HIV Risk & Prophylaxis After Sexual Assault:

A Companion to the HIV nPEP Access Toolkit

Objectives

- Outline the stages of HIV and the clinical symptoms associated with each;
- Identify the level of risk associated with sexual assault using the resources from the CDC and other organizations;
- Summarize the CDC recommended HIV antiretroviral treatment (nPEP) regimens for survivors of sexual assault;
- List recommendations for initial baseline labs, follow up labs and testing schedule;
- Discuss the elements of a comprehensive discharge planning process

Disclaimer

- Due to periodic changes in standards of care and non-occupational post exposure (nPEP) guidelines, it is imperative that healthcare professionals refer to the most recent clinical guidelines and confirm the information contained in this presentation. Additionally, each clinician should refer to their own individual state practice acts and facility guidelines.
- Any references or sample documentation that is provided or reviewed, are done so by way of example only and are not intended to replace facility policy or legal team guidance and advice. Any use in practice and/or alteration of provided documents is the responsibility of the user.
- This presentation and the referenced toolkit is for informational purposes only and is not intended to replace professional medical advice or current U.S. Public Health Guidelines. If there are questions regarding the provision of nPEP, healthcare professionals should contact the National Clinician Consultation Center PEPline at 1-888-448-4911

What is HIV?

What is HIV?

- HIV stands for Human Immunodeficiency Virus
- HIV is a viral infectious disease that is transmitted by body fluids.
- HIV does not currently have a cure and can develop into AIDS (Acquired Immunodeficiency Syndrome)
- HIV can cause significant immunological deficiency that predisposes a person to life threatening illnesses
- HIV destroys CD4 cells, often referred to as T helper cells
- CD4/T cells help the immune system fight off infections
- Untreated HIV reduces the number of these cells making it harder to fight off some diseases

Stages of HIV



Acute HIV Infection

- 40-90% of people have flu-like symptoms within 2-4 weeks of infection
- Large amounts of virus being produced in the body
- Some people never feel sick during the early stage
- Symptoms last a few days to a few weeks
- Tests may be negative, but patient can still be highly infectious
- Fever, chills, rash, night sweats, muscle aches, sore throat, fatigue, swollen lymph nodes, mouth ulcers

Clinical Latency (Chronic Infection)

- HIV is still active but reproduces at low levels
- Mild to no symptoms
- If not on Antiretroviral Therapy (ART) latent period can last up to a decade
- If on ART latent period can last several decades
- Still can transmit even if asymptomatic

AIDS Symptoms

- Rapid weight loss
- Recurring fever or profuse night sweats
- Extreme and unexplained tiredness
- Prolonged lymphadenopathy
- Prolonged diarrhea
- Sores in the mouth, anus or genitals
- Pneumonia
- Red, brown, pink, or purplish blotches on or under the skin or inside the mouth, nose, or eyelids
- Memory loss, depression, other neuro disorders

AIDS

- CD4 count <200 (normal is 500-1600 cells/mm3)
- Opportunistic illness, regardless of CD4 count
- Survival without treatment usually about 3 years
- If you have opportunistic illness, usually about a year

Opportunistic Infections/diseases

- Upper or lower airway Candidiasis
- Invasive cervical cancer
- Coccidioidomycosis
- Cryptococcus
- Cryptosporidiosis, chronic
- Cytomegalovirus (CMV)
- HIV Encephalopathy
- Chronic HSV
- Histoplasmosis
- Isosporiasis, chronic
- Kaposi's sarcoma

- Lymphoma
- Tuberculosis (TB)
- MAC disseminated or extrapulmonary
- Pneumocystis jirovecii pneumonia
- Recurrent pneumonia
- Progressive multifocal leukoencephalopathy
- Recurrent Salmonella septicemia
- Toxoplasmosis of brain
- Wasting syndrome of HIV

What is this Virus?

