

living with HIV have improved we have seen our patients live longer with a vastly improved quality of life. Oral health issues continue to be very important in the diagnosis of HIV and play an increasingly significant role in helping to maintain overall systemic health in this patient population.

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Reviewing the basics of HIV/AIDS

It is critical to obtain specific information at each patient visit. Ask for most recent lab results, date taken, current medications and obtain a medical condition update. **These include the CD4 or T cell count and the Viral Load. The CD4 count is a marker for immune deficiency associated with HIV infection.** The CD4 lymphocyte count reflects the number of cells/mm³ circulating in the blood. The **lower** the number, the stronger the infection, the weaker the immune system. **Viral load is a quantitative measure of HIV viral RNA in the plasma.** Viral replication in HIV infection is rapid and continuous. From the time of infection new viral copies are produced daily. The **higher** the viral load the more active the HIV infection.

Howard dental center is a tax-exempt, non-profit organization providing comprehensive oral health care to men, women, and children living with HIV/AIDS in the metropolitan Denver area. Providing care since 1994, the clinic has continually expanded its mission to meet the ever-changing needs of the immunocompromised patient.

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THE MONOGRAPH
SERIES
ON
ORAL TREATMENT
OF
HIV+ PATIENTS
IN
PRIVATE PRACTICE

2006

UNDERWRITTEN
BY
FOUNDATION
OF
THE PIERRE FAUCHARD ACADEMY



An International Honor
Dental Organization
www.fauchard.org

Introduction

It is generally accepted that HIV is a descendant of a Simian Immunodeficiency Virus. It is surmised that it was first introduced to humans via a contamination from apes in central Africa during the mid 20th Century, most likely from eating contaminated bush meat. In the United States, the HIV virus first appeared in men who had sexual relationships with other men. During the first twenty years of the spread of the virus, the public reacted with different tolerances. Fortunately, research into the disease quickly took hold and by 2000 antiretroviral medications were available to provide some degree of maintenance for people living with HIV/AIDS. The antiretroviral medications have been a source of great relief for the millions of people suffering from this disease which at present time remains incurable.

HIV/AIDS is difficult to acquire. It is equally difficult to live with it. In addition to the physical suffering that exists, the disease is compounded by stigma, isolation, rejection, self-recrimination, and depression.

The HIV/AIDS population is well represented by people of wealth as well as the indigent. It affects people with jobs and those who are unemployed. It affects women as well as men. It is true that in the United States, men having sex with men are disproportionately represented. But this is a disease that changes. In 2005, women of color age 20-30 represent a significant proportion of the newly diagnosed.

This is a complex population and one that is not easily characterized. The oral health professional who encounters an HIV+ patient can provide appropriate treatment given the information provided here and in other useful resources.

During the 1990's, Congress enacted the Ryan White Care Act, named in memory of a boy who had contracted AIDS through a blood transfusion and had subsequently died. The Care Act is a unique approach to management of an illness. Because of it, millions of US residents benefit from comprehensive health care. Part of the Care Act included dental care. Howard Dental Center was established in 1994 through funding from the Ryan White Care Act. In 1994, many patients were still assuming they would die from this disease. Howard Dental Center strove to provide high quality compassionate oral health care to the population it served. By 2000, the

Motor Function.

Neuropathy of the extremities is common. Patients may require special help in getting to the dental office and into the dental chair. They may also be on high doses of pain medication.

Allergies and Drug Interactions

Because of the multiple medications that HIV+ patients may have been exposed to during the course of their illness, they have a propensity to develop adverse drug-to-drug interactions as well as overt allergies. An excellent source for determining the adverse interactivity of specific medications is the Epocrates® program which can be accessed at www.epocrates.com. Specifically, the side effects of the antiretroviral medications used to treat HIV are available in chart form from the Mountain-Plains AIDS Education and Training Center (www.mpaetc.org). Finally, judicious use of antibiotics as well as other medications used by dentists such as pain medications is recommended.

Premedication with antibiotics

There is no reason to pre-medicate HIV+ patients for routine dental care including routine oral surgery based on CD4 count or viral load. Having said that, there are some issues to keep in mind:

- Severely compromised patients may suffer from neutropenia (neutrophil count less than 500mm^3) and should be premedicated and/or referred to a hospital setting for care. Consultation with the patient's physician is strongly recommended in cases of severe illness.
- Due to the increased incidence of diabetes, hemophilia and avascular necrosis in this population, the need for joint replacement is higher. Although the guidelines for premedication are the same as for non-HIV infected patients, occasionally a physician will request that their patients be premedicated longer than the usual two year post operative period.
- There is an increased incidence of a history of sub-acute bacterial endocarditis in the HIV population. Again, a thorough medical history is imperative.

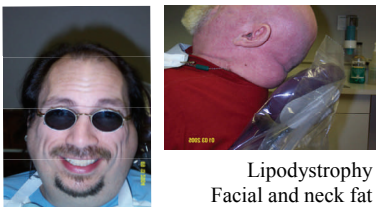
Conclusion: We hope that this compilation of monographs assists you in treating your HIV+ patients. As treatments for those

with the physician is imperative and the following laboratory tests will help dictate treatment.

