

Epstein-Barr Virus

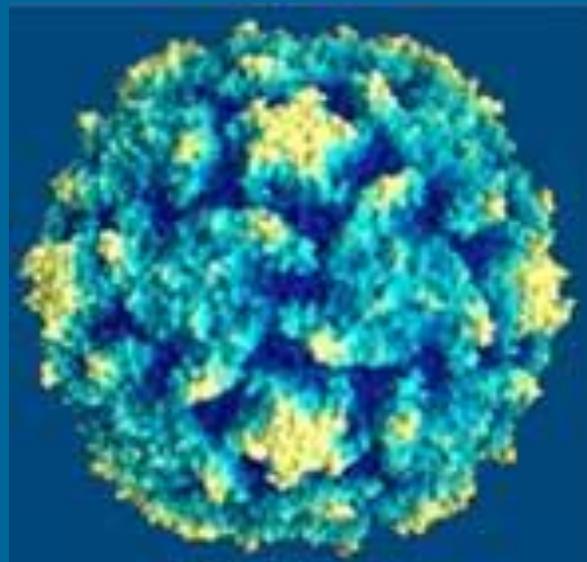
Parvo-Virus

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Human Herpes (HHV) Epstein-Barr Virus (EBV)

- Members of the Herpes Virus Family which are some of the most common human viruses
- Herpes Family – (linear DNA virus HHV4)
- Surrounded by nucleocapsid and glycoprotein envelope



EBV

Human Herpes Virus classification

HHV-1	Herpes Simplex Virus 1	(HSV-1)] α
HHV-2	Herpes Simplex Virus 2	(HSV-2)	
HHV-3	Varicella Zoster Virus	(VZV)	
HHV-4	Epstein-Barr Virus	(EBV)	— γ
HHV-5	Cytomegalo Virus	(CMV)] β
HHV-6	Human Herpes Virus 6	(HHV-6)	
HHV-7	Human Herpes Virus 7	(HHV-7)	
HHV-8	Kaposi's Sarcoma-associated Herpes Virus (KSHV)		— γ

Epidemiology

- Worldwide Prevalence of EBV
- Infections peak in early childhood and late adolescence/young adulthood.
- By adulthood , 90% of individuals have been infected and have antibodies to the virus.

“The Kissing Disease”

Modes of Transmission

- Intimate Contact
 - kissing, sharing food, coughing
 - “The Kissing Disease”