- DNA—deoxyribonucleic acid
- RNA—ribonucleic acid
- Retrovirus
 - Contains an RNA-dependent DNA polymerase (a reverse transcriptase)
 - Directs synthesis of a DNA form of the viral genome after infection of the host cell
 - RNA is transcribed into DNA in the host cell
 - This was a big deal!
 - Always thought that it was DNA—RNA—protein
 - Similar process occurs in some tumors
 - Being investigated for gene therapy



Replication



Why So Insidious?

- Uses CD4+T cells to replicate and destroys them in the process
 - Direct infection and destruction of cells
 - Immune clearance of infected cells
 - Immune exhaustion due to aberrant cellular activation
 - Activation-induced cell death
- Constantly adapting to body conditions and medications
- Interestingly, there are certain genes that allow a slow progression or even protection

HIV 1 and HIV 2

- Genetic differences
- HIV 1 has more genes which code for proteins involved in modifying the host cell to enhance virus growth and the regulation of viral gene expression
- Thought that it is these genes that control pathogenesis of HIV disease
- HIV 1 most common in the US
- HIV 2 has lower transmissibility and has reduced likelihood of progression to AIDS

Testing

Nucleic Acid Test (NAT)—looks for the virus RNA in the blood

 10-33 days after exposure Antigen/Antibody Combination Tests (4th & 5th generation)

- HIV p24 antigen as well as HIV IgM and IgG
- 18-45 days if from venipuncture sample
- 18-90 days from finger prick sample

Antibody Tests

- Detects HIV IgM and IgG
- 23-90 days
- This is most rapid and self-tests



* Western blot is no longer used for HIV.

(Centers for Disease Control and Prevention [CDC], 2023)

It FDA-approved Tests for HIV.

History & Statistics

History



United States HIV Statistics

- Over 1 million people living with HIV
- Annual HIV infections have reduced by more than 2/3 since the mid-1980's
 - Approximately 34,800 new infections in the United States in 2019
- CDC estimates show new HIV infections declined 8% from 2015-2019 after a period of general stability
- HIV diagnoses are not evenly distributed across the states
- Younger people most likely not to know they have HIV

atistics

are **unaware** of their infection.

1 in 7 living with HIV



Pennsylvania Statistics 2020

- There were 36,613 people living with HIV in Pennsylvania.
- 335/100,000 people were living with HIV
 - 72% of these were men
 - Just over 70% were non-white
 - 98.5% were age 25 years and older
- 775 people were newly diagnosed with HIV.
 - Statistics were similar though age group of 13-24 years made up almost 21% of this group
 - 23.7% of new diagnosis were "late diagnosis"
 - Having AIDS within three months of initial HIV diagnosis

People living with HIV in Pennsylvania (2020)



(AIDSVu, n.d.)

Using Statistics in Practice

- Should be used to reinforce need for prophylaxis, not to dissuade
- Understanding risk in your area/population can help ensure best outcomes for victims
- PA Department of Health releases statistics
 - These can lag somewhat
 - If you have a local health department they can also provide statistics
 - State data can also be found on the AIDSVu Website
 - https://aidsvu.org/local-data/united-states/northeast/pennsylvania/

HIV Transmission

Myths about HIV Transmission









HUGGING, SHAKING, HANDS, SHARING TOILETS, SHARING DISHES, CLOSED MOUTH KISSING SALIVA, TEARS, SWEAT NOT MIXED WITH BLOOD MOSQUITOES, TICKS OR OTHER BLOOD-SUCKING INSECTS

THROUGH THE AIR

How is HIV Actually Transmitted?

Blood, semen, pre-seminal fluid, rectal fluids, vaginal fluids, breast milk

Fluids must come in contact with a mucous membrane or be directly injected into the blood

In the US, the highest risk sexual behavior is receptive anal sex

Either partner can contract through vaginal sex

HIV can live in a needle up to 42 days!

How Else is HIV Transmitted?

