HIV/AIDS
Course Outline

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OBJECTIVES:
1. Be able to discuss the signs, symptoms, current treatment, and transmissibility of HIV.
2. Identify necessary treatment precautions when treating patients with HIV/AIDS.
3. Review history and current statistics regarding persons with HIV/AIDS.
4. Learn post prophylactic methods for contact with blood products of HIV/AIDS patients.
OVERVIEW

Human Immunodeficiency Virus (HIV) was first identified in the United States in 1981 after a number of gay men started getting sick with a rare type of cancer. It took several years for scientists to develop a test for the virus, to understand how HIV was transmitted between humans, and to determine what people could do to protect themselves.

Since then, more than 1.7 million people in the U.S. are estimated to have been infected with HIV, including over 600,000 who have already died and approximately 1.2 million estimated to be living with the disease today. According to the Centers for Disease Control (CDC), HIV/AIDS Statistics and Surveillance data, the estimated number of HIV infections in the United States was 47,129 confirmed cases in 2010. While the majority remains adult and adolescent males diagnosed with HIV infections reported at 37,045 cases, followed by adult and adolescent females who reported 9,868 cases. Lastly, cases diagnosed among children under age 13 years were reportedly 217. For more detailed information, please refer to www.cdc.gov/hiv/topics/surveillance/index.htm.

The table below shows the diagnoses of HIV Infection by age for 2009. This table confirms the majority of diagnoses occur between the ages of 20-24. The distribution of the estimated number of diagnoses of HIV infection among children in the 40 states with confidential name-based HIV infection reporting, by transmission category, follows:

<table>
<thead>
<tr>
<th>Age (Years)</th>
<th>Estimated Number of Diagnoses of HIV Infection, 2009</th>
</tr>
</thead>
<tbody>
<tr>
<td>Under 13</td>
<td>166</td>
</tr>
<tr>
<td>Ages 13-14</td>
<td>21</td>
</tr>
<tr>
<td>Ages 15-19</td>
<td>2,036</td>
</tr>
<tr>
<td>Ages 20-24</td>
<td>6,237</td>
</tr>
<tr>
<td>Ages 25-29</td>
<td>5,951</td>
</tr>
<tr>
<td>Ages 30-34</td>
<td>5,020</td>
</tr>
<tr>
<td>Ages 35-39</td>
<td>5,232</td>
</tr>
<tr>
<td>Ages 40-44</td>
<td>5,519</td>
</tr>
<tr>
<td>Ages 45-49</td>
<td>4,865</td>
</tr>
<tr>
<td>Ages 50-54</td>
<td>3,323</td>
</tr>
<tr>
<td>Ages 55-59</td>
<td>2,004</td>
</tr>
<tr>
<td>Ages 60-64</td>
<td>900</td>
</tr>
<tr>
<td>Ages 65 or older</td>
<td>736</td>
</tr>
</tbody>
</table>

SOURCE: CDC, 2010. (CDC.GOV/HIV/TOPICS/SURVEILLANCE/BASIC.HTM#HIVINFECTION)

AIDS: WHAT IS IT, WHAT CAUSES IT?

AIDS stands for acquired immunodeficiency syndrome. AIDS is the advanced stage of HIV disease. An HIV infected person receives a diagnosis of AIDS after developing one of the CDCs defined AIDS indicator illnesses, or without any serious illness, a diagnosis based on certain blood
tests. Infection with HIV weakens the immune system so that it cannot fight off certain infections. These types of infections are known as “opportunistic” infections because they take the opportunity a weakened immune system gives to cause illness. These opportunistic infections may be life-threatening for people with AIDS. The immune system of a person with AIDS may become weakened to the point that medical intervention is necessary to prevent or treat serious illness. Medical treatment can slow down the rate at which HIV weakens the immune system. On average, ten or more years pass from the time of a person’s infected until signs of clinical AIDS appear. With proper care, this “incubation period” can be extended because of new treatments and preventive therapies.

Some opportunistic infections that may become life threatening are bacterial infections, fungal infections, protozoal infections, and viral infections. Malignancies and neurological conditions may occur and further complicate the situation. Psychologically, depression is common. Symptoms of fatigue, nausea, and wasting syndrome are often experienced. These diseases are more likely to cause death then HIV, itself. The weakening immune system cannot reverse the effects of these common infections.

**WHAT IS HIV?**

HIV, human immunodeficiency virus, is the virus that causes AIDS. This virus is passed from one person to another through blood-to-blood and/or sexual contact. In addition, infected pregnant women can pass HIV to their baby during pregnancy or delivery, as well as through breast feeding. The CDC is recommending that all pregnant women be tested for HIV because there are medical therapies to reduce perinatal transmission. Counseling is advised for those who test positive with safeguards assured for confidentiality. Therapy can help improve prospects for the fetus.

Most adults are sexually active. Most people with HIV infection do change their sexual practices after testing positive. However, various studies have indicated that more than 70% of seropositive men and women engage in oral, vaginal, or anal sex after they have HIV. While some infected people do reveal their serostatus to sex partners, as many as 52% of sexually active HIV men do not disclose their infection status. Fortunately, most seropositive adults do feel a sense of responsibility to protect their primary sex partners. A positive HIV test result does not mean that a person has AIDS. However, most people with HIV infection will develop AIDS as a result of their HIV infection.

**WHO IS AT RISK?**

By far, men having sex with men (MSM) remain the greatest risk. Some of these men have infected their wives or lovers and women and children have become at risk as well. Injection drug use is another risk factor that has widened the risk for women and children as well as men. Illegal drug use is an integral factor contributing to the HIV/AIDS epidemic. Healthcare workers are at risk through
contact with patient’s blood and body fluids; however, more careful infection control procedures and barrier protection methods have lessened chances of problems for those treating HIV infected patients.

Body fluids that have proven to spread HIV are blood, semen, vaginal fluid, breast milk, and other body fluids containing blood. In addition, body fluids that may transmit the virus to healthcare workers are cerebrospinal fluid, synovial fluid, and amniotic fluid. The latest statistics show the following results of those infected with HIV in the United States. Minorities, women and children are suffering from the spread of HIV.

According to the CDCs 2009 statistics, diagnoses of HIV infection, by race/ethnicity and selected characteristics (40 states with confidential name-based HIV infection reporting) reported the greatest number of cases were among African Americans with male-to-male sexual contact with the highest percentage diagnosed between the ages of 20-24. The second highest incidence was among Whites with male-to-male sexual contact. Furthermore, the CDC reported African American females are the largest population with increasing incidence, due to risky behavior with infected sexual partners.

<table>
<thead>
<tr>
<th>Race or Ethnicity</th>
<th>Estimated Number of Diagnoses of HIV Infection, 2009</th>
</tr>
</thead>
<tbody>
<tr>
<td>American Indian/Alaska Native</td>
<td>189</td>
</tr>
<tr>
<td>Asian</td>
<td>470</td>
</tr>
<tr>
<td>Black/African American</td>
<td>21,652</td>
</tr>
<tr>
<td>Hispanic/Latino</td>
<td>7,347</td>
</tr>
<tr>
<td>Native Hawaiian/Other Pacific Islander</td>
<td>34</td>
</tr>
<tr>
<td>White</td>
<td>11,803</td>
</tr>
<tr>
<td>Multiple Races</td>
<td>516</td>
</tr>
</tbody>
</table>

Source: CDC, 2010.

