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HIV/AIDS:
Updated Review and Clinical Considerations

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Table of Contents

Objectives

Upon successful completion of this online course video and self study course book the learner will be able to:

- Understand the definitions and differences between HIV and AIDS.
- Understand etiology and epidemiology of the disease.
- Identify major clinical manifestations including major oral lesions associated with HIV/ AIDS.
- Review treatment options and appropriate referral protocols.
- Use appropriate Universal Precautions and strict infection control.
- Know best practices and protocols for post-exposure reporting.
- Understand the role of the entire dental team in management of the medically complex patient.

Introduction

For many years, a diagnosis of HIV infection or AIDS was a death sentence. Then the highly effective, anti-retroviral medications were discovered. Despite all the advances in precautions and treatment, the HIV virus and the infections it causes continue to be greatly feared. Significant efforts have been made by researchers and clinicians to increase our knowledge of HIV, its infections, and effective prevention and treatment since viruses were first identified in the 1980s. The massive public health efforts have helped to reduce the fear that initially gripped the U.S. The general public and health care workers have benefited from this collectively gained knowledge. These topics were selected for dental team professionals for their continuing education yet it is up to each individual dental professional to adhere to their state's licensing requirements.

Definition, Etiology, and Epidemiology of HIV and AIDS

Clarification: HIV and AIDS are not the same. Everyone who has AIDS has been infected with HIV; but everyone with HIV infection does not have AIDS.

Human Immunodeficiency Virus (HIV)

HIV is a retrovirus that attacks the body's immune system (CD4 and t-cells), damaging the body's ability to fight diseases and infections. It can take years for HIV to weaken the immune system, but without a healthy, functioning immune system, a person is at risk of infections by bacteria, other viruses, and disease-causing organisms. Some of these infections can cause life-threatening illnesses. HIV is a sexually transmitted infection. It can also be spread by contact with infected blood or from mother to child during pregnancy, childbirth or breast-feeding. Without medication, it may take years before HIV weakens your immune system to the point that you have AIDS. (Mayo Clinic,

July 2020)

HIV—Strains and Subtypes

“HIV type 1 and HIV type 2 are two distinct viruses. Worldwide, the predominant virus is HIV-1, and generally when people talk about HIV without specifying the type of virus they are referring to HIV-1.

The relatively uncommon HIV-2 virus is concentrated in West Africa, but has been seen in other countries. It is less infectious and progresses slower than HIV-1. While commonly used antiretroviral drugs are active against HIV-2, optimum treatment is poorly understood. The strains of HIV-1 can be classified into four groups.4 The most important group, M, is the ‘major’ group and is responsible for the majority of the global HIV epidemic.

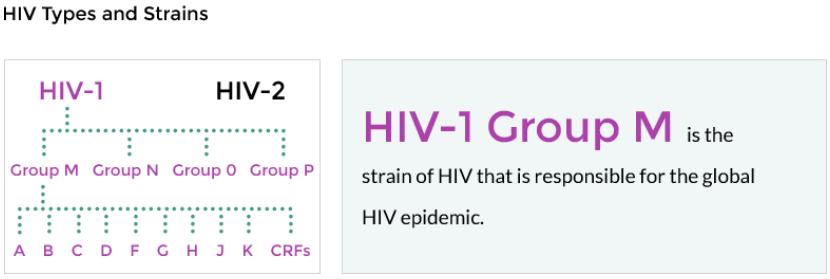
The other three groups are N, O and P. They are quite uncommon and only occur in Cameroon, Gabon and Equatorial Guinea.

Within group M there are known to be at least nine genetically distinct subtypes of HIV-1. These are subtypes A, B, C, D, F, G, H, J and K.

Additionally, different subtypes can combine genetic material to form a hybrid virus, known as a ‘circulating recombinant form’ (CRFs), of which quite a few have been identified.

The dominant HIV subtype in the Americas, Western Europe and Australasia is subtype B. As a result, the great majority of HIV clinical research has been conducted in populations where subtype B predominates. However, this subtype represents only 12% of global HIV infections.

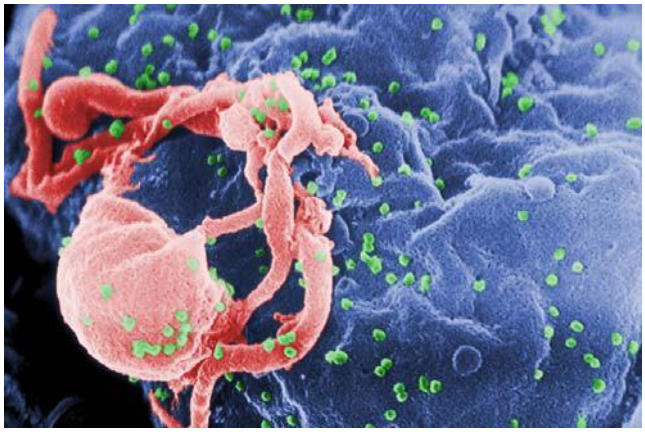
In contrast, less research is available for subtype C, although just under half of all people living with HIV have subtype C. It is very common in the high prevalence countries of Southern Africa, as well as in the horn of Africa and India.”(www.avert.org/professionals/hiv-science/types-strains, 2020)



(www.avert.org 2017)

Acquired Immunodeficiency Syndrome (AIDS)

AIDS is a complex of symptoms and infections caused by the HIV virus as it damages the immune system. AIDS is an acquired syndrome; it is not hereditary. A person must come in contact with contaminated blood and/or body fluids. As HIV damages the immune system, infected persons become vulnerable to opportunistic infections and/or diseases. Anti-retroviral medications delay the onset of AIDS in infected persons. The diagnosis of AIDS requires a positive HIV antibody test or evidence of HIV infection and the appearance of some very specific conditions/diseases.



Scanning electron micrograph of HIV-1 (in green) budding from cultured lymphocyte. Multiple round bumps on cell surface represent sites of assembly and budding of virions.

Etiology and Epidemiology of HIV/AIDS

Etiology

HIV is thought to have originated in non-human primates in sub-Saharan Africa and was transferred to humans in the late 19th or early 20th century. Both HIV-1 and HIV-2 are believed to have originated in West-Central Africa and to have jumped species from non-human primates to humans. HIV-1 appears to have originated in southern Cameroon through the evolution of SIV, a simian immunodeficiency virus (SIV) that infects wild chimpanzees. HIV-1 is thought to have jumped the species barrier on at least three separate occasions, giving rise to the three groups of the virus, M, N, and O. The earliest well-documented case of HIV in a human dates back to 1959. The virus may have been present in the United States as early as 1966, but the vast majority of infections occurring outside sub-Saharan Africa (including in the U.S.) can be traced back to a single unknown individual who became infected with HIV in Haiti and then brought the infection to the United States sometime around 1969. The epidemic then rapidly spread among high-risk groups.

