

**LGB+ and Trans Health Standardized Patient Cases**

**AMSA National Gender and Sexuality Committee**

**2018**

## **Introduction**

The AMSA National Gender and Sexuality Committee is focused on and driven to improving the overall patient experience for people who identify as LGB+ and transgender. We believe that healthcare professionals must be equipped with up-to-date and non-biased information on how to best provide care for this population of people.

To achieve the above stated goals, we have written and published the following set of standardized patient cases for use in educating and training healthcare professional students to provide exceptional care for LGB+ and transgender persons. These standardized cases are for educational purposes, and rely on the traditional standardized patient model adopted by medical schools across the country and by the USMLE in the clinical skills portion of Step 2.

The topics of the patient cases highlight areas of knowledge that are typically lacking in medical education curricula, and place an additional focus on creating a safe space for patients of all backgrounds, orientations and sexualities to receive care. Resources are listed after each case and are provide excellent sources for self-directed study.

We hope that through these practice cases current and future healthcare professionals not only improve individual patient care experiences for LGB+ and transgender people, but also take on the onus of educating colleagues and staff on these topics so that every single person can feel comfortable and welcome in a physician's office.

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  - Encourage students to study information prior to encounter so that they can practice applying their knowledge in a practice clinical setting

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- **Background information:**
  - To be posted on the door of the patient encounter room and read by student before entering
  - Contains information about expectations of encounter, objectives for the student to achieve, and patient information that will be useful during patient interaction
- **Patient information:**
  - To be studied by the standardized patient prior to the encounter
  - Contains patient information relevant to the encounter
  - Any information pursued by the student that is not included in the patient information section should prompt the standardized patient to respond no
- **Learning points:**
  - To be handed out to students before and after completion of patient encounter
  - Encourage students to study information prior to encounter so that they can practice applying their knowledge in a practice clinical setting

### Case #3

- **Topic: Pre-exposure prophylaxis for prevention of HIV transmission**
- **Educational goals:** To be handed out to students prior to the patient encounter
- **Background information:**
  - To be posted on the door of the patient encounter room and read by student before entering
  - Contains information about expectations of encounter, objectives for the student to achieve, and patient information that will be useful during patient interaction
- **Patient information:**
  - To be studied by the standardized patient prior to the encounter
  - Contains patient information relevant to the encounter
  - Any information pursued by the student that is not included in the patient information section should prompt the standardized patient to respond no
- **Learning points:**
  - To be handed out to students before and after completion of patient encounter
  - Encourage students to study information prior to encounter so that they can practice applying their knowledge in a practice clinical setting

## **Case #1 Discussing feminizing hormone therapy with a patient**

### **Educational Goals:**

- Improve 2<sup>nd</sup> year medical student comfort with discussion of sensitive topics pertaining to sexual health and orientation prior to beginning clinical rotations
- Encourage change in use of language by medical providers to become more inclusive of all gender identities and sexual orientations
- Provide basic knowledge of hormonal therapy for gender transitioning thereby encouraging providers in all fields to counsel patients appropriately and refer out appropriately to specialists/specialty clinics

## **Background information:**

Setting: You are the internist working at a primary care outpatient clinic

Scenario: Jonathon Cooper is a 24 year old male at birth here for their first visit in the office. They want to discuss hormone treatment for transitioning from male to female (feminizing hormone therapy).

### Objectives:

- Gather a focused patient history, including HPI, past medical, surgical, social, and sexual histories, with a focus on their sexual history
- Discuss patient's goals of care with hormone use, including long term medical/surgical goals
- Briefly counsel patient on available medical and surgical treatment for transitioning

The encounter will last 20 minutes. An announcement will be made with 5 minutes and 1 minute remaining. Please wrap up your encounter upon hearing the 1 minute left warning.

## **Patient Information:**

You are a 24 year old male at birth who comes to the primary care physician today for an annual checkup. For years you have felt that your sex at birth does not align with your gender identity and you are planning on bringing this up with a physician for the first time.

You don't currently have any symptoms and are feeling well today. Your past medical history is significant only for asthma as a young child. You have not used an albuterol inhaler in years, and have never been hospitalized or intubated. You are not currently on any medications. You have never had surgery in the past. You have never been diagnosed with any psychological illnesses.

You smoke ½ pack of cigarettes a day, and drink alcohol occasionally at social events. You do not use any illicit or non-prescribed medications. You work at an advertising agency, and are worried about how coworkers will respond if you tell them you are transgender. You live with 1 roommate.

Your preferred pronouns are they/them. You are sexually active with male partners only, have never had a sexually transmitted disease to your knowledge and were tested for "the usual STDs" at a pop-up clinic several months ago. You use condoms during sex and are currently single. You do not believe you engage in high risk sexual behavior and have had 2 life-time partners, both relationships that lasted approximately 1 year.

