

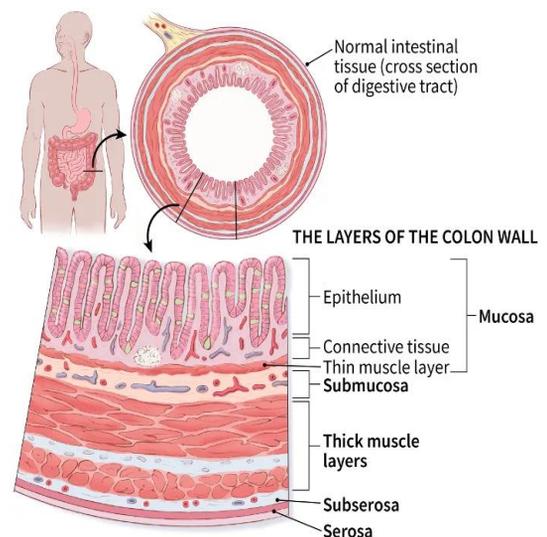
Infections. Yep. You Gussed It. Sexually Transmitted Infections of the Anus and Rectum

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Colorectal Surgery Research Fellow Creighton University

1

Anorectal Immunology

- Mucosal layer acts a physical and immune barrier for protection against bacteria and viruses
- Abrasive force causes destruction to the mucosal layer which allows bacteria and viruses access to the circulatory system



2

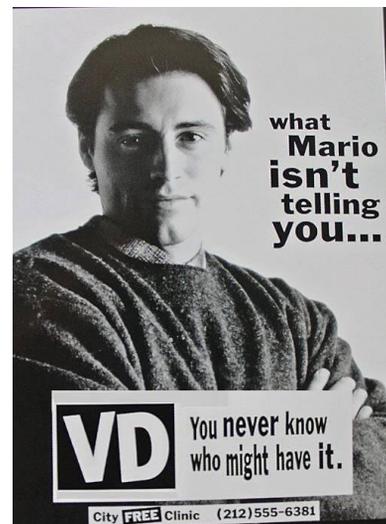
Bacterial STIs

- Chlamydia
- Lymphogranuloma Venereum
- Gonorrhea
- Syphilis
- Chancroid
- Donovanosis

3

Incidence

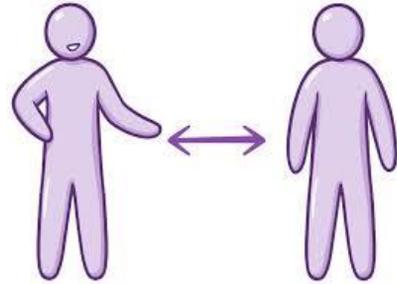
- 2.2 million reported bacterial STIs in 2024
- Reported cases declined 9% from 2023 but were still 13% higher compared to a decade ago
- **Bottom line:** although incidence is decreasing in recent years, there is still a substantial number of new cases reported annually in the US



4

Transmission

- Unprotected vaginal, anal, or oral sex
- Vertical transmission to neonates
- Often co-infected with other STIs
- Rectal disease acquired via anal receptive intercourse or contiguous spread from genital disease

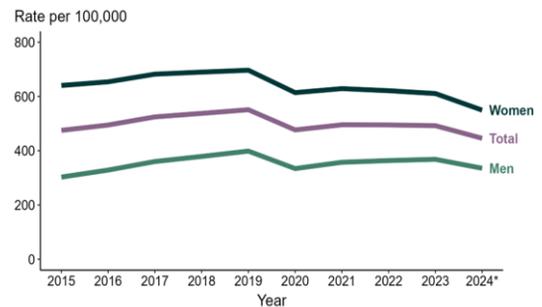


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Chlamydia

- Most common STI in US with over 1.5 million cases reported in 2024
 - 4% reduction in reported cases over the past 5 years, 8% reduction over the past 1 year
- *Chlamydia trachomatis* bacterium
- Incubation period is several days to 3 weeks after contact

Chlamydia — Rates of Reported Cases by Sex and Year, United States, 2015–2024

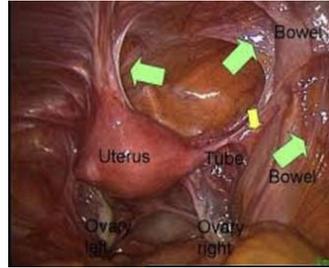


Centers for Disease Control and Prevention. Sexually Transmitted Infections Surveillance 2024 (Provisional). Atlanta: U.S. Department of Health and Human Services; 2025

