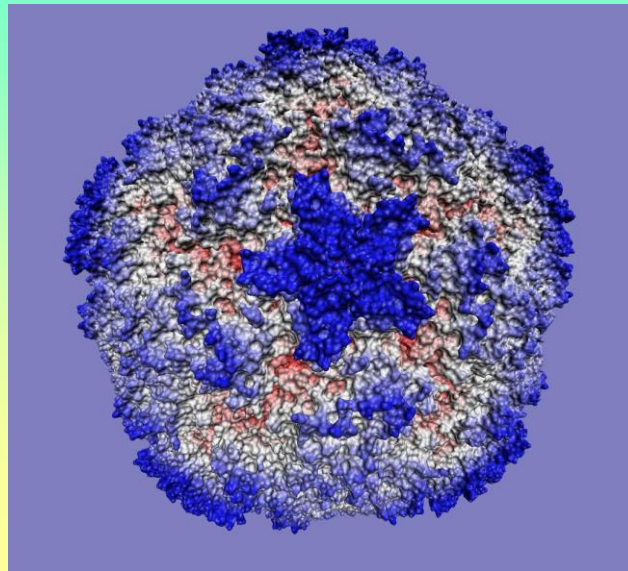


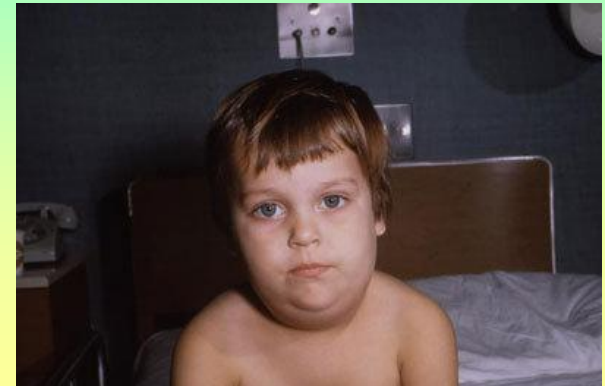
VIRUSES-Part 2



Viruses Causing Glandular Enlargement

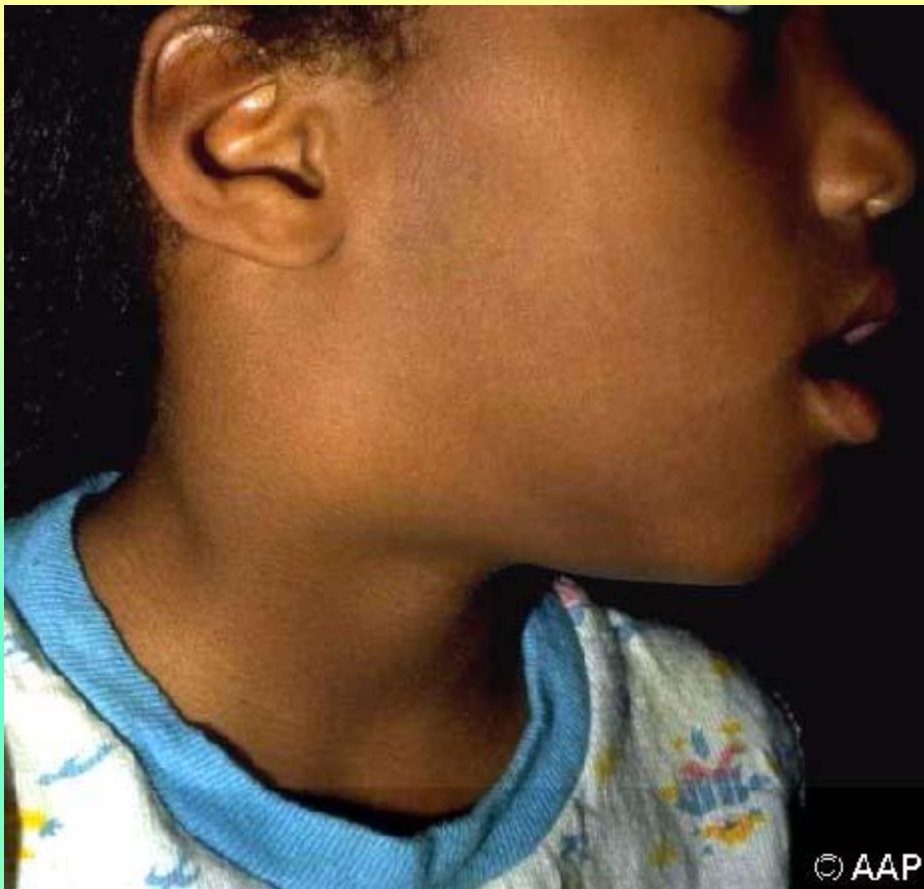
- MUMPS

- Childhood disease; bilateral inflammation of parotid glands; many inapparent infections
- **Complications:** meningitis, orchitis (can lead to sterility), ovaritis
- **Epidemiology:** spread by salivary and respiratory secretions; incubation 18-21 days
- **Prevention:** MMR vaccine (live, attenuated)



Infectious Mononucleosis (Epstein-Barr Virus)

- Belongs to Herpes virus family
- Mild disease; children and young adults; can be prolonged and debilitating
- Transmission by saliva (kissing disease)
- **Symptoms:** lymphadenopathy, fever, sore throat, atypical lymphocytes, enlargement of liver and spleen
- Latent virus
 - Chronic disease (rare) or asymptomatic shedding (common) for lifetime of host
- **Diagnosis:** blood picture (↑ in atypical lymphocytes)
 - Monospot Test (detects RBC agglutination)
 - Presence of EBV antigens