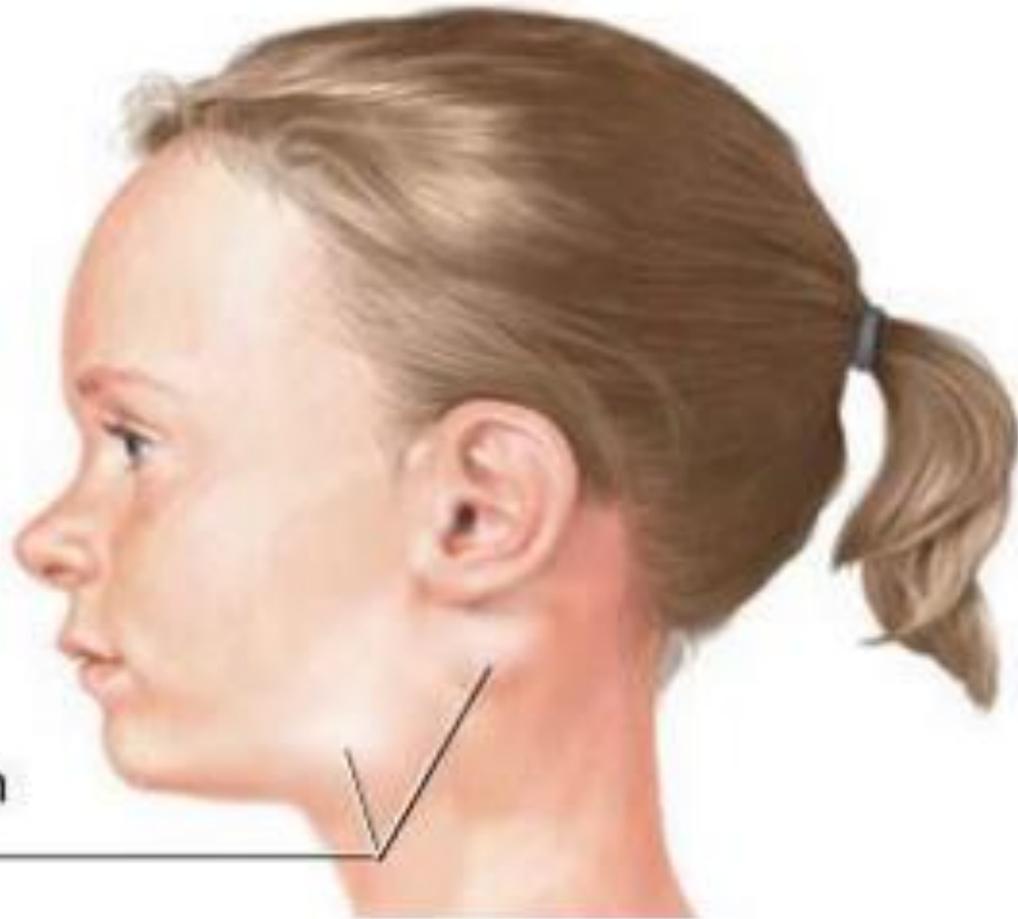
EBV- Clinical Manifestations

- **The presence of Signs and symptoms associated with EBV infection is called Infectious mononucleosis (IM).**
- A prodrome of fatigue, malaise, and myalgia may last for 1–2 weeks before the onset of fever, sore throat, and lymphadenopathy.

