Navigating the Treatment of Sexually Transmitted Infections (STI's)

Russell "Rusty" Rooms, DNP, APRN-CNP

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Relevant Financial Disclosure(s)

Russell R. Rooms, DNP, APRN-CNP

- I have nothing to disclose

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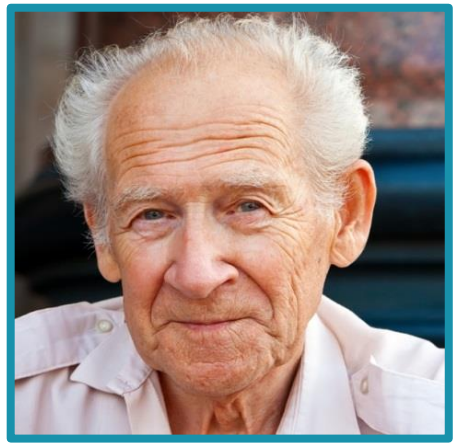
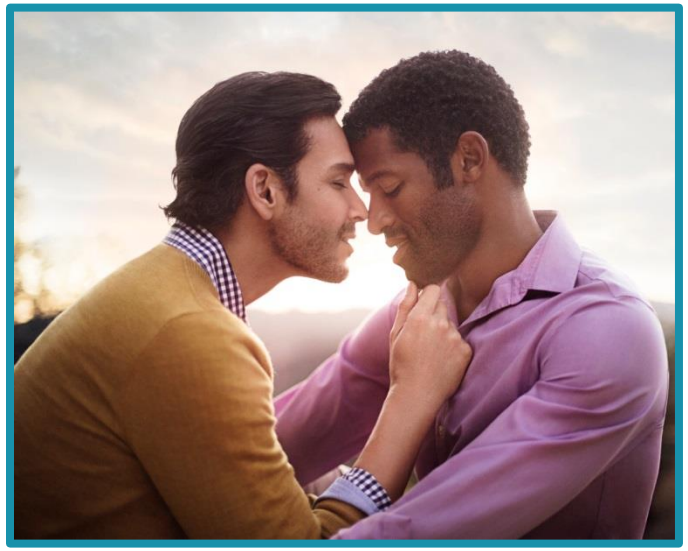
Objectives

- Review epidemiology of sexually transmitted infections
- Prescribe current treatment for sexually transmitted infections.
- Address challenges with treatment of sexually transmitted infections
- Discuss pharmalogical prevention strategies for sexually transmitted infections.

Epidemiology of STI's




All sexually active people are at risk for STIs



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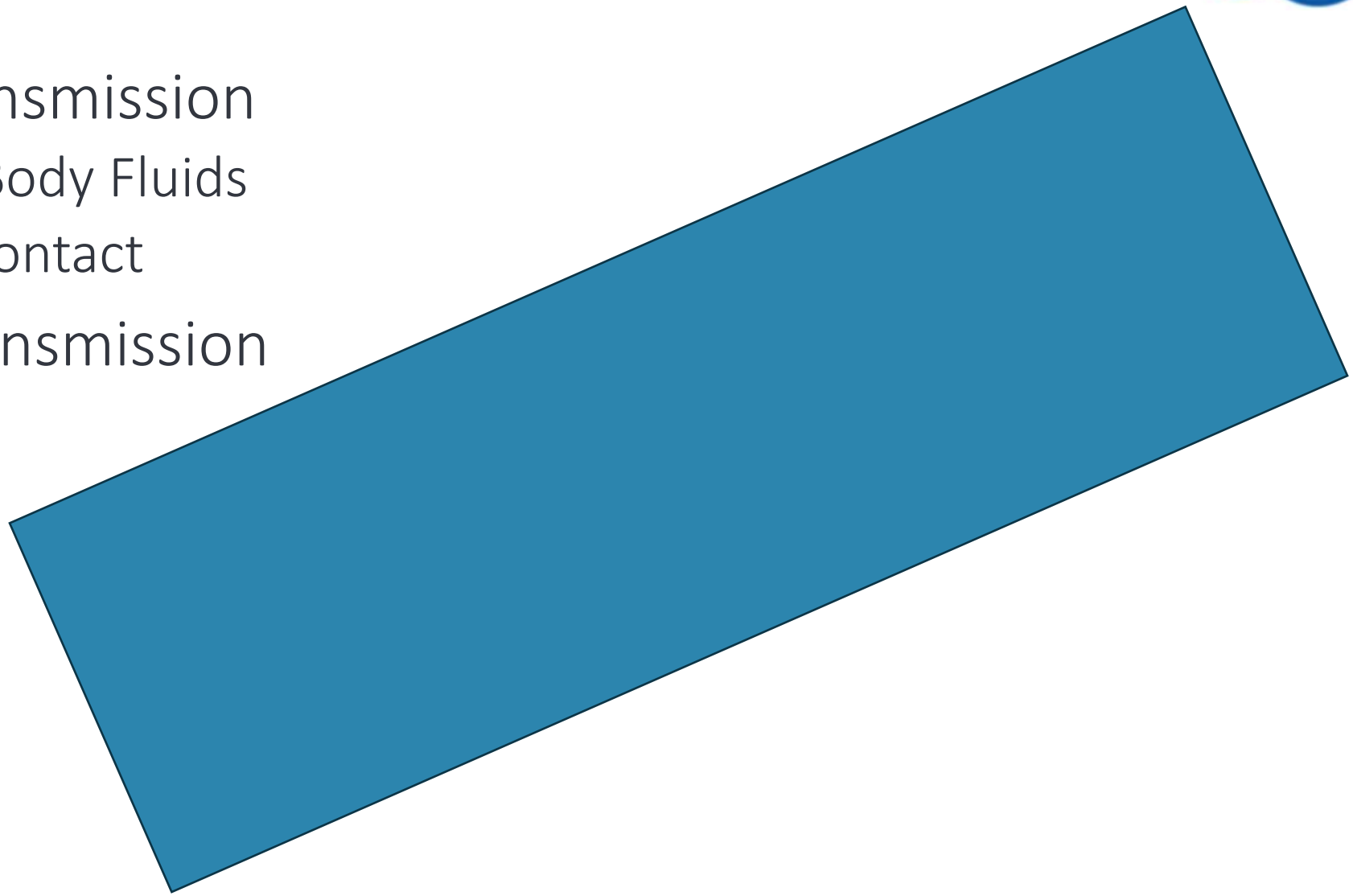
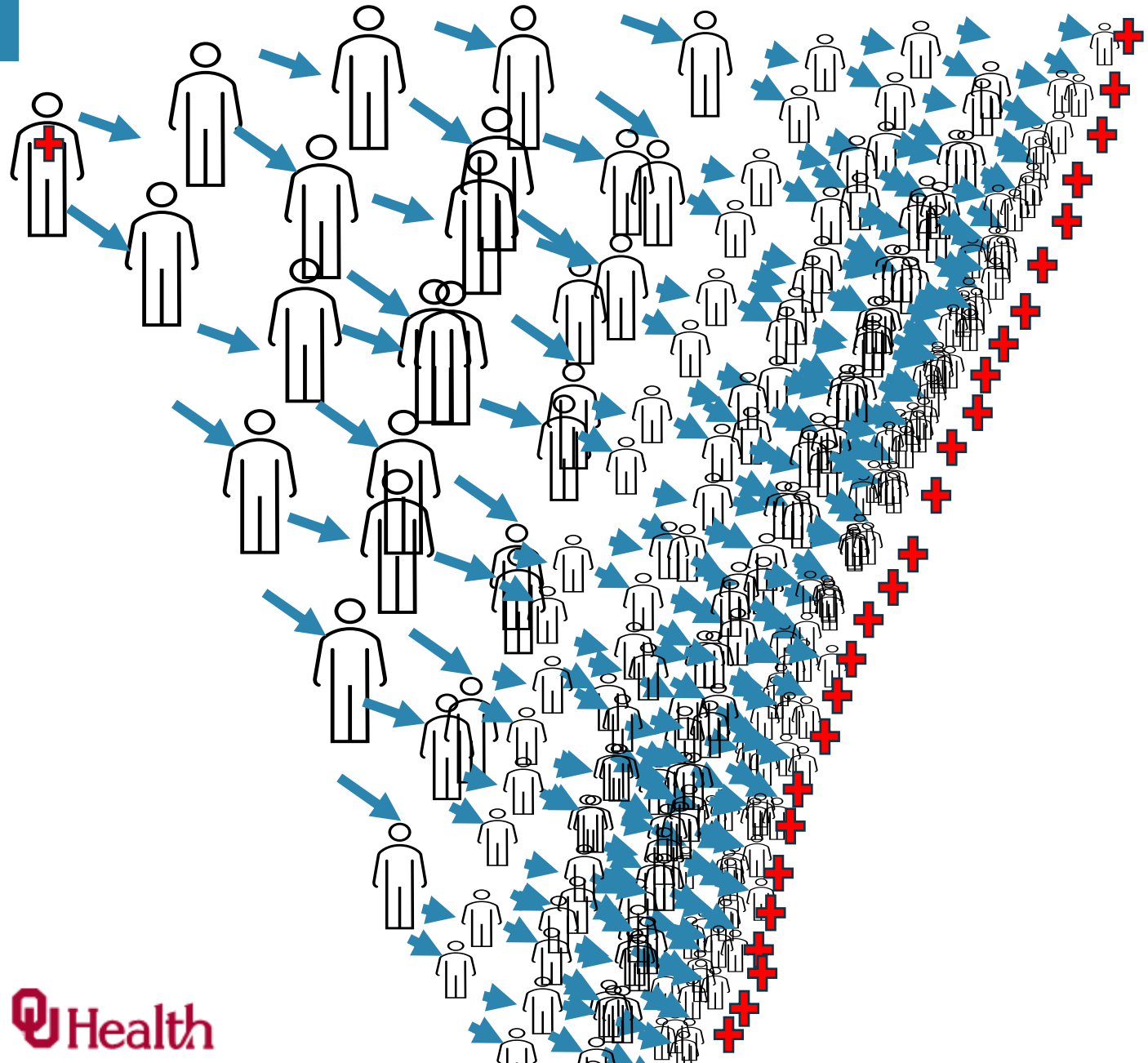
Epidemiology of Sexually Transmitted Infections

- Method of Transmission
  - Exchange of Body Fluids
  - Skin to Skin Contact
- Location of Transmission
  - Oral
  - Vaginal
  - Penile
  - Anal
  - Vertical





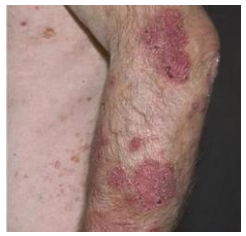
Are STIs Curable?