- From mom to baby during pregnancy, breast feeding or both
- Being stuck with a contaminated sharp
- Rare
 - Oral sex—highest risk is ejaculation into the mouth
 - Blood transmissions and organ donation
 - Eating pre-chewed food....infant cases
 - Being bitten by a person with HIV
 - Contact between blood and open wounds
 - Open mouth kissing with mouth wounds

Transmission Rates per Act

Vaginal Intercourse 0.1-0.2% Receptive Rectal Intercourse 0.5-3%

Oral even lower risk May need to have conversation about how to interpret these numbers

Exposure type	Rate for HIV acquisition per 10,000 exposures		
Parenteral			
Blood transfusion	9,250		
Needle sharing during injection drug use	63		
Percutaneous (needlestick)	23		
Sexual			
Receptive anal intercourse	138		
Receptive penile-vaginal intercourse	8		
Insertive anal intercourse	11		
Insertive penile-vaginal intercourse	4		
Receptive oral intercourse	Low		
Insertive oral intercourse	Low		
Other ^b			
Biting	Negligible		
Spitting	Negligible		
Throwing body fluids (including semen or saliva)	Negligible		
Sharing sex toys	Negligible		

Table 1. Estimated per-act risk for acquiring human immunodeficiency virus (HIV) from an infected source, by exposure act^a

Source: http://www.cdc.gov/hiv/policies/law/risk.html

^a Factors that may increase the risk of HIV transmission include sexually transmitted diseases, acute and late-stage HIV infection, and high viral load. Factors that may decrease the risk include condom use, male circumcision, antiretroviral treatment, and preexposure prophylaxis. None of these factors are accounted for in the estimates presented in the table.

^b HIV transmission through these exposure routes is technically possible but unlikely and not well documented.

HIV Treatment & Prevention

Treatment

- Antiretroviral therapy (ART) is the term for the medication
- Introduced in the 1990's
- In the US people who are diagnosed with HIV and who start treatment early can live as long as a person without HIV
- Skipping doses or starting and stopping medication can lead to drug resistance

Classes of Medications

- Non-nucleoside reverse transcriptase inhibitors (NNRTIs)
- Nucleoside reverse transcriptase inhibitors (NRTIs)
 - Emtricitabine (FTC), tenofovir disoproxil fumarate (TDF), zidovudine (AZT)
- Protease inhibitors (PIs)
 - Ritonavir (RTV)
- Fusion inhibitors
- CCR5 antagonists
- Integrase strand transfer inhibitors (INSTIs)
 - raltegravir (RAL-Isentress), dolutegravir (DTG--Tivicay)
- Post-attachment inhibitors
- Attachment Inhibitors
- Pharmacokinetic enhancers



Treatment Regimens

- 2 NRTIs, an INSTI an NNRTI or a PI with a booster
 - Example: emtricitabine & tenofovir disoproxil fumarate (Truvada) + raltegravir (Isentress)
- Boosters—cobicistat (Tybost), ritonavir (Norvir)
- Other adaptations are made if there is resistance or tolerance issue
- Renal and hepatic function are important to monitor as well

The HIV Life Cycle

HIV medicines in seven drug classes stop () HIV at different stages in the HIV life cycle.



(National Institutes of Health, 2021b)

Side Effects of Medications



Is it Working?

- Viral load is the amount of HIV in a person's blood.
- A main goal of ART is to reduce a person's viral load to an undetectable level.
- Once effective ART is started, it usually takes 3 to 6 months for a person's viral load to reach an undetectable level.
- Having an undetectable viral load doesn't mean a person's HIV is cured.
- People with HIV who maintain an undetectable viral load have effectively no risk of transmitting HIV to their HIV-negative partner through sex.