Metabolic Disorders

Diabetes: HIV infected persons are three times more likely to develop diabetes than those who are not infected. As with all diabetics, careful periodontal monitoring and special care in wound healing is imperative for these patients.

Lipodystrophy: Approximately one third of all HIV infected patients are affected with lipid abnormalities. Lipodystrophy may be caused by HAART therapy and is characterized by abnormal fat distribution and metabolism. Patients may experience fat depositing in the midsection, neck, face, and back and wasting in the face and limbs. An increased incidence of hypercholesterolemia and hyperlipidemia also are characteristic of lipodystrophy and may require statins and other cardiac medications to control.



Lipodystrophy
Facial and neck fat
deposition
Photo by Howard Dental

Adrenal Insufficiency: HIV related adrenal insufficiency is rare, but requires consultation with the patient's physician prior to dental treatment. Patients may not be able to produce sufficient endogenous mineralcorticoids and glucocorticoids to respond to the stress of dental procedures. Depending upon the stress anticipated for the procedure, a doubling of the patient's normal medications for adrenal insufficiency may be necessary (for example: dexamethasone and fludrocortisone) on the day of the procedure.

Mental/Psychiatric Status.

HIV Dementia can affect cognitive, motor and behavioral activity. Memory loss is common. Many HIV infected patients suffer from depression and other psychiatric illnesses either pre-existing or as a result of the HIV virus itself or the medications they take. It is important to know the mental status of your patient to insure that they understand their treatment, are able to follow post-operative instructions and are able to get to and from their dental appointments. It may be necessary to request the assistance of an accompanying adult.

antiretroviral medications had begun to make a significant impact on HIV/AIDS patients. It became clear that HIV could become a chronic disease.

In 2003, Howard Dental Center recognized the need to change its operational systems in order to provide comprehensive care to the patient population. There was one reason for this: provision of comprehensive oral health care would bring patients to optimum oral health. That would enhance their immune systems, thus enabling patients to live more comfortable, productive lives.

Through the process of providing comprehensive care, the staff at Howard Dental Center recognized the oral health needs of the patient population were distinctive. Treating this population had become a specialty area within oral health. The Center has produced a series of monographs that would aid the private practitioner in treatment of people with HIV/AIDS. The purpose of the series is to provide the private oral practitioner with science-based information that will ensure appropriate chair-side treatment of the HIV+ patient. Through generous grants from the Caring for Colorado Foundation and the Foundation of the Pierre Fauchard Academy, a series of four monographs were sent to every actively licensed dentist and hygienist in Colorado.

This 2006 Revision is a compilation of the original four monographs.

- **Monograph I** gives a general overview of the HIV+ patient.
- **Monograph II** discusses periodontal issues and treatments.
- **Monograph III** examines one of the most troublesome aspects of HIV/AIDS oral health: xerostomia.
- **Monograph IV** deals with the medical implications of HIV/AIDS.

Howard Dental Center acknowledges the work of Sally Preston, DMD, Colleen Concepcion, DDS, Elizabeth Towne, DDS and Felicia Diamond, MA. Each person was significantly responsible for the research and drafting of the series. We also acknowledge the editing skills of Pierre Fauchard fellow, Dr. Gene S. Bloom. We are deeply indebted to the Foundation of the Pierre Fauchard Academy for their generous support of this publication.

Do You have HIV+ Patients in Your Practice?

There are between 10,000-15,000 HIV+ patients living in Colorado. With a few exceptions, (Baca, Bent, Cheyenne, Conejos, Dolores, Hinsdale, Kiowa, Phillips, and Rio Blanco) every Colorado county reports at least one HIV+ patient. The majority of HIV+ patients reside in Arapahoe, Boulder, Broomfield, Denver, El Paso, Fremont, Jefferson, Larimer, Mesa, Pueblo and Weld Counties.

Colorado demographics are similar to those throughout the United States. Seventy percent are white and sixty-three percent are men. The majority are between age 30-39. Sixteen percent are African-American, African or Caribbean; 17% are Latino. According to the Center for Disease Control (CDC), "early in the epidemic, HIV infection and AIDS were diagnosed for relatively few women. Today, the HIV/AIDS epidemic represents a growing and persistent health threat to women in the United States, especially young women and women of color."

Monograph I. Overview of the HIV Patient.

HIV may manifest itself orally. *Oral conditions that are common in the general population may indicate significant change in the HIV patient's status. Therefore, it is critical to obtain specific information at each visit. Ask for most recent lab results, current medications, and obtain a medical condition update.*

- **Most recent lab results and date taken:** Most well-monitored patients will have these values checked every 2-6 months for maintenance/monitoring. **These include the CD4 or T cell count and the Viral Load. The CD4 count is a marker for immune deficiency associated with HIV infection.** The CD4 lymphocyte count reflects the number of cells/mm³ circulating in the blood. The **lower** the number, the stronger the infection, the weaker the immune system. **Viral load is a quantitative measure of HIV viral RNA in the plasma.** Viral replication in HIV infection is rapid and continuous. From the time of infection new viral copies are produced daily. The **higher** the viral load the more active the HIV infection.

