsible for establishing a mechanism for evaluating health care workers with HIV or HBV infection as part of their infection control process. Additional information regarding resources for HIV-infected dentists is available through the American Dental Association Well-Being Program [(312)-440-2622].

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CHAPTER 7

ETHICAL AND LEGAL CONSIDERATIONS

I. ETHICAL CONSIDERATIONS

RECOMMENDATION:

A dentist practicing in New York State is bound by specific laws, including those outlined in the *Principles of Ethics and Code of Professional Conduct* of the ADA, the *Principles of Ethics and Code of Conduct* of the New York State Dental Association, and the code of ethics of the component society of which he/she practices.^{1,2}

The *Principles of Ethics and Code of Professional Conduct* of the American Dental Association (ADA) defines five principles of ethical behavior: patient autonomy (self-governance); non-maleficence (do no harm); beneficence (do good); justice (fairness); and veracity (truthfulness).¹ It provides extensive guidance for oral health professionals in ethical behavior for treatment of all patients, including those with HIV infection.

The foundation of the *Principles of Ethics and Code of Conduct* of the New York State Dental Association is that service to the public is the oral health care provider's primary professional obligation. In serving the public, a dentist may exercise reasonable discretion in selecting patients for his/her practice. However, he/she may not deny dental care to an individual solely based on race, creed, color, sex, handicap, disability (including HIV), or national origin.

RECOMMENDATION:

Providers and patients should have open discussions regarding treatment options and the potential sequelae of treatment choices.

Oral health care providers should strive for informed decision-making by all patients. HIV disease prevention should be included in the discussion of the patient's health when deemed appropriate.

As stated in the ADA code of ethics, "qualities of compassion, kindness, integrity, fairness and charity complement the ethical practice of dentistry and help to define the true professional."¹

II. LEGAL CONSIDERATIONS

RECOMMENDATION:

The ADA Principles of Ethics and Code of Professional Conduct states that all dentists are obligated to provide care to patients who seek it if the indicated treatment is within the scope of their practice.¹ Even if a practitioner is unfamiliar with management of HIV disease, routine care of an HIV-infected patient should not be refused, although referral to an experienced provider may be made.

Under federal, state, and municipal laws, it is illegal to refuse routine treatment based on HIV status alone. The employer must include reasonable accommodations for people with disabilities. HIV is classified as a disability under the ADA. Even if a practitioner is unfamiliar with management of HIV disease, routine care of an HIV-infected patient should not be refused, although referral to an experienced provider may be made. Referral should not be based on inadequate infection control procedures, unfamiliarity with HIV disease, or the belief that a hospital setting is better suited to treating patients with HIV. Failure to follow scientifically accepted infection prevention techniques in health care practice is unprofessional conduct.

III. CONFIDENTIALITY

All medical and dental records are confidential. Oral health care providers and their employees may be subject to criminal or civil prosecution if they release information regarding the health or treatment of their patients without authorization. In addition, special regulations apply to disclosure of a patient's HIV status. Information related to HIV infection may be shared only with the patient's written consent (see Appendix II). Disclosure of HIV information is allowed without patient consent only under specific conditions. These conditions, including medical necessity for the treatment of the patient, are stipulated in New York State Public Health Law, which specifies confidentiality requirements regarding HIV-related information.³

New York State Public Health Law states that patient-identifiable HIV information may be disclosed "to a health care provider or health facility when knowledge of HIV-related information is necessary to provide appropriate care or treatment to the protected individual or a child of the individual."⁴

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FURTHER READING

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APPENDIX I

SELECTED AGENTS USED TO TREAT HIV INFECTION OR RELATED CONDITIONS

TABLE I-1
SELECTED AGENTS USED TO TREAT HIV INFECTION OR RELATED CONDITIONS

Agent	Description	Adverse effects
Abacavir (Ziagen)	A nucleoside analogue reverse transcriptase inhibitor antiretroviral agent.	Hypersensitivity reaction is a serious and potentially fatal side effect. Clinical features include fever, skin rash, fatigue, malaise, gastrointestinal (GI) symptoms, arthralgia, cough and/or dyspnea.
Abacavir/lamivudine/zidovudine (Trizivir)	A combination of three nucleoside analogs.	GI symptoms, anorexia, insomnia, lab abnormalities, elevated liver enzymes, mild hyperglycemia, elevated triglycerides, headache, malaise, neuropathy, lactic acidosis, severe hepatomegaly with steatosis.
Acyclovir (Zovirax)	An antiviral used to treat herpes simplex viruses 1 and 2 and herpes zoster.	Nausea, diarrhea, headache.
Amprenavir (Agenerase)	A protease inhibitor antiretroviral agent.	GI intolerance, rash, headache, oral paresthesias, and fat redistribution. Interactions with many drugs: caution must be used when prescribing in combination with other medications. Adverse oral effect: Oral/perioral paresthesia.
Atovaquone (Mepron)	An antiprotozoal agent used to treat <i>Pneumocystis carinii</i> pneumonia.	Rash, nausea, diarrhea, headache. Adverse oral effects: Oral candidiasis, oral monilia.
Azithromycin (Zithromax)	An antibiotic used to treat <i>Chlamydia</i> and bacterial infections of the skin and respiratory tract. Used to prevent and treat <i>Mycobacterium avium</i> complex disease.	Nausea, muscle weakness, headache, and bone marrow suppression leading to anemia, leukopenia, and neutropenia. Adverse oral effects: Oral moniliasis, taste perversion.