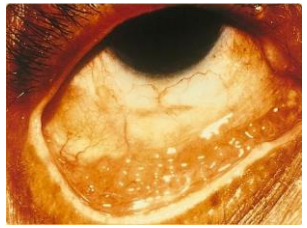
Antibiotics can cure bacterial STDs, but cannot reverse the long-term damage

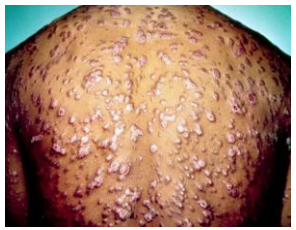
- Chlamydia
- Gonorrhea
- Syphilis

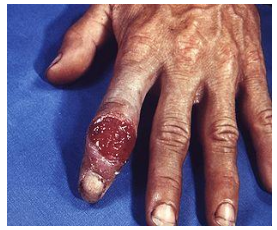
Treatment can improve the lives of many people living with viral STDs, (but there is NO CURE)

- HIV
- Herpes
- HPV
- Hepatitis









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With Many STI's…

Often no signs or symptoms

↓

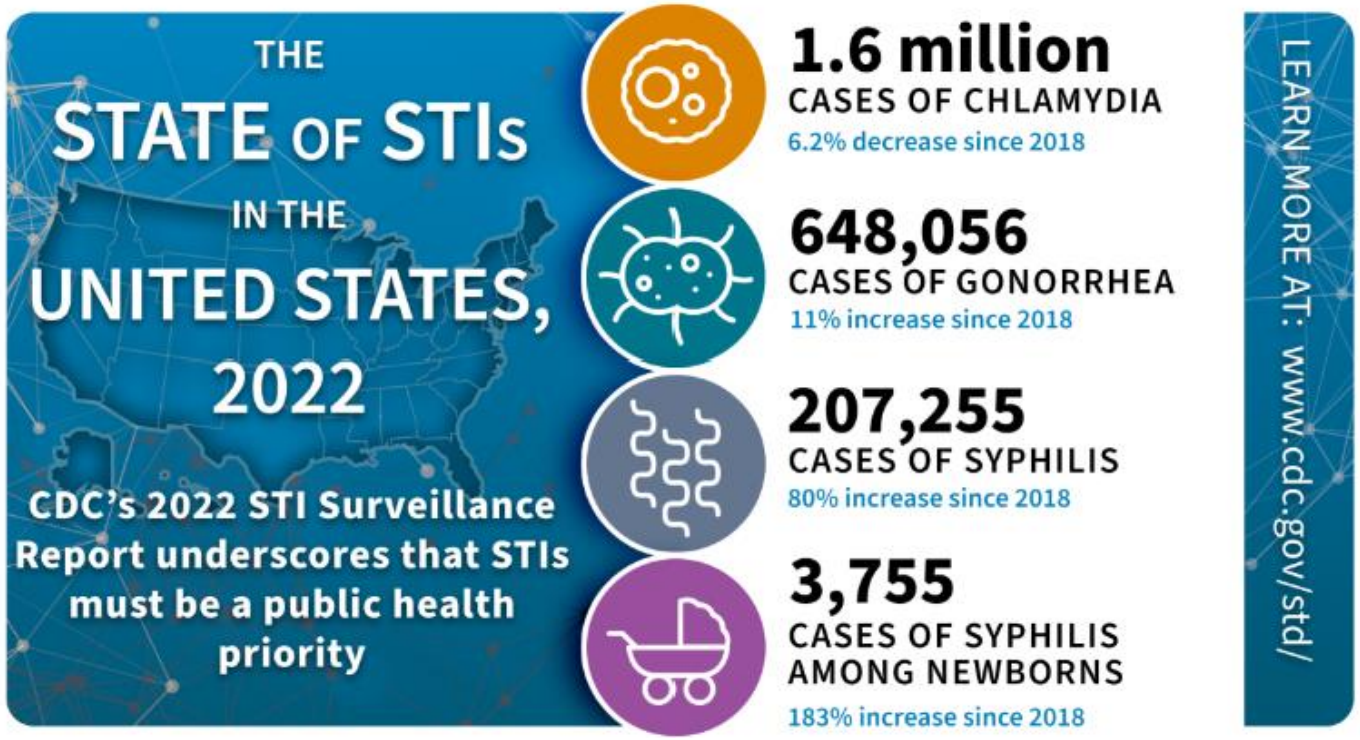
People are unaware of infection, and don't receive treatment.

↓

Long-term damage

↓

May have passed infection to others



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Identification, Treatment, and Challenges of STI's

Chlamydia

Chlamydia

In the U.S.

- Most frequently reported STD
- 1.6 million new cases in 2022

Could fill the OU Football Stadium 20x!

How is it spread?

1. Vaginal, anal, or oral sex with someone who has chlamydia.
2. Infected pregnant women can pass it to their baby during pregnancy or childbirth.

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Chlamydia

The "Silent" Disease!!!

Possible symptoms include:

- Abnormal vaginal/penile discharge
- Burning sensation when urinating
- Rectal pain, discharge, or bleeding
- Pain/swelling in one or both testicles (less common)

Can lead to:

- Sterility or infertility
- Pelvic Inflammatory Disease (PID)
  - -Long-term abdominal/pelvic pain
  - -Scar tissue formation in fallopian tubes
  - -Ectopic pregnancy

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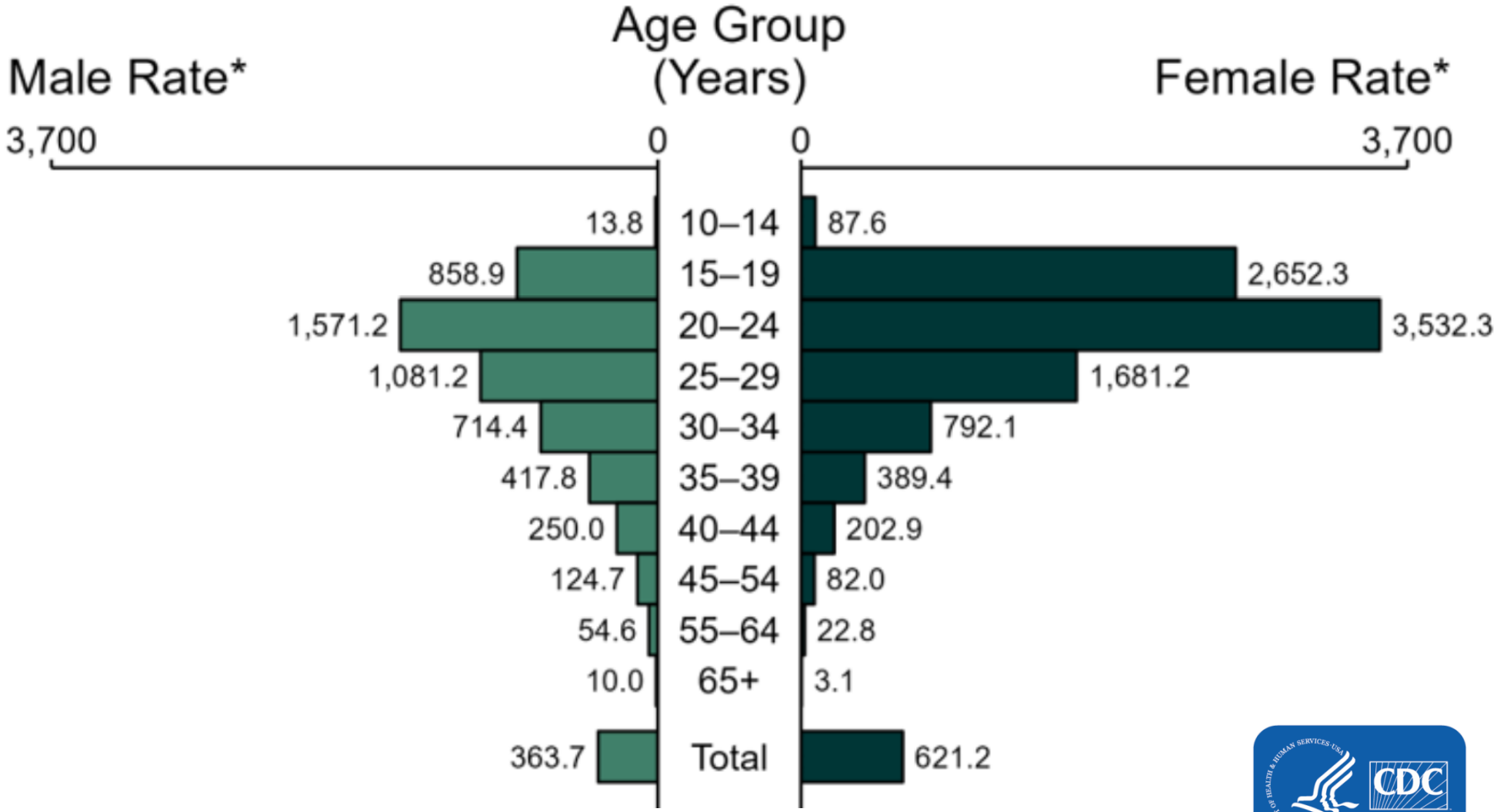
Chlamydia

Rates (Reported) by Age and Sex, U.S. in 2022



Chlamydia Treatment

Primary

- Doxycycline 100mg BID x 7 days.