Resistance

- Drug resistance can be found in some people before beginning treatment
 - Up to 10% of adults starting treatment can have resistance to NNRTI class
- Medications cannot prevent HIV from multiplying
- Variations of HIV will develop while on ART
- Can be infected with drug-resistant strain or develop drug resistance
- There is drug resistance testing that can be done prior to starting testing
- Adherence to medication regimen is key to minimizing resistance

HIV Non-occupational Post-exposure Prophylaxis

Non-Occupational Post-Exposure Prophylaxis (nPEP)

Need to start treatment as soon as possible Close follow-up and up to 72 hours after the assault Adhere to Potential recommended adverse effects dosing

Assessing Risk of HIV from Sexual Assault

- Frequency of seroconversion from sexual assault or abuse is likely low
 - Between 0.1 and 3% depending on the circumstances of the assault
- Specific circumstances of assault may increase risk
- Reduction of 81% with a 28-day course of an ARV is the baseline—this comes from occupational percutaneous exposure
- Additional evidence has been compiled from animal studies, evaluation of ARTs given post-partum, and in observational studies (such as from PEP programs).
 - In studies showing seroconversion while on PEP, factors included continued increased risk behaviors, non-adherence, and starting after the 72 hour window

How to Determine Risk

- CDC has an algorithm
- Adapt for your facility
- Know your regional statistics
- Be able to have a conversation about the risk and what starting a regimen means

Algorithm for Evaluation and Treatment of Possible Nonoccupational HIV Exposures



(CDC, 2022c)

Risk Category	Clinical / Historical Findings	Recommendation for Non- Occupational Post Exposure Prophylaxis	Medication Recommendation
High	 Penetration assault by one or more assailants known to be HIV positive or at high risk of HIV infection. (Injection drug users, men who have sex with men) * and / or Anal penetration with or without injuries ** * HIV virus prevalence among convicted sex offenders may be twice the general male population which emphasizes the higher risk of HIV exposure following sexual assault. ** Injuries include trauma / tearing of mucosal tissue and bleeding or presence of blood. 	Strongly Recommended	Truvada, (Emtracitabine, 200 mg/ Tenofovir 300 mg), 1 tablet po daily x 28 days And Isentress (Raltegravir 400 mg), 1 tablets po twice daily x 28 days
Moderate High	 Penetration assault by one or more assailants of unknown HIV status with vaginal injuries and known or unsure ejaculation and no or uncertain condom use. Penetration assault in the presence of sexually transmitted infection, genital lesion, IUD, menstruation. Penetration assault by one or more uncircumcised assailants of unknown HIV status. 	Recommended	As per High Risk
Moderate Low	• Penetration assault by one or more assailants of unknown HIV status with no vaginal injuries with ejaculation or vaginal injuries without ejaculation.	Optional	As per High Risk
Low Risk	 No anal or vaginal penetration No ejaculation from the assailant Oral penetration only Condom use Assailant known to be HIV negative Bite injury unless the biter's mouth was bloody and the exposed patient's skin is visibly broken 	Not Recommended	None
N/A	• Assault occurred greater than 72 hours ago		Consult ID or NPEP Hotline 1-888-448-4911 as needed

What Part of the Medical-Forensic History is Important?

Medical history

Allergies

Medications currently taking

Details of the assault

What information about the assault is important?

- When did the assault occur
 - What if they don't know?
- What parts of the patient's body were touched by the assailant's body?
 - Was there just touching or was their penetration?
 - Must consider oral cavity, anus/rectum, vagina, penis
- How many assailants were there?
- If the assailant was a biological male, did he/they ejaculate?
- Is the assailant's HIV status known?
- Condom use

What Part of the Medical Forensic Exam is Important?

Are there any injuries to mucous membranes

• Mouth, vagina, rectum

Are there any breaks in the skin where there could have been body fluid exposure

- Bite mark
- Shared needles

There is often NOT genital injury in a sexual assault

 This is one of the biggest challenges from a prosecution and a mental health/trauma perspective

Other Considerations

- Often cannot determine if the assailant is HIV positive
- Necessity of early initiation of nPEP (72 hours)
- Importance of close follow-up
- The benefit of adherence to recommended dosing
- Potential adverse effects of ARTs
 - Severe adverse effects are rare from nPEP
 - Reactivation of Hep B
 - Nausea, vomiting, diarrhea, fatigue are most common side effects
- Minimal drug-drug interactions
 - First dose given, then consultation

