Antifungal Prophylaxis and Treatment in Paediatric Oncology and Immunocompromised Children

Purpose
This Guideline provides recommendations regarding best practice for Antifungal Prophylaxis and Treatment in paediatric oncology and immunocompromised children.

Scope
This Guideline provides information for Children’s Health Queensland (CHQ) staff caring for paediatric oncology and immunocompromised children.

Related documents
Procedures, Guidelines, Protocols

- Management of Fever in the Neutropenic Paediatric Oncology Patient – Queensland Paediatric Haematology Oncology Network
- Management of paediatric non-neutropenic Oncology Patient with fever – Queensland Paediatric Haematology Oncology Network

Antifungal Prophylaxis and Treatment in Paediatric Oncology and Immunocompromised Children Guideline

- Glossary of acronyms
- Section 1: Treatment and prophylaxis guideline, risk stratification, dosing, therapeutic drug monitoring, drug interactions and dosing optimization
- Section 2: Background – rationale for antifungal prophylaxis and treatment guidelines
## Glossary of acronyms

<table>
<thead>
<tr>
<th>Acronym</th>
<th>Definition</th>
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<tr>
<td>ALL</td>
<td>Acute lymphoblastic leukaemia</td>
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<td>AML</td>
<td>Acute myeloid leukaemia</td>
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<td>BMT</td>
<td>Bone marrow transplant</td>
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<tr>
<td>CGD</td>
<td>Chronic Granulomatous Disease</td>
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<td>CHQ</td>
<td>Children’s Health Queensland</td>
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<td>CKN</td>
<td>Clinicians Knowledge Network</td>
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<tr>
<td>CYP450</td>
<td>Cytochrome P450 enzyme system</td>
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<td>ECIL</td>
<td>European Conference on Infections in Leukaemia</td>
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<td>GM</td>
<td>Galactomannan</td>
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<tr>
<td>GvHD</td>
<td>Graft-versus-Host-disease</td>
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<td>HCT</td>
<td>Haematopoietic cell transplantation</td>
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<tr>
<td>HSCT</td>
<td>Haematopoietic stem cell transplantation</td>
</tr>
<tr>
<td>IA</td>
<td>Invasive aspergillosis</td>
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<tr>
<td>IFI</td>
<td>Invasive fungal infection</td>
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<tr>
<td>IV</td>
<td>Intravenous</td>
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<tr>
<td>IMPS</td>
<td>Infection Management and Prevention service (CHQ)</td>
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<tr>
<td>LCH</td>
<td>Langerhans Cell Histiocytosis</td>
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<tr>
<td>PBS</td>
<td>Pharmaceutical Benefit scheme</td>
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<tr>
<td>PID</td>
<td>Primary Immune deficiency</td>
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<tr>
<td>PO</td>
<td>Per oral</td>
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<tr>
<td>SAA</td>
<td>Severe Aplastic Anaemia</td>
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<tr>
<td>SCN</td>
<td>Severe Congenital Neutropenia</td>
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<tr>
<td>SCID</td>
<td>Severe Combined Immunodeficiency Disorder</td>
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<tr>
<td>TDM</td>
<td>Therapeutic drug monitoring</td>
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<td>WAS</td>
<td>Wiskott-Aldrich Syndrome</td>
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Section 1: Treatment and prophylaxis guideline, risk stratification, dosing, therapeutic drug monitoring, drug interactions and dosing optimization

Risk stratification
Prophylaxis - High risk patients

> 8 years old

Relapse AML (PBS)

Relapse ALL (non PBS)

Severe aplastic anaemia (SAA) neutrophils <0.5 more than 4 weeks

Allogeneic transplant: grade 2-4 GvHD (PBS)

Posaconazole 200mg 8 hourly PO.
No TDM required for prophylaxis
Continue until neutropenia resolved and patient in remission.
In SAA monitor cyclosporine levels carefully on initiation and stopping azole.
Alternative during induction:
Liposomal Amphotericin (Ambisome®) 3mg/kg/day IV on Mondays, Wednesdays and Fridays
Alternative: Voriconazole

< 8 years old

Infant ALL (<1y); High Intensity Induction; Delayed intensification

Relapse ALL

Relapse AML

Severe aplastic anaemia neutrophils <0.5 more than 4 weeks

Allogeneic transplant: grade 2-4 GvHD

Voriconazole (TDM required)
Continue until neutropenia resolved and patient in remission.
In SAA monitor cyclosporine levels carefully on on initiation and stopping azole.
Alternative during induction:
Liposomal Amphotericin (Ambisome®) 3mg/kg/day IV on Mondays, Wednesdays and Fridays
Alternative: Posaconazole