Alternative

- Azithromycin 1gram PO in single dose

  or

- Levofloxacin 400mg PO q day x 7 days

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Gonorrhea

Gonorrhea

In the U.S.

- 2nd most common disease reported
- Estimated 648,056 new cases in 2022

How's It Spread?

1. Vaginal, anal, or oral sex with someone who has gonorrhea
2. A pregnant woman infected with gonorrhea can give the infection to her baby during childbirth

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Gonorrhea

Possible symptoms include:

- Painful or burning sensation when urinating
- Abnormal vaginal/penile discharge (white, yellow, or green)
- Rectal discharge, itching, soreness, bleeding
- Vaginal bleeding between periods
- Painful or swollen testicles (less common)

Can lead to:

- Sterility or infertility
- Disseminated infection (rash, arthritis, fever, meningitis, etc.)
- Painful infection of the testicles
- Pelvic Inflammatory Disease (PID)
  - -Scar tissue formation in fallopian tubes
  - -Ectopic pregnancy
  - -Long-term pelvic/abdominal pain

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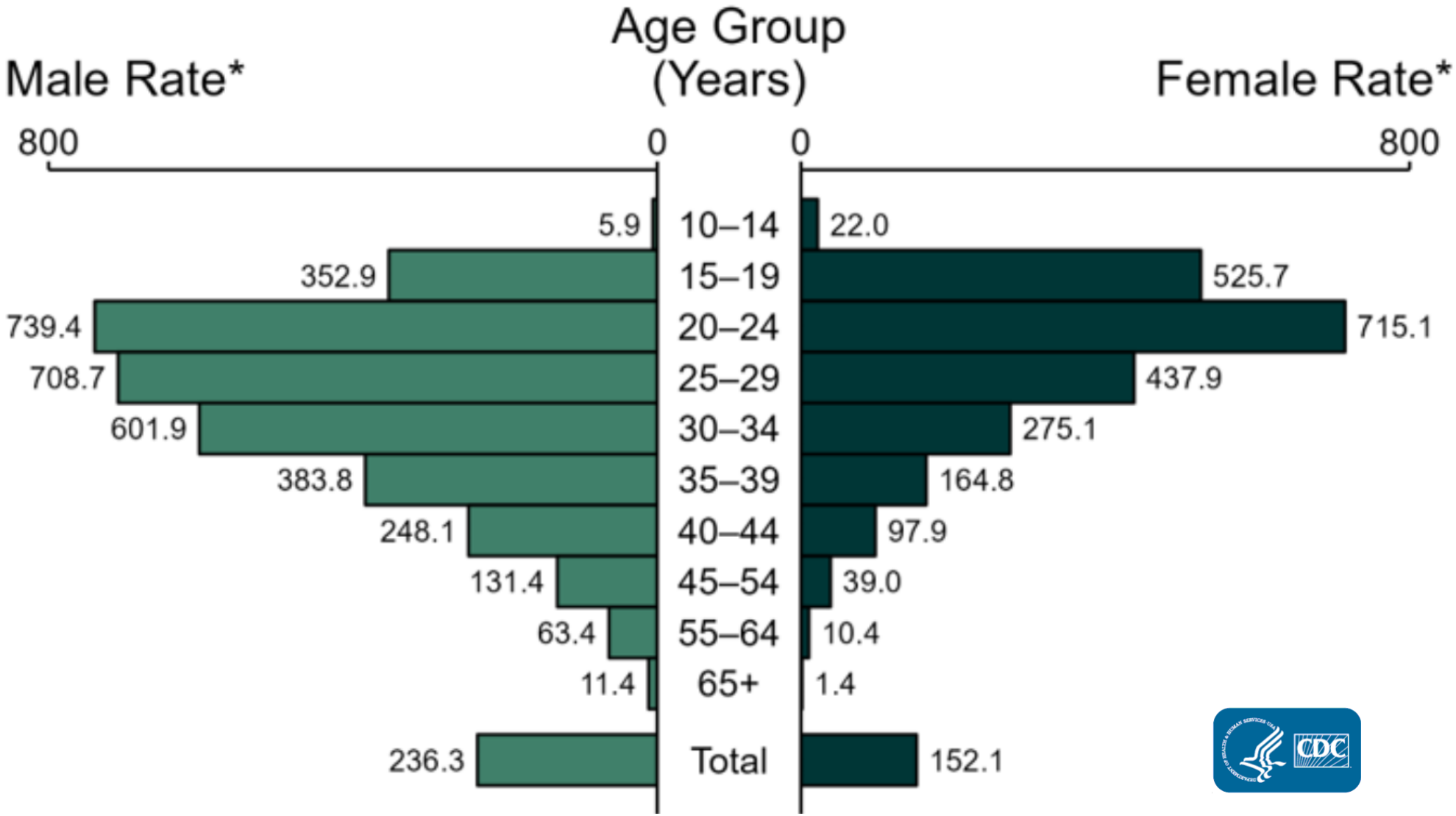
Gonorrhea

Rates (Reported) by Age and Sex, U.S. in 2022



Gonorrhea Treatment

Primary

- Ceftriaxone 500mg IM for those <150kg (330#)
- Ceftriaxone 1 gram IM for those >150kg

Alternative

- Ceftriaxone Allergy
  - Gentamicin 240mg IM x 1, and
  - Azithromycin 2g PO x 1
- Ceftriaxone not available
  - Cefixime 800mg PO x 1
- No alternative for Oral GC

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Importance of Extragenital Screening for STIs

Proportion of CT and GC infections that would be missed among 3398 asymptomatic MSM if screening only urine/urethral sites, San Francisco, 2008-2009[1]

- **Rectal chlamydia and gonorrhea infections are asymptomatic 85% of the time**

supporting the need for routine screening[2]

CT, chlamydia; GC, gonorrhea.

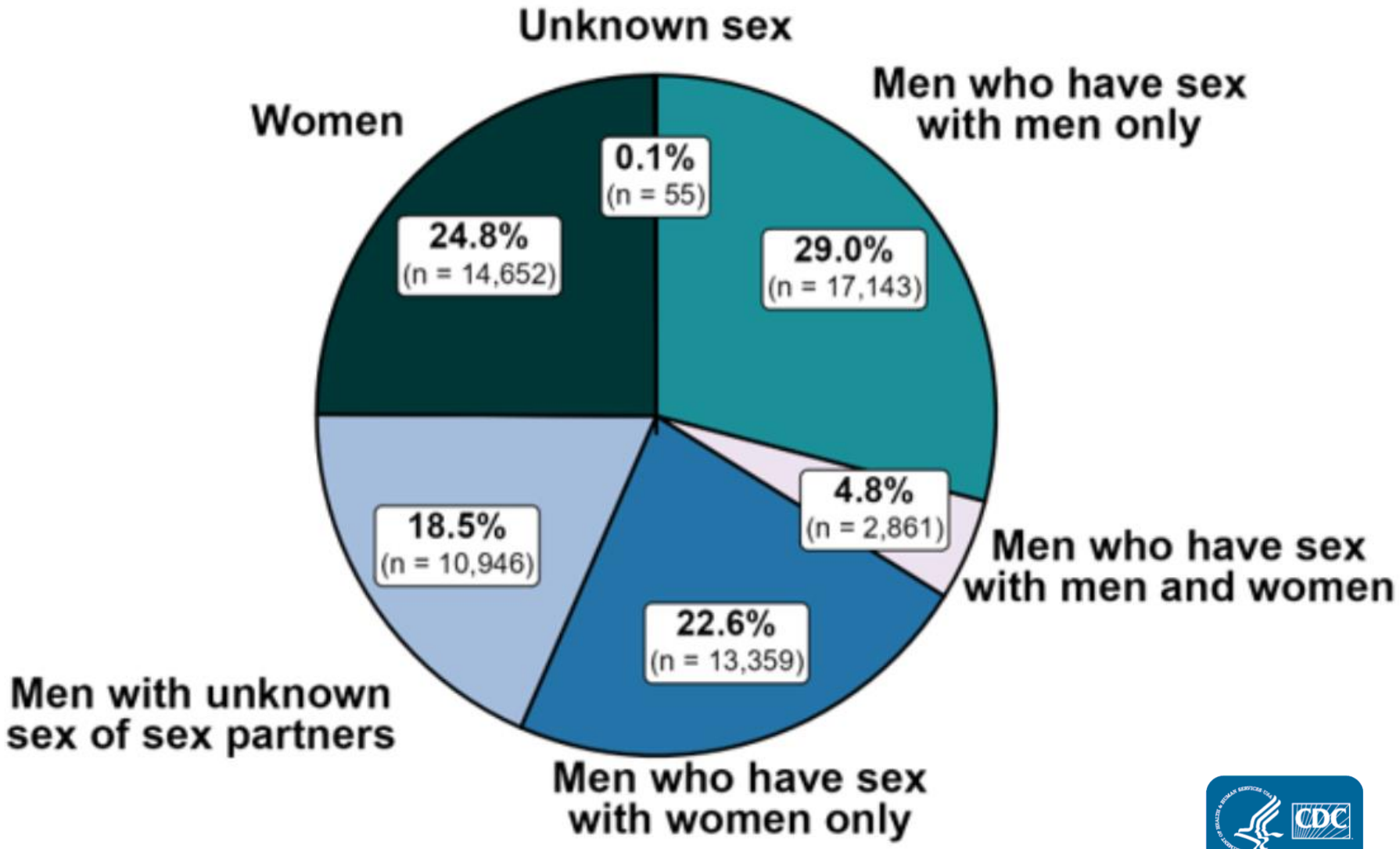
1. Marcus JL, et al. *Sex Transm Dis*. 2011;38:922-924. 2. Kent CK, et al. *Clin Infect Dis*. 2005;41:67-74.