Epidemiology

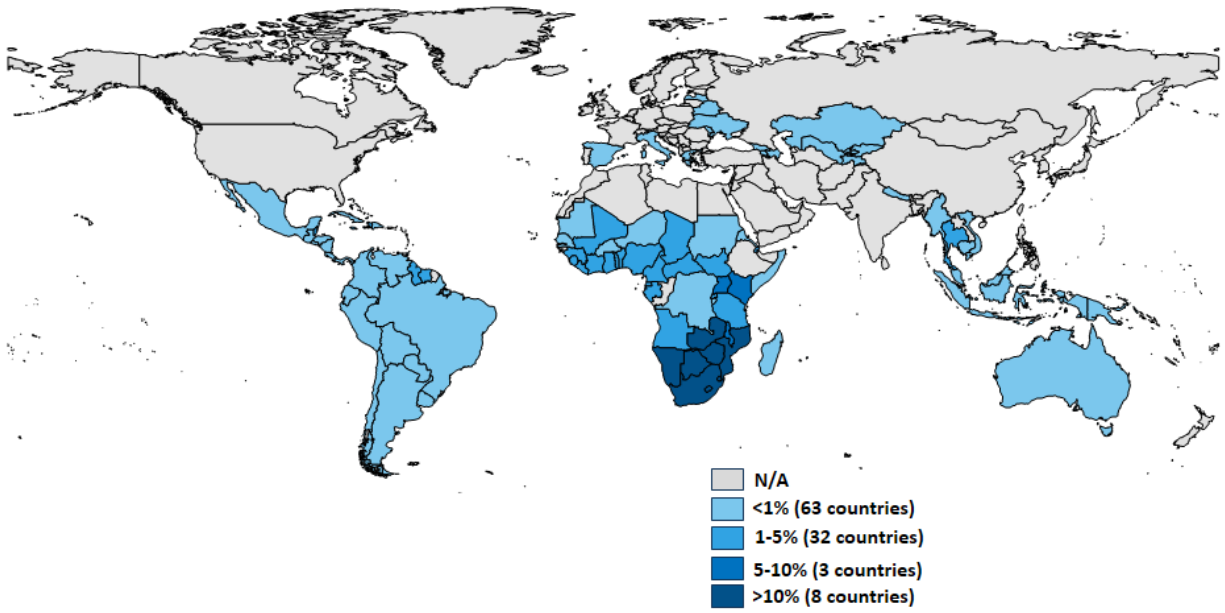
Epidemiology is the study of how disease is distributed throughout populations and the factors that influence or determine this distribution. Epidemiologists try to discover why a disease develops in some people and not in others. The transmission of HIV has been driven by multiple changes in migration, housing, travel, sexual practices, drug use, war and economics that have affected both Africa and the entire world since 1940. People who are infected with HIV come from all races, countries, sexual orientations, genders and income levels. Globally, most of the people who are infected with HIV have not been tested and are unaware that they are infected.

According to the latest estimates from UNAIDS: (www.kff.org/global-health-policy/fact-sheet/the-global-hivaids-epidemic/, 2020

- There were 36.7 million people living with HIV in 2019, up from 33.3 million in 2010, the result of continuing new infections, people living longer with HIV, and general population growth.
- Global prevalence (the percent of people ages 15-49 who are infected) has leveled since 2001 and was **0.8%** in 2019.
- **1.1 million** people died of AIDS in 2019, a 45% decrease since its peak in 2005. Deaths have declined due in part to antiretroviral treatment (ART) scale-up. HIV remains a leading cause of death worldwide and the number one cause of death in Africa.
- There were about **2.1 million** new infections in 2019 or about 5,700 new infections per day. While there have been significant declines in new infections since the mid-199os, new infections among adults have failed to decline over the past 5 years and incidence is rising in some regions.
- Most infections are transmitted heterosexually, although risk factors vary. In some countries, men who have sex with men, injecting drug users, sex workers, transgender people, and prisoners are disproportionally affected by HIV.
- Although HIV testing capacity has increased over time, enabling more people to learn their HIV status, about 4 in 10 of people with HIV are still unaware they are infected.
- HIV has led to a resurgence of tuberculosis (TB), particularly in Africa, and TB is a leading cause of death for people with HIV worldwide. In 2015, approximately 11% of new TB cases occurred in people living with HIV. However, between 2004 and 2019 TB deaths in people living with HIV declined by 32%, largely due to the scale up of joint HIV/TB services.
- Women represent half (51%) of all adults living with HIV worldwide. HIV is the leading cause of death among women of reproductive age. Gender inequalities, differential access to service, and sexual violence increase

women's vulnerability to HIV, and women, especially younger women, are biologically more susceptible to HIV.

- Young people, ages 15-24, account for approximately a third of new HIV infections. In sub-Saharan Africa, young women 15-24 account for 25% of all new HIV infections among adults, even though they represent only 17% of the adult population.
- Globally, there were **1.8 million** children living with HIV, 110,000 AIDS-related deaths, and 150,000 new infections among children in 2015. Since 2001, new HIV infections among children have declined by more than 70%.



Accessed June 2017: www.kff.org/global-health-policy/fact-sheet/the-global-hivaids-epidemic/

The Progression and Clinical Manifestations and Treatment of HIV Infection

Progression of HIV

A person with untreated HIV infection will experience several stages in infection. These include:

- Viral transmission
- Primary HIV infection
- Seroconversion
- Asymptomatic HIV infection
- Symptomatic HIV infection
- AIDS

These stages are sometimes called the “natural history” of infection progression and are described below. The natural history of HIV infection has changed dramatically in developed countries because of new medications. In countries where there is no access to medication, or in cases where people do not become aware of their HIV infection until very late in the progression of the disease, the infection progresses as described below. A cofactor is a separate condition that can change or speed up the course of infection. There are several cofactors that can increase the rate of progression of HIV to AIDS. They include a person's age, certain genetic factors and possible drug use, smoking, nutrition and HCV (Hepatitis C virus). Currently, if the infection is untreated, the average time from HIV infection to death is ten to twelve years. Early detection and medical treatment may mean that the person will live longer.

Primary HIV Infection

During the first few weeks of HIV infection, an infected person has a very high amount of virus in their bloodstream. The high viral load means the individual may more easily pass the virus to others. Unfortunately, during primary infection, many people are unaware that they are infected. The most common symptoms noticed by persons newly infected with HIV are fever, swollen lymph glands in the neck, armpits and/or groin, rash, fatigue and a sore throat (which are also common with many other types of infections). These initial symptoms go away in a few weeks, but the individual continues to be infectious. This is sometimes called “seroconversion syndrome” or “seroconversion sickness.” It resembles mononucleosis infection with similar symptoms and length of illness.

Seroconversion

Seroconversion is the time period that it takes from infection to the production of antibodies. This may vary from person to person. HIV antibodies are detectable usually within the first two to eight weeks. Results are more reliable after three months of possible exposure. The interval between HIV exposure and seroconversion may stretch as long as six months, although there are very rare cases reported in which seroconversion does not occur for up to a year.
(www.aidsmap.com/Seroconversion/page/1322973/, 2020)

Asymptomatic HIV Infection

During this time period, an HIV-infected person has no noticeable signs or symptoms. The person may look and feel healthy, but can still pass the virus to others. It is not unusual for an HIV-infected person to live ten years or longer without any outward physical signs of progression to AIDS. Meanwhile, the person’s blood and other systems are affected by HIV. This would be reflected in laboratory tests. Unless a person in this stage has been tested for HIV, he or she will probably not be aware of

infection. It is extremely important that healthcare providers consider special testing for HIV if a patient engages in HIV high-risk behaviors and is presenting with the symptoms outlined above (fever, swollen lymph glands in the neck, armpits and/or groin, rash, fatigue and sore throat). If patients experience these symptoms after having unprotected sex or sharing needles, they should seek medical care and tell their provider why they are concerned about HIV infection.

