

Human immunodeficiency virus



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HIV



AIDS



WHAT IS HIV ?

Human Immunodeficiency Virus



H = *Infects only Human beings*

I = *Immunodeficiency virus weakens the immune system and increases the risk of infection*

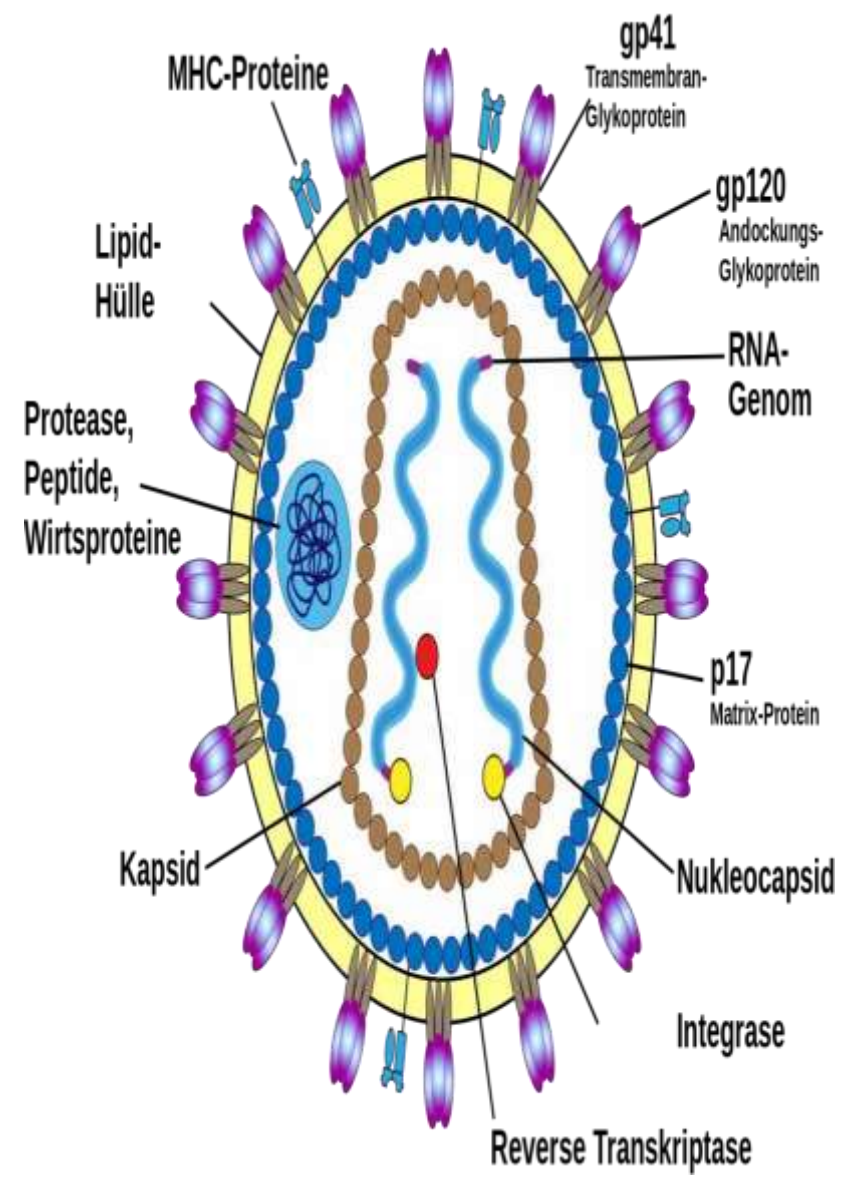
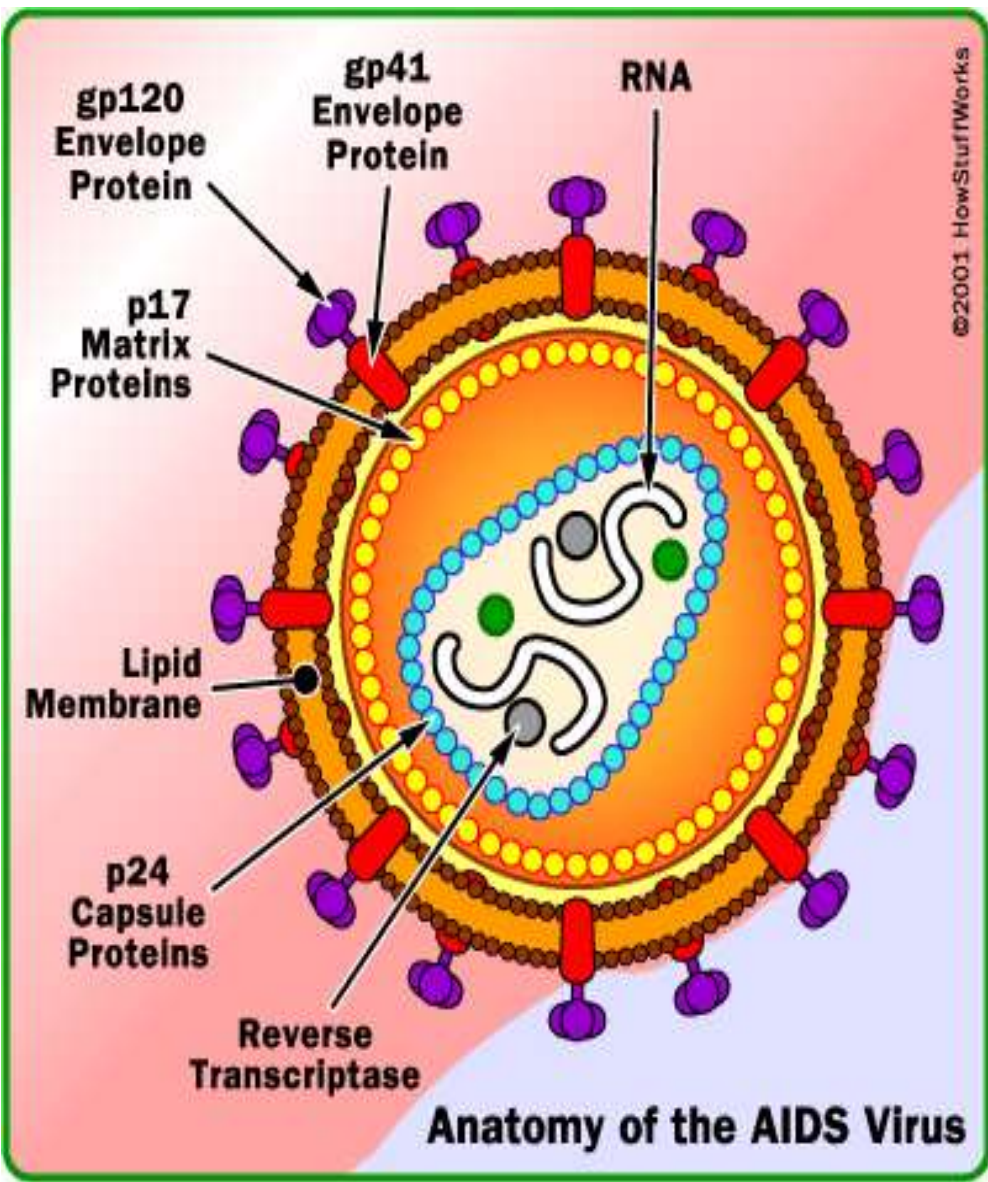
V = *Virus that attacks the body and eventually*