Syphilis

What is Syphilis?

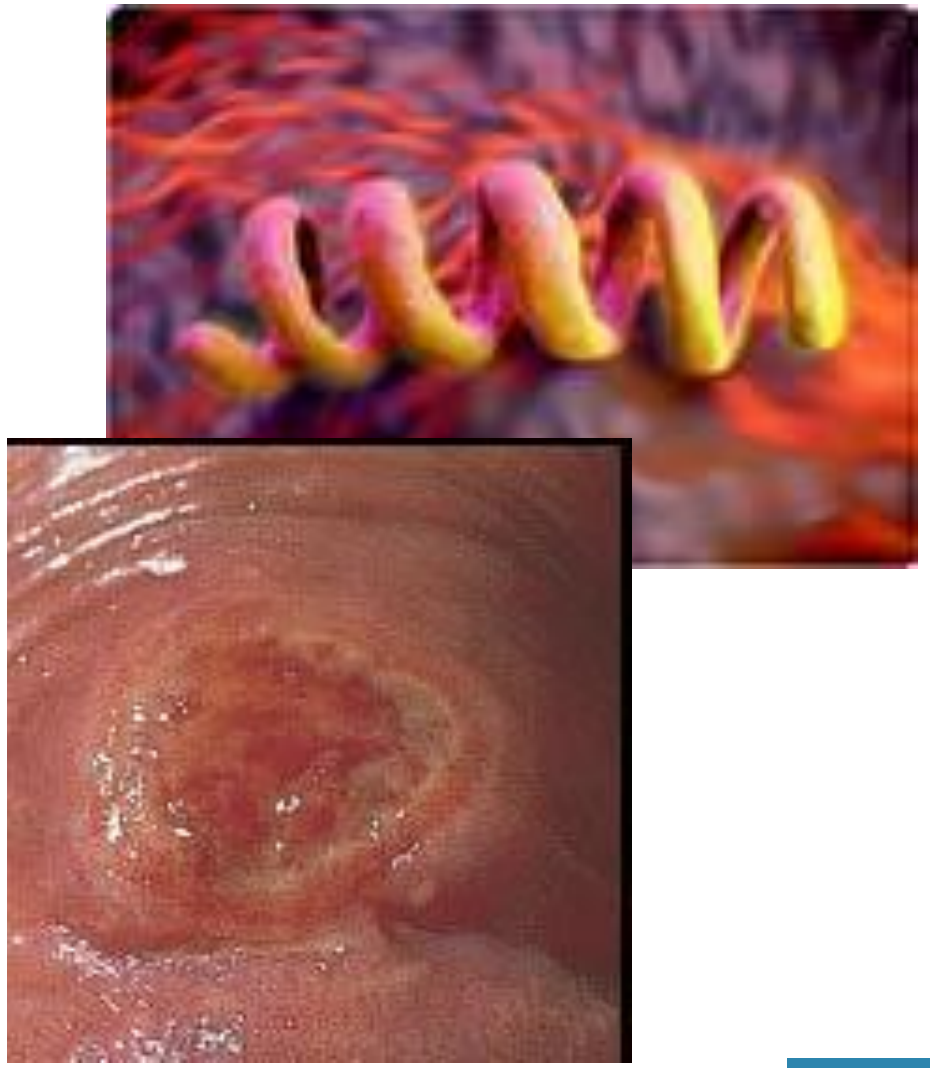
COMPLICATED!

Primary and Secondary Syphilis — Rates of Reported Cases by State, United States and Territories, 2022



Syphilis

- Bacteria known as *Treponema pallidum*.
- Referred to as spirochetes due to their spiral shape.
- The organisms penetrate into the lining of the mouth or genital area.
- Transmitted by skin to skin contact with open sore
  - **Chancre**
- Easy to treat if diagnosed early
- Fatal if not treated.



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“The Great Imitator” affected approximately 207,255 people in 2022 in the U.S., a 17% increase from 2021

How is Syphilis Spread?

- Direct contact with a syphilis sore (chancre) during vaginal, anal, or oral sex.
- Can be spread from an infected mother to her unborn baby.

Primary Syphilis → Secondary Syphilis → Tertiary/Late Syphilis

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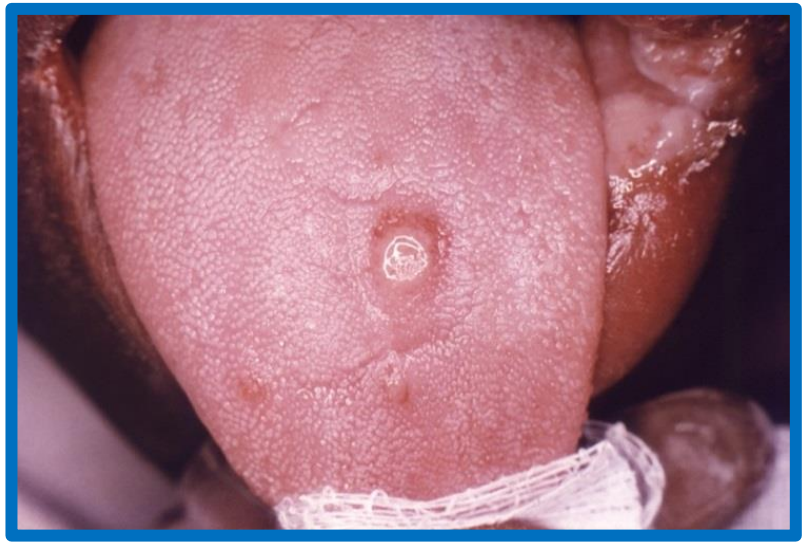
Primary Syphilis

Chancre - syphilis sore

- Firm, round, and **painless**
- Appears within 2-6 weeks after exposure (could take up to 3 months)
- Found on the part of the body exposed to the infection (penis, vagina, anus, lips, in rectum, or in mouth)
- Typically disappear after a few weeks without treatment (still progresses to next stage)



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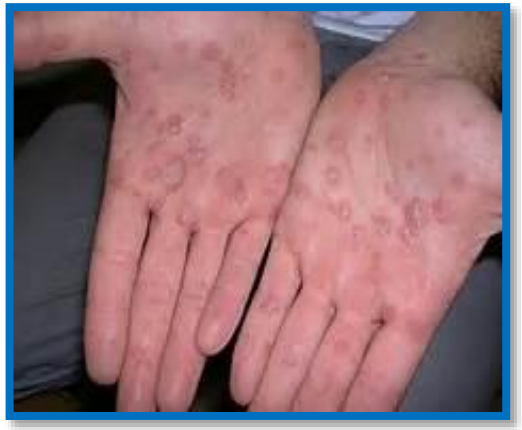
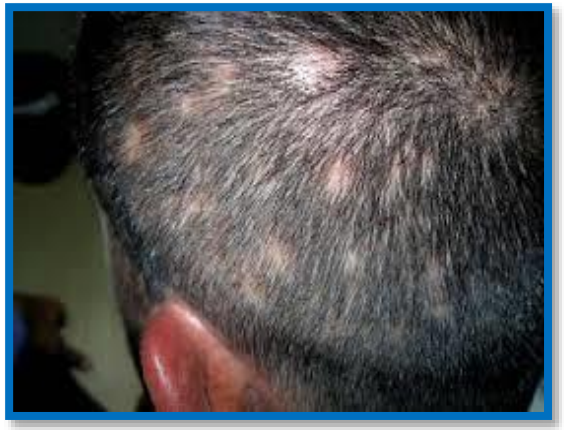
Secondary Syphilis

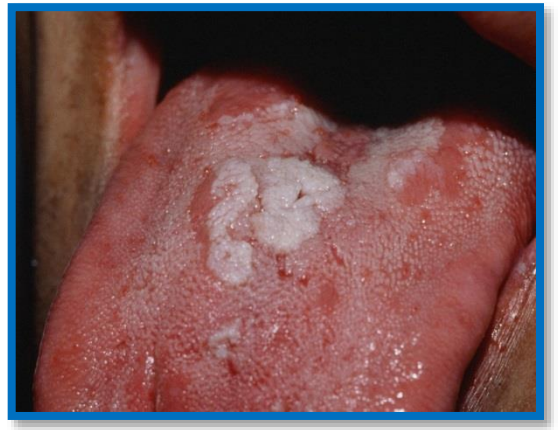
- Appears about 4 weeks after chancre heals
- Will go away without treatment, but infection will progress



non-itchy **RASH** with rough red or reddish brown spots



Alopecia or patchy hair loss



Mucous Patches usually in the mouth, vagina, or anus

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Latent Syphilis

The period when there are no signs/symptoms, but syphilis is still present in the body

If left untreated, you can continue to have syphilis in your body for years without any signs or symptoms.