The rest of your history is all negative and you can respond negatively to any further questioning by the medical student outside of the above described information.

## Learning Points:

### 1) Provide a welcoming clinic environment for all gender identities

- a. Check-in
  - i. A welcoming clinic environment for all patients will enable them to feel more comfortable speaking to medical professionals and will encourage them to return for follow up care
  - ii. Include gender neutral restrooms easily accessible from the waiting area
  - iii. Add the following to intake forms and EMRs:
    1. Name preference
    2. Gender identity
    3. Gender at birth
    4. Preferred pronouns
    5. Sexual Orientation

### 2) Suggestions for performing the physical exam

- a. Physical exam should be directed by chief complaint and type of visit scheduled
- b. Most of the exam will remain unchanged when comparing cis and trans patients. Below are a few pointers:
  - i. Gender affirming approach → continue to use preferred name and pronouns throughout encounter
  - ii. Genitalia exam
    1. Only when clinically indicated
    2. For vaginal exam in transgender women
      - a. Vaginal cuff without cervix
      - b. Anoscope smaller and more comfortable for exam than speculum
      - c. Explain every step prior to and during the exam

### 3) Introduction to feminizing hormonal therapy

- a. Goal of feminizing hormone therapy
  - i. **Development of female secondary sex characteristics via estrogens**
    1. Estrogens
      - a. Preferred form is 17-Beta estradiol
        - i. MOA: bioidentical to estrogen, agonist of estrogen receptors
        - ii. Side effects = mood swings, HA, hot flashes, weight gain



- iii. Low VTE risk so safe for use in most patients, consider alternative methods if patient has underlying clotting disorder
- iv. Methods of delivery= transdermal patch, sublingual tablet, PO, injected as a conjugated ester
- v. Serum levels unpredictable with transdermal absorption
- b. Currently do not recommend use of ethinyl estradiol or conjugated equine esters because of increased VTE risk

## ii. Suppression of male secondary sex characteristics via anti-androgens

1. Allow lower doses of estrogens which decreases potential side effects
2. Can be used without estrogen, but increased risk for hot flashes, low energy, depressed mood, low bone density (estrogen withdrawal type symptoms)
  - a. Spironolactone
    - i. MOA: K<sup>+</sup>-sparing diuretic, direct antagonist of androgen receptors, suppressor of testosterone synthesis
    - ii. Side effects = elevated K<sup>+</sup> levels, polyuria, orthostatic hypotension, polydipsia
  - b. 5 alpha reductase inhibitors (finasteride)
    - i. MOA: blocks 5 alpha reductase enzyme, therefore preventing conversion of testosterone to dihydrotestosterone (a potent androgen with many physiological effects)
    - ii. Less dramatic effects, no effect on production or action of testosterone
  - c. GnRH analogs
    - i. MOA: shut down hypothalamic pituitary testicle axis therefore reducing testosterone production
    - ii. Used for patients not achieving desired androgen suppression with above medications or for patients approaching and desiring to delay puberty
    - iii. Barriers to use = cost, daily injection vs implantable release device
  - d. Progestogens
    - i. MOA: synthetic analogues of physiologic hormone, agonist to progesterone receptors, antagonist of gonadotropins
    - ii. Case reports of improved breast and areolar development, improved libido and mood
    - iii. Side effects = low mood in some

- iv. Women’s Health Initiative (WHI) study results likely not applicable to transgender population, no suspected increase in cardiovascular mortality or breast cancer

b. Lab monitoring while on hormone therapy

- i. Titrate medications up until total estradiol and total testosterone levels are within female sex at birth physiological levels
  - 1. Check estradiol and testosterone Q3 mo until achieved then check yearly after that unless new medical conditions arise
  - 2. Current evidence shows that titrating serum estradiol to higher end of physiologic range does not correlate directly to more feminizing effects or improved breast development
  - 3. Recommended total testosterone level <55ng/ml
  - 4. Above recommendations per Society of Endocrinology
  - 5. Other societies argue for checking bioavailable testosterone levels, to ensure SHBG elevation is not preventing complete feminization
- ii. If on spironolactone
  - 1. FSH/LH→ ensure adequate gonadotropin levels to maintain bone density
  - 2. BUN/Cr
- iii. Remainder of lab monitoring as normally performed in primary care setting per USPTF guidelines

**Summary of feminizing hormonal therapies:**

Hormonal therapy	Category	MOA	Side effects
17-Beta estradiol	Feminizing	Direct agonist of estrogen receptors	Mood swings, hot flashes, weight gain
Spironolactone	Anti-androgen	Direct antagonist	Hyperkalemia, polydipsia, polyuria, orthostatic hypotension
5 alpha reductase inhibitors	Anti-androgen	Inhibits synthesis of dihydrotestosterone	No major
GnRH analogs	Anti-androgen	Shut down HPA axis reducing androgen synthesis	No major
Progestogens	Anti-androgen	Central antagonist to gonadotropins	Mood changes

**References:**

Deutsch, M. Guidelines for the Primary and Gender-Affirming Care of Transgender and Gender Nonbinary People. Center of Excellence for Transgender Health. Department of Family and Community Medicine. UCSF. 2nd Edition. June, 17<sup>th</sup>, 2016.

