Faculty Disclosure

In compliance with ACCME Guidelines, I hereby declare:

- I do not have financial or other relationships with the manufacturer(s) of any commercial services(s) discussed in this educational activity.

I. Jean Davis, PhD, DC, PA, MS
Co-Principal Investigator & Director
Pre-test Questions

1. The GI associated lymphoid tissue constitutes the largest immune compartment in the body:
   a. True
   b. False
   c. Unsure

2. The following are HIV enzymes:
   a. Protease
   b. Reverse transcriptase
   c. Integrase
   d. a and c
   e. all of the above
   f. unsure

3. Review the structure
   Box #3 is the Nucleocapsid:
   a. True
   b. False
   c. Unsure
Pre-test Questions

4. The following group(s) should be offered HIV and STD testing:
   a. Patients with multiple sex partners
   b. Heterosexual patients
   c. Patients over the age of 55
   d. Heterosexual patients that are over the age 55
   e. All of the above
   f. Unsure

Pre-test Questions

5. Which of the following is a common misconception about HIV transmission?
   a. You can't transmit HIV when your viral load is undetectable?
   b. Oral sex safer than vaginal intercourse without a condom?
   c. HIV can be transmitted to an infant during labor and delivery
   d. HIV is easier to transmit to an infant during labor and delivery
   e. Unsure

Pre-test Questions

6. Tailored intervention are strategies designed to change a person's:
   a. Knowledge and concern
   b. Knowledge, attitude and behavior
   c. Concern, attitude and behavior
   d. Knowledge and behavior
   e. Unsure

Pre-test Questions

7. The following STD(s) can not be transmitted orally:
   a. Herpes (HSV) I and II
   b. Gonorrhea (GC)
   c. Chlamydia
   d. Syphilis
   e. HPV
   f. HIV
   g. All of them can be transmitted orally
   h. Only a, b, c, and d can be transmitted orally
   i. None of them can be transmitted orally
   j. Unsure
Pre-test Questions

8. Patients retain almost half of medical information given.
   a. True
   b. False
   c. Unsure

9. Which of the following statements regarding HIV epidemiology is true?
   a. Worldwide, 75% of new HIV infections occur in low-income countries
   b. The prevalence of HIV/AIDS in Washington, D.C., is approximately the same as that in Botswana
   c. It is estimated that only about half of HIV-infected persons in the United States are aware of their HIV status
   d. Among men who have sex with men and are between 13 and 24 years of age, approximately half as many HIV/AIDS cases are estimated to have occurred in 2007 among African Americans as among Caucasians
   e. For the 34 states with confidential name-based HIV infection reporting since at least 2003, the estimated 2007 HIV/AIDS case rates among African American men and women are approximately 7 and 20 times higher, respectively, than are those among Caucasian men and women
   f. Unsure

10. Which of the following statements regarding antiretroviral therapy (ART) is true?
    a. In addition to 2 nucleoside reverse transcriptase inhibitors (NRTIs), currently recommended regimens for ART-naïve patients include only a non-nucleoside reverse transcriptase inhibitor (NNRTI) or a ritonavir-boosted protease inhibitor (PI)
    b. If a patient takes 75% of his/her ART doses, his/her risk of virological failure is minimal
    c. Raltegravir (an integrase inhibitor [II]) and NNRTIs (efavirenz, nevirapine) have high genetic barriers to resistance
    d. An African American patient with newly diagnosed HIV infection, HIV-associated nephropathy (HIVAN), and a CD4+ T-lymphocyte count of 600 cells/mm³ should be started on ART
    e. A patient newly diagnosed with HIV/hepatitis B virus (HBV) co-infection with a CD4+ T-lymphocyte count of 600 cells/mm³ should not be started on ART
    f. Unsure
The National Minority AIDS Education and Training Center is committed to reducing disparities in clinical outcomes in minority patients infected with HIV. Through the provision of capacity building assistance, we strive to assist primary care organizations improve the delivery of HIV medical care and social services resulting in measurable and sustainable change.

Mission Statement

National Minority AIDS Education & Training Center

- HOWARD UNIVERSITY
  National Headquarters
  Washington, District of Columbia
- CHARLES DREW UNIVERSITY OF MEDICINE AND SCIENCE
  Los Angeles, California
- COLORADO STATE UNIVERSITY
  Fort Collins, Colorado
- MEHARRY MEDICAL COLLEGE
  Nashville, Tennessee
- MOREHOUSE SCHOOL OF MEDICINE
  Atlanta, Georgia
- NAVAJO AIDS NETWORK, INC.
  Chinle, Arizona
- UNIVERSITY OF TEXAS
  Saint Antonio, Texas
- XAVIER UNIVERSITY COLLEGE OF PHARMACY
  New Orleans, Louisiana

The AETCs conduct targeted, multidisciplinary education and training programs for health care providers treating persons living with HIV/AIDS.
Learning Objectives

At the conclusion of this session, participants will have an enhanced ability to:

• Describe the epidemiology of HIV/AIDS in adults and adolescents: Global, National and Local
• Explain HIV/AIDS as a Health Disparity addressing Race, Ethnicity, Sexual Orientation, Biological Sex and Gender
• Describe how to Screen for Risk and Prevention Factors
• Describe Prevention Messages Related to HIV/STD Prevention & Progression
• Explain Lifecycle of HIV
• Explain culturally relevant approaches to caring for HIV positive clients

Presentation Outline

Epidemiology

Prevention

Pathophysiology

Impact of Culture on HIV Prevention, Treatment and Care

HIV/AIDS Treatment

Global Epidemiology
Adults and children estimated to be living with HIV, 2008

Total: 33.4 million (31.1 – 35.8 million)

Estimated number of adults and children newly infected with HIV, 2008

Total: 2.7 million (2.4 – 3.0 million)
Estimated adult and child deaths due to AIDS, 2008

- Western & Central Europe: 13,000 (10,000–15,000)
- Middle East & North Africa: 20,000 (15,000–25,000)
- Sub-Saharan Africa: 1.4 million (1.1–1.7 million)
- Eastern Europe & Central Asia: 13,000 (10,000–15,000)
- East Asia: 87,000 (72,000–110,000)
- South & South-East Asia: 270,000 (220,000–310,000)
- North America: 25,000 (20,000–31,000)
- Latin America: 77,000 (66,000–89,000)
- South & South-East Asia: 270,000 (220,000–310,000)

Total: 2.0 million (1.7–2.4 million)

Over 7400 new HIV infections a day in 2008

- More than 97% are in low- and middle-income countries
- About 1200 are in children under 15 years of age
- About 6200 are in adults aged 15 years and older, of whom:
  - almost 48% are among women
  - about 40% are among young people (15–24)

U.S. Epidemiology
34 states with laws/regulations requiring confidential name-based HIV infection surveillance since at least 2003:

- Alabama
- Alaska
- Arizona
- Arkansas
- Colorado
- Florida
- Georgia
- Idaho
- Indiana
- Iowa
- Kansas
- Louisiana
- Michigan
- Minnesota
- Mississippi
- Missouri
- Nebraska
- Nevada
- New Jersey
- New Mexico
- New York
- North Carolina
- North Dakota
- Ohio
- Oklahoma
- South Carolina
- South Dakota
- Tennessee
- Texas
- Utah
- Virginia
- West Virginia
- Wisconsin
- Wyoming

---

**Washington Post**

**March 15, 2009 (2)**

For residents over the age of 12 (according to the 2008 epidemiology report issued by the District of Columbia's HIV/AIDS office):

- 2,984 residents per every 100,000 have HIV/AIDS, i.e.,
- 15,120 residents have HIV/AIDS

---

**Washington Post**

**March 15, 2009 (3)**

Shannon L. Hader, M.D., director of the District's HIV/AIDS Administration and former leader of CDC's work in Zimbabwe:

- "Our rates are higher than West Africa. They’re on par with Uganda and some parts of Kenya."
- "We have every mode of transmission" – men having sex with men, heterosexual, and injected drug use – "going up, all on the rise, and we have to deal with them."
**Estimated Numbers and Percentages of HIV/AIDS Cases among Adults and Adolescents Attributed to High-Risk Heterosexual Contact*, by Race/Ethnicity, 2007—34 States**

<table>
<thead>
<tr>
<th>Race/Ethnicity</th>
<th>No.</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>American Indian/Alaska Native</td>
<td>59</td>
<td>&lt;1</td>
</tr>
<tr>
<td>Asian†</td>
<td>126</td>
<td>1</td>
</tr>
<tr>
<td>Black/African American</td>
<td>9,371</td>
<td>69</td>
</tr>
<tr>
<td>Hispanic/Latino†</td>
<td>2,052</td>
<td>15</td>
</tr>
<tr>
<td>Native Hawaiian/Other Pacific Islander</td>
<td>5</td>
<td>&lt;1</td>
</tr>
<tr>
<td>White</td>
<td>1,913</td>
<td>14</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>12,627</td>
<td></td>
</tr>
</tbody>
</table>

*Note: Data include persons with a diagnosis of HIV infection regardless of their AIDS status at diagnosis.