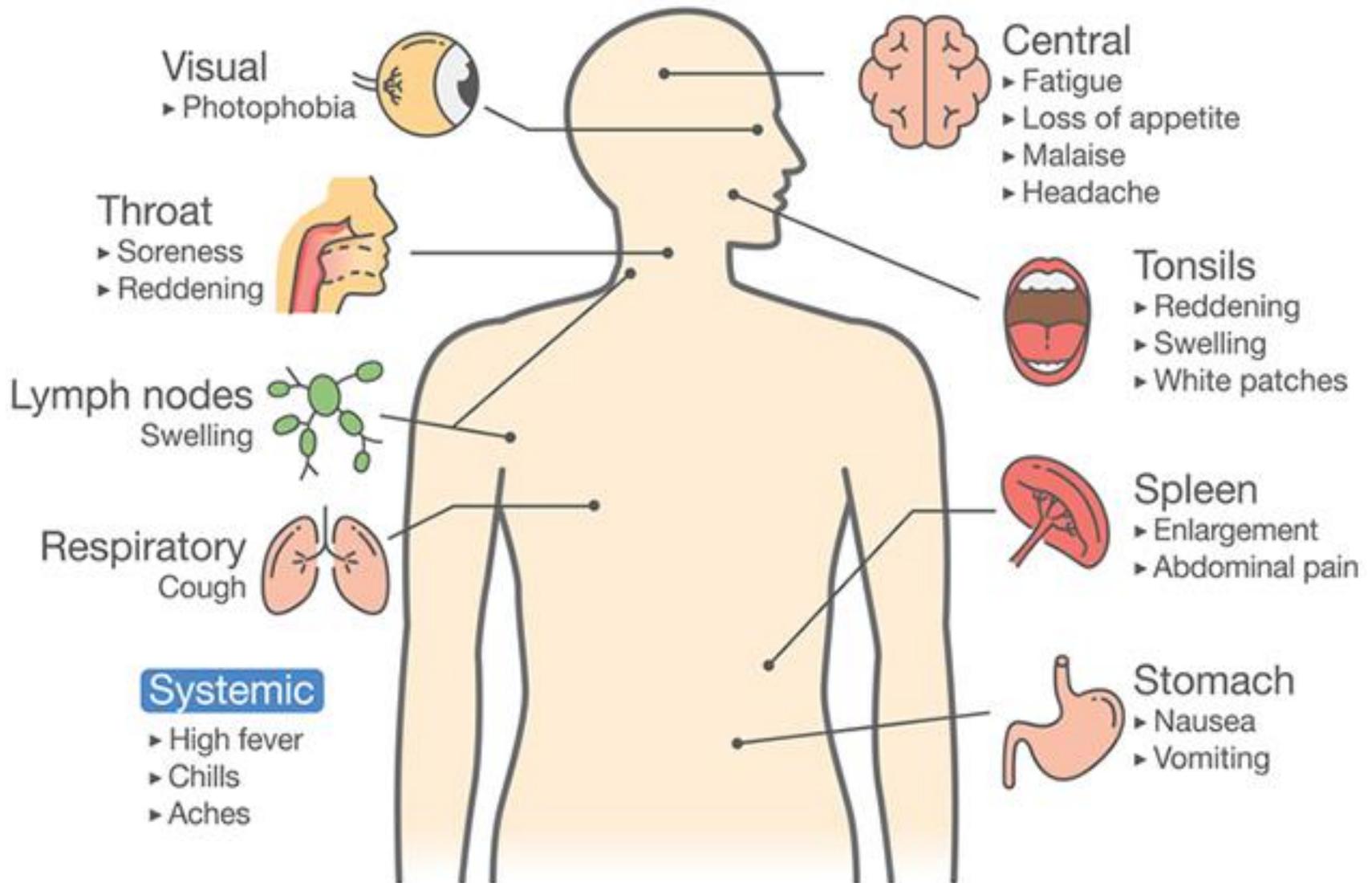
EBV- Symptoms

Mononucleosis
causes:

- Fever
- Fatigue
- Sore throat
- Swollen lymph glands



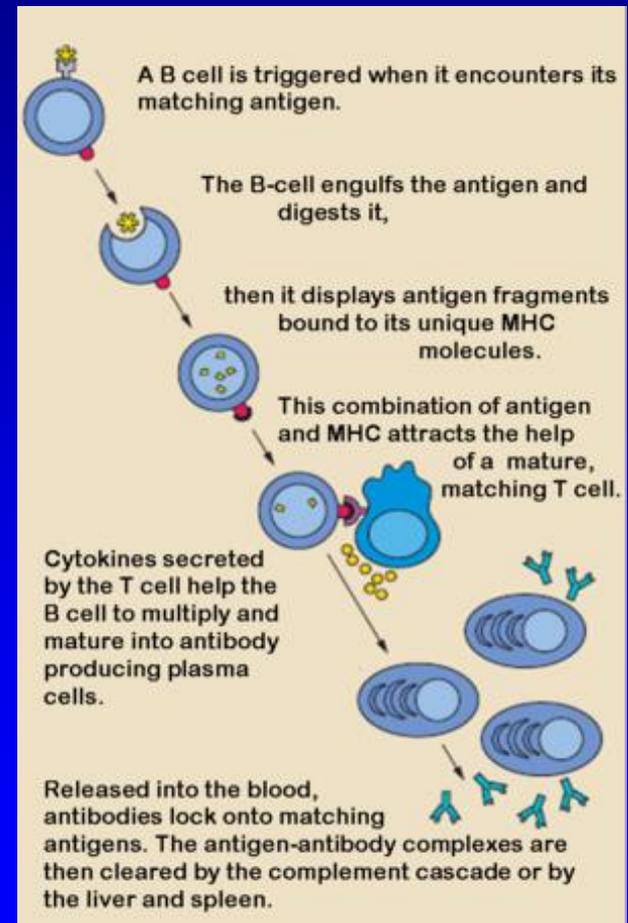
Main symptoms of Infectious Mononucleosis



Infectious Mononucleosis

Pathogenesis

- EBV infects the epithelium of the oropharynx and salivary glands.
- Lymphocytes in the tonsilar crypts are directly infected -> BLOODSTREAM.
- Infected B cells and activated T cells proliferate and expand.
- Polyclonal B cells produce antibodies to host and viral proteins.