For the vast majority of HIV+ patients, there are no contraindications to having routine dental care in your office. However, for a minority of patients, especially those with an AIDS diagnosis and some long-term survivors, there are medical concerns that arise with some frequency that necessitate special consideration in the delivery of dental care. These include hematological, metabolic, psychiatric, neurological and medication-related issues.

Hematological Disorders:

HIV infected patients are at an increased risk for bleeding problems. Many take anticoagulants such as warfarin (Coumadin®) because of a higher incidence of intravascular thrombosis and cardiac issues. They may also have bleeding problems related to impaired hepatic function secondary to co-infection with hepatitis, antiretroviral medications or from the effects of the virus, itself. Hemophilic patients who are HIV+ will require preoperative factor replacement before dental treatment. For all patients with a history of bleeding problems, the placement of intrasocket medicaments such as Surgicel® or Gelfoam® following oral surgery as

Pertinent laboratory tests for patients with suspected bleeding abnormalities

Internationalized Normalized Ratio (INR) was established by the World Health Organization and is widely accepted as the norm for reporting Prothrombin Time.

- ◆ Normal INR is 1.
- ◆ Most dental procedures including extractions can be performed if the INR is less than 3.
- ◆ If INR is greater than 3, consult physician. Anticoagulant therapy may need to be adjusted.

Platelet Count

- ◆ Normal is 150,000/mm³ to 400,000/mm³.
- ◆ HIV Related Thrombocytopenia. Defined as platelet count less than 140,000/mm³. Dental work including routine extractions can be performed with platelet counts 50,000/mm³ or more. If platelet count is less than 50,000/mm³, platelet transfusion may be indicated.
- ◆ Atraumatic surgical technique, the placing of intrasocket medicaments such as Gelfoam® or Surgicel® and suturing are helpful in minimizing postoperative bleeding.

well as suturing are helpful in minimizing post operative bleeding. If a patient has a history of bleeding abnormalities, consultation

the physicians that treat the HIV+ population are very open to consultation with their dental colleagues and will provide valuable information to you.

- *CD4 count and viral load* should be obtained at **every visit** (see page 5 for details). These values provide information to track the progression of the infection and effectiveness of their medications.
- *Mode of transmission* may provide information that is relevant to care. For example, Kaposi's sarcoma is more common in transmission among men who have sex with men; coagulation issues are more prevalent in hemophiliacs; and a history of endocarditis and hepatitis is increased in substance abusers.
- *List of medications* should be reviewed at **every visit**. These may be numerous and can change often. Many of the problems HIV+ patients experience are related to the side effects of the medications they take.
- *History of Opportunistic Infections*. This information is valuable in assessing a patient's susceptibility to certain infections as well as the overall progression of disease status. The range of opportunistic infections that affect this population is broad, and includes fungal, parasitic, viral, bacterial and protozoan.
- *Co-infections*. Approximately one third of HIV+ patients are co-infected with Hepatitis C. *Co-infected patients do not fare as well as those who are singly infected*. Drug metabolism as well as coagulation issues are associated with hepatitis infection. HIV infected patients are more likely to contract Tuberculosis. It is important to ascertain Tb status and to refer those patients with active disease to appropriate facilities for treatment. The Colorado Department of Public Health and Environment closely monitors Tb patients and active infection is rare.
- *Tobacco, alcohol and illicit drug use*. The progression of HIV disease is adversely affected by smoking and alcohol use. Recreational drug use, especially cocaine, methamphetamine and ecstasy in combination with dental anesthetics and vasoconstrictors can be dangerous. In these cases, avoid using anesthetics with vasoconstrictors.

HIV/AIDS: The Basics

Lab results will indicate two readings for the CD4 or T cell count: a numerical factor and a percentage. These give the practitioner a good idea of the immune health of the patient.

<u>CD4cells/mm³</u>	<u>CD4%</u>	<u>Adults</u>
>600	32-50	Normal value
<500	<29	Initial immune suppression
<400		Manifestations of opportunistic infections, including oral lesions
200—400	14—28	Increased number and severity of opportunistic infections
<200	<14	Severe immune suppression. Appearance of major opportunistic infections. AIDS diagnosis

American Academy of Oral Medicine, 2001

Viral Load (mm³)

"non-detectable"	virus replication is well controlled by current drug regimen
>50– 1,000	good control of virus
1,000—10,000	some control of virus
100,000—1,000,000	virus is not controlled