overcomes the body's immune system ???????

HIV:

- *HIV belongs to a special class of viruses called **retroviruses**. Within this class, HIV is placed in the subgroup of **lentiviruses***
- *All viruses except retroviruses contain DNA*
- *Other lentiviruses include SIV(Simian immunodeficiencyvirus) , FIV(feline immunodeficiency virus,)Visna(ovine lentivirus) and CAEV(Caprine arthritis encephalitis virus), which cause diseases in monkeys, cats, sheep and goats. ???????*

- HIV particles surround themselves with a coat of fatty material known as the *viral envelope*.
- This envelope gives out lots of little spikes around 72 in number.
- These spikes are made of knobs and handles made of *proteins gp120 and gp41* respectively.
- Just below the viral envelope is a layer called the matrix, which is made from *the protein p17 (Matrix proteins)*
- Below the matrix is another layer of *proteins P24* forming viral core (or capsid) and is usually bullet-shaped.
- Inside the core are three enzymes required for HIV replication called *Reverse transcriptase, Integrase and protease*
- Also held within the core is HIV's genetic material, which consists of *two identical copies of single stranded RNA* ????



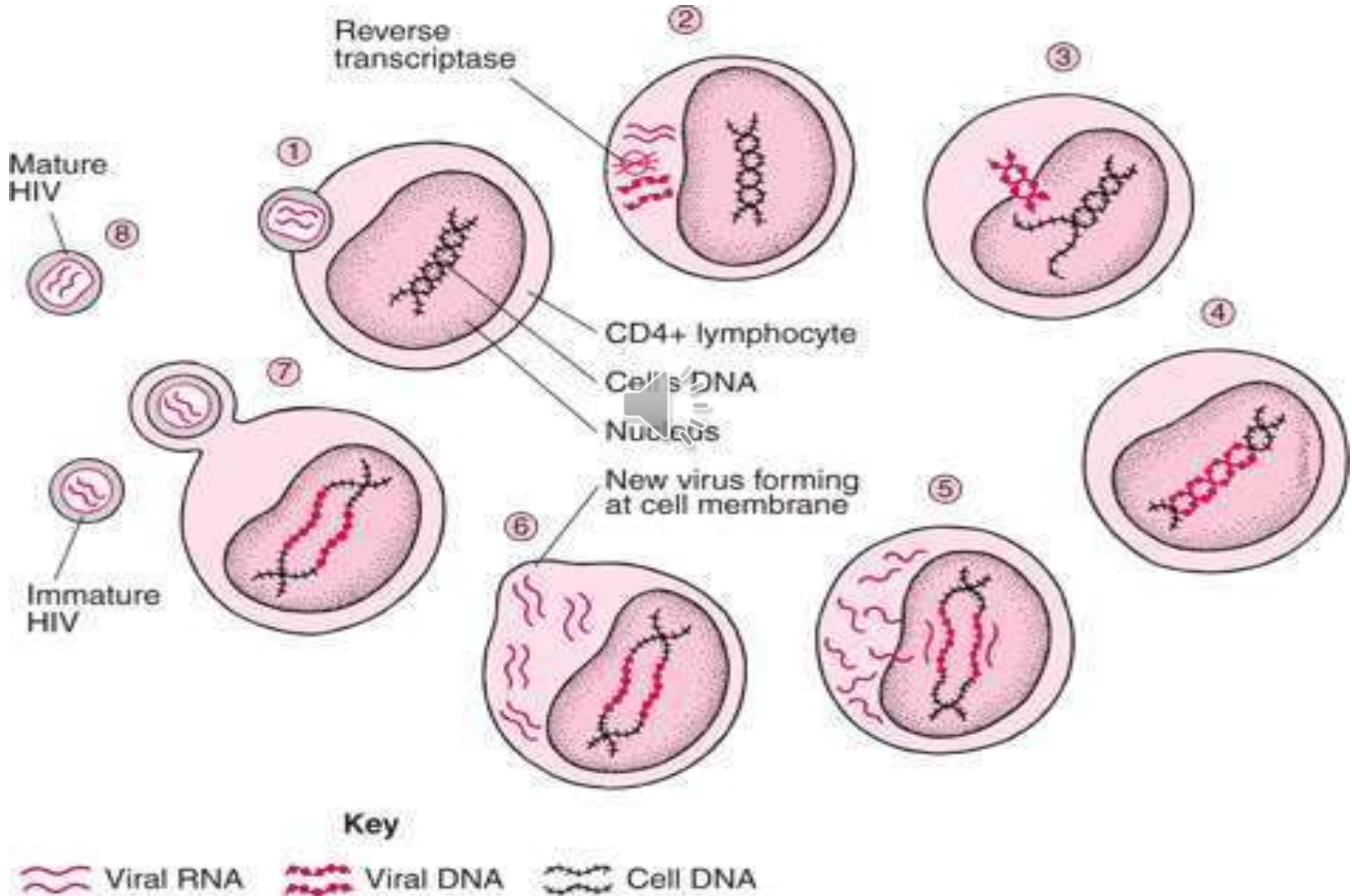
- *After HIV in the body, it starts to destroy CD4+T cells, which are white blood cells that help the body fight infection and disease.*

HIV is spread when blood, semen, or vaginal fluids from an infected person enter another person's body, usually through sexual contact, from sharing needles when injecting drugs, or from mother to baby during birth ??????

