Welcome to Pathogen Group 6

- Human herpesviruses 1 (HHV-1) and 2 (HHV-2 or HSV-2)
- Varicella-zoster virus (chickenpox and shingles)
- *Neisseria gonorrhoeae*
- *Treponema pallidum*
- Human papillomaviruses (HPV)
- Human immunodeficiency virus (HIV)
Herpes Simplex viruses

- HHV-1 (HSV-1) and HHV-2 (HSV-2)
- *Human herpesvirus* 1 and 2
- Genus *Simplexvirus*
- ds DNA with envelope
- latency in ganglia
- common sites: oral, genital, finger, eye, buttock, thigh, disseminated in infants
• virus moves up nerves to ganglia at base of brain or along spinal cord
oral herpes
oral herpes
oral and finger herpes
herpes on penis

lots to learn from CDC factsheet:
herpes on penis
herpes on finger (whitlows)

- deep lesions
neonatal herpes
Varicella-zoster virus: chickenpox (Varicella) and shingles (Herpes Zoster)

- a herpes virus
  human herpesvirus 3
- latency following primary infection
- shingles by reactivation of virus
- Study figure 21.11

chickenpox
Infant immunization since 1995

- Before that: 4 million cases/year; 11,000 hospitalizations, 100 deaths in U.S.
  - Most deaths from secondary bacterial infections and pneumonia
  - Also risk of encephalitis and hemorrhagic disease
- In pregnancy: 5% risk of congenital varicella syndrome: limb abnormalities, cataracts, skin scarring, CNS abnormalities
chickenpox

- papulovesicular rash
- as of 7/1/01, immunization required for school, pre-school, or day care
varicella virus moving into nervous system
varicella virus causing shingles
Now a zoster vaccine for adults 60 years & older
latency following chickenpox
shingles
shingles
shingles
Neisseria gonorrhoeae: gonorrhea

- “the gonococcus” (GC)
- Gram - diplococci
- often intracellular in WBCs
Gonorrhea

- transmission almost always sexual
- general nature: usually a local infection of membranes (eye, throat, rectum, urogenital).
- If untreated may become systemic
- untreated cases may also result in sterility in either sex and PID in females
- Check out this awesome CDC fact sheet 😊
  http://www.cdc.gov/std/Gonorrhea/STDFact-gonorrhea.htm
Gonorrhea

- pus discharge
Gonorrhea

Normal cervix (left) and cervix with mucopus (right).
Gonorrhea in eyes
Gonorrhea diagnosis

- **A. Laboratory based:**
  - Cultures (Thayer Martin agar, inexpensive, high sensitivity and specificity, takes 24-72 hours)
  - Nucleic acid amplification (NAA) tests
  - Nucleic acid hybridization (NA probes)
  - ELISA

- **B. Point of care tests (faster):**
  - Gram stain
    › Requires trained technician
    › Not recommended for testing women
    › May give false positive by nonpathogenic spp.
Treponema pallidum: Syphilis

- Gram-negative spirochete
- best viewed with darkfield microscope or silver-impregnation stain
- transmission usually sexual contact of all kinds
- general nature: always systemic
- chronic, with definite stages to know (primary, secondary, latent, tertiary)
- CDC factsheet [http://www.cdc.gov/std/syphilis/STDFact-Syphilis.htm](http://www.cdc.gov/std/syphilis/STDFact-Syphilis.htm)
primary syphilis

- lesion is chancre
- open sore
- does not hurt
- swarms with spirochetes
primary syphilis: chancre
secondary syphilis

- variable rash
- often on palms of hands and soles of feet
- does not itch
- Still very infectious
- flat oral and genital lesions that swarm with spirochetes
- head and body aches
- hair falls out

*Figure 17.4* The skin rash in secondary syphilis may form on the trunk.
secondary syphilis
latent syphilis

- no symptoms
- no sexual transmission
- transplacental transmission at about 5 months of pregnancy
- lasts average of 5-10 years, can be longer
tertiary or late syphilis

- damage to vital organs
- potentially fatal
- aneurysms of arteries
- paresis: gradual degeneration of brain and spinal cord, with paralysis and psychosis
- photo is gumma (often internal)
Congenital syphilis:

• 25% untreated cases die in uterus
• 25% untreated cases die as neonates
• Many survivors have permanent birth defects and/or neurological damage
Hutchinson’s teeth: from congenital syphilis
Syphilis summary
Diagnosis of syphilis

- Explained in detail on page 755 in your textbook!
Human papillomaviruses (HPV): genital warts and cervical cancer

- Two general types of HPV:
  - Epidermitrophic: cause warts on skin
  - Mucosatrophic: anogenital warts, oral and throat lesions

- About 40 HPV types are sexually transmitted
- Most prevalent STI in the U. S.

- Vaccine now available to protect against HPV: the primary cause of cervical cancer
  - Girls and women: Two vaccines (Cervarix and Gardasil) are available to protect females against the types of HPV that cause most cervical cancers. One of these vaccines (Gardasil) also protects against most genital warts. Gardasil has also been shown to protect against anal, vaginal and vulvar cancers. Either vaccine is recommended for 11 and 12 year-old girls, and for females 13 through 26 years of age, who did not get any or all of the shots when they were younger. These vaccines can also be given to girls beginning at 9 years of age. It is recommended to get the same vaccine brand for all three doses, whenever possible.

  - Boys and men: One available vaccine (Gardasil) protects males against most genital warts and anal cancers. This vaccine is available for boys and men, 9 through 26 years of age.
Human papillomaviruses (HPV): genital warts and cervical cancer

- ds DNA, no envelope
- 2 strains (16 & 18) associated with 93% of cases of cervical cancer
- HPV Factsheet from CDC
genital warts
HIV/AIDS

• Your textbook does an awesome job informing you of this pathogen & disease!

• So...read pp. 539-548 carefully and study the figures in these pages as well! (referring to your Tortora textbook’s 10th edition)

• HIV will also be an example of an RNA virus during our virology lectures.

• HIV is also covered in 2 of our lab exercises

• And...don’t forget the handouts within the thick Pathogen Groups packet given to you in lab (i.e. Frequently Asked Questions About HIV/AIDS, HIV/AIDS 101, HIV: Five Important Time Periods, Safe and Unsafe Sexual Activities...)

• Also...check this from CDC