Symptomatic HIV Infection

During the symptomatic stage of HIV infection, an infected person begins to have noticeable physical symptoms that are related to HIV infection. Although there are no symptoms that are specific only to HIV infection, some common symptoms are:

- A persistent low-grade fever
- Pronounced weight loss that is not due to dieting
- Persistent headaches
- Diarrhea that lasts more than one month
- Difficulty recovering from colds and the flu
- A person may become sicker than they normally would
- Women may have recurrent vaginal yeast infections
- Thrush (a yeast infection) coating the mouth or tongue

Anyone who has symptoms like these and has engaged in behaviors that transmit HIV should seek medical advice. The only way to know for sure if you are infected with HIV is to take an HIV antibody test.

AIDS

An AIDS diagnosis can only be made by a licensed health care provider. The diagnosis is based on the result of HIV-specific blood tests and the person’s physical condition. A diagnosis of AIDS is made because the person has one of the “AIDS defining illnesses”, and has white blood cell counts and other conditions that are specifically linked to an AIDS diagnosis. People who have an AIDS diagnosis may often appear to a casual observer to be quite healthy, but continue to be infectious and can pass the virus to others. Over time, people with AIDS frequently have a reduced white blood cell count and develop poorer health. They may also have a significant amount of virus present in their blood which is measured as viral load. People are diagnosed with AIDS when they have certain signs or symptoms defined by the U.S. Centers for Disease Control and Prevention (CDC). The CDC's definition of AIDS includes:

Less than 200 CD4 and t-cells per cubic milliliter of blood, compared with about 1,000 CD4 and t-cells for healthy people. CD4 and t-cells are white blood cells that play an important role in the body's immune system. These cells are destroyed by HIV. Even

when an HIV positive person feels well and is not experiencing any symptoms of the disease, CD4 and t-cells are being infected by HIV.

CD4 and t-cells account for less than 14% of all lymphocytes, a type of white blood cell.

One of more of the illnesses listed below:

- Candidiasis of bronchi, esophagus, trachea or lungs Cervical cancer that is invasive
- Coccidioidomycosis that has spread
- Cryptococcosis that is affecting the body outside the lungs Cryptosporidiosis affecting the intestines and lasting more than a month Cytomegalovirus disease outside of the liver, spleen or lymph nodes Cytomegalovirus retinitis that occurs with vision loss
- Encephalopathy that is HIV-related
- Herpes simplex including ulcers lasting more than a month or bronchitis, pneumonitis or esophagitis
- Histoplasmosis that has spread
- Isosporiasis affecting the intestines and lasting more than a month
- Kaposi's sarcoma
- Lymphoma that is Burkitt type, immunoblastic or that is primary and affects the brain or central nervous system
- Mycobacterium avium complex or disease caused by M. kansasii
- Mycobacterium tuberculosis in or outside the lungs Other species of mycobacterium that has spread Pneumocystis jiroveci (formerly called carinii, pneumonia) Pneumonia that is recurrent
- Progressive multifocal leukoencephalopathy Salmonella septicemia that is recurrent Toxoplasmosis of the brain, also called encephalitis Wasting syndrome caused by HIV infection
- Symptoms also may include anxiety, dementia, depression and insomnia.

Clinical Manifestations and Treatment of HIV Related Fungal and Bacterial Infections

Many signs and symptoms of HIV infection first appear in the mouth and are noticed during routine clinical and screening dental examinations. When a patient presents with oral conditions of the soft tissue which may indicate an HIV-related condition such as candidiasis, the role of the dental health team cannot be overstated since this may be the primary health care contact for the patient. Discussions are underway in the public health sector about the value of offering HIV screening, in the dental setting, because in the office tests are available which give preliminary information in 20 minutes.

Ethical, public health, and practical considerations are currently being analyzed by major policy makers in dentistry. And It is interesting to note that public heath dentistry is proactively exploring the ethical issues which involve some medically complex patients in the 21st century. Although the overall prevalence of HIV-related oral lesions has declined since the advent of combination anti-retroviral therapy (ART), these conditions are still frequently seen. Dental clinicians need to be able to recognize, manage, and address the significance of the oral manifestations seen in association with HIV/ AIDS. (Dimensions of Dental Hygiene, 2011)

Oral Signs of HIV Infection

Oral lesions are significant features of HIV and AIDS infections and are often the first physical manifestation of the disease. As clinicians, it is our responsibility to be able to recognize and identify lesions associated with HIV infection. The presence or absence of certain lesions can often act as predictors to the overall progression of the disease in a diagnosed patient. However, it is important to note that the presence of oral lesions alone should not be used to diagnose HIV but should prompt the clinician to encourage further testing.

Fungal Infections

The most common oral lesion associated with HIV infection is candidiasis, predominately attributed to Candida albicans. Candida is a normal oral flora found in almost 50% of the mouths in healthy adults. However, in an immune-compromised patient, Candida is able to thrive and becomes readily apparent upon examination. Oral candidiasis can be found in over a quarter of patients with HIV disease and over 90% of patients with AIDS.

Clinically, it can have one of four different appearances:

- Erythematous or atrophic candidiasis
- Pseudomembranous candidiasis
- Hyperplastic or chronic candidiasis
- Angular cheilitis

In the case of pseudomembranous candidiasis, the infection is superficial and can be removed by scraping with a wooden tongue blade. Treatment with oral Nystatin suspension, Clotrimazole troches, or a 0.12% chlorhexidine gluconate mouth rinse is generally effective. Treatment will differ depending on how the candida presents itself in the mouth. Some forms are more invasive and require systemic treatment. The following table gives the complete treatment protocol. Recurrences are common and ultimately may require treatment with ketoconazole and fluconazole.

Pseudomembranous candidiasis

Pseudomembranous candidiasis

Hyperplastic candidiasis

TREATMENT PROTOCOL FOR FUNGAL INFECTIONS IN HIV PATIENTS			
Drug	**Route**	**Indication**	**Dose**
Nystatin suspension	topical	erythematous and pseudomembranous	500,000 U/5cc, 1 tsp rinse and swallow 4x/day
Clotrimazole troche	topical	erythematous and pseudomembranous	10 mg troche, 1 troche 5x/day
Chlorhexidine 0.12%	topical	erythematous and pseudomembranous	1 tsp rinse and spit 3x/day
ketoconazole and fluconazole	systemic, oral	all types	100-200 mg tab, 2 stat, 1 tab/day
ketoconazole 2% cream	topical	angular cheilitis	apply 4x/day

Viral Infections

Many oral viral infections found in HIV-infected individuals develop early in the illness and, if left untreated, can persist for the duration of the illness. Herpes virus causes most of the viral infections in these patients with the main culprits being herpes simplex (HSV) and Epstein-Barr (EBV) viral infections. Less common oral viral infections include cytomegalovirus (CMV), human papilloma virus (HPV) and Varicella-zoster virus (VZV). Herpes simplex virus appears intraorally as multiple, small ulcerations that form in a cluster. These lesions may be painful in the early stages but should resolve within ten days in an otherwise healthy patient. In HIV-infected patients, these lesions may take

one month or more to resolve. Likewise in HIV-infected individuals, the lesions are often found in poorly keratinized areas of the oral cavity such as buccal and labial mucosa. These sites are rarely infected in healthy individuals. Most cases are treated with 2g/day systemic Acyclovir. Human papilloma virus, also known as an oral wart, forms a hyperplastic connective tissue lesion. More than 50 strains of HPV exist. The treatment of choice is surgical excision.