Risk of HIV Transmission Associated with Sexual Practices

High risk in descending order:
- Receptive anal intercourse with ejaculation (no latex condom)
- Receptive vaginal intercourse with ejaculation (no latex condom)
- Insertive anal intercourse (no latex condom)
- Insertive vaginal intercourse (no latex condom)
- Receptive anal intercourse with withdrawal prior to ejaculation
- Insertive anal intercourse with withdrawal prior to ejaculation
- Receptive vaginal intercourse (with spermicidal foam but no latex condom)
- Insertive vaginal intercourse (with spermicidal foam but no latex condom)
- Receptive anal or vaginal intercourse (with a latex condom)*
- Insertive anal or vaginal intercourse (with a latex condom)*
Some risk (in descending order of risk):
- Oral sex with men with ejaculation
- Oral sex with women
- Oral sex with men with pre-ejaculation fluid (pre-cum)
- Oral sex with men, no ejaculation or pre-cum
- Oral sex with men (with a latex condom)

Some risks (depending on situation, intactness of mucous membranes, etc.):
- Mutual masturbation with external or internal touching
- Sharing sex toys
- Anal or vaginal fisting

No risk:
- Masturbating with another person without touching one another
- Hugging/massage/dry kissing
- Frottage (rubbing genitals while remaining clothed)
- Masturbating alone
- Abstinence

Unresolved issues:
- The role of pre-cum in transmission
- The protection offered by covering female genitals with a dental dam during oral sex on the women
- The risk of transmission from wet kissing

CENTER FOR DISEASE CONTROLS
OPT-OUT TESTING RECOMMENDATIONS

Use opt-out screening for HIV means that HIV tests will be done routinely unless a patient explicitly refuses to take an HIV test. This is a policy of routine HIV testing for everyone between the ages of 13-64 and all pregnant women. CDC believes HIV testing can be covered under a general permission form (consent form) that is signed for all medical care. According to the CDC;

- Screening should be voluntary and undertaken only with the patient's knowledge and understanding that HIV testing is planned.
- Patients should be informed orally or in writing that HIV testing will be performed unless they decline (opt-out screening). Oral or written information should include an explanation of HIV infection and the meanings of positive and negative test results, and the patient should be offered an opportunity to ask questions and to decline testing. With such notification, consent for HIV screening should be incorporated into the patient's general informed consent for medical care on the same basis as other screening or diagnostic tests; a separate consent form for HIV testing is not recommended.
- Easily understood informational materials should be made available in the languages of the commonly encountered populations within the service area. The competence of interpreters
and bilingual staff to provide language assistance to patients with limited English proficiency must be ensured.

If a patient declines an HIV test, this decision should be documented in the medical record.

ASSOCIATED ORAL LESIONS

Oral lesions are significant features of HIV and AIDS infections and, in fact, are often the first physical manifestation of the disease. As clinicians, it is our responsibility to be able to recognize and identify those 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 immunocompromised patient, it 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 (Figure 2.1), hyperplastic or chronic candidiasis (Figure 2.2)

![Figure 2.1-Pseudomembranous Candidiasis](image1)
![Figure 2.2 Hyperplastic Candidiasis](image2)
![Figure 2.3 Angular Cheilitis](image3)
### Treatment Protocol for Fungal Infections in HIV Patients

<table>
<thead>
<tr>
<th>Drug</th>
<th>Nystatin suspension</th>
<th>Clotrimazole troche</th>
<th>Chlorhexidine 0.12%</th>
<th>Ketoconazole and fluconazole</th>
<th>Ketoconazole 2% cream</th>
</tr>
</thead>
<tbody>
<tr>
<td>Route</td>
<td>Topical</td>
<td>Topical</td>
<td>Topical</td>
<td>Systemic, oral</td>
<td>Topical</td>
</tr>
<tr>
<td>Indication</td>
<td>Erythematous and pseudomembranous</td>
<td>Erythematous and pseudomembranous</td>
<td>Erythematous and pseudomembranous</td>
<td>All types</td>
<td>Angular cheilitis</td>
</tr>
<tr>
<td>Dose</td>
<td>500,000 U/5 cc, 1 tsp rinse and swallow 4x/day</td>
<td>10 mg troche, 1 troche 5x/day</td>
<td>1 tsp rinse and spit 3x/day</td>
<td>100 - 200 mg tab, 2 stat, 1 tab/day</td>
<td>Apply 4xday</td>
</tr>
</tbody>
</table>

**Viral Infections**

Many of the viral infections found in the oral cavity of HIV infected individuals develop early in the illness and, if left untreated, can persist for the duration of the illness. Herpesvirus 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 viral infections in the oral cavity 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 (Figures 3.1 and 3.2). These lesions may be painful in the early stages but should resolve within 10 days in an otherwise healthy patient. In HIV infected patients, these lesions may take upwards of 1 month 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.

![Figure 3.1 Herpes Labialis (early stage infection)](image1)

![Figure 3.2 Herpes Labialis (late stage infection)](image2)

Epstein-Barr viral infections produce a lesion known as Oral Hairy Leukoplakia (OHL) (Figures 4.1 and 4.2). 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-wipeable 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.

Home Study Solutions.com, Inc.
Human papilloma virus, also known as an oral wart (Figure 5.1), forms a hyperplastic connective tissue lesion. More than 50 strains of HPV exist. The treatment of choice is surgical excision.

Cytomegalovirus (CMV) 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/mm³. Typical treatment consists of peri debridement with adjunctive antibiotic therapy and twice daily chlorhexidine gluconate 0.12% rinses.

Figure 6.1- Neoplasms

Kaposi sarcoma (KS) is the most common neoplasm (Figures 6.1-6.3) in AIDS infected individuals. It 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 and currently there is no cure.

Figure 6.2- Kaposi Sarcoma (early stage lesion)  
Figure 6.3- Kaposi Sarcoma (late stage lesion)

MODES OF TRANSMISSION

HIV can be detected in several fluids and tissues of a person living with HIV. It is important to understand however, that finding a small amount of HIV in a body fluid or tissue does not mean that HIV is transmitted by that body fluid or tissue. Only specific fluids (blood, semen, vaginal secretions, and breast milk) from an HIV-infected person can transmit HIV. These specific fluids must come in contact with a mucous membrane or damaged tissue or be directly injected into the blood-stream (from a needle or syringe) for transmission to possibly occur. In the United States, HIV is most
commonly transmitted through specific sexual behaviors (anal or vaginal sex) or sharing needles with an infected person. It is less common for HIV to be transmitted through oral sex or for an HIV-infected woman to pass the virus to her baby before or during childbirth or after birth through breastfeeding or by prechewing food for her infant. In the United States, it is also possible to acquire HIV through exposure to infected blood, transfusions of infected blood, blood products, or organ transplantation, though this risk is extremely remote due to rigorous testing of the U.S. blood supply and donated organs.

Some healthcare workers have become infected after being stuck with needles containing HIV-infected blood or, less frequently, when infected blood comes in contact with a worker's open cut or is splashed into a worker's eyes or inside their nose. There has been only one instance of patients being infected by an HIV-infected dentist. In addition, there are other body fluids that may transmit the virus to health care workers: cerebrospinal fluid, synovial fluid, and amniotic fluid.

<table>
<thead>
<tr>
<th>Transmission Category</th>
<th>Estimated Number of Diagnoses of HIV Infection, 2010</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male-to-male sexual contact</td>
<td>28,782 Adult and Adolescent Males, 28,782 Adult and Adolescent Females, 28,782 Total</td>
</tr>
<tr>
<td>Injection drug use</td>
<td>2,373 Adult and Adolescent Males, 1,393 Adult and Adolescent Females, 3,766 Total</td>
</tr>
<tr>
<td>Male-to-male sexual contact and injection drug use</td>
<td>1,443 Adult and Adolescent Males, -, 1,443 Total</td>
</tr>
<tr>
<td>Heterosexual contact*</td>
<td>4,416 Adult and Adolescent Males, 8,459 Adult and Adolescent Females, 12,875 Total</td>
</tr>
<tr>
<td>Other**</td>
<td>31 Adult and Adolescent Males, 16 Adult and Adolescent Females, 47 Total</td>
</tr>
</tbody>
</table>

Source: CDC  * Heterosexual contact with a person known to have, or to be at high risk for, HIV infection.
** Includes hemophilia, blood transfusion, perinatal exposure, and risk not reported or not identified

**Occupational Exposure Facts:**

- The HIV epidemic has promoted an appreciation for risk in the health care setting. In the late 1980’s, reports started to appear about health care workers infected with HIV after contact with patient’s blood, largely through accidental needle sticks or punctures. 914 incidents were reported to the scheme between 2006-2007.
- Percutaneous injuries involving hollow bore needles remain the most commonly reported occupational exposures in the healthcare setting (between 2000-2007, 68% of all percutaneous exposures).
- HCV exposures to infected source patients remain the greatest proportion of percutaneous exposures reported (48%, 1113/2296 between 2000-2007).
- Numerically, between 2000-2007 most occupational exposures involved nursing professionals. However by profession, medical professionals (doctors and dentists) reported a higher number of occupational exposures than nursing professionals in 2007 (200 compared...
to 191). About a third of the incidents involving doctors were reported to be in Senior House Officers.

- Of concern is that over a third of incidents occurring between 2000-2007 in the ward or in Accident & Emergency (43% and 37% respectively), and around 20% in intensive care and in operating theatres (22% and 20% respectively) were preventable with proper adherence to universal precautions and safe disposal of clinical waste.