**Estimated Numbers of HIV/AIDS Cases and Rates for Male Adults and Adolescents, by Race/Ethnicity 2007—34 States**

<table>
<thead>
<tr>
<th>Race/Ethnicity</th>
<th>Cases</th>
<th>Rate (per 100,000 population)</th>
</tr>
</thead>
<tbody>
<tr>
<td>American Indian/Alaska Native</td>
<td>160</td>
<td>23.1</td>
</tr>
<tr>
<td>Asian†</td>
<td>363</td>
<td>15.5</td>
</tr>
<tr>
<td>Black/African American</td>
<td>14,247</td>
<td>136.8</td>
</tr>
<tr>
<td>Hispanic/Latino‡</td>
<td>5,906</td>
<td>56.2</td>
</tr>
<tr>
<td>Native Hawaiian/Other Pacific Islander</td>
<td>42</td>
<td>76.7</td>
</tr>
<tr>
<td>White</td>
<td>10,563</td>
<td>18.7</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>31,518</td>
<td>38.3</td>
</tr>
</tbody>
</table>

*Note: Data include persons with a diagnosis of HIV infection regardless of their AIDS status at diagnosis.

**Estimated Numbers and Percentages of HIV/AIDS Cases Attributed to Injection Drug Use, by Race/Ethnicity 2007—34 States**

<table>
<thead>
<tr>
<th>Race/Ethnicity</th>
<th>No.</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>American Indian/Alaska Native</td>
<td>29</td>
<td>1</td>
</tr>
<tr>
<td>Asian†</td>
<td>19</td>
<td>&lt;1</td>
</tr>
<tr>
<td>Black/African American</td>
<td>2,812</td>
<td>57</td>
</tr>
<tr>
<td>Hispanic/Latino‡</td>
<td>977</td>
<td>20</td>
</tr>
<tr>
<td>Native Hawaiian/Other Pacific Islander</td>
<td>2</td>
<td>&lt;1</td>
</tr>
<tr>
<td>White</td>
<td>1,070</td>
<td>22</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>4,939</td>
<td></td>
</tr>
</tbody>
</table>

*Note: Data include persons with a diagnosis of HIV infection regardless of their AIDS status at diagnosis.

**Estimated Numbers of HIV/AIDS Cases and Rates for Female Adults and Adolescents, by Race/Ethnicity 2007—34 States**

<table>
<thead>
<tr>
<th>Race/Ethnicity</th>
<th>Cases</th>
<th>Rate (per 100,000 population)</th>
</tr>
</thead>
<tbody>
<tr>
<td>American Indian/Alaska Native</td>
<td>68</td>
<td>9.4</td>
</tr>
<tr>
<td>Asian†</td>
<td>88</td>
<td>3.5</td>
</tr>
<tr>
<td>Black/African American</td>
<td>7,196</td>
<td>60.6</td>
</tr>
<tr>
<td>Hispanic/Latino‡</td>
<td>1,555</td>
<td>16.0</td>
</tr>
<tr>
<td>Native Hawaiian/Other Pacific Islander</td>
<td>5</td>
<td>9.0</td>
</tr>
<tr>
<td>White</td>
<td>1,971</td>
<td>3.3</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>10,977</td>
<td>12.9</td>
</tr>
</tbody>
</table>

*Note: Data include persons with a diagnosis of HIV infection regardless of their AIDS status at diagnosis.
**Estimated Prevalence Rates for Adults and Adolescents Living with HIV Infection (not AIDS), 2007—34 States and 5 U.S. Dependent Areas**

- Number HIV infected: 850,000 - 950,000
- Number unaware of their HIV infection: 180,000 - 280,000

**DIAGNOSIS**

Revised recommendations for HIV testing of adults, adolescents, and pregnant women in health-care settings.

MMWR, September 22, 2006 / 55(RR14);1-17
http://www.cdc.gov/mmwr/preview/mmwrhtml/rr5514a1.htm

CDC now recommends HIV screening for patients in all health-care settings after the patient is notified that testing will be performed unless the patient declines (opt-out screening).
DIAGNOSIS (2)
Rapid HIV Tests: Trade-offs

ADVANTAGES

• Increase number of venues where testing can be offered to high-risk persons
• Increase feasibility of testing in acute-care settings
• Decrease the number of persons who fail to learn their test results, i.e., more HIV-positive people receive their test results
• Increase identification of HIV-infected pregnant women so they can receive effective prophylaxis for prevention of mother-to-child transmission (MTCT)
• Reduce the resources expended to locate persons identified as HIV-infected

CAVEATS

• Positive rapid HIV test results are preliminary and must be confirmed (not just by HIV enzyme immunoassay [EIA]!) before the diagnosis of HIV infection is established.
• Some people will receive a false-positive result before confirmatory testing.
• The positive predictive value (PPV) of a single rapid HIV test:
  – depends on the specificity of the rapid HIV testing method being used
  – varies with HIV prevalence

DIAGNOSIS (3)
Rapid HIV Tests: Trade-offs (2)

CAVEATS

• Possible causes of a false-negative rapid HIV test:
  – Window period
  – Seroconversion
  – Antiretroviral therapy
  – Group N or O HIV-1 infection
  – HIV-2 infection (for some rapid HIV testing methods)
• Persons with a positive rapid HIV test may test negative on HIV EIA but positive on HIV-1 Western blot

U.S. Epidemiology
Race/Ethnicity
AIDS Cases among Minority Races/Ethnicities 1985–2007—United States and Dependent Areas

Year of diagnosis

Cases, No.

AIDS in Blacks/African Americans

Of the 1,030,832 AIDS cases reported to CDC through 2007, blacks/African Americans accounted for

- 41% of total
- 60% of women
- 58% of heterosexual persons at high risk*
- 59% of children aged <13 years

Of AIDS cases reported during 2007, 47% were in black/African American adults and adolescents.

*High-risk heterosexual contact with a person known to have or to be at high risk for HIV infection.

AIDS in Hispanics/Latinos*

Of the 1,030,832 AIDS cases reported to CDC through 2007, Hispanics/Latinos accounted for

- 16% of total
- 19% of women
- 21% of heterosexual persons at high risk†
- 23% of children aged <13 years

Of AIDS cases reported during 2007, 20% were in Hispanic/Latino adults and adolescents.

*Hispanic/Latino can be of any race.
†High-risk heterosexual contact defined as sexual contact with a person known to have or to be at high risk for HIV infection.
U.S. Epidemiology
Men Who Have Sex with Men (MSM)

Estimated AIDS Cases in Males
Cumulative through 2007—50 States and DC
Of the 1,009,219 AIDS cases in adults and adolescents
80% were in males
60% of cases in males were attributed to male-to-male sexual contact
4% of cases in males were aged 13–24 years
68% of cases in males aged 13–24 were attributed to male-to-male sexual contact

Of AIDS cases diagnosed during 2007, 47% of cases in adults and adolescents were attributed to male-to-male
AIDS Cases among Female Adults and Adolescents Attributed to Injection Drug Use or High-Risk Heterosexual Contact, by Region, 2003–2007—50 States and DC

Diagnosis Rates of HIV/AIDS for Female Adults and Adolescents, 2007—34 States

Reported AIDS Cases among Female Adults and Adolescents, by Region and Race/Ethnicity, 2007—50 States and DC

Georgia Epidemiology
Cumulative HIV/AIDS Cases by District of Residence at Diagnosis, Georgia, 1980-September 30, 2008

GA Total=48,637

1-1  Northwest (Rome)
1-2  North Georgia (Dalton)
2-0  North (Gainesville)
3-1  Cobb-Douglas
3-2  Fulton
3-3  Clayton (Morrow)
3-4  East Metro (Lawrenceville)
3-5  DeKalb
4-0  LaGrange
5-1  South Central (Dublin)
5-2  North Central (Macon)
6-0  East Central (Augusta)
7-0  West Central (Columbus)
8-1  South (Valdosta)
8-2  Southwest (Albany)
9-1  Coastal (Savannah/Brunswick)
9-2  Southeast (Waycross)
10-0 Northeast (Athens)

Source: Georgia HIV/AIDS Reporting System
Georgia Division of Public Health
Note: Numbers are based on data reported as of October 2008 and are not adjusted for reporting delays.