Herpes labialis early stage


Herpes labialis late stage


Human papilloma virus


Human papilloma virus

Epstein-Barr

This type of viral infection produces a lesion known as Oral Hairy Leukoplakia. This lesion was once thought to be pathognomonic for HIV infection, but that belief has recently been reassessed after OHL lesions were found in patients with other immunosuppressive diseases. These lesions appear as a white, corrugated, non-wipable patch that typically appears on the lateral border of the tongue. Candida infections may be superimposed over the OHL making it painful for the patient and difficult to diagnose. Otherwise, the lesion is asymptomatic and requires no treatment other than for the sake of cosmetics.

Cytomegalovirus (CMV)

This type of virus causes a singular, deep ulceration most often involving the buccal mucosa. This lesion is clinically indistinguishable from other ulcer-like lesions. However, it is important to recognize the possibility that a lesion of this type is caused by CMV due to the serious nature of its sequelae. These include retinitis and meningitis which are seen in a vast majority of postmortem AIDS patients. CMV has increased pathogenicity in immunosuppressed people and, similar to other herpes viruses, has immunosuppressive characteristics. In order to make a definitive diagnosis, a biopsy and histological exam are required.

Bacterial Infections

Necrotizing ulcerative periodontitis (NUP) is a very aggressive form of gum disease characterized by rapid destruction of the bone, generalized bone pain, spontaneous bleeding and overall significant attachment loss. This condition has been linked to microorganisms frequently associated with periodontal disease such as the Treponema

and Selenomonas species, Fuscobacterium nucleatum, Prevotella intermedia, and Porphyromonas gingivalis. The aggressive nature of this disease is attributed to the immunosuppressed state of the patient, which is why it is commonly seen in individuals with AIDS. In fact, 95% of patients with NUP have a CD4 lymphocyte count of less than 200/ml3. Typical treatment consists of perio debridement with adjunctive antibiotic therapy and twice daily chlorhexidine gluconate 0.12% rinses.

Necrotizing ulcerative periodontitis

Kaposi's sarcoma

Neoplasms

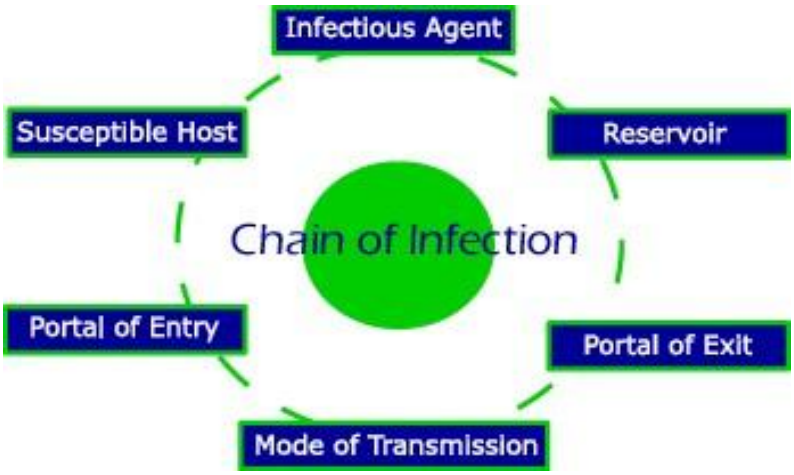
Kaposi's sarcoma is characterized by a flat, plaque phase that progresses into a multicolored, raised tumor. The most common intraoral site is the palate (both soft and hard), but the lesion has also been seen on the facial gingiva. Lesions may also occur outside of the mouth generally on the skin of the lower extremities. KS is far more common in homosexual and bisexual AIDS patients due to the presence of a certain type of human herpes virus (HHV8). This virus is thought to be an important cofactor in the incidence of KS. Diagnosis of KS requires a histologic examination. Currently there is no cure.

HIV Transmission and Infection Control

HIV and the Chain of Infection

HIV is a relatively fragile virus. It is not spread by casual contact. The chain of infection provides a model for understanding how any infection is spread.

All of the components in the illustration below must be present for an infection to occur.



The **pathogenic microorganism** is the microorganism that causes infection such as bacteria, viruses, fungi and parasites.

The **reservoir** is the place where microorganisms live, such as in humans and animals, soils, food, plants, air or water. The reservoir must meet the needs of the pathogen in order for the pathogen to survive and multiply.

The **means of escape** is how the microorganism leaves the reservoir.

The **method of transmission** is how the microorganism moves from place to place.

The **means of entry** is how the microorganism enters the host. There must be an adequate number of organisms to cause infection.

The **host susceptibility** is the person who may become infected. All of these components together are considered to be the chain of infection. In the dental care setting, all of these factors come into play in the spread or the control of infection. There are effective strategies of infection control that will prevent infection transmission by interrupting one or more links in the chain of infection (CDC, 2003).

As this chain of infection relates to HIV/AIDS:

- The pathogenic microorganism is the human immune deficiency virus.
- The reservoir is blood or body fluids of the “source” patient; anyone with the virus can be an HIV source.
- The means of escape are how the blood or body fluids of the source patient exit the source patient. This includes infected blood, semen, vaginal secretions, or breast milk.
- Mode of transmission is through direct contact with infected blood or body fluids noted above.

- The means of entry is through the non-intact skin that can occur through unprotected sex, injecting drug use, and rarely splashing onto mucous membranes.
- Host susceptibility is the person who may now become infected with HIV.

Anyone who is infected with HIV can be the HIV source. As stated above, transmission occurs primarily through infected **blood, semen, vaginal secretions or breast milk**. Sweat, tears, saliva, urine and feces are not capable of transmitting HIV unless visibly contaminated with blood. In settings such as hospital operating rooms, other fluids, like cerebrospinal fluid, synovial fluid, pleural fluid, pericardial fluid and amniotic fluid may be considered infectious if the source is HIV positive.

These fluids are generally not found outside the hospital setting, so we consider the most common fluids—blood, semen, vaginal secretions, and breast milk—as infectious in the “real world.” Again, outside of the laboratory or medical and dental operation situations, only blood, semen, vaginal fluids, and breast milk are considered to be infectious for HIV. HIV is not transmitted through the air.

