HIV/AIDS - 4 hours

This CBL contains 245 slides and will take approximately 4 hours to complete.

Welcome to the self-learning module on AIDS. This module contains information on topics such as AIDS Education, History, Life Cycle of HIV, Modes of Transmission, Statistics, Disease Progression, Lab Testing, Treatment, Occupational Risks/Protection, Consent for Testing and the Future of AIDS.

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A Self-Study CBL Program

4.0 Contact Hours Awarded to:

- Nursing - Florida Nursing Provider Number #FBN 2114
- Laboratory – Clinical Laboratory Continuing Education #JP545
- Radiology – Bureau of Radiation Control #3201069 (approved for the one-time requirement to be licensed in the State of FL, not approved for ongoing continuing education.)
- Respiratory – Respiratory Care Continuing Education # RCE48
- Social Work – Board of Clinical Social Work, Marriage and Family Therapy and Mental Health Counseling BAP #834
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- This course is also approved by the following complementary boards:
  - FL Bureau of Emergency Medical Services
  - FL Council of Dietetics and Nutrition
  - FL Council of Licensed Midwifery
  - FL Council of Medical Physicists

All continuing education programs are entered into CE Broker.

Initiated: 2001
Revised: 07/03, 12/04, 12/05, 12/06, 12/07, 10/08, 8/09, 8/10, 8/11, 2/12, 1/13, 9/13, 1/14
Objectives

- Recognize the importance of current HIV information to the healthcare provider.
- Describe the pathophysiology of HIV.
- State 4 methods of transmission of HIV.
- List 5 common symptoms associated with opportunistic infections.
Objectives

- Identify medications currently used in the treatment of HIV.
- Discuss various mechanisms available for use to protect against the AIDS virus.
- Utilize the appropriate protocol when an exposure occurs.
- Discuss the consent process required by Florida Law.
Importance of AIDS Education

- Knowledge is power
- AIDS has been identified for over 22 years, yet has no known cure or preventative vaccine.
Importance of AIDS Education

- AIDS is and will be a significant disease in the U.S. and world for years to come.
- Education provides opportunity for healthcare workers to update knowledge and address their concerns.
- Healthcare professionals play major role in preventing spread of HIV.
- Current treatment has extended life expectancy of HIV+ individual to 37 years.
Importance of AIDS Education

- Current information necessary to:
  - provide compassionate care
  - minimize personal risk of contracting the virus
Importance of AIDS Education

- Patients infected with HIV will need our assistance in helping to deal with medical, psychological and social challenges.

- Need to help foster a strong patient-provider relationship.
History of AIDS

Speculated that HIV first appeared in central Africa over 900 years ago.
History of AIDS

- Originally believed to be disease among monkeys.
  - Transmission to man
  - Bite from monkey to man
  - Contact with blood of infected monkey during hunting, slaughtering, and field dressing the animal for food.
- AIDS is an acquired disease it is not hereditary.
History of AIDS

- First transported to Western Hemisphere in 1970’s
- Began infecting Americans around 1976
History of AIDS

- First thought to be a disease that primarily affected homosexual men
  - Initially called Gay Related Immunodeficiency Syndrome (GRIDS)

- Became clear that other groups acquiring through means such as needle sharing and unprotected sexual contact with infected individuals.
  - Name changed to AIDS
History of AIDS

- 1985 – Human immunodeficiency virus (HIV) was identified as causative agent.

- 1986 – Centers for Disease Control and Prevention (CDC) set up classification system for HIV diseases for public health purposes.
Strains of HIV

- Two major strains: HIV-1 & HIV-2
- Transmission same for both strains
- Treatment and testing differ
Life Cycle of HIV

1. Viral RNA and reverse transcriptase enter the cell.
2. DNA copy synthesized by reverse transcriptase.
3. RNA degraded: second DNA strand synthesized.
4. DNA circularizes or integrates into human chromosome.
5. With host cell activation, viral DNA is transcribed, yielding viral messenger RNAs and viral genome RNA.
6. Viral RNAs are translated, yielding viral enzymes and structural proteins.
7. Viral membrane proteins are transported to host cell membrane.
8. Final viral assembly and budding take place.
HIV-1

- Found worldwide but most prevalent in Americas and Europe
- Two identified groups: Group N and Group O
  - Several different subtypes
  - Unevenly distributed throughout the world
Preliminary studies conducted to determine specific implications for transmission, infectivity, and treatment of subtypes.

More information needed before specific recommendations can be made.
HIV-2

- Prevalent in West Africa but uncommon elsewhere
- May be less easily transmitted
- May have longer period between initial infection and onset of illness
HIV Invasion

- AIDS is a syndrome caused by a breakdown of the immune system after an invasion of the human immunodeficiency virus.

- A virus is a self-replicating life form that needs to live inside other cells in order to survive.
Viruses are made up of genetic material, DNA and RNA, and are surrounded by a protein envelope.

DNA and RNA are the “building blocks of life.” They are the chemical structures that allow cells to exist, grow, and divide.
HIV Invasion

- A virus infects a cell by inserting some of its DNA/RNA into the cell’s DNA.
- HIV is a special type of virus known as a retrovirus, part of the lente virus group.
- Retroviruses cause various kinds of illnesses in all types of animals.
  - 4 types of retroviruses found in humans
  - Not all as fatal as HIV
Life Cycle of HIV

- Formerly known as human T-cell lymphotropic virus (HTLV-III)
- Measures $1/10,000$ of a millimeter
- Carries genetic information in RNA rather than DNA
- Infects the T-cell by binding to the CD4 receptor site and inserting its RNA into the T-cell
Life Cycle of HIV

- Through an enzyme called reverse transcriptase, the HIV RNA is converted to DNA.

- When a T-cell is activated to reproduce, its genetic information is now programmed to produce more of the HIV virus.

- Functional T-cells diminish rapidly.
HIV is the virus that attacks T-cells and causes the immune system to decline in function.

- True
- False
Transmission of HIV

Body Fluids Where HIV Found

- Blood
- Breast milk
- Seminal fluid
- Vaginal secretions
- Synovial fluid
- Pleural fluid
- Pericardial fluid
- Amniotic fluid
- Cerebrospinal fluid
- Any other obviously bloody body fluids
Transmission of HIV

- Requires direct contact with infected blood or body fluids

Red Blood Cell
Kissing

• The act of kissing on it own carries no risk for HIV. It doesn’t matter whether it’s a peck on the cheek or deep kissing.

• You can’t transmit HIV through cold sores.
Kissing

• The only kissing scenario that would involve even a remote risk would be where fresh blood was exchanged.
Shaking Hands

• It doesn’t matter if the shaking involved hands (yours, theirs, or both) that were peeling, sweaty, dirty, or had cuts on them.

• Shaking hands is called casual contact and absolutely does not put you at risk for contracting...
• The same goes for other common concerns, such as hugging someone, being scratched or even bitten (unless the bite is very deep, meaning it went all the way through your skin..)
Sharing a Drinking Glass

• Saliva is **not** one of the four bodily fluids that can transmit the virus.

- That list is reserved for blood, semen, vaginal secretions and breast milk.
Eating at a Restaurant

• HIV doesn’t live long enough outside of the body for any restaurant scenario to carry a risk.
• Did you forget to put down toilet paper on the seat before using the toilet?

- There is no risk and you do not need to run out for an HIV test.
Public Restrooms

- Even if a bodily fluid left on the seat were somehow able to get into your bloodstream, the HIV within the fluid wouldn’t survive long enough outside of the body to harm you.
- Not only that, but there wouldn’t be enough HIV in that small amount of fluid to pose an infection risk.
Mosquito Bites

• What if mosquito bites an HIV-positive person and then bites you?

• If a mosquito can transmit malaria, it can transmit HIV too, right?

**Wrong!** Malaria is very different kind of disease than HIV.
• Even if HIV could survive long enough in the extracted blood, there would be so little HIV in there that you’d have no risk of being infected by it if your were the mosquito’s next victim.
• Whether it’s merely touching an old piece of chewed-up gum or transferring a wad of it from your HIV-positive friend’s mouth to yours, gum does not represent an HIV risk.
Coughing or Sneezing

• Some people still find danger in simply being in the vicinity of someone who is HIV positive.
• There is no need to be afraid of being near people with HIV.

• HIV is not an airborne disease and cannot be transmitted even if some one with HIV coughs or sneezes directly in your face or onto your food.
Swimming in a Pool

• HIV is not transmitted through water, period. It doesn’t matter whether you’re standing in it, bathing in it or drinking gallons of it. (That also goes for hot tubs, showers, the sink at the gas station – you name it!)
Transmission of HIV by Human Bite

- There is no risk from a bite where the skin is not broken.
- There is a remote risk of transmission by human bite, with extensive tissue damage with blood present.
Anxiety

• There is no doubt the uncertainty you might feel about a possible exposure can be terrifying.