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Writing Group for the Women's Health Initiative Investigators. Risks and benefits of estrogen plus progestin in healthy postmenopausal women: principal results from the women's health initiative randomized controlled trial. *JAMA.* 2002 Jul 17;288(3):321-33.

Deutsch MB, Bhakri V, Kubicek K. Effects of cross-sex hormone treatment on transgender women and men. *Obstet Gynecol.* 2015 Mar;125(3):605-10.

## **Case #2 Safe sex practices for women who have sex with women**

### **Educational Goals:**

- Improve 2<sup>nd</sup> year medical student comfort with discussion of sensitive topics pertaining to sexual health and orientation prior to clinical rotations
- Encourage change in use of language by medical providers to become more inclusive of all gender identities and sexual orientations
- Enhance knowledge of and encourage inclusive counseling on safe sex practices for non-heterosexual patients
- Improve knowledge of true STD risk in the women who have sex with women (WSW)
- To better understand the barriers to accessing healthcare for WSW and other sexual orientation minorities

## **Background information:**

Setting: You are the obstetrician/gynecologist working at a your private practice office

Scenario: Kate Miller, a 22 year old female is here for an annual exam.

### Objectives:

- Gather a focused patient history, including a brief HPI, past medical, surgical, and social history.
- Obtain a detailed sexual history including current relationships, sexual orientation, gender identity, and a screen for domestic violence.
- Counsel patient on safe sex practices and guidelines for routine STD testing based on the history you have obtained.

The encounter will last 20 minutes. An announcement will be made with 5 minutes and 1 minute remaining. Please wrap up your encounter upon hearing the 1 minute left warning.

## **Patient Information:**

You are a 22 year old female patient named Kate Miller coming into the gynecologist for your annual visit. You recently began starting dating women and want to ask your provider about safe sex practices for women having sex with other women. You also want to know what your risk for STDs is if you only have female partners.

You don't currently have any symptoms and are feeling well today. Your past medical history is not significant. You are currently on LoEstrin to control your heavy periods. You have been on this medication since you were 15 years old. You have never had surgery in the past. You have never been diagnosed with any psychological illnesses.

You do not smoke, and drink alcohol on weekends at social events. You do not use any illicit or non-prescribed medications. You are a senior in college and live with 3 roommates.

You are sexually active with female partners only at this time. You were previously sexually active with your ex-boyfriend but have not had sex with men in 3 years. You identify as a cis-gendered lesbian and are not currently in a relationship. You have never had a sexually transmitted disease to your knowledge but are not sure when or what you were tested for.

The rest of your history is all negative and you can respond negatively to any further questioning by the medical student outside of the above described information.

## Learning points:

### 1) General definitions to know when taking care of women who have sex with women (WSW)

<i>Term</i>	<i>Definition</i>
Bisexual (female) <sup>2</sup>	Women who are attracted to or engage in sexual behavior with both sexes
Dental dam <sup>3,4</sup>	A sheet of latex rubber used as a barrier between the mouth and vulva or the mouth and anus
Heterosexism <sup>5</sup>	Practices or beliefs based on the assumption that all persons are heterosexual; for example, patient intake forms that lack options for partners (as opposed to spouses) and assuming that all females have only male sex partners
Heterosexual <sup>5</sup>	A person who is sexually attracted to persons of the opposite sex; some WSW may self-identify as heterosexual
Internalized homophobia <sup>5</sup>	Negative feelings about homosexuality that are turned inward by persons with same-sex attraction
Lesbian <sup>2</sup>	Women with same-sex attraction or same-sex sexual behavior
LGB or LGBT	Lesbian, gay, or bisexual; when the studies referenced in the text include transgender persons, T is added
Sexual minority	Lesbian, gay, or bisexual person
Sexual minority stress <sup>6</sup>	The theory that sexual minorities, including WSW, are stressed by prejudice, expectations of rejection, internalized homophobia, and concealment of their feelings in response to societal expectations; such stress may explain in part the disproportionate incidence of several health issues in WSW
Women who have sex with women (WSW)	A term that focuses on behavior rather than labels and includes all WSW, whether they self-identify as lesbian, bisexual, or heterosexual; WSW sometimes is used to refer to lesbians only, whereas WSMW is used to refer to bisexual females