Age group	Preferred/ alternative	Medication
Adults and adolescents aged ≥ 13 years, including pregnant women, with normal renal function (creatinine clearance ≥ 60 mL/min)	Preferred	A 3-drug regimen consisting of tenofovir DF 300 mg and fixed dose combination emtricitabine 200 mg (Truvada ^c) once daily with raltegravir 400 mg twice daily or dolutegravir 50 mg once daily
	Alternative	A 3-drug regimen consisting of tenofovir DF 300 mg and fixed dose combination emtricitabine 200 mg (Truvada) once daily with darunavir 800 mg (as 2, 400-mg tablets) once daily and ritonavir ^b 100 mg once daily

Table 5. Preferred and alternative antiretroviral medication 28-day regimens for nPEP^{a,b}

Children aged 2–12 years	Preferred	A 3-drug regimen consisting of tenofovir DF, emtricitabine, and raltegravir,
		with each drug dosed to age and weight
	Alternative	A 3-drug regimen consisting of
		zidovudine and lamivudine
		with
		raltegravir
		or
		lopinavir/ritonavir ^ь ,
		with raltegravir and lopinavir/ritonavir dosed to age and weight
	Alternative	A 3-drug regimen consisting of
		tenofovir DF and emtricitabine and lopinavir/ritonavir [,]
		with each drug dosed to age and weight

Additional Testing & Considerations

- Baseline labs—Liver function testing, BUN/creatinine
- Pregnancy test
- HIV test
 - CDC does not recommend a separate consent but still a roadblock in some facilities
- Hepatitis B & C and Syphilis testing
- Other STI screening
- Giving first doses of nPEP—first 3-7 days should be given
- What if they are high risk but decline?
- Can we test the assailant?

Recommended Schedule of Laboratory Evaluations of Source and Exposed Patients for Providing nPEP With Preferred Regimens

Test	Source Baseline	Baseline	4–6 Weeks After Exposure	3 Months After Exposure	6 Months After Exposure
		For all patients cons	idered for or prescribe	d nPEP for any expos	ure
HIV Ag/Ab testing ^a (or antibody testing if Ag/Ab test unavailable)					•
HBV serology, including: HBV surface antigen HBV surface antibody HBV core antibody			_	_	.
HCV antibody test			_	_	d
	For all patients considered for or prescribed nPEP for sexual exposure				
Syphilis serology ^e				_	
Gonorrheat			9	-	-
Chlamydia ^r			9	_	-
Pregnancy ^h	_			_	-
	For patients prescribed: TDF + F + RAL or TDF + F + DTG				
Serum creatinine (for calculating estimated creatinine clearance ⁱ)	_			_	-
Alanine transaminase, aspartate aminotransferase	_			_	-

- a. Any positive or indeterminate HIV antibody test should undergo confirmatory testing of HIV infection status.
- b. Only if HCV infection was acquired during the original exposure; delayed HIV seroconversion has been seen in people who simultaneously acquire HIV and HCV infection.
- c. If exposed person susceptible to HBV at baseline.
- d. If exposed person susceptible to HCV at baseline.
- e. If determined to be infected with syphilis and treated, should undergo serologic syphilis testing 6 months after treatment.
- f. Testing for chlamydia and gonorrhea should be performed using nucleic acid amplification testing. For patients diagnosed with a chlamydia or gonorrhea infection, retesting 3 months after treatment is recommended. Comprehensive STI testing and treatment guidelines are available from CDC: cdc.gov/std/treatment-guidelines/default.htm.
 - a. Screening of transgender and gender-diverse patients should be based on anatomy and sexual behaviors and exposure. Access CDC's full screening recommendations: cdc.gov/std/ treatment-guidelines/screeningrecommendations.htm.
 - b. For men or people assigned male at birth reporting insertive vaginal, anal, or oral sex, a urine specimen (preferred) or urethral swab should be tested for chlamydia and gonorrhea.
 - c. For women or people assigned female at birth reporting receptive vaginal sex, a vaginal (preferred) or endocervical swab or urine specimen should be tested for chlamydia and gonorrhea.
 - d. For any patient reporting receptive anal sex, a rectal swab specimen should be tested for chlamydia and gonorrhea.
 - e. For any patient with urogenital or rectal gonorrhea reporting receptive oral sex, pharyngeal testing for gonorrhea should be performed. If chlamydia is identified while screening for pharyngeal gonorrhea, provide appropriate treatment. Review CDC's guidelines for treating gonococcal infections: cdc.gov/std/treatmentguidelines/gonorrhea-adults.htm.
- g. If not provided presumptive treatment at baseline or if symptomatic at follow-up visit

