

## HIV/AIDS Update (1 HOUR)

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#### Goals & Objectives

##### Course Description

"HIV/AIDS Update (1 Hour)" is an asynchronous online continuing education course for occupational therapists and occupational therapy assistants. This course presents updated information about HIV/AIDS including sections on physiology, transmission, diagnosis, treatment, and legal issues.

##### Course Rationale

The purpose of this course is to present current information about HIV/AIDS. Occupational therapists and occupational therapy assistants will find this information pertinent and useful when addressing the challenges and needs specific to individuals who have been diagnosed with either HIV infection or AIDS.

##### Course Objectives

Upon completion of this course, the participant will be able to:

1. Recognize the physiology, structure, and life cycle of HIV
2. Identify the transmission modes of HIV infection
3. List the early symptoms of HIV infection
4. Identify medical conditions associated with AIDS
5. Identify and differentiate HIV screening tests and HIV confirmatory tests
6. List current treatment recommendations for HIV infection
7. Identify the implications of HIV/AIDS for healthcare workers
8. Recognize the laws and statutes that pertain to the rights, care, and treatment of individuals with HIV/AIDS.

**Course Provider** – Innovative Educational Services

**Provider Contact Information** – [information@cheapceus.com](mailto:information@cheapceus.com)

**Course Instructor** – Michael Niss, DPT

**Financial/Non-financial Disclosure** - Neither the Provider nor the instructor have any financial or non-financial conflict of interest related to the presentation of this CE program.

**Target Audience** – Occupational Therapists, Occupational Therapy Assistants

**OT Scope of Practice** – Foundational Knowledge

**Course Educational Level** – This course is applicable for introductory learners.

**Course Prerequisites** – None

**Method of Instruction** – Distance Learning – Independent; Asynchronous online text-based home study

**Location** - Cheapceus.com

**Date** – Continuously available on-demand

**Course Completion Requirements / Criteria for Issuance of CE Credits** – Completion of instructional materials and a score of 70% or greater on the course post-test.

**Continuing Education Credits** – One (1) contact hour / .1 AOTA CEU / NBCOT 1.25 PDUs

**Course Fee** - \$9.95

**Registration Information** – No pre-registration required; available on-demand at Cheapceus.com

**Special Needs Requests** – Email: [information@cheapceus.com](mailto:information@cheapceus.com) or phone: 954-663-4101

**Cancellation by the Learner** – Learners may cancel their participation at any time and receive a full refund of all paid fees.

**Cancellation by the Provider** – Registrants for the cancelled activity will be contacted by an IES staff member via phone call or email within 12 hours of the cancellation decision. If the decision to cancel is made less than 14 hours prior to the event, each participant will be contacted no later than 2 hours prior to the scheduled start time of the activity. Registrants will receive a full refund if an activity is cancelled by the Provider. The refund will be processed back to the Registrant within 12 hours of the cancellation.

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**HIV/AIDS Update (1 Hour)**

**Course Outline**

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## Overview

### Scope of the HIV/AIDS Pandemic

HIV infection and AIDS are among the most pressing concerns facing health providers worldwide. Although the impact of HIV/AIDS is serious in both developed and developing countries, it is most profound in the developing world, where resources to prevent, diagnose, and manage HIV infection are scarce.

The Joint United Nations Program on HIV/AIDS (UNAIDS) estimates that more than 40 million men, women, and children worldwide are now living with HIV/AIDS, of which 28 million are in Sub-Saharan Africa. In this region, 1 in 10 adults ages 15 to 49 is living with the virus, and in seven countries more than 20% of the population is infected. Women, especially young women, are becoming infected at alarmingly increasing rates. A great many infected people do not know they carry HIV and so may be spreading the virus to others unknowingly.

This global epidemic is now far more extensive than was predicted even a decade ago, and the challenges that HIV poses vary enormously from region to region. Since the beginning of the epidemic, AIDS has killed more than 21 million people, and it has replaced malaria and tuberculosis as the world's leading cause of death by infectious disease among adults. AIDS is now the fourth leading cause of death among adults worldwide, and more than 13 million children have been orphaned by the epidemic.

A host of economic, political, social, and cultural factors play a critical role in determining how quickly the epidemic spreads within a particular region and whether communities and countries are able to rally the resources needed to combat HIV/AIDS.