**OPPORTUNISTIC INFECTIONS**

People with advanced HIV infection are vulnerable to infections and malignancies that are called 'opportunistic infections' because they take advantage of the opportunity offered by a weakened immune system. Opportunistic infection (OI) associated with human immunodeficiency virus (HIV) infection, include:

- Pneumocystis jirovecii (formerly carinii) pneumonia (PCP)
- Toxoplasma gondii encephalitis
- Cryptosporidiosis
- Microsporidiosis
- Mycobacterium tuberculosis infection (TB) and disease
- Disseminated Mycobacterium avium complex (MAC) disease
- Bacterial respiratory disease
- Bacterial enteric disease
- Bartonellosis
- Syphilis
- Mucocutaneous candidiasis
- Cryptococcosis
- Histoplasmosis
- Coccidioidomycosis
- Aspergillosis
- Cytomegalovirus (CMV) disease
- Herpes simplex virus (HSV) disease
- Human herpes virus type 6 (HHV-6) and type 7 (HHV-7) disease
- Varicella zoster virus (VZV) disease
- Human herpesvirus type 8 (HHV-8) disease
- Progressive multifocal leukoencephalopathy caused by JC virus infection
- Human papillomavirus (HPV) disease
- Hepatitis C virus (HCV) infection
- Hepatitis B virus (HBV) infection
- Geographic OIs of special consideration, including malaria, Penicilliosis marneffi, leishmaniasis, isosporiasis, and Chagas disease

Different conditions typically occur at different stages of HIV infection. In early HIV disease people can develop tuberculosis, malaria, bacterial pneumonia, herpes zoster, staphylococcal skin infections and septicemia. These are diseases that people with normal immune systems can also get, but with HIV they occur at a much higher rate. It also takes longer for a person with HIV to recover than it takes for someone with a healthy immune system.
When the immune system is very weak due to advanced HIV disease or AIDS, opportunistic infections such as PCP, toxoplasmosis and cryptococcosis develop. Some infections can spread to a number of different organs, which is known as 'disseminated' or 'systemic' disease. Many of the opportunistic infections that occur at this late stage can be fatal.

PREVENTION AND MANAGEMENT

As more knowledge is gained studying the HIV/AIDS pandemic, new treatment and prevention measures are evolving. Recent setbacks in vaccine research emphasize the importance of basic prevention measures. Although new treatment with antiviral drugs have prolonged the lives of many living with AIDS, a difficult death is probable with slow progression and destruction of the person’s immune system.

Periodic testing and early detection is the responsibility of all patients who may be at risk for contracting the HIV virus. Patients can be tested at labs that keep their identity secret, by a family doctor, or the local public health department. Home tests are now available to determine if the HIV virus is present. If a home test is done, a positive result means the patient should see a doctor to confirm the results.

According to the CDC, sexual transmission is responsible for nearly two-thirds of AIDS cases in the United States. Therefore, preventing transmission will have a great impact on slowing the HIV epidemic. People who are HIV-infected have a practical and an ethical responsibility to help control the spread of HIV through their sexual behavior. Studies have shown that the use of a latex condom during each act of intercourse is the most effective way to prevent HIV transmission during both anal and vaginal intercourse. Natural condoms do not prevent HIV. Although current opinion is that the use of a new latex condom during each act of intercourse is the most effective way to prevent HIV transmission during both anal and vaginal intercourse, recently some have questioned whether condoms are really effective. Latex condoms sold in the US are regulated by the FDA. Failure rates are about 3% but may be higher. Cases of HIV transmission among latex condom users is attributed to inappropriate or inconsistent use. Male condoms made of materials other than latex are available in the United States. Two general categories of non-latex condoms exist. The first type is made of polyurethane or other synthetic material and provides protection against STDs/HIV and pregnancy equal to that of latex condoms. These can be substituted for latex condoms by persons with latex allergy. Although they have had higher breakage and slippage rates when compared with latex condoms and are usually more costly, the pregnancy rates among women whose partners use these condoms are similar to those associated with use of latex condoms.
How Are Condoms Used?

Condoms can protect during contact between the penis, mouth, vagina, or rectum. Condoms won’t protect from HIV or other infections unless they are used correctly and consistently.

- Store condoms away from extreme heat, cold, or friction. Do not keep them in a wallet or a car glove compartment.
- Check the expiration date. Don’t use outdated condoms.
- Don’t open a condom package with the teeth. Be careful that fingernails or jewelry don’t tear the condom. Body jewelry in or around the penis or vagina might also tear a condom.
- Use a new condom every time you have sex, or when the penis moves from the rectum to the vagina.
- Check the condom during sex, especially if it feels strange, to make sure it is still in place and unbroken.
- Do not use a male condom and a female condom at the same time.
- Use only water-based lubricants with latex condoms, not oil-based. The oils in Crisco, butter, baby oil, Vaseline or cold cream will make latex fall apart.
- Use un-lubricated condoms for oral sex.
- Do not throw condoms into a toilet. They can clog plumbing.

Using a Male Condom:

- Put the condom on when your penis is erect – but before it touches a partner’s mouth, vagina, or rectum. Many couples use a condom too late, after some initial penetration. Direct genital contact can transmit some diseases. The liquid that comes out of the penis before orgasm can contain HIV.
- If desired, put some water-based lubricant inside the tip of the condom.
- If the male is not circumcised, push the foreskin back before putting on a condom. This lets the foreskin move without breaking the condom.
- Squeeze air out of the tip of the condom to leave room for semen (cum). Unroll the rest of the condom down the penis.
- Do not “double bag” (use two condoms). Friction between the condoms increases the chance of breakage.
- After orgasm, hold the base of the condom and pull out before your penis gets soft.
- Be careful not to spill semen onto your partner when you throw the condom away.

Using a Female Condom:

- The female condom is a sleeve or pouch with a closed end and a larger open end. Some female condoms have flexible rings at each end. Others have a flexible v-shaped frame.
- Put the condom in place before your partner’s penis touches your vagina or rectum.
- For use in the vagina, insert the narrow end of the condom, like inserting a diaphragm. The larger end goes over the opening to the vagina to protect the outside sex organs from infection.
- Guide the penis into the large end to avoid unprotected contact between the penis and the partner’s rectum or vagina.
- Some people have used female condoms in the rectum after removing the smaller ring. Put the condom over the partner’s erect penis. The condom will be inserted into the rectum along with the penis.
• After sex, remove the condom before standing up. Twist the large end to keep the semen inside. Gently pull the condom out and throw it away.
• Avoid exposure of a mucous membrane, such as the mouth (especially non-intact tissue), to vaginal secretions and menstrual blood.

Using condoms consistently and correctly each and every time for sexual contact with men or when using sex toys. Sex toys should not be shared. No barrier methods for use during oral sex have been evaluated as effective by the Food and Drug Administration (FDA). However, natural rubber latex sheets, dental dams, cut open condoms, or plastic wrap may offer some protection from contact with body fluids during oral sex and possibly reduce the risk of HIV transmission.

DRUG USERS AND HIV/AIDS

The greatest threat comes from the sharing of needles and syringes by drug users for the injection of heroin, cocaine, methamphetamine, and other drugs. Injection-drug users (IDUs) acquire human immunodeficiency virus (HIV) infection by sharing drug equipment with HIV-infected persons and by engaging in risky sexual behavior. In 2007, injection-drug use was the third most frequently reported risk factor for HIV infection in the United States, after male-to-male sexual contact and high-risk heterosexual contact. In 2009 however, 9% of AIDS cases reported as opposed to 46% reported in 2004 were the result of injection drug use. These latest statistics show a positive trend.

This occurs because the drug user will draw blood into a syringe to be sure the needle is in a vein. Then after injecting, the user will repeatedly fill the same syringe with blood to flush out the drug. If this user is infected with HIV and shares this needle and syringe, HIV will be transmitted.

Sharing drug equipment (or "works") can be a risk for spreading HIV. Infected blood can be introduced into drug solutions by:

• Using blood-contaminated syringes to prepare drugs;
• Reusing water;
• Reusing bottle caps, spoons, or other containers ("spoons" and "cookers") used to dissolve drugs in water and to heat drug solutions; or
• Reusing small pieces of cotton or cigarette filters ("cottons") used to filter out particles that could block the needle.
• "Street sellers" of syringes may repackage used syringes and sell them as sterile syringes. For this reason, people who continue to inject drugs should obtain syringes from reliable sources of sterile syringes, such as pharmacies.
• Obviously, discontinuing the use of illicit drugs is the best prevention. However, since this may not be a realistic achievable option, there are several things that can be done to reduce the risk of transmitting HIV through injection drug use.
• Never share needles and syringes, use sterile needles and syringes obtained through needle-exchange programs, or over the counter in states where this is legal. If new needles and syringes are not available, use full strength bleach to clean equipment.
Obviously, discontinuing the use of illicit drugs is the best prevention. However, since this may not be a realistic, achievable option at this time, there are several things that can be done to reduce the risk of transmitting HIV through injection drug use. Never share needles and syringes, use sterile needles and syringes obtained through needle-exchange programs, or over the counter in states where this is legal.