Georgia HIV/AIDS Epidemiology 2008
HIV (not AIDS)
Highlights (2)

- Among (1) adults & adolescents & (2) children, African-Americans accounted for 73 and 81 percent of cases, respectively.
- Among males, the leading transmission category was male-to-male sex contact (MSM) (43% of cases).
- Among females, the leading transmission category was “no risk factor reported” (NRR) (47% of cases), followed by “no identified risk factor” (NIR) (24% of cases) and high-risk heterosexual contact (22% of cases).
- NRR = no risk factor reported at the time of initial report
- NIR = after one year, or after investigation, no risk factor identified

Georgia HIV/AIDS Epidemiology 2008
Source/Context

- Source: HIV Epidemiology Unit, Epidemiology Branch, Division of Public Health, Georgia Department of Community Health (DCH)
- Context:
  - HIV (non-AIDS) cases reported separately from AIDS cases
  - Cases run in Sept 2009 by DIAGNOSIS date and not report date, i.e., include all cases/deaths diagnosed through Dec. 31, 2008, even if they were reported in 2009
  - Cumulative number of 2008 cases went down from the interim number of 2008 cases because of national process of de-duplicating Georgia data when compared with data from other states, i.e., some cases “lost” to other states where these cases were first diagnosed
Prevention

Requires an Interdisciplinary Team

1st Prevention: Primary Transmission
- Health Promotion/Ilness Prevention Programs/Social Marketing
- Risk Assessment
- Reinforcement of Positive Health Behaviors
- Psychological and Social Health Support Systems
- Women
  - Birth Control vs. STI/HIV
- Youth
  - Sexual Responsibility
- Concrete vs. Abstract Thinking

2nd Prevention: Primary and Secondary Transmission
- HIV Screening
- Reduction of Health Risk Behavior (Prevention for Positives)
- Proper Utilization of Diagnostic Tools
- State of the Art Treatment Regimen
- Adherence Based on Informed Choices
- Physical, Psychological and Social Health Support Systems

3rd Prevention: Progression to AIDS and the Development of OIs

What is HIV/AIDS?

- HIV
  - HIV may not progress to Acquired Immunodeficiency Syndrome (AIDS)
  - A person can be infected with HIV and not have AIDS
- AIDS
  - Final stage of HIV infection.
  - It can take years for a person infected with HIV, even without treatment, to reach this stage.
  - Diagnosis is based on 2 indicators:
    - CD4 Count (less than 200)
    - Presence and/or a history of an Opportunistic Infection (OI)

HIV/AIDS is a disease that affects everyone
Anyone can be infected, regardless of sexual orientation, gender, biological sex, race, ethnicity, or age
The Primary mode of transmission is sexual exposure
- Condoms decreases HIV transmission by 69% when used consistently and properly

What is HIV/AIDS?

- HIV/AIDS is a disease that affects everyone
- Anyone can be infected, regardless of sexual orientation, gender, biological sex, race, ethnicity, or age
- The Primary mode of transmission is sexual exposure
  - Condoms decreases HIV transmission by 69% when used consistently and properly

HIV
- HIV may not progress to Acquired Immunodeficiency Syndrome (AIDS)
- A person can be infected with HIV and not have AIDS

AIDS
- Final stage of HIV infection.
- It can take years for a person infected with HIV, even without treatment, to reach this stage.
- Diagnosis is based on 2 indicators:
  - CD4 Count (less than 200)
  - Presence and/or a history of an Opportunistic Infection (OI)
Modes of Transmission

- Sexual (Heterosexual & Homosexual)
  - Unprotected Sex
    - Sexual Activities: Anal Sex, Vaginal Sex, Oral Sex
    - Unhealthy Oral Cavity
  - Sex for Drugs
    - Multiple Sex Partners
    - Serial Monogamy
- Blood Contact
  - Injection Drug Use
  - Transfusion History
- Occupational & Non-Occupational Exposure
  - Perinatal (mother to child)
  - Breast Feeding

Transmissible Infections By Oral Sex

- Herpes I and II
- Gonorrhea
- Chlamydia
- Syphilis
- HPV
- HIV

The STD-HIV Connection

- Behavioral links between HIV and other STDs
- Biological evidence
  - STDs facilitate HIV infection
    - Ulcerative STDs
      - Syphilis and Herpes
    - Inflammatory STDs
      - Chlamydia, Gonorrhea and Trichomoniasis
  - HIV facilitates STD infection

- STD/HIV Co-Infection
- STD treatment slows the spread of HIV
- HIV education, counseling, and prevention must also incorporate STD information
Available HIV Tools

• Screening Tools

• Diagnostic Tools

• Resistance Tools

HIV/AIDS Presentation

• Presenting Symptoms
  • Chief Complaints
  • Present Medical History
  • Underlying Issues
  • Past Medical History
  • Opportunistic Infections
  • Review of Systems

• Physical Exam
  • Physical Findings

• Differential Diagnosis

• Co-morbidities

Common Clinical Manifestations of Chronic HIV Infection

• Constitutional Symptoms
  • Fever
  • Weight loss/wasting
  • Fatigue

• Organ/System Specific
  • Virtually all organ systems can be affected

• Consider HIV testing
  • Unexplained syndromes

What are the Recommendations?

Medical providers can substantially affect HIV transmission when they

• screen for risk behaviors
• identify & treat other STDs
• communicate prevention messages
• discuss sexual & drug-use behavior
• positively reinforce changes to safer behavior
• refer patients for services (substance abuse treatment)
• facilitate partner notification, counseling, & testing
What is the rationale for this new emphasis?

• “Every HIV transmission event involves a person already HIV infected” (IOM)
• Those living with HIV are fewer in number and easier to define than those at risk
• Most HIV+ persons have contact with healthcare system
• Better prevention services to HIV+ will improve their health outcomes

Prevention = Care

Why is it Important NOW?

• Emerging trends among the HIV-infected:
  - Increases in unsafe sex
  - Increases in syphilis, gonorrhea
  - Transmission of drug-resistant virus

• STDs increase amount of HIV shed at genital mucosa (cervix, urethra, rectum)
  - Directly increases risk of transmitting HIV
  - HIV infection is increasing in vulnerable minority populations, especially women

Estimated Number of New HIV Infections Annually 56,300 for 2007

The Youth Factor

• Not exposed to fear of AIDS
• Not exposed to typical prevention messages
• “Invincibility”
• Lack of significant support systems
HIV Prevention: Challenges in a Third Decade

- HIV/AIDS seen as a chronic illness
- Persons with HIV (and their providers) weary of prevention messages
- Role of medical providers in HIV prevention arena de-emphasized
- HIV incidence static despite ongoing prevention efforts of increasing scale

The Impact of STDs on Sexual Transmission of HIV

- STDs increase susceptibility to and infectiousness of HIV infection
- Risk of HIV transmission is 2 to 5 times higher in the presence of other STDs

SO........

- Risk screening and STD screening is an effective intervention for reducing HIV transmission

Awareness of Serostatus among Persons with HIV & Estimates of Transmission

Estimated: 1,200,000 PLWH in US
Estimated: 56,300 new infections/year

- ~75% aware of infection
- ~25% unaware of infection

Median Concentration of HIV-1 RNA in Semen Among 135 HIV-Infected Men With (n=86) & Without (n=49) Urethritis in Malawi

Association between Urethritis and Semen Viral Load Suggests that HIV-infected persons co-infected with other STI may be more likely to transmit HIV

A Missed Screening Opportunity…

- Tony is a 40-year-old HIV-positive man
- CD4 = 350, viral load undetectable, on HAART
- Comes in with his girlfriend, feeling well
- Volunteers that his girlfriend recently had a yeast infection
- Around the same time, he noticed an area of irritation on his penis, resolved after using miconazole cream

A Missed Diagnostic Opportunity…

- Returns two weeks later
- Rx topical steroids, referred for dermatology follow-up
A Missed Opportunity…

- Dermatology orders RPR: reactive at titer of 1:128
- Returns, and reports receptive/insertive anal and oral sex with 5 male partners in prior 3 months
- Uses Internet to meet partners, mostly anonymous
- ‘Almost always’ uses condoms with them, while reports no condom use with girlfriend

What went wrong?

HIV Self Assessment Survey of HIV Care Providers Suggests “Needs” Despite “Comfort”

- Adherence to ART 84%
- Condom use 16%

Proportion of Physicians Discussing Topics with HIV-Positive Patients

- Adherence to ART 84%

(Clin Infect Dis 2003; 36: 1577-84)
Proportion of Physicians Discussing Topics with HIV-Positive Patients

4 US Cities (n=317)

- Adherence to ART 84%
- Condom use 16%
- HIV transmission and/or risk reduction 14%

(Clin Infect Dis 2003; 36: 1577-84)

Discomfort as a Barrier

“Ironically, it may require greater intimacy to discuss sex than to engage in it.”