Voriconazole until day 112 post onset GvHD or resolution.
### Prophylaxis - High risk patients (continued)

#### Any age

- **Allogeneic transplant:**
  - Previous fungal infection or anti-mold prophylaxis.
  - PID with high risk fungal infection (CGD, SCN, WAS, SCID)
  - Liposomal Amphotericin (Ambisome®) 1mg/kg/day IV daily.
  - Start after conditioning, continue as per protocol
- PID with high risk fungal infection (CGD, WAS, SCID)
  - Itraconazole (TDM required)

#### AML

- ALL and Downs syndrome

#### Autologous transplant:

- Day -7 to Day +30

#### Allogeneic transplant:

- Not considered high risk fungal infection

#### Neuroblastoma stage IV

#### LCH Induction therapy

#### Lymphoma

#### Chemotherapy for solid organ tumours

#### ALL

- Fluconazole until neutropenia resolved
- No routine prophylaxis
Secondary prophylaxis (after probable or proven fungal infection)
- Oral voriconazole (dose is the same as Treatment – see 4.2.6 below)
- Oral posaconazole
- IV Liposomal Amphotericin (Ambisome®): usually 1 mg/kg once daily (or intermittent dosing 3mg/kg/day 3 times per week)
- Secondary prophylaxis until neutropenia resolved and not Immunosuppressed

NOTE: Duration of voriconazole prophylaxis
If voriconazole prophylaxis (primary or secondary) is necessary for longer than 6 months, in view of the risk of photosensitivity (and recent rare reports of skin malignancies) it may be appropriate to consider switching to another azole, for example either itraconazole or posaconazole. This should be a consultant-led decision based on the individual patient’s clinical circumstances.

Empirical antifungal treatment
IV Liposomal Amphotericin 1 mg/kg once daily

Treatment of suspected or proven fungal infection (discuss with IMPS)
- If no specific organism suspected or identified (for example: ill patient, fungal infection suspected but no findings to suggest type of fungus), give IV Liposomal amphotericin 3 to 5 mg/kg once daily
- When a yeast or mould is isolated from a sterile site in an immunocompromised patient request that pathology perform sensitivity testing.
- Directed therapy (tailor to sensitivities when possible and only on discussion with Infection Management and Prevention Service (IMPS) Consultant):
  - Candida albicans - fluconazole (alternatives: caspofungin, voriconazole, liposomal amphotericin)
  - Candida albicans severe disseminated disease – caspofungin (alternatives: voriconazole, liposomal amphotericin)
  - Aspergillus spp- voriconazole (alternative: liposomal amphotericin)
  - Directed therapy for other fungi (see 4.3 Section 2 – “Background – rationale for antifungal prophylaxis and treatment guidelines”)
- Duration of treatment is tailored to individual patients, underlying diagnosis and pathogen but is generally 6 to 12 weeks.
- Where possible switch to oral therapy (voriconazole/ posaconazole) when afebrile, clinically stable, tolerating oral feeds and able to maintain therapeutic levels.

Dosing (Treatment and Prophylaxis)
- Itraconazole oral (liquid preparation)
  - 2.5mg/kg/dose PO twice daily
- Voriconazole IV (titrate treatment dose to levels)
  - <2 to 14 years: 9mg/kg/dose IV every 12 hours for 2 doses, then 8mg/kg/dose every 12 hours
  - 14 years (and 12 to 4 year olds >50kg): 6 mg/kg/dose IV every 12 hours for 2 doses, then 4 mg/kg/dose IV every 12 hours
- Voriconazole oral (titrate treatment dose to levels)
  - <2 to 14 years: 9 mg/kg/dose (maximum: 400 mg/dose) oral every 12 hours
  - >14 years (and 12-14 year olds >50kg): 200 mg oral every 12 hours (maximum: 300 mg/dose)
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- **Posaconazole oral (titrate treatment dose to levels)**
  - **<2 years:** Appropriate dose unclear. Discuss with Infectious Diseases team and pharmacy
  - **2 to 18 years:**
    - Treatment - 200 mg oral every 6 hours with fatty foods
    - Prophylaxis -200mg oral every 8 hours with fatty foods