### The Future of the Epidemic

More than 21 million people have died from AIDS. However, a staggering 40 million people are currently living with HIV, and 5 million new infections are expected yearly.

The devastation of the epidemic has clearly just begun. AIDS has already sharply reduced the rate of population growth in some countries, and within a few years, Botswana, South Africa, and Zimbabwe will experience negative population growth. Life expectancy is already dramatically reduced in many countries in Africa and has also decreased significantly in countries in Asia, the Caribbean, and Latin America.

In more developed countries, recent advances in treatment have dramatically changed the perspectives of those living with HIV infection, of health workers,

and of researchers. Many have now begun to think of HIV infection as potentially treatable, rather than an automatic death sentence.

However, most of those living in the developing world lack access to treatment regimens that have proved effective in extending lives and treating opportunistic infections, and the costs of such treatments—which can exceed \$10,000 per year—are well outside the reach of most individuals infected with HIV. Even though there have been price reductions in some developing countries, treatment is still out of reach for the vast majority.

Lack of access to treatment has been the cause of much recent global debate between public health activists and the pharmaceutical companies that hold the patents to these drugs, and recent events suggest that some measure of greater access may soon be achieved.

Although lack of access to treatment regimens is only one of many complex factors barring progress in the fight against HIV/AIDS in the developing world, many see improved access as an important first step.

### **Physiology**

HIV belongs to a class of viruses called retroviruses, which have genes composed of ribonucleic acid (RNA) molecules. Like all viruses, HIV can replicate only inside cells, commandeering the cell's machinery to reproduce. However, only HIV and other retroviruses, once inside a cell, use an enzyme called reverse transcriptase to convert their RNA into DNA, which can be incorporated into the host cell's genes.

HIV belongs to a subgroup of retroviruses known as lentiviruses, or slow viruses. The course of infection with these viruses is characterized by a long interval between initial infection and the onset of serious symptoms.

### **Structure of HIV**

HIV is composed of two distinct components, the viral envelope and the viral core.

The viral envelope is the outer coat of the virus. It is composed of two layers of fatty molecules called lipids, taken from the membrane of a host human cell when a newly formed virus particle buds from the cell.

Within the envelope of a mature HIV particle is a bullet shaped core or capsid, made of 2000 copies of another viral protein, p24. The capsid surrounds two single strands of HIV RNA, each of which has a copy of the virus's nine genes.

## **Life Cycle of HIV**

### **Entry of HIV into the Cells**

Infection typically begins when an HIV particle, which contains two copies of the HIV RNA, encounters a cell with a surface molecule called a cluster designation 4 (CD4). Cells with this molecule are known as CD4 positive cells. The membranes of the virus and the cell fuse. Following the fusion, the virus's RNA, proteins, and enzymes are released into the cell.

### **Reverse Transcription**

In the cytoplasm of the cell, HIV reverse transcriptase converts viral RNA into DNA, the nucleic acid form in which the cell carries its genes.

### **Integration**

The newly made HIV DNA moves to the cell's nucleus, where it is spliced into the host's DNA with the help of HIV integrase. Once incorporated into the cell's genes, HIV DNA is called a "provirus". Billions of cells in an HIV infected person may contain HIV DNA.

### **Transcription**

For a provirus to produce new viruses, RNA copies must be made that can be read by the host cell's protein-making machinery. These copies are called messenger RNA (mRNA), and production of mRNA is called transcription, a process that involves the host cell's own enzymes.

### **Translation**

After HIV mRNA is processed in the cell's nucleus, it is transported to the cytoplasm. HIV proteins are critical to this process. In the cytoplasm, the virus co-opts the cell's protein-making machinery, including the ribosomes, to make long chains of viral proteins and enzymes, using HIV mRNA as a template.

### **Assembly and Budding**

Newly made HIV core proteins, enzymes, and RNA gather just inside the cell's membrane, while the viral envelope proteins aggregate within the membrane. An immature viral particle forms and pinches off from the cell, acquiring an envelope that includes both cellular and HIV proteins from the cell membrane. During this part of the viral life cycle, the core of the virus is immature and the virus is not yet infectious. The long chain of proteins and enzymes that make up the immature viral core are now cleaved into smaller pieces by a viral enzyme called protease. This step results in infectious viral particles.

