HIV / AIDS

A Comprehensive Approach
What is HIV

- Human Immunodeficiency Virus
- Retro Virus
- Subgroup lentivirus (SIV and FIV)
- HIV has 9 genes
- Gag, Pol and Env (makes new viruses)
- Tat, Rev, Nef, Vif, Vpr and Vpu (how HIV infects cells and cause the disease)
What is HIV

- Two main strains type-1 and type-2
- Type-2 mainly found in Africa
- Type-2 closely related to SIV
- Type-1 is more pathogenic than type-2
- The virus that leads to AIDS (Acquired Immunodeficiency Syndrome)
HIV Virus

Human Immunodeficiency Virus – Structure

env gp120

env gp41

gag p17

gag p24

RNA
HIV Origins
HIV Transmission

- Found in blood, semen and vaginal fluids
- Transmitted while having unprotected sex
- Transmitted while sharing needles
- Transmitted through occupational exposures
- HIV can cross the placental barrier
- HIV is a communicable disease
HIV invade the blood stream

Attaches to cd-4 immune cells (T-cells)

Integrates into that cells genome

Renders that cell useless to fight disease

Infected cell now only makes HIV viruses

Which in turn seeks and infects T-cells

Cycle keeps going
HIV Life Cycle
HIV Leads to AIDS

- Acquired Immunodeficiency Syndrome
- This is not a disease in itself
- This is a “state of Being”
- This is having a severely compromised immune system unable to fight of disease
- Two diagnostic tests are used to determine this state
Cd-4 Cell Count

- Cd-4 cell count tests
- Non HIV infected persons have a normal cd-4 cell count of 700-1000 in a drop of blood
- HIV infected persons have a normal cd-4 cell count above 500
- Below 200, this is AIDS defining
**HIV Viral Load Tests**

- This is used to see how many copies of the virus is in the body.
- Determines if the virus is progressing, regressing or stabilizing.
- Mainly used in the management of the disease.
- Individual results widely vary.
How to Slow the Progression

- There are different classes of drugs used to hinder the progression of HIV into AIDS.
- Focused at different stages in the HIV Life Cycle.
- These can reduce the time it takes for HIV to progress into AIDS.
Drugs

- Nucleoside/Nucleotide Reverse Transcriptase Inhibitors (NRTI)
- Nonnucleoside Reverse Transcriptase Inhibitors (NNRTI)
- Protease Inhibitors
- Entry Inhibitors or Fusion Inhibitors
- Integrase Inhibitors
Fusion Inhibitors
Attachment Inhibitors
Cellular Inhibitors
Drug Effects

- There are many side effects to these drugs
- Some of these side effects may impact a person's day to day life
- Some may produce false positive results on drug screens
Why Drugs Fail

- HIV is designed to survive and kill its host
- HIV frequently and randomly mutates
- This mutation can code for drug resistance
- Individuals contracting new strains of HIV
- Individuals co-infected with other diseases
- Resistant strains being transmitted
- Starting, stopping and restarting drugs
What Happens in AIDS

- In AIDS, the person has a severely compromised immune system.
- People do not die from AIDS but from an opportunistic infection.
- A simple cold can be life threatening for someone in AIDS.
Precautions

- HIV cannot survive out in the open.
- HIV in the blood dropped on the desk or floor rapidly oxidized.
- Standard Personal Protection Equipment (PPE) is recommended when handling blood and or bodily fluids.
- 10% bleach solution to disinfect area.
Precautions

- In the event of occupational exposure, those involved would be tested.
- Prophylaxis medication would be offered depending on the severity of the exposure.
- Follow-up testing would be administered to cover possible incubation period.
- Sharps injury are a reportable incident.
Facts

- No documented cases of HIV from kissing
- No documented cases from drinking or eating after another
- HIV is not transmitted from toilet seats
- HIV is a blood-borne pathogen and found in bodily fluids
- HIV has to get in the bloodstream
Facts

- HIV / AIDS cases in the US are on the rise
- HIV medications are allowing those infected to live longer
- The Ryan White Act provides assistance to those with HIV / AIDS
Questions

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