- **Caspofungin IV**
  - **1 to 18 years:** 70 mg/m² IV (maximum dose 70 mg) on 1st day, then 50 mg/m² IV (maximum dose 70 mg) once daily; *(Note: can be increased to 70 mg/m² IV (maximum dose 70 mg) once daily if lower dose is tolerated but response is inadequate)*
  - **Adult:** 70 mg IV on 1st day, then 50 mg IV once daily *(Note: 70 mg IV once daily if bodyweight >80 kg)*
  - Dose adjustment required for hepatic impairment

- **Fluconazole oral/ IV**
  - **Treatment:** >1 month to 18 years: 12mg/kg/dose IV or oral once daily *(maximum dose 400mg/day)*
  - **Prophylaxis:** >1 month to 18 years: 3 to 5mg/kg/dose oral once daily *(maximum dose 400mg/day)*

- **Liposomal Amphotericin (Ambisome®) IV**
  - **Treatment:** 3 to 5mg/kg/dose IV once daily *(up to 7.5mg/kg/dose on IMPS consultant advice)*
  - **Prophylaxis:** 3mg/kg/dose IV 3 times per week or 1mg/kg/dose IV once daily.

Therapeutic Drug monitoring

**A. Prophylaxis**

There is no evidence so far that efficacy of prophylaxis is associated with specific levels, although this is likely due to a lack of evidence rather than a lack of association. The recent trial of failure of superiority of voriconazole over fluconazole [Wingard 2010] may have been confounded by not achieving sufficient prophylactic levels. Given the variable pharmacokinetics in young children, azole levels should be performed for children under 8 years of age both on prophylaxis and treatment in order to avoid both over and under dosing. For older children (> 8years) on prophylaxis and more stable pharmacokinetics, at present there is no evidence that levels are beneficial for improved outcomes. However levels are recommended for children on long term itraconazole.

**Prophylaxis target drug levels for children < 8 years:**
- Voriconazole > 1mg/L
- Posaconazole > 0.5 mg/L
- Itraconazole > 500microgram/L (> 0.5mg/L)

**B. Treatment**

There is a recognised association between treatment success and voriconazole levels, with levels <1mg/L associated with treatment failure [Neely 2010], whilst high levels are associated with toxicity.

**Treatment target drug levels:**
- Voriconazole > 2mg/L to 5.5 mg/L
- Posaconazole > 1.25 mg/L
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- Itraconazole > 1000 microgram/L (> 1 mg/L)

**Drug Interactions**

- Increased neurotoxicity with vincristine/vinblastine and itraconazole, voriconazole and probably posaconazole. Fluconazole has a dose-dependent effect on the CYP450 enzyme system and when used in prophylactic low dose there are no reports of vincristine toxicity associated with fluconazole.
- Cyclophosphamide hepatotoxicity with itraconazole and rarely fluconazole described, probably all other azoles
- Imatinib (dasatinib, sorafenib and bortezomib) increased toxicity with voriconazole; probably all azoles
- Cyclosporin, tacrolimus, sirolimus serum levels increased with voriconazole and posaconazole
- Warfarin, phenytoin serum levels increased with voriconazole.

**Recommended adjustments:**

- **Vincristine, cyclophosphamide**: avoid voriconazole, posaconazole, itraconazole (not fluconazole). Withhold the day before, day of and day after. May use liposomal amphotericin on the off days when the patient is receiving weekly vincristine and is high risk.
- **Imatinib, dasatinib, sorafenib**: avoid voriconazole, posaconazole, itraconazole, fluconazole. Use Ambisome® preferentially.
- **Bortezomib**: avoid voriconazole, posaconazole, itraconazole, fluconazole. Withhold 72 hours prior to start day of bortezomib and until 72 hours after last dose of bortezomib.
- **Cyclosporin, tacrolimus, sirolimus, warfarin, phenytoin**: monitor levels.

**Useful drug interaction resources for comprehensive drug interaction information:**

- UpToDate® Drug Interactions (Available via subscription)
- Flockhart Cytochrome P450 Drug Interaction Table, Division of Clinical Pharmacology, Indiana University
- Micromedex® 2.0 Drug Interactions search. Truven Health Analytics® (Available via CKN)

**Optimising azole absorption and levels**

**Itraconazole**

- Use liquid preparation
- Take on empty stomach
- Take with acidic drinks (coca cola, orange juice)
- Avoid antacids, H2 Receptor antagonist, Proton Pump Inhibitors, sucralfate
- Increase dose

