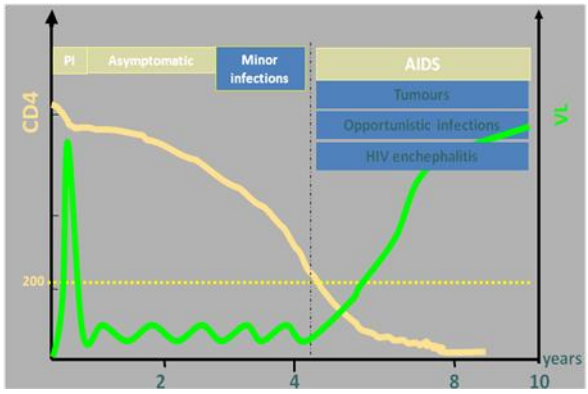
- **Definition of opportunistic infections**: these are infections caused by organisms which take advantage of a weakened immune system (in immunocompromised patients). Opportunistic infections occur (and are life-threatining) when CD4+ count is ≤ 200 cells/mm^3 and they are the most common cause of death in patients with AIDS.
- When a person is infected with HIV virus, there will be a long incubation period where there are no clinical features of AIDS or opportunistic infections. After many years, CD4+ count will start to drop until they reach a threshold of 200 cels/mm^3. Below this threshold level, AIDS will appear as the viral load will rise and reaches its peak. Also, there will be opportunistic infections and tumors (the most common are lymphoma & Kaposi's sarcoma).

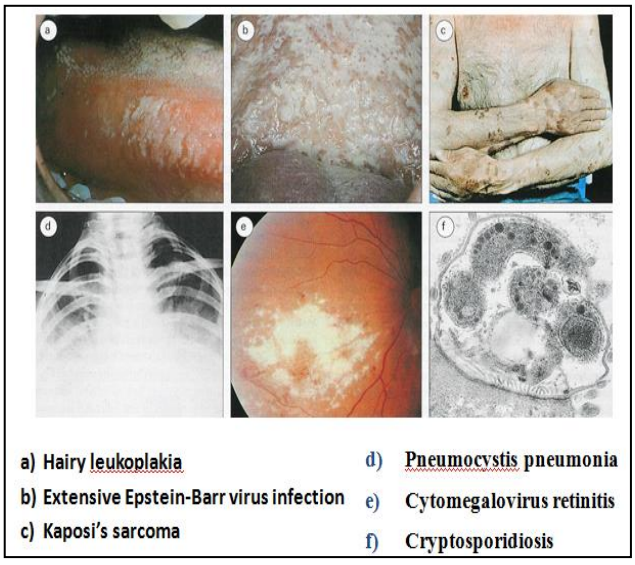


Opportunistic infections		
CD4+ count is between 500 cells/mm^3 and 200 cells/mm^3		
Disease/organism	**Candidiasis (thrush) – yeast**	**Kaposi's sarcoma**
Characteristics	The pathogenic form of Candida is Candida albicans and when it occurs in the throat it is known as thrush	It is caused by Human Herpes Virus-8 (HHV-8) and it results in lesions on the body and in the mouth.
Diagnosis	Gram (+) in gram stain, culture in sabouraud agar	Inspecting the lesion and taking direct biopsy from it.
Treatment	-	Chemotherapy + antiretroviral therapy

Opportunistic infections			
CD4+ count is between 200 cells/mm^3 and 100 cells/mm^3			
Disease/organism	**Pneumocystis Jirovecii (Carinii) Pneumonia (PCP)**	**Histoplasmosis & Coccidioidomycosis**	**Progressive Multifocal Leukoencephalopathy (PML)**
Characteristics	It is a fungal infection & most common cause of death in AIDS	Fungal infections presenting as severe disseminated illness	Caused by JC virus and causing neurological condition
Diagnosis	Secretions taken by bronchioalveolar lavage (BAL) and then identification by microscope (silver or Giemsa stains) or by direct antigen detection immunofluorescence (adding monoclonal antibodies)	Blood test looking for antibodies.	-
Treatment	Antibiotic therapy + prophylaxis	-	Antiretroviral therapy, no definitive treatment, resolves without treatment in some cases

Opportunistic infections				
CD4+ count is between 100 cells/mm^3 and 50 cells/mm^3				
Disease/organism	**Toxoplasmosis**	**Cryptosporidiosis**	**Cryptococcosis**	**Cytomegalovirus (CMV)**
Characteristics	Parasite (Toxoplasma gondii) causing brain abscess (encephalitis), carried by cats, birds & pork (tachyzoites are the infectious form)	Protozoa (Cryptospordium parvum), causing abdominal cramps & severe chronic diarrhea, infection occurs through contaminated water or uncooked food or person to person trans.	Fungal infection that enters through lungs & spread to brain causing meningitis, urease (+)	β-herpes virus family (latency), transmitted by blood/saliva/semen or other body fluids, causing interstitial pneumonia or GI symptoms or retinitis in HIV patients.
Diagnosis	Blood test looking for antibodies	Acid Fast staining in direct film microscopy	India ink preparation or toluidine blue (sample is taken from CSF), culture in sabouraud or blood agars (creamy mucoid colonies), serology (detecting antibodies)	Serology (IgG, IgM), viral culture, CMV antigenemia assay (monoclonal antibodies detecting pp65 in PMNs cells), PCR (for viral load)
Treatment	Aggressive therapy + prophylaxis	-	Antifungal therapy	Ganciclovir

Opportunistic infections	
CD4+ count is less than 50 cells/mm^3	
Disease/organism	**Mycobacterium Avium Complex (MAC)**
Characteristics	Bacteria found in soil & water; causing 4 clinical syndromes and those are: pulmonary disease, lymphadenopathy, skin disease & disseminated disease
Diagnosis	-
Treatment	-



a) Hairy leukoplakia
b) Extensive Epstein-Barr virus infection
c) Kaposi's sarcoma
d) Pneumocystis pneumonia
e) Cytomegalovirus retinitis
f) Cryptosporidiosis