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## CLINICAL DIAGNOSIS AND MANAGEMENT OF COMMON OPPORTUNISTIC INFECTIONS IN HIV-INFECTED CHILDREN

Table 15: Management of common opportunistic infections

Opportunistic infections	Clinical and laboratory manifestations	Diagnosis	Treatment
<i>Mycobacterium avium</i> complex (MAC)	<p>Fever, night sweats, weight loss, fatigue, chronic diarrhoea and abdominal pain</p> <p>Laboratory findings: neutropenia, raised alkaline phosphatase or lactate dehydrogenase (LDH)</p>	<p>Definitive diagnosis: isolation of organism from blood or specimen from normally sterile sites</p> <p>Histology demonstrating macrophage-containing acid-fast bacilli is suggestive</p>	<p>ART should be provided to restore immune function</p> <p>Treatment with at least 2 drugs: clarithromycin 7.5–15 mg/kg twice daily (max 500 mg/dose) plus ethambutol 15–25 mg/kg/day once daily (max 1 g/dose)</p> <p>Consider adding a third drug, e.g. amikacin or ciprofloxacin in severe cases</p> <p>Duration of treatment: at least 12 months</p>
<i>Pneumocystis jiroveci</i> pneumonia (PCP)	<p>Dry cough, tachypnoea, dyspnoea, cyanosis</p>	<p>Chest X-ray: bilateral diffuse parenchymal infiltrates with “ground-glass” or reticulogranular appearance</p> <p>Associated with a high level of LDH</p> <p>Microscopy of sputum induced by bronchoalveolar lavage (BAL): Gram stain—stains cyst wall brown or black; Wright stain—stains the trophozoites and intracystic sporozoites pale blue</p>	<p>TMP/SMX 15–20 mg/kg/day of TMP in 3–4 divided doses in a 21-day course</p>

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<b>Candidiasis</b>	<p><b>Oral candidiasis:</b> creamy-white, curd-like patches that can easily be scraped off showing an inflamed underlying mucosa</p> <p><b>Esophageal candidiasis:</b> odynophagia, dysphagia, or retrosternal pain</p>	<p><b>Oral candidiasis:</b> KOH preparation demonstrates budding yeast cells</p> <p><b>Esophageal candidiasis:</b> barium swallow shows cobblestone appearance</p> <p>Endoscopy shows small white raised plaques to elevated confluent plaques with hyperaemia and extensive ulceration</p>	<p><b>Oral candidiasis</b> Clotrimazole oral troches 10 g, or Nystatin 400,000–600,000 units 5 times daily for 7–14 days, or oral fluconazole 3–6 mg/kg once daily for 7–14 days</p> <p><b>Esophageal candidiasis</b> Oral fluconazole 3–6 mg/kg once daily for 14–21 days</p>
<b>Penicilliosis</b>	<p>Persistent fever, anaemia, hepatomegaly, generalized lymphadenopathy and translucent umbilicated papules which may resemble molluscum</p> <p>Laboratory findings: anaemia, and/or thrombocytopenia</p>	<p>Definitive diagnosis: isolation of organism from blood, bone marrow aspirate or specimens from normally sterile sites</p> <p>Wright stain of skin scraping shows basophilic, spherical or oval yeast-like organisms with clear central septation (diameter 3–8 <math>\mu\text{m}</math>)</p>	<p><b>Induction therapy:</b> Amphotericin B (0.7–1.5 mg/kg/day) for 2 weeks</p> <p><b>Consolidation therapy:</b> Itraconazole 5–6 mg/kg/dose twice daily for 8 weeks.</p> <p><b>Maintenance therapy:</b> Itraconazole 3–6 mg/kg/day</p>
<b>Cryptococcosis</b>	<p>Manifestations of meningoencephalitis: fever, headache, altered mental status, nuchal rigidity</p> <p>Manifestations of disseminated disease: persistent fever with translucent umbilicated papules which may resemble molluscum</p>	<p>Raised intracranial pressure, elevated cerebrospinal fluid (CSF) protein and mononuclear pleocytosis</p> <p>India ink stain of CSF should show budding yeast</p> <p>Cryptococcal antigen can be detected in the CSF or serum by the latex agglutination test</p> <p>Wright stain of skin scraping shows budding yeast</p>	<p><b>Induction therapy:</b> Amphotericin B (0.7–1.5 mg/kg/day) plus flucytosine (25 mg/kg/dose four times daily) for 2 weeks</p> <p><b>Consolidation therapy:</b> Fluconazole 5–6 mg/kg/dose twice daily for 8 weeks.</p> <p><b>Maintenance therapy:</b> Fluconazole 3–6 mg/kg/day</p>