- NO VACCINE



© AAP



**"Mono"
Kissing
Disease**

(Epstein-Barr Virus)



Cytomegalovirus (CMV)

- Herpes family, infection usually asymptomatic and latent BUT dangerous for
 - **Pregnant women:** neonatal infection with jaundice, enlarged liver and spleen, mental retardation and motor disorders
 - **Transplant patients:** disseminated infection can cause transplant rejection
 - **AIDS and other immunocompromised patients:** frequent infection, GI tract ulceration and retinitis

CMV

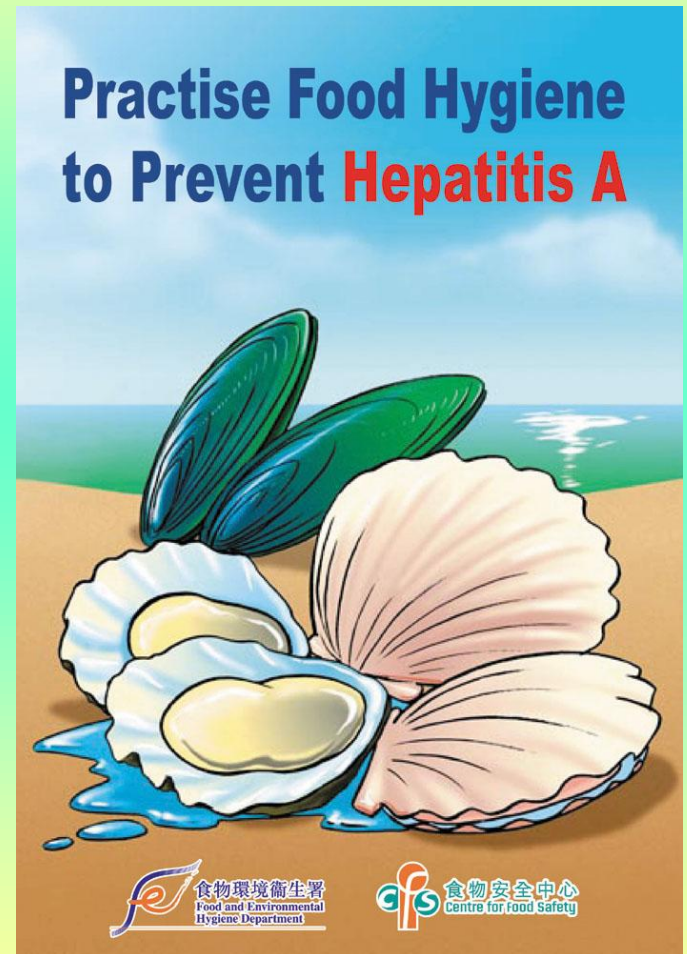
- **Diagnosis:**
 - Isolation of virus from urine, blood, organ biopsies (slow process, but accurate)
 - CMV antigen detection, DNA hybridization and PCR in leucocytes much faster
 - Serology screening for donors and recipients before transplant
- **Treatment: antivirals**
- **Prevention (immunocompromised):**
 - Match CMV immune status between donor and recipient in transplants
 - Preventative administration of antivirals
 - Universal precautions to prevent transmission
 - NO VACCINE

