

**COMMON MANIFESTATIONS OF
HIV INFECTION BY ORGAN SYSTEM**

Syndrome	Cause	Diagnostic Evaluation	Treatment	Symptoms/ Comments
NEUROLOGIC				
Mild to severe dementia Cognitive impairment with or without motor deficits	Direct virus-induced brain damage	HIV RNA level in CSF CT or MRI to check for brain atrophy (nonspecific)	Antiretroviral drugs, which may reverse damage and improve function	Does not always progress to AIDS dementia
Ascending paralysis	Guillain-Barré syndrome or CMV polyradicu- lopathy	Spinal cord MRI CSF testing	Treatment of CMV polyradiculopathy Supportive care for Guillain-Barré syndrome	Neutrophilic pleocytosis due to CMV polyradicu- lopathy
Acute or subacute focal encephalitis	<i>Toxoplasma gondii</i>	CT or MRI to check for ring-enhancing lesions, especially near basal ganglia Antibody testing of CSF (sensitive but not specific) Response to empiric antiviral treatment Brain biopsy (rarely indicated)	Pyrimethamine, folinic acid, sulfadiazine, and possibly trimethoprim/sul- famethoxazole (clin- damycin if allergic to sulfa)	Prophylaxis with clin- damycin and pyrimethamine or trimethoprim/sul- famethoxazole (as for <i>Pneumocystis pneumonia</i>) indicated for patients with a CD4 count of < 200/ μ L and previous tox- oplasmosis or positive antibodies
Subacute encephalitis	CMV Less often, herpes simplex virus or varicella-zoster virus	CSF PCR Response to treatment	Antiviral drugs	With CMV, often delirium, cranial nerve palsies, myoclonus, seizures, and progressively impaired consciousness at presen- tation Often responds rapidly to treatment
Myelitis or polyradiculopathy	CMV	Spinal cord MRI CSF PCR	Antiviral drugs	Simulates Guillain-Barré syndrome

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Progressive encephalitis of white matter only	Progressive multifocal leukoencephalopathy or HIV	Brain MRI CSF testing	Antiretroviral drugs	Usually fatal within a few months May respond to antiretroviral drugs
Subacute meningitis	<i>Cryptococcus</i> , <i>Histoplasma</i> , or <i>Mycobacterium tuberculosis</i>	CT or MRI CSF stains and cultures	Treatment of cause	Good outcomes if patients are treated early
Peripheral neuropathy	Direct effects of HIV or CMV or antiviral toxicity	History Sensory and motor testing	Treatment of cause or withdrawal of toxic drugs	Very common Not quickly reversible
OPHTHALMOLOGIC				
Retinitis	CMV	Direct retinoscopy	Specific anti-CMV drugs	Requires examination by specialist
CARDIAC				
Cardiomyopathy	Direct viral damage to cardiac myocytes	Echocardiography	Antiretroviral drugs	Symptoms of heart failure
RENAL				
Nephrotic syndrome or renal insufficiency	Direct viral damage, resulting in focal glomerulosclerosis	Renal biopsy	Antiretroviral drugs or ACE inhibitors possibly useful	Increased incidence in African Americans and patients with a low CD4 count
ORAL				
Oral candidiasis	Immunosuppression by HIV	Examination	Systemic antifungals	Possibly painless in early stages
Intraoral ulcers	Herpes simplex virus or aphthous stomatitis			May be severe and result in undernutrition
Periodontal disease	Mixed oral bacterial flora	Examination	Improved hygiene and nutrition Antibiotics	May be severe, with bleeding, swelling, and tooth loss
Painless intraoral mass	Kaposi's sarcoma or lymphoma	Biopsy	Treatment of cause	—

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Painless white filiform patches on the sides of the tongue (oral hairy leukoplakia)	Epstein-Barr virus	Examination	Acyclovir	Usually asymptomatic
GI				
Esophagitis	Candidiasis, CMV, or herpes simplex virus	Esophagoscopy with biopsy of ulcers	Treatment of cause	Dysphagia, anorexia
Gastroenteritis or colitis	Intestinal <i>Salmonella</i> , MAC, <i>Cryptosporidium</i> , CMV, <i>Microsporidia</i> , <i>Isospora belli</i> , or <i>Clostridium difficile</i>	Cultures and stains of stools or biopsy, but determination of cause possibly difficult	Supportive treatment of cause and symptoms	Diarrhea, weight loss, abdominal cramping
Cholecystitis or cholangitis	CMV or <i>Cryptosporidium</i>	Ultrasonography or endoscopy	Treatment of CMV Antiretrovirals for <i>Cryptosporidium</i>	Possibly pain or obstruction
Anal, rectal, and perirectal lesions	Herpes simplex virus, human papillomavirus, or anal cancer Possibly multiple causes	Examination Gram staining and culture Biopsy	Treatment of cause	High incidence in homosexual men
Hepatocellular damage due to hepatitis viruses, opportunistic infections, or antiviral toxicity	TB, MAC, CMV, or peliosis (bartonellosis) Chronic hepatitis B or C, worsened by HIV	Differentiation from hepatitis due to antiretroviral or other drugs Liver biopsy sometimes necessary	Treatment of cause	Symptoms of hepatitis (eg, anorexia, nausea, vomiting, jaundice)
SKIN				
Herpes zoster	Varicella-zoster virus	Clinical evaluation	Acyclovir or related drugs	Common Possible prodrome of mild to severe pain or tingling before skin lesions
Herpes simplex ulcers	Herpes simplex virus	Usually clinical evaluation	Antiviral drugs if lesions are severe, extensive, persistent, or disseminated	Atypical lesions of herpes simplex that are extensive, severe, or persistent