**Voriconazole**

- Use tablets if possible
- Take on empty stomach (1 hour before or after food)
- Concurrent omeprazole may increase IV voriconazole levels; (boosting via CYP2C19 interaction). Unclear effect with oral voriconazole but avoidance not required.
- Increase dose
Posaconazole

- Take with fatty food meal
- Nutritional supplement (Boost Plus®)
- Avoid antacids, H2 Receptor antagonist, Proton Pump Inhibitors

**Step down Treatment**

- All patients on antifungal prophylaxis or treatment should have their treatment reviewed at least weekly.
- Treatment should be stepped down (eg from IV liposomal amphotericin to oral voriconazole) as soon as possible, under the direction of Oncology and/or IMPS consultant.
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Section 2: Background – rationale for antifungal prophylaxis and treatment guidelines

Antifungal prophylaxis discussions are mainly informed by adult data; however there are significant differences in children in terms of the ways in which treatment and supportive care is delivered, the kinds of invasive fungal infection (IFI) they develop and the pharmacokinetics and metabolism of antifungal drugs.

Risk groups

Central to any decisions about antifungal prophylaxis is the definition of local high risk groups for IFI and distinguishing within these groups between those at highest risk of mould infection warranting anti-mould prophylaxis and those more at risk of candida. Knowledge of local epidemiology of IFI would be ideal, evaluating relative incidence of candida, aspergillus and other mould infections by underlying disease and chemotherapy regime.

However individual centres numbers are generally small both in terms of total IFI and incidence for specific treatment regimes (eg. Acute Myeloid Leukaemia (AML)). A limited local retrospective review of 31 AML patients at the Royal Children’s Hospital Brisbane (RCH) suggests that fluconazole has been the standard of care, with voriconazole occasionally used in those perceived as very high risk.

Risk of IFI is driven mainly by treatment regime rather than underlying disease process and these vary across time and centres. In paediatric AML for instance a highly intensive AML regime (CCG 2891) produced very high IFI rates in phase 1 (19% yeast, 12% moulds), compared with a Standard phase 1 regime (with count recovery between cycles; 8% yeast 1.5% mould). [Sung 2009]. The only chemotherapy protocol to mandate antifungal prophylaxis is Interfant (itraconazole, although “local protocol antifungal” can be used). ALL R3 protocol recommends anti-mould cover for phases I to III and NECTAR suggests “consider when neutrophils <0.75”.

Most reviews agree that children with cancer most at risk of IFI include relapsed ALL, AML, post allogeneic haematopoietic stem cell transplant (HSCT) especially with graft-versus-host-disease (GvHD) and severe aplastic anaemia [Dvorak 2011, Tragiannidis 2012, Hale 2010, Quarello 2012].

There is some variation in the literature around Acute lymphoblastic leukaemia (ALL), with some studies with higher rates in “high risk” ALL [Hale 2010, Mor 2011], whilst others suggest low rates for ALL [Dvorak 2011, Zauoutis 2006]. Local experience does not support high rates of IFI in ALL.

A Paediatric Antifungal working group for European Conference on Infections in Leukaemia (ECIL 4) (Sept 2011) produced a risk stratification derived (fig 1) from rates within published literature (fig 2).
Figure 1

<table>
<thead>
<tr>
<th>Risk stratum</th>
<th>Patient population</th>
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<tbody>
<tr>
<td>High risk (≥ 10%)</td>
<td>-acute myeloblastic leukemia</td>
</tr>
<tr>
<td></td>
<td>-recurrent acute leukemia's</td>
</tr>
<tr>
<td></td>
<td>-allogeneic HSCT</td>
</tr>
<tr>
<td>Low risk (≤5%) *</td>
<td>-acute lymphoblastic leukemia **</td>
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<tr>
<td></td>
<td>-non-Hodgkin lymphoma's</td>
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<td></td>
<td>-autologous HSCT</td>
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<tr>
<td>Sporadic occurrence*</td>
<td>-pediatric solid tumors</td>
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<td></td>
<td>-brain tumors</td>
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<td></td>
<td>-Hodgkin's lymphoma</td>
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* consider that low and sporadic risk is not equal to no risk
** depending on the protocol and additional risk factors, risk for IFD may exceed 10 %

Figure 2

From: ECIL4 – paediatric group considerations for fungal diseases and antifungal treatment in children. Sept 2011 (figure 1 and 2).

What is less clear is which of these are at greatest risk of mould rather than candida infection; this distinction is essential in terms of which antifungal to choose; fluconazole or a mould active agent?