Symptoms



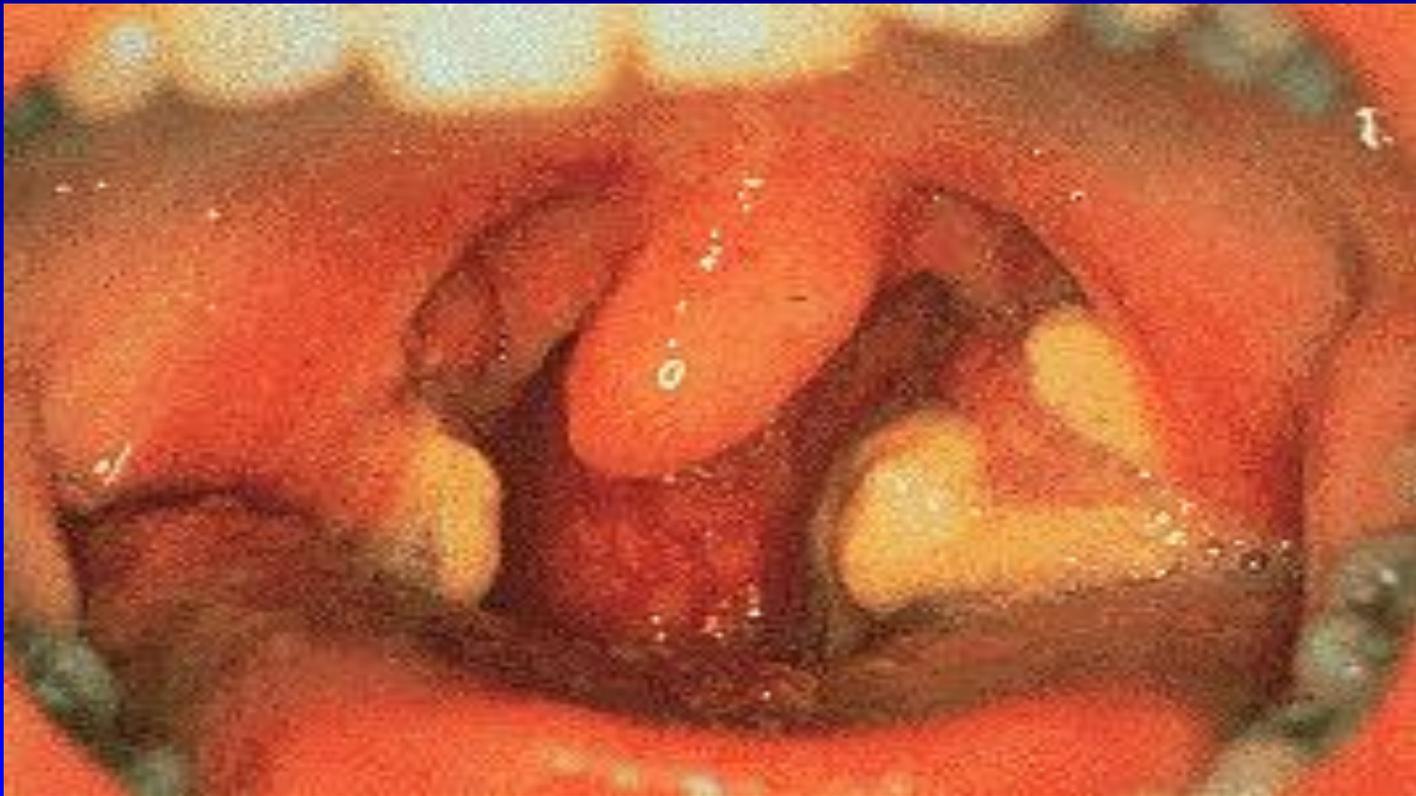
Infectious Mononucleosis



IM with rash after treatment with amoxicillin or ampicillin

NEJM;343:481-492.

