How Do You Catch An Infection?

Animals

Insects

Water

People

Food
Infectious Diseases – Considerations for the 21\textsuperscript{st} Century

- Viruses, bacteria, fungi, protozoa, helminths

- Infectious diseases are the second leading cause of death world-wide

- A virus takes over a body cell’s reproductive ability & instructs it to produce new viral particles which are released to enter other cells.
Infectious Diseases – Considerations for the 21st Century

- 3 greatest microbial killers worldwide:
  - HIV, malaria, tuberculosis

- Protozoa-single cell organism
  - Example-Giardia protozoan most common in U.S.

Immune Response
Antigen-a substance that white blood cells recognize as foreign.
Antibodies-proteins that bind to antigens & mark them for destruction by other white blood cells.
AIDS/HIV

- In 2000, 36 million people worldwide living with HIV
- Worldwide 3 million die of AIDS each year
- 30% of new HIV infections occur in women
- Next epicenters predicted – India and southern and south east Asia
Facts Relating To The Common Cold

- There are 200 distinct cold viruses.
- Americans come down with 1 billion colds annually.
- The common cold results in ~20 million lost work days and 22 million days of absence from school.

**Spring, Summer and Early Fall Colds**
- Rhinoviruses causing symptoms above the neck (stuffy nose, headache, runny nose)

**Winter Colds**
- Adenoviruses, parainfluenza viruses, coronaviruses, influenza viruses which are more likely to get into the bronchi and trachea and cause more fever and bronchitis.
Bacteria

- Bacteria are microscopic, unicellular organism with a simple cell structure.
- Bacteria cause infections such as strep throat, certain types of food poisonings.
- When bacteria enter the body, they adhere to the host’s cells and grow and multiply there.
Fungi

- *Fungi* are more commonly called molds and yeasts.
- Fungi cannot produce their own food and must grow on various organisms to survive.
- Mushrooms are fungi that grow on rotting logs
- Mold grows on bruised fruit
- *Healthy humans have a high degree of resistance against fungi*
- *Fungi cause opportunistic diseases such as athlete’s foot when the body’s resistance is lower.*
HIV Transmission

- Sexual contact with infected person
- Direct contact with blood, semen, vaginal secretions & breast milk
- Risky sexual practices include unprotected anal intercourse between men or vaginal intercourse between a man and woman.
- ANY sexual behavior that results in contact with infected blood, semen, vaginal secretions is risky!
HIV and AIDS
Risky Behaviors to Avoid

- Unprotected vaginal, anal, or oral sex with an HIV-infected individual.
- Multiple or anonymous sexual partners.
- Anal sex with or without a condom.
- Vaginal or oral sex with a drug user or individual that engages in anal sex.
- Sex with an individual who has several sex partners.
How HIV is NOT Transmitted

- Casual contact with infected people
- Sharing things such as telephones, combs, eating utensils or using drinking fountains
- Kissing does not appear to transmit HIV
- Mosquitoes do not transmit HIV
Symptoms of HIV & AIDS

**Progression of HIV**

- Possibly no initial symptoms for a number of years
- Typical signs as the immune system weakens, include fatigue, dry cough, fever, night sweats, diarrhea, skin rashes, swollen lymph glands, vaginal yeast infections, unexplained weight loss.
- Over time opportunistic infections develop, and AIDS is diagnosed.
HIV versus AIDS

**Human Immunodeficiency Virus (HIV)**
A virus spread through the exchange of:
1. blood
2. semen
3. vaginal secretions
4. breast milk

**Acquired Immune Deficiency Virus (AIDS)**
An incurable, sexually transmitted viral disease caused by (HIV).
Immune suppression associated with AIDS can lead to opportunistic diseases and cancers.
No known cure.