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<p><b>Herpes simplex virus (HSV)</b></p>	<p><b>HSV gingivostomatitis:</b> fever, irritability, superficial painful ulcers in the gingival and perioral areas, and oral mucosa</p> <p><b>HSV encephalitis:</b> fever, alteration of consciousness, abnormal behaviour</p>	<p>HSV gingivostomatitis is diagnosed by clinical evaluation</p> <p>HSV encephalitis is diagnosed by detection of HSV DNA in the CSF</p>	<p><b>HSV gingivostomatitis:</b> oral acyclovir 20 mg/kg/dose three times daily or intravenous acyclovir 5–10 mg/kg/dose three times daily for 7–14 days</p> <p><b>Disseminated HSV or encephalitis:</b> intravenous acyclovir 10 mg/kg/dose or 500 mg/m<sup>2</sup>/dose three times daily for 21 days</p>
<p><b>Herpes zoster virus (HZV)</b></p>	<p><b>Primary varicella infection:</b> generalized pruritic vesicular rash</p> <p><b>Herpes zoster:</b> painful rash with fluid-filled blisters, dermatomal distribution</p>	<p>Use clinical features for diagnosis</p> <p>If on clinical examination the diagnosis is not clear then Giemsa staining (Tzanck preparation) of cell scrapings from the lesions can be done. These show multinucleated giant cells suggestive of Varicella zoster virus (VZV). (Note that this is also seen in HSV infection.)</p>	<p><b>Primary varicella infection:</b> intravenous acyclovir 10 mg/kg/dose or 500 mg/m<sup>2</sup>/dose three times daily for 7 days in children with moderate to severe immunosuppression. An oral formulation should be used only in a child with mild immunosuppression.</p> <p><b>Herpes zoster:</b> Oral acyclovir 20 mg/kg/dose four times daily (max 800 mg/dose) for 7 days</p>
<p><b>CMV infection</b></p>	<p><b>CMV retinitis:</b> young HIV-infected children are frequently asymptomatic and the infection is discovered on routine examination. Older children present with floaters or loss of vision</p> <p>Extraocular CMV disease; e.g. CMV colitis, CMV esophagitis, CMV pneumonitis, CMV hepatitis</p>	<p>Diagnosis of CMV retinitis is based on the clinical appearance—white and yellow retinal infiltrates and associated retinal haemorrhages</p> <p>Extraocular CMV disease: recovery of the virus from tissues or histopathological examination of specimens demonstrates</p>	<p>Intravenous ganciclovir 5 mg/kg/dose twice daily for 14–21 days followed by lifelong maintenance therapy</p>

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		characteristic “owl’s eye” intranuclear inclusion bodies or positive staining of biopsy specimens with CMV monoclonal antibodies	
Cryptosporidiosis	Subacute or chronic watery diarrhoea often associated with cramps, nausea and vomiting	Modified Kinyoun acid-fast stain of stool: small oocyst (4–6 µm in diameter)	<p>Effective ART is the only treatment that controls persistent cryptosporidiosis</p> <p>Supportive care includes hydration, correction of electrolyte abnormalities and nutritional supplementation</p> <p>Nitazoxanide is approved for treatment (age 1–3 years: 100 mg twice daily, age 4–11 years: 200 mg twice daily)</p>