Invasive aspergillosis (IA) was explored in 666 children in the United States (US) with the highest incidence in patients with Wiskott-Aldrich Syndrome (WAS) (30%), followed by chronic granulomatous disease (CGD) (6.5%), allogeneic bone marrow transplant (BMT) (4.5%), and AML (3.7%). Among allogeneic BMT patients, those with GVHD did not have a significantly higher incidence of IA than those without GvHD. Lower risk IA included ALL (0.6%) and autologous BMT (0.3%) [Zauotis 2006].
An Australian paediatric series found the highest risk of mould infections in relapsed ALL (19%), then high risk ALL (15%), medium risk ALL (9%), relapsed AML (8%), stem cell transplant (SCT) (5%), AML (3%) [Hale 2010]. Univariate analysis found high risk ALL, relapsed disease and renal impairment were associated with mould infection. [Hale 2010].

With concern from adult series around increasing mould infections in AML, fungal infections in paediatric AML have increasingly been examined. Across 15 Canadian centres IFI was found in 12% AML, with 50% of these candida and 30% aspergillus (equating to 4% of the total had IA). About half the children were given fluconazole prophylaxis [Johnston 2013].

A recent study on infectious complications in children with severe aplastic anaemia (SAA) suggested invasive fungal disease (IFD) rates between day 0 to 120 were similar to HSCT; but were mostly mould infections. [Quarello 2012].

- Antifungal prophylaxis has shown most benefit and should be considered where the incidence of IFI is >10%. Minimal benefit is seen where incidence is <5% [Rogers 2011].
- Children with malignancy at highest risk of mould infections appear to be relapsed leukaemia and possibly SAA, BMT with GVHD.
- Children most at risk of yeast infections include the former as well as AML, allogeneic BMT and intensive ALL regimes.

### Prophylactic drug choices

**Fluconazole** has randomised controlled trial (RCT) support for a survival benefit in haematopoietic cell transplantation (HCT) patients >12 years. It has become the accepted standard of care for patients at high risk of IFI. Other oral azoles are an attractive option providing yeast and mould activity. Dose for prophylaxis used across centres is very variable and the range between 3-12mg/kg/day [UK BNFc 2013]. In adults doses less than 200mg day are felt to be ineffective [Tomblyn BMT 2009] “Low dose fluconazole has variable efficacy, therefore doses lower than 200mg are not recommended”. Children’s doses are ill defined and tend to be centre specific based on traditional practice. Royal Children’s Hospital (Brisbane) practice has been to use 3mg/kg/day during chemotherapy and 5mg/kg/day in HSCT. There is little evidence to inform dosing.

**Itraconazole**

Although a meta-analysis of itraconazole versus fluconazole (adults) showed less IFI, itraconazole has more side effects, greater drug interactions, and poor tolerability. Thus many paediatric oncology centres do not favour itraconazole prophylaxis.

**Voriconazole and Posaconazole**

There is no easily accessible paediatric data. For adults, meta-analyses comparing mould active with fluconazole prophylaxis indicate reduction in proven/probable IFI, IA and IFI related mortality but overall mortality is unaffected. [Ethier 2012].

However these meta-analyses encompass many variables and individual trials provide a more confusing picture.

For instance in a RCT post HCT voriconazole was not better than fluconazole in the prevention of IFI, though the safety profile was similar [Wingard 2010].

Given voriconazole’s broader spectrum of activity, this result was surprising, but may be due to an incomplete understanding of the complex pharmacokinetics of voriconazole. The low rate of mould infections nowadays seen post HCT may also have possibly
confounded this outcome. Voriconazole dosing in children almost certainly requires higher doses than appreciated to achieve equivalent adult levels, thus levels may be important in dosing correctly in children even in prophylaxis.

On the other hand, in a trial in adult patients with neutropenia, posaconazole prophylaxis was superior to fluconazole or itraconazole, but was also associated with an increased risk of serious adverse events [Cornely 2007]. This trial has informed adult practice but questions remain. Many IFI diagnoses were made on positive galactomannan (GM) results only, with the possibility that this simply reflects the ability of posaconazole to suppress GM expression. It is also unclear as to whether posaconazole was better than itraconazole as this was not separated out from fluconazole and posaconazole has not been compared with voriconazole.

Posaconazole use is limited in children < 13 years old as optimal paediatric dosing is uncertain and with no intravenous formulation and variable oral absorption with poor oral intake it is difficult to use in sick children. Posaconazole also shares many of the same drug interactions as voriconazole.

