MODULE 1: HIV BASIC FACTS

Understanding the basic facts about HIV is the first step toward awareness, prevention, and proper care. This section provides clear, accurate, and essential information about what HIV is, how it differs from AIDS, how it is transmitted, the stages of infection, and the signs and symptoms associated with the disease.

Topic 1: What is HIV?

Human Immunodeficiency Virus, commonly referred to as HIV, is a type of retrovirus that specifically targets the human immune system. More precisely, it attacks and progressively destroys critical immune cells known as CD4-positive T lymphocytes and macrophages. These cells play a fundamental role in the body's natural defense mechanism, working to identify, combat, and eliminate harmful pathogens such as bacteria, viruses, and fungi that cause disease.

Once the virus enters the body, it integrates itself into the host's immune cells and begins to replicate. Over time, the continued replication of the virus leads to a gradual depletion of these vital immune cells. As the number of CD4 cells declines, the immune system becomes increasingly impaired. This deterioration reduces the body's ability to fight off infections and certain types of cancer, resulting in a condition known as immunodeficiency.

When the immune system is weakened to a significant degree, the individual becomes highly susceptible to a wide range of infections and illnesses that would not ordinarily pose a serious threat to someone with a healthy immune system. These illnesses are known as opportunistic infections because they exploit the body's compromised immunity.

If HIV remains undiagnosed or untreated, it can advance to the most critical and life-threatening stage of the infection, known as Acquired Immunodeficiency Syndrome or AIDS. At this point, the immune system is severely damaged, and the risk of severe infections, chronic conditions, and death increases substantially. However, with early diagnosis and consistent antiretroviral treatment, individuals living with HIV can maintain a strong immune system and lead long, healthy lives.

Topic 2: HIV vs. AIDS

There is a common misconception that HIV and AIDS are interchangeable terms. However, they represent distinct stages in the progression of the same disease. Human Immunodeficiency Virus, or HIV, is the virus responsible for gradually weakening the immune system by targeting and destroying essential immune cells. If left untreated, this damage accumulates over time and ultimately leads to a condition known as Acquired Immunodeficiency Syndrome, or AIDS.

AIDS is not a virus but rather a syndrome, a collection of symptoms, diseases, and infections, that manifest in the most advanced and severe stage of HIV infection. At this stage, the immune system is critically weakened, and the body can no longer effectively defend itself against opportunistic infections. These infections are typically rare or mild in individuals with healthy immune systems but can cause severe illness in those with AIDS.

The diagnosis of AIDS is based on specific medical criteria. One key indicator is a CD4 cell count falling below 200 cells per cubic millimeter of blood. Another is the presence of certain AIDS-defining conditions, including chronic diarrhea lasting more than a month, recurrent bacterial infections, pulmonary tuberculosis, and particular cancers such as Kaposi's sarcoma.

The progression of HIV infection can be categorized into clinical stages. Stage I is generally asymptomatic and does not meet the criteria for an AIDS diagnosis. However, clinical signs appearing in Stages II through IV may indicate advancement toward AIDS. Stage II includes minor mucocutaneous manifestations and recurrent respiratory tract infections. Stage III is characterized by more serious conditions, such as unexplained chronic diarrhea lasting longer than a month, severe bacterial infections, and pulmonary tuberculosis. Stage IV involves life-threatening illnesses, including toxoplasmosis of the brain, candidiasis of the esophagus or respiratory tract, and Kaposi’s sarcoma.

While many of these opportunistic infections are treatable and rarely dangerous in healthy individuals, they can be fatal when the immune system is severely compromised. Without medical intervention, most individuals infected with HIV progress to AIDS within eight to ten years. However, with early diagnosis and consistent use of antiretroviral therapy, or ART, the progression of the disease can be halted or significantly delayed. ART suppresses viral replication, preserves immune function, and enables people living with HIV to lead longer, healthier lives.

Topic 3: Signs and Symptoms

The symptoms of HIV vary depending on the stage of infection. During the initial few months after infection, HIV spreads more rapidly; however, many individuals remain unaware of their status until later stages. In the first few weeks following infection, some people may be asymptomatic, while others may experience an influenza-like illness characterized by:

- fever
- headache
- rash
- sore throat

As the infection progresses, the virus gradually weakens the immune system, leading to additional signs and symptoms such as:

- swollen lymph nodes
- unexplained weight loss
- persistent fever
- chronic diarrhea
- prolonged cough

Without treatment, HIV infection can advance to severe illnesses, including:

- tuberculosis (TB)
- cryptococcal meningitis
- severe bacterial infections
- certain cancers, such as lymphomas and Kaposi's sarcoma

Moreover, HIV can exacerbate other infections, including hepatitis B, hepatitis C, and mpox.