6

Chlamydia

- Often asymptomatic
- Neonates → conjunctivitis
- In males, urethra is most commonly affected → thin penile drainage, painful urination, testicular pain/swelling
- In females, urethra and cervix are most commonly affected → thin cervical discharge/bleeding. Can cause pelvic inflammatory disease
- Rectal disease → rectal pain, bleeding, discharge



Alan Bolnick, Jay Bolnick, Michael P. Diamond. Postoperative Adhesions as a Consequence of Pelvic Surgery. *Journal of Minimally Invasive Gynecology*, Volume 22, Issue 4, 2015, Pages 549-563, ISSN 1553-4650, <https://doi.org/10.1016/j.jmig.2014.12.009>.



Manasseh G S L, Amarakoon S, Photiou V, Arruti N, Borman A D. Approach to conjunctivitis in newborns. *BMJ* 2022; 376 :e068023 doi:10.1136/bmj-2021-068023



Richard P. Usatine, Mindy Ann Smith, Heidi S. Chumley, Camille Sabella, E.J. Mayeaux, Jr., Etumalai Appachi. *The Color Atlas of Pediatrics*: www.accesspediatrics.com Copyright McGraw-Hill Education

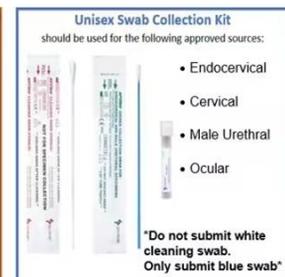
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Chlamydia

- Diagnosis: Nucleic acid amplification test (NAAT) of urine samples or vaginal swabs
Specialized assay approved for rectal samples
- Treatment:
 - Empiric treatment against for gonorrhea and herpes simplex virus
 - Azithromycin 1mg PO x1 dose OR doxycycline 100mg PO BID x 7 days
 - ****Doxycycline more effective for rectal chlamydia**
 - Re-test 3-months post-treatment



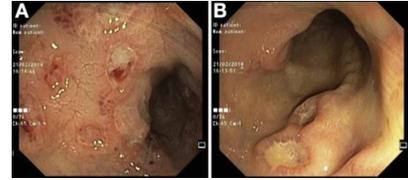
Arévalo, F., Rayme, S., Zurita, F. *et al.* Immunohistochemical detection of chlamydia trachomatis in sexually transmitted infectious proctitis. *BMC Gastroenterol* 22, 171 (2022). <https://doi.org/10.1186/s12876-022-02233-w>



8

Lymphogranuloma Venereum (LGV)

- Incidence is higher in MSM population and HIV+ individuals
- Caused by a more aggressive type of *Chlamydia trachomatis*
- Presentation can mimic IBD
 - Severe proctitis with ulcers leading to abscesses, fistulas, strictures
 - Lymphadenopathy (buboes), fever, weight loss
- Diagnosis: NAAT testing for chlamydia followed by cultures for LGV
- Treatment: doxycycline 100mg BID x 21 days



Riault, Clémentine et al.
Clinical Gastroenterology and Hepatology, Volume 17, Issue 8, e91



Sobral-Costas TG, López-Alcázar S, Escudero-Tomero R, et al. Single case of lymphogranuloma venereum on the tongue. *Sexually Transmitted Infections* 2024;100:108-109.

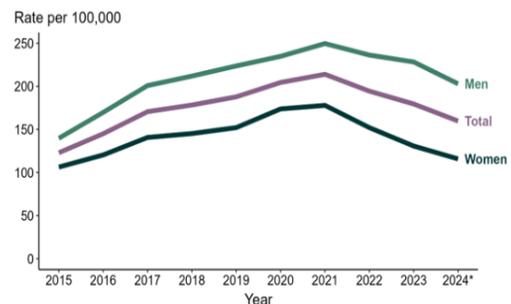
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9

Gonorrhea

- 2nd most common STI in US with over 540,000 cases reported in 2024
 - 19.8% reduction in reported cases over the past 5 years, 9.6% reduction over the past 1 year
- *Neisseria gonorrhoeae* bacterium → increased antibiotic resistance compared to other STIs
- Incubation period is about 2 weeks after contact

Gonorrhea— Rates of Reported Cases by Sex and Year, United States, 2015–2024



Centers for Disease Control and Prevention. *Sexually Transmitted Infections Surveillance 2024 (Provisional)*. Atlanta: U.S. Department of Health and Human Services; 2025