• The good news is that it’s almost impossible to be infected with HIV while just going about your day.
Contact With Contaminated Blood

- Estimated:
  - A drop of human blood infected with HIV contains 1 – 100 live virus particles.
  - A drop of human blood infected with Hepatitis B contains 100 million – 1 billion virus particles.
- Despite such low odds, HIV can be transmitted through blood transfusions, sharing contaminated needles, and accidental occupational needle sticks and splashes.
Blood Transfusions

- Risk of transmission of HIV through transfusion estimated to be 1 in 225,000.
- Infection has occurred with transfusions of whole blood, packed red blood cells (including washed), fresh frozen plasma, cryoprecipitate, platelets, and plasma-derived products.
- Risk of acquiring the virus increases with the transfusion of specific blood components such as factor VIII since multiple donors are needed to produce adequate quantities of these components.
Blood Supply Screening

- March, 1985: donor screening program of the nation’s blood supply implemented
- Current measures used to purify the blood:
  - Sophisticated cross-matching
  - Antibody screening
  - HIV testing
  - Heat treatment of clotting factors
Blood Supply Screening

- Present screening tests cannot identify people recently infected with HIV-1 since antibodies usually do not develop for 6-12 weeks following exposure.
Contact With Contaminated Needles

- Sharing contaminated needles and injection paraphernalia is the primary source of transmission of HIV among IV drug users.
- Risk increased by:
  - Needle sharing
  - “Booting” the injection with blood
  - Performing frequent injections
- Sharing is promoted by financial, legal, and cultural reasons.
Unprotected Sexual Contact

- African American and Latino women are high risk, especially with partner who is IV drug user.
- Transmission of HIV can occur when engaging in unprotected vaginal or anal intercourse with an HIV infected person.
- HIV gains access to the bloodstream through breaks in the rectal or vaginal mucosa or through contact with infected bowel epithelial cells.
Unprotected Sexual Contact

- The person receiving the semen is at greater risk of getting HIV because the lining of the rectum is thin and may allow the virus to enter the body during anal sex.
- In women, the lining of the vagina can sometimes tear and possibly allow HIV to enter the body.
Unprotected Sexual Contact

- Behaviors that increase the risk of transmission:
  - Unprotected sex with multiple partners
  - Unprotected sex with partner who is an IV drug user
  - Engaging in any sexual behavior that involves exposure to blood

- Transmission of HIV by oral sex is possible.
Unprotected Sexual Contact

- Individuals who use cocaine by any route have a higher incidence of HIV infections since cocaine is often exchanged for sex.
Unprotected Sexual Contact

- The growing usage of the stimulant drug Methamphetamine has contributed to increased risk for exposure to HIV.

- Methamphetamine is very addictive, it can be injected, and it can increase sexual arousal while reducing inhibitions.
Unprotected Sexual Contact

- From 2001-2004, the estimated number of HIV/AIDS cases increased among men who have sex with men.

- Men who have sex with men and persons exposed through heterosexual contact accounted for 84% all HIV/AIDS cases diagnosed in 2006.
Reduction of Sexual Transmission

- Risk of transmission is reduced through use of latex condoms.

- Natural membrane condoms do not block HIV passage and should not be used.

- **Water-soluble** lubricants are safe to use with condoms.

- **Oil based** lubricants make condoms ineffective and should not be used.
Reduction of Sexual Transmission

- Partners who are both HIV+ should use condoms to prevent transmission of drug resistant strains of HIV.
Prevention of Sexual Transmission of HIV

- Abstinence is the only safe way to totally prevent sexual transmission of HIV.

- Mutually monogamous relationships in which neither partner is HIV infected and there are no other risk factors are considered safe.
According to the CDC, several types of research have documented that male circumcision significantly reduces the risk of HIV acquisition by men during penile-vaginal sex.
Transmission of HIV in Healthcare Workers

- Highest risk (account for 84%):  
  - Needle stick accidents  
  - Scalpel accidents

- Other risks:  
  - Blood splashes of the eyes, nose and mouth  
  - Exposure of non-intact skin to contaminated surfaces
Transmission of HIV in Healthcare Workers

- Deep injury contact with contaminated equipment (needle stick, lacerations)
- Visible blood on a device
- Device in an artery or vein
Uncommon Methods of Transmission of HIV to Health Care Workers

- Fluid surrounding the brain and the spinal cord
- Fluid surrounding bone joints
- Fluid surrounding an unborn baby
Uncommon Methods of Transmission of HIV to Health Care Workers

- Using blood-contaminated syringes to prepare drugs.

- Reusing bottle caps, spoons, or other containers used to dissolve drugs in water and to heat drug solutions.

- Reusing small pieces of cotton or cigarette filters used to filter out particles that could block the needle.
Prevention of Transmission of HIV to Health Care Workers

- Using protective practices and personal protective equipment to prevent HIV and other blood-borne infections.
- Proper disposal of needles and other sharp instruments.
- Proper disposal of blood or body fluid contaminates.
Prevention of Transmission of HIV to Patients

- Careful practice of Infection Control Procedures
- Use of universal precautions (i.e. using protective practices and personal protective equipment)
- Proper hand washing techniques
Prevention of Transmission of HIV to Patients

- A risk of HIV transmission does exist if instruments contaminated with blood are not sterilized or disinfected or are used inappropriately between clients.
What It’s Like to Live With HIV/AIDS: Myths and Facts
Having HIV Means You Have AIDS

**MYTH.** Human immunodeficiency virus (HIV) is a virus that destroys the body’s CV4 immune cells, which help fight disease.

With the right medications, you can have HIV for years or decades without HIV processing to AIDS. AIDS is diagnosed when you have HIV as well as certain opportunistic infections or your CD4 cell count drops below 200.
It’s Difficult to Get HIV from Casual Contact

FACT. You can’t catch or spread HIV from hugging someone, using the same towel, or sharing the same glass.

It’s very rare to get HIV from a blood transfusion. However, you can spread the disease from having unprotected sex, sharing needles, or getting a tattoo from unsterilized equipment.
You Have Just a Few Years to Live

**MYTH.** Everyone with HIV experiences it differently.

Some people may develop AIDS within a few months as the virus quickly weakens their immune system.

Many others can live for decades with HIV and have a normal life expectancy.
You’ll Know You Have HIV Because of Your Symptoms

**MYTH:** Some people don’t show any signs of HIV for years after being infected.

Many can have some symptoms within 10 days to a few weeks after infection.

These first symptoms are similar to the flu or mono and may include rash, fever, fatigue, and sore throat. They usually disappear after a few weeks.
HIV Can Be Cured

**MYTH:** There is no cure for HIV, but treatment can keep virus levels low and help maintain your immune system.

Some drugs interfere with proteins HIV needs to copy itself, others block the virus from entering or inserting its genetic materials into your immune cells.
Anyone Can Get HIV

FACT: As of 2009, about 56,000 people in the U.S. get HIV each year, and 18,000 people with AIDS die each year.

Anyone can get HIV: men, women, children, and people who are gay or straight.
Sex is Safe When Both Partners Have HIV

**MYTH:** Just because you and your partner both have HIV, doesn’t mean you should forget about protection when you have sex.

Using a condom can protect you from other STD’s as well as other strains of HIV.
You Can Have a Baby if You Are HIV-Positive

**FACT:** Infected mothers can indeed pass HIV to their babies during pregnancy or delivery.

However, you can lower the risk by working with your doctor and getting the appropriate care and medication.
You Can’t Avoid Other HIV-Related Infections

**MYTH:** Due to weakened immune systems, people with HIV can be vulnerable to infections like pneumocystis pneumonia, TB, candidiasis, cytomegalovirus, and toxoplasmosis.