Topic 4: How is HIV Transmitted?

Understanding how HIV is transmitted is crucial in preventing its spread. HIV is found in certain body fluids of an infected person, including:

- Blood
- Semen
- Vaginal fluids
- Rectal fluids
- Breast milk

The virus can only be transmitted when these fluids come into contact with:

- A mucous membrane (like those in the genitals, rectum, or mouth),
- Damaged tissue, or
- Directly injected into the bloodstream through the use of contaminated needles or syringes.

Main Modes of Transmission:

1. **Sexual Transmission.** HIV can be transmitted through unprotected penetrative sex, including both vaginal and anal intercourse. Although the per-act risk of transmission during vaginal sex is relatively lower compared to other routes, it still poses a considerable risk, especially with repeated exposure or when other sexually transmitted infections (STIs) are present. Anal sex carries a transmission risk approximately ten times higher than vaginal sex due to the fragile tissue lining of the rectum. Additionally, individuals with untreated STIs, particularly those involving ulcers or genital discharge, are six to ten times more likely to transmit or acquire HIV during sexual activity. While oral sex is generally considered low-risk for HIV transmission, this risk can increase if there are cuts, sores, or bleeding gums present.

2. **Sharing Needles or Syringes.** Reusing or sharing needles and syringes is a highly efficient mode of HIV transmission. Among people who inject drugs, the risk can be significantly reduced by consistently using new, disposable needles or by properly sterilizing reusable ones. In healthcare settings, adherence to universal precautions by medical personnel is essential in preventing such transmission.

3. **Mother-to-Child Transmission.** HIV can be passed from an infected mother to her child during pregnancy, labor, delivery, or breastfeeding. Without medical intervention, the risk of transmission ranges from 15% to 30%. This risk increases with higher maternal viral loads. However, if the mother is receiving ART throughout pregnancy and breastfeeding, the likelihood of transmission is significantly reduced and can be almost eliminated.

4. **Blood Transfusions.** Receiving infected blood or blood products carries a very high risk of HIV transmission, greater than 90%. To prevent this, strict blood safety standards have been implemented in many countries. These measures include rigorous screening of all donated blood for HIV and other blood-borne infections, along with proper donor selection processes to ensure the safety and quality of transfused blood.

Additional Considerations:

- Kissing: HIV is not transmitted through casual contact or kissing. Deep kissing is extremely low-risk unless both partners have open sores or bleeding gums.
- Body Piercing/Tattooing: There is a risk if equipment is not properly sterilized. Use licensed providers who follow safety protocols.
- Sharing Razors or Toothbrushes: Avoid sharing items that may be contaminated with blood.
- Sex with a Partner Living with HIV: Safe when the partner has an undetectable viral load, uses condoms, or if the HIV-negative partner is on PrEP (pre-exposure prophylaxis).

Topic 5: Stages of HIV Infection

HIV progresses through four distinct stages, each affecting the immune system differently. Early diagnosis and treatment can slow or stop disease progression, enabling individuals to live long and healthy lives.

1. **Acute HIV Infection**
   - Occurs 2 to 4 weeks after exposure
   - Often accompanied by flu-like symptoms such as fever, rash, sore throat, and swollen glands
   - Viral load is very high, making the person highly infectious
   - Some individuals may experience no symptoms at all

2. **Chronic HIV Infection (Clinical Latency Stage)**
   - The virus remains active but reproduces at a slower rate
   - People may show no symptoms during this stage
   - Can last for years or even decades with antiretroviral therapy (ART)
   - Without treatment, the immune system gradually weakens over time

3. **Symptomatic HIV Infection**
   - Immune system damage becomes more apparent, causing symptoms such as:
   - Persistent fever
   - Weight loss
   - Chronic diarrhea
   - Oral or skin infections
   - Opportunistic infections may begin to develop

4. **AIDS (Acquired Immunodeficiency Syndrome)**
   - The final and most severe stage of HIV infection
   - Marked by serious illnesses such as:
     - Tuberculosis
     - Pneumonia
     - Certain cancers like Kaposi’s sarcoma and lymphomas
   - CD4 cell count falls below 200 cells/mm^3
   - Without treatment, life expectancy is greatly reduced, but ART can still improve outcomes

MODULE 2: HIV PREVENTION

Human Immunodeficiency Virus (HIV) prevention remains a crucial component in the global effort to combat the spread of the virus. While no cure currently exists, a wide array of evidence-based strategies are available to help individuals and communities reduce the risk of HIV transmission. This section outlines the preventive measures, methods, and interventions recommended by health authorities and research institutions.