The Hidden Epidemic
Institute of Medicine, 1997

“Whoa—way too much information.”

“Good news, honey—seventy is the new fifty.”
An Initial Presentation

• Helen is a 60 year old widow
• Lives in a retirement community
• HTN, new Diabetes, skin rashes, some neuropathy
• No history of operations, accidents, blood transfusions
• Smokes 1/2 ppd
• Drinks 1 bottle of “good wine” a week

Helen

• Risk factors
• History of Present Illness
• Stage of HIV
• Barriers to Care
  – Plans to resolve barriers
    • Knowledge
    • Skills
    • Readiness to Change
    • Behavior Modification
      – Tailored Intervention

An Initial Presentation (con’t)

• Married for 40 years, 5 sons grown
• Husband died 3 months ago of ? Overdose sleeping pills
• Feeling depressed and weak since then
• Seen regularly by LMD
• Mild anemia, 21 lb weight loss
• Reports only 1 sexual partner in her lifetime
• Tested 2 months ago for HIV+ for change in insurance

History of Present Illness

Common presenting symptoms associated with HIV, but too common?

• Headache
• Skin Rashes
• Diarrhea
• Cough and SOB
• Fever
• Blurred Vision
• Oral, esophageal and vaginal candidiasis
Structural Interventions to Support and Enhance Prevention

- **Patient Prompts**
  - Posters
  - Brochures
  - Condoms
  - Prescriptions
  - Peer educators

- **Provider Prompts**
  - Local opinion leader
  - Computer reminders
  - Chart stickers
  - Screening tools
    - Patient administered
    - Provider administered
  - Posters
  - Inclusion of risk screening in chart review

Tailored intervention

- **Patient Education**
  - Knowledge

- **Tailored Intervention**
  - Knowledge
  - Attitudes/ Beliefs
  - Behaviors
  - Circumstances
  - Skills
  - Readiness

What are Misconceptions?

Incorrect assumptions or beliefs patients may have about HIV transmission

Small Groups

- Case Studies
  - Develop a list of 4 questions
  - Determine the primary problem
  - Determine the secondary problem
  - Possible provider barriers to care
  - Possible patients barriers to care
  - Discussion
**Case Review**

- Bob is a 38-year-old, Latino, HIV positive (18 years) MSM in a long-term relationship
- He and his male partner do not use condoms and believe they are in a monogamous relationship
- The partner has tested once before for HIV and the results came back negative
- Bob has had a recent episode of unprotected sex with another man.
- He states “I was on top”; therefore felt he had almost no risk of being re-infected, didn’t think about getting a STD
- Bob was just informed that the male with whom he had unprotected sex has GC and HPV
- He has had unprotected sex with his partner since his “slip up”

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**Case Review**

- Sharon is a 22-year-old, Black female college student came in to take an STI test because of fears about her relationship
- She had been in a one-year relationship with a man who she thinks may be having sex with men
- After six months with her partner, she stopped using barriers (condoms, dental dams)
- Sharon is concerned about the possibility getting a “gay disease”
- She feels that she can handle her boyfriend being bisexual, if only he would talk to her about it

---

**Awareness of HIV Results Among People with HIV and Estimates of Transmission**

- ~25% Unaware of Infection
- ~75% Aware of Infection
- ~46% New Infections
- ~54% New Infections

Marks, et al. AIDS 2006;20:1447-50
Centers for Disease Control and Prevention (CDC) Revised Recommendations

• HIV Testing of Adults, Adolescents, and Pregnant Women in Health Care Settings
  – HIV screening is recommended for patients in all health care settings after the patient is notified that testing will be performed unless the patient declines (opt-out screening)
  – Persons at high risk for HIV infection should be screened for HIV at least annually

New/Revised CDC Recommendations: Repeat Screening

• At least annually for all persons at high risk of HIV infection:
  – IDUs
  – Sex partners of IDUs
  – Persons who exchange sex for money or drugs
  – Sex partners of HIV infected
  – Men who have sex with men (MSM)
  – Heterosexual who themselves or their sex partners have had >1 sex partner since last HIV test
• Before new sexual relationship

Terminology:

• Informed Consent – a legal concept; defined as a communication between patient and provider resulting in an authorization to undergo HIV testing; capacity to understand testing should be assured
• Opt-out screening – performing an HIV test after notifying the patient that the test will be done; consent is inferred unless the patient decline (i.e., opt out)
• HIV Prevention counseling: interactive process to assess risk, recognize risky behavior, and develop a plan to take steps that reduce risk
“OPT-OUT” Screening

2007 HIV/AIDS Laws Supplement
AB 682 (Berg): HIV/AIDS Testing
Health and Safety Code
Amends: Section 125090, 125107
Repeals and Adds Section 120990

• Deletes the provision requiring written consent for an HIV test. Requires a medical provider, prior to ordering an HIV test, to inform the patient that the test is planned, to provide information about the test, to inform the patient of treatment options for persons that test positive for HIV, and that a person who tests negative for HIV should continue to be routinely tested. If a patient declines the test, the medical provider shall note that fact in the patient’s medical file.

• For pregnant women, this 2007 statute requires medical providers to inform the woman of the intent to perform an HIV test, the routine nature of the test, the purpose of the test, the risks and benefits of the test, the risk of perinatal transmission of HIV, that approved treatments are known to decrease the risk of perinatal transmission of HIV, and that the woman has the right to decline the testing. If during the final review of standard of prenatal care medical tests, the medical provider engaged in the prenatal care of the woman or attending the woman at the time of labor or delivery finds the woman’s medical records do not document an HIV test, the provider shall inform the woman, if not declined, and if not declined, the woman’s blood shall be tested by a method that will assure the earliest possible results.

Public Health Benefit of ART

• A potential public health benefit of earlier ART is that it apparently reduces sexual transmission if HIV by reducing HIV viremia and shedding and possibly by reducing the transmission fitness of HIV as well

• Over time, the population health benefit of earlier treatment, coupled with risk-reduction programs may be substantial
HIV Test Counseling & Testing

Pathophysiology

HIV Structural Biology

- Products of the HIV Genome
  - Two Envelope Proteins
  - Three Structural Proteins
  - Three Enzymes
  - Six Accessory/Regulatory Proteins

HIV Envelope Proteins
HIV Envelope Proteins

HIV Envelope

HIV Envelope (with Glycan Shield)
HIV Core

HIV Envelope and Structural Proteins

HIV Envelope and Structural Proteins

HIV Accessory/Regulatory Proteins

- Net (negative factor)
- Rev
- Tat (transactivator of transcription)
- Vpr (viral protein R)
- Vpu (viral protein U)
- Vif (viral infectivity factor)
What are the three HIV enzymes?

1. _____________________________________
2. _____________________________________
3. _____________________________________

Host (Human) Cell: HIV Receptors

- CD4 Receptor
- CCR5 Co-Receptor
- CXCR4 Co-Receptor

Host Cellular Receptors
CD4, CCR5, & CXCR4
Pathogenesis and Natural History of HIV
Natural History of Untreated HIV

- Acute CD4 Deposition
- Immune Activation
- Immune Suppression

Normal Intestine

Acute HIV Infection

CD4 Cell Count
Normal Intestine

Acute HIV Infection

Destruction of CD4 Cells in Gut

Reasons for Massive Gut Mucosal CD4 Depletion

- Large Population of Preferred Target Cells for Acute Infection
  - Gut 50-70% express CCR5
  - Blood 10-20% express CCR5
- Dense Clustering of Cells in GI Mucosa
  - Close proximity leads to cell-to-cell HIV transmission
- Binding to Integrin Receptor (alpha-4, beta7)
  - This integrin receptor preferentially expressed on gut CD4 cells

Normal Gut

Profound Loss of Intestinal CD4 Cells
**CD4 Depleted Gut: Consequences**

- Enteropathy
  - Diarrhea
  - Malabsorption
  - Increased Gut Permeability

**Gut Involvement in Chronic Inflammatory State**

- Massive Gut CD4 Cell Depletion
- Increased Gut Permeability
- Bacterial Translocation
- Increased Bacterial LPS
- Chronic Inflammation

**Natural History Phases: Interventions**

- **Phase 1: Acute CD4 Depletion**
  - Gut depletion severe within 4 weeks
  - Vaccine that would lessen effect on "GALT"
- **Phase 2: Inflammatory and Immune activation**
  - Antiretroviral Therapy: ? Optimal Timing
  - Gut Repair/Restoration
  - Specific Anti-Inflammatory/Immunosuppressant
- **Phase 3: Immune Suppression**
  - OI Treatment and Prophylaxis
  - Antiretroviral Therapy
Impact of Culture

Definitions

- Culture
  One's worldview, values, beliefs, customs and behaviors influenced by one's race, ethnicity, national origin, primary language, religious beliefs/spirituality, class/socioeconomic status, gender, sexual orientation, age, history, gender identity, geography, etc.