The best way to reduce your risk is to take HIV medications.
Without Insurance You Can’t Get Lifesaving Drugs

MYTH: There are government programs, nonprofit groups, and some pharmaceutical companies that may help cover the cost of HIV/AIDS drugs.
Discrimination and Stigma

- People may feel:
  - Afraid of those with AIDS due to it being a life-threatening disease.
  - People with AIDS got it because of their unacceptable life-style choices.
  - It’s a result of moral fault deserving punishment.
Discrimination and Stigma

- People with AIDS:
  - May be afraid to seek care for fear of disclosing their condition.
  - Experienced rejection from others and not trusting of healthcare providers.
  - Feel isolated and abandoned.
Hepatitis vs. HIV

- Risk of infection after a significant exposure from an infected individual
  - HIV - ±0.3%
  - Hepatitis B - 30%
  - Hepatitis C - 3%
Emotional Aspect of HIV/AIDS

- Patients may experience:
  - Anger
  - Fear
  - Shock
  - Disbelief
  - Sadness
  - Depression
  - Sense of being overwhelmed
Emotional Aspect of HIV/AIDS

- Loss is a major concern and feeling.
- Loss can occur in many ways.
  - Health
  - Family/friends
  - Job/Income
Emotional Aspect of HIV/AIDS

- Emotional states of the patient may affect their medical health.
- Healthcare providers need to work in a multi-disciplinary approach to ensure the patient’s emotional needs are met.
Hepatitis vs. HIV

- Risk of Hepatitis exposure greater
- Concern for HIV greater probably due to ultimate consequences
- Hepatitis B and C may lead to death even more quickly than HIV
Prenatal Transmission AKA Vertical Transmission

- Methods of transmission
  - Transplacentally from mother to fetus in utero
  - During delivery
  - Through breast feeding
- Infants highly susceptible
  - Underdeveloped natural resistance systems
Prenatal Transmission

- In the United States a pregnant woman has 16-30% chance of transmitting the virus to her infant either during pregnancy or at the time of delivery.

- Early use of chemotherapeutetics has significantly decreased the development of HIV infection in infants.
Perinatal Transmission

- Currently, it is possible to PLAN a healthy pregnancy and infant for an HIV+ woman.
  - Requires careful planning with HIV specialist physician
  - Involves use of HAART during pregnancy and/or IV AZT during delivery
  - Often involves elective c-section at 38 weeks
  - Infant placed on prophylaxis for a few weeks
Transmission of AIDS

- It is estimated that up to two-thirds of new infections are transmitted by individuals who do not know that they are infected.
Review Question 2

The most common transmission methods of HIV viral infection include:

- Contact with contaminated needles
- Unprotected sex
- Contaminated blood
- All of the above
CDC Classification

- CDC has developed a classification for the progression of HIV/AIDS based on signs and symptoms.
  - Initial infection
  - Asymptomatic HIV infection
  - Development of symptoms
  - AIDS
Initial Infection

- **Primary infection/Acute infection**
  - Occurs within 1-3 weeks after initial exposure
  - Transient flu-like symptoms which last average of 2-3 weeks
  - May be unrecognized and pass quickly or may last several weeks
  - Some individuals asymptomatic
Symptoms of Initial Infection

- Fever
- Malaise
- Aching
- Maculopapular rash
- Diarrhea
- Enlarged lymph nodes
Initial Infection

- It takes 72 hours from initial exposure for virus to move into T-cell.

- Post-exposure prophylaxis (PEP) initiated during this time drastically reduces risk of infection.
Initial Infection

- Detectable HIV antibodies will usually appear in the blood within 6-12 weeks, although for some it may take years.

- During this phase, diagnosis is made through testing for HIV P24 antigen.

- **Viral loads** are high during this phase and gradually decrease and stabilize around 6 months. If treatment initiated while antibodies negative and viral loads positive, individual may become long term, non-progressor.

- During this period, infected individuals are very infectious and HIV is present in large quantities in genital fluids.
Latent Symptoms

- Depression
- Diarrhea
- Thrush
- Weight Loss
- Lipodystrophy: fat redistribution syndrome
- Lactic Acidosis
Latent Symptoms

- Sinus Infection
- Fatigue
- Nausea/Vomiting
- Burning and Tingling of the Feet and Hands
Asymptomatic HIV Infection

- Average duration 6-10 years
  - Virus appears to be clinically latent.
  - Infected individual experiences no symptoms.
  - Many individuals are unaware they are HIV infected because they feel well. An estimated 25% of people with AIDS do not know they are infected.

- Danger is that the infection can be transmitted to another person through blood or body fluid contact.
Asymptomatic HIV Infection

- An overwhelming infection is building and the body’s immune system is aggressively fighting.

- HIV is infecting and killing the immune system’s helper T-lymphocytes (CD4 cells), but is concealed in the lymph nodes.

- Immunologic testing is important during this phase to monitor the progression of the disease and provide guidelines for treatment and evaluation.
Review Question 4

People with an asymptomatic HIV infection are at low risk for passing the virus to another person.

- True
- False
Development of Symptoms

- After many years of a relative asymptomatic infection, various conditions begin to develop.
- The group of symptoms that progress from the silent phase of HIV to full-blown AIDS was formerly called AIDS-related complex (ARC). “HIV disease” is the term currently used.
Generalized Symptoms Which May Cause Individual to Seek Medical Care

- Fatigue
  - Prolonged
  - Individual constantly feels weak, tired, and in need of more rest

- Weight loss
  - Important objective measure of disease progression
  - Involuntary weight loss 10 or more pounds in less than 2 months
  - Caused by reduced food intake, poor absorption of nutrients, and altered metabolism
Generalized Symptoms Which May Cause Individual to Seek Medical Care

- Fever
  - Low grade
  - May be accompanied by night sweats

- Diarrhea
  - More than 2 unformed stools per day for 30 days or longer may be symptomatic of HIV infection
  - Many factors involved or there may be no identifiable cause
  - May cause severe dehydration and loss of electrolytes if prolonged
Generalized Symptoms Which May Cause Individual to Seek Medical Care

- Persistent generalized lymphadenopathy
  - Caused by disease process itself, other infections, or malignancies
  - Often accompanied by low-grade fever
  - Lymph node characteristics
    - Enlargement of two or more sites that persist for 3 months or longer in the absence of concurrent illness
    - Possible shrinkage with progression of the disease due to architectural destruction
- Affected nodes may include:
  - Cervical, axillary, inguinal, supraclavicular, intraclavicular, and popliteal
Generalized Symptoms Which May Cause Individual to Seek Medical Care

- **Bruising and/or bleeding**
  - Usually caused by an increase in clotting time from thrombocytopenia.

- **Cough or shortness of breath**
  - May be caused by pneumonia, bronchitis, TB, or other respiratory infections

- **Pneumocystis carinii (PCP)**
  - Common cause of pneumonia in immunocompromised individual.
Review Question 5

Signs and symptoms of early HIV infection may include:

- Headache
- Eczema
- Edema
- Bruising and/or bleeding
## Some Opportunistic Infections

<table>
<thead>
<tr>
<th>Bacterial</th>
<th>Viral</th>
<th>Protozoan</th>
<th>Fungal</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Mycobacterium Avium Complex (MAC)</strong></td>
<td>Cytomegalovirus (CMV)</td>
<td>Cryptosporidiosis</td>
<td>Candidiasis</td>
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<tr>
<td>Mycobacterium Tuberculosis</td>
<td>Herpes: Simplex Varicella-zoster (VZV)</td>
<td><strong>Toxoplasmosis gondii</strong></td>
<td><strong>Pneumocystis carinii pneumonia (PCP)</strong></td>
</tr>
<tr>
<td>Pneumonia: Streptococcus Haemophilus influenzae</td>
<td>Human papilloma virus (HPV)</td>
<td>Isosporiasis</td>
<td>Cryptococcosis</td>
</tr>
<tr>
<td>Salmonella</td>
<td>Progressive multifocal leukoencephalopathy (PML)</td>
<td></td>
<td>Histoplasmosis</td>
</tr>
</tbody>
</table>
Opportunistic Infections

- Brain
  - Cryptococcal meningitis
  - Toxo (toxoplasmosis)
  - AIDS dementia complex

- Eyes
  - CMV (cytomegalovirus)

- Mouth and throat
  - Cold sores and ulcers
  - Thrush (oral candidiasis)

- Blood
  - Hyperglycemia (high blood sugar) and dyslipidemia (abnormal amount of fats in the blood)

- Lungs
  - Histoplasmosis
  - PCP (pneumocystis jiroveci pneumonia)
  - TB (tuberculosis)

- Bone
  - Osteoporosis

- Heart
  - Heart disease, stroke

- Liver
  - HCV (hepatitis C virus)

- Stomach
  - CMV (cytomegalovirus)
  - Crypto (cryptosporidiosis)
  - MAC (mycobacterium avium complex)

- Reproductive system
  - Genital ulcers
  - HPV (human papillomavirus) and cervical cancer
  - Menstrual problems
  - PID (pelvic inflammatory disease)
  - Vaginal yeast infections (candidiasis)

- Body
  - HIV wasting syndrome
Opportunistic Infections (OI)

- In addition to general symptoms, individuals may begin to develop other processes identified as opportunistic infections.