TABLE I-1 SELECTED AGENTS USED TO TREAT HIV INFECTION OR RELATED CONDITIONS (CONT'D.)		
Agent	Description	Adverse Effects
Cidofovir (Vistide)	An antiviral used to treat cytomegalovirus infection. Given with saline and probenecid to diminish the risk of nephrotoxicity.	Nephrotoxicity, neutropenia, metabolic acidosis, uveitis, and ocular hypotony. Adverse oral effects: Oral candidiasis, stomatitis, aphthous stomatitis, mouth ulceration, dry mouth.
Ciprofloxacin (Cipro)	An antibiotic used to treat many common bacterial infections. Occasionally used in combination with other drugs to treat <i>Mycobacterium avium</i> complex disease.	GI symptoms, seizure, rash. Adverse oral effect: Painful, dry mouth.
Clarithromycin (Biaxin)	An oral macrolide used to prevent and treat <i>Mycobacterium avium</i> complex disease.	Diarrhea, nausea, abdominal pain (at high doses). Adverse oral effect: Abnormal taste.
Clindamycin (Cleocin)	An antibiotic used as an alternative treatment for <i>Pneumocystis carinii</i> pneumonia and toxoplasmosis.	Diarrhea.
Dapsone	An antileprotic drug used as an alternative in the treatment and prophylaxis of <i>Pneumocystis carinii</i> pneumonia.	Rash, fever, GI symptoms.
Delavirdine (Rescriptor)	A non-nucleoside reverse transcriptase inhibitor antiretroviral agent.	Rash (which could require drug discontinuation), headaches, and possible increase in transaminases. Adverse oral effects: Gingivitis, gum hemorrhage, increased saliva, mouth ulceration, stomatitis, tongue edema or ulceration.
Didanosine (ddI, Videx)	An antiretroviral nucleoside analogue reverse transcriptase inhibitor.	Pancreatitis, peripheral neuropathy, seizure, diarrhea. Adverse oral effect: Xerostomia.
Doxorubicin, liposome-encapsulated (Doxil)	An antineoplastic antibiotic used in chemotherapy for advanced Kaposi's sarcoma.	Neutropenia.
Dronabinol (THC, Marinol)	A cannabinoid used to treat wasting syndrome (anorexia, cachexia).	Asthenia, tachycardia, vasodilation, amnesia, anxiety, euphoria, hallucinations, paranoid reaction, somnolence. Adverse oral effect: Xerostomia.

TABLE I-1 SELECTED AGENTS USED TO TREAT HIV INFECTION OR RELATED CONDITIONS (CONT'D.)		
Agent	Description	Adverse Effects
Efavirenz (Sustiva)	A non-nucleoside reverse transcriptase inhibitor antiretroviral agent.	Rash, central nervous system side effects, including confusion, abnormal thinking, impaired concentration, depersonalization, abnormal dreams and dizziness. Interactions with many drugs; caution must be used when prescribing in combination with other medications. Adverse oral effect: Dry mouth.
Erythropoietin (Procrit, Epogen)	A glycoprotein that stimulates the production of red blood cells. Used to treat AIDS-related anemias.	Headache, arthralgia, fatigue, fever, diarrhea.
Famciclovir (Famvir)	An antiviral used to treat herpes simplex and herpes zoster.	Nausea, diarrhea, headache.
Fluconazole (Diflucan)	An antifungal used to treat candidiasis and cryptococcosis.	Nausea, headache, rash, vomiting, diarrhea, prolonged prothrombin time with Coumadin. Adverse oral effect: Erythema multiforme syndrome.
Foscarnet (Foscavir)	A non-nucleoside analogue reverse transcriptase inhibitor used to treat cytomegalovirus infection and acyclovir-resistant herpes virus infections.	Impaired renal function, thrombocytopenia, anemia. Adverse oral effects: Oral ulcers, xerostomia, circumoral fasciculation due to hypocalcemia.
Ganciclovir (Cytovene)	An antiviral used for treatment or prevention of cytomegalovirus retinitis and other types of cytomegalovirus end-organ disease.	Neutropenia, thrombocytopenia, anemia, rash. Adverse oral effects: Aphthous stomatitis, mouth ulceration, tongue disorder.
Hydroxyurea (Hydrea)	A ribonucleoside reductase inhibitor.	Bone marrow suppression with leukopenia, anemia, and thrombocytopenia. GI intolerance, including stomatitis, nausea, vomiting, anorexia, diarrhea, and constipation.
Immune globulin	An agent used for treatment of primary immunodeficiencies.	Flushing, headache, dizziness, myalgia.
Indinavir (Crixivan)	A protease inhibitor antiretroviral agent.	Hyperbilirubinemia, kidney stones.

TABLE I-1 SELECTED AGENTS USED TO TREAT HIV INFECTION OR RELATED CONDITIONS (CONT'D.)		
Agent	Descriptions	Adverse Effects
Interferon α -2a (Roferon-A)	A protein that inhibits viral replication; used in treating Kaposi's sarcoma.	Flu-like symptoms, neutropenia, depression, confusion, anemia, paresthesia. Adverse oral effects: Xerostomia, gingivitis.
Interferon α -2b (Intron)	A protein that inhibits viral replication; used in treating Kaposi's sarcoma, hepatitis B, and hepatitis C.	Adverse oral effects: Xerostomia, gingivitis.
Itraconazole (Sporanox)	An antifungal used for treatment of blastomycosis, histoplasmosis, and candidiasis.	GI intolerance, rash, pruritis, headache, hepatitis. Adverse oral effects: Gingivitis, ulcerative stomatitis.
Ketoconazole (Nizoral)	An antifungal used to treat oral, vaginal, and esophageal thrush, candidiasis, and cryptococcosis.	Serious liver damage, reduced testosterone levels.
Lamivudine (3TC, Epivir)	A nucleoside analogue that appears to increase responsiveness to zidovudine in patients with previously zidovudine-resistant virus.	Hair loss.
Lopinavir/Ritonavir (Kaletra)	A combination protease inhibitor antiretroviral agent.	GI symptoms, diarrhea. Interactions with many drugs: caution must be used when prescribing in combination with other medications; elevations in cholesterol and triglycerides. Adverse oral effects: Dry mouth, ulcerative stomatitis.
Megestrol acetate (Megace)	A synthetic progestin used for treatment of wasting syndrome (anorexia, cachexia).	Most serious: hypogonadism, diabetes, adrenal insufficiency. Most common: diarrhea, impotence, rash, flatulence, asthenia, hyperglycemia, pain.
Nelfinavir (Viracept)	A protease inhibitor antiretroviral agent.	Diarrhea or loose stools, fat redistribution, increased levels of triglycerides and/or cholesterol, hyperglycemia, osteoporosis, possible increased bleeding with hemophilia. Adverse oral effect: Mouth ulceration.