*Information from references 2 through 6.*

### 2) Barriers to optimal care for women who have sex with women (WSW)

- a. Barriers include
  - i. Lack of health insurance
  - ii. Unwelcoming clinic environments
  - iii. Lack of honest and open communication with physicians
  - iv. Poor past experiences or discrimination
- b. Barriers to care ultimately lead to poorer health outcomes including increased risk for STDs, tobacco use, substance abuse, mental health issues and intimate partner violence
- c. Barriers can also contribute to poor outcomes by causing patients to delay or avoid seeking medical care which will further exacerbate the above stated conditions

- 3) How physicians can overcome communication barriers with WSW patients
  - a. WSW can be hesitant to disclose sexual activity and orientation for fear of discrimination or dismissal
    - i. To counteract this, physicians must open up honest and non-judgmental dialogue
  - b. Honest and non-judgmental dialogue
    - i. Setting up the conversation
      1. Place an emphasis on the “routine”
        - a. By initially informing a patient that questions about sexual activity are routine (i.e. something you ask every patient), you can avoid making the patient feel as though they are being singled out
      2. Confidentiality
        - a. Also preface conversation by assuring patient that all information shared is confidential unless they are a clear and present danger to themselves or others
        - b. Especially important for teenage patients
    - ii. Ask direct questions
      1. Focus on behavior rather than labels or identities
        - a. A patient may identify as heterosexual but engage in sexual activity with persons who identify as genders other than male
        - b. Various studies have shown a relatively poor correlation between self-identity and sexual behaviors
      2. Below are examples of appropriate questions to ask during a sexual history:



**Table 4. Culturally Competent Sexual and Social History Questions for Women Who Have Sex with Women**

**Questions to ask after assuring the patient about confidentiality:**

Are you having or have you ever had sex with women, men, or both?

In the past year, how many persons have you had sex with?

Does your current partner (or do your current partners) have sex with someone other than you?

Have you ever been pregnant? If so, how many times?

How many living biologic children do you have? Any miscarriages or abortions?

Do you have oral sex? Vaginal sex? Anal sex? Other types of sex?

Do you use barrier protection such as condoms, gloves, or dental dams?

Are there times you do not use barrier protection?

Do you use another method of birth control? (if sexually active with men)

Do you (or does your partner) have any plans to conceive in the next 12 months?

Have you ever had a sexually transmitted infection?

Do you ever have sex with strangers or people you do not know well?

Do you have a support system, including family and close friends?

Do you have any concerns about your sexual practices that I have not asked about?

Does your partner:

Physically hurt you?

Insult or talk down to you fairly often?

Threaten you with harm?

Scream or curse at you fairly often?<sup>20</sup>

*Information from references 5, 14, and 20.*

#### 4) Safe sex practices for WSW

##### a. Barrier protection

##### i. Dental dams

1. Initially developed for oral surgery practice
2. Used as barrier between mouth and vulva or anus during sexual activity
3. Studies show that they are only rarely used by WSW
4. Are a method to prevent transmission of HIV and other STDs
  - a. There is a low risk of HIV transmission from oral sex
  - b. Things that increase transmission risk of HIV during oral sex include open sores in either the mouth or vagina, oral contact with menstrual blood, bleeding gums, co-infections with other STDs

##### ii. Latex or rubber gloves

1. Used during penetration of fingers or hand into vagina or anus
2. Some studies concluded that this barrier method is used more frequently than dental dams

##### iii. Condoms

1. Used on sex toys

- 2. Recommended that the condom be changed when using the same toy on a different partner
    - iv. Tampons
      - 1. Used more frequently than dental dams to prevent contact with menstrual blood during sexual activity
  - b. Sex toys
    - i. See condoms above for safe use or alternatively have designated toys for each partner
  - c. During menstruation
    - i. If partner is currently menstruating avoid contact with menstrual blood by using barrier protection, leaving a tampon in place or by abstaining during that time
  - d. Visible genital lesions
    - i. Avoid intercourse during active outbreak of an STD
    - ii. Seek medical care to diagnose and treat the infection
    - iii. Partners should also be informed and tested for common STDs
- 5) STDs in WSW
- a. Incidence and prevalence not well known because of lack of published literature on the subject
  - b. STD myth surrounding WSW
    - i. WSW are less likely to contract an STD than women who engage in sexual behavior with men
      - 1. Thought to have developed from safe sex education largely focusing on condom use and therefore leaving people with the impression that female-female sex is safer than heterosexual or male-male sex
  - c. Transmission of STDs in WSW
    - i. Via mucosal contact (“scissoring”), vaginal fluids, menstrual blood, skin-skin contact, sharing sex toys
  - d. Screening guidelines for WSW
    - i. Physicians should not assume that WSW are at lower risk for STDs than women who have sex with men
    - ii. Use same guidelines for STD testing for all women, regardless of sexual behaviors
    - iii. The guidelines published by the CDC in 2015 for STD screening in non-pregnant women are summarized in the table below:

