




Sexually Transmitted Infections and Treatment

 Click for more information


Click content to learn more:

 Symptoms of an STI

 Chlamydia

 Effects on Fertility

 Syphilis

 Human Papilloma Virus (HPV)

 HIV


 Herpes Simplex Virus

 Hepatitis B

 Trichomonas

 Pelvic Inflammatory Disease

 Gonorrhea

 Living with an STI



Sexually Transmitted Infections and Treatment

Overview of STI Symptoms



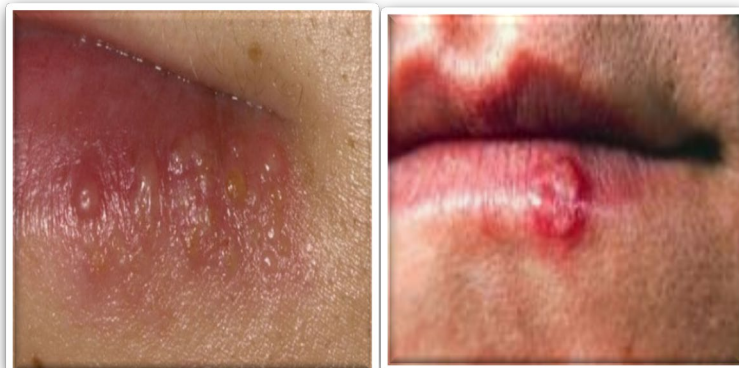
Abnormal discharge from gonorrhea



Syphilis sores



Genital warts from HPV



Oral herpes

Note: Many STIs do not show symptoms, and these symptoms above can be treated with antibiotics or antivirals depending on the STI.



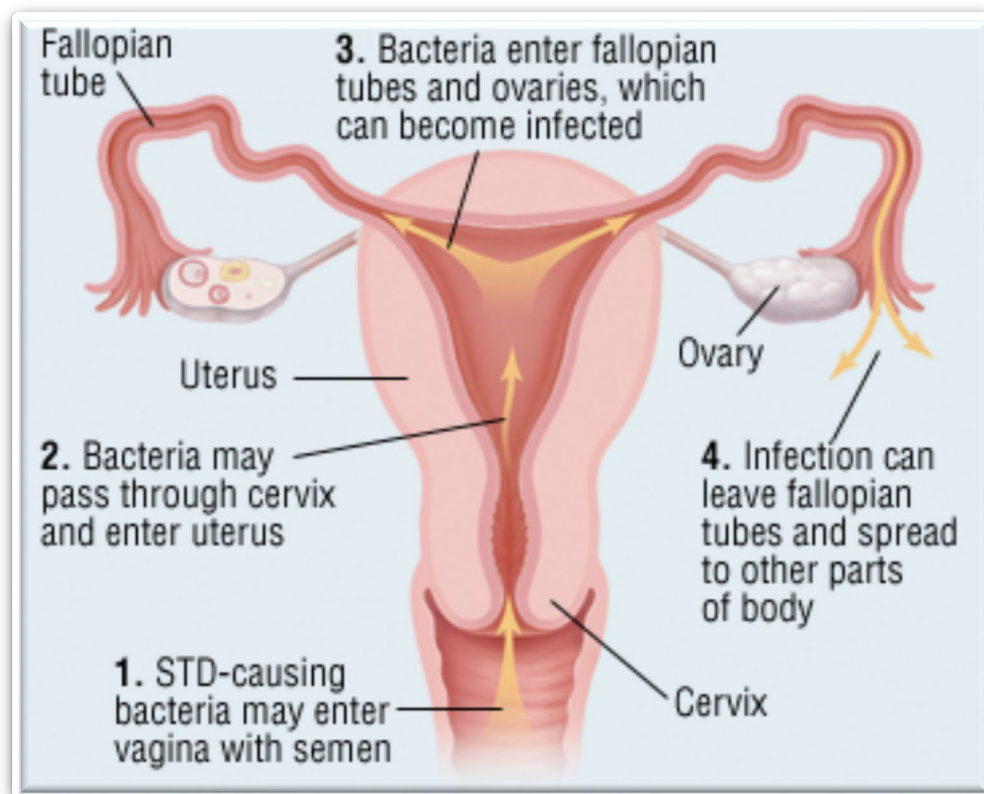
Sexually Transmitted Infections and Treatment