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Neurosyphilis

Usually occurs during late syphilis but can occur at anytime during the infection

Symptoms:

- Headache
- Visual changes
- Difficulty coordinating muscle movements
- Paralysis (not able to move certain parts of your body)
- Numbness
- Blindness
- Dementia (mental disorder)
- Damage to internal organs
- Can result in death

More likely to occur early in the disease process if HIV infection is also present!

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Diagnosing Syphilis

Diagnosing Syphilis

- History of syphilis
- Most recent serologic test for syphilis
- Known contact to an early case of syphilis
- Signs or symptoms of syphilis in the past 12 months
- CURRENT sign/symptoms

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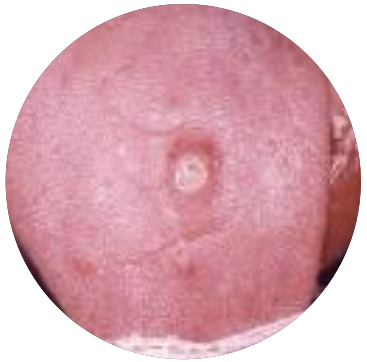
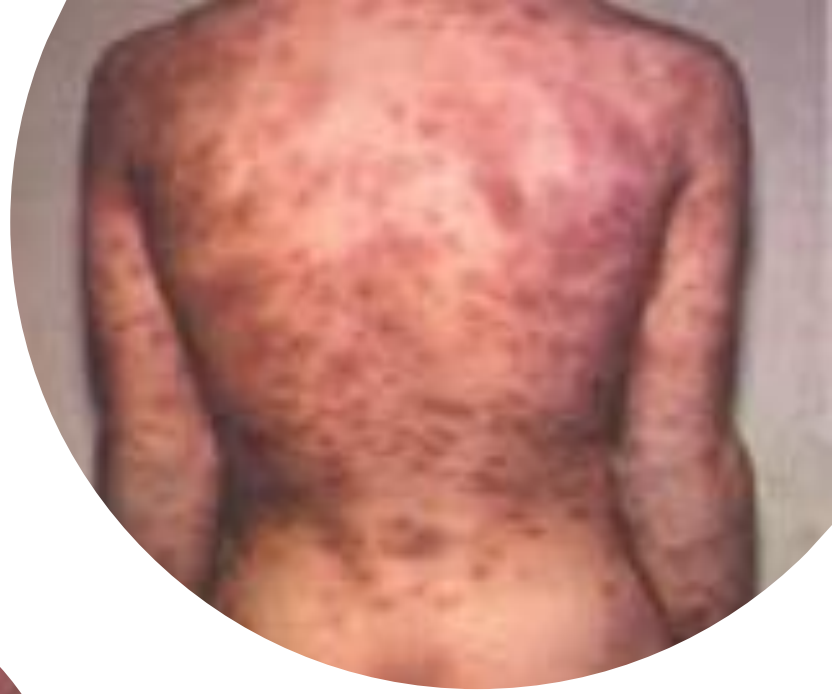
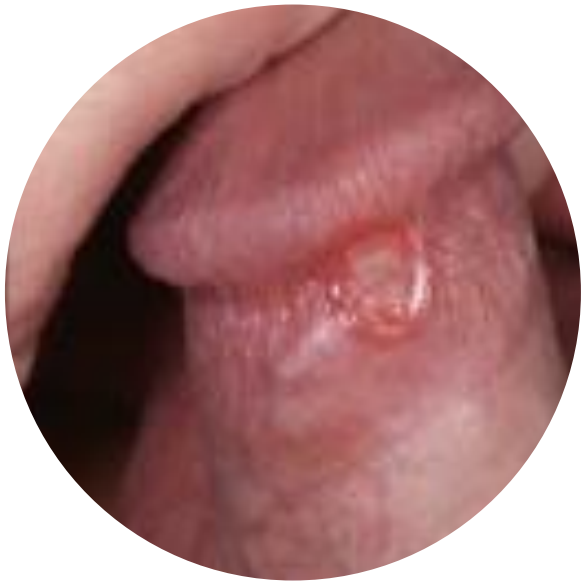
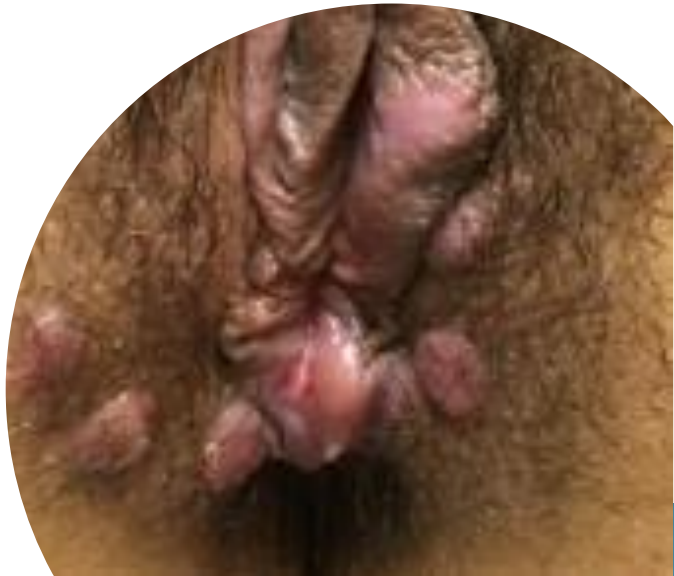
Physical Examination

- Oral cavity
- Palms and soles
- Skin (generalized Body)
- Genitalia area
- Perianal area
- Neurologic examination
- Serology Screening









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Syphilis Testing

Treponemal

- Detects antibodies of Treponema Pallidum
  - Chemiluminescence ImmunoAssays (CIA)
  - Enzyme-linked Immunosorbent Assay (EIA)
  - *T. pallidum* passive particle agglutination **(TP-PA)**
  - Fluorescent Treponemal Antibody Absorption (FTA-ABS)
- Good for screening for specifically T. Pallidum
- Not specific to stage

Non-Treponemal Test

- Detects antibodies to cardiolipin
  - Qualitative Rapid Plasma Reagin (RPR)
  - Venereal Disease Research Laboratory (VDRL)
- More reactive to non-treated infections
- Monitor reaction to treatment

Both tests can produce nonreactive results when the infection has been acquired recently; approximately 20% of test results are negative when patients have primary syphilis

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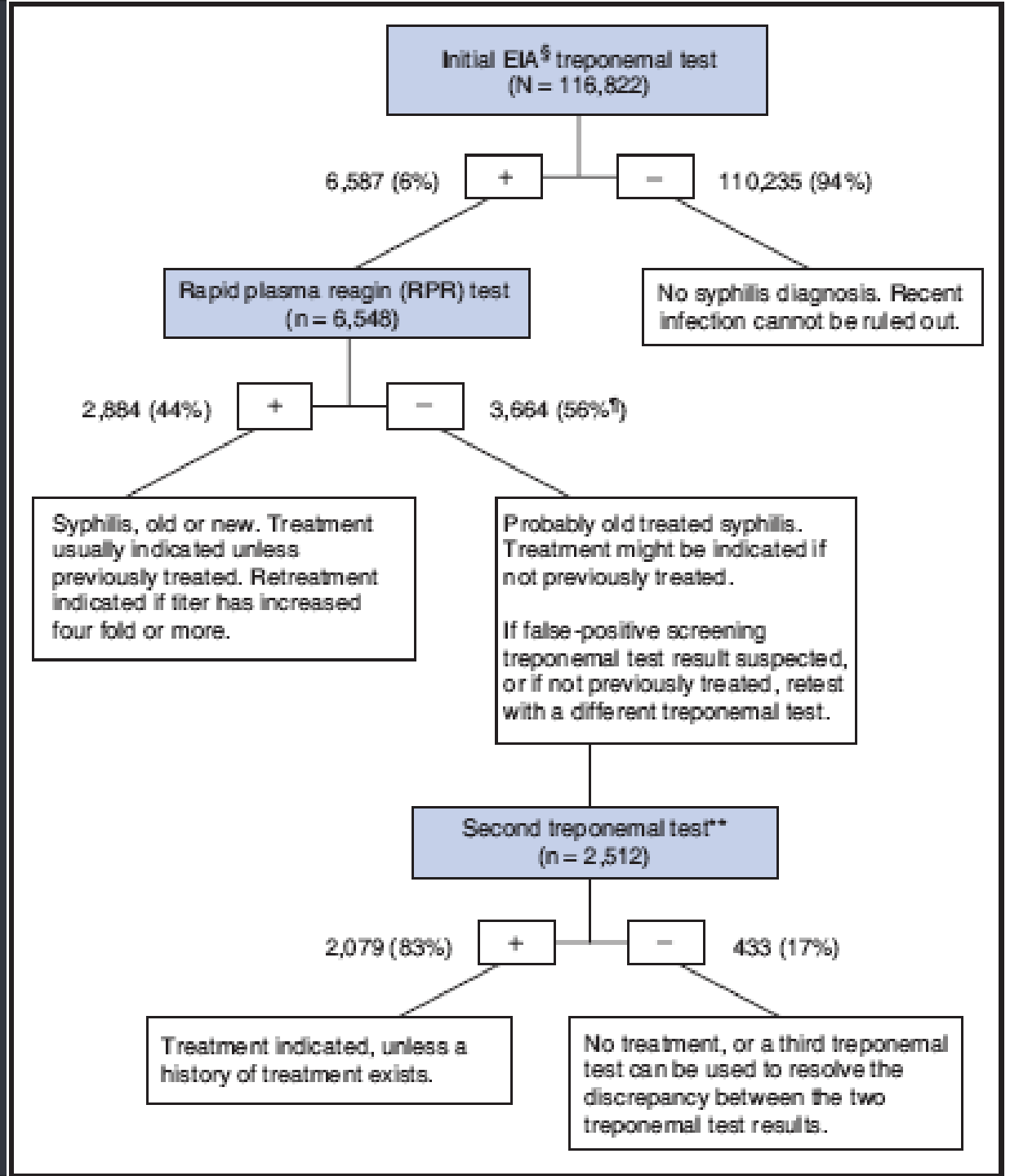
False Positive RPR's