TABLE I-1 SELECTED AGENTS USED TO TREAT HIV INFECTION OR RELATED CONDITIONS (CONT'D.)		
Agent	Description	Adverse Effects
Nevirapine (Viramune)	A non-nucleoside reverse transcriptase inhibitor antiretroviral agent.	The major toxicities are life-threatening cutaneous and hepatic reactions during the initial 8 weeks of treatment. Patients should be warned to promptly report symptoms of hypersensitivity reaction (fever, rash, arthralgias, myalgias).
Octreotide (Sandostatin)	A synthetic hormone used for controlling diarrhea.	Cholelithiasis or biliary sludge in 15% to 20%; GI symptoms, including nausea, vomiting, cramping, and diarrhea. CNS symptoms: headache, dizziness, lightheadedness, and asthenia. Hyperglycemia.
Pentamidine (Pentam for IV use; NebuPent for inhalation)	An antiprotozoal agent used in aerosol form as an alternative agent for <i>Pneumocystis carinii</i> pneumonia prophylaxis and in intravenous form for treatment of PCP.	Nephrotoxicity, hypotension, hypoglycemia, leukopenia.
Pyrimethamine (Daraprim)	An oral antiprotozoal drug used in combination with sulfadiazine for the treatment of toxoplasmosis.	Severe allergic reactions and rashes, anemia, leukopenia, thrombocytopenia, insomnia, diarrhea. Adverse oral effect: Atrophic glossitis.
Rifabutin (Mycobutin)	An antibiotic used to prevent and, in combination with other drugs, to treat <i>Mycobacterium avium</i> complex disease.	Neutropenia, eye and muscle irritation, discoloration of skin and urine. Adverse oral effects: Red discoloration of saliva, sputum.
Ritonavir (Norvir)	A protease inhibitor antiretroviral agent.	Elevations in cholesterol and triglycerides. Interactions with many drugs: caution must be used when prescribing in combination with other medications. Adverse oral effects: Periodontal abscess, dry mouth, gingivitis, mouth ulceration, oral moniliasis.
Saquinavir (Invirase or Fortovase)	A protease inhibitor antiretroviral agent.	Nephrolithiasis, diarrhea, abdominal discomfort, nausea. Adverse oral effect: Taste alteration.

TABLE I-1 SELECTED AGENTS USED TO TREAT HIV INFECTION OR RELATED CONDITIONS (CONT'D.)		
Agent	Description	Adverse Effects
Stavudine (d4T, Zerit)	A nucleoside reverse transcriptase inhibitor antiretroviral agent.	Peripheral neuropathy, panic attacks, insomnia, headache.
Trimethoprim/sulfamethoxazole (TMP/SMX) (Septra or Bactrim)	An antibiotic used to prevent and treat <i>Pneumocystis carinii</i> pneumonia.	Skin rash (which can progress to Stevens-Johnson syndrome), digestive disturbances, bone marrow suppression, liver impairment.
Zalcitabine (ddC, Hivid)	A nucleoside reverse transcriptase inhibitor agent.	Skin rash, peripheral neuropathy. Adverse oral effects: Oral ulcers, stomatitis.
Zidovudine (ZDV, AZT, Retrovir)	A nucleoside reverse transcriptase inhibitor agent. Recommended as the first agent to be used when antiretroviral therapy for AIDS is initiated.	Bone marrow suppression leading to anemia, leukopenia or neutropenia, nausea, muscle weakness, headache. Adverse oral effects: Dry mouth, taste perversion.
Zidovudine/Lamivudine (Combivir)	A combination of two reverse transcriptase inhibitors.	See zidovudine and lamivudine.

APPENDIX II

AUTHORIZATION FOR RELEASE OF CONFIDENTIAL HIV-RELATED* INFORMATION†

Confidential HIV-related information is any information indicating that a person had an HIV-related test or has HIV infection, HIV-related illness or AIDS, or any information that could indicate that a person has been potentially exposed to HIV.

Under New York State law, confidential HIV-related information can only be given to people you allow to have it by signing a written release or to people who need to know your HIV status in order to provide medical care and services, including medical care providers; persons involved with foster care or adoption; parents and guardians who consent to care of minors; jail, prison, probation, and parole employees; emergency response workers and other workers in hospitals, other regulated settings, or medical offices who are exposed to blood/body fluids in the course of their employment; and organizations that review the services you receive. The law also allows your HIV information to be released under limited circumstances (i.e., by special court order, to public health officials as required by law, and to insurers as necessary to pay for care and treatment). Anyone who illegally discloses HIV-related information may be punished by a fine of up to \$5,000 and a jail term of up to 1 year. For more information about HIV confidentiality, call the New York State Department of Health HIV Confidentiality Hotline at 1-800-962-5065.

If you sign this form, HIV-related information can be given to the people listed on the form, and for the reason(s) listed on the form. You do not have to sign the form, and you can change your mind at any time.

The law protects you from HIV-related discrimination in housing, employment, health care, or other services. For more information, call the New York State Division of Human Rights Office of AIDS Discrimination Issues at 1-800-523-2437 or (212) 417-5043 or the New York City Commission on Human Rights at (212) 306-7500. These agencies are responsible for protecting your rights.

* Human immunodeficiency virus that causes AIDS.

† Available for download at:

<http://www.health.state.ny.us/nysdoh/hiv aids/hivpartner/infoprov.htm#consent>

APPENDIX III

SUMMARY OF HIV REPORTING AND PARTNER NOTIFICATION

Chapter 163 of the Laws of 1998 amended Public Health Law (PHL) Article 21 (“Control of Acute Communicable Diseases”) to require the reporting of persons with 1) HIV, 2) HIV-related illness, and 3) AIDS by New York State physicians and other medical providers (e.g., physician assistants, nurse practitioners, midwives) who make diagnoses and by laboratories performing diagnostic tests. (Note: HIV tests performed for research purposes only are not included.) The new law also requires that reports contain names of sexual or needle-sharing partners who are known to the medical provider or whom the infected person wishes to have notified.

The law reflects the recognized need, given new pharmaceuticals that delay the progression from HIV to AIDS significantly, to better track the epidemic in order to target resources and plan services appropriately. AIDS reporting alone is no longer an effective public health tool. Also, provisions requiring notification of exposed persons reflect a traditional public health intervention to limit the spread of communicable disease.