**Intravenous anti-mould therapy**
Interestingly, although accepted as a viable anti-mould prophylactic regime, liposomal amphotericin 1mg/kg/dose three times a week has little evidence of superiority over fluconazole. Several trials, including one in children in HCT and acute leukaemia, demonstrated increased side-effects and no greater efficacy. Ongoing studies using intermittent liposomal amphotericin prophylaxis are using higher doses aiming for 6 to 10mg/kg/week (personal communication Gilead® Pharmaceuticals).

Caspofungin has been shown to be at least equivalent to itraconazole in the setting of antifungal prophylaxis [Mattizuzi 2006]. The major disadvantages to widespread echinocandin use are cost and the lack of an available oral formulation.

**Summary of prophylaxis options**
Antifungal prophylaxis should be considered standard of care for patients receiving chemotherapy for:
- Relapsed disease
- AML
- Infant ALL
- ALL with prolonged neutropenia expected
- Any form of HCT
- SAA

Children with malignancy at highest risk of mould infections where antimould prophylaxis could be considered appear to be:
- Relapsed leukaemia (ALL/AML)
- Bone marrow transplant (BMT) with GVHD
- Very SAA
- Infant ALL (as mandated in Interfant protocol)

Neither liposomal amphotericin nor the triazoles (voriconazole and posaconazole) are conclusively superior prophylactic agents compared to fluconazole based on adult efficacy and safety data, and lack of paediatric trial data and optimal paediatric dosing make it challenging to define the best antifungal prophylaxis for paediatric patients.
Despite only having an intravenous formulation, there is interest in exploring echinocandins as prophylaxis in children due to their good safety profile and broad coverage. Ongoing Children’s Oncology Group (COG) trials may provide paediatric specific data.

As surveys consistently show wide variation in practice for AML and unrelated donor (URD) HCT children, from no antifungal use to fluconazole, voriconazole, posaconazole, liposomal amphotericin or echinocandin [Lehrnbecher 2009].

Local choice should reflect local preferences, ease and cost. In Queensland, where posaconazole is on the Pharmaceutical Benefit Scheme (PBS) for AML antifungal prophylaxis, it seems sensible to use this in children over 8 years where anti-mould prophylaxis is required.

With uncertainties around dosing and variable absorption in younger children with posaconazole, voriconazole would be the preferred choice in under 8 year olds.

Treatment of suspected or proven fungal infection (discuss with IMPS)

- Candida albicans - fluconazole (alternatives: caspofungin, voriconazole, liposomal amphotericin (Ambisome®)) This treatment regimen can be used for infections due to C tropicalis, C keny, C dubliniensis, C lusitaniae, and C guilliermondi.
- Candida albicans severe disseminated disease – caspofungin (alternatives: voriconazole, Ambisome®)
- Candida glabrata – caspofungin (alternatives: voriconazole, Ambisome®)
- Candida krusei - caspofungin (alternative: posaconazole, voriconazole)
- Candida parapsilosis - fluconazole (alternatives: voriconazole, Ambisome®)
- Aspergillus spp- voriconazole (alternative: Ambisome®)
- Aspergillus terreus – voriconazole (resistant to amphotericin)
- Scedosporium - voriconazole and terbinafine (alternative: posaconazole)
- Fusarium –Ambisome® (5mg/kg/day IV) and voriconazole
- Mucormycoses - Ambisome® (5 to 7.5mg/kg/day IV) and caspofungin (alternative: posaconazole)
References and Suggested Reading


2. Clark J. Background: Antifungal Prophylaxis and Treatment in Paediatric Oncology and Immunocompromised Children. RCH Brisbane document. 2013


8. Guideline revision and approval history

<table>
<thead>
<tr>
<th>Version No.</th>
<th>Modified by</th>
<th>Amendments authorised by</th>
<th>Approved by</th>
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<tr>
<td>1.0</td>
<td>Paediatric Infectious Diseases Consultant team (IMPS, CHQ) Paediatric Oncology Consultant Team (CHQ) Paediatric Immunologist (CHQ) Clinical Oncology Pharmacy Manager (CHQ) Antimicrobial Stewardship Pharmacist (CHQ)</td>
<td>Medicines Advisory Committee (MAC)</td>
<td>General Operations Manager</td>
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Keywords
Antifungal, Anti-mould, Prophylaxis, Treatment, Oncology, Immunocompromised

Accreditation
EQuIP National Standard: 3, 1, 4