Infectious Mononucleosis

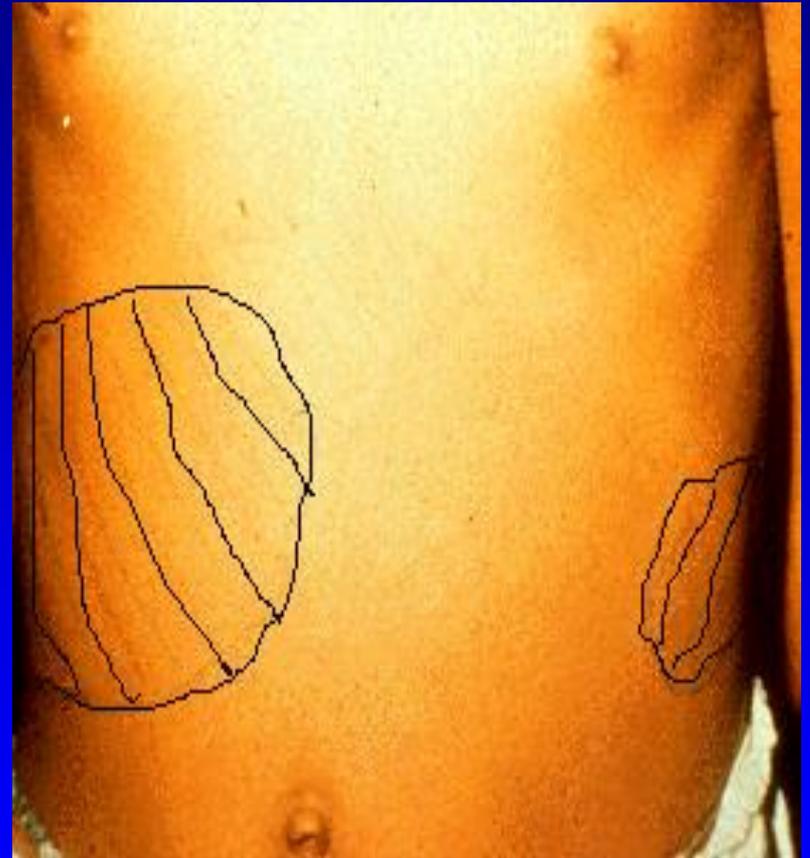


Exudative pharyngotonsillitis

Infectious Mononucleosis



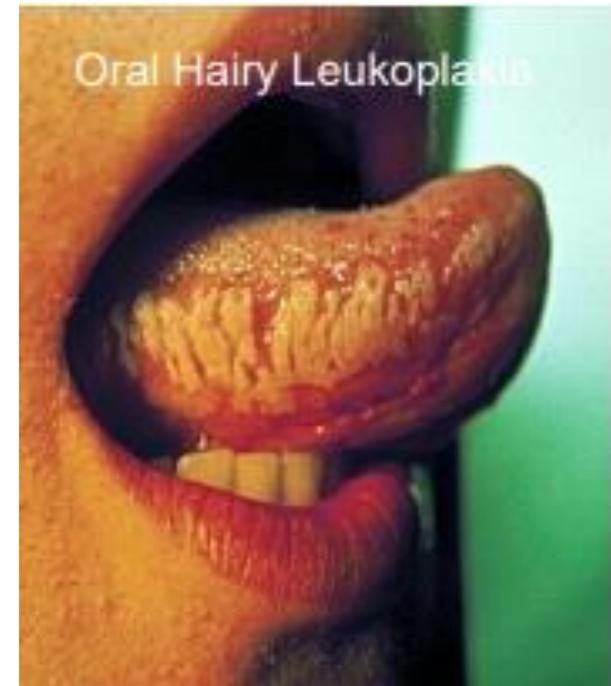
Cervical lymphadenopathy



Hepatosplenomegaly

EBV- Diseases resulting from EBV in reduced immunity patients

- PTLD (Post-transplant lymphoproliferative disease) -a tumor often found in organ transplant patients)
- Oral Hairy Leukoplakia – Nonmalignant hyperplastic lesion of the tongue epithelial cells