STIs and Threat to Fertility



Potential Harm to Fertility

- Gonorrhea, chlamydia, syphilis and HIV can reduce fertility
- HIV can make it more likely to contract gonorrhea, chlamydia, and syphilis, which impact fertility
- Scarring from these infections can make it hard to conceive (pelvic inflammatory disease)





Sexually Transmitted Infections and Treatment

Human Papilloma Virus (HPV)



General Information and Transmission

- Most common viral STI
- **Spread by skin-to-skin contact, oral sex, anal sex, and vaginal sex**
- **Condoms do not necessarily prevent HPV**
- Most do not know they have the infection, since it may not show symptoms
 - HPV can be spread even without symptoms

Symptoms and Treatment

- Most people are asymptomatic and do not know they have the infection
- There are many types (strains) of HPV, which vary in symptoms:
 - Some go away on their own
 - Some have no symptoms
 - Some cause **cervical cancer**
 - Some cause **genital warts**
- Can also cause cancer of the vagina, anus, head and neck
- **HPV is not curable, but symptoms can be treated**



Genital warts from HPV



Sexually Transmitted Infections and Treatment

Medical Treatment for Genital Warts



First Line Patient Applied Therapy

Imiquimod (Aldara, Zyclara)

- 3.75% Cream: Apply thin film once daily before bedtime for two weeks to the skin of the affected area; keep on eight hours, then wash off with soap and water. Continue nightly until the warts are gone, no more than eight weeks.
- 5% Cream: Apply a thin layer three times per week (on alternate days) prior to bedtime; leave on skin for six to ten hours, then remove with mild soap and water. Continue until there is total clearance of the genitals/perianal warts for a maximum duration of therapy of sixteen weeks.

Podophyllotoxin

- Apply podophyllotoxin twice daily for three consecutive days, then withhold use for four consecutive days. This one-week course may be repeated up to four times until warts are no longer visible. The total treatment area should not exceed 10 cm², and the total volume of podophyllotoxin should be limited to 0.5 mL per day. The area to which podophyllotoxin is applied should not contain any open lesions or wounds. Podophyllotoxin should be washed off one to four hours after application in order to minimize local irritation. If feasible, the clinician should apply the first treatment to demonstrate the correct sites for application and proper technique. **Sexual intercourse should be avoided when podophyllotoxin is on the skin.**

Sinecatechins (Veregen)

- Apply a thin layer three times daily to warts until all warts have cleared, maximum duration sixteen weeks.



Sexually Transmitted Infections and Treatment

Medical Treatment for Genital Warts



Clinician Applied Therapy

Cryotherapy: Liquid nitrogen is typically applied via a spray gun device or a cotton bud, and two freeze-thaw cycles are performed. A small margin of healthy skin (e.g., 1 mm) should be included in the treatment area. Treat patients every two weeks for up to six to ten weeks. If clearance has not been achieved within six to ten weeks, other treatment should be implemented.

Electrosurgery: After the injection of a local anesthetic, warts are desiccated and are either left to fall off or curetted. Care must be taken to control the depth of electrocautery to minimize scarring. Similar to surgical excision, high clearance rates (94% - 100%) have been reported but recurrence is possible. More likely to result in permanent dyspigmentation and scarring.

Surgical Excision: Surgical excision is most beneficial for patients who have large (e.g., >1 cm), exophytic anogenital warts. A scissor or shave excision can remove most anogenital warts. Excision to the depth of the superficial dermis is generally sufficient.

Laser Therapy: Carbon dioxide (CO₂) lasers are the principal lasers used to destroy anogenital warts. Treatment is painful; local or general anesthesia is necessary. The surgeon must be certified and credentialed to use the laser.



Sexually Transmitted Infections and Treatment

HPV Vaccine



Gardasil

What is Gardasil?

- Gardasil is an optional vaccine available for male and females age 9 – 45
- Only 5% of eligible military males are currently being vaccinated and approximately 26% of eligible military females
- The vaccine can prevent genital warts, cervical cancer, anal cancer, and oropharyngeal cancer, so **OFFER YOUR ELIGIBLE PATIENTS THE VACCINE IF THEY HAVE NOT HAD IT!**

How does it work?