Table 8. Causes of False-Positive, Nontreponemal Syphilis Serology[48,49,76,85]

Spirochaete Infections	• Leptospirosis • Lyme disease • Pinta • Rat-bite fever • Relapsing fever • Yaws
Other Infections	• Bacterial Endocarditis • Brucellosis • Chancroid • Cytomegalovirus • Herpes simplex virus • HIV seroconversion illness • HIV/AIDS • Infectious mononucleosis (EBV) • Kala-azar (visceral leishmaniasis) • Lepromatous leprosy • Lymphogranuloma venereum • Malaria • Measles • Mumps • Pneumonia (pneumococcal, mycoplasma) • Rickettsial disease • Toxoplasmosis • Tropical spastic paraparesis (HTLV-1) • Trypanosomiasis • Tuberculosis • Varicella-zoster virus • Viral hepatitis

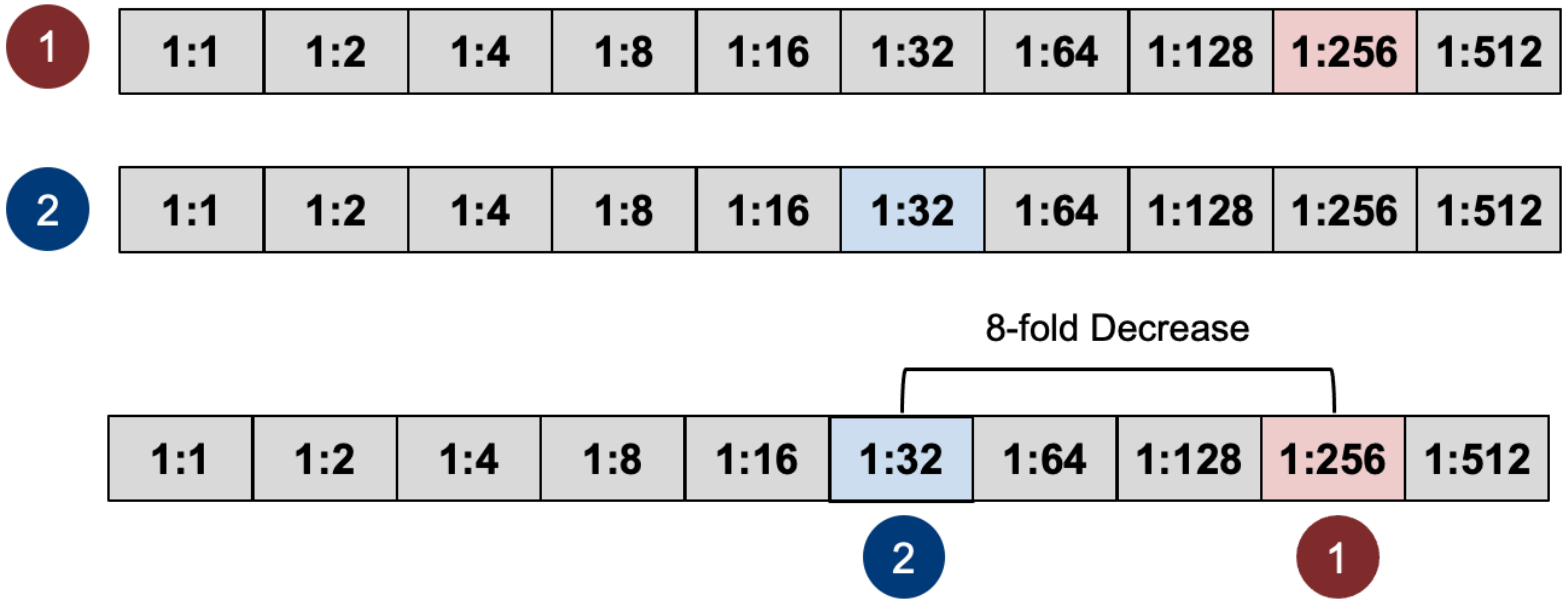
Physiologic	• Older age • Pregnancy
Autoimmune Disorders	• Autoimmune hemolytic anemia • Autoimmune thyroiditis (Hashimoto's disease) • Primary biliary cirrhosis • Idiopathic thrombocytopenic purpura • Immunoglobulin abnormalities • Rheumatoid arthritis • Systemic lupus erythematosus • Ulcerative colitis
Other Conditions	• Dysproteinemias • Hepatic cirrhosis • Intravenous drug use • Lymphoproliferative disorders • Malignancy • Malnutrition • Some vaccinations

Abbreviation: AIDS, acquired immune deficiency syndrome; EBV, Epstein-Barr virus; HIV, human immunodeficiency virus; HTLV-1, human T-lymphotropic virus type 1.


Initial EIA§ treponemal test
(N = 116,822)
6,587 (6%)
+
−
110,235 (94%)
Rapid plasma reagin (RPR) test
(n = 6,548)
No syphilis diagnosis. Recent infection cannot be ruled out.
2,884 (44%)
+
−
3,664 (56%¶)
Syphilis, old or new. Treatment usually indicated unless previously treated. Retreatment indicated if titer has increased four fold or more.
Probably old treated syphilis. Treatment might be indicated if not previously treated.
If false-positive screening treponemal test result suspected, or if not previously treated, retest with a different treponemal test.
Second treponemal test**
(n = 2,512)
2,079 (83%)
+
−
433 (17%)
Treatment indicated, unless a history of treatment exists.
No treatment, or a third treponemal test can be used to resolve the discrepancy between the two treponemal test results.

RPR Titers

- Needed to assist providers with identifying signs, symptoms, or past history of infection.
- Monitors a patient's response to treatment or determine if client has been re-infected.
- Tends to peak in secondary syphilis, then fall over a long period of time even without treatment; however, infection will still be present.
- Become non-reactive with time, following successful treatment or even incidental antibiotics or may serofast.
- A ≥ 4-fold decline in titers at 12 months signifies successful treatment.
- A < 4-fold decline in titers at 12 months indicates treatment failure or re-infection, or "serofast" condition.



$$\frac{1}{2} = \frac{256}{32} = \text{8-fold titer decrease}$$

You can diagnosis Syphilis with only a Treponemal Test

You need a Non-Treponemal test to appropriately treat/monitor

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Primary and Secondary Syphilis

Primary Syphilis

- Signs consistent with stage - chancre(s)
- **Positive treponemal test** result

OR

- Positive non-treponemal result

Secondary Syphilis

- Signs consistent with stage
  e. g., rash, c.lata, alopecia, mucocutaneous lesions, lymphadenopathy
- **Positive treponemal test**

OR

- **Positive Non-Treponemal result**

Treatment is Bicillin LA 2.4mu x 1
Alternative is Doxycycline 100mg BID x 14 days

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Early Non-Primary, Non-Secondary vs. Unknown Duration/Late Syphilis

Early Non-Primary Non-Secondary (Early Latent)

- **Positive treponemal test** result and non-treponemal result

AND one of the following:

- Negative test within last year
- Signs/symptoms within last year
- Sexual exposure to Primary, Secondary or Early NP NS with last 12 months
- Sexual debut within last 12 months

Treatment is Bicillin LA 2.4mu x 1
Alternative is Doxycycline 100mg BID x 14days

Unknown Duration (Late Latent)

- **Positive treponemal test** result

AND

- Positive non-treponemal result
- Does not meet criteria for Primary, Secondary or Early NP NS (No symptoms, No history of syphilis, unable to determine source of contact

Treatment is Bicillin LA 2.4mu x 3 over 3 weeks
Alternative is Doxycycline 100mg BID x 28 days

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Herpes
(HSV- 1 & 2)

How is it Spread?

Vaginal, oral, or anal sex OR **skin-to-skin contact** with someone who has the virus

Symptoms:

- One or more painfull blisters on or around the genitals, rectum, or mouth
- The blisters break & leave painful sores that take weeks to heal
- *These symptoms are sometimes called "having an outbreak"*

Usually characterized by NO or very mild symptoms… NO CURE.

1 in 8 people aged 14-49 have genital herpes.

Most people do not know it!

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Herpes Treatment

(HSV- 1 & 2)

1st Episode	Recurrent	Suppressive
Acyclovir 800mg BID for 5 days Or Acyclovir 800mg TID for 2 days Or Valacyclovir 1g PO BID for 3 days	Acyclovir 400mg TID for 10 days Or Famciclovir 250mg PO TID for 10 days Or Valacyclovir 1g PO BID for 10 days	Acyclovir 400mg BID Or Valacyclovir 500mg daily Or Valacyclovir 1g PO daily

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Human Papillomavirus

Human Papillomavirus (HPV)

How is HPV transmitted?

