

Opportunistic Infections in Immunocompromised Patients

A plain-English guide for you and your family

WHAT IS HAPPENING

Layered immunity prevents OIs. Keep that picture in your head, because the weird findings only make sense as a change from it. When this normal job fails, weak immunity by type shows certain infection patterns — that is the upstream break we are about to trace. Weak immunity by type shows certain infection patterns. That break does not stay local. The downstream signal you will actually see at the bedside is HIV/AIDS: PJP, Toxo, CMV, MAC, cryptococcal bugs. Read all the weird findings backwards from there — they all point to this one broken thing upstream. HIV/AIDS: PJP, Toxo, CMV, MAC, cryptococcal bugs. Transplant: times above. Neutropenic: bacterial, fungal bugs. No spleen: covered bacteria (*S. pneumo*, *H. flu*, *N. meningitidis*). Complement low: *Neisseria* bugs. B-cell low: covered bugs, *Giardia*. None of this is random. The body is trying to keep blood flow, oxygen, or balance going — so each finding is the body trying to help, not the real sickness itself. Trace it back: layered immunity prevents OIs, then weak immunity by type shows certain infection patterns, and this response is the body buying time.

What you might feel

- Fever that won't go away or keeps coming back
- Pneumonia with cough, shortness of breath, and low oxygen
- White patches or sores in the mouth or throat (thrush)
- Diarrhea that lasts for weeks
- Blurry vision or floating spots in one or both eyes
- Painful blisters or rash on the skin, often in a strip along one side of the body
- Severe headache, stiff neck, confusion, or seizures
- Night sweats that drench clothes and sheets
- Weight loss without trying
- Swollen lymph nodes that stay enlarged

Call the doctor right away if...

- New or worsening confusion, seizures, or severe headache—may signal brain infection (meningitis or encephalitis)
- Shortness of breath with low oxygen levels—may be life-threatening pneumonia from Pneumocystis, CMV, or fungi
- Sudden vision loss or blurry vision—may be CMV retinitis that can cause permanent blindness if not treated fast
- High fever with very low blood pressure or fast heart rate—may be sepsis (infection in the bloodstream spreading everywhere)
- Severe abdominal pain or blood in the stool—may be invasive gut infection or perforation (a hole in the intestine)

What the care team will do

- Place patient in private room with contact precautions if neutropenic (absolute neutrophil count below 500) or standard precautions if HIV alone, and enforce strict handwashing for all visitors and staff
- Monitor temperature every 4 hours and notify provider immediately if temperature rises above 100.4°F (38°C), even without other symptoms
- Assess respiratory rate, oxygen saturation, and work of breathing every 4 hours; report respiratory rate above 20, oxygen below 92 percent, or new shortness of breath immediately
- Check neurological status every shift: orientation to person-place-time, pupil reaction, strength in arms and legs, and ask about headache or vision changes
- Verify medication adherence by watching patient swallow all HIV medicines and prevention (prophylaxis) antibiotics; use pill counts and teach about consistent daily timing
- Inspect mouth, skin folds, and perianal area daily for white patches, ulcers, rashes, or new lesions; document size and appearance with photos if available
- Maintain strict sterile technique for all IV lines, change dressings per protocol, and remove central lines as soon as not needed
- Coordinate with dietitian to provide high-calorie, high-protein meals; weigh patient daily and track intake-output closely; hold all raw fruits, vegetables, and undercooked foods

Medicines you may be given — and why

Trimethoprim-sulfamethoxazole (TMP-SMX)

This drug blocks two different steps bacteria use to build folate (a vitamin-like molecule bacteria need to copy their DNA and grow). By hitting two steps at once, it stops bacteria from multiplying. It protects against *Pneumocystis jirovecii* (the fungus that causes PJP pneumonia) and *Toxoplasma gondii* (the parasite that causes brain infections in people with weak immune systems).

Azithromycin

This drug locks onto the ribosome (the protein-making factory inside bacteria) and stops it from building new proteins. Without proteins, the bacteria cannot grow or survive. It prevents *Mycobacterium avium* complex (MAC), a slow-growing germ that spreads through the blood and organs when CD4 counts drop below 50.

Valganciclovir (or IV ganciclovir)

This drug is a fake building block for viral DNA. Cytomegalovirus (CMV) uses it to build new DNA, but once the fake piece is inserted, the DNA chain stops growing and the virus cannot make copies of itself. It prevents CMV reactivation (eye, gut, and lung infections) in transplant patients and people with advanced HIV.

Fluconazole (or other azole antifungals)

This drug blocks an enzyme fungi use to make ergosterol, a fat molecule that keeps the fungal cell membrane strong and flexible. Without ergosterol, the membrane becomes weak and leaky, and the fungus dies. It prevents *Candida* infections (mouth, throat, and bloodstream) and *Cryptococcus* (brain and lung infections) in people with weak immune systems.

Acyclovir (or valacyclovir)

This drug is a fake building block for viral DNA. Herpes simplex virus (HSV) and varicella-zoster virus (VZV) use it to copy their DNA, but once the fake piece is inserted, the DNA chain stops and the virus cannot multiply. It prevents HSV and VZV reactivation (cold sores, shingles, disseminated disease) in immunocompromised patients.

Isoniazid (INH)

This drug blocks the enzyme that bacteria use to build mycolic acid, a waxy fat that makes the outer shell of *Mycobacterium tuberculosis* tough and hard to penetrate. Without mycolic acid, the bacteria cannot build their protective wall and they die. It prevents active tuberculosis (TB) in people with latent infection (positive TB test but no symptoms) when their immune system is about to be weakened.

Where this information comes from

- IDSA Clinical Practice Guidelines for Opportunistic Infections
- CDC Guidelines for Prevention and Treatment of Opportunistic Infections in HIV
- NEJM review on infections in immunocompromised hosts
- ATS/IDSA Guidelines on Healthcare-Associated Pneumonia

Last reviewed: 2026-07-07