- **Prevents against nine most common types of HPV which cause 90% of cervical cancer and genital warts**
- This is a **3-shot series for those age 15 and above (2 shots for ages 9 - 14)**
 - 1st shot: between ages 15-45 years old
 - 2nd shot: 2 months later
 - 3rd shot: 6 months after first (can be completed any time after the initial vaccine)



Sexually Transmitted Infections and Treatment

Herpes Simplex Virus





Sexually Transmitted Infections and Treatment

Herpes Simplex Virus



Types and Transmission

Types

- HSV 1: Typically appears on the mouth (i.e., cold sores)
- HSV 2: Typically appears on the genitals
 - But HSV1 can be spread to the genitals if someone who gets cold sores performs oral sex

Transmission

- Skin-to-skin contact, oral, anal, and vaginal sex
- Transmission may occur when an infected person does not have a visible sore, or does not even know the infection is present
- Very common, many catch HSV1 during their childhood
- **Condoms** reduce the risk of getting/spreading genital herpes but **do not eliminate risk**

Symptoms and Treatment

Symptoms

- During the first outbreak, one may experience
 - Painful, red bumps (sores)
 - Blisters that rupture and spread
- Stress can trigger outbreaks
- Over time, outbreaks happen less frequently or stop

Treatment

- Herpes is **not curable**, but outbreaks can be treated with antivirals to lessen discomfort
- Stigma against herpes is often worse than the actual infection itself



Sexually Transmitted Infections and Treatment

Herpes Simplex Virus



Primary vs. Recurrent

Primary: Initial presentation can be mild or severe with painful genital ulcers, dysuria, fever, tender local inguinal lymphadenopathy, and headache, or may be asymptomatic. Typical incubation is four days but can range two to twelve days. Duration nineteen days with viral shedding for two to five days.

Non-primary first episode: Same as primary but associated with fewer lesions and less systemic symptoms. Duration ten days with viral shedding two to five days.

Recurrent: Same as primary but associated with fewer lesions, shorter duration, and less systemic symptoms.

Testing

No shipboard capability of testing, so treatment initiation is based upon symptoms. If not on ship, it can be diagnosed by culturing a lesion (unroof it and obtain sample of vesicular fluid), or by type specific serologic tests. It can also be diagnosed with polymerase chain reaction. Obtaining the serotype (HSV 1 vs HSV 2) can help predict expected recurrence of outbreaks.

Treatment

Primary: Important to initiate treatment within 72 hours of symptoms. Treatment duration 7-10 days.

- [Acyclovir](#): 400 mg three times daily
- [Famciclovir](#): 250 mg three times daily
- [Valacyclovir](#): 1000 mg twice daily

Recurrent: Important to initiate treatment within 24 hours of symptoms.

- [Acyclovir](#): 800 mg three times daily for two days; or 800 mg twice daily for five days; or 400 mg three times daily for five days
- [Famciclovir](#): 1000 mg twice daily for a single day duration; or 125 mg twice daily for five days; or 500 mg once, followed by 250 mg twice daily for two days
- [Valacyclovir](#): 500 mg twice daily for three days or 1000 mg once daily for five days



Sexually Transmitted Infections and Treatment

Trichomonas



Transmission and Symptoms

- Also known as “trich”
- Common bacterial STI
- Transmitted through oral, anal and vaginal sex
- In most cases has no symptoms
- Men typically have no symptoms
- Symptoms for women include:
 - Foul-smelling vaginal discharge
 - Genital itching
 - Painful urination

Treatment

- Metronidazole (Flagyl): 2 grams in a single oral dose or alternatively 500 mg orally twice daily for seven days as 2 grams is not always tolerated
- **DO NOT DRINK ALCOHOL WHILE TAKING FLAGYL:** Abdominal cramps, nausea, vomiting, headaches, and flushing have been reported with oral and injectable metronidazole and concomitant alcohol consumption (disulfiram-like reactions)
- Alternative: Tinidazole: 2 gram single dose or 500 mg twice a day for seven days



Sexually Transmitted Infections and Treatment

Chlamydia and Gonorrhea



Types and Transmission

General Information

- Bacterial STI
- Retesting three to six months after treatment is recommended due to risk of re-infection
- Ensure the patient's partner is treated to avoid re-infection
- Resistant strains of gonorrhea are on the rise

Transmission

- Oral, anal, and vaginal sex



Symptoms and Treatment

Symptoms

- Majority are asymptomatic
- **Can cause infertility due to fallopian tube scarring**
- Symptoms for women:
 - Increased vaginal discharge
 - Pain with intercourse
 - Fever
 - Sore throat
 - Irregular bleeding
 - Pain with urination
 - Cervical friability or mucopurulent discharge



Sexually Transmitted Infections and Treatment

Chlamydia and Gonorrhea



Treatment

The rising rates of gonococcal resistance to non-cephalosporin classes of antimicrobial agents led to the use of cephalosporins, particularly intramuscular injections of ceftriaxone and oral cefixime. However, trends in increasing mean minimum inhibitory concentrations (MICs) of *N. gonorrhoeae* for both agents, indicating decreasing susceptibility, have been reported worldwide and have led to changes in the recommendations for use of these agents. For patients with allergies or suspected gonococcal resistance, consult a physician for other treatment options as these patients may require intravenous therapy.