- **Medications:** Most patients take *multiple* medications to 1) combat HIV; 2) treat the complications of HIV/AIDS; and 3) treat the side effects of the medications themselves. **At each visit, ask if medications have changed.** The medications are frequently altered in order to respond to changes in the patient's individual needs. Many of the medications interact negatively with commonly prescribed medicines, some over-the-counter drugs, and "alternative" medicines. **It is essential to use caution when prescribing medications to the HIV+ patient. Infectious disease physicians are a good source for help in coordinating oral health procedures as well as additional prescriptions. A phone call to the patient's infectious disease physician will generally result in a quick response.**
- **Medical condition update:** HIV+ patients may have lengthy and complicated health histories. Ask specifically about:
 - * Recent infections
 - * Hospitalizations
 - * Heart disease
 - * Liver disease
 - * Co-infections with Hepatitis B and/or C
 - * Tuberculosis
- **HIV patients may have particular problems with bleeding and metabolism** because of
 - 1) a high rate of Hepatitis C co-infection and
 - 2) toxicity caused by HIV medications. Both can cause severe damage to the liver making it difficult to metabolize local anesthetics, antibiotics and analgesics. Damaged livers as well as alterations in platelet metabolism caused by the HIV virus itself may elevate bleeding duration.
- **Common oral complications and conditions**

Thrush: a fungal infection, usually of *Candida albicans*, include leukoplakic, erythematous, atrophic, and hyperplastic forms. Patients may complain of pain, altered taste sensations, or halitosis.



Pseudomembranous candidiasis
Photo by HIVDENT.ORG

the HIV patient in order to provide appropriate treatment.

With the advent of HAART (highly active anti-retroviral therapy) in the mid 1990's, the nature of HIV infection changed. The diagnosis of HIV no longer implies the probability of premature death. Patients can expect to live a long and fruitful life. It is important to remember, however, that there is no cure for HIV. The virus is relentless and has an uncanny ability to mutate and resist the medications used to treat it. These patients must endure a lifetime of constantly changing drug therapies and the numerous side effects that accompany them. Even with the best of treatments, opportunistic infections can and do occur. Maintaining a healthy life style is paramount in achieving longevity. Oral health plays an important role in helping to achieve and sustain a higher quality of life. As important members of the health care team that treat the HIV infected, dentists and hygienists have a responsibility to familiarize themselves with some of the medical issues that these patients face.

The HIV virus adversely affects the immune system, specifically the CD4 lymphocytes. In so doing, the host's immune capabilities are compromised, thus opening the portal for opportunistic infections to occur. We are familiar with the common opportunistic infections of the oral cavity such as *Candida*, herpes simplex, aphthous stomatitis, human papillomatous virus and acute necrotizing periodontitis that affect the HIV+ patient. *What we need to keep in mind, however, is the fact the HIV+ patient may suffer from a myriad of systemic issues outside the oral cavity that may affect our treatment decisions.*

Health History

The professional relationship with the HIV+ patient begins with obtaining a thorough and complete health history and ensuring that each subsequent visit begins with an update. As with any patient a thorough and relevant health history is paramount. Once the patient is identified as HIV positive, more detailed information should be obtained. The following information will help you to evaluate your patient's overall HIV status and provide you with information that will facilitate appropriate and safe dental care.

- *Name and telephone number of treating physician and/or nurse practitioner* should be in the record of all HIV+ patients. Because the medical status of these patients is constantly changing it is imperative that they be under the care of a physician well versed in infectious disease. Generally speaking,

patches associated with candidiasis, topical therapy is recommended.

Maintenance

The patient can do a variety of things to help alleviate the symptoms and minimize the damage caused by xerostomia. We give our patients the following suggestions:

- Drink plenty of water
- Avoid caffeine
- Chew sugarless gum and use sugarless candies/mints
- Avoid tobacco and alcohol (including alcohol mouth rinses)
- Use a humidifier in the home
- Maintain a healthy diet low in sweets which can lead to caries
- Rinse with chlorhexidine which reduces caries-causing bacteria (*Perio-Med*®, *Peridex*®).
- Dentures may be lined with *Vaseline*® or *Ora-Jel*® to soothe tissues and increase adherence
- Use fluoride toothpaste
- Avoid illegal drug use, especially methamphetamine and cocaine.

For the vast majority of HIV positive patients there are no contraindications to having routine dental care in your office.

Xerostomia can be a very debilitating condition. For many HIV patients, it is a chronic condition. It is challenging to treat as it is usually a side effect of something necessary (medicines) or something pathologic (HIV or salivary gland disease). There are many things a dentist can offer a patient suffering from dry mouth. Our experience at Howard Dental Center has shown us that with appropriate diagnosis and treatment protocols, we can alleviate some of the morbidity associated with xerostomia in our HIV patients.

Monograph IV. Medical Considerations in Treating the HIV+ Dental Patient.

The purpose of this section is to help the oral health professional develop an understanding of medical issues pertinent to

Treatments include:

Antifungal rinses:

nystatin oral suspension 5000,000 U

Disp 280 ml

Sig. Swish 5ml (tsp) in mouth 2 minutes, QID for 14 days

Oral toches or pastilles:

Clotrimazole 10mg

Disp. 70 troches

Sig. Dissolve one troche in mouth 5x/day for 14 days
To avoid sucrose for high caries risk patients, vaginal suppositories can be substituted for off-label use.