Briefly, the implementing regulations [10 New York Code Rules and Regulations (NYCRR) § 63] and protocols provide that:

- Physicians, nurse practitioners, physician assistants, and midwives report identifying information, including patient name, on standard forms to the New York State Commissioner of Health, except in New York City where medical provider reports are to be sent to the New York City Department of Health (following the established protocol for AIDS reporting, which has been in effect since 1985).
- Clinical laboratories (including blood banks) electronically report HIV tests to the New York State Commissioner. For the purpose of the regulation, reportable HIV tests include HIV antibody tests, HIV nucleic acid detection tests, and CD4 lymphocyte counts <500 unless such tests are known to be performed for reasons other than HIV infection/diagnosis (e.g., related to cancer monitoring). Encryption and electronic security protocols (e.g., firewall, passwords) have been put in place for these transfers.
- Medical providers complete a timely report listing sexual (e.g., spouses) and needle-sharing partners who are known to the medical provider or whom the infected person wishes to have notified and indicating if notification of these partners has already been performed in addition to identifying whether a domestic violence screening protocol has been conducted with the patient and/or the patient’s contacts. Trained public health staff (in some cases, state employees; in other cases, county/New York

City health staff) may contact providers to verify information and, when appropriate, notify partners to ensure they are aware of their exposure. Such partners will be counseled and offered HIV testing. In all partner notification activities, the name of the infected person is never to be disclosed.

- Partner names will be maintained no longer than 1 year after case closure.
- Anonymous testing is specifically excepted from the reporting requirement; anonymous counseling and testing services will continue to be available.
- Disclosing existing HIV information in certain listed occupational settings to persons who have been exposed to blood and body fluids is permitted under the new statute and regulations [10 NYCRR § 63.8(m)]* when:
 - the exposure incident occurred to staff/employees/volunteers in their employment or professional duties in a medical/dental office or a facility regulated by DOH, OMH, OMRDD, OCFS, OASAS, DOCS, or when the exposure incident involved an emergency response employee (e.g., fire, police).
 - the incident is documented by supervisory staff.
 - the provider of the exposed person requests disclosure, stating that information is necessary for decisions on treatment.
 - the exposed person is HIV negative or has consented to an HIV test him/herself; however, if the test returns positive prior to disclosure, no disclosure will occur.
 - documentation is placed in the chart of the exposed person; however, the name of the person whose HIV test result is released is not given to the exposed person.
 - the medical provider for the source of the exposure determines that a risk of transmission is likely to have occurred.
- Liability provisions in PHL § 2136: good-faith reporting or disclosure shall not constitute libel or slander, or violations of the right to privacy, or protections of privileged communications. Immunity is granted with respect to civil or criminal liability for any person complying in good faith with the law.
- Disclosure of partners is a voluntary activity; no criminal or civil liability arises for non-disclosure of contacts by the patient.

* Although these measures address disclosure of existing HIV information in a person's record, such disclosure does NOT permit testing of the source.

APPENDIX IV

NEW YORK STATE DEPARTMENT OF HEALTH ANONYMOUS HIV COUNSELING AND TESTING PROGRAM

The New York State Department of Health Anonymous Counseling and Testing Program provides free counseling and testing services as well as support and referral throughout the state. Each region has a hotline staffed by trained counselors who can provide counseling, information about community resources, and schedule appointments for all anonymous counseling and testing sites in their region.

Individuals who are tested by the program will not be asked for their names. However, all individuals who test HIV positive have the option of attaching their names to their test results. This allows them to access medical care and other services more quickly without having to take another HIV antibody test. Listed below are the telephone numbers for each region. Please use the 800 number when calling from outside the local area. The hours of hotline operation are 8:30 am to 4:30 pm, Monday through Friday.

	Local Number	800 Number
Albany	(518) 473-4641	1-800-962-5065
Buffalo	(716) 847-4520	1-800-962-5064
Nassau	(516) 565-4628/9	1-800-462-6785
New Rochelle	(914) 632-3443	1-800-828-0064
Rochester	(716) 423-8080	1-800-962-5063
Suffolk	(516) 952-2083	1-800-462-6786
Syracuse	(315) 426-7760	1-800-562-9423

During non-business hours, call the
NYS HIV Counseling Hotline: 1-800-872-2777
Monday to Friday 4:00 pm to 8:00 pm
Saturday to Sunday 10:00 am to 6:00 pm

New York City Department of Health
All HIV Counseling and Testing Sites: (212) 447-8200

APPENDIX V

INFORMED CONSENT FORM

DOH-2556*

INFORMED CONSENT TO PERFORM AN HIV TEST

The decision to have an HIV test is voluntary. In order to have an HIV test in New York State, you must give your consent in writing at the end of this form.

TESTING FOR HIV INFECTION

Testing Methods:

There are a number of tests that can be done to show if you are infected with HIV, the virus that causes AIDS. Your provider or counselor can provide specific information on these tests. These tests involve collecting and testing blood, urine, or oral fluid. The most common test for HIV is the HIV antibody test.

Meaning of HIV Test Results:

- A negative result on the HIV antibody test most likely means that you are not infected with HIV, but it may not show recent infection. If you think you have been exposed to HIV, you should take the test again 3 months after the last possible exposure.
- A positive result on the test means that you are infected with HIV and can infect others.
- Sometimes the HIV antibody test result is not clearly positive or negative or may be a preliminary result. Your provider or counselor will explain this result and may ask that you give your consent for further testing.

Confidential or Anonymous HIV Testing:

When you decide to have an HIV antibody test, you may choose either a confidential or an anonymous test.

- If you want your test result to become part of your medical record so it can be used for your medical care, you can have a confidential test done. A confidential test requires that you provide your name.
- If you do not want anyone to know your test results or that you were tested, you can have an anonymous test at an anonymous test site. You will not be asked your name, address, or any other identifying information.
- If you receive an HIV positive test result at an anonymous test site approved by the NYS Department of Health, you will have the option of changing your test result to confidential by attaching your name to the test result. This will allow your test result to become part of your medical record.

