

# Management of fungal nail infections (onychomycosis)

## Assessment and diagnosis

- Onychomycosis most frequently appears as an infection that begins in the distal or lateral part of the nail plate and spreads proximally under the nail; [click here](#) for information about other morphological types of onychomycoses, and [here](#) for a general overview of nail anatomy
- Dermatophytes are fungi that degrade keratin and are the most common cause of fungal nail infection:
  - Dermatophytes – 60 – 90% of infections (e.g. *Trichophyton rubrum*, *T. interdigitale* *T. indotineae*)
  - Yeasts – 10 – 20% of infections (mainly *Candida albicans*; mostly affects fingernails)
  - Non-dermatophyte moulds – 10% of nail infections (e.g. *Aspergillus*, *Fusarium*, *Scopulariopsis* and *Neocytalidium* species)
  - Polymicrobial infections are possible
- Other nail conditions can mimic onychomycosis, e.g. chronic nail trauma, lichen planus; [click here](#) for a list of differential diagnoses
  - Dermatoscopy may be useful to identify features that distinguish onychomycosis from these conditions

## Laboratory confirmation is recommended before initiating treatment

- Confirm onychomycosis via laboratory diagnosis prior to initiating antifungal treatment
- Ask about previously trialled prescription or over-the-counter treatments
  - A washout period of three to six months for both topical and oral antifungals is recommended before attempting mycological culture
- Include treatment history in the clinical details when requesting laboratory testing, if applicable
- Dermatologist opinion is available in some regions if uncertainty remains: [click here](#) for a checklist for your enquiry



### To collect a specimen:

- Decontaminate the affected nail with soap and water or isopropyl alcohol
- Take nail clippings (using chiropody clippers) from the affected part of the nail
- Use a curette or scalpel blade to remove subungual debris
- Scrape nail surface with a scalpel if superficial white onychomycosis is suspected
- Provide the laboratory with as much of a sample as possible
- Send clippings and scrapings in a single container. N.B. Some laboratories recommend including the scalpel blade with the sample.

## Treatment

Inform the patient of the risks and benefits associated with treatment; [click here](#) for discussion points

### Oral Treatment

#### Terbinafine (see Table 1)

- First-line treatment for dermatophyte onychomycosis
- Avoid terbinafine in patients with severe renal impairment (i.e. CrCl < 20 mL/min) and hepatic impairment
- Halve dose in patients with less severe renal impairment (i.e. CrCl < 50 mL/min) if there is no alternative treatment available
- Advise patients to promptly seek medical attention if they develop symptoms suggestive of hepatotoxicity such as anorexia, nausea, vomiting or fatigue

## Itraconazole (see Table 1)

- Preferred for treating candidal onychomycosis (and alternative treatment option for dermatophyte onychomycosis)
- Pulse treatment may reduce adverse effects
- Avoid in patients with a history or risk of heart failure
- Use with caution in patients with hepatic impairment or elevated liver enzymes
- Advise patients to seek medical attention if they develop symptoms suggestive of hepatotoxicity or heart failure while taking itraconazole

## Topical treatments

- Generally less effective than oral antifungals
- Suitable in the following situations:
  - No nail matrix involvement (i.e. superficial white onychomycosis, early distal or lateral subungual onychomycosis) and only one or two nails affected
  - Patient is unable (or unwilling) to take oral antifungals, e.g. due to contraindications, medicine interactions, potential for adverse effects
- Topical preparations available in New Zealand:
  - **Amorolfine 5%** (MycONail [funded on prescription, Pharmacy-Only], Loceryl [not funded, Pharmacy-Only])
  - **Ciclopirox 8%** (Rejuvenail [not funded, Pharmacy-Only], Batrafen [Section 29])
  - See [NZF](#) or product information leaflet for application instructions
- Assess for and treat co-existing tinea pedis – if identified, prescribe standard topical antifungal (e.g. miconazole cream) alongside topical onychomycosis treatment
- Switch patients to oral treatment (if no contraindications) if no visible improvement after six months

## Combination antifungal treatment

Consider for patients with highest risk of complications in the following clinical situations:

- No resolution with previous oral monotherapy – prescribe sequential treatment (another course of oral treatment, then topical)
- Poor prognostic factors (e.g. diabetes, immunodeficiency, peripheral vascular disease) – prescribe parallel treatment (oral and topical concurrently)
- Antifungal-resistant dermatophyte strains or moulds identified – discuss with a clinical microbiologist

**Table 1.** Oral antifungal treatment options.<sup>14,17,19</sup>

Medicine	Indications	Dose (for paediatric dosing, see NZFC)	Baseline testing and monitoring
<b>Terbinafine</b>	Dermatophyte onychomycosis	250 mg, once daily, for six weeks (fingernails) or 12 weeks (toenails)	Request baseline full blood count and liver function tests (LFTs)
		Longer course may be required if fungal toenail infection has not shown improvement in 12 weeks	Re-check four to six weeks after treatment initiation – discontinue treatment if abnormal results
<b>Itraconazole*</b>	Candidal onychomycosis	200 mg, twice daily, for seven consecutive days of the month, for two months (fingernails) or three months (toenails†). Treatment-free interval is 21 days.	Measure LFTs at baseline
		Alternatively, 200 mg, once daily, for three months**	Ongoing liver function monitoring is recommended for courses lasting longer than one month, or if patient has a history of hepatotoxicity or is taking hepatotoxic medicines

\* Take with food or acidic beverage to improve absorption

† Candidal onychomycosis is less common in toenails

\*\* There is no evidence that continuous or intermittent regimens produce significantly different cure rates or adverse effects

## Follow-up

- Review patients with fungal nail infections regularly (e.g. every three months)
  - Photograph the nail or make a groove with a scalpel at the proximal end of the infected area
- Stop treatment once you are satisfied the infection is not progressing proximally past the marked groove (clinical judgement)
  - Resolution may take three to six months for fingernails and up to 18 months for toenails
- Prescribing a repeat antifungal course is appropriate in most cases if there is some evidence of the infection clearing
- Check treatment adherence and application technique (for topical antifungals) if no evidence of nail improvement after approximately three months
- Further treatment options include:
  - A higher dose for a longer duration (e.g. terbinafine 500 mg per day for 24 weeks)
  - Different medicine choice or combination treatment
  - Discuss management with a dermatologist or clinical microbiologist
- Consider weekly or twice-weekly prophylactic topical antifungal application after successful treatment (high-risk patients)
  - Optimal duration of prophylaxis has not been determined (may need to continue indefinitely)
- Provide footcare advice for patients with recurrent nail infection; [click here](#) for examples



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