Discharge Planning

- Discharge paperwork with clear instructions for follow up
 - PA DOH paperwork has discharge section
 - Resources for discharge also on the toolkit site
- HIV test at 6 weeks and 3 months as well as other STI testing
- Referrals for follow-up
 - PCP, OBGYN, local clinic
 - PrEP
- Referral to Rape Crisis Center/Advocacy Organization
- Education on reducing risk of transmission in the 12 week follow up period

VCAP and NPEP

- Victims Compensation Assistance Program (VCAP)
 - State funding that provides financial assistance to victims of crime, including co-pays, and other out of pocket medical expenses
- Medications provided at the hospital/clinic should be included in the visit, which is billed to VCAP by the facility
- Majority of healthcare facilities provide first 3-7 days of medication and then a prescription for the remainder of the 28 days
 - Patient will have to pay out of pocket for this though amount will vary
- If the patient has out of pocket costs, those can be submitted for reimbursement
- Learn more about PA VCAP
 - <u>https://www.pccd.pa.gov/Victim-Services/Pages/Victims-Compensation-Assistance-Program-(VCAP).aspx</u>

VCAP Compensation Considerations

- Crime must have occurred in Pennsylvania
- Crime must be reported to proper authorities
 - This is for costs outside of those associated with the "Forensic Rape Exam"
- The claim must be filed within 5 years
- The victim must have a minimum loss of at least \$50 (if less than 60 years of age)
- Advocates can be a key resource in assisting survivors to complete forms and file claims

PA Code 28, Chapter 117-Emergency Services

- (a) A hospital shall provide a sexual assault victim with an assessment of the victim's risk for contracting a sexually transmitted disease, hepatitis and HIV.
- (b) The hospital shall base the risk assessment upon the following considerations:
 - (1) Available information regarding the assault as well as the subsequent findings from medical examinations and tests that may be conducted.
 - (2) Established standards of risk assessment, including consideration of recommendations made by the United States Department of Health and Human Services Centers for Disease Control and Prevention.
- (c) In addition to the assessment required in subsection (a), a hospital shall advise a sexual assault victim of sexually
 transmissible diseases, hepatitis and HIV, for which postexposure prophylaxis exists, and for which deferral of treatment
 would either significantly reduce treatment efficacy or would pose a substantial risk to the individual's health.
- (d) Upon the victim's consent, the hospital shall provide the victim with an initial dosage of up to 72 hours of postexposure prophylactic treatment for sexually transmissible diseases, hepatitis and HIV, and provide the victim with information and prescriptions necessary to obtain the remainder of the treatment regimen. A hospital will not be required to comply with this subsection when risk evaluation, adopted by the United States Department of Health and Human Services Centers for Disease Control and Prevention, clearly recommends against the application of postexposure prophylaxis

Assisting Patients in Obtaining NPEP Medications

Patient Medication Assistance Programs

- Both Gilead (Truvada) and Merck (Isentress) have voucher and co-pay card options on their websites
- Multiple steps for application and must be filled out with patient and prescriber
 - Income requirements
 - Basic patient info
 - Prescriber info
 - Indication that no insurance or inadequate insurance coverage
- The company must approve the patient
- Co-pay cards are also available with less restrictions

