

Leg Ulcer Infection in Adults – Antibiotics – Full Clinical Guideline

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Introduction

According to NICE (2020) a leg ulcer is a “long-lasting (chronic) open wound that takes more than 4 to 6 weeks to heal”. Leg ulcers usually develop on the lower leg, between the shin and the ankle.

There are many causes of leg ulcers, and although most leg ulcers are colonised by bacteria, few are actually infected. There is no difference in outcomes between treatment with antibiotics and standard care in patients with uninfected leg ulcers.

Signs & symptoms

Some common signs of infection (localised redness, discharge or an unpleasant odour) may be present in all leg ulcers irrespective of infection status, particularly if compression is removed. Therefore, clinicians should assess for the following signs to determine if the ulcer is infected:

- Redness or swelling that spreads beyond the ulcer itself
- Localised heat
- Increased pain
- Fever

Risk factors

Comorbidities including diabetes, venous insufficiency, arterial disease, immunosuppression

Complications/consequences

If infected ulcers are left untreated, this causes delays in ulcer healing and can lead to complications including impairment of quality of life and sometimes resulting in hospital admission.

More serious complications can include:

- Necrotising fasciitis – a rare but serious infection affecting the subcutaneous tissues and surrounding muscles and organs (fascia). Early symptoms may include intense pain that appears out of proportion to the visible damage to the skin and a fever. Most commonly caused by group A streptococcus
- Osteomyelitis – an infection of the bone, most commonly affecting the long bones of the leg (although can occur in other bones e.g. spine, hands. Osteomyelitis can occur in any patient, although there are certain groups which are considered high risk, including those with diabetes or those who are immunocompromised

Please note that this guideline does not cover the following conditions:

- [Erysipelas & Cellulitis](#)
- Cellulitis associated with [Human Bites](#) and [Animal Bites](#)
- [Soft tissue infection associated with water exposure](#)
- Surgical site infections
- [Lacerations](#)

- [Diabetic foot ulcers](#)
- [Necrotising soft tissue infections](#)

Refer to the appropriate guideline on NETi for the above conditions

This guideline should also be read in conjunction with the UHDB [Tissue Viability Leg Ulcer Guideline](#).

Management

Ensure that underlying conditions, such as venous insufficiency and oedema, are managed appropriately.

Microbiological Investigations

- MRSA swab if there is an open wound
- Blood cultures, if patient is febrile
- Send aspirate, pus or loose tissue for culture; include wound duration, site and any recent antibiotics on microbiology request. Cleanse the area with sterile saline and take a sample from areas of overt infection and edges of the wound adjacent to inflamed tissue.
- For patients who have had exposure to fresh water or sea water at site of skin break, seek advice from a consultant microbiologist

Interpretation of Microbiology Results

The most common causative organisms in leg ulcer infections are Gram positives such as *Staphylococcus aureus* and beta-haemolytic *Streptococci spp.*

In patients with chronic ulcers and multiple co-morbidities (e.g. diabetes, immunocompromised, vasculopathy, post-surgery, retention of metal work), infection may also be caused by Gram negative and anaerobic bacteria therefore this must be taken into consideration when prescribing antimicrobial treatment.

If Gram negative organisms, including multi-drug resistant organisms such as ESBL/AMPc producers or CRE/CRO are isolated from a post-antibiotic sample, interpret the results carefully as these microbes may represent colonisation at this site and are not necessarily an indication for antibiotics. If the patient is symptomatic and if clinically indicated, an appropriate antibiotic may be selected from the sensitivity profile.

If a multi-drug resistant organism is isolated, ensure appropriate infection control precautions are adhered to when caring for the patient.

Antibiotic Treatment

There are many causes of leg ulcers; whilst most leg ulcers are colonised by bacteria, few are 'infected'.

Antibiotics are only indicated for leg ulcers:

- 1) Where an organism(s) is isolated AND when the patient presents with systemic symptoms of infection (pyrexia, rigors, tachycardia etc.)

OR

- 2) For patients presenting with any of the following³:
 - redness or swelling of the skin spreading beyond the ulcer itself
 - delayed healing
 - unexpected/disproportionate pain
 - abnormal odour
 - pocketing at the base of the wound
 - discoloured (i.e. unusually dark) granulation tissue
 - friable granulation tissue
 - devitalised (sloughy or necrotic) tissue.

Empirical Oral Antibiotics:

- Flucloxacillin 1g 6 hourly
- OR
- Doxycycline 100mg 12 hourly
- OR
- Clarithromycin 500mg 12 hourly
 - In pregnancy: Erythromycin 500mg 6 hourly

If no response or worsening of symptoms on empiric PO antibiotics but otherwise systemically well:

- Oral Co-Amoxiclav 625mg TDS
- OR
- Oral Co-Trimoxazole 960mg BD (adjusted according to renal function as necessary)

If the patient has a history of diabetes or arterial disease, consider adding in PO Metronidazole 400mg 8 hourly to the regimes above to cover for anaerobic organisms. NB Metronidazole is not required in patients treated with co-amoxiclav as this alone provides adequate anaerobic cover

If unable to tolerate PO antibiotics or concerns over enteral absorption:

Convert the chosen regime above to the intravenous route. Flucloxacillin, Clarithromycin, Erythromycin, Co-Amoxiclav, Co-Trimoxazole and Metronidazole are all available via the intravenous route.

If there is no response to empirical antibiotics but the patient is systemically well, discuss with a Consultant Microbiologist

For systemically unwell patients, including Red Flag Sepsis:

- IV Piperacillin/Tazobactam 4.5g TDS (adjusted according to renal function as needed)
OR in penicillin allergy
- IV Teicoplanin ([dosed as per hospital guidelines](#)) plus IV Ciprofloxacin 400mg 12 hourly plus IV Metronidazole 500mg TDS

Methicillin-resistant *Staphylococcus aureus* (MRSA):

If MRSA is suspected or confirmed, add one of the following antibiotics to the existing regime:

- Vancomycin – [dosed as per hospital guidelines](#)
- Teicoplanin – [dosed as per hospital guidelines](#)
- Linezolid* 600mg 12 hourly (PO or IV) – on the advice of a consultant microbiologist, only if vancomycin and teicoplanin are both contraindicated.

* NB Linezolid has multiple contraindications and interactions that must be considered before prescribing should occur; consult the BNF or discuss with a pharmacist. Linezolid has a very high oral bioavailability (~100%). IV Linezolid should only be used if the patient is unable to tolerate oral treatment or there are concerns over enteral absorption.

The choice of antibiotics should be reviewed and adjusted to culture and sensitivity results from samples taken wherever possible.

Duration of treatment:

7 days of treatment (combination of IV and PO routes) should usually be sufficient to effectively treat an infected leg ulcer.

Review intravenous antibiotics within 48 hours and consider switching to oral antibiotics as soon as possible.

Longer durations may be required if the infection is not improving adequately, particularly in patients with poor healing and a higher risk of complications due to comorbidities.

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