## **Transmission**

HIV is spread by sexual contact with an infected person, by sharing needles and/or syringes with someone who is infected or, less commonly through

transfusions of infected blood or blood clotting factors. Babies born to HIV-infected mothers may become infected before or during birth or through breastfeeding after birth.

There has only been one instance of patients being infected by a healthcare worker in the United States. This involved HIV transmission from one infected dentist to six patients.

HIV does not survive well in the environment, making the possibility of environmental transmission remote. Live HIV cells are found in varying concentrations in different body fluids. Very high concentrations: Blood, semen vaginal secretions. Moderate concentrations: Breast milk. Very low\* concentrations: saliva, tears, perspiration, feces, urine. (\*These fluids are completely, or nearly completely free of live cells, and pose no risk of infection)

Although HIV has been transmitted between family members in a household setting, this type of transmission is very rare. These transmissions are believed to have resulted from contact between skin or mucous membranes and infected blood.

There is no known risk of HIV transmission to co-workers, clients, or consumers from contact in industries such as food service establishments.

The CDC knows of no instances of HIV transmission through tattooing or body piercing. One case of HIV transmission from acupuncture has been documented.

### **Early Symptoms**

Many people do not develop any symptoms when they first become infected with HIV. Some people, however, have a flu-like illness within a month or two after exposure to the virus. The illness may include fever, headache, tiredness, and enlarged lymph nodes. These symptoms usually disappear within a week to a month and are often mistaken for those of another viral infection. During this period, people are very infectious, and HIV is present in large quantities in genital fluids.

More persistent or severe symptoms may not surface for a decade or more after HIV first enters the body in adults, or within two years in children born with HIV infection. This period of asymptomatic infection is highly individual. Some people may begin to have symptoms as soon as a few months, while others may be symptom free for more than 10 years. During the asymptomatic period, however, the virus is actively multiplying, infecting, and killing cells of the immune system. HIV's effect is seen most obviously in a decline in the blood levels of CD4+T cells (also called T4 cells).

As the immune system deteriorates, a variety of complications start to take over. For many people, their first sign of infection is large lymph nodes that may be enlarged for more than three months. Other symptoms often experienced months to years before the onset of AIDS include: lack of energy, weight loss, frequent fevers and sweats, persistent yeast infections, skin rashes, pelvic inflammatory disease (women), and short term memory loss.

## **AIDS**

The Center for Disease Control (CDC) defines AIDS to include all HIV infected people who have fewer than 200 CD4+T cells per cubic millimeter of blood. (Healthy adults have counts of 1000 or more.) In addition, the definition includes 26 clinical conditions that affect people with advanced HIV disease. Most of these conditions are opportunistic infections.

People with AIDS are particularly prone to developing various cancers, especially those caused by viruses such as Kaposi's sarcoma and cervical cancer, or cancers of the immune system known as lymphomas.

## **Diagnosis**

There are two broad categories of HIV tests: screening tests and confirmatory tests. Using these two types of test together can lead to highly accurate and reliable diagnosis of HIV infection.

### **Screening Tests**

Screening tests are used for initial testing because they are easier to perform than confirmatory tests, well suited to testing large numbers of samples, and less costly. They are highly sensitive and result in few false negatives (i.e., most infected people test positive). However, screening tests are not as specific as confirmatory tests, so in a small percentage of cases the test result will be positive even if the person is not infected. Therefore, providers should never give results from screening tests that have not been verified through a confirmatory test.

### **ELISA Tests**

The most common screening tests are enzyme-linked immunosorbent assay (ELISA) tests. These tests measure antibodies to HIV. Different types of ELISA tests are available. Most require serum specimens, though one uses urine and another uses an oral specimen.

**Serum tests** - Traditional screening tests use a blood sample. About two dozen types of ELISA tests are in use around the world.

**Urine tests** - An ELISA test for detecting HIV in urine samples has been approved for use in the U.S.; however, its biggest drawback is that there is no approved confirmatory test for urine samples (in other words, if the urine ELISA results are positive, a blood sample must then be drawn for confirmatory testing).