Systemic therapy

Fluconazole 100 mg

Disp. 15

Sig. Take 2 tabs for the initial dose, then 1 tab per day for 14 days

For more aggressive infections or potentially systemic infections, the duration and dosage should be increased.

Angular cheilitis: Although this condition may have a number of etiologies (nutritional deficiencies, decreased vertical dimension, or local habits coupled with an inflammatory response), in the HIV/AIDS patient **it is important to assume that these lesions have fungal infiltrates.** Treatments include:

Topical antifungal cream. Avoid those combinations that often include steroidal components which may further suppress the immune system. (For instance, Mycolog II cream and Lotriderm contain corticosteroids.)

Plain clotrimazole lotions and nystatin creams. These work well if applied topically 5x/day.

Herpes: Recurrent herpetic labialis is common, as well as recurrent mucosal herpes. Topical acyclovir and penciclovir are useful, but it is also appropriate for vulnerable patients to be on systemic acyclovir.

Acyclovir 400 mg

Disp.30

Sig. Take 1 tab TID for 10 days

HPV/ Human Papilloma Virus: This is the virus responsible for “venereal warts”. They are contagious. They can be removed via surgery or laser, but often recur, so treatment should be limited to those lesions which are disfiguring or hinder function. They should not be removed by electro-surgery as the virus can become aerosolized.



HPV Human Papilloma Virus
Photo by Howard Dental Center

Aphous Stomatitis: Aphous ulcerations can be severe in the HIV+ population. They are present on non-keratinized tissues such as the buccal mucosa and oropharynx and are characterized by a ring of inflammation (not always present in the severely compromised individual) and a grayish pseudomembrane. We have had very good results using the following formulated mouthwash:



Aphous ulcer of the uvula
Howard Dental Center photo

30 ml. viscous lidocaine 2%
20 ml dexamethasone solution
30 mg nystatin in suspension
60 ml liquid tetracycline
Mix with water to make 180 ml.

Disp. 180 ml
Sig. Swish and spit 5-10 ml (1-2 tsp) TID as needed

Oral Hairy Leukoplakia: OHL is characterized by whitish patches usually along the lateral border of the tongue that cannot be wiped off like those associated with candida. It is caused by the Epstein-Barr virus, usually does not require treatment and is considered benign.

Special considerations in managing oral health.

Caries susceptibility: Due to the damage of salivary glands and the xerostomic properties of many of the medicines these patients take, our patients are highly vulnerable to decay, especially cervical caries. Poor diet, high in simple carbohydrates, can of course compound the problem. We recommend fluoride treatments at each recall visit, and/or fluoride trays and rinses, such as you would prescribe for a patient receiving radiation treatment to the

Patients may experience sweating, diarrhea, chills, rhinitis, headache, visual disturbances, respiratory distress, vomiting and various cardiovascular complications such as pulmonary edema, brady or tachycardia and hyper or hypotension. *Pilocarpine* is metabolized by the liver and excreted by the kidneys.

- *Pilocarpine HCl* 5mg
Disp. 90 tablets
Sig: take 1 tab TID before meals.

There is research currently underway to develop safer, more effective anti-xerostomia medications as this problem is so common and can severely compromise an individual's quality of life. Perhaps the most effective methods to mitigate the dental effects of xerostomia are topical treatments in the dental office and treatments available to the patient at home. There are many artificial saliva products available (*Opti-Moist™*, *Salivart®*, *Xero-Lube®*) that are water-based and include cellulose derivatives which increase contact time with the oral mucosa. Another product, *Biotene*, contains an antimicrobial enzyme which helps increase intraoral moisture. Chair-side instruction coupled with written information enables the patient to use the product successfully.

Using a Fluoride Protocol as a Component of Treatment of Xerostomia

Because of the high caries rates among our patients at Howard, we have an aggressive fluoride treatment program. Fluoride varnish is applied after every prophylaxis appointment as well as at the completion of the restorative phase of treatment. The protocol for recall appointments for the HIV patient is every four months. There are several different brands of varnish available including *CavityShield*, *Duraphat* and *Duraflor*. . . all 5% sodium fluoride. For those patients who are compliant and who can afford it, we also encourage over the counter and prescription fluoride treatments.

Depending upon the severity of the dryness, it may be appropriate to do radiographs more frequently as decay is often aggressive. The patients must be educated to the possibilities of tooth loss if meticulous oral hygiene is not maintained. Sealants should be placed on non-carious surfaces when possible. To help prevent recurrent caries we encourage the use of fluoride containing cavity liners and bases. If the patient reports burning sensation coupled with erythema or has the more common white

glands and milking these glands to assess salivary flow should be a regular part of comprehensive and recall exams. Note the color, texture and moisture level of the soft tissue. Particular attention should be paid to the presence of possible oral candidiasis infection. An examination of the dentition may indicate an increase in the caries rate especially along the gingival margin and root surfaces. We have noted in many of our patients a somewhat chalky appearance and texture along the gingival margin, which may indicate early enamel/cementum breakdown. The hygienist can provide crucial diagnostic information, as this softer "texture" is very evident when scaling. Some of the questions that should be asked of a patient complaining of dry mouth are:

- Do you have trouble swallowing, tasting or chewing your food?
- Does your mouth burn?
- Is your tongue dry?
- Do you have dry, cracked lips?
- What medications do you take regularly?
- Do you use illegal (street) drugs?