- Cultural Fluency
  Possessing sufficient knowledge, skills, and experience to communicate effectively with and work together with someone from a different culture

- Community Fluency
  Evolves from the concept of cultural proficiency and is tied to the history of a community (connected to the current actions you want to take)

Journey of Cultural Fluency
Minorities Face Greater Difficulty in Communicating with Physicians

<table>
<thead>
<tr>
<th></th>
<th>Total</th>
<th>White</th>
<th>African American</th>
<th>Hispanic</th>
<th>Asian American</th>
</tr>
</thead>
<tbody>
<tr>
<td>Percent of adults with one or more communication problems</td>
<td>25%</td>
<td>10%</td>
<td>20%</td>
<td>25%</td>
<td>20%</td>
</tr>
</tbody>
</table>

Base: Adults with health care visit in past two years. *Problems include understanding doctor, feeling doctor listened, had questions but did not ask. Source: The Commonwealth Fund 2001 Health Care Quality Survey

Cultural Issues and Concerns

• Historically perceived relationship with the health care system
• Locus of control
• Perceived health disparities due to gender, race, ethnicity, or sexual orientation in communities highly impacted by HIV/AIDS

Why Cultural Competence is Important in Health Care

• Cultural competence facilitates the development of treatment plans that are followed by patients and supported by their families
• Culturally competent health care reduces delays in seeking care and allows for more use of health services
• Cultural competence enhances overall communication and the clinical interaction between provider and patient
• Providing culturally competent health care enhances the compatibility between Western health practices and traditional cultural health practices

Other Issues and Concerns

• Perceived relationship with the health care system
• Locus of control
  - Self
  - Others
  - Supreme Being
  - Health Care Provider
  - No Control
• Perceived & Real Health Disparities due to sex, gender, race, ethnicity, or sexual orientation in communities highly impacted by HIV/AIDS
### Intra-Cultures

**Sex:**
The characteristics that biologically differentiate males and female

**Sexual Orientation:**
Self Identification vs. Sexual Activity

**Gender:**
The sex classification of an individual. An inner sense of maleness or femaleness influenced by culture, rather than biological factors

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### Transgender

Is a spectrum-gender expression spanning a continuum from masculine to feminine (MTF or FTM). Being a transgender person is not indicative of a change in sexual orientation. Being a transgender person, therefore, is not directly associated with homosexuality

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### Age

- **Adolescence**
- **Older Americans**
  50 years: Change in risk behavior/Lack of sexual activity

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### Cultural Competency/Fluency

- Skills and tools for cultural analysis are needed for:
  - Health literacy
  - Linguistic competency
  - Inter-cultural understanding
  - Intra-cultural understanding

---
Risk Screening focus on behaviors:
- How often have you shared works in the last 3 months?
- How often do you use condoms?
- When was your partner last tested for HIV?

Tailored interventions focus on circumstances attitudes & readiness:
- When is it easier to use clean works?
- What does your partner think about condoms?
- Does your partner need an HIV test?

Health Literacy

“The capacity of an individual to obtain, interpret, and understand basic health information and services and the competence to use such information and services in ways which are health-enhancing.”

(Joint Committee on National Health Education Standards, 1995)

Patient-Provider Communication Challenges
- 40-80% of medical information is immediately forgotten
  - Almost half is remembered incorrectly
  - The more given the more forgotten
- Speaking information – 17%
- Speaking and pictogram- 84%
  - Four month recall higher with S and P

Health Literacy includes Ability to Understand
- Instructions on prescription drug bottles
  - When, How & Why
- Appointment slips
  - Day, Date & Time
- Medical education brochures
  - Reading Level & Culturally Appropriate Illustrations
- Doctor's direction and consent forms
  - Reading Level, Assistance, Understanding thereby Informed
- Ability to negotiate complex health care systems
  - Intake Specialist, Case Manager, Others
HIV/AIDS Treatment

Natural History of HIV Infection in Average Patient Without Antiretroviral Therapy from the Time of HIV Transmission to Death at 10-11 Years


- x-axis: time (weeks // years)
- y-axis: CD4+ T-lymphocyte count (squares)
- plasma viremia (circles)
- HIV RNA viral load (copies/mL) (triangles)

Evolution of HIV-1 Antibodies

AIDS Surveillance Case Definition for Adolescents and Adults:1993

Columns: "A": asymptomatic, or persistent generalized lymphadenopathy, or acute HIV infection; "B": symptomatic (not "A" or "C"); "C": AIDS indicator condition.

All patients in categories A3, B3, and C1-3 are reported as having AIDS, based on the AIDS indicator conditions and/or a CD4+ T-lymphocyte count <200/mm³.
Treatment of Persons Living with HIV Infection

• Antiretroviral therapy (ART)

• Prophylaxis and treatment of opportunistic infections (OIs)

Guidelines Outline

• Overview
• Initiation of Therapy
• Management of the Treatment-Experienced Patient
• Special Issues

Guidelines for the Use of Antiretroviral Agents in HIV-1-Infected Adults and Adolescents

Developed by the Department of Health and Human Services (DHHS) Panel on Antiretroviral Guidelines for Adults and Adolescents – A Working Group of the Office of AIDS Research Advisory Council (OARAC)

What the Guidelines Address

• Baseline evaluation
• Laboratory testing (HIV RNA, CD4 cell count, resistance)
• When to initiate therapy
• When to change therapy
• Therapeutic options
• Adherence
• ART-associated adverse effects
What the Guidelines Address (2)

• Treatment of acute HIV infection
• Special considerations in adolescents, pregnant women, injection drug users, HIV-2 infection, and patients coinfected with HIV and HBV, HCV, or TB
• Preventing secondary transmission

Goals of Treatment

• Improve quality of life
• Reduce HIV-related morbidity and mortality
• Restore and/or preserve immunologic function
• Maximally and durably suppress HIV viral load
• Prevent HIV transmission

Tools to Achieve Treatment Goals

• Selection of ARV regimen
• Maximizing adherence
• Pretreatment resistance testing
Improving Adherence

• Support and reinforcement
• Simplified dosing strategies
• Reminders, alarms, timers, and pillboxes
• Ongoing patient education
• Trust in primary care provider

Use of CD4 Cell Levels to Guide Therapy Decisions

• CD4 count
  – The major indicator of immune function
  – Most recent CD4 count is best predictor of disease progression
  – A key factor in decision to start ART or OI prophylaxis
  – Important in determining response to ART
    • Adequate response: CD4 increase 50-150 cells/µL per year
• CD4 monitoring
  – Check at baseline (x2) and at least every 3-6 months

Use of HIV RNA Levels to Guide Therapy Decisions

• HIV RNA
  – May influence decision to start ART and help determine frequency of CD4 monitoring
  – Critical in determining response to ART
    • Goal of ART: HIV RNA below limit of detection (ie, <40-75 copies/mL, depending on assay)
• RNA monitoring
  – Check at baseline (x2)
  – Immediately before initiating ART
  – 2-8 weeks after start or change of ART
  – Every 3-6 months with stable patients

Testing for Drug Resistance

• Before initiation of ART:
  – Transmitted resistance in 6-16% of HIV-infected patients
  – In absence of therapy, resistance mutations may decline over time and become undetectable by current assays, but may persist and cause treatment failure when ART is started
  – Identification of resistance mutations may optimize treatment outcomes
  – Resistance testing (genotype) recommended for all at entry to care
  – Recommended for all pregnant women
• Patients with virologic failure:
  – Perform while patient is taking ART, or ≤4 weeks after discontinuing therapy
  – Interpret in combination with history of ARV exposure and ARV adherence
## Drug Resistance Testing: Recommendations

<table>
<thead>
<tr>
<th>RECOMMENDED</th>
<th>COMMENT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acute HIV infection, regardless of whether treatment is to be started</td>
<td>To determine if resistant virus was transmitted; guide treatment decisions. If treatment is deferred, consider repeat testing at time of ART initiation. Genotype preferred.</td>
</tr>
<tr>
<td>Chronic HIV infection, at entry into care</td>
<td>Transmitted drug-resistant virus is common in some areas; is more likely to be detected earlier in the course of HIV infection. If treatment is deferred, consider repeat testing at time of ART initiation. Genotype preferred.</td>
</tr>
<tr>
<td>Suboptimal suppression of viral load after starting ART</td>
<td>To assist in selecting active drugs for a new regimen.</td>
</tr>
</tbody>
</table>