- Opportunistic infections are infections that can occur in persons with weak immune systems due to AIDS, cancer, or immunosuppressive drugs such as steroids or chemotherapy.
Opportunistic infections often associated with HIV include various

- Bacterial infections
- Fungal infections
- Viral infections
- All of the above
Oral Candidiasis

- Also called thrush

- Appears as separate or connecting confluent white patches on the mucous membrane of the mouth or throat

- Caused by Candida Albicans

- May be early indicator of HIV infection
Skin Rashes or Lesions

- May include herpes simplex or zoster, seborrheic dermatitis and nail infections

- Kaposi’s Sarcoma (KS)
  - Neoplasm that can affect the skin, mucous membranes, and internal organs
  - Early signs include reddish-blue lesions on the skin or in the oral cavity
  - Later progression – swelling in the lower extremities, penis, scrotum, or face can develop
  - Also affects lungs, lymph, and GI tract
Vaginal Candidiasis

- Commonly called yeast infection
- Presents as severe itching of the labia and vulva accompanied by thick white or yellow vaginal discharge and dysuria
- May be clinical indicator of HIV in women if more than 2 episodes occur in 6 months or if persists after 2 courses of treatment
Cytomegalovirus (CMV)

- Viral disease that affects multiple organs such as the liver, pancreas, lungs, colon, adrenal glands, esophagus, and nervous system

- CMV retinitis
  - May cause blindness

- Transmitted sexually or through contact with contaminated blood
Pulmonary Tuberculosis (TB)

- Presents high risk for individuals infected with HIV
- Rapidly devastating
- Ongoing monitoring for exposure to and development of TB is an important part in management of the HIV+ person.
Review Question 7

Kaposi’s Sarcoma can affect the GI tract, the lower extremities, skin, lungs, and lymph system.

- True
- False
AIDS

- Final clinical stage of the disease
- Immune system exhausted and virus moves from lymph nodes to blood
- Virus continues to replicate and kill cells bearing CD4 receptors
- As virus progresses, **CD4 count** will drop
  - Indication of imminent immune system failure
Criteria for Diagnosis of AIDS

- All patients with a CD4 count of 200 or less
- Evidence of HIV infection and any one of the following:
  - Thrush
  - Vulvovaginal candidiasis that is persistent and poorly responsive
  - Cervical dysplasia or carcinoma in situ
  - Fatigue, night sweats, weight loss more than one month
  - Oral hairy leukoplakia
  - Shingles of more than one dermatome or more than 2 episodes
  - Idiopathic thrombocytopenia purpura
  - **Peripheral neuropathy**
Criteria for Diagnosis of AIDS

- Evidence of HIV infection and any of the following:
  - Bronchial candidiasis
  - Esophageal candidiasis
  - Invasive cervical cancer
  - Cytomegalovirus (CMV) other than the liver, spleen, and lymph nodes
  - CMV retinitis
  - HIV encephalopathy
  - Herpes simplex ulcers, bronchitis, pneumonia or esophagitis
Criteria for Diagnosis of AIDS

- Evidence of HIV infection and any of the following:
  - Histoplasmosis
  - Kaposi’s sarcoma
  - Burkitt’s lymphoma
  - Mycobacterium infection
  - Pneumocystis pneumonia (PCP)
  - Recurrent pneumonia
  - Recurrent Salmonella septicemia
  - Toxoplasmosis
  - Wasting syndrome
Review Question 8

As the AIDS virus progresses, the CD4 count will rise indicating imminent immune system failure.

- True
- False
Lab Testing

- Once the discovery is made that a person may have been infected with HIV, testing should begin.

- Client’s signs and symptoms, as well as the presence of HIV antibodies in the blood, determine the diagnosis of HIV infection.
Testing For HIV Late

- Late testers, compared to those tested early (>5 years before AIDS diagnosis) were more likely to be:
  - Younger (18-28 years)
  - Heterosexual
  - Less educated
  - African American or Hispanic
# Reasons for Testing Early Versus Late

## Reasons for Testing: Late vs Early Teens

Supplement to HIV/AIDS Surveillance, 2000-2003

<table>
<thead>
<tr>
<th>Reason</th>
<th>Late (Tested &lt; 1 year before AIDS diagnosis)</th>
<th>Early (Tested &gt; 5 years before AIDS diagnosis)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Illness</td>
<td>[Bar Chart]</td>
<td>[Bar Chart]</td>
</tr>
<tr>
<td>Self/partner at risk</td>
<td>[Bar Chart]</td>
<td>[Bar Chart]</td>
</tr>
<tr>
<td>Wanted to know</td>
<td>[Bar Chart]</td>
<td>[Bar Chart]</td>
</tr>
<tr>
<td>Routine check-up</td>
<td>[Bar Chart]</td>
<td>[Bar Chart]</td>
</tr>
<tr>
<td>Required</td>
<td>[Bar Chart]</td>
<td>[Bar Chart]</td>
</tr>
<tr>
<td>Other</td>
<td>[Bar Chart]</td>
<td>[Bar Chart]</td>
</tr>
</tbody>
</table>

Rapid HIV Testing

- HIV antibody test
- Screening test
- Fingerstick blood/oral specimen
- Non-reactive results do not require further testing (at this time)
- Reactive results *must* be confirmed
Rapid HIV Testing

- Requires minimal training
- Point-of-care
- High-client satisfaction
- Accurate
- Less potential for clients lost to follow-up
ELISA
Enzyme-Linked Immunosorbent Assay

- First lab test to be done
- Easy, inexpensive, HIV sensitive
- Used as a primary screen for presence of viral antibodies
- Will not be positive until 6-10 weeks after exposure
- False positive results possible following recent viral illness or in presence of autoimmune disease - 5% false positive rate
- Florida law prohibits reporting positive ELISA tests unless they are confirmed
Western Blot

- This test, or test of equivalent technology, used to confirm presence of HIV antibodies.
- Highly specific for HIV - 1% false positive.
- Occasionally will not be definitive and must be reported as “indeterminate.”

Positive ELISA and negative Western Blot:
- May indicate another infectious disease or anti-inflammatory process.
- May mean that the HIV antibodies are not sufficiently concentrated to give clear positive result at the time.
- Indicates need for repeat test at a later time – should not be ignored or assumed to be false.
Immunofluescent Assay Test

- Done if result of Western Blot is “indeterminate”
- Further identifies HIV infected cells
P-24 Antigen Protective Test

- Can be done in early phase of disease to determine the presence of the antigen from the HIV virus before antibody levels convert to positive.

- Used to detect antigen when there has been exposure from someone known to be HIV positive.
CD4 Lymphocyte Counts

- Measure immune function *after* diagnosis has been made.
- Normal range: 600-1200 cells/mm³
- Symptoms of immunodeficiency increase as the CD4 count reaches and falls below 500
- Treatment started for counts <350 if viral load > 100,000
- According to CDC, count less than 200 meets criteria for diagnosis of AIDS
Viral Load

- Measures the amount of virus detected in the blood
- More direct method to monitor progression of disease
  - The higher the viral load, the more rapid the disease progression
- The higher the load, the more susceptible the patient is to opportunistic infections.
  - Function of immune system is decreasing
- Indications for measuring viral load
  - Initial work-up
  - When CD4 counts indicate immune system deterioration
  - 3-4 weeks after starting or changing antiviral therapy
- Expensive
Viral Load

- 3 tests used to measure
  - RT PCR (quantitative polymerase chain reaction)
  - bDNA (branched-chain DNA)
  - NASBA (nucleic acid sequence based amplification)

- Results reported in copies per millimeter
  - < 10,000 – low risk for clinical progression
  - 10,000-100,000 – moderate risk
  - >100,000 – high risk

- Temporary elevation causes
  - Illnesses such as influenza, herpes, and pneumonia
  - Vaccines such as the influenza vaccine
Review Question 9

Which test is specific for HIV antibodies and must be done to confirm ELISA test results?