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Gonorrhea

- Often asymptomatic
- In males, urethra is most commonly affected → painful urination, thick mucopurulent penile discharge, less often testicular pain
- In females, cervix, urethra, and rectum commonly affected → thick mucopurulent drainage, bartholin gland abscesses. Like chlamydia, can cause pelvic inflammatory disease.
- Rectal disease → tenesmus, hematochezia, discharge, abscesses



Public Health Agency of Canada



Public Health Agency of Canada



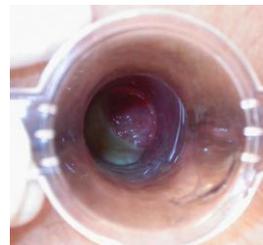
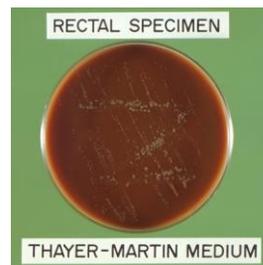
CDC/Susan Lindsley

Dr. med. Mirjam C. Nägeli.
DERMATOLOGIE PRAXIS 2016;
26(3): 16-19

11

Gonorrhea

- Diagnosis:
 - Anoscopy shows friable mucosa with thick mucopurulent discharge from the anal crypts
 - NAAT testing
 - Gram stain and culture
- Treatment:
 - Dual-therapy given antibiotic resistance
 - Ceftriaxone 250mg once IM plus Azithromycin 1g once PO
 - Re-test at 3 months post-treatment

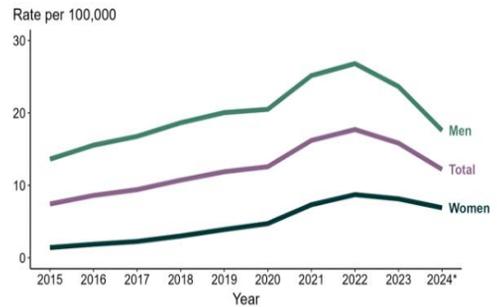
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26(3): 16-19Fabre, Valeria. "Neisseria Gonorrhoeae." *Johns Hopkins ABX Guide*. The Johns Hopkins University, 2025. *Johns Hopkins Guides*. www.hopkinsguides.com/hopkins/view/Johns_Hopkins_ABX_Guide/540249/all/Neisseria_gonorrhoeae.

12

Syphilis

- Over 190,000 cases reported in US in 2024
 - 42% increase in reported cases over the past 5 years, 9.1% reduction over the past 1 year
- *Treponema pallidum* spirochete → 3 stages of infection (primary, secondary, tertiary)
- Incubation period
 - Primary: 1-21 days after contact
 - Secondary: weeks-months after primary infection
 - Tertiary: 1-30 years after primary infection

Primary and Secondary Syphilis— Rates of Reported Cases by Sex and Year, United States, 2015–2024



Centers for Disease Control and Prevention. Sexually Transmitted Infections Surveillance 2024 (Provisional). Atlanta: U.S. Department of Health and Human Services; 2025

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Syphilis

- Primary syphilis
 - More often asymptomatic in HIV+ patients
 - Painless genital ulcers
 - Painful extragenital ulcers
 - Ulcers spontaneous resolve within 3-6 weeks
- Secondary syphilis
 - Fever, malaise, arthralgia, diffuse LAD, rectal mass, rash on hands and soles of feet
 - **Failure to treat this stage results in progression to latent asymptomatic stage before tertiary stage
- Tertiary syphilis
 - Occurs in a minority of patients
 - Cardiac involvement, gummas
- **Neurosyphilis (meningitis, cranial nerve palsies, paralysis, dementia) can occur at any stage and is increased in patients with HIV



<https://www.anaisdermatologia.org.br/en-acquired-syphilis-update-on-clinical-articulo-S0365059625000406>



Passos, M.R.L. (2018). Syphilis. In: Passos, M. (eds) Atlas of Sexually Transmitted Diseases. Springer, Cham. https://doi.org/10.1007/978-3-319-57470-7_2