<b>Chlamydia</b>
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<b>Women</b>	<ul style="list-style-type: none"> <li>• Sexually active women under 25 years of age<sup>1</sup></li> <li>• Sexually active women aged 25 years and older if at increased risk<sup>2</sup></li> <li>• Retest approximately 3 months after treatment<sup>3</sup></li> </ul>
<b>Gonorrhea</b>	
<b>Women</b>	<ul style="list-style-type: none"> <li>• Sexually active women under 25 years of age<sup>1</sup></li> <li>• Sexually active women age 25 years and older if at increased risk<sup>9</sup></li> <li>• Retest 3 months after treatment<sup>10</sup></li> </ul>
<b>Trichomonas</b>	
<b>Women</b>	<ul style="list-style-type: none"> <li>• *Consider for women receiving care in high-prevalence settings (e.g., STD clinics and correctional facilities) and for women at high risk for infection (e.g., women with multiple sex partners, exchanging sex for payment, illicit drug use, and a history of STD)<sup>17</sup></li> </ul>
<b>Herpes</b>	
<b>Women</b>	<ul style="list-style-type: none"> <li>• *Type-specific HSV serologic testing should be considered for women presenting for an STD evaluation (especially for women with multiple sex partners)<sup>17</sup></li> </ul>
<b>HIV</b>	
<b>Women</b>	<ul style="list-style-type: none"> <li>• All women aged 13-64 years (opt-out)**<sup>18</sup></li> <li>• All women who seek evaluation and treatment for STDs<sup>19</sup></li> </ul>
<b>HPV/Cervical Cancer</b>	

<b>Women</b>	<ul style="list-style-type: none"><li>• Women 21-29 years of age every 3 years with cytology</li><li>• Women 30-65 years of age every 3 years with cytology, or every 5 years with a combination of cytology and HPV testing<sup>23,24,25</sup></li></ul>
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### References:

Centers for Disease Control and Prevention. National Center for HIV/AIDS, Viral Hepatitis, STD, and TB Prevention. 2015 Sexually Transmitted Diseases Treatment Guidelines <https://www.cdc.gov/std/tg2015/screening-recommendations.htm>. Accessed: February 26, 2018.

Centers for Disease Control and Prevention. National Center for HIV/ AIDS, Viral Hepatitis, STD, and TB Prevention. Oral sex and HIV risk. <http://www.cdc.gov/hiv/pdf/risk/cdc-hiv-oral-sex-fact-sheet.pdf>. Accessed June 20, 2016.

Richters J, Prestage G, Schneider K, Clayton S. Do women use dental dams? Safer sex practices of lesbians and other women who have sex with women. *Sex Health*. 2010;7(2):165-169.

Knight DA, Jarrett D. Preventative Health Care for Women Who Have Sex with Women. University of Arkansas for Medical Sciences. *American Family Physician*. 2017 March. 95(5): 314-321.

### **Case #3: Pre-exposure prophylaxis for prevention of HIV transmission**

#### **Educational Goals:**

- Improve 2<sup>nd</sup> year medical student comfort with discussion of sensitive topics pertaining to sexual health and orientation prior to clinical rotations
- Encourage change in use of language by medical providers to become more inclusive of all gender identities and sexual orientations
- To provide basic knowledge of HIV transmission, risk factors for acquiring, testing, and prevention
- To educate healthcare providers on indications for, side effects and recommended monitoring for patients taking pre-exposure prophylaxis for HIV prevention

## **Background information:**

Setting: You are the family medicine physician working at a primary care outpatient clinic

Scenario: Robert Canello is a 28 year old male who is coming into your office today for an annual physical and to discuss starting pre-exposure prophylaxis.

### Objectives:

- Gather a focused patient history, including HPI, past medical, surgical, social, and sexual histories, with a focus on their sexual history
- Discuss patient's understanding of behaviors that increase his risk for HIV, and the methods that HIV is transmitted from one person to another
- Counsel patient on advantages and disadvantages of starting on pre-exposure prophylaxis for HIV prevention, including necessary follow-up care if he starts the medication

The encounter will last 20 minutes. An announcement will be made with 5 minutes and 1 minute remaining. Please wrap up your encounter upon hearing the 1 minute left warning.

## **Patient Information:**

You are a 28 year old male named Robert Canello who comes to his family doctor today for an annual checkup. In addition to your physical, you wish to discuss pre-exposure prophylaxis (PrEP) which you have heard about from several friends.

