

**NCCU CLINICAL GUIDELINES**  
**SECTION: 8**

**INFECTION, SEPTIC SCREENING AND MANAGEMENT**

Section 8: Infection, septic screen and management  
Candida infections  
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## **CANDIDA INFECTIONS**

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Candidiasis is an important cause of infection-related morbidity and mortality in the NICU. Most neonates are colonized by *Candida* species via the maternal gastrointestinal or genitourinary tract. A variety of factors predispose infants to this invasive infection. Infants <1000g are particularly vulnerable and an overwhelming infection is often fatal. *Candida* survivors have a worse neurological outcome, especially when there is infection of the central nervous system.

### **THE FOLLOWING RISK FACTORS SHOULD BE BORNE IN MIND:**

- Preterm infants, especially <1000g
- Prolonged antibiotic use
- Intubation and ventilation
- Parenteral Nutrition
- Central catheters
- Low APGARS
- Shock

The clinical picture can range from mild, such as thrush visible on the perianal area and in the mouth, through to widespread macular rash, vesicles, pustules and invasive dissemination to organs (lungs, brain, heart, kidneys, eye, liver, bone).

### **SIGNS AND SYMPTOMS**

Systemic candidiasis is usually a late-onset infection. Signs and symptoms are often non-specific, and can mimic bacterial infection.

- Lethargy (handles poorly)
- Apnoeas and bradycardias
- Temperature instability
- Respiratory distress
- Abdominal distension/ NEC-like illness
- Decreased perfusion

### **DIAGNOSIS**

Leucocytosis is usually marked, and thrombocytopenia is almost invariable. However, thrombocytopenia occurs in many cases of bacterial sepsis, so is not pathognomonic of systemic candida infection.

As candida may grow slowly in cultures, false-negative results of blood cultures and lumbar punctures can potentially lead to misdiagnosis or delayed diagnosis. A high index of suspicion is necessary, especially in high-risk patients.

Once the diagnosis is confirmed, a renal and cranial ultrasound is indicated. A cardiac echo may be indicated where infective endocarditis is suspected. An ophthalmologic review is warranted.

## PROPHYLAXIS OF CANDIDA INFECTIONS

- Minimise and rationalise antibiotic use.
- Where possible, extubate infants early.
- Current practice for infants requiring any form of respiratory support (Ventilation or CPAP) is to administer oral [Nystatin](#) TDS until off such respiratory support. This practice is based on a small trial of 67 preterm infants <1250g, in whom oral nystatin reduced fungal colonisation and infection.
- There is some evidence from multicentre randomised trials, and also in a recent Cochrane review (2007) to support the use of prophylactic intravenous, followed by oral, [Fluconazole](#) in preterm VLBW infants. Concerns relate to emergence of resistance to such drugs, although this has not yet been demonstrated.

## TREATMENT OF SYSTEMIC FUNGAL INFECTIONS

- Consideration should be given to removal of central lines.
- The drug of choice for systemic candidiasis is [Amphotericin \(Fungizone\)](#). The drug is extremely well tolerated in neonates, with few renal adverse effects. The drug must be infused over 6 hours. In some instances where venous access is difficult, and parenteral nutrition cannot be ceased for the 6 hour infusion, consideration can be given to using [Amphotericin Liposomal \(Ambisome\)](#). This formulation has no other specific benefits, but can be infused over 30-60 minutes. Note that Ambisome is far more expensive; seek advice from a neonatologist and/or clinical microbiologist.
- [Flucytosine](#) may need to be added, especially in cases of meningitis.
- Length of treatment will vary; systemic treatment may be continued with oral Fluconazole, but there is a paucity of data evaluating its efficacy. Newer antifungal agents, such as Voriconazole and Caspofungin, have also not been well studied in neonates.