<table>
<thead>
<tr>
<th>Race/Ethnicity</th>
<th>Males</th>
<th>Females</th>
</tr>
</thead>
<tbody>
<tr>
<td>American Indian/Alaska Native</td>
<td>&lt;1%</td>
<td>1%</td>
</tr>
<tr>
<td>Asian</td>
<td>1%</td>
<td>1%</td>
</tr>
<tr>
<td>Black/African American</td>
<td>46%</td>
<td>51%</td>
</tr>
<tr>
<td>Hispanic/Latino*</td>
<td>32%</td>
<td>15%</td>
</tr>
<tr>
<td>Native Hawaiian/Other Pacific Islander</td>
<td>&lt;1%</td>
<td>&lt;1%</td>
</tr>
<tr>
<td>White</td>
<td>19%</td>
<td>30%</td>
</tr>
<tr>
<td>Multiple Races</td>
<td>1%</td>
<td>2%</td>
</tr>
</tbody>
</table>

Source: CDC 2010

Increased HIV prevention and testing efforts are needed to further reduce HIV infections among IDUs. In 2010, the largest majority of HIV diagnoses among IDUs were African American males (46%) and African American females (51%).

**ORAL SEX TRANSMISSION OF HIV**

Some MSMs believe that oral sex is safer. Although the incidence is lower, it was not without risk. Oral sex is dangerous for men as well as for women when contacting tissues that contain blood with a person with HIV. Vaginal, anal and seminal fluids can contain blood and HIV can be transmitted via oral tissues or blood from bleeding gums can infect a partner’s vagina, penis or anal tissues. Methods of prevention would include abstinence from oral sex, the use of a condom with a male partner and a dental dam with a female partner.

**WOMEN’S ISSUES**

Women with HIV/AIDS have remained the same proportionately since 2006 with 9.8 million diagnosed cases reported in 2010. Most of these women have contracted HIV through heterosexual contact with partners who were HIV positive and some through sharing needles with HIV infected drug users. African American and Hispanic women account for more than 79% of recent AIDS cases among women. The epidemic among infants and children comes from women who have transmitted HIV to their unborn fetus or during the birthing process and/or breastfeeding. One of the largest concerns in public health is advising women to be tested for HIV before giving birth. Women who have contracted HIV can be treated with HAART to provide protection for the unborn fetus. Included in the HAART regimen should be the drug known as AZT, a nucleoside reverse transcriptase inhibitor.
that is able to interfere with the virus’ ability to reproduce itself. Even if the mother does not receive prophylactic treatment with HAART, the infant can receive treatment for six weeks after birth with various antiviral drugs, including AZT, to prevent the transmission of the virus if diagnosis of the mother is accomplished.

### Diagnoses of HIV Infection among Adult and Adolescent Females, by Race/Ethnicity, 2010

<table>
<thead>
<tr>
<th>Race/ethnicity</th>
<th>No.</th>
<th>Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>American Indian /Alaska Native</td>
<td>61</td>
<td>6.4</td>
</tr>
<tr>
<td>Asian</td>
<td>134</td>
<td>2.5</td>
</tr>
<tr>
<td>Black/African American</td>
<td>6,268</td>
<td>41.7</td>
</tr>
<tr>
<td>Hispanic/Latino</td>
<td>1,533</td>
<td>9.2</td>
</tr>
<tr>
<td>Native Hawaiian/other Pacific Islander</td>
<td>6</td>
<td>4.5</td>
</tr>
<tr>
<td>White</td>
<td>1,733</td>
<td>2.1</td>
</tr>
<tr>
<td>Multiple races</td>
<td>133</td>
<td>9.7</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>9,868</strong></td>
<td><strong>8.0</strong></td>
</tr>
</tbody>
</table>

*Source: CDC, 2010. Data include persons with a diagnosis of HIV infection regardless of stage of disease at diagnosis. Rates are per 100,000 population.*

Delayed treatment is recommended in some instances for patients who have had HIV for several months as opposed to early treatment. Because the virus may become resistant to drug therapy, differing regimens are offered using up to three drugs. HAART (Highly Active Antiretroviral Therapy) is a combination of three drugs that includes AZT, used during the later stages of AIDS to fight the virus before it can become resistant. The toxicity of the combination of these drugs must be monitored closely. A need for individual and a collective responsibility for HIV prevention are important. In the absence of an effective vaccine against HIV, refraining from behaviors and practices that increase the risk of acquiring HIV are necessary. HIV is transmitted in three principal ways; through sexual activity, through contact with infected blood primarily during injection drug use, and from Mother-to-Child (Perinatal) HIV Transmission and Prevention.

HIV transmission from mother to child during pregnancy, labor and delivery, or breastfeeding is called perinatal transmission. Research published in 1994 showed that zidovudine (ZDV) given to pregnant women infected with HIV and their newborns reduced the risk for this type of HIV transmission. Since then, the testing of pregnant women and treatment for those who are infected have resulted in a dramatic decline in the number of children perinatally infected with HIV. However, much work remains to be done: about 100–200 infants in the United States are infected with HIV annually. Many of these infections involve women who were not tested early enough in pregnancy or who did not receive prevention services. Perinatal HIV transmission is the most common route of HIV infection in children and is now the source of almost all AIDS cases in children in the United States. Most of the children with AIDS are members of minority races/ethnicities. Treatment for HIV infected mothers can be used at any time during their pregnancy. Tests, although not conclusive, show low toxicity for the fetus in comparison with high results for controlling transmissions rates. A three part
ZDV chemoprophylaxis is used for early intervention treatment after the first three months and during labor. ZDV may also be used for the infant for chemo prophylactic treatment for six weeks after birth and continued if diagnosed that transmission has occurred.

**FUTURE OPTIONS FOR TREATING HIV**

The trends for the new millennium are somewhat favorable as far as treatment options are concerned. New medications have decreased the number of deaths especially among infants with HIV. Currently, the disease is being treated as a chronic disease without a cure however; medications can sustain the patient’s condition for many years. Because the virus may become resistant to therapy, differing regimens are offered using up to three medications. HAART is a combination of three or more substances used during the later stages of AIDS to fight the virus before it can become resistant. The toxicity of the combination must be monitored closely.

Antiretroviral therapy (ART) is the recommended treatment for HIV. ART involves taking a combination of anti-HIV medications (a regimen) every day. Anti-HIV medications (also called antiretrovirals) are grouped into **six drug classes** according to how they fight HIV (see table below). The six classes are non-nucleoside reverse transcriptase inhibitors (NNRTIs), nucleoside reverse transcriptase inhibitors (NRTIs), protease inhibitors (PIs), fusion inhibitors, CCR5 antagonists, and integrase inhibitors.

Recommended HIV treatment regimens include three or more anti-HIV medications from at least two different drug classes. Taking a combination of anti-HIV medications from different classes is the most effective way to control the virus. Some anti-HIV medications are available in combination (two or more medications in one pill). All patients are monitored closely for toxicity and different combinations are experimented with to find the combination that works best for each individual.

HAART, or highly active antiretroviral therapy, refers to the use of combinations of various antiretroviral drugs with different mechanisms of action to treat HIV. There are several different drug "cocktails" used as HAART, but it is the use of a **combination** of drugs that is the most important hallmark of HAART as therapy. HIV can easily develop resistance to individual antiretroviral therapies, but it is harder for HIV to become drug-resistant when multiple antiretroviral drugs with varied mechanisms of action are combined into a single HIV treatment.

HAART usually involves a combination of at least three drugs from two or more classes of antiretroviral treatment. These cocktails of reverse transcriptase inhibitors, protease inhibitors, and other types of HIV treatment may be prescribed either individually or as multiple drugs combined in a single co-formulated pill.
Antiretroviral Medications used to treat HIV/AIDS
Six Major Drug Classes

**Reverse Transcriptase (RT) Inhibitors** interfere with the critical step during the HIV life cycle known as reverse transcription. During this step, the HIV enzyme RT converts HIV RNA to HIV DNA. There are two main types of RT inhibitors.