Medication Vouchers & Co-pay cards

- www.gileadadvancingaccess.com
- www.merckhelps.com
- www.tevahivgenerics.com
- If you are using another medication, can explore drug company site for voucher and/or co-pay card information
- Generics will not have this option
- Can also explore other discount programs (GoodRx, WellRx, SingleCare, etc.)
- Partnership for Prescription Assistance
 - <u>https://medicineassistancetool.org/</u>

Other resources

- Community resources
 - Provider list available on toolkit page
- CDC HIV Prevention Page
 - <u>https://www.cdc.gov/hiv/basics/prevention.html</u>
- AIDS Education and Training Center
 - https://aidsetc.org/
- CDC STI guidelines
 - <u>https://www.cdc.gov/std/treatment-guidelines/default.htm</u>
 - <u>https://www.cdc.gov/std/treatment-guidelines/toc.htm</u>
- CDC HIV basics
 - <u>https://www.cdc.gov/hiv/basics/index.html</u>

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Help

National Clinician's Post Exposure Prophylaxis Hotline 1-888-448-4911

References

AIDSVu. (nd). Local data: Pennsylvania. Emory University, Rollins School of Public Health. https://aidsvu.org/local-data/united-states/northeast/Pennsylvania/

Centers for Disease Control and Prevention. (2016). Updated guidelines for antiretroviral postexposure prophylaxis after sexual, injections drug use, or other nonoccupational exposure to HIV—United States, 2016. <u>https://www.cdc.gov/hiv/pdf/programresources/cdc-hiv-nPEP-guidelines.pdf</u>

Centers for Disease Control and Prevention. (2021a). *AIDS and opportunistic infections* [Webpage]. U.S. Department of Health and Human Services. <u>https://www.cdc.gov/hiv/basics/livingwithhiv/opportunisticinfections.html</u>

Centers for Disease Control and Prevention. (2021b). *Sexual assault and abuse and STIs—Adolescents and adults* [Webpage]. U.S. Department of Health and Human Services. <u>https://www.cdc.gov/std/treatment-guidelines/sexual-assault-adults.htm</u>

Centers for Disease Control and Prevention. (2022a). HIV basics [Webpage]. U.S. Department of Health and Human Services. https://www.cdc.gov/hiv/basics/index.html

Centers for Disease Control and Prevention. (2022b). *HIV incidence* [Webpage]. U.S. Department of Health and Human Services. <u>https://www.cdc.gov/hiv/statistics/overview/in-us/incidence.html</u>

Centers for Disease Control and Prevention. (2022c). A guide for healthcare providers: PEP for HIV prevention: FAQs. (Pub No. 300985), U.S. Department of Health and Human Services. <u>https://www.cdc.gov/stophivtogether/library/topics/prevention/brochures/cdc-lsht-prevention-brochure-pep-faq-provider.pdf</u>

Centers for Disease Control and Prevention. (2023). Which HIV tests should I use [Webpage]? https://www.cdc.gov/hiv/clinicians/screening/tests.html

Commonwealth of Pennsylvania. (2008). Prevention of sexually transmitted diseases. (Title 28. Chapter 117. 28 Pa. Code § 117.54.). http://www.pacodeandbulletin.gov/Display/pacode?file=/secure/pacode/data/028/chapter117/s117.54.html&d=reduce

Longo, D. L. Kasper, D. L. Jameson, J. L., Fauci, A. S., Hauser, S. L., & Loscalzo, J. (Eds). (2012). Harrison's principles of internal medicine (18th ed., Vol.1). McGraw-Hill.