Effective Methods for Preventing HIV

HIV is primarily transmitted through unprotected sexual contact, the sharing of contaminated needles, and, in some cases, from mother to child during childbirth or breastfeeding. However, with proper awareness and preventive actions, the risk of transmission can be significantly minimized. These methods include:

- **Mutual Monogamy**: Engaging in a mutually monogamous relationship with a partner who has tested negative for HIV reduces the risk of exposure.
- **Non-Penetrative Sexual Practices**: Activities such as mutual masturbation carry no risk of HIV transmission and may be considered safer alternatives to penetrative intercourse.
- **Correct and Consistent Condom Use**: Male and female condoms, when used properly, serve as an effective barrier against HIV and other sexually transmitted infections (STIs).
- **Viral Suppression through Antiretroviral Therapy (ART)**: Individuals living with HIV who maintain an undetectable viral load through consistent ART usage cannot transmit the virus to their sexual partners—a concept known as **U=U (Undetectable = Untransmittable)**.
- **Pre-Exposure Prophylaxis (PrEP)**: PrEP is a daily medication regimen taken by HIV-negative individuals who are at high risk of infection. It significantly lowers the chance of acquiring HIV.
- **Voluntary Medical Male Circumcision (VMMC)**: Circumcision has been shown to reduce the risk of heterosexual men acquiring HIV.

In addition, individuals who inject drugs can reduce their risk of infection by:

- Using new, sterile needles and syringes with every injection.
- Engaging in opioid substitution therapy or seeking non-injection alternatives.

In healthcare settings, ensuring the safety of blood and blood products through proper screening and infection control procedures remains critical in preventing HIV transmission.

Understanding Safer Sex Practices

"Safer sex" refers to behaviors and precautions that significantly lower the risk of HIV and STI transmission during sexual activity. These include:

- Consistent and correct use of condoms during all sexual encounters.
- Considering non-penetrative sexual acts as alternatives to reduce exposure to bodily fluids.
- Taking PrEP for individuals at increased risk.

- Engaging with sexual partners who are adherent to effective ART and have achieved an undetectable viral load.

Safer sex practices are most effective when combined with open communication between partners and regular HIV testing.

Condom Effectiveness and Proper Use

When used properly and consistently, both male and female condoms offer high levels of protection against HIV and other STIs. However, misuse or inconsistent use can significantly reduce their effectiveness. Common errors include using expired condoms, using oil-based lubricants with latex condoms (which can cause breakage), and failing to use a new condom for each act of intercourse.

Steps for Correct Male Condom Use:

1. Select a lubricated, high-quality condom and check the expiration date.
2. Avoid using sharp objects or teeth to open the package.
3. Place the rolled condom on the tip of the erect penis, pinching the tip to remove air and leave room for semen.
4. Unroll the condom all the way to the base of the penis.
5. After ejaculation, hold the base of the condom while withdrawing the penis to prevent slippage.
6. Dispose of the used condom by wrapping it in tissue and placing it in the trash. Never flush it down the toilet.

It is essential to use a new condom for every sexual encounter.

Female Condoms: Use and Benefits

The female condom is a soft, polyurethane pouch inserted into the vagina prior to sexual intercourse. It serves as a barrier to sperm and infectious agents, including HIV.

Advantages include:

- No prescription required.
- No systemic side effects.
- Provides women with more control over their sexual health.

Steps for Proper Female Condom Use:

1. Gently remove the condom from its packaging and apply a water-based lubricant to ease insertion.
2. Squeeze the inner ring and insert it into the vagina, ensuring it is placed past the pubic bone.
3. Leave approximately 2 cm of the condom outside the vaginal opening.
4. During intercourse, guide the penis to ensure it enters the condom rather than slipping outside.

5. After intercourse, twist the outer ring to seal the condom and gently remove it.
6. Dispose of the condom properly. Female condoms are for single use only.

Post-Exposure Prophylaxis (PEP)

Post-Exposure Prophylaxis (PEP) is an emergency intervention involving antiretroviral medications taken after potential exposure to HIV. It must be initiated within 72 hours of the exposure, preferably within the first two hours.

PEP is commonly administered in the following situations:

- Unprotected sexual contact with an HIV-positive or high-risk individual.
- Sexual assault.
- Accidental needle-stick injuries, especially among healthcare workers.

A standard PEP regimen involves a 28-day course of antiretroviral drugs, along with follow-up testing and counseling. It is not intended for routine use but serves as a critical response to emergency situations.