1. **Nucleoside/nucleotide RT inhibitors** are faulty DNA building blocks. When these faulty pieces are incorporated into the HIV DNA (during the process when HIV RNA is converted to HIV DNA), the DNA chain cannot be completed, thereby blocking HIV from replicating in a cell.
2. **Non-nucleoside RT inhibitors** bind to RT, interfering with its ability to convert the HIV RNA into HIV DNA.
3. **Protease Inhibitors** interfere with the protease enzyme that HIV uses to produce infectious viral particles.
4. **Fusion/Entry Inhibitors** interfere with the virus' ability to fuse with the cellular membrane, thereby blocking entry into the host cell.
5. **Integrase Inhibitors** block integrase, the enzyme HIV uses to integrate genetic material of the virus into its target host cell.
6. **CCR Antagonists** inhibitors block CCR5, a protein on the CD4 cells that HIV needs to enter the cells.

Another HIV/AIDS drug class known as maturation inhibitors is still in development. If successful, they could potentially prevent HIV from properly assembling and maturing. For example, these treatments could block HIV from forming a protective outer coat or from emerging from human cells. New research is in progress and some success is achieved in prolonging life. However, no real cure has been achieved.

<table>
<thead>
<tr>
<th>FDA-Approved Anti-HIV Medications</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Drug Class</strong></td>
</tr>
<tr>
<td>----------------</td>
</tr>
<tr>
<td>Non-nucleoside Reverse Transcriptase Inhibitors (NNRTIs)</td>
</tr>
<tr>
<td>NNRTIs bind to and alter reverse transcriptase, an enzyme HIV needs to make copies of itself.</td>
</tr>
<tr>
<td>Efavirenz (EFV)</td>
</tr>
<tr>
<td>Etravirine (ETR)</td>
</tr>
<tr>
<td>Nevirapine (NVP)</td>
</tr>
<tr>
<td>Rilpivirine (RPV)</td>
</tr>
<tr>
<td>Nucleoside Reverse Transcriptase Inhibitors (NRTIs)</td>
</tr>
<tr>
<td>NRTIs block reverse transcriptase, an enzyme HIV needs to make copies of itself.</td>
</tr>
<tr>
<td>Didanosine (ddl)</td>
</tr>
<tr>
<td>Emtricitabine (FTC)</td>
</tr>
<tr>
<td>Lamivudine (3TC)</td>
</tr>
<tr>
<td>Stavudine (d4T)</td>
</tr>
<tr>
<td>Tenofovir DF (TDF)</td>
</tr>
<tr>
<td>Zidovudine(ZDV, AZT)</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>Protease Inhibitors (PIs)</td>
</tr>
<tr>
<td>PIs block HIV protease, an enzyme HIV needs to make copies of</td>
</tr>
<tr>
<td>Darunavir (DRV)</td>
</tr>
<tr>
<td>Indinavir (IDV)</td>
</tr>
<tr>
<td>Nelfinavir (NFV)</td>
</tr>
</tbody>
</table>
Fusion Inhibitors

Fusion inhibitors block HIV from entering the CD4 cells of the immune system.

<table>
<thead>
<tr>
<th>Name</th>
<th>Company</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Enfuvirtide (T-20)</td>
<td>Hoffmann-La Roche, Trimeris</td>
<td>March 13, 2003</td>
</tr>
</tbody>
</table>

CCR5 Antagonists

CCR5 entry inhibitors block CCR5, a protein on the CD4 cells that HIV needs to enter the cells.

<table>
<thead>
<tr>
<th>Name</th>
<th>Company</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maraviroc (MVC)</td>
<td>Pfizer</td>
<td>Aug. 6, 2007</td>
</tr>
</tbody>
</table>

Integrase Inhibitors

Integrase inhibitors block HIV integrase, an enzyme HIV needs to make copies of itself.

<table>
<thead>
<tr>
<th>Name</th>
<th>Company</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Raltegravir (RAL)</td>
<td>Merck</td>
<td>Oct. 12, 2007</td>
</tr>
</tbody>
</table>

Fixed-Dose Combination

Fixed-dose combination tablets contain two or more anti-HIV medications from one or more drug classes.

<table>
<thead>
<tr>
<th>Combination</th>
<th>Company</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Abacavir, Lamivudine</td>
<td>GlaxoSmithKline</td>
<td>Aug. 2, 2004</td>
</tr>
<tr>
<td>Abacavir, Lamivudine, Zidovudine</td>
<td>GlaxoSmithKline</td>
<td>Nov. 14, 2000</td>
</tr>
<tr>
<td>Efavirenz, Emtricitabine, Tenofovir DF</td>
<td>Bristol-Myers Squibb, Gilead Sciences</td>
<td>July 12, 2006</td>
</tr>
<tr>
<td>Emtricitabine, Rilpivirine, Tenofovir DF</td>
<td>Gilead Sciences</td>
<td>Aug. 10, 2011</td>
</tr>
<tr>
<td>Emtricitabine, Tenofovir DF</td>
<td>Gilead Sciences</td>
<td>Aug. 2, 2004</td>
</tr>
<tr>
<td>Lamivudine, Zidovudine</td>
<td>GlaxoSmithKline</td>
<td>Sept. 27, 1997</td>
</tr>
<tr>
<td>Lopinavir, Ritonavir</td>
<td>Abbott Laboratories</td>
<td>Sept. 15, 2000</td>
</tr>
</tbody>
</table>

Source: Aidsinfo.nih.gov-Revised August 2012

This information is based on the U.S. Department of Health and Human Services’ Guidelines for the Use of Antiretroviral Agents in HIV-1-Infected Adults and Adolescents. Although experimental in many cases, the FDA has approved these drugs for use. These new drug methods are keeping HIV under control in many cases. With introduction of highly active antiretroviral therapy, AIDS diagnoses and deaths declined substantially from 1995 to 1998 and have remained stable from 1999 to 2008 according to the 2009 National HIV Surveillance System.
TAKEING RESPONSIBILITY

A need for individuals and collective responsibility for HIV prevention is important. With the absence of an effective vaccine against HIV, refraining from behaviors and practices that increase the risk of acquiring HIV are necessary. According to the CDC, sexual transmission is responsible for nearly two-thirds of AIDS cases in the United States. Therefore, preventing transmission will have a great impact on slowing the HIV epidemic. People who are HIV-infected have a practical and an ethical responsibility to help control the spread of HIV through their sexual behavior. Although current opinion is that the use of a latex condom during each act of intercourse is the most effective way to prevent HIV transmission during both anal and vaginal intercourse, recently some have questioned whether condoms are really effective. Natural condoms do not prevent HIV. Latex condoms sold in the US are regulated by the FDA. Failure rates are about 3% but may be higher.

Blood to blood is a very efficient way for HIV to be transmitted. However, since early 1985 all blood donations have been screened, therefore making transfusions and treatment for hemophiliacs less likely a source of HIV transmission. However, mistakes have occurred and some infected blood has gotten through. Anyone needing a blood transfusion should be aware of the risks and/or use only donated blood from relatives or friends who have been screened or tested for HIV.

PREVENTION FOLLOWING PERCUTANEOUS EXPOSURE OF HEALTHCARE WORKERS

Healthcare workers and laboratory workers can become infected with HIV if they accidentally stick themselves with a sharp object that is HIV contaminated, such as a needle, scalpel, or broken glass. HIV can also infect through an open wound, even a tiny one that comes in contact with HIV infected blood. Exposure to infectious agents through any break in the skin is referred to as “percutaneous exposure”. The risk of acquiring HIV through percutaneous exposure is believed to be about 0.3% per exposure. In other words, this risk of exposure leading to infection is 99.7%. The following is the recommendation by the CDC for high risk percutaneous exposures and those exposures identified as high risk.

High risk exposures
- A deep injury.
- Presence of visible blood on the object that caused the injury.
- An injury caused by a device that had been placed in an infected person’s vein or artery, such as a needle used to draw a blood sample.
- An injury caused by a device used for an infected patient who died as a result of AIDS within 60 days of injury, and who, therefore, was presumed to have a high viral load of HIV.
**Recommendations: “Post-Exposure Prophylaxis” or PEP**

- Antiretroviral therapy be administered promptly and continued for several weeks to reduce the risk of infection. Nucleoside/Nucleotide Reverse Transcriptase Inhibitors like zidovudine, lamivudine, and abacavir are used.
- An expanded regimen may include: indinavir, nelfinavir, efavirenz, abacavir, ritonavir, saquinavir, amprenavir and lopinavir (Protease Inhibitors).
- This regimen should be implemented by an individual in consultation with a doctor experienced in antiretroviral therapy and HIV transmission.
- Healthcare workers who receive this prophylaxis are encouraged to enroll in an anonymous registry to provide the CDC with important data on the effectiveness of this treatment.