National Institute of Allergy and Infectious Diseases. (2018). *HIV replication cycle* [Webpage]. National Institutes of Health. <u>https://www.niaid.nih.gov/diseases-conditions/hiv-replication-cycle</u>

References

National Institutes of Health (2021a). HIV overview: The HIV life cycle [Webpage]. https://hivinfo.nih.gov/understanding-hiv/fact-sheets/hiv-life-cycle

National Institutes of Health (2021b). *HIV treatment: Drug resistance* [Webpage]. <u>https://hivinfo.nih.gov/understanding-hiv/fact-sheets/drug-resistance</u> National Institutes of Health. (2022a). *HIV treatment overview* [Webpage]. <u>https://www.hiv.gov/hiv-basics/staying-in-hiv-care/hiv-treatment/hiv-treatment-overview/</u> National Institutes of Health (2022b). *What are HIV and AIDS* [Webpage]? <u>https://www.hiv.gov/hiv-basics/overview/about-hiv-and-aids/what-are-hiv-and-aids/</u>

Pennsylvania Commission on Crime and Delinquency. (n.d.). *Helping crime victims: Offsetting the cost of crime* [Webpage]. <u>https://www.pccd.pa.gov/Victim-Services/Pages/Victims-Compensation-Assistance-Program-(VCAP).aspx</u>

Pennsylvania Department of Health. (2023). *Sexual assault evidence collection* [Webpage]. <u>https://www.health.pa.gov/topics/programs/violence-prevention/Pages/Sexual-Assault-Evidence-Collection.aspx</u>

Sheridan, T. G., & Callaway, T. R. (2016). Improving emergency department care to sexual assault survivors using a risk stratification tool. *Open Medicine Journal, 3* (Suppl 2: M4), 194–201. <u>http://dx.doi.org/10.2174/1874220301603010194</u>

U.S. Department of Health & Human Services. (2022a). *HIV basics: Global statistics* [Webpage]. <u>https://www.hiv.gov/hiv-basics/overview/data-and-trends/global-statistics/</u>

U.S. Department of Health & Human Services. (2022b). *HIV basics; Paying for HIV care and treatment* [Webpage]. <u>https://www.hiv.gov/hiv-basics/staying-in-hiv-care/hiv-treatment/paying-for-hiv-care-and-treatment/</u>

U.S. Department of Health & Human Services. (2022c). *HIV basics: U.S. statistics* [Webpage]. <u>https://www.hiv.gov/hiv-basics/overview/data-and-trends/statistics/</u> World Health Organization. (2022). *HIV drug resistance*. <u>https://www.who.int/news-room/fact-sheets/detail/hiv-drug-resistance</u>

References

•Pennsylvania Department of Health. (2023). *Sexual assault evidence collection*. Pennsylvania Department of Health. Retrieved March 9, 2023 from <u>https://www.health.pa.gov/topics/programs/violence-prevention/Pages/Sexual-</u> <u>Assault-Evidence-Collection.aspx</u>

•Sheridan, T.G., & Callaway, T.R. (2016). Improving emergency department care to sexual assault survivors using a risk stratification tool. *Open Medicine Journal, 3* (Suppl 2:M4) 194-201. DOI: <u>10.2174/1874220301603010194</u>

•U.S. Department of Health & Human Services. (2022, August 3). *HIV basics: Global Statistics*. U.S. Department of Health & Human Services. Retrieved March 9, 2023 from <u>https://www.hiv.gov/hiv-basics/overview/data-and-trends/global-statistics/</u>

•U.S. Department of Health & Human Services. (2022, October 27). *HIV basics: U.S. statistics*. U.S. Department of Health & Human Services. Retrieved March 9, 2023 from <u>https://www.hiv.gov/hiv-basics/overview/data-and-trends/statistics/</u>

•U.S. Department of Health & Human Services. (2022, October 6). *HIV Basics; Paying for HIV Care and Treatment*. Retrieved March 9, 2023 from <u>https://www.hiv.gov/hiv-basics/staying-in-hiv-care/hiv-treatment/paying-for-hiv-care-and-treatment/</u>

•World Health Organization. (2022, November 17). *Fact sheet: HIV drug resistance*. World Health Organization. Retrieved March 9, 2023, from <u>https://www.who.int/news-room/fact-sheets/detail/hiv-drug-resistance</u>