Chapter 22

Sexually Transmitted Diseases
Bacterial Infections

- Chlamydia.
  - Leading sexually transmitted disease in the US.
    ✤ Usually asymptomatic to mild burning sensation on urination.
    ➢ Risk of spreading from the cervix to the oviducts and into pelvic inflammatory disease.
      ✤ Usually treated with a single dose of antibiotics.
Chlamydia Eye Infection

Bacterial Infections

- **Gonorrhea.**
  - Affected individuals often have a secondary infection with chlamydia.
    - Asymptomatic to pain on urination and milky urethral discharge within 3-5 days.
    - Usually cured with antibiotics.
Secondary Gonorrheal Infection

Bacterial Infections

- Syphilis.
  - Three stages.
    - Primary stage - Hard chancre.
    - Secondary stage - Rash.
    - Tertiary stage - Weakened arterial walls.
      - Prompt and adequate treatment is critical for control.
        - Treatment is a form of penicillin.
Syphilis

Viral Infections

- **Herpes Infections.**
  - HSV-1 - Sores and fever blisters.
  - HSV-2 - Genital herpes.
    - Asymptomatic to tingling and itching prior to blistering.
    - May be reoccurring due to stressors.
    - Presently no cure.
Genital Herpes

Genital Warts

- Human papillomaviruses cause many forms of warts, including genital warts.
  - Commonly seen on the penis and near vaginal opening.
    - Associated with cervical cancer.
    - Presently no cure.
  - Effective treatment relies on various forms of wart removal.
### Hepatitis

- **Hepatitis A** is usually acquired from sewage-contaminated drinking water.
- **Hepatitis C** is usually acquired from contact with infected blood.
  - Can lead to chronic hepatitis and liver cancer.
- **Hepatitis B** is a DNA virus usually spread through needle sharing or sex with infected individuals.
  - No treatment available.

### Incidence of New Cases of Common STD’s

<table>
<thead>
<tr>
<th>Condition</th>
<th>Incidence (per year)</th>
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<tbody>
<tr>
<td>chlamydia</td>
<td>3 million</td>
</tr>
<tr>
<td>gonorrhea</td>
<td>650,000</td>
</tr>
<tr>
<td>syphilis</td>
<td>70,000</td>
</tr>
<tr>
<td>genital herpes</td>
<td>1 million</td>
</tr>
<tr>
<td>genital warts</td>
<td>5.5 million</td>
</tr>
<tr>
<td>hepatitis B</td>
<td>120,000</td>
</tr>
<tr>
<td>trichomoniasis</td>
<td>5 million</td>
</tr>
<tr>
<td>AIDS</td>
<td>40,000</td>
</tr>
</tbody>
</table>
Other Infections

- **Vaginal Infections.**
  - **Bacterial vaginosis.**
    - Thin, foul-smelling gray discharge.
  - **Trichomoniasis.**
    - Abundant, frothy foul-smelling yellow discharge accompanied by itching.
  - **Candidal vaginitis.**
    - White, clumpy discharge.
- **Public Lice (Crabs).**

Acquired Immunodeficiency Syndrome

- Generally accepted that human immunodeficiency virus (HIV) originated in Africa and then spread outward.
  - May have come to US and Britain in 1950’s.
    - First documented case in US was 1969 in Missouri.
      - HIV found to be cause of AIDS in 1983.
Prevalence of AIDS

- Pandemic disease.
  - Transmitted by sexual contact with an infected person, needle-sharing, and transfusions of infected blood.
  - Incidence in more-developed countries is modest, while incidence in less-developed countries is much higher.
  - In sub-Saharan Africa, AIDS affects 9% of adult population between 15 and 49 years of age.
Phases of an HIV Infection

- **Category A: Acute Phase.**
  - Normal CD4 T-cell count is at least 800 cells per mm$^3$ of blood.
  - First phase characterized by CD4 T-cell count of 500 per mm$^3$ or greater.
    - Immune system functions normally.
    - Small percentage of affected individuals may show recurring mononucleosis-like symptoms.

- **Category B: Chronic Phase.**
  - CD4 T-cell count is 200-499 per mm$^3$.
  - Symptoms begin to appear.
    - Persistent swollen lymph nodes.
    - Severe fatigue.
    - Night sweats.
    - Persistent cough, cold, or flu.
    - Nervous system impairment.
Phases of an HIV Infection

- **Category C: AIDS.**
  - CD4 T-cell count is below 200 per mm$^3$.
  - Lymph nodes have degenerated and patient is extremely weak and thin.
  - Develop opportunistic infection.
    - Pneumonia.
    - Tuberculosis.
    - Encephalitis.
    - Kaposi’s sarcoma.
    - Invasive cervical cancer.

Stages of an HIV Infection

[Graph showing CD4 T lymphocytes and HIV in blood and plasma over years since infection]
HIV Structure and Life Cycle

- Retrovirus Reproductive Cycle.
  - Attachment.
  - Fusion.
  - Uncoating.
  - Reverse transcription.
  - Replication.
  - Integration.
  - Biosynthesis.
  - Maturation.
  - Release.

Reproduction of HIV
Treatment for HIV

- Until a few years ago, an HIV infection almost inevitably led to AIDS and death.
  - Since late 1995, scientists have gained a much better understanding of the structure and life cycle of HIV.
  - Combination drug therapy has met with encouraging success and vaccine development is being pursued.

Review

- Bacterial Infections
  - Chlamydia
  - Gonorrhea
  - Syphilis
- Viral Infections
  - Herpes
  - Hepatitis
- Other Infections
  - Vaginal Infections
- AIDS