### HIV Post-Exposure Prophylaxis Regimens

<table>
<thead>
<tr>
<th>Regimen Type</th>
<th>Medication Details</th>
<th>Dosage</th>
<th>Side Effects</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Basic Regimen</strong></td>
<td>Zidovudine (Retrovir™; ZDV;AZT)</td>
<td>300 mg twice daily or 200 mg three times daily, with food; 600 mg daily</td>
<td>Side effects (nausea and fatigue) common</td>
</tr>
<tr>
<td></td>
<td>Lamivudine (Epivir™; 3TC)</td>
<td>150 mg twice daily</td>
<td>Safe regimen for PG</td>
</tr>
<tr>
<td></td>
<td>Combivir™</td>
<td>Twice daily</td>
<td>Resistant virus potential</td>
</tr>
<tr>
<td><strong>Alternate Regimen</strong></td>
<td>Lamivudine (3TC)</td>
<td>150 mg twice daily</td>
<td>Well tolerated</td>
</tr>
<tr>
<td></td>
<td>Stavudine (Zerit™; d4T)</td>
<td>40 mg twice daily</td>
<td>Potential viral resistance</td>
</tr>
<tr>
<td></td>
<td>Didanosine (Videx)™</td>
<td>400 mg once daily (chewable) or 200 mg twice daily</td>
<td>Rare toxicity</td>
</tr>
<tr>
<td><strong>Preferred Expanded Regimen</strong></td>
<td>Lopinavir/ritonavir (Kaletra; LPV/RTV)</td>
<td>400/100 mg =3 capsules twice daily with food</td>
<td>Generally well tolerated</td>
</tr>
<tr>
<td>(Basic Regimen Plus;)</td>
<td></td>
<td></td>
<td>Potential for life threatening drug interactions</td>
</tr>
<tr>
<td></td>
<td>Enfuvirtide (Fuzeon; T20)</td>
<td>90 mg (1ml) twice daily by subcutaneous injection</td>
<td>New class</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Single-dose vial, reconstituted to 90mg/ml</td>
<td>Unique viral target; to block cell entry</td>
</tr>
<tr>
<td><strong>Used Only With Expert Consultation</strong></td>
<td></td>
<td></td>
<td>Prevalence to resistance low</td>
</tr>
<tr>
<td><strong>Alternate Expanded Regimens</strong></td>
<td>Atazanavir (Reyataz;ATV) + ritonavir (Novir; RTV)</td>
<td>400 mg once daily ATV 300mg +RTV: 100mg once daily</td>
<td>Generally well tolerated</td>
</tr>
<tr>
<td>(Basic regimen plus one of the following)</td>
<td>Fosamprenavir(Lexiva;FOSAPV) +ritonavir (Norvir RTV)</td>
<td>1400 mg twice daily (without RTV)</td>
<td>GI side effects common</td>
</tr>
<tr>
<td></td>
<td>Indinavir( Crixivan; IDV) + ritonavir (Norvir: RTV)</td>
<td>1400 mg once daily + RTV 200 mg once daily</td>
<td>Potent HIV inhibitor</td>
</tr>
<tr>
<td></td>
<td></td>
<td>IDV 700 mg twice daily +RTV</td>
<td>Serious toxicity</td>
</tr>
<tr>
<td></td>
<td></td>
<td>800 mg twice daily +RTV 100 mg twice daily</td>
<td>Possible rash</td>
</tr>
<tr>
<td></td>
<td></td>
<td>IDV 800 mg every 8 hours on an empty stomach</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>NFV 250 or 625 mg tablet</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>600 mg daily at bed time</td>
<td></td>
</tr>
</tbody>
</table>

Source: CDC, Morbidity and Mortality Weekly Report, January 21, 2005
Standard Precautions

Standard precautions for the care of all patients, regardless of their presumed infection status or their diagnosis, are recommended by the CDC. The standard precautions should apply to blood, all body fluids, mucous membranes, and excretions, except sweat, regardless of whether or not they contain visible blood. Hand washing, appropriate personal protective equipment such as gloves, masks, gowns, whenever exposure or touching a patients’ body fluids is anticipated, are universally known as standard precautions. Standard precautions will reduce the risk of transmission of infection. Needle capping devices are used to prevent accidental needle sticks when healthcare workers recap a used syringe. These devices make it possible for the healthcare worker to use one hand to replace the cap of the needle. Needles are never left uncapped and special receptacles are used to dispose of all medical waste and especially needles used for injections. Anywhere contact with someone’s blood is possible or probable, standard precautions should be in place.

Prevention of HIV can occur only through a real awareness of why prevention is necessary and how it is accomplished. Education must begin early to ensure that by adolescence, people have a solid understanding of the nature of drug abuse and of infectious diseases, particularly sexually transmitted diseases, and how to avoid them. Instead of blaming youth for taking risks, we need to give them information to help them make the right choices.

The widespread use of vaccines in the United States has dramatically reduced the incidence of several viral diseases, including measles, mumps, and poliomyelitis. Many features of HIV make it difficult to develop a vaccine against it. In fact, no single vaccine exists today against any of the three known human retroviruses. This is due in part to the ability of the HIV infection to establish itself quickly in the body because the virus target helper T-lymphocytes cells with CD4 molecules on them. Also, HIV mutates frequently just as the influenza virus does which requires people to get a different flu shot every year. In addition, there are multiple subtypes of HIV worldwide. Other than the chimpanzee, no animal has been found to develop an AIDS-like immune deficiency when given HIV. However, researchers are hopeful that a vaccine can be found.

There are also other issues involved in the HIV vaccine development. The prevention of AIDS is the most challenging scientific problem ever undertaken by immunologists, and the most expensive. When and if an HIV vaccine is ready it is going to be relatively expensive. We need to be prepared on a public and private sector level to fund the cost and availability of the vaccine. The impact of current ethical guidelines on biomedical research also needs to be considered in light of using human subjects for vaccine trails.
INFECTION CONTROL

Individuals with HIV infection are highly likely to have infectious diseases, some of which could be transmitted to others, including healthcare workers (HCW). Also, immunocompromised individuals can become seriously, even fatally ill from infectious agents that are easily treatable in the non HIV-infected individual. Therefore, infection control practices are vital in the work place of healthcare workers. Infections may be transmitted in the dental operatory through several routes, including direct contact with blood, oral fluids or other secretions; indirect contact with contaminated instruments, operatory equipment, or environmental surfaces; or contact with airborne contaminants present in either droplet, splatter, or aerosols of oral and respiratory fluids.

The following are guidelines for and the appropriate use of barrier precautions, the cleaning, disinfecting, and sterilization of instruments and equipment recommended by the American Dental Association and the Center for Disease Control.

**Barrier Precautions**

**Hand Washing:**

Performed:

- Before and after each patient contact
- After removal of examination gloves
- Immediately after contact with blood, body fluids, or mucous membranes

**Gloves:**

Worn for anticipated contact with:

- Blood
- Mucous membranes
- Non-intact skin
- Handling objects, or surfaces soiled with blood or body fluids

Non sterile gloves are appropriate for examinations and non-surgical procedures.

Sterile gloves for sterile procedures.

Single use gloves may not be washed, decontaminated and reused.

Washing of gloves can create undetected holes and is not recommended.