Hepatitis Viruses

- **Hepatitis** = Inflammation of the liver
 - Malaise, fatigue, nausea, loss of appetite and jaundice
- Hep A, B most common and well characterized
 - Hep C, E, G less common
- *Other viruses and bacteria can cause hepatitis as a complication of infection*
- **Diagnosis:** serological

Hepatitis A

- Mainly children and young adults
- Sporadic cases and small epidemics
- **Epidemiology:**
 - Transmission by fecal-oral route
 - Incubation 15-50 days
 - Stools infectious 2-3 weeks before onset
 - Mild or inapparent infection in children
 - No chronic hepatitis
 - Life-long immunity



Hepatitis A

- **Diagnosis:**
 - Suspected clinical cases: detection of IgM
 - Immunity: detection of IgG (before travel)
- **Prevention:**
 - Vaccine for high risk populations
 - Commercial γ -globulin for prevention after exposure



Hepatitis B

- Sporadic cases; all ages
- **Epidemiology:**
 - Contaminated blood/blood products; saliva, urine, semen
 - Avg. incubation 90 days
 - Infective serum 30-60 days before onset of symptoms
 - Carriers
- **Clinical**
 - More severe than HepA
 - Chronic hepatitis and chronic carrier-state



Hepatitis B

- **Diagnosis:**
 - Blood test for HepB surface antigen (HBsAg)
 - Antibodies are produced several months after onset of symptoms
 - Used as markers of infection and immunity

Hepatitis B

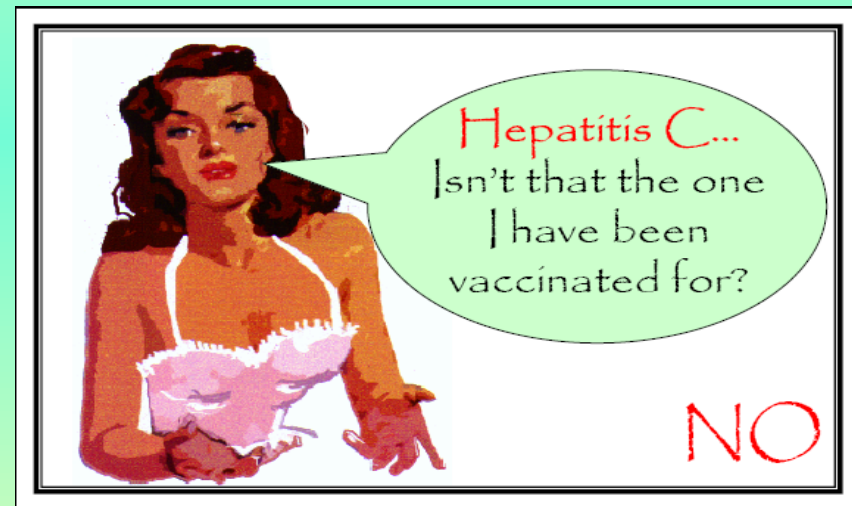
- Prevention

- Universal precautions for blood and body fluids
- Proper handling of needles
- Screening
- Vaccination
- HepB immunoglobulins after exposure
- HepB carriers



Hepatitis C

- Epidemiology:
 - Blood and sexual transmission
 - Initially mild disease but can cause chronic hepatitis
- Diagnosis:
 - Serological
- Prevention:
 - Same as HepB
 - Treatment/cure?
 - Eplusa (sofosbuvir-velpatasvir) 😊



Hepatitis Delta Agent

- Epidemiology:
 - Blood and sexual transmission
 - “Viroid”-relies on HepB presence for replication in cells
 - Increases severity of HepB infection
- Diagnosis:
 - Serological
- Prevention:
 - Vaccination against **HepB**

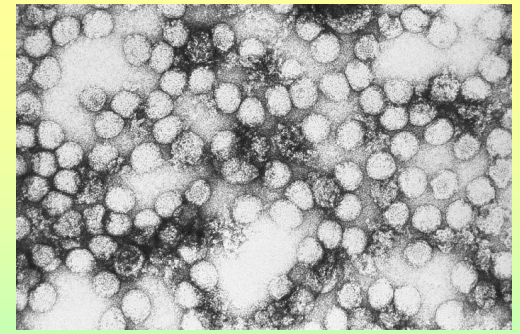
Hepatitis E

- Transmission via fecal-oral route
- Incubation 15-50 days
- Symptoms similar to HepA **BUT** 20% mortality in pregnant women
- Endemic in India, Pakistan, Nepal, Burma, North Africa and Mexico