- P-24 Antigen Protective Test
- Western Blot
- Immunofluorescent Assay Test
- CD4 Lymphocyte Counts
Treatment of HIV Disease

- Physical care, emotional support, and counseling are included.
- Hope, compassion, and respect should guide any approach to care.
- How a person became infected is not important.
- Only way to determine most suitable therapy for patients is for practitioners to spend time getting to know their patients and the circumstances under which they will be taking their medications.
Goal of Treatment

- Put viral load into remission
  - Higher viral load = faster disease progression
- Keep CD4 count > 200
Factors Influencing Pharmacotherapy Choices

- Lifestyle and personal circumstances
- Response to therapy
- Side effects
- Ability to manage pill burdens
- Drug resistance
- Previous treatment (treatment naïve vs. treatment experienced)
- Access to drugs and medical care
Criteria for Treatment

- The following HIV+ individuals should be placed on medications:
  - Antibodies negative, viral load positive (Initial infection)
  - CD4 count < 350 with viral load > 100,000
  - Individuals who are symptomatic
  - Pregnant women
Challenges of Treatment

- Choosing the proper combination of drugs to control the virus while:
  - Minimizing side effects
  - Maintaining quality of life
  - Optimizing compliance

- Must be highly individualized for each patient
Drug Resistance

- Increased incidence of newly diagnosed patients with HIV which shows *resistance* to certain drug therapies
- Limits drug treatments available
- Increases the time drugs take to work against the disease, increasing the risk for the individual to develop potentially life-threatening opportunistic infections
HAART Combination Drug Therapy

- Combination Therapy
- Highly active, anti-retroviral therapy (HAART).
- Basis for medical treatment.
- Combination of 3-4 anti-HIV agents used to decrease the efficiency and effectiveness of HIV invasion into healthy cells.
- Medications that attack the virus itself have been the backbone for treating HIV.
- Classes of drugs used include:
  - Nucleoside Reverse Transcriptase Inhibitors (NRTI)
  - Non-nucleoside RT Inhibitors
  - Protease inhibitors
- Use of multi-drug therapy challenging due to tendency of virus toward mutation.
- Expensive – cost of therapy may exceed $25,000 per year.
Non-nucleoside Reverse Transcriptase Inhibitors (NNRTIs)

- Act to interrupt the viral life cycle by binding to reverse transcriptase to block RNA and DNA dependent activities.
NRTIs

- Interrupts the first step in replication process
  - Inhibits the activity of reverse transcriptase, the enzyme needed by HIV to change its RNA into a DNA virus to cause infection
- Interrupts spread of HIV to new cells
  - No change for already infected cells
- Affects all cells – not just those infected with virus
NRTIs

- Potential for serious and significant side effects:
  - Suppression of bone marrow leading to anemia and granulocytopenia
  - Nausea and vomiting
  - Diarrhea
  - Anorexia
  - Headaches
  - Lightheadedness
  - Peripheral neuropathy
Since 1987, five NRTIs approved by the Food and Drug Administration (FDA) are for sale in the United States.
NRTIs

- AZT (Zidovudine, Retrovir)
  - First drug approved by FDA
    - Treatment of HIV infection
    - First line drug of choice among antiviral drugs
  - Inhibits viral reproduction
    - Interferes with reverse transcriptase
  - Usual adult dosage: 300mg bid
  - Resistance develops early
    - Should not be used alone
  - Side effects include: incapacitating nausea, vomiting and anemia.
NRTIs

- DDI (Videx, Didanosine)
  - FDA approved in 1991
  - Second line antiviral drug
  - Patients with advanced HIV disease who were progressing on or intolerant to first line drugs
- Interferes with reproduction of DNA
  - Leads to chain termination
- Usual adult dosage: 200mg bid (125mg bid for < 60kg)
- Large tablet must be dissolved in water, chewed and then swallowed 30 minutes before meals.
- Side effects include: pancreatitis, diarrhea, and peripheral neuropathy that is usually not reversible.
NRTIs

- DDC (Havid, Zalcitabine)
  - Initially approved in 1992
  - Used only in combination with AZT for patients with advanced HIV disease
  - Inhibits viral DNA synthesis and interrupts chain progression
  - Rarely used
  - Usual adult dosage: 0.75mg tid
  - Most common side effects: peripheral neuropathy and oral ulcers
NRTIs

- **Stavudine (d4t, Zerit)**
  - FDA approved in 1994
  - Advanced HIV infection
  - Intolerance to other medications or significant clinical deterioration
  - Usual adult dosage: 40mg bid (30mg bid < 60kg)
  - May cause peripheral neuropathy
    - Resolved if drug stopped promptly
  - Does not cause nausea
NRTIs

- Epivir (3TC, Lamivudine)
  - Approved as combination drug
    - Usually combined with AZT
  - Usual adult dosage: 150mg bid
  - Well tolerated, fewer side effects
  - Side effects include: myalgias, arthralgias, anemia, and GI upset
NNRTIs

- Nevirapine (Viramune)
  - Usual adult dose: 200mg daily x 2 weeks, then bid
  - Side effects: rash, elevated liver function tests

- Delavirdine (Rescriptor)
  - Usual adult dose: 400mg tid
  - Side effect: rash
NNRTIs

- Loviride
  - Usual adult dose: 100mg tid
  - Side effect: rash

- Efavirenz (DMP-266, Sustiva)
  - Usual adult dose: 600 mg daily
  - Side effect: dizziness
Review Question 10

Which of the following statements is false?

- Medications are used to decrease invasion of healthy cells.
- A major component of therapy is the use of NRTIs.
- NRTIs work to interrupt the first step in the viral replication process.
- Combination drug therapy is inexpensive.
Most drugs used to treat HIV infections have side effects which include:

- **GI complaints**
- **Headache**
- **Peripheral neuropathy**
- **All of the above**
Protease Inhibitors

- Block the protein conversions necessary for creating intact viral particles – interrupt the virus from making copies of itself at a later step in its life cycle.

- Ability to reach HIV infected lymphatic tissue (other drugs cannot).

- Remarkable effect on some patients when used in combination with AZT and other drugs.
Protease Inhibitors

- **Indinavir (Crixivan)**
  - Usual adult dose: 800mg q8h
  - Side effect: kidney stones
  - Must take without food or with a low-fat, low-protein snack

- **Ritonavir (Novir)**
  - Usual adult dose: 600mg bid
  - Side effects: GI upset, circumoral paresthesias
  - Many drug interactions
Protease Inhibitors

- **Saquinavir (Invirase)**
  - Usual adult dose: 600mg tid
  - Must take with fatty snack

- **Nelfinavir (Viracept)**
  - Usual adult dose: 750mg tid
  - Side effect: diarrhea
  - Must take with food
Future of HIV Treatment

- Research for treatment of HIV with medications continues. Several drugs initially thought to combat the virus have been shown to be unsuccessful.

- Scientists continue to study the immunopathologic structure of the virus and work to develop potential interventions to control the HIV infection. It is believed that treatment will incorporate several different approaches with anti-viral medications being only one component.

- A cure remains elusive at this time.
Future of HIV Treatment

- Clinical trials in progress to determine effectiveness of daily oral Tenofovir for prevention of HIV infection in high risk individuals
  - Heterosexuals in Botswana
  - IV drug users in Thailand
  - Men who have sex with men in U.S.
Future of HIV Treatment

- There is currently no vaccine available to prevent the transmission of HIV and the onset of AIDS. Research continues and some promising lab results have been identified. However, due to the rapid mutation of the HIV virus, vaccine development is problematic.
Review Question 12

The discovery of a vaccine to prevent the transmission of HIV is imminent.

- True
- False
Occupationally Acquired HIV

- Based on the CDC statistics for 1981-2010, the routes of exposure resulting in infection were:
  - 48 percutaneous (puncture/cut injury) five, mucocutaneous (mucous membrane and/or skin); two, both percutaneous and mucocutaneous; and two were of unknown route.
  - 49 healthcare personnel were exposed to HIV-infected blood; three to concentrated virus in a laboratory; one to visibly bloody fluid; and four to an unspecified fluid.
  - In addition, 143 possible cases of HIV infection have been reported among healthcare personnel.
### Healthcare Personnel with Documented and Possible Occupationally Acquired HIV Infection, by Occupation: 1981-2010

<table>
<thead>
<tr>
<th>Occupation</th>
<th>Documented</th>
<th>Possible</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nurse</td>
<td>24</td>
<td>36</td>
</tr>
<tr>
<td>Laboratory worker, clinical</td>
<td>16</td>
<td>17</td>
</tr>
<tr>
<td>Physician, nonsurgical</td>
<td>6</td>
<td>13</td>
</tr>
<tr>
<td>Laboratory technician, nonclinical</td>
<td>3</td>
<td>-</td>
</tr>
<tr>
<td>Housekeeper/maintenance worker</td>
<td>2</td>
<td>14</td>
</tr>
<tr>
<td>Technician, surgical</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>Embalmer/morgue technician</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Health aide/attendant</td>
<td>1</td>
<td>15</td>
</tr>
<tr>
<td>Respiratory therapist</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Technician, dialysis</td>
<td>1</td>
<td>3</td>
</tr>
<tr>
<td>Dental worker, including dentist</td>
<td>-</td>
<td>6</td>
</tr>
<tr>
<td>Emergency medical technician/paramedic</td>
<td>-</td>
<td>12</td>
</tr>
<tr>
<td>Physician, surgical</td>
<td>-</td>
<td>6</td>
</tr>
<tr>
<td>Other technician/therapist</td>
<td>-</td>
<td>9</td>
</tr>
<tr>
<td>Other healthcare occupation</td>
<td>-</td>
<td>6</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>57</strong></td>
<td><strong>143</strong></td>
</tr>
</tbody>
</table>
Protection From HIV Infection