**Oral tests** - OraSure is an HIV test that uses mucosal transudate as the sample. (Although some call this a saliva test, the sample is not saliva, but an oral sample called mucosal transudate.) The sample is collected by placing the special collection device between the cheek and gum. The specimen is then sent to a lab for ELISA testing. Positive ELISA results can be confirmed using the Western blot test. These tests are more expensive than blood tests.

### **Rapid serologic tests**

Rapid serologic tests provide results in less than 30 minutes. These tests also measure antibodies to HIV, but by different mechanisms than ELISA tests, including agglutination tests, immunocomb tests, immunodot tests, and immunochromatographic membrane tests. Most rapid tests are kits that include all of the necessary supplies. These tests are relatively simple, involve a limited number of steps, and are quite accurate when performed correctly. (Most rapid tests require refrigeration.) While the inherent sensitivity and specificity of ELISA tests may be greater than those of some of the rapid tests, the field performance of rapid tests is often as good as or better than the ELISA because the former is simpler and easier to do in a low-resource setting.

**HIV Dipstick Test Kit** - This is a rapid (results in approximately 20 minutes), inexpensive (less than \$0.50/test) test that requires no specialized equipment. Sensitivity is more than 99%, and specificity is more than 98%.

### **Confirmatory Tests**

A confirmatory test is done when the results of a screening test are positive. The confirmatory test is expensive and labor intensive and requires subjective interpretation, but it is very specific (in other words, false-positive results are extremely rare). The Western Blot Test is considered by most to be the “gold standard” for confirmation of positive screening test results. This test also measures antibodies to HIV, but it is more specific than screening tests and false positives are minimal. Another, less commonly used confirmatory test is the immunofluorescence assay (IFA). Positive results from ELISA or rapid tests are commonly confirmed using a Western blot.



## **Prevention**

Because no vaccine for HIV is available, the only way to prevent infection by the virus is to avoid behaviors that put a person at risk of infection, such as sharing needles and having unprotected sex.

Many people infected with HIV have no symptoms. Therefore, there is no way of knowing with certainty whether a sexual partner is infected. People should either abstain from having sex or use latex condoms, which may offer partial protection, during oral, anal, or vaginal sex. Although some laboratory evidence shows that spermicides can kill HIV, researchers have not found that these products can prevent a person from getting HIV.

### **Preventing Occupational HIV Transmission to Health Care Workers**

The most common way for a health care worker to be exposed to HIV infection is via a percutaneous puncture or cut. The primary means of preventing occupational exposure to HIV and other blood-borne pathogens is to follow infection control precautions with the assumption that the blood and other body fluids from all patients are potentially infectious. These precautions include routinely using barriers (such as gloves and/or goggles) when anticipating contact with blood or body fluids, immediately washing hands and other skin surfaces after contact with blood or body fluids, and carefully handling and disposing of sharp instruments during and after use.

Although the most important strategy for reducing the risk of occupational HIV transmission is to prevent occupational exposures, plans for post-exposure management should be in place. The administration of antiretroviral drugs as post exposure prophylaxis should be considered. Using zidovudine has been shown to be safe and associated with decreased risk for occupationally related HIV infection.

## **Florida's Omnibus AIDS Act**

The Florida Omnibus AIDS Act is comprehensive legislation created to combat the spread of HIV and to protect the rights of those infected. It mandates that every licensed healthcare professional must take a course on HIV/AIDS and every healthcare facility must educate its employees about HIV infection.

### **Testing**

The Omnibus Act places these provisions on testing:

1. Informed consent must be obtained.
2. Reasonable efforts must be made to notify the test subject about the test results.
3. Positive test results must be confirmed through a corroborating test before informing the subject of the test results.

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### **Informed Consent**

Prior to testing, an individual must understand and explicitly agree to the HIV test. General consent to draw blood and to run unspecified tests is insufficient.

### **Information Requirements**

Satisfying the legal standard of “informed consent” in general depends on whether the information provided to the patient meets accepted standards of medical practice and whether a reasonable patient would have a sufficient understanding of the procedure to make an intelligent decision from the information provided.