To treat Chlamydia:

- Azithromycin: 1 gram in a single oral dose
- Alternative 1: Ofloxacin 300 mg twice a day for 7 days
- Alternative 2: Levofloxacin 500 mg orally once a day for 7 days

To treat Gonorrhea:

- Ceftriaxone 250 mg intramuscular in a single dose for treatment of gonococcal infection
- In addition to Ceftriaxone: Azithromycin (1 gram in a single oral dose) for possible additional activity against *N. gonorrhoeae* and for treatment of potential chlamydia coinfection. (Dual therapy is related to concerns regarding the early emergence of cephalosporin resistance and the paucity of alternative first-line agents)
- Alternative: Doxycycline (100 mg orally twice daily for seven days) is not an optimal alternative to azithromycin for uncomplicated gonococcal infections given concerns about the increased prevalence of *N. gonorrhoeae* resistance to doxycycline. However, doxycycline is used in combination with ceftriaxone for pelvic inflammatory disease (in combination with ceftriaxone) due to its activity against *C. trachomatis*. Doxycycline is also used for cases of epididymitis or proctitis, in which azithromycin has not been studied.



Sexually Transmitted Infections and Treatment

Syphilis



Transmission

Transmitted through direct contact with a syphilis sore.

- Can be spread through skin-to-skin contact, oral, anal, and vaginal sex
- Incidence is on the rise
- Testing: RPR (Rapid Plasma Reagin) looks for presence of antibodies. A reactive nontreponemal test is then confirmed with a treponemal test, such as the fluorescent treponemal antibody absorption (FTA-ABS)
- If recently infected, serologic testing may be negative; if high suspicion, treat and retest in four weeks

Symptoms and Treatment

Primary Symptoms

- Single, small, round painless sore; can appear from ten to ninety days after sex with infected person. Sore can heal within three to six weeks, even without treatment (but infection is still present).

Secondary Symptoms

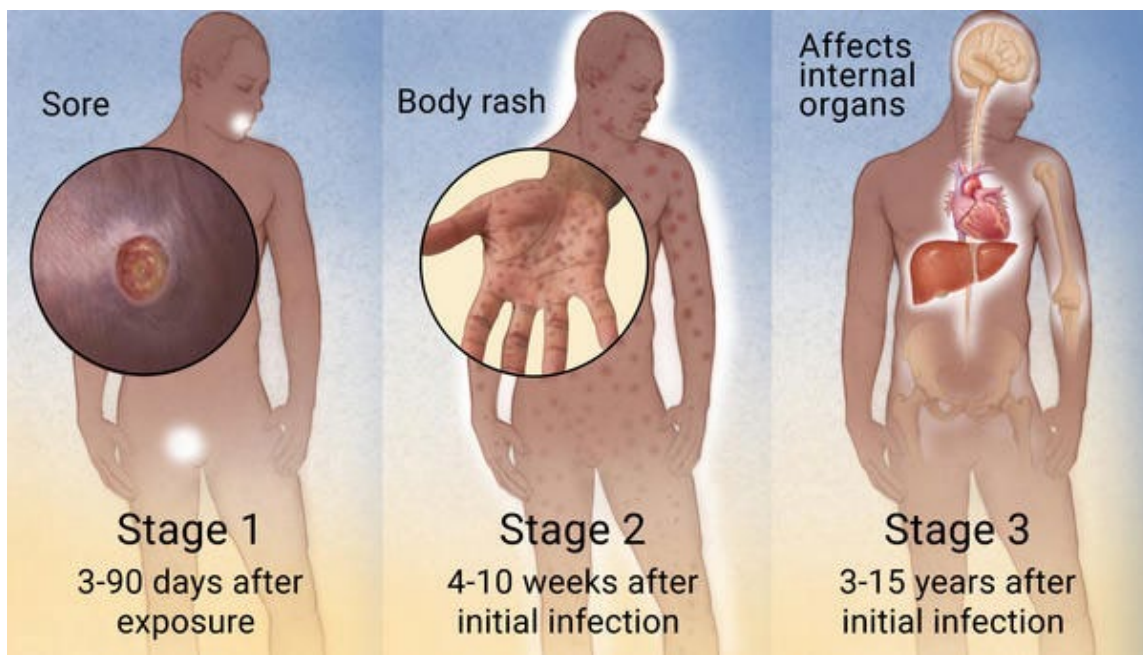
- Rash on hands and feet; can appear two to ten weeks after appearance of sore.