## Drug Resistance Testing: Recommendations (2)

<table>
<thead>
<tr>
<th>RECOMMENDED</th>
<th>COMMENT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Virologic failure during ART</td>
<td>To assist in selecting active drugs for a new regimen. Genotype preferred if patient on 1st or 2nd regimen; add phenotype if known or suspected complex drug resistance pattern. If virologic failure on integrase inhibitor or fusion inhibitor, consider testing for resistance to these to determine whether to continue them. Coreceptor tropism assay if considering use of CCR5 antagonist.</td>
</tr>
</tbody>
</table>

## Drug Resistance Testing: Recommendations (3)

<table>
<thead>
<tr>
<th>RECOMMENDED</th>
<th>COMMENT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pregnancy</td>
<td>Recommended before initiation of ART or prophylaxis. Recommended for all on ART with detectable HIV RNA levels. Genotype usually preferred; add phenotype if complex drug resistance mutation pattern.</td>
</tr>
</tbody>
</table>

## Drug Resistance Testing: Recommendations (4)

<table>
<thead>
<tr>
<th>NOT USUALLY RECOMMENDED</th>
<th>COMMENT</th>
</tr>
</thead>
<tbody>
<tr>
<td>After discontinuation (&gt;4 weeks) of ARVs</td>
<td>Resistance mutations may become minor species in the absence of selective drug pressure</td>
</tr>
<tr>
<td>Plasma HIV RNA &lt;500 copies/mL</td>
<td>Resistance assays cannot consistently be performed if HIV RNA is low</td>
</tr>
</tbody>
</table>
Other Assessment and Monitoring Studies

- HLA-B*5701 screening
  - Recommended before starting abacavir, to reduce risk of hypersensitivity reaction (HSR)
  - HLA-B*5701-positive patients should not receive ABC
  - Positive status should be recorded as an ABC allergy
  - If HLA-B*5701 testing is not available, ABC may be initiated after counseling and with appropriate monitoring for HSR

- Coreceptor tropism assay
  - Should be performed when a CCR5 antagonist is being considered
  - Requires plasma HIV RNA ≥ 1,000 copies/mL
  - Consider in patients with virologic failure on a CCR5 antagonist

When to Start ART

- Exact CD4 count at which to initiate therapy not known, but evidence points to starting at higher counts

- Current recommendation: ART for all patients with CD4 <500 cells/µL
  - For patients with CD4 >500 cells/µL, 50% of the panel recommend ART, 50% consider ART to be optional
  - Randomized control trial (RTC) data support benefit of ART if CD4 ≤ 350
  - No RTC data on benefit of ART at CD4 >350, but observational cohort data

- Currently available ARVs are effective and well tolerated

Potential Benefits of Early Therapy (CD4 count >500 cells/µL)

- Cohort study data show survival benefit if ART initiated at CD4 count >500 cells/µL

- Earlier ART may prevent HIV-related end organ damage; deferred ART may not reliably repair damage acquired earlier

  - Increasing evidence of direct HIV effects on various end organs and indirect effects via HIV-associated inflammation
  - End organ damage occurs at all stages of infection
Potential Benefits of Early Therapy (CD4 count >500 cells/µL) (2)

- Potential decrease in risk of many complications, including:
  - HIV-associated nephropathy
  - Liver disease progression from hepatitis B or hepatitis C
  - Cardiovascular disease
  - Malignancies (AIDS defining and non-AIDS defining)
  - Neurocognitive decline
  - Blunted immunological response due to ART initiation at older age
  - Persistent T-cell activation and inflammation

HIV-associated nephropathy (HIVAN):
the only racially-specific HIV complication (occurs only in Africans and African Americans)

Potential Benefits of Early Therapy (CD4 count >500 cells/µL) (3)

- Prevention of sexual and bloodborne transmission of HIV
- Prevention of mother-to-child transmission of HIV

Guidelines for the Management of Chronic Kidney Disease in HIV-Infected Patients: Recommendations of the HIV Medicine Association (HIVMA) of the Infectious Diseases Society of America (IDSA)

Clinical Infectious Diseases
2005;40:1559-85

Accessed at:
https://www.idsociety.org/content.asp?x?id=9202#mckd
SCREENING AND INITIAL EVALUATIONS

Recommendations

1. All patients at the time of HIV diagnosis should be assessed for existing kidney disease with a screening urine analysis for proteinuria and a calculated estimate of renal function (e.g., MDRD, Cockcroft-Gault).

Recommendations (2)

2. If there is no evidence of proteinuria at initial evaluation, patients at high risk for the development of proteinuric renal disease (i.e., African American persons, those with CD4+ cell counts <200 mL or HIV RNA levels >4000 copies/mL, and those with diabetes mellitus, hypertension, or hepatitis C virus coinfection) should undergo annual screening. Renal function should be estimated on a yearly basis to assess for changes over time.

Recommendations (3)

3. Additional evaluations (including quantification of proteinuria, renal ultrasound, and potentially renal biopsy) and referral to a nephrologist are recommended for patients with proteinuria of grade 1+ by dipstick analysis or glomerular filtration rate (GFR) <60 mL/min per 1.73 m².

MANAGEMENT

Recommendations

1. In HIV-infected patients with evidence of nephropathy, blood pressure should be controlled to a level no higher than 125/75 mm Hg, with the initial preferential use of angiotensin converting enzyme (ACE) inhibitors or angiotensin receptor blockers (ARBs) for those patients with proteinuria. Calcium channel blockers should be avoided in patients receiving protease inhibitors.
MANAGEMENT Recommendations (2)

2. Dialysis and the placement of arteriovenous (AV) fistulae (native fistulae preferred) should not be withheld for patients solely because of HIV infection.

3. Renal transplantation may be considered for patients with end-stage renal disease (ESRD) if provided in a supervised clinical trial or at centers with adequate experience in this area.

MANAGEMENT Recommendations (3)

4. Patients with HIV-associated nephropathy (HIVAN) should be treated with antiretroviral therapy (ART) at diagnosis. ART should not be withheld from patients simply because of the severity of their renal dysfunction.

5. Addition of ACE inhibitors, ARBs, and/or prednisone should be considered in patients with HIVAN if ART alone does not result in improvement of renal function.

MANAGEMENT Recommendations (4)

6. Patients receiving tenofovir (TDF) who have a GFR <90 mL/min per 1.73 m², patients receiving other medications eliminated via renal secretion (e.g., adefovir, acyclovir, ganciclovir, or cidofovir), patients with other co-morbid diseases (e.g., diabetes or hypertension), or patients receiving ritonavir-boosted protease inhibitor ART regimens should be monitored (for TDF-induced Fanconi syndrome) at least biannually with measurements of renal function, serum phosphorus, and urine analysis for proteinuria and glycosuria.

Potential Limitations of Early Therapy (CD4 count >500 cells/µL)

• ARV-related toxicities
• Drug resistance
• Nonadherence to ART
• Cost
Recommendations for Initiating ART

<table>
<thead>
<tr>
<th>Clinical Category or CD4 Count</th>
<th>Recommendation</th>
</tr>
</thead>
<tbody>
<tr>
<td>• History of AIDS-defining illness</td>
<td>Initiate ART</td>
</tr>
<tr>
<td>• CD4 count &lt;350 cells/μL</td>
<td></td>
</tr>
<tr>
<td>• CD4 count 350-500 cells/μL</td>
<td></td>
</tr>
<tr>
<td>• Pregnant women</td>
<td></td>
</tr>
<tr>
<td>• HIV-associated nephropathy (HIVAN)</td>
<td></td>
</tr>
<tr>
<td>• Hepatitis B (HBV) coinfection, when HBV treatment is indicated*</td>
<td></td>
</tr>
</tbody>
</table>

* Treatment with fully suppressive drugs active against both HIV and HBV is recommended.