Health care providers must convey three pieces of information, all essentially involving the choice of a testing site, as part of the process of obtaining informed consent:

- Disclose that the provider is required by law to report the test subject’s name to the local county health department if the HIV test results are positive;
- Alert the patient that as an alternative, the patient may secure the HIV test at a site that tests anonymously, the locations of which the provider must make available; and
- Relate the extent of the confidentiality rights that adhere to the test results in the provider's patient records.

An explanation of the following information constitutes sound and reasonable practice in providing information sufficient to secure informed consent from an HIV test subject:

- An HIV test is a test to determine if an individual is infected with the virus that causes AIDS.
- The potential uses and limitations of the test.
- The procedures to be followed.
- HIV testing is voluntary and consent to be tested can be withdrawn at any time prior to testing.

For the purposes of HIV testing, minors in the state of Florida are considered adults, and are allowed to provide consent for testing of themselves.

### **Notification Responsibilities**

Test providers must confirm the test subject’s identity. They must also establish a procedure to confirm the identity of the person to whom the test results are given.

The provider must provide post-test counseling. In instances where the test results are negative, this should include information on preventing the transmission of HIV. When the test result is positive, post-test counseling must include information on the availability of appropriate medical and support

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services, the importance of notifying partners who may have been exposed, and prevention of the transmission of HIV.

### **Confirmatory Tests**

The preliminary test for HIV is usually the ELISA test. If the patient tests positive using this test, a second confirmatory test, usually the “Western Blot” or “IFA” test, must be performed prior to notification of the test subject.

### **Confidentiality**

Florida’s Omnibus AIDS Act considers the results of an HIV test to be “superconfidential”. This places additional responsibilities on those who know the results of this testing. This superconfidentiality relates only to the fact that an HIV test was performed and the results that were obtained from it.

### **Special Handling of HIV Information**

Test results may only be released to a third party after written authorization has been obtained from the test subject. Access to HIV test results is limited to employees or agents who either provide care to the test subject, conduct necessary administrative supportive tasks, or handle body fluids or tissues of a test subject.

### **Permitted Disclosures**

Any disclosure that does not fall within one of the following permitted situations is prohibited.

1. The test subject of course may be told.
2. Employees and agents of health care providers and facilities may disclose to one another a patient's HIV test status if they have a "need to know."
3. Health care providers involved in the care or treatment of a test subject and consulting among themselves or with health care facilities to determine diagnosis or treatment of the test subject may divulge superconfidential HIV test information without the patient's knowledge or consent
4. A health care provider involved in the delivery of a child may note the mother's HIV test status in the medical record of the newborn.
5. Specific situations in which disclosure without consent of the test subject is permitted:
  - a. The Department of Health in order to comply with laws and rules governing reporting and controlling the spread of HIV infection.
  - b. To appropriate authorities in the course of reporting child sexual abuse or neglect.
  - c. By certain licensed providers notifying their patient's sex or needlesharing partner of their exposure
  - d. Among health care facilities and providers engaged in certain kinds of transfers of human body parts and tissues.

- e. Health facility staff committees who engage in activities such as peer review and health program monitoring and evaluation and service reviews.
- f. Authorized medical and epidemiologic researchers.
6. Separate statutes govern release of HIV test information within correctional facilities, for convicted prostitutes, and for disclosing test results to the victim of a criminal offense, involving the transmission of body fluids of persons charged with or convicted of certain offenses in which transmission might have occurred.
7. When a child is placed in foster care or for adoption, the adults responsible for the child (including governmental personnel overseeing the child's care) may be told the child's HIV test status provided they are directly involved in the placement, care, control, or custody of the child.
8. Employees of residential facilities or community based care programs for developmentally disabled persons who are directly involved "in the care, control, or custody of the test subject, and who have a need to know such information," may have access to the test subject's HIV test status.
9. Health care providers may disclose to public health authorities without the test subject's consent that a patient is HIV positive in only very limited circumstances:
10. A court may order the release of HIV test results when certain procedural safeguards are followed.
11. Medical examiners, who can test without informed consent, must report positive HIV test results to the Department of Health.
12. Certain providers in tightly defined circumstances may tell the sexual and needle-sharing partners of HIV-positive patients that they have been exposed to HIV.

