Candidemia

Invasive candidiasis in the ICU · echinocandin first · take the line out

Echinocandin
not fluconazole

SUSPECT IT *persistent sepsis despite broad antibacterial cover, in a patient with the risk profile*

THE RISK FACTORS

Central line plus parenteral nutrition · prolonged broad-spectrum antibiotics · abdominal surgery or perforation · renal replacement therapy · immunosuppression · multi-site Candida colonization · prolonged ICU stay. The commonest scenario is a patient deteriorating on day 7 of meropenem, where the instinct is to broaden the antibacterial cover again.

THE DIAGNOSTIC PROBLEM

Blood cultures are insensitive and miss up to half of invasive candidiasis, and they take days to turn positive. **A negative culture does not exclude it.** Repeat them daily to document clearance, and use **beta-D-glucan or T2 assays as adjuncts** where available, remembering that beta-D-glucan is non-specific.

WHY IT MATTERS

Mortality is high and rises steeply with delayed treatment. That combination, an insensitive test and a time-critical infection, is why **empiric therapy is reasonable in the right patient** rather than waiting for microbiological proof.

TREAT *echinocandin first-line in everyone, and the reason is resistance and kill kinetics*

Step	Agent and dose	Why
1. Echinocandin *first-line*	**Caspofungin 70 mg then 50 mg daily · micafungin 100 mg daily · anidulafungin 200 mg then 100 mg daily**	**Fungicidal, active against biofilm, and covers the fluconazole-resistant species** (C. glabrata, C. krusei) that you cannot exclude at the outset. **Starting with fluconazole is the classic error**, because a meaningful proportion of ICU isolates are resistant to it and the delay costs lives.
2. Step down	**Fluconazole 400 to 800 mg (6 mg/kg) daily**	**Only after at least 5 days, and only if the patient is stable, the isolate is susceptible, and the bloodstream has cleared.** Speciation is what permits the step-down.
Resistant species	Keep the echinocandin	**C. glabrata** is dose-dependent or resistant to fluconazole · **C. krusei** is intrinsically resistant · **C. auris** is multidrug-resistant and **requires isolation and infection-control notification** because it spreads through units.
Deep sites	**Liposomal amphotericin B or fluconazole**	**Echinocandins penetrate the eye, CNS and urine poorly**, so endophthalmitis, meningitis and urinary tract disease need a different agent. This is the exception that catches people out.

SOURCE CONTROL AND THE SEARCH FOR SEEDING *the single most important intervention is not a drug*

REMOVE THE CENTRAL LINE

This is the single highest-impact step. Candida forms **biofilm on the catheter that no antifungal reliably penetrates**, so leaving the line in means treating around a permanent reservoir. **Remove it promptly, and place any new line at a new site** rather than rewiring.

DILATED FUNDOSCOPY

Within the first week, in every patient. Endophthalmitis is sight-threatening, frequently asymptomatic in a sedated ICU patient, and changes both the drug and the duration. It is the examination most often skipped, and the one that cannot be recovered later.

ECHO AND IMAGING

Echocardiography if cultures persist, looking for endocarditis, ideally transesophageal. **Image for a deep focus**: hepatosplenic candidiasis, an abdominal collection, or septic thrombophlebitis if the line site is inflamed.

DURATION AND FOLLOW-THROUGH

Element	Detail
Duration	**14 days from the FIRST NEGATIVE blood culture**, not from the first dose. **A patient still culture-positive on day 4 has not begun counting**, which is the commonest way these courses are accidentally truncated.
Repeat cultures	**Daily until negative**, to establish the start of the clock and to detect failure early.
Longer therapy	**Endophthalmitis, endocarditis, osteomyelitis, or a deep undrained focus** all need weeks rather than days, and often surgery.

NOT CLEARING? *almost always a source problem rather than a drug problem*

THE LINE IS STILL IN

The commonest reason by far. Remove it. Persistent candidemia with a catheter in situ is not an indication to escalate the antifungal.

ENDOCARDITIS OR THROMBUS

Get an echo and image the line site. Suppurative thrombophlebitis and fungal endocarditis both need prolonged therapy and frequently surgery.

A DEEP OR PRIVILEGED FOCUS

Eye, CNS, abscess, or an undrained abdominal collection. Reconsider the drug's penetration as well as the source: an echinocandin will not treat the eye.

EMPIRIC THERAPY AND STEWARDSHIP *when to start without proof, and when to stop*

Question	Answer	Why
Start empirically?	**Reasonable in a deteriorating ICU patient with several risk factors and no bacterial explanation**	**Cultures are too insensitive and too slow to wait for**, and delayed treatment is strongly associated with death. **Take the cultures first, then treat.**
Stop if cultures stay negative?	**Yes, if the patient is improving and there is no deep focus**, typically after 4 to 5 days	**Empiric antifungal therapy that is never stopped is a major driver of echinocandin resistance**, and of cost. Set a review date when you start it.
Prevent it	**Remove central lines early, limit parenteral nutrition, and stop unnecessary broad antibiotics**	**Every one of these is also the treatment for something else you are already doing.** Routine antifungal prophylaxis is not indicated outside defined high-risk groups.

PEARLS & PITFALLS

- **Echinocandin first, never fluconazole**, until you know the species and susceptibility.
- **Remove the central line.** It is the single most important intervention.
- **Dilated fundoscopy in the first week**, every time. Endophthalmitis is silent and sight-threatening.
- **Count 14 days from the first negative culture**, not from the first dose.

References: IDSA clinical practice guideline for the management of candidiasis · ESCMID guideline on invasive candidiasis · CDC guidance on *Candida auris* · reviews of echinocandin versus azole therapy in invasive candidiasis.

Educational aid; verify doses against local protocol, renal function, and patient factors.