You are currently asymptomatic and are not having any acute medical problems. Your past medical history is significant for eczema and irritable bowel syndrome. You occasionally use hydrocortisone cream for your eczema flairs. You control your irritable bowel syndrome by trying to eat healthy and avoiding caffeine. You had surgery as a baby for inguinal hernias on both sides. You have never been diagnosed with any psychological illnesses.

You do not smoke. You drink alcohol most weekends at social events. You do not use any illicit or non-prescribed medications. You recently got out of a year-long relationship and have started dating casually again. You live with two roommates in an apartment. You work as an elementary school teacher at the local public school.

You are sexually active with male partners only. You recently began “going out” more with your friends to bars and have had sex with multiple partners since your break-up 6 months ago. You use condoms during sex “most of the time”. You have never had an STD in the past and have not been tested for HIV since your early 20’s. With your recent change in sexual activity, you want to discuss ways besides condoms to reduce your risk of getting HIV. One of your close friends has been on PrEP for several years and you would like to know more about it.

The rest of your history is negative and you can respond negatively to any further questioning by the medical student outside of the above described information.

## Learning Points:

### 1) Basic information on Human Immunodeficiency Virus (HIV)

#### a. Microbiology

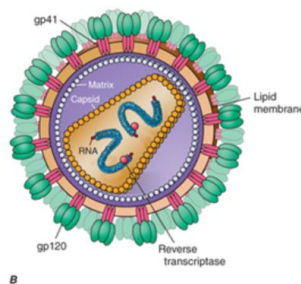
i. HIV is a retrovirus → RNA virus that converts RNA to DNA during replication via an enzyme called reverse transcriptase, with subsequent insertion of DNA into host genome

#### ii. Two types of HIV

1. HIV-1 → most common cause of HIV disease throughout the world
2. HIV-2 → originally identified in and confined to West Africa, has since spread to other regions in the world

#### iii. Structure

1. Provides molecular targets for HIV treatment and PrEP
2. Overall HIV has an icosahedral structure
3. Two major envelope proteins are gp120 and gp41
  - a. Gp120 protein on virus binds to CD4 on T-cells of host, allowing binding and entry into T-cells
4. Virions bud off of host cells resulting in the incorporation of a lipid membrane bilayer on outer surface



#### iv. Replication cycle of HIV

##### 1. Shown in figure below:

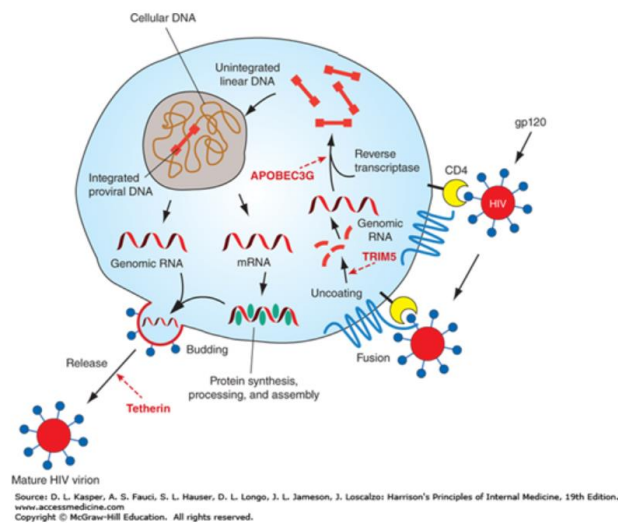
- a. Includes binding of virus into host cell via gp120:CD4 interactions, along with co-receptors CCR5 and CXCR4 on host cells
- b. Host cells targeted by HIV include CD4 T lymphocytes, macrophages and dendritic cells



- c. After initial binding, viral membrane fuses with the host cell membrane via gp41 located on the HIV virus, and the virus enters the cell
- d. The virus then uncoats the capsid protein shell surrounding the HIV RNA, and reverse transcriptase begins converting the RNA into double-stranded DNA (called proviral HIV-DNA)
- e. Proviral HIV-DNA then enters the host cell nucleus, where the HIV-DNA is integrated into the host cell genome via enzymes called integrases
- f. Host cell transcription and translation proceeds, producing viral proteins necessary for the creation of new viral particles. It also results in the generation of new genomic RNA to be packaged into HIV capsids of new viral particles.
- g. New virions are produced, and bud off of the host cell.

FIGURE 226-3

The replication cycle of HIV. See text for description. (Adapted from AS Fauci: *Nature* 384:529, 1996.)