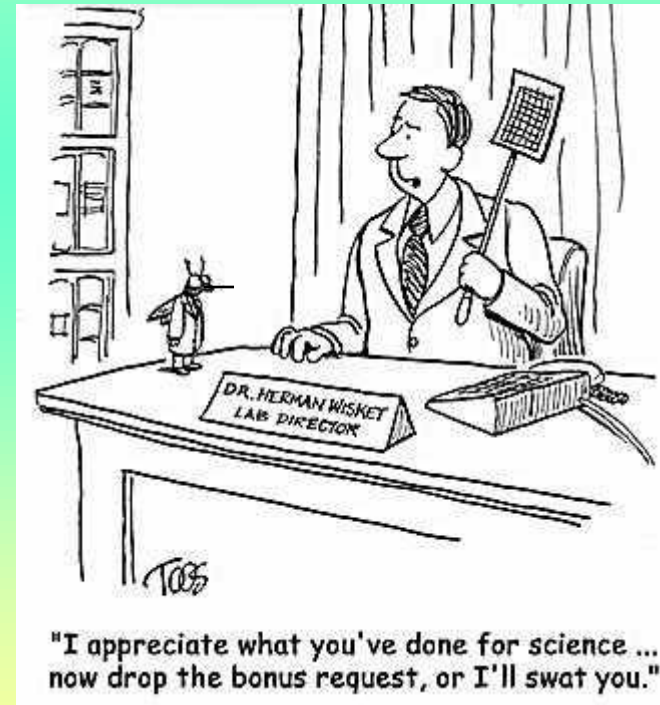
Hepatitis G

- Epidemiology:
 - Blood and sexual transmission
 - Incubation 14-180 days
 - Initially mild and no jaundice, can cause chronic hepatitis
- Diagnosis:
 - Detection of viral DNA by PCR or other molecular methods
- Prevention:
 - **NO VACCINE**

Yellow Fever Virus



- Haemorrhagic fever with hepatitis
- Endemic in Africa, South America and Caribbean
- Mortality rates as high as 50%
- Transmitted by mosquito
- Travellers to endemic countries receive live attenuated vaccine



Viruses affecting the CNS

- **Clinical Manifestations**
 - Aseptic meningitis
 - Encephalitis
 - Meningo-encephalitis
 - Poliomyelitis
 - Slow progressive, persistent infections

CNS Viruses

- **General Diagnosis**

- *Always first exclude possibility of bacterial or fungal infection*

- Lumbar puncture X4

- Other specimens

- Blood, urine, aspirates,
- throat swabs
- stools, sera



CNS Viruses with a Human Reservoir

- Usually an extension of a primary infection in another part of the body
 - Mumps-aseptic meningitis in children
 - Enteroviruses-aseptic meningitis in infants and children
 - HSV1-RARE cause of herpetic encephalitis in young adults
 - HSV 1 or 2-RARE cause of meningo-encephalitis in neonate or young adult
 - Vaccination for mumps, measles and polio (entero)

CNS Viruses with an Animal Reservoir

- **RARE:** Humans are accidental or dead-end hosts
 - Arbovirus:
 - over 200 different types
 - Tropical rainforest areas
 - Encephalitis
 - Eg. West Nile
 - Rabies virus
 - Fatal, acute encephalitis
 - Infects mammals, transmitted via saliva
 - Long incubation (30-60 days)
 - Combined active and passive immunization
 - Prevention by vaccination of wildlife and pets

HIV and AIDS

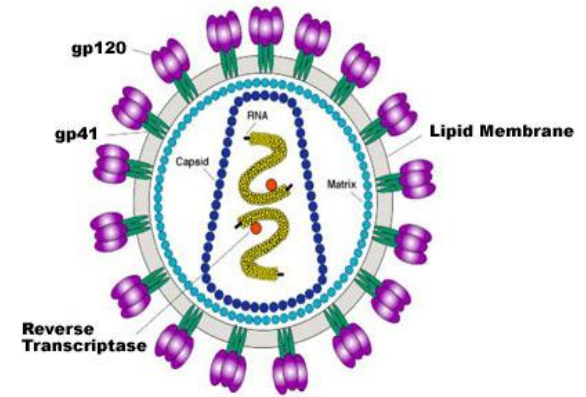
- Severe immunosuppressive condition; often fatal; predisposition to opportunistic infections and cancers
- HIV causes depletion in helper T-cells making the host very susceptible to other infections
- Frequent antigenic changes