* Available for download at:

<http://www.health.state.ny.us/nysdoh/hiv aids/hivpartner/infoprov.htm#consent>

Benefits to Testing:

There are many benefits to having an HIV test and knowing if you are infected.

If you receive an HIV negative test result:

- Your provider or counselor will tell you how to protect yourself from getting infected with HIV in the future.

If you receive an HIV positive test result:

- Your provider can give you medical care and treatment that can help you stay healthy and can manage your HIV illness.
- Your provider or counselor can tell you how to prevent passing the virus to your sexual or needle-sharing partners.
- You can increase your chances of staying healthy by eating a well-balanced, nutritious diet; getting enough sleep; exercising; avoiding alcohol, tobacco, and recreational drugs; reducing stress; and having regular check-ups.

If you are a woman who receives an HIV positive test result:

- If you are thinking about having a child, your provider will give you information to help you make informed choices about your health care and pregnancy.
- If you are pregnant, your doctor can provide the care you need and information about services and options available to you. Your provider can tell you about the risks of passing HIV infection to your baby, about medications given during pregnancy that can significantly reduce the risk of passing HIV to your baby, and the medical care available for babies who may be infected with HIV.
- If you have given birth to or breastfed a child since you were infected, your child will need to be tested for HIV and, if infected, may need additional care and treatment. Your provider can give you information about medical care available for children who may be infected with HIV.

Confidentiality of HIV Information:

If you take the HIV antibody test, your test results are confidential. Under New York State law, confidential HIV information can only be given to people you allow to have it by giving your written approval or to people who need to know your HIV status in order to provide medical care and services, including medical care providers; persons involved with foster care or adoption; parents and guardians who consent to care of minors; jail, prison, probation, and parole employees; emergency response workers and other workers in hospitals, other regulated settings or medical offices who are exposed to blood/body fluids in the course of their employment; and organizations that review the services you receive. The law also allows your HIV information to be released under limited circumstances (i.e., by special court order, to public health officials as required by law, and to insurers as necessary to pay for care and treatment).

Reporting Requirements:

Your name will be reported to the health department if you have a confirmed positive HIV antibody test result received through a confidential test, other HIV-related test results, a diagnosis of AIDS, or if you have chosen to attach your name to a positive test result at an anonymous site. The Health Department will use this information to track the epidemic and to better plan prevention, health care, and other services.

Notifying Partners:

If you test HIV positive, your provider will discuss with you the importance and benefits of notifying your partners of their possible exposure to HIV. It is important that your partners know that they may have been exposed to HIV so they can find out whether they are infected and benefit from early diagnosis and treatment. Your provider may ask you to provide the names of your partners and whether it is safe for you if they are notified. If you have been in an abusive relationship with one of these partners, it is important to share this information with your provider. For information regarding services related to domestic violence, call 1-800-942-6906.

- Under state law, your provider is required to report to the health department the names of any of your partners (present and past sexual partners, including spouses, and needle-sharing partners) of whom they know.
- If you have additional partners of whom your provider does not know, you may give their names to your provider so they can be notified.
- Several options are available to assist you and your provider in notifying partners. If you or your provider do not have a plan to notify your partners, the Health Department may notify them without revealing your identity. If this notification presents a risk of harm to you, the Health Department may defer the notification for a period of time sufficient to allow you to access domestic violence prevention services.
- If you do not name any partners to your provider or if a need exists to confirm information about your partners, the Health Department may contact you to request your cooperation in this process.

Confidentiality of HIV Test Results and Related Information:

If you feel your confidentiality has been broken or for more information about HIV confidentiality, call the New York State Department of Health HIV Confidentiality Hotline at 1-800-962-5065. Any health or social service provider who illegally tells anyone about your HIV information may be punished by a fine of up to \$5,000 and a jail term of up to 1 year.

The law also protects you from HIV-related discrimination in housing, employment, health care, or other services. For more information, call the New York State Division of Human Rights at 1-800-523-2437.

My questions about the HIV antibody test were answered. I agree to be tested for HIV.

Signature: _____

Date: _____

I provided pre-test counseling in accordance with Article 27-F of the New York State Public Health Law. I answered the above individual's questions about the test and offered him/her an unsigned copy of this form.

Signature: _____ Title: _____

Facility/Provider

Name: _____

APPENDIX VI

INFORMED CONSENT FORM

DOH-4054*

INFORMED CONSENT TO PERFORM AN HIV TEST AND AUTHORIZATION FOR RELEASE OF HIV-RELATED INFORMATION FOR PURPOSES OF PROVIDING POST-EXPOSURE CARE TO A HEALTH CARE WORKER EXPOSED TO A PATIENT'S BLOOD OR BODY FLUIDS

An employee has been exposed to your blood or a body fluid in a manner that may pose a risk for transmission of a bloodborne infection. Many individuals may not know whether they have a bloodborne infection because people can carry these viruses without having any symptoms. We therefore are asking for your consent to test for the presence of human immunodeficiency virus (HIV). You will also be tested for hepatitis B virus (HBV) and hepatitis C virus (HCV).

Under New York State law, HIV testing is voluntary and requires your consent in writing (consent can be withdrawn for the test at any time). There are a number of tests that can be done to show if you are infected with HIV. Your provider or counselor can provide specific information on these tests. These tests involve collecting and testing blood, urine, or oral fluid. The most common test for HIV is the HIV antibody test. In this circumstance, the test result will be used to help determine whether the exposed health care worker is now at risk for HIV and needs treatment for that exposure. Additional testing also will tell whether you are carrying HBV or HCV.

Meaning of HIV Test Results

- A negative result on the HIV antibody test most likely means that you are not infected with HIV but may not show recent infection. If you think you have been exposed to HIV, you should discuss this with the person requesting your consent for HIV testing, and you should take the test again 3 months after the last possible exposure.
- A positive result on the test means that you are infected with HIV and can infect others.
- Sometimes the HIV antibody test result is not clearly positive or negative. Your provider or counselor will explain this result and may ask that you give your consent for further testing.

