The Transmission Puzzle and STD-HIV Connection

Understanding Risk

- What are my chances of getting HIV or other STDs through sexual contact?
- How does having an STD increase my chances of getting HIV?
The Transmission Puzzle

**Dose ( Germ)**
- Body Fluids
  - Rectal and Vaginal secretions
  - Blood
  - Semen
  - Breast milk
- Mucous membranes
- Rectum
- Vagina
- Mouth
- Penis

**Exposure**
- # Times
- Chance partner has infection

**Resistance**

**The Transmission Puzzle (continued)**

**Dose**
- How much HIV or STD germ?

**Exposure**
- How long are you in contact with germ?
- How many times?
- Chance your partner is infected?

**Resistance**
- How healthy are your pink parts?
DOSE—How Much Germ?

Semen Low germ dose

High germ dose – INCREASES risk

Dose—How Much Germ Depends On:

- Which fluid
  - Semen, blood, rectal and vaginal secretions, breast milk
- Which stage of HIV a person living with HIV/AIDS (PLWHA) is in
  - Acute HIV, carrier, AIDS
- Whether the PLWHA also has another STD
  - Another STD will increase HIV viral dose
Risk of HIV Transmission = 1/20 coital episodes

Risk of HIV Transmission (w/STD Infection) = 1/35

Risk of HIV Transmission (w/ AIDS) = 1/100

Viral load ~ DOSE

Acute HIV Infection (1 month)
Asymptomatic Carrier Stage
AIDS

Dose—Depends on Whether PLWHA Also Has an STD

- If a PLWHA has an STD, the amount of HIV in his semen and rectal secretions increases—even though the viral load in the blood may be undetectable
- Most persons with STDs have no symptoms
**Exposure Depends On:**

- Type of sex you have (how long you are in contact with the germ)
- How many times
- How likely it is that your partner has HIV or another STD

![Exposure Diagram](image1)

**Exposure—Depends on the Type of Sex You Have**

- How long is the germ in my body?
  - For rectal, vaginal, or oral sex
- Depends on who has the semen in their body after sex

![Exposure Diagram](image2)
Exposure—Depends on How Long the Germ Is in Your Body

Germs can live in semen inside the rectum (and vagina) for:

- STDs = up to 3 days after sex
- HIV = up to 12–24 hours

So, you can be exposed to STD or HIV germs for ½ to 3 days each time there is an ejaculation.

Exposure—Depends on How Long the Germ Is in Your Body (continued)

The longer the germ is in the body, the greater the risk:

- Bottoms: Semen in rectum—hours to days
- For women: Semen in vagina—hours to days
- Tops: Penis in rectum—minutes
- For straight men: Penis in vagina—minutes
- Penis in mouth or mouth in vagina—minutes
Exposure—Depends on How Many Times You Have Sex

- The more times you have unprotected sex with partners whose HIV/STD status is unknown to you, the greater the chances of infection
- Tops are at less risk for HIV for one episode of rectal sex
  - HOWEVER, the more times they have unprotected rectal sex, the higher their risk

Exposure—Depends on Chance Your Partner Is Infected

What are the chances?

- Partner A: No high-risk behaviors
  - Recently STD/HIV tested negative
  - Discussion

- Partner B: High-risk behaviors
  - Never STD/HIV tested
  - No discussion
Exposure—Depends on Chance Your Partner Is Infected (continued)

Why monogamy may not be low risk:

- Sex once/week with 13 one-night stands (different partners) over 3 months = 13 chances to get HIV
- Sex once/week same partner over 3 months = 5 chances to get HIV

Exposure—Depends on Chance Your Partner Is Infected (continued)

If mutually monogamous:

- Both you and your partner are tested negative for STDs/HIV
- And you repeat the testing in 3 months to account for the “window period”

Then, mutual monogamy with an uninfected partner is a recommended prevention option
Resistance

How healthy are my pink parts?

That is, the tissue (mucous membranes) inside the mouth, rectum, urethra, and vagina

Pink Parts (Mucous Membranes)
Resistance—Depends on How Many White Blood Cells!

- HIV infects certain types of white blood cells (WBCs) on pink parts
- If the WBCs on your pink parts increase in number (due to an STD or inflammation), it is easier to get HIV

How Does HIV Get Into Your Body?

- Day 0: Sexual exposure to HIV at mucosal surface
- Days 0–2: Virus connects to white blood cells (WBCs) and is then carried to lymph node
- Days 4–11: HIV replicates in CD4 cells and is then released into the bloodstream
- Days 11–on: Via the bloodstream, the virus spreads to other organs
How Healthy Are My Pink Parts?

Healthy Pink Parts
► No sores or abrasions
► No STDs or other source of inflammation—few WBCs

Unhealthy Pink Parts
► Sores—pink parts not intact
► Has an STD or other source of inflammation—many WBCs

The Transmission Puzzle—Example

How much germ Average
× Number and type of exposure Average

Resistance of pink parts Average

Chance of infection: Average
Example—You Don’t Have HIV

And your partner is in early phase of HIV infection or has an STD:

- Higher dose
- Average exposure
- Average resistance

**Chance of infection:** Higher

If your sexual partner has a lot of HIV in his semen, your chance of getting HIV goes up.

Example—If You Don’t Have HIV

And you are a Bottom:

- Average dose
- Higher duration of exposure
- Average resistance

**Chance of infection:** Higher

If you have semen in your rectum, your chance of getting HIV goes up.
If You *Don’t* Have HIV

And you have an STD:

Average dose \( \times \) Average exposure

Lower resistance of pink parts

Chance of infection: \( \uparrow \) Higher

If you get an STD your resistance goes down—so your chance of getting HIV goes up

If You *Don’t* Have HIV

And you have an STD, but get it treated:

Average dose \( \times \) Average exposure

Resistance goes back up

Chance of infection: \( \downarrow \) Lower

If you get treated for an STD and recover, your resistance goes back up—so risk of getting HIV goes down again
Transmission Puzzle

- Reducing your chances of getting HIV means
  - Decreasing dose and exposure
  - Increasing resistance
- You can use the Transmission Puzzle to help you PREVENT getting HIV and other STDs
- Stay tuned for Session 3!