PATHOGENESIS :

- *Attachment of virus at the CD4 receptor and chemokine co-receptors .*
- *viral fusion and uncoating*
- *Reverse transcriptase .*
- *Migration to nucleus*
- *Integration of the viral DNA into cellular DNA by the enzyme integrase*
- *Transcription and RNA processing*
- *Protein synthesis.*
- *protease cleaves polypeptides into functional HIV proteins and the virion assembles*
- *virion budding*
- *Virion maturation ?????*

PATHOGENESIS



FOUR STAGES OF HIV



STAGE 1 – PRIMARY :

- *flu like illness - occurs two to six weeks after infection*
- *no symptoms at all*
- *Infected person can infect other people*





Stage 2 - Asymptomatic



- *This stage is free from symptoms*
- *There may be swollen glands.*
- *HIV antibodies are detectable in the blood*
- *This stage is last for about ten years*

STAGE 3 – SYMPTOMATIC :


The person starts showing symptoms like fever, skin disease.



The immune system deteriorates emergence of opportunistic infections and cancers



STAGE 4 - HIV : AIDS :

- *The immune system weakens*
- *The illnesses become more severe leading to*
AIDS 
- *The illnesses become more severe leading to*
emergence of opportunistic infections and
cancers

TRANSMISSION OF HIV VIRUS:



- *HIV virus is passed from one person to another through **blood-to-blood** and **unprotected sex**.*
- *In addition, infected **pregnant women** can pass **HIV** to their baby during pregnancy or delivery, as well as through **breast-feeding**.*



○ *The body fluids have been proven to spread HIV:*

• *blood*

• *semen*

• *vaginal fluid*

• *breast milk*

• *other body fluids containing blood*

• *cerebrospinal fluid* surrounding the brain and the spinal cord

• *synovial fluid* surrounding bone joints



HIV CAN BE TRANSMITTED THROUGH...



Sexual Contact



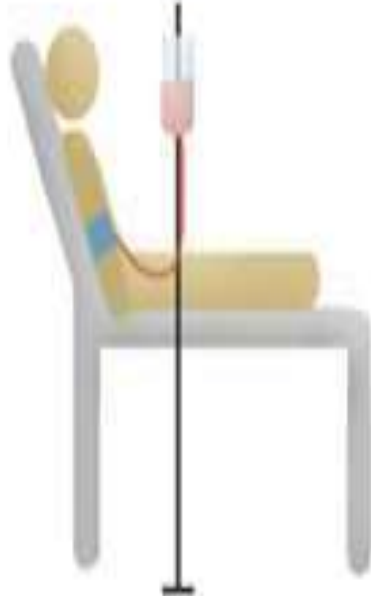
Pregnancy, Childbirth & Breast Feeding



Injection Drug Use



Occupational Exposure

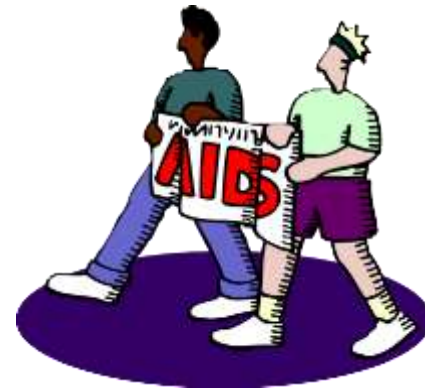


**and rarely,
Blood Transfusion/Organ Transplant**

SYMPTOMS :

The symptoms of this :

- *diarrhea*
- *fatigue or weakness*
- *fever*
- *headache*
- *joint pain*
- *night sweats*
- *rash*
- *swollen glands*
- *weight loss*
- *yeast infections (of the mouth or vagina) that last a long time or occur frequently*