The benefits of having an HIV test and your confidentiality protections and discrimination issues under the law are explained on the reverse side of this form. You also are being asked to authorize the release of confidential HIV-related information related to this request to the health professional, named below, who is treating the exposed health care worker. This is necessary to provide appropriate care and to counsel the worker about his or her risk of becoming infected

* Available for download at:
<http://www.health.state.ny.us/nysdoh/hiv aids/hivpartner/infoprov.htm#consent>

and possibly infecting others. Under New York State law, except for certain people, confidential HIV-related information can only be given to persons you allow to have it by signing a release. These individuals are prohibited by law from subsequently disclosing these test results in a way that could reveal your identity. A list of people who can be given confidential HIV-related information without a release form appears on the reverse side of this form.

_____ Name of exposed employee's health care provider to whom HIV test result will be disclosed	_____ (Optional) Name of exposed health care worker to whom HIV test result will be disclosed
--	--

Prior to executing this consent, you must be counseled about the implications of HIV testing and your confidentiality protections under the law.

I understand the purpose for which I am being asked to submit a specimen for HIV testing. My questions about the HIV test were answered. I agree to be tested for HIV, and I authorize release of this information to the exposed health care worker and his/her health care providers. This release is effective for one year after the date listed below.

_____ Print name of the person to be tested	_____ Date
--	---------------

Signature of the person to be tested or of the person consenting if different from the person to be tested

I provided pretest counseling in accordance with Article 27-F of the New York State Public Health Law. I answered the above individual's questions about the test and offered him/her an unsigned copy of this form.

Signature_____Title_____

Facility/Provider Name_____

Although confidential testing with identifiers is necessary for occupational exposure, New York State law requires that you be informed that HIV testing can be performed anonymously. For a list of anonymous sites, call 1-800-541-2437.

Benefits to Testing

There are many benefits to having an HIV test and knowing if you are infected.

If you receive an HIV negative test result:

- Your provider or counselor will tell you how to protect yourself from getting infected with HIV in the future.

If you receive an HIV positive test result:

- Your provider can give you medical care and treatment that can help you stay healthy and can manage your HIV illness.
- Your provider or counselor can tell you how to prevent passing the virus to your sexual or needle-sharing partners.
- You can increase your chances of staying healthy by eating a well-balanced, nutritious diet, getting enough sleep, exercising, avoiding alcohol, tobacco, and recreational drugs, reducing stress and having regular check-ups.

If you are a woman who receives an HIV positive test result:

- If you are thinking about having a child, your provider will give you information to help you make informed choices about your health care and pregnancy.
- If you are pregnant, your doctor can provide the care you need and information about services and options available to you. Your provider can tell you about the risks of passing HIV infection to your baby, about medications given during pregnancy that can significantly reduce the risk of passing HIV to your baby, and about the medical care available for babies who may be infected with HIV.
- If you have given birth to or breastfed a child since you were infected, your child will need to be tested for HIV and, if infected, may need additional care and treatment. Your provider can give you information about medical care available for children who may be infected with HIV.

Confidentiality of HIV Information:

If you take the HIV antibody test, your test results are confidential. Under New York State law, confidential HIV information can only be given to people you allow to have it by giving your written approval or to people who need to know your HIV status in order to provide medical care and services, including medical care providers; persons involved with foster care or adoption; parents and guardians who consent to care of minors; jail, prison, probation and parole employees; emergency response workers and other workers in hospitals, other regulated settings or medical offices who are exposed to blood/body fluids in the course of their employment; and organizations that review the services you receive. The law also allows your HIV information to be released under limited circumstances (i.e., by special court order, to public health officials as required by law, and to insurers as necessary to pay for care and treatment).

Reporting Requirements:

Your name will be reported to the New York State Health Department if you have a confirmed positive HIV antibody test result received through a confidential test, other HIV-related test results, a diagnosis of AIDS, or if you have chosen to attach your name to a positive test result at an anonymous site. The New York State Health Department will use this information to track the epidemic and to better plan prevention, health care, and other services.

Notifying Partners:

If you test HIV positive, your provider will discuss with you the importance and benefits of notifying your partners of their possible exposure to HIV. It is important that your partners know they may have been exposed to HIV so they can find out whether they are infected and can benefit from early diagnosis and treatment. Your provider may ask you to provide the names of your partners and whether it is safe for you if they are notified. If you have been in an abusive relationship with one of these partners, it is important to share this information with your provider. For information regarding services related to domestic violence, call 1-800-942-6906.

- Under state law, your provider is required to report to the Health Department the names of any of your partners (present and past sexual partners, including spouses, and needle-sharing partners) of whom they know.
- If you have additional partners of whom your provider does not know, you may give their names to your provider so they can be notified.
- Several options are available to assist you and your provider in notifying partners. If you or your provider do not have a plan to notify your partners, the Health Department may notify them without revealing your identity. If this notification presents a risk of harm to you, the Health Department may defer the notification for a period of time sufficient to allow you to access domestic violence prevention services.
- If you do not name any partners to your provider or if a need exists to confirm information about your partners, the Health Department may contact you to request your cooperation in this process.

Confidentiality of HIV Test Results and Related Information:

If you feel your confidentiality has been broken or for more information about HIV confidentiality, call the New York State Department of Health HIV Confidentiality Hotline at 1-800-962-5065. Any health or social service provider who illegally tells anyone about your HIV information may be punished by a fine of up to \$5,000 and a jail term of up to 1 year. The law also protects you from HIV-related discrimination in housing, employment, health care, or other services. For more information, call the New York State Division of Human Rights at 1-800-523-2437.