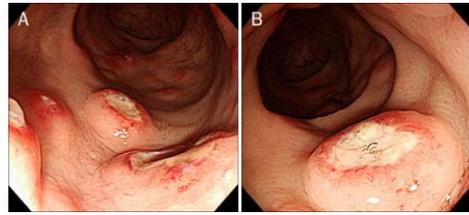


BSIP, SIDEA REVUZ / SCIENCE PHOTO LIBRARY

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Syphilis

- Diagnosis:
 - Screening tests: Venereal disease research lab (VDRL) +/- rapid plasma reagin (RPR)
 - Confirmatory antibody testing for all positive screening tests (FTA-ABS, enzyme immunoassays)
- Treatment:
 - Single IM dose of Penicillin G for all stages
 - Jarisch-Herxheimer Reaction can occur within 24 hours of treatment → myalgia, fever, headache, preterm labor
 - Re-test at 6 and 12 months post-treatment



Korean J Gastroenterol 2016;68(4):218-220.
Published online: 4 October 2016
DOI: <https://doi.org/10.4166/kjg.2016.68.4.218>



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Screening and Prevention

- Chlamydia & Gonorrhea Screening:
 - Sexually-active women <25y/o
 - Sexually-active women >25y/o if increased risk
 - Pregnant women
 - All sexually-active MSM annually or every 6 months if increased risk
 - All HIV+ patients annually
- Syphilis Screening:
 - Pregnant women
 - All sexually-active MSM
 - All HIV+ patients
- Prevention: safe-sex practices, abstinence for at least 1 week following completion of treatment



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Chancroid

- Not common in US - more likely to occur in regions of Africa and Caribbean
- Caused by *Haemophilus ducreyi* bacterium
- Incubation period is a few hours to days
- Presents as painful papule that progress to painful genital or anal ulcer +/- suppurative inguinal LAD
- Dx: Clinical exam (difficult to culture)
- Tx: Ceftriaxone 250mg IM once or Azithromycin 1g PO once



Goldsmith LA, Katz SI, Gilchrist BA, Paller AS, Leffell DJ, Wolff K: *Fitzpatrick's Dermatology in General Medicine, 8th Edition*; www.accessmedicine.com Copyright: The McGraw-Hill Companies, inc



Dr. M.A. Ansary / Photo Researchers, Inc., David M. Phillips / Photo Researchers, Inc.

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Donovanosis

- Rare in US - more likely to occur in tropical and developing areas such as Brazil, South Africa, and Caribbean
- Caused by *Klebsiella granulomatis* bacterium
- Presents as non-tender, beefy-red, bleeding genital ulcer. Anorectal ulcers present as verrucous lesions +/- deep fissures. Ulcers present with extragenital granulomas.
- Dx: Donovan bodies within mononuclear cells on Giemsa stain
- Tx: Azithromycin 1g PO once a week x 3 weeks or 500mg daily for 3 weeks



Dermatology Atlas:
<http://www.atlasdermatology.co.com.br/disease.jsf?diseaseId=109>

Walter Belda Junior.
Donovanosis, *Anais Brasileiros de Dermatologia*, Volume 95, Issue 6, 2020, Pages 675-683, ISSN 0365-0596, <https://doi.org/10.1016/j.abd.2020.07.002>.



Nigel O'Farrell,
Donovanosis, *Clinics in Dermatology*, 2025

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Viral STIs

- Herpes Simplex Virus (HSV)
- Human Papillomavirus (HPV)
- Human Immunodeficiency Virus (HIV)

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Herpes Simplex Virus (HSV)

- One of the most prevalent STIs in the US with >20% of adults as carriers
- Caused by DNA virus of the *Herpesviridae* family
 - Oral lesions → HSV-1 most commonly
 - Genital lesions → HSV-2 most commonly but can be caused by HSV-1
- Transmission: Vaginal, anal, or oral sexual contact
- Incubation period is 4-21 days



Dermatology Institute
for Skin Cancer &
Cosmetic Surgery

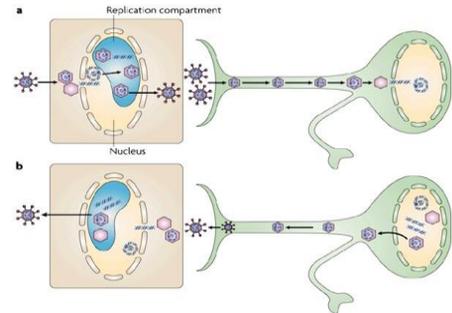


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of perianal herpes: sexual
abuse or autoinoculation?
Forensic Sci Med Pathol (2025).
<https://doi.org/10.1007/s12024-025-01086-5>

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Herpes Simplex Virus (HSV)