- Skin-to-Skin contact
- Vaginal, Anal, and Oral sex

(Vaginal & anal most common)

HPV is VERY common!

Most sexually-active men and women will get at least one type of HPV at some point in their lives (estimated 80%).

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HPV-Related Health Problems

1. Genital warts
2. HPV related cervical cancer
3. HPV related anal cancer
4. HPV related oral cancer

- #1 cause of cervical, anal, and penile cancers
- Most people with HPV do not know they have it
- There is **no treatment** for the virus itself, but there are treatments for HGSIL & LGSIL it can cause
- In most cases, the immune system will clear HPV on its own

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HPV and Anal Cancer

- HPV infection
  - Infects squamous epithelium, skin to skin contact
  - 200 types, 6, 11 are benign warts, 16, 18, 45 are pre-oncogenic
- HPV in Men
  - Self limited outside of re-exposure
  - 31% after first sexual encounter
  - Men don’t create antibodies in levels to protect
  - HIV confounding factor
- HPV in Men with HIV
  - 70% MSM with HIV have HPV
  - 37% had 16,18

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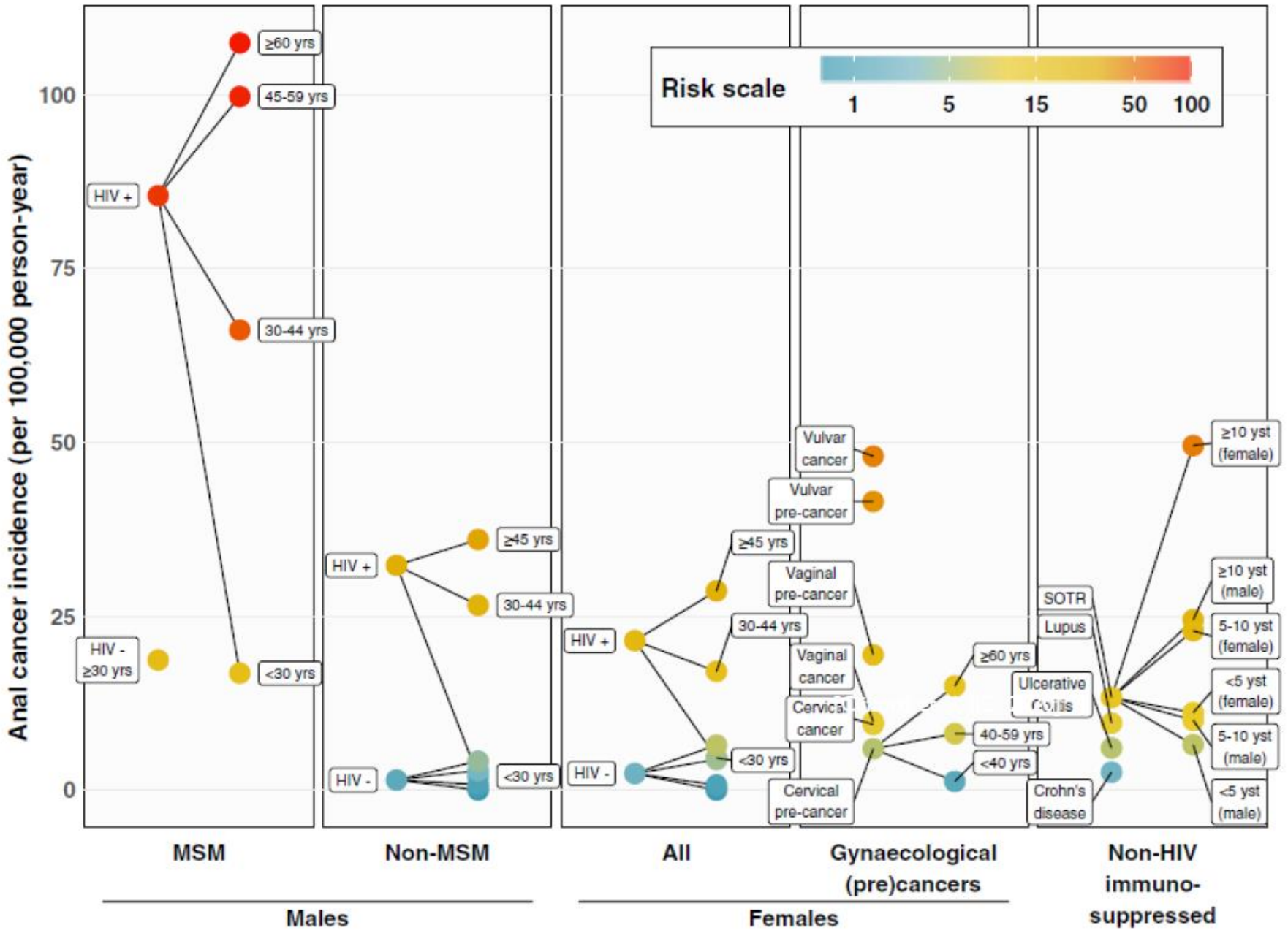
Anal HPV Screening



Hepatitis

Hepatitis

	Hepatitis A	Hepatitis B	Hepatitis C
How is it spread?	Person ingests infected fecal matter—even in very small amounts—from contact with contaminated objects, food, drinks	Blood, semen, or other body fluids from a person with the virus - even in very small amounts - enters the body of a non-infected person	Blood from a person infected with the virus - even in very small amounts - enters the body of a non-infected person
How long does it last?	A few weeks to several months	Mild illness (a few weeks) – Lifelong or chronic condition	Mild illness (a few weeks) – Lifelong if not treated to cure
How serious is it?	Most recover from mild illness with no lasting liver damage, but death can occur (although rare)	15-20% develop chronic liver disease including cirrhosis, liver failure, or liver cancer	75-85% develop chronic liver disease, 5-20% develop cirrhosis, and 1-5% will die

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Hepatitis Treatment

Hepatitis A	Hepatitis B	Hepatitis C
No Treatment Needed Vaccination to Prevent	See Guidelines IF HBV viral load >2000, Treat Entecavir (ETV) Tenofovir (TAF or TDF) Vaccination to Prevent	See Guidelines Treat to Cure Epclusa (sofosbuvir/velpatasvir) Mavyret Glecaprevir/pibrentasvir) Vaccination to Prevent
	Martin, et al, (2022)	Bhattacharya, et al (2023)

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Human Immunodeficiency Virus

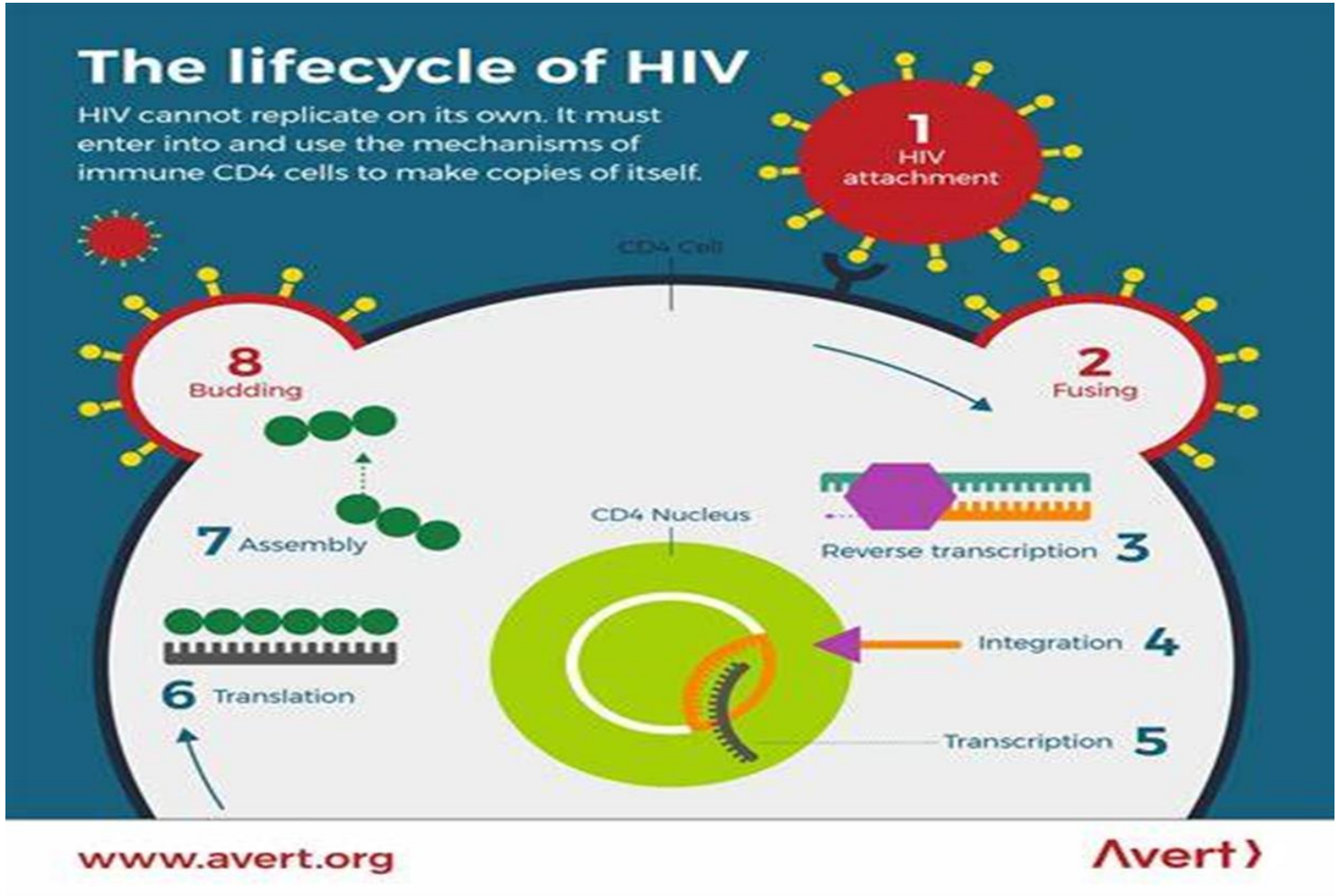
HIV

Human Immunodeficiency Virus

HIV is spread through bodily fluids and affects specific cells of the **immune system**.