Treatment

If medications are identified as the causative agent, the patient's physician can be contacted to see if alternative medications could be used to minimize the drying effect or to rule out malignancy of the salivary gland. A change of medication regimen, however, is very unlikely in the HIV population. The limited number of HIV medications available as well as resistance profiles preclude making changes in drug regimens except when drug resistance occurs or side effects are intolerable.

A prescription for oral *pilocarpine* (*Salagen*) can be given to the patient to help the saliva glands increase their production of saliva. We, however, do this rarely as the side effects can be significant. *Pilocarpine* stimulates the parasympathetic system and activates the muscarinic cholinergic receptors, which activate exocrine glands.

Over-the-counter fluoride treatments

- ◆ .05% sodium fluoride rinse (*ACT*®, *Fluoriguard*®)
- ◆ .04% stannous fluoride gel (*Gel-Kam*®)

Prescription fluoride treatments

- ◆ .2% sodium fluoride rinse (*Prevident*®rinse, *Fluorinse* by *Oral B*®). * These are used weekly
- ◆ 1.1% sodium fluoride gel (*Prevident 5000*®)*
- ◆ 0.63% Stannous pH (*Perio-Med*®) daily rinse

*Custom trays made for home use

area. We routinely use Cavity Shield 5% neutral sodium varnish, made by Omni.

Periodontal/odontogenic infections: All infectious processes can be dangerous to these patients and must be treated aggressively. ANUG and ANUP are common. For these patients:

- Use a providine iodine 10% (*Betadine*) swab
- Local debridement.
- Prescribe antibiotics, generally metronidazole (*Flagyl*) 250 mg tabs, qid x 7 days (remind patient to avoid alcohol when taking metronidazole)
- Send the patient home with a 0.12% chlorhexidine rinse (*Peridex*).
- Careful follow up for these periodontally involved patients as well as those with odontogenic infections is vital.

Monograph II. Periodontal Disease and HIV/AIDS

The management of periodontal disease has become a critical element in providing oral health care to people living with HIV/AIDS. In many cases, periodontal disease is considered among the many opportunistic infections that occur in an immunosuppressed population. The most likely cause is the way the natural flora of the mouth reacts with the immunosuppressive tendencies of HIV/AIDS. While many people suffer from some form of periodontal disease, people living with HIV tend to develop more severe infections. This section will focus on those forms of periodontal disease and common protocols utilized for treatment.

HIV/AIDS, by definition, suppresses the immune system. That fact alone makes it more difficult for an HIV+ individual to fight periodontal pathogens. The pathogenic species associated with periodontal diseases in the HIV+ patient are similar to those associated with periodontal diseases of the non HIV+ patient including *P. gingivalis*, *P. intermedia*, *E. nucleatum*, *E. corrodens* and spirochetes. Unique, however, to the HIV+ patient is the presence of a high number of candida species as well as opportunistic flora not usually associated with the oral cavity such as *Klebsiella*, *E. Coli* and *Clostridium*.¹ Because some of these organisms have proven to be responsible for tissue destruction elsewhere in the body (for example, *Clostridium* is found in pseudomembranous ulcerative colitis), it is possible that they are the cause of the more rapid and aggressive tissue destruction seen in periodontal infections of the HIV+ population.² In addition, the medications utilized to treat HIV+ can create oral conditions such as xerostomia that

encourage periodontal disease.

The incidence and severity of periodontal disease in the HIV+ population is related to levels of immune suppression. It is critical to remember that HIV/AIDS is a disease that exists in a continuum . . . at one point in time, a patient may have an AIDS diagnosis (CD4 or T Cell count less than 200) and be highly susceptible to periodontal infections. A few months later that same patient, with successful anti-viral therapy, may have a CD4 or T cell count of several hundred and be medically stable therefore decreasing susceptibility.



Acute Necrotizing Ulcerative Gingivitis
Photo by Howard Dental Center

Common forms of periodontal disease in HIV+ patients

The most common forms of AIDS/HIV related periodontal disease are:

1. Linear Gingival Erythema
2. Acute Necrotizing Ulcerative Gingivitis
3. Acute Necrotizing Ulcerative Periodontitis

Symptoms and sequela

LGE: Linear Gingival Erythema. Presents as an erythematous band visible at the free gingival margin. The redness may extend to the attached gingiva. Pain may or may not be present. According to the National Institutes of Health, LGE has a prevalence of 4%-50%. It is recognized as a possible precursor to necrotizing ulcerative periodontal conditions.