## b. Transmission

### i. Mainly by sexual contact

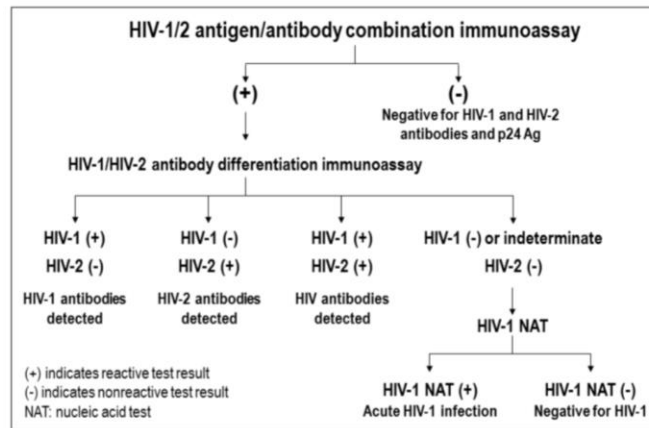
1. Receptive anal intercourse has highest risk of transmission in terms of probability of acquiring HIV per-act (138 per 10,000 exposures)
2. Insertive anal intercourse had the second highest probability for sexual contact transmission (11 per 10,000 exposures)

3. Anal intercourse considered more efficacious due to higher likelihood of traumatic tears in anal mucosa permitting HIV entry and due to the presence of immunological cells in anal mucosa (dendritic cells) allowing direct infection in the absence of mucosal tears
  4. Most commonly transmitted among heterosexual couples, especially in developing countries
    - a. Male to female transmission more efficient than female to male transmission, although both are less efficient than anal intercourse
  5. Presence of other STDs increases transmission of HIV
    - a. Especially the presence of genital ulcerations from organisms like HSV, syphilis and haemophilus ducreyi
    - b. Even STDs that do not result in ulceration are associated with increased HIV transmission (chlamydia, gonorrhoeae and trichomonas)
    - c. Bacterial vaginosis (not an STD) is also associated with increased HIV transmission
    - d. Treating other STDs besides HIV is effective in reducing the risk that your patient will contract HIV so this should be done as soon as possible
    - e. Follow CDC recommended guidelines for STD testing, and tailor your screening approach based on the patient's specific risk factors for STD acquisition
- ii. Also via blood/blood products
    1. With universal screening of blood products this has become a less common method of exposure
    2. If exposed via blood transfusion, has a very high probability of transmission (9250 per 10,000 exposures)
    3. Contact with blood during needle-sharing carries a probability of infection of 63 per 10,000 exposures
    4. Needle-sticks carry a probability of infection of 23 per 10,000 exposures
  - iii. Also via vertical transmission (mother to fetus in-utero) and breast milk
  - iv. Transmission is affected by viral load
    1. Viral load is directly correlated to the transmission rate of HIV per-coital act

c. Diagnosis

- i. Initial test will usually be an antigen/antibody combination test or an antibody alone test
  1. Rapid form available and must be confirmed with further testing
  2. Antigen tested is p24
  3. Algorithm for testing is shown below:

Recommended Laboratory HIV Testing Algorithm for Serum or Plasma Specimens

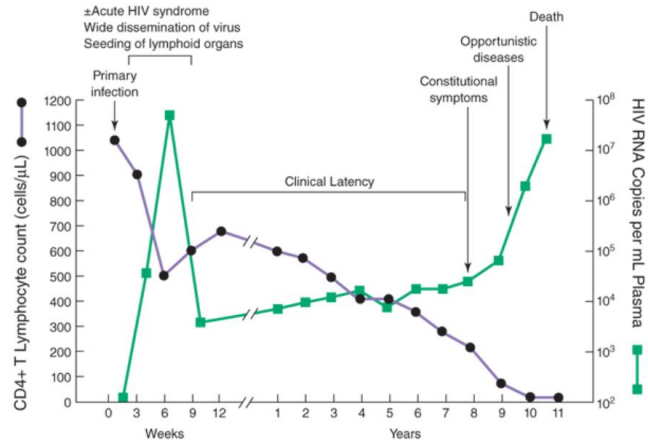


d. Disease progression in untreated adults

- i. Primary/Acute infection:
  1. High viral load, dissemination of disease to organ systems
  2. CD4 count will drop precipitously
  3. +/- acute HIV syndrome with largely constitutional symptoms including weight loss, fevers, night sweats, decreased appetite, fatigue
- ii. Clinical latency/Persistent infection:
  1. Continued viral replication but maintained at relatively stable level by individual's immune response, CD4 count recovers slightly and remains at stable level
  2. No clinical symptoms
- iii. Advanced HIV/AIDs:
  1. Viral replication surges, CD4 count drops
  2. Constitutional symptoms re-emerge
  3. Opportunistic infections develop
  4. CD4 count <200 or AIDs defining illness occurs → officially diagnosed with AIDs
- iv. Clinical course summarized below:

FIGURE 226-17

Typical course of an untreated HIV-infected individual. See text for detailed description. (From G Pantaleo et al: *N Engl J Med* 328:327, 1993. Copyright 1993 Massachusetts Medical Society. All rights reserved.)