Recommendations for Initiating ART (2)

<table>
<thead>
<tr>
<th>Clinical Category or CD4 Count</th>
<th>Recommendation</th>
</tr>
</thead>
<tbody>
<tr>
<td>CD4 count &gt;500 cells/μL, asymptomatic, without conditions listed above</td>
<td>50% of the Panel favors starting ART; 50% views ART as optional</td>
</tr>
</tbody>
</table>

Recommendations for Initiating ART (3)

- “Patients initiating ART should be willing and able to commit to lifelong treatment and should understand the benefits and risks of therapy and the importance of adherence.”
- Patients may choose to postpone ART
- Providers may elect to defer ART, based on patients’ clinical and/or psychosocial factors

Consider More Rapid Initiation of ART

- Pregnancy
- AIDS-defining condition
- Acute opportunistic infection
- Lower CD4 count (eg, <200 cells/μL)
- Rapid decline in CD4
- Higher viral load
- HIVAN
- HBV coinfection when HBV treatment is indicated
Consider Deferral of ART

- Clinical or personal factors may support deferral of ART
  - If CD4 is low, deferral should be considered only in unusual situations, and with close follow-up
- When there are significant barriers to adherence
- If comorbidities complicate or prohibit ART
- “Elite controllers” and long-term nonprogressors

Current ARV Medications

<table>
<thead>
<tr>
<th>NRTI</th>
<th>PI</th>
<th>Integrase Inhibitor (II)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Abacavir (ABC)</td>
<td>Anazanavir (ATV)</td>
<td>Raltegravir (RAL)</td>
</tr>
<tr>
<td>Didanosine (ddI)</td>
<td>Darunavir (DRV)</td>
<td>Fusion Inhibitor</td>
</tr>
<tr>
<td>Emtricitabine (FTC)</td>
<td>Fosamprenavir (FPV)</td>
<td>Enfuvirtide (ENF, T-20)</td>
</tr>
<tr>
<td>Lamivudine (3TC)</td>
<td>Indinavir (IDV)</td>
<td>CCR5 Antagonist</td>
</tr>
<tr>
<td>Stavudine (d4T)</td>
<td>Lopinavir (LPV)</td>
<td>Maraviroc (MVC)</td>
</tr>
<tr>
<td>Zidovudine (AZT, ZDV)</td>
<td>Nelfinavir (NFV)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Ritonavir (RTV)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Saquinavir (SQV)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Tipranavir (TPV)</td>
<td></td>
</tr>
</tbody>
</table>

Initial Treatment: Choosing Regimens

- 3 main categories:
  - 1 NNRTI + 2 NRTIs
  - 1 PI + 2 NRTIs
  - 1 II + 2 NRTIs
- Combination of NNRTI, PI, or II + 2 NRTIs preferred for most patients
- Fusion inhibitor, CCR5 antagonist not recommended in initial ART
- Few clinical end points to guide choices
- Advantages and disadvantages to each type of regimen
- Individualize regimen choice

Initial Treatment: Preferred

<table>
<thead>
<tr>
<th>NNRTI based</th>
<th>PI based</th>
<th>II based</th>
<th>Pregnant Women</th>
</tr>
</thead>
<tbody>
<tr>
<td>• EFV/TDF/FTC&lt;sup&gt;1,2&lt;/sup&gt;</td>
<td>• ATV/r + TDF/FTC&lt;sup&gt;2&lt;/sup&gt;</td>
<td>• RAL + TDF/FTC&lt;sup&gt;2&lt;/sup&gt;</td>
<td>• LPV/r (BID)&lt;sup&gt;3&lt;/sup&gt; + ZDV/3TC</td>
</tr>
<tr>
<td></td>
<td>• DRV/r (QD) + TDF/FTC&lt;sup&gt;2&lt;/sup&gt;</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<sup>1</sup> EFV should not be used during the first trimester of pregnancy or in women trying to conceive or not using effective and consistent contraception.
<sup>2</sup> TDF can be used in place of FTC and vice versa.
<sup>3</sup> FTC can be used in place of FTC and vice versa.
### ARV Components in Initial Therapy: NNRTIs

<table>
<thead>
<tr>
<th>ADVANTAGES</th>
<th>DISADVANTAGES</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Long half-lives</td>
<td>• Low genetic barrier to resistance – single mutation</td>
</tr>
<tr>
<td>• Less metabolic toxicity (dyslipidemia, insulin resistance) than with some PIs</td>
<td>• Cross-resistance among most NNRTIs</td>
</tr>
<tr>
<td>• PIs and II preserved for future use</td>
<td>• Rash; hepatotoxicity</td>
</tr>
<tr>
<td></td>
<td>• Potential drug interactions (CYP450)</td>
</tr>
<tr>
<td></td>
<td>• Transmitted resistance to NNRTIs more common than resistance to PIs</td>
</tr>
</tbody>
</table>

### ARV Components in Initial Therapy: PIs

<table>
<thead>
<tr>
<th>ADVANTAGES</th>
<th>DISADVANTAGES</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Higher genetic barrier to resistance</td>
<td>• Metabolic complications (fat maldistribution, dyslipidemia, insulin resistance)</td>
</tr>
<tr>
<td>• PI resistance uncommon with failure (boosted PI)</td>
<td>• GI intolerance</td>
</tr>
<tr>
<td>• NNRTIs and II preserved for future use</td>
<td>• Potential for drug interactions (CYP450), especially with RTV</td>
</tr>
</tbody>
</table>

### ARV Components in Initial Therapy: II (Raltegravir)

<table>
<thead>
<tr>
<th>ADVANTAGES</th>
<th>DISADVANTAGES</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Virologic response noninferior to EFV</td>
<td>• Less experience with IIIs, limited data</td>
</tr>
<tr>
<td>• Fewer adverse events than with EFV</td>
<td>• Twice-daily dosing</td>
</tr>
<tr>
<td>• Fewer drug-drug interactions than with PIs or NNRTIs</td>
<td>• Lower genetic barrier to resistance than PIs</td>
</tr>
<tr>
<td>• NNRTIs and PIs preserved for future use</td>
<td>• No data with NRTIs other than TDF/FTC in initial therapy</td>
</tr>
</tbody>
</table>

### ARV Components in Initial Therapy: Dual-NRTI Pairs

<table>
<thead>
<tr>
<th>ADVANTAGES</th>
<th>DISADVANTAGES</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Established backbone of combination therapy</td>
<td>• Lactic acidosis and hepatic steatosis reported with most NRTIs (rare)</td>
</tr>
<tr>
<td>• Minimal drug interactions</td>
<td></td>
</tr>
</tbody>
</table>
Adverse Effects: NNRTIs

- All NNRTIs:
  - Rash, including Stevens-Johnson syndrome
  - Drug-drug interactions
- EFV
  - Neuropsychiatric
  - Teratogenic in nonhuman primates + cases of neural tube defects in human infants after first trimester exposure
- NVP
  - Higher rate of rash
  - Hepatotoxicity (may be severe and life-threatening; risk higher in patients with higher CD4 counts at the time they start NVP)

Adverse Effects: PIs

- ATV
  - Hyperbilirubinemia
  - PR prolongation
  - Nephrolithiasis
- DRV
  - Rash
  - Liver toxicity
- FPV
  - GI intolerance
  - Rash
  - Possible increased risk of MI

- IDV
  - Nephrolithiasis
  - GI intolerance
- LPV/r
  - GI intolerance
  - Possible increased risk of MI
  - PR and QT prolongation
- NFV
  - Diarrhea
Adverse Effects: PIs

- RTV
  - GI intolerance
  - Hepatitis
- SQV
  - GI intolerance
- TPV
  - GI intolerance
  - Rash
  - Hyperlipidemia
  - Liver toxicity
  - Cases of intracranial hemorrhage

Adverse Effects: II

- RAL
  - Nausea
  - Headache
  - Diarrhea
  - CPK elevation

Adverse Effects: NRTIs

- All NRTIs:
  - Lactic acidosis and hepatic steatosis (highest incidence with d4T, then dDI and ZDV, lower with TDF, ABC, 3TC, and FTC)
  - Lipodystrophy (higher incidence with d4T)

- ABC
  - HSR*
  - Rash
  - Possible ↑ risk of MI
- dDI
  - GI intolerance
  - Peripheral neuropathy
  - Pancreatitis
  - Possible noncirrhotic portal hypertension

* Screen for HLA-B*5701 before treatment with ABC; ABC should not be given to patients who test positive for HLA-B*5701.
### Adverse Effects: NRTIs

- **d4T**
  - Peripheral neuropathy
  - Pancreatitis
- **TDF**
  - Renal impairment
  - Possible decrease in bone mineral density
  - Headache
  - GI intolerance
- **ZDV**
  - Headache
  - GI intolerance
  - Bone marrow suppression

### Adverse Effects: CCR5 Antagonist

- **MVC**
  - Drug-drug interactions
  - Abdominal pain
  - Upper respiratory tract infections
  - Cough
  - Hepatotoxicity
  - Musculoskeletal symptoms
  - Rash
  - Orthostatic hypotension

### Adverse Effects: Fusion Inhibitor

- **ENF**
  - Injection-site reactions
  - HSR
  - Increased risk of bacterial pneumonia

### Treatment-Experienced Patients

- In clinical studies of ART, most patients maintained virologic suppression for at least 3-7 years
- Appropriate initial ARV regimens should suppress HIV indefinitely, assuming adequate adherence
- In patients with suppressed viremia:
  - Assess adherence frequently
  - Simplify ARV regimen as much as possible
- Patients with ARV failure: assess and address aggressively
Treatment-Experienced Patients: ART Failure