### **Consequences of Breaching Confidentiality**

Release of HIV test results other than in accordance with the situations the Act specifically permits can have serious repercussions. The health care professional, who violates any of the Act's requirements, is subject to disciplinary action by the provider's licensing body. It is a first-degree misdemeanor (subject to up to one year of imprisonment) for anyone who violates the Act's confidentiality requirements; the Act does not require the violation to be intentional. It is a third degree felony (which carries punishment of up to five years imprisonment) for any person maliciously or for monetary gain to disseminate information identifying an individual with a sexually transmissible disease, including HIV infection.

### **Notification of Third Parties**

The Act eliminates any legal obligation for providers to tell third parties of the danger posed by the behavior of an individual infected with HIV. However, providers may willingly intervene and disregard superconfidentiality when certain conditions have been met.

1. Identification of the third party must come from the patient.

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2. The practitioner must recommend that the patient notify the partner.
3. The practitioner must advise the patient of the practitioner's intent to notify the partner.
4. The preceding three steps must be documented in the patient's medical record without identifying the third party.
5. The practitioner takes full responsibility for notifying the third party.

### **Accidental Exposures to Healthcare Workers**

An exposure is considered significant when skin or mucous membranes are exposed to the blood or body fluids of a patient, or if they experience a "sharps" accident. Healthcare workers and non-medical workers exposed while providing emergency medical assistance, have the right to know the patient's HIV status.

### **Supplemental Information**

#### **[Global action to reduce HIV stigma and discrimination](#)**

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**HIV / AIDS Update (1 Hour)**

**Post-Test**

1. AIDS has killed more than \_\_\_\_\_ people, and is now the \_\_\_\_\_ leading cause of death among adults worldwide. (p. 3)
  - A. 21 million, fourth
  - B. 40 million, fifth
  - C. 28 million, third
  - D. 13 million, second
  
2. HIV belongs to a subgroup of \_\_\_\_\_ known as \_\_\_\_\_. (p. 4)
  - A. adenoviruses, reoviruses
  - B. parvoviruses, herpesviruses
  - C. retroviruses, lentiviruses
  - D. hepadnaviruses, poxviruses
  
3. HIV DNA moves into the cell's nucleus and is spliced into the host's DNA during \_\_\_\_\_. (p. 5)
  - A. reverse transcription
  - B. integration
  - C. transcription
  - D. translation
  
4. Which of the following body fluids typically has the highest concentrations of live HIV cells? (p. 6)
  - A. Semen
  - B. Breast milk
  - C. Tears
  - D. Saliva
  
5. Which of the following is TRUE regarding HIV infection? (p. 6-7)
  - A. Most people experience flu-like symptoms within a week or two after exposure to the virus.
  - B. HIV is present in very low quantities in genital fluids during the first several months after infection.
  - C. The HIV virus is dormant during asymptomatic periods
  - D. Persistent lymph node enlargement is often the first sign of HIV infection for many people.
  
6. An HIV infected individual who has fewer than \_\_\_\_\_ per cubic milliliter of blood is considered to have AIDS. (p. 7)
  - A. 300 lymphocytes
  - B. 200 CD4+T cells
  - C. 100 CD3+T cells
  - D. 26 leukocytes

HIV/AIDS Update (1 HOUR)

7. \_\_\_\_\_ is a confirmatory test for HIV infection. (p. 7-8)
- A. Enzyme-Linked Immunosorbent Assay (ELISA)
  - B. Rapid Serologic Test
  - C. HIV Dipstick Test
  - D. Western Blot Test
8. A combination of several drugs including reverse transcriptase inhibitors and protease inhibitors is known as \_\_\_\_\_. (p. 9)
- A. AZT
  - B. ZDV
  - C. HAART
  - D. 3TC
9. To reduce and prevent accidental exposure to HIV, health care workers should \_\_\_\_\_. (p. 10)
- A. Assume that body fluids from all patients are potentially infectious.
  - B. Develop a system to discreetly identify infectious patients.
  - C. Routinely use glove/gown barriers with all patients when providing any type of patient care.
  - D. Receive annual prophylactic gamma globulin injections
10. Under the Omnibus AIDS Act, it is a \_\_\_\_\_ for a health care worker to accidentally disclose a patient's HIV results (p. 13)
- A. discretionary breach
  - B. civil rights violation
  - C. first degree misdemeanor
  - D. third degree felony

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