**HIV is NOT spread through casual contact (i.e. toilet seats or hugging)!**
Sexually Transmitted Infections
The Facts

- Almost 700,000 people are infected every day with one of the over 20 STIs.
- The highest rates of STIs occur among 16- to 24-year-olds.
- **STI Complications:**
  - Sterility, miscarriage, premature delivery, uterine infections after delivery, and increased risk of HIV transmission.
  - Many STIs may not cause ANY symptoms.
Factors That Increase The Risk Of STIs In Young People

Feelings of Invulnerability

Substance Abuse

Multiple Partners

Failure to Use Condoms
How HIV Infection and Other STIs Are Spread

Blood

Vaginal fluid

Semen

Other body fluids: saliva, urine, feces, breast milk

Tough outer skin covers the outside of your body, including hands and lips. Germs may enter when skin is chapped, or through a hangnail, cut, scrape, sore, or needle puncture.

HIV and other STDs

Fragile inner skin lines the inside of your vagina or penis, anus, and mouth. Germs may enter when skin is torn during sexual contact that involves rubbing, stretching, or not enough lubrication (wetness).

Use a barrier to help prevent the spread. Barriers made of latex help prevent body fluids from entering your body. Latex condoms are recommended for intercourse. Spermicides containing nonoxynol-9 or water-based lubricants help kill many STD germs. They also reduce friction so latex condoms are less likely to break.

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1. Transmission

- How does the STI pass from one person to another?
- Some STIs can be passed without any symptoms or sores present
- Sexual fluids mixing, skin to skin contact, oral/anal/vaginal sex
- Can get STIs from oral sex in your throat
2. Symptoms

- How can people tell if they have the STI?
- Most common symptom is NOTHING
- Can have a sore, discharge from penis or vagina
- Genital warts or body rash
3. Treatment

- How is the STI treated? Is it curable? What happens if it goes untreated?
- Bacterial IS treatable and curable
- Viral is treatable but NOT curable
- If untreated serious infections, blindness, infertility and death can occur
4. Prevention

- How can someone prevent getting the STI?
- Abstinence
- Condom Use (although does not protect against herpes & warts)
- Getting tested every 6 months if sexually active (picking up results)
- Communicate with partner about getting tested
- Limit number of partners
Chlamydia

**Description**
A sexually transmitted disease
caused by **bacterial** infection,
that cause significant damage
to the reproductive system.

**Signs and Symptoms**
Discharge, produces no symptoms in 70% of women.

**Treatment**
Antibiotics, but be aware that reproductive damage is irreversible.
Gonorrhea

**Description**
A sexually transmitted disease caused by bacterial infection characterized by pus-like secretions from the penis and painful menstruation.

**Side Effects**
Infertility, widespread bacterial infection, incubation period is 2-8 days

**Treatment**
Antibiotics
Syphilis

**Description**
A sexually transmitted disease caused by bacterial infection.

Primary Syphilis
Secondary Syphilis
Latent Syphilis
Tertiary Syphilis

**Signs and Symptoms**
Periodic, painless sores that disappear and reappear. Latent syphilis can lead to paralysis, blindness, heart disease, brain damage, and insanity.

**Treatment**
Antibiotics
Herpes (Greek definition means *to creep*)

Highly Contagious

**Description**
A sexually transmitted disease caused by a viral infection of the herpes simplex virus Type I (oral herpes) and II (genital herpes).

The virus can attack different areas of the body, but commonly causes blisters on the genitals.

**Symptoms**
Fever, swollen glands, and headaches.

**Treatment**
None! Prescription medications can reduce length of outbreaks. Wash hands following contact with cold or herpes sores.
Human Papilloma (HPV)

**Description**
Infection with HPV can cause genital warts and is the most common viral STI. Half of HPV infected individuals do not develop symptoms.

**Associated with:**
Increased cancers of the cervix, vulva, and penis, and enlargement and spread of warts, leading to obstruction of the urethra, vagina and anus.

**Treatment**
Vaccine? Removal of warts by liquid nitrogen freezing, chemical dissolving, and laser- or electro-surgery.