Sneezing, breathing, and coughing do not transmit HIV. Touching, hugging, and shaking hands do not transmit HIV. No cases of HIV transmission have been linked to sharing computers, telephones, paper, water fountains, bathrooms, desks, office furniture, toilet seats, showers, tools, equipment or coffee pots. However, personal items that may be contaminated with blood—including but not limited to, razors and toothbrushes should not be shared. There have been no cases of HIV transmission by children playing, eating, sleeping, kissing and hugging. There are isolated cases of transmission from dental care workers to patients.

To date, there have been three instances where transmission of HIV could only be tracked to the HIV-infected doctor, dentist or nurse treating the patient. At least one of these cases occurred prior to the implementation of strict equipment disinfection. However, the CDC reports that there has been one case of infection from health care worker to patient. That case involved a dentist. Biting poses very little risk of HIV transmission. The possibility only exists if the person who is biting and the person who is bitten have an exchange of blood (such as through bleeding gums or open sores in the mouth). Bites may transmit other infections, and should be treated immediately by thoroughly washing the bitten skin with soap and warm water and disinfecting with antibiotic skin ointment.

HIV Transmission

People may become infected with HIV if they engage in specific behaviors that put them at risk, or if they are exposed through needlestick injuries (usually in a dental care setting). The transmission of HIV depends upon:

- The availability of the infectious agent in sufficient quantity.
- The viability of the infectious agent (how strong it is).
- The virulence of the infectious agent (how infectious it is).
- The ability of the infectious agent to reach the blood stream, mucous membranes, or broken skin of a potential host (getting into another person's body). One of the predictors of how infectious an HIV-positive person may be is his or her viral load which indicates how much HIV is present in the bloodstream. Studies show a clear connection between higher viral load in the blood and increased transmissibility of HIV.

Probability of HIV Transmission

The CDC has estimated the following probabilities of infection following one exposure to HIV:

- Contaminated blood transfusion (prior to 1986) 95%

HIV infection rate:

- One intravenous syringe or needle exposure 0.67%
- One percutaneous exposure (a needlestick) 0.4%

A 1% risk means 1 chance in 100 for infection to occur. A 10% risk means 1 chance in 10.

Transmission of Multi-drug Resistant Forms of HIV

There is evidence of transmission of multi-drug resistant forms of HIV. People who have been infected with HIV and have used a number of the available anti-retroviral medicines may transmit forms of HIV that are resistant to some of these available drug therapies. This reduces the treatments available for the newly, HIV-infected person. It is believed that inconsistent use of anti-retroviral medications can contribute to this multi-drug resistant HIV.

Acute HIV infection (the first few weeks after infection with HIV) is a time when a person may not know that he or she is infected. However, the amount of virus (or viral load) in his or her bloodstream can be extremely high. This may make their blood, semen, vaginal fluids, and breast milk more infectious for HIV transmission. Anti-retroviral therapy can reduce a person's viral load if the correct combination is used and the person adheres to the dosing schedule.

Risk Reduction Methods in the Dental Setting

Methods for reducing the risk of transmission of HIV include:

- Standard/universal precautions and barrier protection

The Academy of Dental Learning and OSHA Training (www.DentalLearning.org) offers several courses and videos in Infection Control & OSHA Training for a comprehensive coursework about standard precautions.

Bloodborne Pathogen Standards

The following standards are mandated by the Occupational Safety and Health Administration (OSHA). The enforcement procedures are used to inspect any employer where employees' jobs involve potential exposure to blood and other potentially infectious materials (OPIM). Occupational groups that have been widely recognized as having potential exposure to bloodborne pathogens such as HIV include, but are not limited to:

- Dental care workers
- Law enforcement personnel
- Fire fighting personnel
- Ambulance personnel
- Other emergency response and public service employees
- While HIV is specifically identified in the standard bloodborne pathogens include any pathogen present in human blood or other potentially infectious materials (OPIM) that can infect and cause disease in people exposed to the pathogen.

Exposure Control Plan

Each employer must develop an Exposure Control Plan. The plan requires the employer to identify those tasks and procedures in which occupational exposure may occur. It also requires the employer to identify the individuals who will receive the training, protective equipment, vaccination, and other benefits of the standard. This Exposure Control Plan shall contain at least the following elements:

- Those job classifications and tasks in which employees have the potential for or documented occupational exposures. The exposure determination shall have been made without taking into consideration the use of personal protective clothing or equipment. It is important to include those employees who are required or expected to administer first aid.
- The schedule and method of implementation in a manner appropriate to the circumstances of the particular workplace.

Universal Precautions/Standard Precautions

Universal or Standard precautions, as defined by the CDC, are designed to prevent transmission of bloodborne pathogens in health care and other settings. Under universal precautions, blood/OPIM of all patients should always be considered potentially infectious for HIV and other pathogens. Standard precautions include all recommendations made for universal precautions, plus body substance isolation (BSI) when OPIM is present. Bodily fluids that have been recognized as OPIM and linked to the transmission of HIV and to which standard precautions and universal precautions apply are: blood, blood products, synovial fluid, pleural fluid, peritoneal fluid, pericardial fluid, amniotic fluid, and specimens with concentrated HIV virus. Although the terms are not interchangeable, most people are more familiar with the term "universal precautions." For this course, the term "standard precautions" will be used, although there may be some settings (like daycare) where body substance isolation may not be needed.

Personal Protective Equipment (PPE)

Standard precautions involve the use of protective barriers to reduce the risk of exposure of the employee's skin or mucous membranes to blood and OPIM. It is also recommended that all dental care workers take precautions to prevent injuries caused by needles, scalpels, and other sharp instruments or devices. Both universal and standard precautions apply to blood and OPIM listed above. Gloves, masks, protective eyewear and chin-length plastic face shields are examples of personal protective equipment (PPE). PPE shall be provided to and worn by employees in all instances where they will or may come into contact with blood or OPIM. This includes, but is not limited to, dentistry, phlebotomy, or processing of any bodily fluid specimen and postmortem (after death) procedures. Traditionally, latex gloves have been used when dealing with blood or OPIM. However, there have been documented cases of people with allergies to latex. In most circumstances, nitrile and vinyl gloves meet the definition of appropriate gloves and may be used in place of latex gloves. Employers are required to provide PPE alternatives to employees with latex and other sensitivities.

Engineering and Work Practice Controls

Engineering and work practice controls must be used in preference to personal protective equipment to minimize or eliminate employee exposure. There are now many safer needle devices available. Since these laws became effective, employers have been required to use needleless syringes, or syringes that have protective devices built into their use. Employers must include employees in ongoing evaluation of engineering controls and implement appropriate engineering controls whenever feasible. Evaluation and implementation of these controls must be documented in the Exposure Control

Plan.

Hand Hygiene

The most common way that infection is spread throughout the dental care system is through hand contact. Hand washing and hand hygiene are the single most effective means of limiting the spread of infection. Employers must provide hand washing facilities which are accessible to employees. According to the bloodborne pathogens standard, hand washing must be performed:

- After removal of gloves or other protective equipment.
- Immediately after hand contact with blood or other infectious materials.
- Upon leaving the work area.