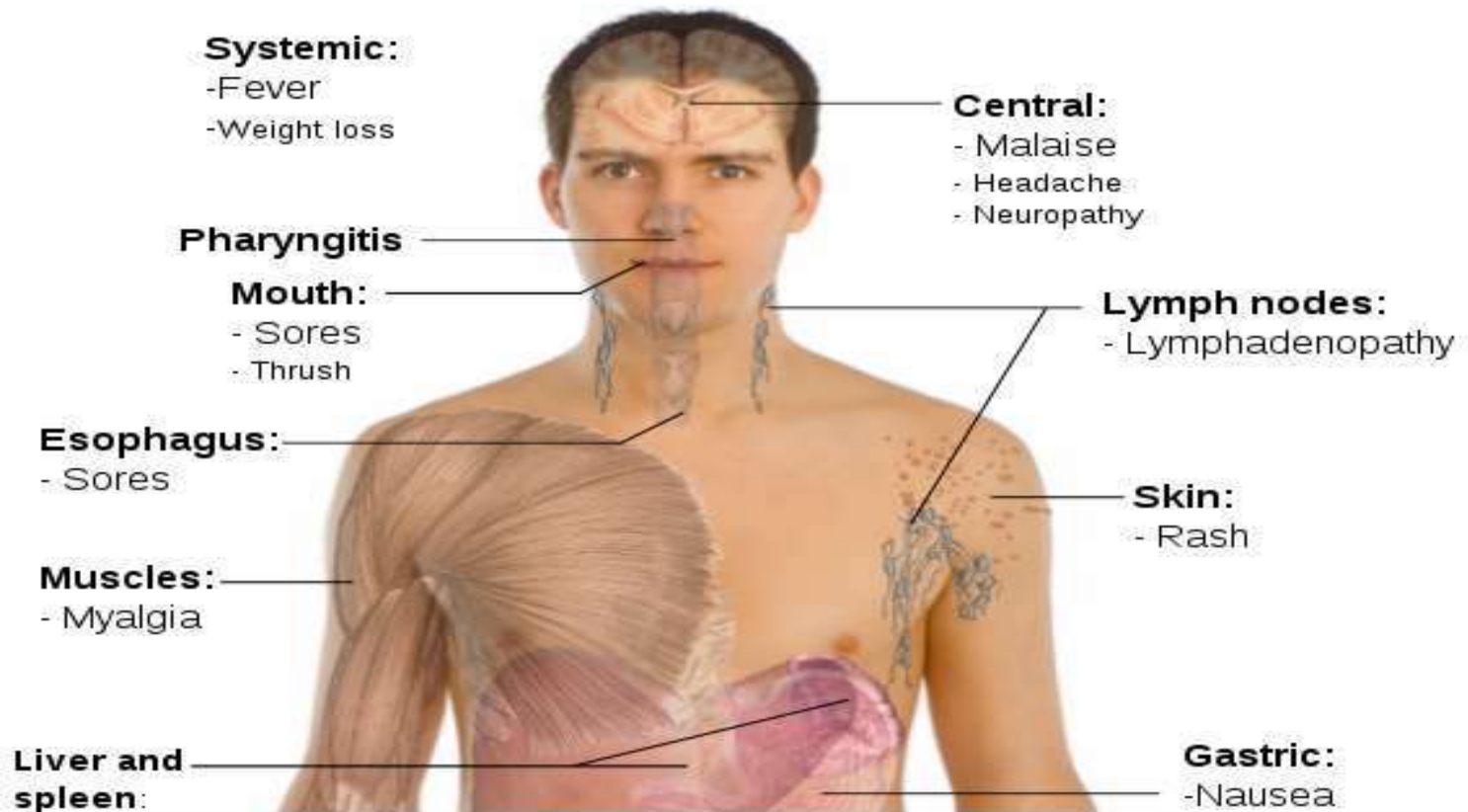


THE ACUTE HIV SYNDROME



Follows 3-6 wks following primary infection

Main symptoms of Acute HIV infection



LABORATORY TEST TO DIAGNOSE HIV



- *Enzyme-Linked Immunosorbent Assay/Enzyme Immunoassay (ELISA/EIA)*
- *Western Blot*

TREATMENT



HIGHLY ACTIVE ANTIRETROVIRAL DRUGS

❖ NUCLEOSIDE REVERSE TRANSCRIPTASE INHIBITOR

Zidovudine

Stavudine



❖ NON-NUCLEOSIDE REVERSE TRANSCRIPTASE INHIBITOR

Efavirenz

Nevirapine



❖ PROTEASE INHIBITOR

Atazanavir

Darunavir

PREVENTION

There's no vaccine to prevent HIV infection and no cure for AIDS. But it's possible to protect yourself and others from infection. That means educating yourself about HIV and avoiding any behavior that allows HIV-infected fluids — blood, semen, vaginal secretions and breast milk — into your body.




HIV-NEGATIVE INDIVIDUAL PREVENTION:

- Ⓜ *Educate yourself and others.*
- Ⓜ *Use a clean needle.*
- Ⓜ *Be cautious about blood products.*
- Ⓜ *Get regular screening tests*
- Ⓜ *Use condoms when having sex*



HIV POSITIVE INDIVIDUAL PREVENTION:

- ✘ *Follow safe-sex practices.*
- ✘ *Don't share needles or syringes.*
- ✘ *Don't donate blood or organs.*
- ✘ *Anti Retro Viral treatment* 
- ✘ *If pregnant, get medical care right away.*