Source: D. L. Kasper, A. S. Fauci, S. L. Hauser, D. L. Longo, J. L. Jameson, J. Loscalzo: *Harrison's Principles of Internal Medicine*, 19th Edition. www.accessmedicine.com Copyright © McGraw-Hill Education. All rights reserved.

## 2) Counseling on high risk behavior and risk reduction

### a. Counseling for risk reduction based largely on transmission methods described above

- i. For patients with high risk sexual encounters you should encourage condom use and frank discussions with their partners about their exposure potential
- ii. Recommend testing for both your patient and their new partners before intercourse
- iii. For patients who are intravenous drug users recommend no needle sharing (look for local services that exchange needles), reduction or discontinuation of IV drug use if patient willing, consider rehab referral

## 3) Guidelines for HIV testing

- a. Center for Disease Control guidelines were most recently updated in 2017 after a systematic literature review
- b. According to these guidelines asymptomatic men who have sex with men (MSM) should be screened at least once per year
- c. The decision to screen more frequently (every 3 or 6 months) is based on the patient's specific risk factors for acquiring HIV and local statistics on HIV prevalence and transmission

## 4) Pre-exposure prophylaxis (PrEP)

- a. Medications used

- i. Fixed-dose combination of 300 mg tenofovir with 200 mg emtricitabine → only FDA approved medication for PrEP
    - 1. Brand-name is Truvada
  - ii. Shown to be safe and effective for MSM, IV drug users, heterosexual men and women who are at significant risk of HIV exposure
  - iii. Also to be considered for HIV-discordant couples (one partner has confirmed HIV + status)
  - iv. Not enough data confirming safety and efficacy for teenagers
    - 1. Must consider their risk level of HIV exposure and ability to make own decisions with or without parental involvement
- b. Prior to starting
- i. Must exclude primary or chronic HIV testing using above described laboratory testing methods
  - ii. Also screen patient for constitutional symptoms and postpone starting PrEP until you confirm patient is HIV negative
  - iii. Baseline kidney function testing (BUN/Cr)
- c. Side effects:
- i. Headache, nausea, flatulence
  - ii. Possible acute renal injury/failure
    - 1. Signs of acute renal injury → decreased urinary output, fluid retention (swelling of extremities, shortness of breath), headache, nausea, fatigue, confusion, seizures, coma and death
- d. Laboratory monitoring:
- i. Every 3 months
    - 1. Laboratory testing for HIV infection
    - 2. Pregnancy testing if applicable
    - 3. Refill with no more than 90 day supply because must re-test for HIV
  - ii. Every 6 months
    - 1. Renal function reassessed (BUN/Cr/Estimated Cr clearance)
      - a. Can continue PrEP even in Cr increases as long as GFR > 60 ml/min
    - 2. Other STD testing (syphilis, chlamydia, gonorrhea)
  - iii. Every 12 months
    - 1. Re-evaluate need for continuing PrEP

Resources:

DiNenno EA, Prejean J, Irwin K, et al. Recommendations for HIV Screening of Gay, Bisexual, and Other Men Who Have Sex with Men — United States, 2017. *MMWR Morb Mortal Wkly Rep* 2017;66:830–832. DOI: <http://dx.doi.org/10.15585/mmwr.mm6631a3>.

Fauci AS, Lane H. Human Immunodeficiency Virus Disease: AIDS and Related Disorders. In: Kasper D, Fauci A, Hauser S, Longo D, Jameson J, Loscalzo J. eds. *Harrison's Principles of Internal Medicine, 19e* New York, NY: McGraw-Hill; 2014. <http://accessmedicine.mhmedical.com.ezproxy2.library.drexel.edu/content.aspx?bookid=1130&sectionid=79738808>. Accessed March 24, 2018.

Quick reference guide - Laboratory testing for the diagnosis of HIV infection : updated recommendations. *Centers for Disease Control and Prevention*. Published June 2014. <https://stacks.cdc.gov/view/cdc/23446> Accessed April 5, 2018.

HIV testing. *Division of HIV/AIDS Prevention, National Center for HIV/AIDS, Viral Hepatitis, STD, and TB Prevention, Centers for Disease Control and Prevention*. Updated January 2018. <https://www.cdc.gov/hiv/testing/index.html> Accessed April 5, 2018.

United States Public Health Service. Pre-exposure prophylaxis for the prevention of HIV infection in the United States- 2014. *Centers for Disease Control and Prevention*. <https://www.cdc.gov/hiv/pdf/guidelines/PrEPguidelines2014.pdf> Accessed April 5, 2018.