The recommendation is that hand washing be performed before and after patient contact, and after using restroom facilities. Proper hand washing technique involves the following:

- Using soap, warm water, and good friction, to scrub the top, back and all sides of the fingers.
- Lather well and rinse for at least ten seconds. When rinsing, begin at the fingertips so that the dirty water runs down and off the hands from the wrists. It is preferable to use a pump-type of liquid soap instead of bar hand soap.
- Dry hands on paper towels. Use the dry paper towels to turn off the faucets (don't touch faucets with clean hands).

Centers for Disease Control Hand Hygiene Guidelines

These guidelines include the following indications for hand washing and hand antisepsis (CDC, 2020):

- If hands are not visibly soiled or contaminated an alcohol based hand rub may be used as an alternative to soap and water.
- Decontaminate hands before having direct contact with patients.
- Decontaminate hands after contact with a patient's intact skin.
- Decontaminate hands after contact with body fluids or excretions, mucous membranes, non-intact skin and wound dressings.
- Decontaminate hands if moving from a contaminated body-site to a clean body- site during patient care.
- Decontaminate hands after contact with inanimate objects (including medical equipment) in the immediate vicinity of the patient.
- Decontaminate hands after removing gloves.

- Before eating and after using the restroom, wash hands with a non-antimicrobial soap and water or with an antimicrobial soap and water.
- Antimicrobial-impregnated wipes (towelettes) may be considered as an alternative to washing hands with non-antimicrobial soap and water. Antimicrobial wipes are not as effective as alcohol-based hand rubs or washing hands, and are not a substitute for hand washing.
- Wash hands with non-antimicrobial soap and water or with antimicrobial soap and water if exposure to Bacillus anthracis is suspected or proven. The physical action of washing and rinsing hands under such circumstances is recommended because alcohols, chlorhexidine, iodophors, and other antiseptics because these agents are not as effective on microbial spores.
- No recommendations were made regarding the routine use of non-alcohol-based hand rubs for hand hygiene in dental care settings; this remains an unresolved issue.

Hand-hygiene technique recommendations of the guidelines include (CDC, 2020):

- When decontaminating hands with an alcohol-based hand rub, apply product to palm of one hand and rub hands together, covering all surfaces of hands and fingers, until hands are dry. Follow the manufacturer's recommendations regarding the volume of product to use.
- When washing hands with soap and water, wet hands first with water, apply an amount of product recommended by the manufacturer to hands, and rub hands together vigorously for at least 15 seconds. Cover all surfaces of the hands and fingers. Rinse hands with water and dry thoroughly with a disposable towel. Use towel to turn off the faucet. Avoid using hot water, because repeated exposure to hot water may increase the risk of dermatitis.
- Liquid, bar, leaflet, or powdered forms of plain soap are acceptable when washing hands with a non-antimicrobial soap and water. When bar soap is used, soap racks that facilitate drainage and small bars of soap should be used.
- Multiple-use cloth towels of the hanging or roll type are not recommended for use in health care settings.

Recommendations **for other aspects of hand hygiene** in the Guidelines include (CDC, 2020):

- Do not wear artificial fingernails or extenders when in direct contact with patients at high risk (those in intensive-care units or operating rooms).
- Keep natural nails tips less than ¼ inch long.
- Wear gloves when contact with blood or other potentially infectious materials, mucous membranes, and non-intact skin could occur.

- Remove gloves after caring for a patient. Do not wear the same pair of gloves for the care of more than one patient. Do not wash gloves between uses with different patients.
- Change gloves during patient care when moving from a contaminated body-site to a clean-body site.
- No recommendations were made regarding wearing rings in dental care settings; this remains an unresolved issue.

Sharp instruments and disposable items

All sharps and disposables must be properly handled and disposed. Needles are NOT to be recapped, purposely bent or broken, removed from disposable syringes or otherwise manipulated by hand. After they are used, disposable syringes and needles, scalpel blades and other sharp items are to be placed in puncture-resistant, labeled containers for sharps disposal. It is important that these containers be conveniently located as close as possible to where they will be used. Additionally, it is important to not overfill the sharps containers. Overfilling containers poses risk when the container is too full with needles, syringes, and other sharp objects.

Housekeeping

Work areas must be maintained in a clean and sanitary condition. The employer is required to determine and implement a written schedule for cleaning and disinfection based on the location within the facility or office, type of surface to be cleaned, type of soil present, and tasks or procedures being performed. All equipment, environmental and working surfaces must be properly cleaned and disinfected after contact with blood or OPIM. Potentially contaminated broken glassware must be removed using mechanical means, like a brush, and dustpan or vacuum cleaner. Specimens of blood or OPIM must be placed in a closeable, labeled or color-coded leak-proof container prior to being stored or transported.

Chemical germicides and disinfectants

Germicides and disinfectants need to be used at recommended dilutions and must be used to decontaminate spills of blood and other body fluids. Consult the Environmental Protection Agency (EPA) lists for registered sterilants, tuberculocidal disinfectants, and antimicrobials with HIV efficacy claims for verification that the disinfectant used is appropriate. The also lists are available from the National Antimicrobial Information Network.

Laundry

All laundry that is or may be soiled with blood or OPIM must be treated as though

contaminated. Contaminated laundry must be bagged at the location where it was used and shall not be sorted or rinsed in patient care areas. The soiled laundry must be placed and transported in bags that are labeled or color-coded (red-bagged). Laundry workers must wear protective gloves and other appropriate personal protective clothing when handling potentially contaminated laundry. All contaminated laundry must be cleaned or laundered so that any infectious agents are destroyed.

Waste disposal

Disposal of waste procedures must be carefully followed. All infectious waste must be placed in closeable, leak-proof containers or bags that are color-coded (red-bagged) or labeled to prevent leakage during handling, storage, and transport. Disposal of waste shall be in accordance with federal, state and local regulations.

Tags or labels

Labeling must be consistently used as a means to prevent accidental injury or illness to employees who are exposed to hazardous or potentially hazardous conditions, equipment, operations which are out of the ordinary, unexpected or not readily apparent. Tags must be used until the identified hazard is eliminated or the hazardous operation is completed.

All required tags must have the following:

- Tags must contain a signal word or symbol and a major message. The signal word shall be BIOHAZARD or the biological hazard symbol. The major message must indicate the specific hazardous condition or the instruction to be communicated to the employee.
- The signal word must be readable at a minimum of five feet or such greater distance as warranted by the hazard.
- The tag’s major message must be presented in either pictographs, written text, or both.
- The signal word and the major message must be understandable to all employees who may be exposed to the identified hazard.
- All employees will be informed as to the meaning of the various tags used throughout the workplace and what special precautions are necessary.

Personal activities such as eating, drinking and smoking, applying cosmetics or lip balm and handling contact lenses are prohibited in laboratories and other work areas where blood or OPIM are present. Food and drink must not be stored in refrigerators, freezers or cabinets where blood or OPIM are stored or in other areas of possible contamination.