Linear Gingival Erythema (LGE)
Photo by Howard Dental Center

ANUG: Acute Necrotizing Ulcerative Gingivitis. This condition is rarely seen in people with an intact immune system. Other groups at risk include those under extreme stress, those who smoke, those whose nutrition is particularly deficient and those with extremely poor oral hygiene. Unfortunately, it is not uncommon amongst people living with HIV/AIDS. ANUG mainly affects the interdental papilla and marginal gingiva. When it is present, the patient's gums are often edematous and erythematous, with a deeper band of red present at the gingival margin. This condition is usually painful, but we have seen it present with no pain on occasion. As it progresses, pseudomembranous areas can be seen

most notably methamphetamine and cocaine can also cause xerostomia.

Xerostomia in the HIV/AIDS Population

Since the advent of anti-retroviral therapy HIV/AIDS has become a chronic disease; one that can be managed rather effectively through medications, lifestyle changes and appropriate medical and oral health intervention. With increased longevity, however, the HIV patient faces a multitude of maladies associated with long-term infection as well as many adverse side effects from the very medications that are keeping him or her alive. One side effect that is not life threatening, but very troublesome for the HIV patient and germane to the dental profession is xerostomia. Some of the anti-retroviral medications that have been implicated in causing low salivary flow include but are not limited to the Protease Inhibitors *Kaletra, Crixivan, Fortovase and Norvir* and the Non-Nucleoside Reverse Transcriptase Inhibitors *Rescriptor and Sustiva*.

The HIV virus itself may cause salivary gland disease. The exact link has not been identified but there are several theories regarding how this may occur. It is thought that an inflammatory infiltrate (similar to Sjögren's Syndrome) allows for dysfunction which, in turn, leads to parotid swelling. Other ideas incorporate inflammation of interglandular lymph nodes, lymphoepithelial lesions and salivary cysts. It has also been suggested that hyperplastic lymphoid tissue from superinfections in HIV patients may obstruct the parotid gland. Parotid swelling is the second most common reported oral lesion in patients with HIV. Oral candidiasis is number one.



3.1 Clinical results of xerostomia:
Cervical caries
Photo by Howard Dental Center

Diagnosis of Xerostomia in the HIV/AIDS Patient

The average adult produces 500ml or more of saliva in a 24 hour period. Although possible, it is unlikely that a general dentist would perform a salivary scintigraphy or sialometry to measure this in the office. Patients may be diagnosed with xerostomia after thorough questioning and a clinical exam. In most cases, the patient will inform the doctor they have "dry-mouth". A thorough medical history and intraoral exam are essential to diagnose xerostomia and to try to find the cause. Palpation of the major

Monograph III Xerostomia.

Xerostomia or “dry mouth” is one of the most significant oral complications associated with HIV infection. There is evidence to suggest that the xerostomia that we see in the HIV population is a result not only of the virus itself, but also a side effect of the antiretroviral medications that are used to treat the disease. It’s toll on oral health can be devastating, leading to root caries, oral infection, periodontal disease, and loss of teeth. This monograph will discuss the causes of xerostomia in patients with suppressed immune systems; particularly those living with HIV/AIDS. Modalities for the diagnosis and treatment of oral conditions resulting from xerostomia as well as methods for preventing its oral complications will also be discussed.

Saliva is critical to maintaining a healthy oral environment. It protects against periodontal disease with its natural antibacterial activity, and protects teeth against dental decay by helping to maintain a normal pH. Normal saliva flow allows for proper processing of food for swallowing and digestion. Lubrication from saliva allows for comfortable and proper speech. Adequate salivary flow is essential for the proper retention of oral appliances such as dentures and removable partial dentures. Xerostomia results when the salivary glands are not functioning at optimal levels to produce the required amount of saliva for proper oral health. Lack of saliva is consistent with a lower pH in the oral cavity. There is also an increased likelihood of yeast/fungal infections (oral candidiasis) when saliva flow is reduced.

Xerostomia is not confined to the immuno-compromised population. It can present as a complication of many diseases including diabetes, Parkinson’s disease, Alzheimer’s disease, Addison’s disease and Sjögren’s Syndrome. It can result from radiation and chemotherapy in cancer patients, hormonal changes in women and emotional stress.

Many medications are commonly linked to dry mouth. Most notable are anti-hypertension medications and anti-depressants. Anti-histamines, decongestants, diuretics and some pain medications can also trigger xerostomia. Illicit drug usage,

There is research currently underway to develop safer, more effective anti-xerostomia medications as this problem is so common and can severely compromise an individual’s quality of life.

along the gingival and interdental papilla as the tissue starts to necrose. After a time there can be a generalized loss of the interdental papilla. Patients with these symptoms often experience a metallic taste related to spontaneous hemorrhage of the damaged tissues. This condition may progress rapidly, extending to the underlying bone and supporting structures of the oral cavity.