**Fluid impervious or Surgical Masks (3M 1800 light blue surgical):**

Worn:

- Anytime a healthcare worker is likely to be splashed in the face with blood or body fluids
- Anytime the HCW is working in close proximity to a patient who is coughing

**Protective Eye Wear / Face Shield:**

Worn:

- Anytime healthcare worker anticipates the possibility of being splashed or splattered with blood and body fluids
If healthcare worker has acne or dermatitis (face shield)
If preparing a tooth with a high-speed hand piece
If polishing a crown

**Water Impervious Garments:**

**Worn:**
- For anticipated soiling of clothing with blood and body fluid

**Disposal of Personal Protective Equipment (PPE):**

- Personal Protective Equipment, including garments, gloves, masks, and eye/face protection are to be removed before the health care worker exits areas of the dental office used for laboratory or patient treatment activities

**Needles and Small Sharps:**

- Do not recap used needles by hand unless under special conditions and only with use of the one handed technique
- Used needles, disposable sharps, and glass tubes or cartridges must be disposed of in designated puncture proof biohazard containers
- Always point the sharp end of instruments away from yourself and others
- Do not pick up multiple sharp instruments together
- Use caution when rotating instruments are in use
- Use sturdy utility gloves during cleaning/decontaminating instruments

**Multiple Use of a Needle/Syringe Unit:**

- Between injections the multi-use needle/syringe unit is recapped using the standard one handed technique or using a mechanical device which stabilizes the needle sheath
- When using a multi-use needle/syringe unit place the unsheathed needle in a location where it will not become contaminated or cause unintentional sticks

**Control of Environmental Contamination:**

- Difficult to clean/decontaminate surfaces cover with a disposable fluid impervious sleeve/drape:
  - light handles
  - hand operated controls x-ray unit head, etc.
- Change such covers after each patient, using a gloved hand
- Use rubber dams when appropriate
- Use high speed evacuation
- Use proper patient/operator positioning

**Linen:**

- Discard disposable drapes in appropriate trash containers
- Used linen is considered contaminated, bag linen at the point of origin before placing in a “soiled linen” container
- Place wet linen in a fluid impervious soiled linen or regular plastic trash bag before placing in a soiled linen bag.

**Waste Disposal:**

- Dispose of solid waste after each patient, place in regular trash container (saliva injectors, paper products, gauze/cotton supplies etc.)
♦ When using a single use suction container, add a solidifying agent to secretions to produce a disposable gel prior to discarding in a biohazards waste container
♦ Collected liquids through use of blood collection devices and high-velocity evacuation system may be emptied in the sewer system.
♦ Use caution when emptying containers to avoid splashes or spilling of potentially infectious materials

Cleaning, Disinfecting, and Sterilization of Instruments and Equipment:
♦ Dental instrument classification, based on risk of infection, transmission, and sterilization need between use:
  • Critical
  • Semi critical
  • Non critical

Standards/Procedures for the Dental Service Unit:
♦ Cover environmental surfaces at chair side with disposable plastic, change after each patient
♦ Handles of overhead dental light
♦ Patients headrest
♦ High speed evacuation
♦ Low speed evacuation
♦ Instrument trays
♦ Air/water syringes
♦ X-ray tube head
♦ Exposure button for x-ray unit

Air/water syringe:
♦ Tips must be autoclaved after each patient or be disposable
♦ Syringe handles covered with disposable wrap

Disposable:
♦ High speed evacuation tips
♦ Low speed evacuation tips
♦ Prophylaxis angles
♦ Cotton supplies
♦ Blood contaminated disposables, placed in red autoclave trash bags or in isolyzers
♦ Barrier wraps

Instruments:
♦ Sterilize between patients, high speed dental hand pieces and slow speed hand piece components used intra orally

Use of the IMS System:
♦ Place instruments in cassettes, place cassettes in ultrasonic cleaner for required time (20 minutes) then remove, rinse, drain, air dry, wrap and autoclave for required time/temperature
♦ All instruments not in cassettes, place instruments in ultrasonic cleaner for required time (20 minutes) rinse, check for debris, return to ultrasonic if debris is present.
♦ Healthcare worker should use heavy durable utility gloves when manipulating instruments
Place instruments in peal pouches, date and initial for monitoring shelf life and responsibility of healthcare worker

Other Disinfecting/Sterilization Procedure:

♦ Disinfect exposed intraoral x-ray film prior to placing in developer
♦ Disinfect impressions, appliances, and dentures prior to handling and/or sending to dental lab
♦ Conduct biological monitoring on a weekly basis
♦ Break down and mechanically clean autoclave monthly

Air and Water Line Maintenance:

♦ Install and maintain anti-retraction valves to reduce the risk of possible aspiration of patient materials into hand pieces and water lines
♦ Run high speed hand pieces a minimum of 20-30 seconds after each patient to discharge water and air
♦ Flush water lines by running water for several minutes at the beginning of each day
♦ Use sterile water or saline during procedures involving the cutting of bone

Education:

♦ Provide OSHA training annually
♦ Provide infection control updates as needed
♦ Provide training in infection control practices as needed

LEGAL RESPONSIBILITIES AND IMPLICATIONS

Case law concerning dental management and treatment of the HIV infected patient is being established and varies somewhat from state to state. Dental professionals are advised to consult their own attorneys for specific legal advice. At this time, the easiest way to avoid legal complications is for the dental professional to treat HIV infected patients just like all other patients.

Many states have laws that govern the healthcare provider’s responsibility as far as patient rights and informed consent. For example, Kentucky Statute 214.625 Legislative findings -- Consent for medical procedures and tests including HIV infection -- Physician’s responsibility -- Confidentiality of results -- Exceptions -- Disclosure -- Network of voluntary HIV testing programs.

(1) The General Assembly finds that the use of tests designed to reveal a condition indicative of human immunodeficiency virus (HIV) infection can be a valuable tool in protecting the public health. The General Assembly finds that despite current scientific knowledge that zidovudine (AZT) prolongs the lives of acquired immunodeficiency syndrome victims, and may also be effective when introduced in the early stages of HIV infection, many members of the public are deterred from seeking testing because they misunderstand the nature of the test or fear that test results will be disclosed without their consent. The General Assembly finds that the public health will be served by facilitating informed, voluntary, and confidential use of tests designed to detect HIV infection.

(2) A person who has signed a general consent form for the performance of medical procedures and tests is not required to also sign or be presented with a specific consent form relating
to medical procedures or tests to determine HIV infection, antibodies to human immunodeficiency virus, or infection with any other causative agent of acquired immunodeficiency syndrome that will be performed on the person during the time in which the general consent form is in effect. However, a general consent form shall instruct the patient that, as part of the medical procedures or tests, the patient may be tested for HIV infection, hepatitis, or any other blood-borne infectious disease if a doctor or advanced practice registered nurse orders the test for diagnostic purposes. Except as otherwise provided in subsection (5) (c) of this section, the results of a test or procedure to determine HIV infection, antibodies to human immunodeficiency virus, or infection with any probable causative agent of acquired immunodeficiency syndrome performed under the authorization of a general consent form shall be used only for diagnostic or other purposes directly related to medical treatment.

(3) In any emergency situation where informed consent of the patient cannot reasonably be obtained before providing health-care services, there is no requirement that a health-care provider obtain a previous informed consent.

**DUTY TO TREAT**

The American with Disabilities Act (AWDA) and other federal, state, and local laws, states that a person with HIV is considered as having a “disability”, as are persons who are perceived to have HIV, which may include patients who have had blood transfusions. HIV is only one of several infectious diseases that are considered as disabilities under AWDA, for example, hepatitis B and tuberculosis are also treated as disabilities. In the 1995 case of U.S. vs. Morant, the constitutionality of this law was upheld. The dentist’s argument that if referrals of HIV infected patients were prohibited by the AWDA, the statute was an unconstitutional intrusion on the exercise of his professional judgment was rejected.

In Abbott vs. Bragdon, March 1997, Dr. Bragdon’s defense, which centered on concerns about HIV transmission and office safety, was a case study on the balance between provider and patient rights. The court ruled in Abbott’s favor stating that Dr. Bragdon had violated the AWDA and that his defense did not support his decision.

Title III of the AWDA, which went into effect January 1992, states:

“\[No individual shall be discriminated against on the basis of disability in the full and equal enjoyment of the goods, services, facilities, privileges, advantages, or accommodations of any place of public accommodation by any person who owns, leases (or leases to), operates a place of public accommodation.\]”

It is unlawful discrimination to refuse to provide treatment to an individual because he/she is perceived to be HIV infected. Cases which have been prosecuted under both federal and state laws against dentist for refusal to provide care to HIV infected patients have usually resulted in fines against the dentist. Some of these fines have been quite substantial.
LIABILITY FOR STAFF ACTIONS

A dentist who owns or operates a dental office is likely to be liable for discriminatory actions by his/her staff. If a staff member has concerns about treating an HIV infected patient, he/she should be further educated in the use of standard precautions and the practice’s legal responsibility to treat the patient. In fact, barring any state law or employee contract, a dentist who requires the dental team to treat HIV infected patients can probably terminate those individuals for refusing to do so.

SCOPE OF DUTY

A general dentist can refer an HIV infected patient to a specialist if the dentist would make the same referral of a non-infected patient for sound dental reasons. However, the current law is that a dentist may not refer a patient with HIV/AIDS based on that person’s status alone. The safest action is to make it clear that the referral to a specialist is for the patient’s benefit, explaining that the needed treatment is outside of his/her scope or expertise.