Risk Reduction for People Who Inject Drugs

To prevent HIV transmission among people who inject drugs, the following harm reduction strategies are recommended:

- Transition from injection to non-injection drug use, such as oral methods.
- Use sterile, new needles and syringes with each injection.
- Employ safe preparation practices, including sterile water and clean containers.
- Clean the skin before injection using alcohol or antiseptic wipes.
- Access support services, including needle exchange programs, to minimize risk.

Prevention of Mother-to-Child Transmission (PMTCT)

HIV can be transmitted from an HIV-positive mother to her child during pregnancy, childbirth, or breastfeeding. Without intervention, the transmission rate can reach up to 45%. However, with appropriate medical care, this risk can be reduced to less than 5%.

Key interventions include:

- Early diagnosis of HIV during pregnancy.
- Initiation of antiretroviral therapy (ART) for the mother, regardless of her CD4 count (Option B+ strategy).
- Appropriate decisions regarding mode of delivery and breastfeeding practices.
- Early infant diagnosis and postnatal care for newborns.

Such interventions are critical in ensuring the health and well-being of both mother and child.

Infection Prevention in Healthcare Settings

Healthcare workers are trained to follow universal precautions to prevent the transmission of HIV and other blood-borne pathogens. These include:

- Proper disposal of sharps such as needles and scalpels in puncture-resistant containers.
- Use of personal protective equipment (PPE) such as gloves, masks, gowns, and goggles.
- Routine handwashing and hygiene practices.
- Adherence to sterilization and disinfection protocols for medical instruments and surfaces.
- Safe handling and testing of blood samples and body fluids.

These standards are implemented regardless of a patient's HIV status and are essential for maintaining safety within clinical environments.

MODULE 3: HIV TREATMENT OPTIONS

Currently, there is no cure for HIV infection. However, it can be effectively managed through **antiretroviral therapy (ART)**, a combination of medications that work to suppress the replication of the virus in the body. ART does not eliminate HIV, but it significantly reduces the viral load, allowing the immune system to recover and function properly. As a result, people living with HIV who maintain consistent treatment can live long, healthy lives and dramatically reduce the risk of transmitting the virus to others.

Goals of HIV Treatment and Care

The primary objectives of HIV treatment are:

- To reduce HIV-related mortality and morbidity.
- To improve the quality of life and life expectancy of individuals living with HIV.
- To prevent onward transmission of the virus to sexual partners and from mother to child during pregnancy, childbirth, or breastfeeding.

ART works by preserving or improving immune function, decreasing the risk of opportunistic infections and associated illnesses, and reducing inflammation caused by chronic immune activation. This inflammation, if left unmanaged, can contribute to the development of cardiovascular, renal, neurological, and other end-organ diseases.

Available Antiretroviral Therapy Options

Antiretroviral medicines (ARVs) are typically taken in combinations of three or more drugs from different classes to maximize effectiveness. Common ARV classes include:

- **Nucleoside Reverse Transcriptase Inhibitors (NRTIs):** Block reverse transcriptase, an enzyme HIV uses to replicate.
- **Non-Nucleoside Reverse Transcriptase Inhibitors (NNRTIs):** Bind directly to and inhibit reverse transcriptase.
- **Protease Inhibitors (PIs):** Prevent the virus from producing mature and infectious viral particles.

Recent advancements in HIV research have led to more potent and better-tolerated ART regimens, often available in fixed-dose combinations for adults, adolescents, and children. These improvements enhance adherence and the long-term effectiveness of treatment.

Effectiveness and Impact of ART

When taken daily and as prescribed, ART reduces the amount of HIV in the body to undetectable levels. Individuals with undetectable viral loads not only experience improved health outcomes but also cannot transmit the virus sexually, a principle summarized by the phrase **"Undetectable = Untransmittable (U=U)"**.

Early initiation and consistent adherence to ART:

- Strengthen the immune response.
- Prevent the progression to AIDS.
- Lower the likelihood of opportunistic infections such as tuberculosis (TB), which remains a leading cause of death among people living with HIV.

ART adherence is crucial to maintain its benefits and to prevent the development of drug-resistant strains of HIV.

Special Considerations and Evolving Strategies

- **Pregnant women** diagnosed with HIV should start ART immediately to protect their health and prevent transmission to the fetus or newborn.
- **Advanced HIV disease** remains a critical concern. The World Health Organization (WHO) promotes the implementation of advanced HIV disease care packages, including prophylaxis and treatment of common opportunistic infections like cryptococcal meningitis.
- The development of **injectable ART formulations** and **short-course treatments** may reshape how individuals receive HIV care in the near future, offering alternatives to daily oral medications.
- **Differentiated care models** tailored to individual needs have been widely adopted to improve service delivery, reduce the burden on healthcare systems, and enhance treatment outcomes.