INDEX

A

Abacavir/lamivudine/zidovudine (Trizivir), 69t
Abacavir (Ziagen), 69t
Access to oral health care, 2–3
Acyclovir (Zovirax), 69t
for hairy leukoplakia, 17
for herpes simplex ulcers, 20
Adolescence and HIV infection, 50. *See also* Pediatric patients
Airborne infection control, 56–58
Americans with Disabilities Act, 55–56, 61
Amphotericin B, 14t, 15t
Amprenavir (Agenerase), 69t
Angular cheilitis, 13, 29. *See also* Candidiasis
 in pediatric patients, 48, 53
Antibiotics
 for necrotizing ulcerative periodontitis, 32
 prophylactic, 6, 35–36
Antifungal agents
 for candidiasis, 13–14, 14t–16t
 caries risk and, 5, 13
 interaction with antiretroviral drugs, 13
 for pediatric patients, 47, 47t
 prophylactic, for patients receiving systemic antibiotics, 32
Antiretroviral therapy, 69t–74t
 adherence to, 1
 effects on dental treatment, 4, 5
 highly active (HAART), 1
 interaction with antifungal agents, 13
 postexposure prophylaxis for health care workers, 59–61, 60
Aphthous ulcers, 17, 20–21, 22t, 30
 in pediatric patients, 49, 53
Aspergillosis, 23
Atovaquone (Mepron), 69t
Authorization for release of confidential HIV-related information, 75–76
Azithromycin (Zithromax), 69t

B

Bacterial endocarditis, 6
BCG vaccine, 57
Betamethasone dipropionate-clotrimazole cream, 15t
Bleeding complications, 11, 36–37
Bloodborne infection control, 58–61
 HIV co-infection with other blood-borne pathogens, 59
 postexposure prophylaxis, 58–61, 60
 risk of HIV transmission to health care workers, 59
Bruxism, 6

C

Candidiasis, 3, 11, 12–16
 angular cheilitis, 13, 29
 antibiotic therapy as risk factor for, 32
 diagnosis of, 12–13
 erythematous, 13, 29
 in pediatric patients, 46–47, 47t, 53
 prophylaxis for recurrent infections, 16
 pseudomembranous (thrush), 12–13, 29
 treatment of, 13–14, 14t–16t
CD4 lymphocyte count, 7, 11, 35
Chemotherapy, for Kaposi's sarcoma, 24
Chlorhexidine oral rinse, 25, 33
Cidofovir (Vistide), 70t
Ciprofloxacin (Cipro), 70t
Cisapride, interaction with antifungal agents, 16t
Clarithromycin (Biaxin), 70t
Clindamycin (Cleocin), 70t
Clobetasol propionate, for aphthous ulcers, 22t
Clotrimazole, 13, 14t, 15t
 for pediatric patients, 47t
Confidentiality, 68
 authorization for release of confidential HIV-related information, 75–76
 of HIV testing, 7, 81, 82, 84, 87, 88
Corticosteroids, for aphthous ulcers, 21, 22t

* Page numbers followed by “t” indicate tables.

Counseling, 6–8, 79
Cryptococcosis, 23
Cytomegalovirus ulcers, 17, 22–23

D

Dapsone, 70t
Delavirdine (Rescriptor), 70t
Dental caries, 5, 6, 25
 induced by antifungal agents, 5, 13
 in pediatric patients, 48
Dental implant surgery, 37
Dental unit waterline contamination, 61
Dentists, 3, 4
 HIV counseling, testing, and reporting
 by, 6–7
 preventive care by, 5–6
 role in primary care team for pediatric
 patients, 41–43
 treatment planning by, 4–5
Dexamethasone, for aphthous ulcers, 22t
Didanosine (ddI, Videx), 70t
Doxorubicin, liposome-encapsulated
 (Doxil), 70t
Dronabinol (THC, Marinol), 70t
“Dry socket,” 36

E

Efavirenz (Sustiva), 71t
Epidemiology of AIDS, 1
Epstein-Barr virus (EBV), 16, 17
Erythropoietin (Procrit, Epogen), 71t
Ethical issues, 67. *See also* Legal issues

F

Famciclovir (Famvir), 71t
Family issues, 43
Fluconazole (Diflucan), 71t
 for candidiasis, 15t, 16, 16t
 for pediatric patients, 47t
Fluocinonide, for aphthous ulcers, 22t
Fluoride therapy, 5, 13, 25, 45t
Foscarnet (Foscavir), 17, 71t

G

Ganciclovir (Cytovene), 71t
Gingival disease, 6, 11, 31–33
 linear gingival erythema, 31–32, 34
 necrotizing ulcerative gingivitis, 33
 necrotizing ulcerative periodontitis,
 32–33, 34
 in pediatric patients, 48

H

Hairy leukoplakia, 3, 11, 16–17, 29
 in pediatric patients, 49, 54
Health care workers
 with HIV or other infectious diseases,
 61–62
 immunizations for, 55
 infection control procedures for,
 55–62
 postexposure prophylaxis for, 59–61,
 60
 testing source patient after
 occupational exposure of, 61, 85–88
Hepatitis B infection, 58, 59
Hepatitis B vaccine, 55
Hepatitis C infection, 58, 59
Herpes simplex ulcers, 11, 17, 18–20, 30
 in pediatric patients, 49, 54
Herpes zoster, 17
Histoplasmosis, 11, 17, 23
HIV counseling, 6–8, 79
HIV reporting and partner notification,
 7, 77–78, 83, 88
HIV testing, 6–8, 79
 confidentiality of, 7, 81, 82, 84, 87, 88
 informed consent for, 7, 81–88
 meaning of test results, 81, 85–86
Human papillomavirus (HPV) infection,
 11, 25
Hydrocortisone acetate oral paste, for
 aphthous ulcers, 22t
Hydrocortisone-iodoquinol cream, 15t
Hydroxyurea (Hydrea), 71t

I

- Immune globulin, 71t
- Immunizations, 55, 57
- Indinavir (Crixivan), 71t
- Infection control, 4, 55–62
 - airborne, 56–58
 - bloodborne, 58–61
 - health care workers with HIV or other infectious diseases, 61–62
 - immunizations for, 55
 - procedures for, 55
 - sources for information on, 55, 61
 - training in, 55
 - waterborne, 61
- Informed consent
 - for HIV testing, 7, 81–88
 - for oral and maxillofacial surgery, 35
 - to test source patient after occupational exposure of health care worker, 61, 85–88
- Interferon
 - for human papillomavirus infection, 25
 - for Kaposi's sarcoma, 24
- Interferon a-2a (Roferon-A), 72t
- Interferon a-2b (Intron), 72t
- Isoniazid, 56
- Itraconazole (Sporanox), 72t
 - for candidiasis, 15t, 16
 - for pediatric patients, 47t

K

- Kaposi's sarcoma, 11, 23–24, 30
 - in pediatric patients, 49
- Ketoconazole (Nizoral), 72t
 - for candidiasis, 15t, 16, 16t
 - for pediatric patients, 47t