- Causes of treatment failure include:
  - Patient factors
    (eg, CD4 nadir, pretreatment HIV RNA, comorbidities)
  - Drug resistance
  - Suboptimal adherence
  - ARV toxicity and intolerance
  - Pharmacokinetic problems
  - Suboptimal drug potency
  - Provider experience

Treatment-Experienced Patients: Virologic Failure

- Incomplete virologic response:
  - In patient on initial ART, HIV RNA >400 copies/mL after 24 weeks on therapy or >50 copies/mL by 48 weeks (confirm with second test)

- Virologic rebound:
  - Repeated detection of HIV RNA after virologic suppression (eg, >50 copies/mL)

Treatment-Experienced Patients: ART Failure (2)

- Virologic failure:
  - HIV RNA >400 copies/mL after 24 weeks, >50 copies/mL after 48 weeks, or >400 copies/mL after viral suppression

- Immunologic failure:
  - Failure to achieve and maintain adequate CD4 increase despite virologic suppression

- Clinical progression:
  - Occurrence of HIV-related events (after ≥3 months on therapy; excludes immune reconstitution syndromes)

Treatment-Experienced Patients: Virologic Failure (2)

- Assess drug resistance:
  - Drug resistance test
  - Prior treatment history
  - Prior resistance test results

- Drug resistance usually is cumulative – consider all previous treatment history and test results
Treatment-Experienced Patients: Virologic Failure (3)

• Management:
  – Clarify goals: aim to reestablish maximal virologic suppression (eg, <50 copies/mL)
  – Evaluate remaining ARV options
    • Newer agents have expanded treatment options
  – Base ARV selection on medication history, resistance testing, expected tolerability, adherence, and future treatment options
  – Avoid treatment interruption, which may cause viral rebound, immune decompensation, clinical progression

Regimen Simplification

• Changing a suppressive ARV regimen to:
  – Reduce pill burden
  – Reduce dosing frequency
  – Enhance tolerability
  – Decrease food and fluid requirements
• Goals: improve patient's quality of life, improve ART adherence, avoid long-term toxicities, reduce risk of virologic failure

Virologic Failure: Changing an ARV Regimen

• General principles:
  – Add at least 2 (preferably 3) fully active agents to an optimized background ARV regimen
  – Determined by ARV history and resistance testing
  – Consider potent RTV-boosted PIs, drugs with new mechanisms of action (eg, integrase inhibitor, CCR5 antagonist, fusion inhibitor, 2nd generation NNRTI) + optimized ARV background
  – In general, 1 active drug should not be added to a failing regimen (drug resistance is likely to develop quickly)
  – Consult with experts

Regimen Simplification (2)

• Types of substitution
  – Within class: substitution of a new agent or coformulation
  – Out-of-class: eg, change from PI to NNRTI or agent from another class
  – Reducing number of active drugs in ARV regimen: simplification to boosted-PI monotherapy is not recommended
• After simplification, monitor in 2-6 weeks (laboratory and clinical)
Websites to Access the Guidelines

- http://www.aidsetc.org

Websites (2)

http://aidsinfo.nih.gov

Up-to-date U.S. Dept. of Health and Human Services (DHHS) guidelines for:
- Antiretroviral treatment of adults, adolescents, and children
- Maternal health/Prevention of mother-to-child transmission (PMTCT)
- Post-exposure prophylaxis (PEP) (occupational and nonoccupational)
- Prevention and treatment of opportunistic infections
- Incorporating HIV prevention into the medical care of persons living with HIV
- HIV counseling and testing

Websites (3)

http://www.nmaetc.org:

National Minority AIDS Education and Training Center (NMAETC)
(national office: Howard University College of Medicine)
- Supported by HRSA/DHHS
- Provides leadership in capacity building, education, support, and advocacy to assist providers in delivering excellent care to persons belonging to minority groups who are diagnosed with HIV/AIDS
- Core service areas:
  - Clinical delivery
  - Cultural competency
  - Infrastructure management

Websites (4)

http://www.seatec.emory.edu:

Southeast AIDS Training and Education Center
(a division of the Dept. of Family & Preventive Medicine, Emory University School of Medicine)
Assists in meeting training needs of providers in Alabama, Georgia, Kentucky, North Carolina, South Carolina, and Tennessee
- Directory of HIV-related services and other resources in Atlanta and Georgia
- Includes information on Internet and hotline resources
Review of Learning Objectives

At the conclusion of this session, participants will have an enhanced ability to:

• Describe the epidemiology of HIV/AIDS in adults and adolescents: Global, National and Local
• Explain HIV/AIDS as a Health Disparity addressing Race, Ethnicity, Sexual Orientation, Biological Sex and Gender
• Describe how to Screen for Risk and Prevention Factors
• Describe Prevention Messages Related to HIV/STD Prevention & Progression
• Explain Lifecycle of HIV
• Explain culturally relevant approaches in caring for HIV positive clients

Post-Test

Post-test Questions

1. The GI associated lymphoid tissue constitutes the largest immune compartment in the body:
   a. True
   b. False

2. The following are HIV enzymes:
   a. Protease
   b. Reverse transcriptase
   c. Integrate
   d. a and c
   e. all of the above
3. Review the structure
   Box #3 is the Nucleocapsid:
   a. True
   b. False

4. The following group(s) should be offered HIV and STD testing:
   a. Patients with multiple sex partners
   b. Heterosexual patients
   c. Patients over the age of 55
   d. Heterosexual patients that are over the age 55
   e. All of the above

5. Which of the following is a common misconception about HIV transmission?
   a. You can't transmit HIV when your viral load is undetectable?
   b. Oral sex safer than vaginal intercourse without a condom?
   c. HIV can be transmitted to an infant during labor and delivery
   d. HIV is easier to transmit to an infant during labor and delivery

6. Tailored intervention are strategies designed to change a person’s:
   a. Knowledge and concern
   b. Knowledge, attitude and behavior
   c. Concern, attitude and behavior
   d. Knowledge and behavior
Post-test Questions

7. The following STD(s) can not be transmitted orally:
   a. Herpes (HSV) I and II
   b. Gonorrhea (GC)
   c. Chlamydia
   d. Syphilis
   e. HPV
   f. HIV
   g. All of them can be transmitted orally
   h. Only a, b, c, and d can be transmitted orally
   i. None of them can be transmitted orally

Post-test Questions

8. Patients retain almost half of medical information given.
   a. True
   b. False

Post-test Questions

9. Which of the following statements regarding HIV epidemiology is true?
   a. Worldwide, 75% of new HIV infections occur in low-income countries
   b. The prevalence of HIV/AIDS in Washington, D.C., is approximately the same as that in Botswana
   c. It is estimated that only about half of HIV-infected persons in the United States are aware of their HIV status
   d. Among men who have sex with men and are between 13 and 24 years of age, approximately half as many HIV/AIDS cases are estimated to have occurred in 2007 among African Americans as among Caucasians
   e. For the 34 states with confidential name-based HIV infection reporting since at least 2003, the estimated 2007 HIV/AIDS case rates among African American men and women are approximately 7 and 20 times higher, respectively, than are those among Caucasian men and women

Post-test Questions

10. Which of the following statements regarding antiretroviral therapy (ART) is true?
    a. In addition to 2 nucleoside reverse transcriptase inhibitors (NRTIs), currently recommended regimens for ART-naïve patients include only a non-nucleoside reverse transcriptase inhibitor (NNRTI) or a ritonavir-boosted protease inhibitor (PI)
    b. If a patient takes 75% of his/her ART doses, his/her risk of virological failure is minimal
    c. Raltegravir (an integrase inhibitor [II]) and NNRTIs (efavirenz, nevirapine) have high genetic barriers to resistance
    d. An African American patient with newly diagnosed HIV infection, HIV-associated nephropathy (HIVAN), and a CD4+ T-lymphocyte count of 600 cells/mm³ should be started on ART
    e. A patient newly diagnosed with HIV/hepatitis B virus (HBV) co-infection with a CD4+ T-lymphocyte count of 600 cells/mm³ should not be started on ART
Acknowledgement

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Center for Health Training

David H. Spach, MD
Professor of Medicine
Division of Infectious Diseases
University of Washington, Seattle

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National HIV/AIDS Clinicians’ Consultation Center

• National Clinicians’ Post-Exposure Prophylaxis Hotline:
  888-448-4911 24hrs a day, 7 days a week
• PEPline: (888) HIV – 4911 (888-448-4911)
• Perinatal Hotline: (888)-448-8765
• National HIV Telephone Consultation Service
  Warmline: 800-933-3413
  www.aids-etc.org   www.nmaetc.org
  std@nmaetc.org

Resources
for
Clinical Providers
&
Health Service Support Providers

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Thank You!