THE “DIRECT THREAT” DEFENSE

Abbott vs. Bragdon was the first case of its kind to rule on this defense. According to the First Circuit Court that ruled on the case, “a service provider like Dr Bragdon is not entitled to demand absolute safety.” This ruling was based on testimony about the efficacy of standard precautions as prescribed by the CDC and the America Dental Association’s policy on AIDS.

OBTAINING AND USING INFORMATION ABOUT PATIENTS’ HIV STATUS

Federal law allows dentists to inquire about their patient’s HIV status, through questions on a health history form utilized for all patients, as long as this information is not used to discriminate, and confidentiality is maintained as law. This has been ruled necessary in order to provide any patient, including the HIV infected patient, the most appropriate treatment based on informed judgment required by state.

SENSITIVITY TRAINING

Healthcare providers have to be aware of their attitudes as they encounter patients with HIV/AIDS. A non-judgmental and compassionate frame of mind will help with long-term treatment, as the disease may be active for many years.

Circumstances of the disease should not affect the caregiver’s performance. A clinical, as well as a humanitarian approach may help the patient keep from depression and despair that commonly accompanies the patient with a terminal disease. Positive affirmation can sometimes increase the patient’s immune system’s capabilities.
Stigma happens when others devalue a person or a group of people because they are associated with a certain disease, behavior or practice. And like a one-two punch, those who are stigmatized often experience discrimination in some fashion. The effects of both can be even worse for groups who already are marginalized because of their gender, sexuality, ethnicity or substance abuse.

Those who stigmatize people living with HIV falsely believe that the virus is highly contagious and that they could easily become infected. When that happens, others start to view HIV-positive women and men as a threat. Many become isolated – within their homes, in public, at their workplaces. They are further stigmatized by others’ assumptions about their moral integrity – such as the belief that they became infected with HIV because they chose to take part in risky behaviors. And because in many countries women are held to a different moral standard than men, they often are disproportionately blamed for HIV in their communities.

In the end, stigma and discrimination continue to undermine prevention, treatment and care of people living with the HIV and AIDS. It hinders those with the virus from telling their partners about their status. It threatens their access to health care. It increases their vulnerability to physical violence. And HIV-related stigma affects people’s ability to earn a living, making it even more difficult for them to lift themselves out of poverty. People should use the “Golden Rule” approach toward and HIV infected person. So in everything, do to others what you would have them do to you,

CONFIDENTIALITY

There are requirements for consent to HIV test in most states. For example, listed in the Kentucky Statute 214.625, as a general rule, dentists may discuss a patient’s HIV status or related information with a third party only when authorized by the patient, mandated by law and/or allowed by law to do so. Primarily state laws govern doctor-patient confidentiality. Some states may mandate the reporting of an infected patient’s HIV status to third parties on a confidential basis. Some states allow a dentist to discuss the patient’s status with the patient’s physician so that an appropriate treatment plan can be developed.

PARTNER COUNSELING AND REFERRAL SERVICES

Local and state public health programs use HIV partner notification as an essential part of an HIV prevention approach known as partner counseling and referral services (PCRS). As an important component of the U.S. Centers for Disease Control and Prevention (CDC) Advancing HIV Prevention Initiative, PCRS is a comprehensive HIV prevention and treatment strategy that informs sex and needle-sharing partners of HIV-positive patients about their potential exposure to HIV; helps these partners gain earlier access to individualized counseling, HIV testing, medical evaluation, and other
services; and assists persons newly diagnosed with HIV to receive prompt medical care to maximize the benefits of life-saving antiretroviral therapy.

PCRS programs notify partners potentially exposed to HIV through four referral strategies: client referral, provider referral, contract referral, and dual referral. For client referral, also known as patient or self-referral, an HIV-positive client (i.e., index patient) informs his or her sex or needle-sharing partners about their possible exposure to HIV. With provider referral, a health service provider (e.g., physician, nurse, counselor, or disease intervention specialist) collects partner contact information from the index patient and then notifies these partners. Contract referral is a combination of the client and provider referral strategies, in which the index patient agrees to notify his or her partners within an established time period. After that time, the provider will then notify any partners not contacted by the client. Finally, dual referral involves both the client and provider notifying the client's partners together.

Most states have laws that criminalize acts which can result in the transmission of HIV to others. In Florida, if you have been informed that you have HIV infection, you must take steps to avoid transmitting it to others. This means informing your sex partners before having sex with them, even if you use a condom. Likewise, persons who have HIV infection and share needles to inject drugs may also be charged with a crime if your needle-sharing partner is unaware of your infection. For example, failure to inform partners is a third-degree felony in Florida and the penalty is up to five years in prison. This applies whether or not the partner becomes infected with HIV.
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HIV/AIDS
Self-Study Examination

Instructions: After carefully reading the text, answer the following questions. Fill in the corresponding circle on the answer sheet provided. Good Luck!

1) AIDS is the advanced stage of HIV disease?
   a) True
   b) False

2) Opportunistic infections:
   a) Weaken the immune system
   b) Cause serious illness
   c) May be life threatening
   d) All of the above

3) Human immunodeficiency virus is the virus that causes AIDS.
   a) True
   b) False

4) The human immunodeficiency virus is passed from one person to another by:
   a) Blood-to-blood contact
   b) Sexual contact
   c) Infected Pregnant woman to baby
   d) All of the above

5) Most people with HIV do change their sexual practices after testing positive.
   a) True
   b) False

6) The greatest number of HIV cases reported was among which segment of the population?
   a) African Americans
   b) Male-to-male sexual contact
   c) Between the ages of 20-24
   d) All of the above

7) Which of the following is an unresolved risk of HIV transmission?
   a. The role of pre-cum in transmission
   b. The protection offered by covering female genitals with a dental dam during oral sex on the women
   c. The risk of transmission from wet kissing
   d. All of the above
8) *Opt-out screening* for HIV means that HIV tests will be done routinely unless a patient explicitly refuses to take an HIV test
   a) True
   b) False

9) The most common oral lesion associated with HIV infection is:
   a) Neoplasms
   b) Herpes simplex
   c) Oral Hairy Leukoplakia
   d) Papilloma
   e) Candidiasis

10) Which is NOT a viral infection found in the oral cavity of HIV infected individual?
    a) Candida Albicans
    b) Herpes Simplex
    c) Epstein-Barr
    d) Cytomegalovirus
    e) Varicella-Zoster

11) Kaposi sarcoma is NOT:
    a) Commonly found on the soft and hard palate
    b) Sometimes present on the outside of the mouth
    c) The most common neoplasm affecting AIDS patients
    d) A deep ulceration most often involving the buccal mucosa
    e) All of the above

12) Finding a small amount of HIV in a body fluid or tissue does not mean that HIV is transmitted by that body fluid or tissue.
    a) True
    b) False

13) Modes of transmission for HIV include which of the following?
    a) Semen
    b) Breast milk
    c) Synovial fluid
    d) Blood
    e) All of the above

14) According to the CDC, which category of the population has the largest number of HIV diagnoses?
    a) Injection drug use
    b) Heterosexual
    c) Male to male sexual contact
    d) Male to male sexual contact and injection drug use
    e) All of the above

15) People with advanced HIV infection are vulnerable to infections and malignancies that are called 'opportunistic infections' because they take advantage of the opportunity offered by a weakened immune system.
    a) True
    b) False
16) According to the CDC, the greatest impact on slowing the HIV epidemic is:
   a) Preventing transmission
   b) Develop a vaccine
   c) Creating more accurate tests for AIDS
   d) Testing all healthcare workers

17) Which of the following are high-risk exposures?
   a) A deep injury
   b) Presence of visible blood on an object that caused an injury
   c) An injury caused by a device placed in an infected person’s vein or artery
   d) All of the above

18) Which of the following standard is not recommended when using a multi-use needle/syringe?
   a) Recap using the two-handed technique
   b) Place unsheathed needle in a safe location to avoid unintentional needle sticks
   c) Recap using the one-handed technique
   d) Use a mechanical device to stabilize the needle sheath

19) Under the Americans with Disabilities Act and other federal, state, and local laws, a person with HIV is considered as having a “disability”.
   a) True
   b) False

20) As a general rule, dentists may discuss a patient’s HIV status with a third party only if:
   a) Authorized by the patient
   b) Mandated by law
   c) Allowed by law
   d) All of the above
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Please darken the circles completely. Choose ONLY ONE best answer. You may not need all 75 of these spaces depending on the number of questions on your test.

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**HIV**

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