Tertiary (Late) Symptoms

- Damage to heart, eyes, brain, nerves, bones, liver, or joints; may be years or decades after infection.

Treatment

- Penicillin G benzathine: 2.4 million units IM once
- Alternative: Doxycycline: 100 mg orally twice daily for 14 days
- **Late stages are not curable.**





Sexually Transmitted Infections and Treatment

Human Immunodeficiency Virus (HIV)

Acquired Immune Deficiency Syndrome (AIDS)



What is HIV?

- Virus that attacks the immune system that can result in AIDS if left untreated.
- Transmitted through oral, anal and vaginal sex, and blood transfer (i.e. sharing needles).
- Cannot be spread through saliva (kissing, sharing drinks) or shared toilet seats.
- Can take up to 6 months to show on a blood test.
- Early infection causes a variety of nonspecific 'flu like' symptoms such as fever, muscle aches, rash, fatigue, sore throat, enlarged lymph nodes.

What is AIDS?

- HIV becomes AIDS when the body's immune system is too weak to fight off infection
- AIDS is diagnosed when a patient develops an AIDS defining illness, such as Kaposi sarcoma, Pneumocystis pneumonia, or toxoplasmosis (there are 27 conditions that define AIDS).
- Can take up to 10 years to develop symptoms and full blown AIDS.
- Immediate use of antiretroviral medications can prolong life expectancy and duration in the asymptomatic phase of HIV.



Sexually Transmitted Infections and Treatment

HIV Prevention with PrEP and PEP



What is PrEP?

- PrEP (pre-exposure prophylaxis) is a **daily medicine that can reduce your chance of getting HIV.**
- Daily PrEP **reduces the risk of getting HIV from sex by more than 90%.** Among people who inject drugs, it reduces the risk by more than 70%.
- **Risk of getting HIV from sex can be lowered by combining PrEP with condoms.**
- **Condoms are available at military pharmacies and can also be purchased for ten cents a piece [here](http://www.totalaccessgroup.com/condoms_for_military.html): (http://www.totalaccessgroup.com/condoms_for_military.html) when you ask for public health pricing.**
- Recommended for:
 - People in an ongoing sexual relationship with an HIV-positive partner.
 - Heterosexual men or women who do not regularly use condoms during sex with partners of unknown HIV status who are at substantial risk of HIV infection.
 - People who have injected drugs in the past 6 months.
 - HIV negative women with an HIV-positive partner who are considering getting pregnant may consider the risks and benefits of PrEP as one strategy to reduce the risk of HIV infection for herself and her baby.

What is PEP?

- PEP (post-exposure prophylaxis) can reduce your chance of getting HIV after potential exposure by taking antiretroviral medications.
- Must be taken within seventy-two hours of potential exposure.
- Available at military pharmacies.
- Recommended for emergency situations, such as exposure to blood from person with an unknown HIV status or sexual assault.



Sexually Transmitted Infections and Treatment

Hepatitis B



Type of Infection and Transmission

- Viral infection that **attacks the liver**.
- **Transmitted through oral, anal, and vaginal sex, and blood contact (Tattoos, IV drug use).**
- Testing:
 - Hepatitis B surface antigen (HBsAg) is the serologic hallmark of HBV infection. It can be detected using an enzyme immunoassay (EIA). HBsAg appears in serum one to ten weeks after an acute exposure to HBV, prior to the onset of hepatic symptoms or elevation of serum alanine aminotransferase (ALT). In patients who subsequently recover, HBsAg usually becomes undetectable after four to six months. Persistence of HBsAg for more than six months implies chronic infection.