Bloodborne Pathogen Training

All new dental workers or dental workers being transferred into jobs involving tasks or activities with potential exposure to blood/OPIM shall receive training in the Bloodborne Pathogen Standard at the time of initial assignment to the tasks where occupational exposure may occur. This training will include information on the hazards associated with blood/OPIM, the protective measures to be taken to minimize the risk of occupational exposure and information on the appropriate actions to take if an exposure occurs. Retraining is required annually or when changes in procedures or tasks affecting occupational exposure occur. As previously mentioned, the limited information in this section does not qualify for the full training. Dental Learning Network (dentallearning.org) offers content appropriate videos for training of new workers.

Bloodborne Pathogen Transmission in Water or Sewage

HIV is not transmitted by water. Any bloodborne pathogen introduced into a water source would be greatly diluted making it noninfectious. One study found that HIV did survive in wastewater for up to 12 hours. However, the transmissibility of HIV in this situation is highly unlikely. There has never been a documented case of HIV transmission due to wastewater exposure.

Occupational Exposure in Dental Care Settings

The CDC states that the risk of infection for HIV in the health care setting varies from case to case. Factors influencing the risk of infection from occupational exposure are:

- Exposure from a hollow-bore needle or other sharp instrument.
- If skin or mucus membranes (such as the eyes, nose, and mouth) are intact.
- Amount of blood
- Amount of virus present in the source’s blood

The risk of HIV infection to a healthcare worker from a needlestick is less than 1%. Approximately 1:300 exposures from a needle or sharp instrument result in infection. The risks of HIV infection through splashes of blood to the eyes, nose, or mouth is even less—approximately 1:1000. There have been no reports of HIV transmission from blood contact with intact skin. There is a theoretical risk of blood contact to an area of skin that is damaged or from a large area of skin covered in blood for a long period of time. As of December 31, 2013, 58 confirmed occupational transmissions of HIV and 150 possible transmissions had been reported in the United States. Of these, only one confirmed case has been reported since 1999. Underreporting of cases to CDC is possible, however, because case reporting is voluntary.

Health care workers who are exposed to a needlestick involving HIV-infected blood at work have a 0.23% risk of becoming infected. In other words, 2.3 of every 1,000 such injuries, if untreated, will result in infection. Risk of exposure due to splashes with body fluids is thought to be near zero even if the fluids are overtly bloody. Fluid splashes to intact skin or mucous membranes are considered to be extremely low risk of HIV transmission, whether or not blood is involved. (CDC, 2020)

Treatment after an Exposure

Follow the protocol of your employer. The CDC recommends that as soon as safely possible, wash the affected area(s). Wash the wound and surrounding skin with soap and water. Flush mucous membranes with water. Antiseptics are not contraindicated, but do not apply caustic agents (bleach) or inject antiseptics or disinfectants into the wound. Application of antiseptics should not be a substitute for washing. It is recommended that any potentially contaminated clothing be removed as soon as possible. It is also recommended that you familiarize yourself with existing protocols and the location of emergency eyewash or showers and other stations within your facility.

Mucous Membrane Exposure

If the exposure is to the eyes, nose or mouth, flush them continuously with water, saline or sterile irrigants for at least five minutes. The risk of contracting HIV through this type of exposure is estimated to be 0.09%.

Needlestick Injuries

Wash the exposed area with soap and clean water. Do not “milk” or squeeze the wound. There is no evidence that shows using antiseptics (like hydrogen peroxide) will reduce the risk of transmission for any bloodborne pathogens. In the event that the wound needs suturing, emergency treatment should be obtained. The risk of contracting HIV from this type of exposure is estimated to be 0.3%.

Bite or Scratch Wounds

Exposure to saliva is not considered substantial unless there is visible contamination with blood. Wash the area with soap and water. Cover with a sterile dressing as appropriate. All bites should be evaluated by a health care professional.

Exposure to Urine, Vomit, or Feces

Exposure to urine, feces, vomit, or sputum is not considered substantial unless the fluid is visibly contaminated with blood. Follow normal procedures for cleaning these fluids.

Reporting the Exposure

Follow the protocol of your employer. The following general guidelines taken from the CDC are not meant to replace an existing protocol. After cleaning the exposed area as recommended above, report the exposure to the department or individual at your workplace that is responsible for managing exposure.

A written report must include:

- The date and time of exposure.
- Details of the procedure being performed when the exposure took place.
- Include where it occurred, what was taking place at the time, what sharp devices were involved, and how the sharp device was being used at the time of the incident.
- Details of the exposure. Include the type of fluid, amount of blood in the fluid, severity of exposure, depth of penetration, estimated volume of material, duration of contact, and the condition of skin or mucosa at the time of contact (intact, chapped, abraded).
- Details of exposure source. Include HIV status if known, stage of disease, history of anti-retroviral therapy, and viral load.
- Details of counseling, post-exposure management and follow-up. Obtain medical evaluation as soon as possible. Discuss with a health care professional the extent of the exposure, prophylaxis/prevention of other bloodborne pathogens, the need for a tetanus shot and other care.

Post-Exposure Prophylaxis

Post-exposure prophylaxis (PEP) provides anti-HIV medications to someone who has had a substantial exposure, usually to blood. PEP has been the standard of care for occupationally-exposed dental care workers with substantial exposures since 1996. A national toll-free hotline at (888) 448-4911 is available to help with counseling and treatment recommendations for health care workers with occupational exposure to bloodborne pathogens. The National Clinicians' Post-Exposure Prophylaxis Hot Line (PEPline) is staffed 24 hours a day by trained physicians. The hotline merges the National HIV Telephone Consultation Service and the University of California/San Francisco General Hospital Epidemiology and Prevention Interventions Center Needlestick Hotline. The CDC released post-exposure recommendations in its Morbidity and Mortality Weekly Report. Animal models suggest that cellular HIV infection happens within two days of exposure to HIV. Virus in blood is detectable within five days. Therefore PEP should be started as soon as possible, optimally within two hours, preferably within 24 hours of the exposure or as soon as possible and continued for 28 days.

Healthcare Workers with Documented Occupationally Acquired HIV	
Type of Occupational Exposure	**Number**
Needlestick or cuts	45
Eye, nose, or mouth and /or skin	5
Both injury and mucous membrane	1
Unknown	1
Total	52

There is a brief window of opportunity in which an anti-retroviral agent may prevent or inhibit viral replication in the target cells or lymph nodes. Human studies and several animal studies have used Zidovudine (ZDV) effectively to reduce the risk of HIV infection by up to 81% with proper use. ZDV is not 100% effective. Some factors believed to contribute to its failure include:

- ZDV resistant strains of HIV.
- High viral titer of HIV or large volume of inoculum.
- Delayed initiation or inadequate duration of post-exposure treatment.
- Host or viral characteristics.

Anti-retroviral Agents for PEP

Several anti-retroviral agents are available for HIV disease treatment. ZDV is the only agent currently shown to prevent HIV transmission in humans, so it is the first drug of choice. It is often supplemented with a drug called lamivudine (3TC). This one-two punch is very effective against ZDV resistant strains. Another drug, Indinavir, can also be given with the other two in cases where large amounts of blood were transferred. This drug can only be taken safely for a short period of time. Post-exposure prophylaxis can only be obtained from a licensed healthcare provider.