COMMON MYTHS AND FACTS ABOUT HIV

1. **Myth:** HIV can be transmitted through mosquito bites.

   Fact: HIV is *not* spread by mosquitoes or any other biting insects. Even if a mosquito bites a person living with HIV, the virus cannot reproduce inside the mosquito's body. Since the virus does not survive or multiply in insects, mosquitoes cannot transmit HIV to another person when they bite again.

2. **Myth:** HIV can be caught through playing sports or casual physical contact.

   Fact: There is no evidence that HIV can be transmitted through contact involved in sports or casual everyday activities. Activities such as hugging, shaking hands, or sharing sports equipment do not transmit the virus.

3. **Myth:** Only homosexuals and drug users get HIV.

   Fact: HIV affects people regardless of their sexual orientation or drug use history. Anyone who has unprotected sex, shares needle, receives contaminated blood, or a baby born to an

HIV-positive mother can become infected. HIV infection is linked to specific behaviors, not a person's identity.

4. **Myth:** You can tell if someone has HIV by their appearance.

   Fact: Many people living with HIV looks healthy and show no outward symptoms, especially in the early years of infection. The only way to know if someone has HIV is through a proper medical test.

5. **Myth:** If you have one sexually transmitted infection (STI), you cannot get another.

   Fact: It is possible to have multiple STIs at the same time. Each infection requires its own treatment, and having one STI can actually increase the risk of getting another because it can make the body more vulnerable to infections.

6. **Myth:** People on antiretroviral therapy (ART) can still spread HIV to others.

   Fact: When ART reduces the amount of HIV in the blood to undetectable levels, people cannot transmit the virus to their sexual partners. This is known as "undetectable = untransmittable" or U=U.

7. **Myth:** HIV can be spread by sharing food, utensils, or drinks.

   Fact: HIV is *not* transmitted through saliva. Eating with or drinking after someone who has HIV poses no risk of infection.

8. **Myth:** You can get HIV from using a public toilet seat.

   Fact: HIV cannot survive long outside the human body, so it cannot be transmitted through toilet seats, doorknobs, or other surfaces.

9. **Myth:** HIV infection immediately leads to AIDS.

   Fact: HIV is a virus that, if untreated, may eventually cause AIDS, which is the most advanced stage of HIV infection. However, with effective treatment, many people living with HIV never develops AIDS.

10. **Myth:** Herbal remedies or alternative medicine can cure HIV.

    Fact: Currently, there is no cure for HIV. The only effective treatment is lifelong antiretroviral therapy, which controls the virus and helps maintain health.

11. **Myth:** Only people with many sexual partners are at risk of HIV.

    Fact: Anyone who engages in unprotected sex or shares needles is at risk, regardless of the number of partners.

12. **Myth:** Condoms are ineffective at preventing HIV.

    Fact: When used correctly and consistently, condoms are highly effective in preventing HIV and many other sexually transmitted infections.

13. **Myth:** HIV-positive mothers cannot have healthy children.

    Fact: With proper treatment during pregnancy, childbirth, and breastfeeding, HIV-positive mothers can significantly reduce the risk of passing the virus to their babies.

14. **Myth:** HIV is a death sentence.

Fact: Advances in medicine mean that people living with HIV can now live long and healthy lives with proper treatment and care.

15. **Myth:** HIV can be transmitted by kissing.

    Fact: HIV is not found in saliva in amounts that can cause infection, so deep or casual kissing does not spread HIV.

16. **Myth:** HIV affects only certain races or ethnic groups.

    Fact: HIV does not discriminate; it can infect anyone regardless of race, ethnicity, or nationality.

17. **Myth:** HIV can be transmitted through sweat or tears.

    Fact: HIV is not spread by sweat, tears, or casual contact with bodily fluids that do not contain blood.

18. **Myth:** Donating blood can transmit HIV.

    Fact: Blood donation centers follow strict safety protocols, so donating blood is safe and does not transmit HIV.

19. **Myth:** You can tell if someone is infected with HIV by symptoms alone.

    Fact: Many people living with HIV shows no symptoms for years; testing is the only way to confirm infection.

20. **Myth:** There is currently a vaccine available to prevent HIV infection.

    Fact: While research is ongoing, no approved HIV vaccine exists at this time.

Sources:

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