HIV

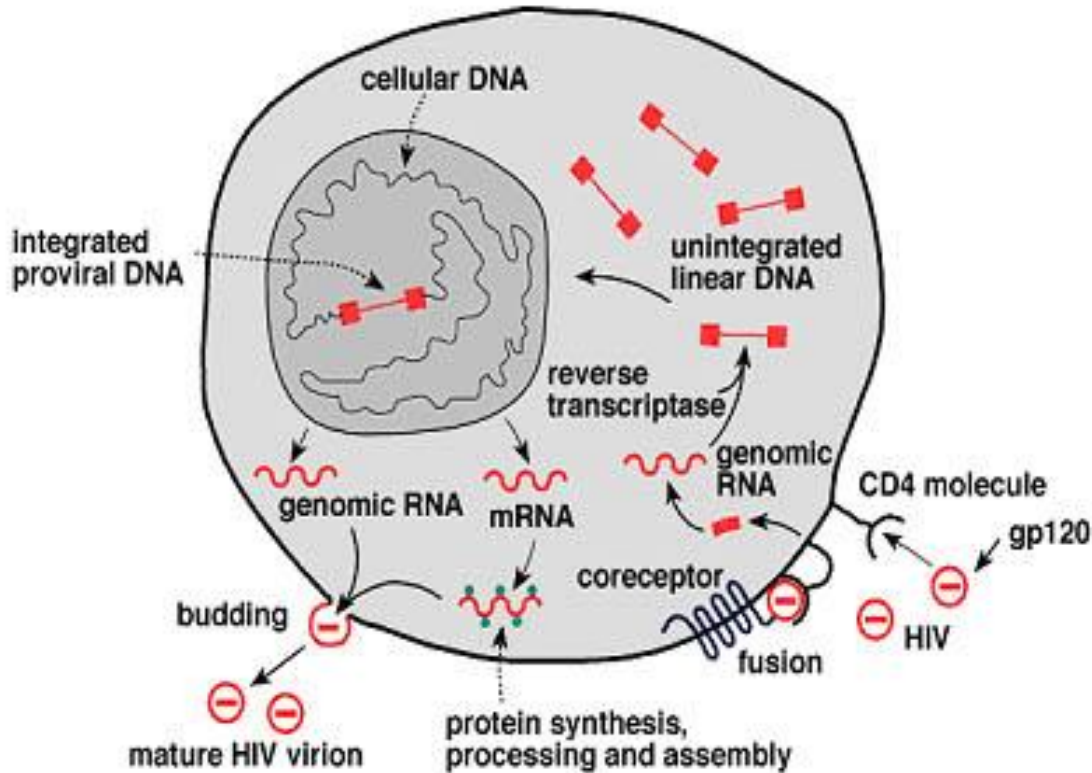
- **Inactivation**
 - Virus often protected by living inside cells, protect it from disinfecting action
- **Transmission**
 - Sexual, blood/blood products, congenital, organ transplants, sperm donation
 - Lengthy asymptomatic period increases spread of disease
- **Pathogenesis**
 - Virus is cytotoxic to helper T4 cells
 - AIDS develops from decreasing immune status

HIV

Organization of the HIV-1 Virion



Replication Cycle of HIV



HIV

- **Clinical**
 - Incubation 6 months-several yrs
 - AIDS-related Complex disease, progress to AIDS
 - Terminal stage patients develop dementias, other neurological problems, many opportunistic infections
- **Lab Diagnosis**
 - Serology based; seropositivity can take months to occur
 - Isolation of virus from blood, plasma, semen, cervical, vaginal secretions

HIV

- Prevention
 - Universal precautions for healthcare personnel
 - Screen blood, organ and semen donors
 - Heat inactivation of plasma for haemophilia patients
 - Sexual education
 - Education of drug users
 - Testing pregnant women at risk
 - NO VACCINE yet, but is a key focus of current research

HIV

- Treatment
 - MANY forms of treatment
 - Most effective is cocktail of treatments
 - HAART
 - Protease inhibitor (stops viral maturation)
 - Reverse transcriptase (stops viral replication)
 - Bad side-effects
 - Expensive
 - Treatment and Prevention in developing countries very difficult