Your facility may have recommendations and a chain of command in place for you to obtain PEP. Employers must design a system of written protocols for reporting, evaluation, counseling, treatment, and follow-up after any occupational injury that may have exposed the worker to a bloodborne infection. Access to post-exposure care must be available to the workers during all working hours to facilitate a timely administration of PEP. Workers must know the system and how to implement it in advance, so they can act as soon as possible after the exposure. After evaluation of the exposure route and other risk factors, certain anti-HIV medications may be prescribed.

For specific details about post-exposure management and treatment, see the Updated U.S. Public Health Service Guidelines for the Management of Occupational Exposures to HBV, HCV, and HIV (CDC, 2001). PEP is not as simple as swallowing one pill. The medications must be started within the first two hours if possible and continued for 28 days. Many people experience significant medication side effects.

HIV Testing Post-Exposure

If a health care professional determines that you have sustained an exposure that puts you at risk, you will be offered antibody testing for HIV vaccine if needed. The HIV test does not show presence of HIV, rather it looks for antibodies (your body's reaction to HIV). It usually takes your body between two weeks and three months to produce antibodies to HIV. The initial test serves as a baseline; it will show whether you were infected with HIV before the exposure. You will need to retest in order to make sure you have not been infected. In 2001, the CDC recommended retesting at six weeks, three and six months after exposure. Testing for up to 12 months may be recommended for high risk exposures or when the source is documented to be infected with HIV.

There are situations where dental care workers and others are not aware of the HIV status of the individual to whose blood they have been exposed. Usually, you cannot force someone to test for HIV and reveal their results to you. If you experience an occupational substantial exposure to another person's blood or OPIM, you can request HIV testing of the source individual through your employer or local health officer. Before the health officer will issue a health order for HIV testing of the source individual, the officer will first make the determination of whether a substantial exposure occurred and if the exposure occurred on the job.

Depending on the type of exposure and risks involved, the health officer may make the determination that source testing is unnecessary. In the case of occupationally exposed healthcare workers, if the employer is unable to obtain permission from the source individual, the employer may request assistance from the local health officer provided the request is made within seven days of the occurrence. Source testing does not eliminate the need for baseline testing of the exposed individual for HIV. Provision of PEP should also not be contingent upon the results of a source's test. Current wisdom indicates immediate provision of PEP in certain circumstances, with discontinuation of treatment based upon the source's test results. PEP for occupational exposure is standard, and its effectiveness has been documented.

Testing

HIV antibody testing has been available since 1985. It is believed that many people who are HIV-infected in the United States have not been tested and are unaware of their HIV positive status. Many of these people may not realize that they are infected with HIV until they present with symptoms of infection. Also, it is important for people to realize that a negative HIV test is not a safeguard if they engage in behaviors that put them at risk for HIV. The Food and Drug Administration (FDA) has approved tests that are available to detect HIV antibodies. These tests determine HIV infection by detecting the presence of HIV antibodies produced by the immune system.

Conclusion

Dental professionals in clinical settings see a wide variety of patients every day, from every walk of life, with the full spectrum of conditions and diseases associated with primary healthcare providers. The goal is to have the highest level of evidenced based information and to apply as appropriate to patients and their conditions, make appropriate referrals and treatment decisions, and adhere to the highest ethical standards.

The resources available for clinicians to review and learn additional didactic, statistical, and treatment information are plentiful—and we encourage our students to use the online resources of the Centers for Disease Control and other public health agencies.

References

Centers for Disease Control and Prevention (CDC). Infection Control. (2020). Available at: http://www.cdc.gov/. Retrieved July 2020.

Centers for Disease Control and Prevention (CDC). Updated U.S. Public Health Service Guidelines for the Management of Occupational Exposures to HBV, HCV, and HIV. (2020). Available at: http://www.cdc.gov/mmwr/preview/mmwrhtml/rr5011a1.htm. Accessed June 2020.

Centers for Disease Control and Prevention (CDC). Hand Hygiene. (2020). Available at www.cdc.gov/handhygiene/providers/index.html. Retrieved June 2020.

Centers for Disease Control and Prevention (CDC). A Glance at the HIV/AIDS Epidemic. (2020). Available at: www.cdc.gov/hiv/pubs/Facts/At-A-Glance.htm. Retrieved July 2020.

Centers for Disease Control and Prevention (CDC). Occupational HIV Transmission and Prevention among Health Care Workers. www.cdc.gov/hiv/workplace/healthcareworkers.html. Accessed June 2020.

Dimensions of Dental Hygiene, "HIV and the Dental Team", David A Resnik, DDS, Helene Bednarsh, RDH; June 2006; 4 (6): 14-16.

Mayo Clinic, Definition of HIV. (2019). Available at: www.mayoclinic.org.

Mayo Clinic, HIV Seroconversion. (2019). Available at: www.mayoclinic.org.

Online Source. www.avert.org/professionals/hiv-science/types-strains. HIV Strains and Types. Accessed July 2020.

Online Source. www.kff.org/global-health-policy/fact-sheet/the-global-hivaids-epidemic/.

Current Global Snapshot. Accessed July 2020.

PubMed, HIV Epidemiology. (2019). Available at: http://www.ncbi.nlm.nih.gov/pubmed/. Accessed July 2020.

Course Test: HIV/AIDS: Updated Review and Clinical Considerations

1.The HIV organism is best characterized as a:

a. Bacterium that is dispersed through the air on operatory aerosols.
b. Fungus transmitted through direct contact.
c. Virus transmitted through blood.
d. None of the above.

2.All people who have HIV infection have AIDS.

a. True
b. False

3.The cells that the HIV virus attacks in the blood are the:

a. Red blood cells.
b. Islets of Langerhans.
c. The t-helper lymphocytes or CD4 cells.
d. HIV does not attack cells in the blood.

4.The most common oral manifestation of HIV:

a. Hairy leukoplakia.
b. Candidiasis.
c. Necrotizing ulcerative periodontitis (NUP).
d. Linea alba.

5. Factors that influence the risk of infection from occupational exposure include:

a. Amount of blood involved.
b. Viral load in source.
c. Condition of skin and mucous membranes.
d. None of the above.
e. All of the above.

6. A person with untreated HIV infection will experience several stages in infection. These include:

- Viral transmission

- Primary HIV infection
- Seroconversion
- Asymptomatic HIV infection
- Symptomatic HIV infection
- AIDS

a. True
b. False

7. Seroconversion (is):

a.Occurs after infection; it is when antibodies are produced that would show positive on an HIV test.
b.The time frame may vary from person to person, with most people having HIVantibodies detectable within the first two to eight weeks of infection.
c.Both A and B.

8. Standard precautions requires that one always assumes that the blood or body fluids of another person could be positive for HIV (or other bloodborne pathogens), thereby requires taking barrier precautions to avoid any infection through bloodborne transmission.

a. True
b. False

9. After occupational exposure to HIV in the workplace, the employee should:

a.Follow facility protocols and policies.
b.Obtain evaluation as soon as is possible; prophylactic treatment should begin within 2-24 hours.
c. Obtain permission to test the source for HIV infection, if possible.
d.All of the above.

10. ____ is (are) involved in the transmission of HIV:

a. Blood
b. Semen
c. Breast milk
d. A, B, and C
e. B and C only