L

- Lamivudine (3TC, Epivir), 60, 72t
- Legal issues, 67–68
- Americans with Disabilities Act, 55–56, 61
 - authorization for release of confidential HIV-related information, 75–76
 - confidentiality, 7, 68
 - health care workers with HIV or other infectious diseases, 61–62
 - HIV reporting and partner notification, 7, 77–78

- HIV testing and counseling, 7, 79
- Legionella, 61
- Linear gingival erythema (LGE), 31–32, 34
 - in pediatric patients, 49–50, 54
- Lopinavir/ritonavir (Kaletra), 72t
- Lymphadenopathy, cervical, 3
- Lymphoma, oral, 11, 17, 24

M

- Megestrol acetate (Megace), 72t
- Miconazole, 15t
- Mucosal melanin pigmentation, 11, 26
- Mycobacterium avium complex (MAC), 58
- Mycobacterium tuberculosis. *See* Tuberculosis

N

- Necrotizing ulcerative gingivitis (NUG), 33
- Necrotizing ulcerative periodontitis (NUP), 32–33, 34
- Nelfinavir (Viracept), 60, 72t
- Nevirapine (Viramune), 73t
- Nystatin, 13, 14t, 15t
 - for pediatric patients, 47t

O

- Octreotide (Sandostatin), 73t
- Oral and maxillofacial surgery, 35–37
 - bleeding tendencies and, 36–37
 - extractions, 36
 - implant surgery, 37
 - post-operative complications and antibiotic prophylaxis for, 35–37
 - treatment planning for, 35
- Oral examinations, 3–4
- Oral health care
 - access to, 2–3
 - for children and adolescents, 41–50
 - complications of, 4
 - HIV counseling, testing, and reporting, 6–8, 77–79
 - initial and periodic oral examinations, 3–4
 - medication effects on, 4, 5
 - modifications in HIV-infected patients, 4
 - preventive care, 5–6
 - recommendations for, 1–2

referral for, 2, 12
for soft-tissue lesions, 11–26
for substance users, 6
treatment planning, 4–5

P

Parotid swelling, 25
 in pediatric patients, 48, 53
Pediatric patients, 1, 41–50
 adolescence and HIV infection, 50
 angular cheilitis in, 48, 53
 aphthous ulcers in, 49, 53
 candidiasis in, 46–47, 47t, 53
 caries and gingivitis in, 48
 diagnosis and management of oral lesions in, 46
 family issues and, 43
 findings suggestive of HIV infection in, 43t
 hairy leukoplakia in, 49, 54
 herpetic stomatitis in, 49, 54
 initial intake visit for, 44
 Kaposi's sarcoma in, 49
 linear gingival erythema in, 49–50, 54
 oral health care provider's role in
 primary care team for, 41–43
 parotid swelling in, 48, 53
 prevention and treatment planning for, 44–46, 45t
 xerostomia in, 48–49
Pentamidine (Pentam, NebuPent), 73t
Periodontal disease, 6, 11, 25, 31–33
 linear gingival erythema, 31–32, 34
 necrotizing ulcerative gingivitis, 33
 necrotizing ulcerative periodontitis, 32–33, 34
 in pediatric patients, 48
Phenytoin, interaction with antifungal agents, 16t
Podophyllin, for human papillomavirus infection, 25
Povidone-iodine intrasulcular lavage, 33
Preventive care, 5–6
 for pediatric patients, 44–46, 45t
Primary care providers, 2
 communicating oral findings to, 4
Primary health care, 1
Pseudomonas, 61
Pyrimethamine (Daraprim), 73t

R

Radiation therapy, for Kaposi's sarcoma, 24
Referral for oral health care, 2, 12
Rifabutin (Mycobutin), 73t
Rifampin, 56
 interaction with antifungal agents, 16t
Ritonavir (Norvir), 73t

S

Salivary flow stimulation, 14
Salivary gland disease, 5, 11, 25
Saquinavir (Invirase, Fortovase), 73t
Sjögren's syndrome, 25
Skin manifestations, 3
Sodium tetradecyl sulfate, for Kaposi's sarcoma, 24
Soft-tissue lesions, 3, 11–26
 biopsy of, 11
 candidiasis, 12–16, 29
 hairy leukoplakia, 16–17, 29
 human papillomavirus infection, 25
 Kaposi's sarcoma, 23–24, 30
 lymphoma, 24
 mucosal melanin pigmentation, 26
 oral ulcers, 17–23, 30
 recommendations for diagnosis and management of, 11–12
 salivary gland disease, 25
Stages of HIV infection, 3
Stavudine (d4T, Zerit), 74t
Substance use history, 4
Substance users, 6

T

Thalidomide
 for aphthous ulcers, 21
 teratogenicity of, 21
Thrombocytopenia, 37
Thrush, 12–13, 29. *See also* Candidiasis
 in pediatric patients, 47
Tooth extractions, 36
Treatment planning, 4–5
 for oral surgery, 35
 for pediatric patients, 44–46
Triamcinolone-nystatin cream, 15t
Trimethoprim/sulfamethoxazole (TMP/SMX, Septra, Bactrim), 74t

Tuberculin skin test, 56, 57
Tuberculosis
 deferring dental treatment in patients
 with, 56–58
 infection control procedures for, 56–58
 multidrug-resistant, 56, 57
 occupational exposure to, 56
 signs and symptoms of, 57
 transmission of, 57

U

Ulcers, oral, 11, 17–23
 aphthous, 20–21, 22t, 30
 cytomegalovirus, 22–23
 drug-induced, 17
 evaluation and management of, 18, 19
 herpes simplex, 18–20, 30
 other types of, 23
 in pediatric patients, 49
Universal precautions, 4, 55. *See also*
 Infection control

V

Varicella vaccine, 55

W

Warfarin, interaction with antifungal
 agents, 16t
Waterborne infection control, 61

X

Xerostomia, 5, 6, 25
 in pediatric patients, 48–49

Z

Zalcitabine (ddC, Hivid), 17, 74t
Zidovudine/lamivudine (Combivir), 60,
 74t
Zidovudine (ZDV, AZT, Retrovir), 60,
 74t

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