- **Primary infection:**
 - Prodrome of fevers, chills, malaise
 - Significant anogenital pain followed by development of cluster of small vesicular lesions
 - Anorectal lesions present with mucoid bowel movements, hematochezia, tenesmus
 - Lesions are highly contagious until epithelial barrier forms over lesions (takes about 3 weeks)
- **Latent phase:**
 - After primary infection, virus travels retrograde along sensory nerves and remains dormant
 - Reactivated virus travels back down the nerves to cause symptoms
- **Recurrent infections:**
 - Lack prodrome phase
 - Less severe symptoms over shorter duration

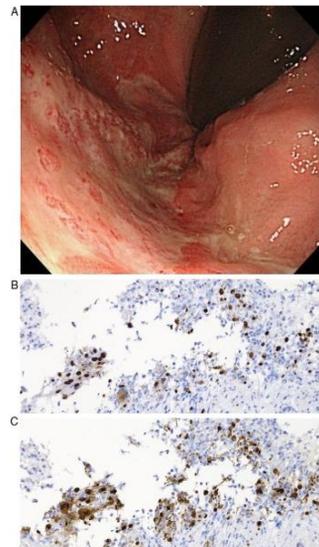


Knipe, D., Cliffe, A. Chromatin control of herpes simplex virus lytic and latent infection. *Nat Rev Microbiol* 6, 211–221 (2008). <https://doi.org/10.1038/nrmicro1794>

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Herpes Simplex Virus (HSV)

- **Dx:**
 - Cultures/staining of sores or serologic testing
 - Endoscopy: friable mucosa with diffuse ulcerations limited to the distal 10cm of rectum
- **Tx:**
 - Primary infection: Acyclovir 400mg PO TID x 7-10 days or Valacyclovir 1g PO BID x 7-10 days
 - Recurrent infection: Acyclovir 400mg PO TID x5 days or Valacyclovir 1g PO daily x 5 days
- **Tx HIV+ patients:**
 - Suppressive Tx: Acyclovir 400-800mg TID or Valacyclovir 500mg BID
 - Recurrent infection: Acyclovir 400mg TID x 5 days or Valacyclovir 1g BID x 5 days



Nakamura, Itaru et al. *International Journal of Infectious Diseases*, Volume 98, 406 - 407

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Human Papillomavirus (HPV)

- One of the most prevalent STIs in the world with over 20 million people affected in US
- Promotes uncontrolled cell growth and is associated with development of oropharyngeal, anal, vulvar, vaginal, cervical, and penile cancers
- Transmission:
 - Vaginal, anal, oral sexual contact
 - Close skin-to-skin contact
 - Can be transmitted even if no visible disease
 - Anorectal disease can result for contiguous spread from genital disease
- Incubation period is up to 3 months



Betz, S.J. HPV-Related Papillary Lesions of the Oral Mucosa: A Review. *Head and Neck Pathol* 13, 80–90 (2019). <https://doi.org/10.1007/s12105-019-01003-7>



Alison Montgomery, Andrew Durden, Srividya Sundararajan, Hoda Al-Booz, Claire Newton, Review of invasive cervical cancer, *Obstetrics, Gynaecology & Reproductive Medicine*, Volume 33, Issue 10, 2023, Pages 281-285



MedScape Reference
Anal Cancer: The Fundamentals

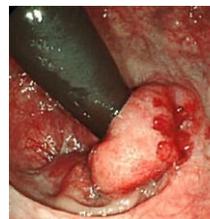
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Human Papillomavirus (HPV)

- Dx:
 - Cauliflower-like growths that cause bleeding, itching, difficulty with hygiene
 - High-resolution anoscopy with 3% acetic acid solution
- Tx: Goal is to remove all visible disease while sparing healthy-appearing tissue
 - Topical agents (imiquimod cream, podofilox, trichloroacetic acid)
 - Surgical excision, cryotherapy, fulguration
 - Giant condyloma: WLE with 1cm margins



ASCRS Textbook of Colon and Rectal Surgery - Anal condyloma (warts)



Matsunaga M, Miwa K, Oka Y, Nagasu S, Sakaue T, Fukahori M, Ushijima T, Akagi Y. mFOLFOX6 Chemotherapy after Resection of Anal Canal Mucinous Adenocarcinoma. *Case Rep Oncol*. 2016 Apr 29;9(1):280-4



Skowrońska-Piekarska U, Kościński T. Buschke – Loewenstein tumor resection with simultaneous reconstruction of extensive tissue losses: case report. *BMC Surg*. 2015 Apr 10;15:41