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Scabies	<i>Sarcoptes scabiei</i>			Possibly severe hyperkeratotic lesions
Violaceous or red papules or nodules	Kaposi's sarcoma or bartonellosis	Biopsy	Treatment of cause	—
Centrally umbilicated skin lesions	Cryptococcosis or molluscum contagiosum			May be the presenting sign of cryptococemia
PULMONARY				
Subacute (occasionally acute) pneumonia	Mycobacteria, fungi such as <i>P. jiroveci</i> , <i>C. neoformans</i> , <i>H. capsulatum</i> , <i>Coccidioides immitis</i> , or <i>Aspergillus</i>	Pulse oximetry Chest x-ray Skin tests (sometimes false-negative because of anergy) Bronchoscopy sometimes necessary	Treatment of cause	Possibly cough, tachypnea, and chest discomfort at presentation Mild hypoxia or increased alveolar-arterial O ₂ gradient possibly occurring before evidence of pneumonia on x-ray
Acute (occasionally subacute) pneumonia	Typical bacterial pathogens or <i>Haemophilus</i> , <i>Pseudomonas</i> , <i>Nocardia</i> , or <i>Rhodococcus</i>	In patients with known or suspected HIV and pneumonia, exclusion of opportunistic or unusual pathogens	Treatment of cause	Possibly cough, tachypnea, and chest discomfort at presentation
Tracheobronchitis	<i>Candida</i> or herpes simplex virus	—	Treatment of cause	Possibly cough, tachypnea, and chest discomfort at presentation
Subacute or chronic pneumonia or mediastinal adenopathy	Kaposi's sarcoma or B-cell lymphoma	Chest CT Bronchoscopy	Treatment of cause	Possibly cough, tachypnea, and chest discomfort at presentation
SYSTEMIC				
Systemic septicemia from disseminated opportunistic infections	<i>M. tuberculosis</i> , MAC, or <i>H. capsulatum</i>	Blood cultures Bone marrow examination	Treatment of cause	—
GYNECOLOGIC				
Vaginal candidiasis	<i>Candida</i>			Possibly increased in severity or recurrent

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Pelvic inflammatory disease	<i>Neisseria gonorrhoeae</i> , <i>Chlamydia trachomatis</i> , and other usual pathogens			Possibly increased in severity, atypical, and difficult to treat
HEMATOLOGIC				
Anemia	Multifactorial: HIV-induced bone marrow suppression Immune-mediated peripheral destruction Anemia of chronic disease Infections, particularly human parvovirus B-19, disseminated MAC, or histoplasmosis Cancers	For parvovirus, bone mar- row examination (to check for multinucleated erythroblasts) or serum PCR	Treatment of cause Transfusion as needed Erythropoietin for anemia due to antineoplastic drugs or zidovudine if severity warrants transfu- sion and erythropoietin level is < 500 mU/L IVIg for parvovirus	With parvovirus, some- times acute severe anemia
Thrombocytopenia	Immune thrombocytopenia, drug toxicity, HIV-induced marrow suppression, immune- mediated peripheral destruction, infections, or cancer	CBC, clotting tests, PTT, peripheral smear, bone marrow biopsy, or von Willebrand's factor measurement	Antiretroviral drugs IVIg for bleeding or pre- operatively Possibly anti-Rho (D) IgG, vincristine, danazol, or interferon If severe and intractable, splenectomy	Often asymptomatic and may occur in otherwise asymptomatic HIV infec- tion
Neutropenia	HIV-induced bone marrow suppression, immune- mediated peripheral destruction, infections, cancer, or drug toxicity		For severe neutropenia (< 500/ μ L) plus fever, immediate broad-spec- trum antibiotics If drug-induced, granulo- cyte or granulocyte- macrophage colony-stim- ulating factors	—

CMV = cytomegalovirus; IVIG = IV immune globulin; MAC = *Mycobacterium avium* complex.