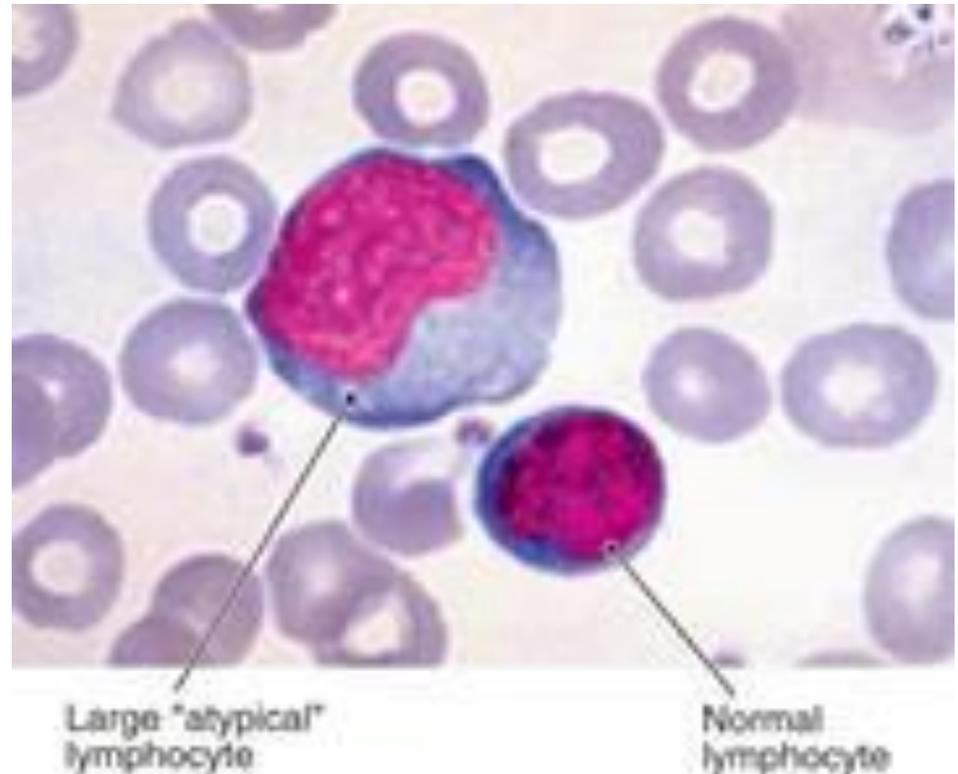
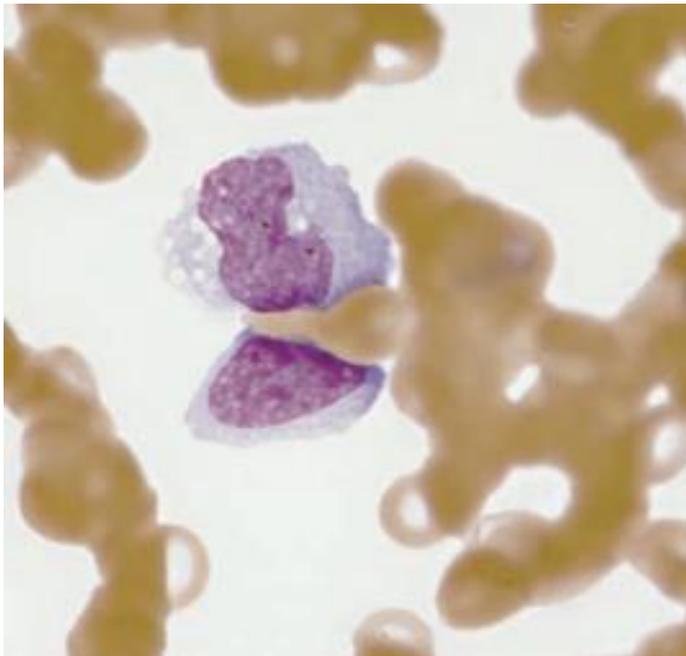


EBV- Laboratory findings

- The WBC count is usually elevated.
- >10% are atypical lymphocytes (CD8+ cells are the predominate cells). These are enlarged lymphocytes that have abundant cytoplasm, vacuoles, and indentations of the cell membrane.
- Low-grade neutropenia and thrombocytopenia are common during the first month of illness.
- Liver function is abnormal in >90% of cases.

EBV- Laboratory findings

- These are enlarged lymphocytes that have abundant cytoplasm, vacuoles, and indentations of the cell membrane.



EBV- Diagnosis

<p>Heterophil Antibody/ Monospot Test</p>	<ul style="list-style-type: none">-detects a type of antibody (heterophil antibody) that forms during infection.- looks for antibodies that possess the unique ability to cause clumping of red cells
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EBV- Prevention and control