- Healthcare workers at increased risk for exposure to HIV.
- Responsibility of employer to provide measures and equipment to decrease risk for exposure to HIV.
- *Personal responsibility* to protect oneself from HIV and other blood borne pathogen infections.
Personal Responsibility

- Avoid contact with blood and infectious body fluids.
  - Outside healthcare setting
    - Abstaining from unprotected sex
    - Abstaining from recreational IV drug use
  - In the healthcare setting
    - Using Universal/Standard Precautions at all times
    - Treat all patients as if infected
Universal Precautions

- Protection from direct contact with blood and body fluids
- Hand washing
- Proper disposal of contaminated waste
- Sharps precautions
Personal Protective Equipment (PPE)

- First line of defense in maintaining good health

- Includes:
  - Disposable gloves
  - Gowns
  - Face shield/mask
  - Safety glasses/goggles
  - Resuscitative bags
  - Mouth to mask resuscitative devices
  - Hoods
  - Shoe covers - where risk of walking in significant amount of blood or other potentially infectious material
Personal Protective Equipment (PPE)

- **Gloves**
  - Most common barrier
  - Worn whenever contact with blood or potentially infectious body fluids likely
Personal Protective Equipment (PPE)

- Masks, gowns, and face shields should be used when possibility of more extensive exposure.
Personal Protective Equipment (PPE)

- Know the risk and use PPE before the exposure can occur.
Hand Hygiene

- Most important preventative procedure to reduce risk of transmitting diseases.
- Necessary, even if gloves are worn.
Hand Hygiene

- May wash hands or use alcohol based product:
  - Between clients
  - After any exposure
  - After removing gloves

- Hands must be washed with soap and water when visibly soiled.
Disposal of Contaminated Waste

- Contaminated biohazardous waste includes anything contaminated with blood or body fluids.
  - Dressings
  - Foley catheters
  - Tubing
  - Etc.
Disposal of Contaminated Waste

- Biohazardous waste placed in *red bags labeled with biohazardous symbol*.
  - Red bags are placed into designated biohazardous waste container.
  - Do not place in regular trash.
Sharps and Needle Stick Precautions

- Dispose of sharps in rigid containers labeled with universal biohazard symbol.

- Needles:
  - Never recap unless using one-handed technique.
  - Never deliberately cut, bend, or break.

- Use tongs, dust pan, broom or appropriate tool to pick up sharp which has fallen and broken – not hands.
Sharps and Needle Stick Precautions

- Be alert at all times.
- Do not take chances.
- Practice safe handling of sharps to lower your exposure risks and to protect yourself.
Sharps and Needle Stick Precautions

- Safety needles and syringes are located throughout the system.
- Individual departments have equipment and devices specific for that area to decrease risk of exposure.
- Department managers can provide information concerning availability and use.
Review Question 13

Using personal protective equipment (PPE) and following Universal/Standard Precautions, which includes handwashing, is the best protection against exposure to blood and body fluids.

- True
- False
Review Question 14

Personal protective equipment in the healthcare setting includes:

- Gloves, boots, mittens
- Goggles, gloves, gowns
- Shoe covers, hoods, TB masks
- Condoms, diaphragms, birth control
Exposure

- Exposure to bloodborne pathogens is considered significant in the following situations:
  - Exposure through a needle stick, instruments, or sharps
  - Exposure of the mucous membrane to visible blood or body fluids including blood, semen, vaginal secretions, cerebrospinal fluid, synovial fluid, pleural fluid, peritoneal fluid, pericardial fluid, amniotic fluid, and laboratory specimens that contain HIV
  - Exposures of skin to visible blood or body fluids, especially when the exposed skin is not intact
Guidelines for Exposure

- Splash to eyes, nose or mouth
  - Flush the area with copious amounts of water.
- Needle stick
  - Wash with soap and water.
- Exposures to non-intact skin
  - Wash vigorously with soap and water.
Follow Facility Policy

- FHMMC policy
  - Report incident to immediate supervisor.
  - Initiate Online RiskMaster procedure.
  - If exposure occurs during business hours (8:30-4:00PM Monday-Friday), go to Employee Health at time of incident.
  - If exposure occurs after hours, on weekend or holidays, go to Emergency Department for physician evaluation at time of incident.
  - Follow recommendations of physician.
  - Refer to hospital policy.
Testing After Exposure

- After exposure, healthcare workers will be tested for HIV initially and periodically throughout the following year.
- Risk of infection after a significant exposure from an infected individual:
  - HIV - ±0.3%
  - Hepatitis B - 30%
  - Hepatitis C - 3%
Post Exposure Prophylaxis (PEP)

- It takes 72 hours for HIV to move from the site of exposure into the T cell.
- Treatment initiated within this 72 hr. window may actually abort infection.
- Treatment occurs for approximately 4 weeks with a combination of 2-3 antiviral medications.
- The rate of infection is reduced by 79%.
- Immediate exposure reporting is crucial!
A significant exposure to bloodborne pathogens may occur because of:

- A needle stick
- Splashing of eyes, nose, or mouth
- Blood exposure to non-intact skin
- All of the above
Review Question 16

If you receive an exposure to blood/blood products through a cut, you should:

- **Wash hands vigorously with soap and water**
- **Report the incident to immediate supervisor**
- **Go to the Emergency Department**
- **All of the above**
Consent for Testing in Florida

- Florida’s Omnibus AIDS Act of 1998 are essential for healthcare providers to understand. They provide guidelines that closely emulate federal guidelines.
- Violations are heavily penalized.
- Principal testing for AIDS/HIV stipulated in this act are education and testing that is informed, voluntary, and confidential.
Consent for Testing

- Testing for HIV infection without the informed consent of the client is against Florida law in most cases.
- Only with appropriate legal advise can a limited exception be made for testing without consent.
- Testing without consent is subject to a fine and/or disciplinary action against the responsible licensed nurse, physician, physician assistant or nurse practitioner.
Consent for Testing

- Legally, consent does not need to be in writing provided there is documentation in the medical record that the test has been explained and the consent has been obtained. However, Florida Hospital Memorial Medical Center policy requires written consent.
Elements of Informed Consent

- According to Florida law, client must be told of:
  - General requirements for informed consent such as risks, benefits, and alternatives
  - Confidential testing and results
  - Availability of anonymous testing
  - Positive test results reported to the Public Health Department
Elements of Informed Consent

In addition, the following components are included in the administrative HIV/AIDS rules and conform to federal guidelines:

- The nature of the test itself.
- Why the test is being done.
- What the results will be used for.
- The limitations and meaning of test results.
- The voluntary nature of the test.
- The right to withdraw consent for testing prior to the test being done.
- Confidentiality requirements.
- Any other special procedures that may follow such as testing at a later date.
Elements of Informed Consent

- All information must be provided to the individual being tested prior to having the consent signed.
Testing Without Consent

- Testing without consent may be done in limited clinical circumstances, which are defined by law.
- Testing without consent may be done only on already drawn blood.
- Carefully distinguish between when HIV test results are needed to manage medical treatment and when the issue is the health care team’s comfort.
Testing Without Consent

- HIV testing may be done without source individual’s consent when an employee has had significant exposure to potentially infectious blood or body fluids during the course of employment or within the scope of practice.

- Employee must agree to have testing done. If employee does not agree to testing, then testing may not be done on source patient.

- Consent must be requested from source patient. If individual refuses to give consent, must use blood already taken from the source patient by medical personnel for other purposes. May not draw new specimen.

- Costs of testing may not be charged to patient – with or without consent. Employer must pay for testing (both HIV and Hepatitis B).
Review Question 17

Florida law requires consent for HIV testing except in very limited clinical circumstances.

- True
- False
Review Question 18

Consent for HIV testing must always be in writing.

- True
- False
Post-Testing Follow-Up

Must include:

- Notification of test results:
  - May be given by phone or mail in special circumstances.
  - FHMMC employees contact Employee Health Department for results within 14 days of the test.

- Information to follow-up with physician as indicated
Disclosure of Test Results

- Florida law considers HIV test results very confidential.