24

Human Papillomavirus (HPV)

- According to the CDC, vaccination could prevent >90% of cancers caused by HPV
- Current guidelines:
 - Recommend all 11-12 year old children receive 2 doses of the HPV vaccine 6-12 months apart
 - Can be given through age 26
- Reduction in infection and cancer rates:
 - Within 12 years, HPV infections decreased 88% among 14-19 year olds and 81% among 20-24 year olds in the US
 - Incidence of HPV-related cervical lesions reduced by 40% in vaccinated women since vaccine introduction

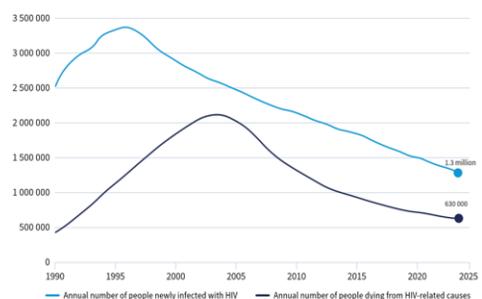


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Human Immunodeficiency Virus (HIV)

- According to the WHO, incidence of HIV infections has reduced by 40% and HIV-related deaths reduced by 54% from 2010-2014
- Caused by a retrovirus that incorporates into the human genome and destroys T-cells, which are important immune cells that help to fight infections
- Transmission:
 - Oral, rectal, vaginal, or penile contact with infected fluid (semen, blood, vaginal or rectal fluids, breastmilk, pregnancy, childbirth)
 - Direct injection into bloodstream (needles/syringes)

Global trends in people acquiring HIV and people dying from HIV-related causes, 1990–2024



Note: These estimates were made before the implementation of cuts to foreign aid.
Source: UNAIDS/WHO estimates, 2025.

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Human Immunodeficiency Virus (HIV)

- 3 phases of infection
- Acute phase:
 - Flu-like symptoms with rash and oral sores
 - Occurs a few weeks after infection
- Dormancy phase:
 - Slow but steady viral reproduction as CD4 counts begin to fall
 - Can last several years
 - Once CD4 counts $<500\text{mm}^3$ → considered immunocompromised and increased risk for other infections such as HSV and HPV
- End-Stage (AIDS):
 - Occurs when CD4 counts $<200\text{mm}^3$ → increased risk of opportunistic infections and AIDS-defining illnesses (CMV, pneumocystis jiroveci PNA, cryptosporidiosis, mycobacterium tuberculosis, Kaposi sarcoma)



Joyce H Y Ma,
Simon Smith and
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Med J Aust 2015;
202 (5): 273-274.
doi:10.5694/mja1
4.01198



By OpenStax
College - Anatomy
& Physiology,
Connexions Web
site. Jun 19, 2013.

27

Human Immunodeficiency Virus (HIV)

- Benign anorectal pathology is the most common anorectal manifestation in HIV+ patients
 - 1) Anal Ulcer
 - 2) Hemorrhoids, abscesses, fistulas, fissures
 - 3) Other STIs → Anal condylomas, HSV
- Dx: serological testing
- Tx: Highly active antiretroviral therapy HAART
 - HIV+ patients who are receiving HAART are at no increased risk for complications following anorectal procedures for benign anorectal pathology
- Screening: Everyone between ages 13-64 should be screened for HIV at least once in their lifetime
- Prevention: Safe-sex practices, post-exposure



Anti-HIV drugs for cancer therapeutics: back to the future? Chow, Warren A et al. The Lancet Oncology, Volume 10, Issue 1, 61 - 71

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Free/Low Cost STI Testing & Treatment - Omaha, NE

- Douglas County Health Department
 - Address: 1111 S. 41st St, Omaha, NE
 - Phone: 402-444-7471
- Planned Parenthood - Omaha Health Center
 - Address: 3105 N. 93rd St., Omaha, NE
 - Phone: 877-859-0589
- MedEx STD Testing
 - Address: 10020 Nicholas St., Omaha, NE
 - Phone: 402-814-8492
- Assure Women's Center
 - Address: 6510 Sorensen Pkwy, Omaha, NE
 - Phone: 402-397-0600
- Pride Health Clinic
 - Address: 4905 S. 107th Ave (Renzig Building), Omaha, NE
 - Phone: 402-243-1526
- Nebraska AIDS Project (NAP)
 - Address: 6220 Maple St., Omaha NE
 - Phone: 402-552-9260

29

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