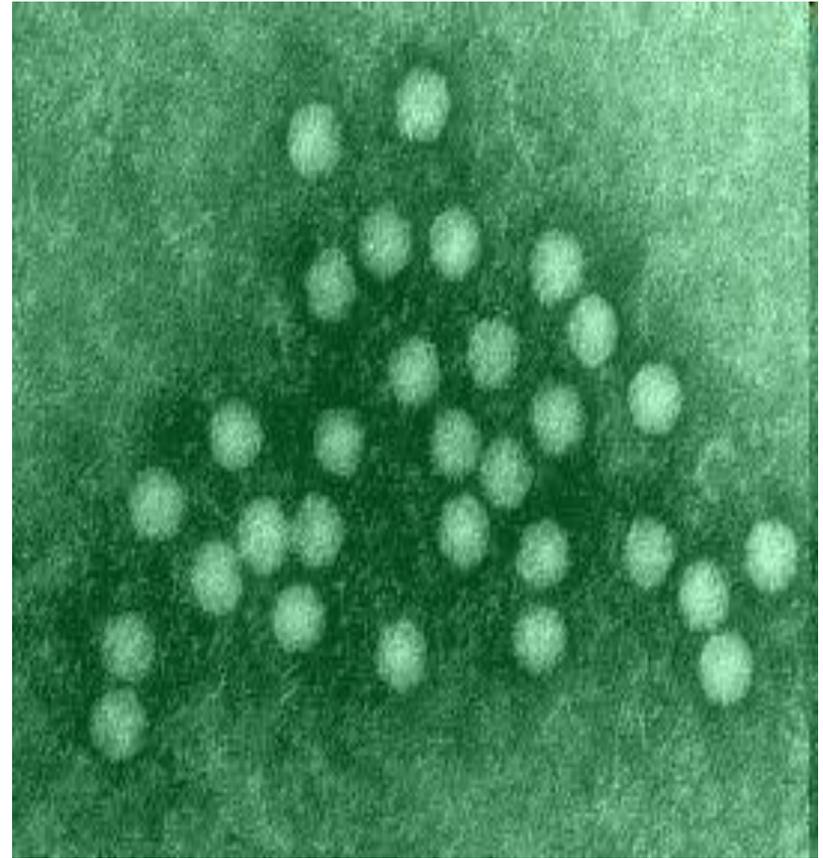
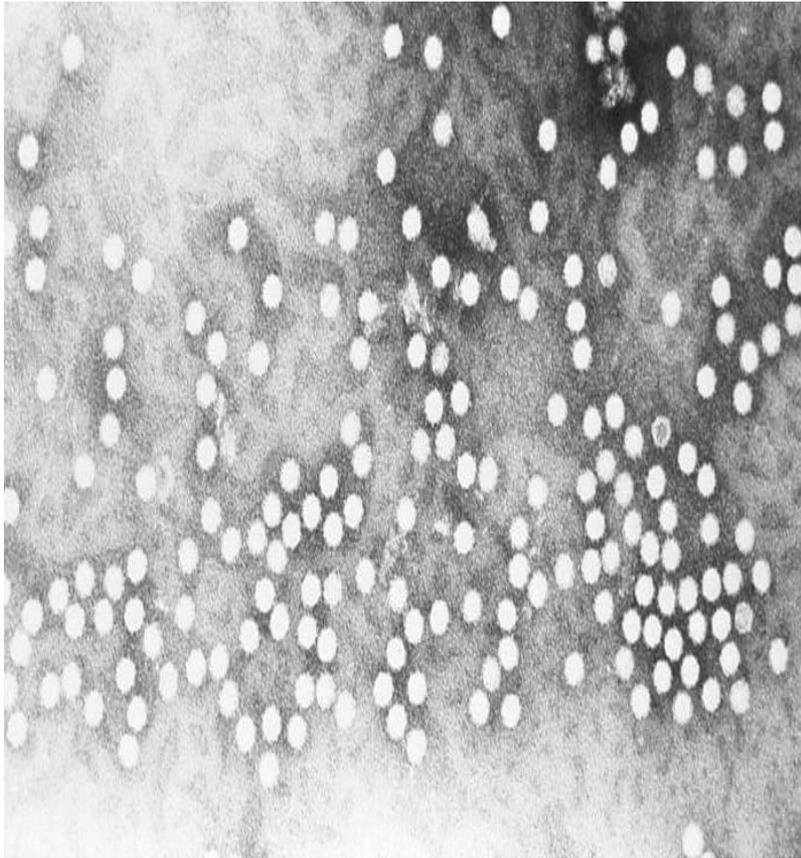
- Avoid sharing drinks, food, or personal items, like toothbrushes, with people who have EBV infection.
- Avoid kissing with people who have EBV infection.
- Wash hands at all time