- Client controls HIV test results and may direct to whom they are disclosed.
  - Release of HIV test results to anyone other than client almost always requires specific written permission of the client or the client’s authorized representative such as a health care surrogate or legal representative.
  - When in doubt, better to withhold disclosure and clarify whether release is permissible (no significant penalty for delaying release while confirming validity).
Disclosure of Test Results

- Penalty for unauthorized release of test results is subject to a fine, disciplinary action, and the possibility of a lawsuit for breach of confidentiality.
Disclosure of Test Results

- HIV test results may be disclosed to members of health care team who need to know the information to guide medical management.
- Nurses can expect that they will be told about the HIV status of their clients but must not expect they will know in every case.
HIV test results may be given to a patient’s spouse upon request.

- True
- False
The Future of AIDS

- Experts predict:
  - AIDS will become the number one cause of death in the U.S. for individuals 25-44 years old.
  - Teenagers will continue to practice risky behavior despite HIV education or lack of information.
  - There will be cutbacks in the funding of state and federal services. Agencies will need to consolidate services resulting in centrally located HIV/AIDS centers providing inpatient, outpatient, and home care.
The Future of AIDS

Experts predict:

- Those involved in homosexual activities will become increasingly lax in following safe sexual practices resulting in an increase in the number of cases. Currently, the number of cases of HIV infection is increasing in areas with a high population of homosexuals.

- Hospital-based care will expand with dedicated HIV/AIDS units responsible for caring for clients who are experiencing acute crisis. This has not yet been seen as early aggressive treatment has enhanced the quality of life of those infected with HIV, allowing them to remain in the outpatient setting.
The Future of AIDS

- Experts predict
  - Satellite clinics will decline as appropriate treatment results in less hospital visits for care of acute symptoms.
  - More clinical drug trials with greater representation. All groups, including minorities, injecting drug users, pregnant women, women and children, will be allowed to enroll and researchers will be able to evaluate the effectiveness of treatments sooner.
The Future of AIDS

Experts predict

- More community hospitals in smaller towns will become involved in clinical trials. This will move treatment centers into the smaller towns allowing clients to be closer to family and friends. Nurses will be needed to work with people undergoing experimental therapies.

- Treatment will involve a combination of drug therapies resulting in AIDS clients living a longer life of better quality. New challenges will arise as they develop traditional diseases of aging.
The Future of AIDS

Experts predict

- Nurse practitioners who have specialized skills in caring for the HIV positive client will be in great demand. Their skills will be needed and utilized in many areas.

- Management of HIV will move from the hospital into the client’s home as the disease becomes more of a chronic, long-term illness. More home health nurses will be needed to take on this expanded responsibility.

- Nursing schools will fulfill these demands by aggressively preparing nursing students to care for these clients. Specialized education programs at the master’s level will be offered.
It is predicted that teens will continue to practice risky behavior despite HIV education.

- True
- False
Every year on December 1, CDC and its offices around the globe observe World AIDS Day to raise awareness of the global impact of HIV/AIDS.
HIV/AIDS Statistics

- **Morbidity**: Rates that measure the frequency of illness or conditions within specific populations.

- **Incidence**: A common morbidity rate for the rapidity with which disease or health conditions like HIV infection, occur or develop over a stated period.
In 2002, the CDC initiated the Interstate Duplication Evaluation Project
- Compared HIV/AIDS records in national database across states
- Identified duplicate cases
- Approximately 40,000 duplicate cases found (less than 5% of total cases)
- May be seen as minor reduction in reported cases.
United States Statistics

- As of 2009, 50,000 people are infected each year in the US with HIV
- At the end of 2008, 1,178,350 people age 13 or older are living with HIV
Diagnoses of HIV Infection among Adults and Adolescents, by Transmission Category, 2011—United States and 6 Dependent Areas

N = 50,007

- Male-to-male sexual contact: 62%
- Injection drug use (IDU) – Males: 18%
- Injection drug use (IDU) – Females: 10%
- Male-to-male sexual contact and IDU: 5%
- Heterosexual contact\(^a\) – Males: 3%
- Heterosexual contact\(^a\) – Females: 3%
- Other\(^b\): <1%

Note. Data include persons with a diagnosis of HIV infection regardless of stage of disease at diagnosis. All displayed data have been statistically adjusted to account for reporting delays and missing transmission category, but not for incomplete reporting.

\(^a\) Heterosexual contact with a person known to have, or to be at high risk for, HIV infection.

\(^b\) Includes hemophilia, blood transfusion, perinatal exposure, and risk factor not reported or not identified.
Transmission-Florida

Estimated AIDS Diagnoses among Adults and Adolescents, by Transmission Category, Cumulative through 2008, Florida
N = 116,041*

*MSM, men who have sex with men; IDU, injection drug users; MSM/IDU, men who have sex with men who also inject drugs
Diagnoses of HIV Infection among Adults and Adolescents, by Sex and Race/Ethnicity, 2011—United States and 6 Dependent Areas

**Males**
- N = 39,495
- 42% White
- 30% Black/African American
- 23% Asian
- <1% American Indian/Alaska Native
- <1% Multiple races

**Females**
- N = 10,512
- 63% White
- 17% Hispanic/Latino
- 17% Native Hawaiian/other Pacific Islander
- <1% American Indian/Alaska Native
- <1% Asian

Note: Data include persons with a diagnosis of HIV infection regardless of stage of disease at diagnosis. All displayed data have been statistically adjusted to account for reporting delays, but not for incomplete reporting.

*Hispanics/Latinos can be of any race.
Race/Ethnicity-Florida

Estimated AIDS Diagnoses, by Race/Ethnicity, Cumulative through 2008, Florida
N = 117,612*

- Black/African American, 48.8%
- Hispanic/Latino, 16.4%
- White, 33.6%
- Multiple Race, 1.1%
- American Indian/Alaska Native, 0.1%
- Asian, 0.1%

*Native Hawaiian/Other Pacific Islander, Unknown Race: >0.1%
### AIDS Diagnoses by Age

Of the *estimated number* of AIDS diagnoses in the 50 states and the District of Columbia, the distribution of ages at time of diagnosis *through 2009* was as follows:

<table>
<thead>
<tr>
<th>Age (Years)</th>
<th>Estimated # of AIDS Diagnoses, 2009</th>
<th>Cumulative Estimated # of AIDS Diagnoses, through 2009*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Under 13</td>
<td>13</td>
<td>9,448</td>
</tr>
<tr>
<td>Ages 13-14</td>
<td>58</td>
<td>1,321</td>
</tr>
<tr>
<td>Ages 15-19</td>
<td>484</td>
<td>7,214</td>
</tr>
<tr>
<td>Ages 20-24</td>
<td>2,095</td>
<td>42,920</td>
</tr>
<tr>
<td>Ages 25-29</td>
<td>3,476</td>
<td>129,639</td>
</tr>
<tr>
<td>Ages 30-34</td>
<td>4,043</td>
<td>214,149</td>
</tr>
<tr>
<td>Ages 35-39</td>
<td>4,893</td>
<td>234,575</td>
</tr>
<tr>
<td>Ages 40-44</td>
<td>5,689</td>
<td>193,237</td>
</tr>
<tr>
<td>Ages 45-49</td>
<td>5,466</td>
<td>126,380</td>
</tr>
<tr>
<td>Ages 50-54</td>
<td>3,983</td>
<td>72,327</td>
</tr>
<tr>
<td>Ages 55-59</td>
<td>2,191</td>
<td>39,025</td>
</tr>
<tr>
<td>Ages 60-64</td>
<td>1,010</td>
<td>20,633</td>
</tr>
<tr>
<td>Ages 65 or older</td>
<td>846</td>
<td>17,743</td>
</tr>
</tbody>
</table>

* From the beginning of the epidemic through 2009.
AIDS Diagnoses by Top 10 States/Dependent Areas

The 10 states or dependent areas reporting the highest number of AIDS diagnoses through 2009 were:

<table>
<thead>
<tr>
<th>State/Dependent Area</th>
<th># of Cumulative AIDS Diagnoses Through 2009*</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Adults or Adolescents</td>
<td>Children (&lt;13)</td>
<td>Total</td>
</tr>
<tr>
<td>New York</td>
<td>199,433</td>
<td>2,438</td>
<td>201,871</td>
</tr>
<tr>
<td>California</td>
<td>160,998</td>
<td>696</td>
<td>161,695</td>
</tr>
<tr>
<td>Florida</td>
<td>120,701</td>
<td>1,577</td>
<td>122,278</td>
</tr>
<tr>
<td>Texas</td>
<td>79,568</td>
<td>399</td>
<td>79,967</td>
</tr>
<tr>
<td>New Jersey</td>
<td>54,483</td>
<td>809</td>
<td>55,292</td>
</tr>
<tr>
<td>Georgia</td>
<td>39,207</td>
<td>253</td>
<td>39,460</td>
</tr>
<tr>
<td>Illinois</td>
<td>38,886</td>
<td>289</td>
<td>39,175</td>
</tr>
<tr>
<td>Pennsylvania</td>
<td>38,282</td>
<td>375</td>
<td>38,657</td>
</tr>
<tr>
<td>Maryland</td>
<td>35,981</td>
<td>332</td>
<td>36,313</td>
</tr>
<tr>
<td>Puerto Rico</td>
<td>32,867</td>
<td>410</td>
<td>33,277</td>
</tr>
</tbody>
</table>