Symptoms and Treatment

- Most people have no symptoms
- Those who do develop symptoms may have fatigue, nausea, loss of appetite, and yellowing of the eyes and skin.
- In most people, Hepatitis B and C cannot be cured and can cause liver failure over time
- Can be prevented by vaccine:
 - Most people have already been vaccinated.
 - For most patients, treatment is mainly supportive. The likelihood of liver failure from acute HBV is less than one percent, and in immunocompetent adults, the likelihood of progression to chronic HBV infection is less than 5%.



Sexually Transmitted Infections and Treatment

Antimicrobial Therapy for Pelvic Inflammatory Disease in Adults and Adolescents



Color Key:

- General Flow Chart Pathway
- Treatment Plan
- Decision Factor

Are any of the following present?

- Severe clinical illness (high fever, nausea, vomiting, severe abdominal pain)
- Complicated PID with pelvic abscess (including tubo-ovarian abscess)
- Possible need for invasive diagnostic exploration for alternate etiology (e.g., appendicitis, ovarian torsion) or surgical intervention for suspected ruptured tubo-ovarian abscess
- Inability to take oral medications due to nausea and vomiting
- Pregnancy
- Lack of response or tolerance to oral medications
- Concern for nonadherence to therapy

Yes

No

Hospitalize and initiate a parenteral regimen*:

- Cefoxitin OR cefotetan PLUS Doxycycline OR
- Clindamycin PLUS Gentamicin
- Continue until clinical improvement

Are any of the following present?

- Gynecologic instrumentation in the prior 2 to 3 weeks
- Trichomonas vaginalis infection
- Bacterial vaginosis

Are any of the following present?

- Pelvic abscesses**
- Trichomonas vaginalis infection
- Bacterial vaginosis

Treat in the outpatient setting with:

- Single IM dose of a long-acting cephalosporin (e.g., ceftriaxone) PLUS
- Doxycycline for 14 days PLUS
- Metronidazole for 14 days

Treat in the outpatient setting with:

- Single IM dose of a long-acting cephalosporin*** (e.g., ceftriaxone) PLUS
- Doxycycline for 14 days)

Yes

No

Once tolerating oral intake, add the following medications:

- Doxycycline PLUS
- Metronidazole to complete a 14-day course

Once tolerating oral intake, add the following medications:

- Doxycycline to complete a 14-day course

IM: Intramuscular; PID: pelvic inflammatory disease. TOA may require surgical management.

*These two regimens are both recommended by the Centers for Disease Control and Prevention in the United States. We generally prefer cefoxitin or cefotetan plus doxycycline for its overall safety and tolerability.

** Refer to other UpToDate content for details on additional management considerations, including other potential antibiotic regimens, for women with a tubo-ovarian abscess.

***We prefer ceftriaxone because it has the best and most established activity against Neisseria gonorrhoeae. Other appropriate cephalosporins include cefoxitin (with probenecid), cefotaxime, and ceftizoxime.

Antibiotic doses:

- Cefoxitin 2 g intravenously every 6 hours
- Cefotetan 2 g intravenously every 12 hours
- Clindamycin 900 mg intravenously every 8 hours
- Gentamicin 3 to 5 mg/kg every 8 hours
- Ceftriaxone 250 mg intramuscularly once
- Doxycycline 100 mg orally twice daily
- Metronidazole 500 mg orally twice daily



Sexually Transmitted Infections and Treatment

Living with STIs



Curable STIs: Gonorrhea, Chlamydia, Trichomoniasis, Syphilis

- Fully treatable with antibiotics, although antibiotic resistance is becoming more common.
- Treatment for gonorrhea, chlamydia, trichomoniasis, syphilis does not protect you against reinfection

Treatable STIs: HPV, Herpes and HIV

- HPV/Herpes
 - Infection remains in your immune system for life, but you can manage the symptoms with antivirals.
 - Can still have children with guidance of a provider.
- HIV
 - Over 6,000 active duty Sailors and Marines have been diagnosed with HIV since 1985.
 - Sailors are diagnosed with HIV at about twice the rate compared to Marines.
 - Most (98%) Sailors and Marines diagnosed with HIV are men and most are aged 20-39.
 - However, women can get HIV.
 - If diagnosed, you can remain active duty and receive excellent care.
 - You can still have a healthy child.
 - Patients with HIV should disclose their status to any potential partners, use condoms and other precautions, and their partners should use PrEP.

**STI screenings are essential to know your STI status.
Disclosure to partners is key to ensure both parties can have informed, safer sex.**