EBV- Treatment

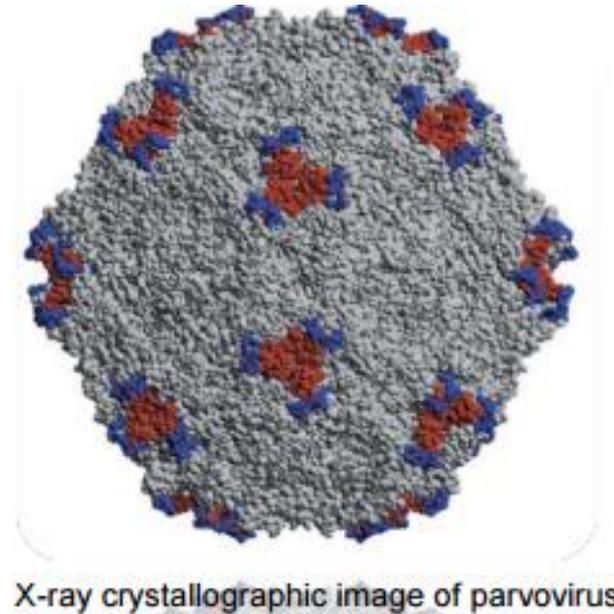
- Infectious Mononucleosis:
 - No specific therapy just nonaspirins and rest.
- Oral Hairy Leukoplakia:
 - Acyclovir – inhibits EBV replication.
- EBV Lymphoproliferative Disease:
 - reduction in the dose of immunosuppressive medication.
 - Surgical removal or irradiation of localized lymphoproliferative lesions.

Parvovirus B19



Parvovirus B19

- Family: Parvoviridae
 - Latin parvus means small
- 20 nm in diameter
 - (0.02 μm)
- Single-stranded DNA virus
- No envelope
- Resistant to both heat and solvent-detergent inactivation.



X-ray crystallographic image of parvovirus

Parvovirus B19- Epidemiology

- Transmission:
 - Infected respiratory droplets.
 - Blood transfusion
- 50% of children by the age of 15 years and >90% among elderly have detectable IgG.
- 1% annual rate seroconversion of pregnant women.

Parvovirus B19- Diseases

- **Fifth disease:**
 - Erythema infectiosum
- **Aplastic crisis:**
 - Patients with hemoglobinopathies.
 - Immunosuppressed, immunodeficient, immunocompromised
- **Congenital parvovirus:**
 - Hydrops fetalis.



Parvovirus B19- Diseases

Fifth Disease

- Six separate childhood exanthems were defined early 20th Century
 - **1st** Measles (rubeola) Morbillivirus
 - **2nd** Scarlet fever (Streptococcus pyogenes)
 - **3rd** Rubella (German measles)
 - **4th** Atypical scarlet fever Duke Filatow's disease staph
 - **5th** Erythema infectiosum
 - **6th** Roseola herpesviruses (HHV-6 and HHV-7)
- Exanthem = rash
- Fifth disease is the only one still called by this name

Symptoms – Fifth Disease

Symptoms – Fifth Disease

- Incubation 7-10 days
- Lasts 5-7 days

Three Phases

1- **First phase** – peak level of virus and RBC destruction

- Fever
- Malaise
- Chills
- Bright red, raised “slap cheek” rash

2- **Second phase** – rash and arthralgia:

3- **Third phase:** clearance phase

Symptoms – Fifth Disease



"Slap cheek" rash on the face, lacy rash on the extremities.

Parvovirus B19- Treatment

Treatment

- Mainly supportive care
- Acetaminophen or Ibuprofen for fever
- Topical anesthetic or antihistamine for itching
- Intravenous Immunoglobulin (IVIG) in chronic parvovirus
- Aplastic crisis may require packed RBC transfusion

Parvovirus B19- Lab studies

- Lab studies not normally done because it resolves in 5-7 days
- Serology – IgM and IgG
 - ELISA
 - Radioimmunoassay (RIA)
 - Immunofluorescence
- Polymerase Chain Reaction (PCR)
 - Useful for clinical diagnosis
 - Detects viral DNA in serum