* From the beginning of the epidemic through 2009.
Rates of Diagnoses of HIV Infection among Adults and Adolescents, 2011—United States and 6 Dependent Areas

N = 50,007  Total Rate = 19.1

Average rates per 100,000 population:
- <10.0
- 10.0 – 19.9
- 20.0 – 29.9
- 30.0 – 39.9
- ≥30.0

American Samoa: 0.0
Guam: 0.0
Northern Mariana Islands: 5.3
Puerto Rico: 28.6
Republic of Palau: 0.0
U.S. Virgin Islands: 39.5

Note: Data include persons with a diagnosis of HIV infection regardless of stage of disease at diagnosis. All displayed data have been statistically adjusted to account for reporting delays, but not for incomplete reporting.
Rates of Diagnoses of HIV Infection among Adults and Adolescents, by Sex and Race/Ethnicity, 2011—United States

Note: Data include persons with a diagnosis of HIV infection regardless of stage of disease at diagnosis. All displayed data have been statistically adjusted to account for reporting delays, but not for incomplete reporting. Rates are per 100,000 population.

a Hispanics/Latinos can be of any race.
Diagnoses of HIV Infection among Adults and Adolescents, by Sex and Transmission Category, 2011—United States and 6 Dependent Areas

**Males**
- Male-to-male sexual contact: 78%
- Injection drug use (IDU): 12%
- Male-to-male sexual contact and IDU: 6%
- Other: <1%
- Total: N = 39,495

**Females**
- Heterosexual contact: 86%
- Other: <1%
- Total: N = 10,512

*Note.* Data include persons with a diagnosis of HIV infection regardless of stage of disease at diagnosis. All displayed data have been statistically adjusted to account for reporting delays and missing transmission category, but not for incomplete reporting.

*a* Heterosexual contact with a person known to have, or to be at high risk for, HIV infection.

*b* Includes hemophilia, blood transfusion, perinatal exposure, and risk factor not reported or not identified.
Diagnoses of HIV Infection among Adults and Adolescents, by Sex and Race/Ethnicity, 2011—United States and 6 Dependent Areas

**Males**
- N = 39,495
- 2% American Indian/Alaska Native
- 42% Asian
- 30% Black/African American
- <1% Multiple races

**Females**
- N = 10,512
- 1% Hispanic/Latino
- 17% Asian
- 63% Black/African American
- <1% Multiple races

Note. Data include persons with a diagnosis of HIV infection regardless of stage of disease at diagnosis. All displayed data have been statistically adjusted to account for reporting delays, but not for incomplete reporting.

*Hispanics/Latinos can be of any race.*
Rates of Adults and Adolescents Living with Diagnosed HIV Infection, Year-end 2010—United States and 6 Dependent Areas

N = 888,921  Total Rate = 342.2

Rates per 100,000 population
- <100.0
- 100.0 – 199.9
- 200.0 – 299.9
- 300.0 – 399.9
- 400.0
- ≥400.0

Note. Data include persons with a diagnosis of HIV infection regardless of stage of disease at diagnosis. All displayed data have been statistically adjusted to account for reporting delays, but not for incomplete reporting.
Rates of Children Aged <13 Years Living with Diagnosed HIV Infection, Year-end 2010—United States and 6 Dependent Areas

N = 2,936          Total Rate = 5.5

Note. Data include persons with a diagnosis of HIV infection regardless of stage of disease at diagnosis. All displayed data have been statistically adjusted to account for reporting delays, but not for incomplete reporting.
According to the CDC, at the end of 2008, an estimated 1,178,350 persons aged 13 and older were living with HIV infection in the United States. Of those, 20% had undiagnosed HIV infections.
AIDS in African Americans

- Leading killer of African-American males ages 25-44
- AIDS affects seven to eleven times more African Americans than whites
- In 2003, two-thirds of AIDS cases in women and children in the US were among African Americans
Other Statistics

- Death rate from AIDS is approximately 60%.
- AIDS is leading cause of non-accidental deaths in males of all races between the ages of 20 and 45.
- AIDS is leading cause of death for black women between the ages of 20 and 45.
- AIDS is a primary cause of mortality among Caucasian women, but it does not surpass cancer and accidents.
Disease Progression

- HIV/AIDS is considered to be a chronic illness.
- If untreated, the disease has a mortality rate of 80% at 10 years.
- With proper treatment, life expectancy has risen over the past 3 years.
- Once CD4 count < 200, average life span is 1.7 years.
AIDS Diagnoses, with Infection Attributed to Male-to-Male Sexual Contact, by Race/Ethnicity, 1985–2009—United States and Dependent Areas

Note. All displayed data have been statistically adjusted to account for reporting delays and missing risk-factor information, but not for incomplete reporting.

*Includes Asian/Pacific Islander legacy cases.
AIDS Diagnoses among Adult and Adolescent Females, with Infection Attributed to Heterosexual Contact, by Race/Ethnicity, 1985–2009—United States and Dependent Areas

Note: All displayed data have been statistically adjusted to account for reporting delays and missing risk-factor information, but not for incomplete reporting.

- Heterosexual contact with a person known to have, or to be at high risk for, HIV infection.
- Includes Asian/Pacific Islander/legacy cases.
- Hispanics/Latinos can be of any race.
Estimated AIDS Diagnoses in the United States and Puerto Rico
Cumulative through 2009  N = 1,141,888

Each Dot Represents 50 Cases

Notes: All displayed data have been statistically adjusted to account for reporting delays, but not for incomplete reporting. Data are cumulative AIDS diagnoses through the end of 2009, reported to CDC by June 2010.
Adults and Adolescents Living with Diagnosed HIV Infection Ever Classified as Stage 3 (AIDS), by Sex, 1993–2010—United States and 6 Dependent Areas

Note. All displayed data have been statistically adjusted to account for reporting delays, but not for incomplete reporting.
Review Question 21

The mortality rate from AIDS is approximately

- 20%
- 40%
- 60%
- None of the above
According to the news, for 2011, the President’s federal budget includes a $27.2 billion request for HIV and AIDS. That’s a 4.6 percent increase over 2010 funding, which totaled $26 billion.
Federal Funding Covers

- Five basic categories
  - Care and treatment (largest $$ amount spent here)
  - Financial and housing assistance
  - Prevention
  - Research
  - Global spending
Engagement in Care

Engagement in HIV Care and Treatment in the United States

Number of Individuals

- HIV-Infected: 1,106,400
- HIV-Diagnosed: 874,056
- Linked to HIV Care: 655,542
- Retained in HIV Care: 437,028
- Need Antiretroviral Therapy: 349,622
- On Antiretroviral Therapy: 262,217
- Adherent/Undetectable VL: 209,773

Stage of Engagement in HIV Care

VL = HIV viral load
Per the CDC

“HIV/AIDS has claimed the lives of more than 550,000 Americans. Today, about 1.1 million Americans are living with HIV, the virus that causes AIDS, and one fifth of those infected are unaware of their infection.”
Is There a Cure?

- There are still studies being done about “potential cures”.

- One confirmed case of a Berlin patient in 2011 that had bone marrow, stem cell transplant from a donor immune to HIV.
  
  - Scientists are hoping to learn from this to see if possible for other patients worldwide. With each individual patient many factors have to be in alignment for this to occur.
Conclusion

Whatever the future course of the HIV epidemic may be, it is certain that it will be around for many years to come.

Healthcare workers will continue to have the challenge of keeping up to date on what’s new about HIV infection, how to prevent and treat this devastating disease.

An educated approach is the best way to provide for personal safety while demonstrating care-giving abilities to HIV/AIDS clients.
References


- The Body, the Complete HIV/AIDS Resource 2011


References


- The Body, the Complete HIV/AIDS Resource 2011


References


- WEB MD Staying Health with HIV 2011
We hope this Computer Based Learning course has been both informative and helpful.

Feel free to review this course until you are confident about your knowledge of the material presented.

Click on **TAKE TEST** to complete the requirements for this course.

Click **EXIT** to return to myCourses/Classes to complete list.