HIV attacks CD4 (T-cells) that help fight disease.

Without treatment, HIV will continue to replicate itself.



How is HIV Spread?

from person to person through the exchange of bodily fluids

3 Main Ways:

1. Unprotected sex with people living with HIV (vaginal, oral, or anal)
2. Blood to blood contact
3. Exposure to HIV before or during birth or through breastfeeding

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HIV

Can experience “flu-like” symptoms (if any) about 2-4 weeks after exposure:

Fever, Enlarged Lymph Nodes, Sore Throat, Rash

What Fluids Transmit HIV?

- Blood
- Semen
- Vaginal Fluids
- Rectal Fluids
- Breast Milk

How Can HIV Enter the Body?

- Vagina
- Mouth
- Penis
- Nose
- Anus
- Eyes
- Broken Skin
- Ears

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Transmission Risks of Different Exposures

	Exposure	Risk/10,000 exposures	95% CI
Parenteral	Blood transfusion	9250	8900-9610
	Needle-sharing IDU	63	41-92
	Needle stick	23	0-46
Sexual	Receptive AI	138	102-186
	Insertive AI	11	4-28
	Receptive PVI	8	6-11
	Insertive PVI	4	1-14
	Receptive oral	Low	0-4
	Insertive oral	Low	0-4
Vertical	Mother-to-child	2260	1700-2900

These are **average estimates**. There are many mitigating factors, the most important of which is HIV viral load.

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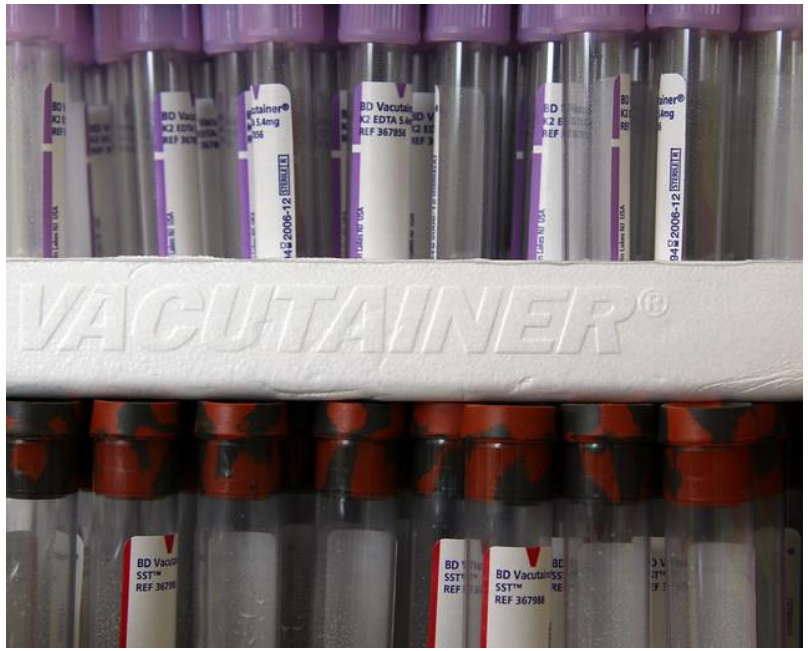
HIV Treatment

Important HIV Positive Labs

- HIV Antigen/Antibody (4th gen) – if not confirmed
- CD4, CMP, CBC (with diff)
- HIV viral load
- Resistance testing (Genotype Integrase/Genotype Resistance)
- Hepatitis Panel (A, B, C)
- Lipids, Full STI panel (Syphilis/GC/CT-3 site)
- Pregnancy Test



Rapid Start ART

COMMERCIAL NAMES

- Biktarvy*
- Triumeq (If HLA-B 5701 is negative)
- Tivicay + (Truvada/Descovy)
- Dovato
- Symtuza

Developed by the HHS Panel on Antiretroviral Guidelines for Adults and Adolescents—A Working Group of the NIH Office of AIDS Research Advisory Council (OARAC)

Recommended Initial Regimens for Most People With HIV

Recommended regimens are those with demonstrated durable virologic efficacy, favorable tolerability and toxicity profiles, and ease of use. Choice of ART during pregnancy should be guided by recommendations from the Perinatal Guidelines.

For people who do not have a history of CAB-LA use as PrEP, the following regimens are recommended:

INSTI plus Two NRTIs

- BIC/TAF/FTC **(AI)**[a]
- DTG/ABC/3TC **(AI)—if HLA-B*5701 negative**
- DTG plus (TAF or TDF)[c] plus (FTC or 3TC) **(AI)**

INSTI plus One NRTI

- DTG/3TC **(AI),** except for individuals with HIV RNA >500,000 copies/mL, HBV coinfection, or in whom ART is to be started before the results of HIV genotypic resistance testing for reverse transcriptase or HBV testing are available

For people with HIV and a history of CAB-LA use as PrEP, INSTI genotypic resistance testing should be performed before the start of ART. If treatment is begun prior to results of genotypic testing, the following regimen is recommended:

- DRV/c[b] or DRV/r with (TAF or TDF)[c] plus (FTC or 3TC)—pending the results of the genotype test **(AIII)**

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Pharmacological Prevention of STI's

Testing is Crucial!

HIV:

--Everyone aged 15 through 64 should get tested **at least once**

--People who have occasional exposure to HIV risks = at least once a year

--People who are at high risk for HIV infection = **3-6 months**

Syphilis:

--If you are pregnant

--Are a man who has sex with other men (MSM)

--Have sex for drugs or money

--Have HIV or another STD

--Had sex with someone who tested positive for syphilis

Chlamydia & Gonorrhea:

Every 3 months if you have had more than one sex partner or with a new sex partner

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Reducing the Risk of STDs

NO Risk

Abstinence (sex): not having oral, vaginal or anal sex

Abstinence (drugs): not using drugs (HIV, HCV)

No genital contact since some are spread by touch (HPV, HSV)

Mutual monogamy between non-infected partners

REDUCED Risk

Sex with Barrier: "correct and consistent" use of condoms/barriers

Fewer sexual partners

Regular HIV/STD Testing: at least twice a year

Never sharing needles or "works" (HIV, Hepatitis)

PrEP: daily preventative medication (HIV)

OU Health

HIV PEP for Exposure

Post-Exposure Prophylaxis (nPEP): within 72 hours of exposure

- Lab prior:
  - HIV (negative)
  - CMP

- Prescribe full regimen for 28 days
  - tenofovir disoproxil fumarate (TDF)(300 mg) & emtricitabine (FTC)(200 mg) TRUVADA® once daily

  PLUS

  - raltegravir (RAL)(400 mg) twice daily or dolutegravir (DTG)(50 mg) once daily

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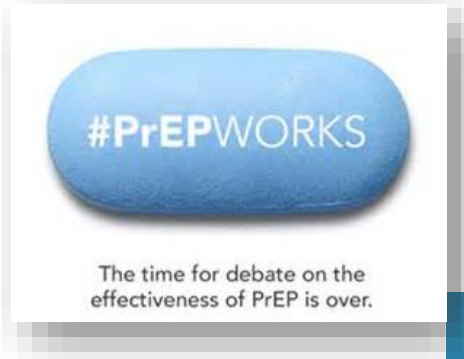
PrEP as HIV Prevention

Pre-Exposure Prophylaxis (PrEP): daily medicine that can stop HIV from replicating inside the body

- PrEP is only prescribed for HIV-negative individuals who are at **ongoing** substantial risk of getting HIV

- PrEP reduces the risk of getting HIV when taken consistently
  - ✓ more than 99% from sexual contact
  - ✓ more than 70% among IDUs
- Prescribe
  - emtricitabine (FTC) 200 mg with tenofovir disoproxil fumarate (TDF) 300 mg (FTC/TDF—brand name **Truvada**® or generic equivalent).
  - emtricitabine (FTC) 200 mg with tenofovir alafenamide (TAF) 25 mg (FTC/TAF—brand name **Descovy**®).
  - cabotegravir (CAB) 600 mg injection (brand name **Apretude**®).



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Doxy PEP for Exposure

Prevention of seroconversion of Chlamydia, Syphilis and partial Gonorrhea

Post-Exposure Prophylaxis within 72 hours of exposure

- Prescribe:
  - Doxycycline 200mg PO x 1 24-72 hours after high-risk encounter.

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Prevention with Vaccination

Hepatitis A & B

HPV

Questions?

Contact Information: Russell Rooms, DNP, APRN-CNP
rrooms@diversityfamilyhealth.com

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Resources:
HIV Guidelines:


thank you
danke
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ngiyabonga
teşekkür ederim
gracias
merci
obrigado
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go raibh maith agat
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Contact Information

Russell Rooms, DNP, APRN-CNP

Diversity Family Health

www.DiversityFamilyHealth.com

RRooms@DiversityFamilyHealth.com