ANUP: Acute Necrotizing Ulcerative Periodontitis When ANUG proceeds without intervention, the tissue continues to deteriorate. In ANUP, not only the gingiva is involved. Alveolar bone and the supporting structures are compromised and there is progressive destruction of the periodontal ligament. Patients with ANUP generally have “perio-breath” related to the ongoing necrosis and causative pathogens. There are clinically prominent changes in the appearance and the shape of the gingiva. Spontaneous bleeding is common in such patients, and they may suffer deep, unrelenting pain in the jaw. In severe cases we have seen sloughing of alveolar bony segments and loss of several teeth as a result of the necrosis of bone.



Acute Necrotizing Ulcerative Periodontitis (ANUP)
Photo by www.hivdent.org

Treatment protocols

When a patient presents with signs and symptoms of ANUG or ANUP, the best course of treatment is to act quickly and aggressively. Treatment includes:

- Local debridement and disinfection using 10% povidone-iodine solution or swabs such as Betadine® or 4% chlorhexidine gluconate wash, such as Hibiciens™.
- Scaling and root planing.
- Oral hygiene instructions.

Rx **Metronidazole 250 mg**
Disp: 28 tabs
Sig: Take one q.i.d until gone (NO ALCOHOL)

Rx **Chlorhexidine gluconate .12% oral rinse(Peridex®)**
Sig: Take 15 ml twice a day/swish for 30 seconds/spit

In cases where the patient's oral condition is too fragile to immediately scale and root plane, the hygienist may prescribe **twice daily rinsing with a chlorhexidine gluconate**. This, along with **warm saline rinses 4 to 5 times a day**, should be continued until the patient's oral condition improves. A prescription of **metronidazole** is helpful in eradicating the causative pathogens involved in these ulcerative periodontal diseases but should be used with caution in pregnant women (Jeffcoat 2003). **Broad spectrum antibiotics** or those that **target gram positive species are not appropriate** as they may allow for an overgrowth of candida. As soon as the patient can tolerate it, scaling and root planing should be initiated. Patients who have a history of ulcerative periodontitis and present with a high rate of recurrence, should be seen by their hygienist on shorter recall intervals than those who are more stable. The current protocol of "a prophy every 4 months", while applicable to less periodontally involved patients, is often not adequate in meeting the needs of those whose immune systems are more suppressed. In our practice, patients with histories of LGE/ANUG/ANUP are seen in our hygiene program every two or three months.

Patients may do well for many years with a routine periodontal program. However, once the patient presents with symptoms that are characteristic of ulcerative periodontitis, the dental hygiene treatment plan needs to be revisited and reworked. The hygienist may want to go "back to the basics". How is the patient brushing? Does he brush? How well? How often? What about flossing? Use of perio aids? All these items need to be addressed with the patient by his hygienist in the Oral Hygiene Instruction portion of the appointment. The hygienist may even have to watch the patient brush! Flossing and the use of interdental cleaners are just as important as brushing. Patients prone to ulcerative gingivitis and periodontitis should be kept on chlorhexidine rinses daily. This seems to cut down the amount of contributing pathogenic flora.

The hygienist may need to assess compliance issues. Determining factors include: Did the patient fill his prescription for an antibiotic and take it as directed? Was the chlorhexidine mouthwash used according to instructions? Is the patient brushing? In cases where the response is muted, medical factors should be discussed with the patient's physician. Refractory cases are often related to ineffective or non-existent antiretroviral therapy.

Once the causative pathogens have been eliminated and

one round of scaling and root planing has been completed, and it is determined that the patient is more stable, perio-prophy visits can be scheduled and a more permanent recall schedule implemented.

Outcomes

Generally, tissue response in a patient who has been treated appropriately for ulcerative periodontitis is excellent. We often see a dramatic tissue response with less pseudo pocketing, minimal bleeding and somewhat improved gingival architecture. Once the pathogenic bacteria is successfully eradicated, home care must remain fastidious, or the ulcerative conditions will likely return.

Other In-Office Issues: What About Aerosols?

This question is asked most often: how safe is it to use an ultrasonic cleaner in scaling the teeth of patients who are HIV+ or HCV+? And the answer is: The ultrasonic *is safe*. In our office, use of either a Piezoelectric or Cavitron scaler is almost *always* used before hand scaling. When the proper universal precautions are implemented, it is very safe for everyone. To minimize infection risks, our hygienist follows the following protocol:

- Patient is asked to pre-rinse with chlorhexidine gluconate prior to the procedure.
- During the scaling portion of the debridement, the patient holds suction passively in the mouth so that it is "always on" throughout the entire scaling.
- The hygienist wears the appropriate attire: lab coat, gloves, mask, safety glasses, and face shield.
- The patient's teeth are then cleaned with an ultrasonic cleaner; then manual scaling is completed.
- Oral irrigation is completed using chlorhexidine gluconate once again.

Treatment of patients who are relatively asymptomatic of periodontal disease.

As previously stated, oral conditions can change rapidly in this patient population due to a change in viral load or t-cell counts, change of medication, stress, co-infections such as HCV or other factors. The standard of care should include a visit to the hygienist not less than once every four months for periodontally stable patients.