POSITION PAPER
DATE OF ISSUE: AUGUST 2026

Australasian Lymphology Association

Management of Cellulitis in Lymphoedema/Chronic Oedema

Approved by: ALA Board
Approval date: August 2026
Version: 2026 revision
Next review: August 2028

This document has been developed and endorsed by the Australasian Lymphology Association to provide an Australasian perspective and consistent, evidence-informed principles on the management of cellulitis in people with lymphoedema/chronic oedema.

It aims to support health professionals in community and hospital settings to effectively manage and prevent cellulitis in this high-risk population.

It also seeks to minimise harms, particularly misdiagnosis, ineffective treatment, antibiotic overuse, and missed opportunities for prevention, while helping patients to better understand cellulitis and access support for prevention and management.

Definitions and presentation

Chronic oedema and cellulitis are both common, co-morbid conditions that are responsible for a significant burden of illness and hospitalisation in Australia.

Chronic oedema (swelling present for >3 months) reflects lymphatic failure and may arise from lymphatic dysfunction – including genetic (primary) causes, or the more common (secondary) cancer-related lymphoedema, venous disease, obesity, or systemic causes such as cardiac failure.

Cellulitis is an acute bacterial infection of the skin and subcutaneous tissues. Erysipelas refers to a more superficial infection; however, for clinical purposes these are managed similarly and are collectively referred to as cellulitis in this position statement. Typical features include erythema, warmth, pain, swelling, and induration, with possible systemic features such as fever and malaise. Bilateral cellulitis is rare and should prompt consideration of alternative diagnoses.

Cellulitis is more likely to occur in the presence of chronic oedema, which is often associated with skin and soft tissue changes that increase susceptibility to infection. Impaired lymphatic drainage may weaken local immune defence by limiting bacterial clearance and the transport of immune cells. Chronic swelling may also compromise skin integrity, facilitating bacterial entry and increasing infection risk.

Misdiagnosis and differential diagnoses of cellulitis

Misdiagnosis of cellulitis is common, with approximately 30% of presumed cases representing alternative diagnoses such as stasis dermatitis, superficial venous thrombosis, eczematous dermatitis or lipodermatosclerosis (1). Inappropriate management of these conditions may result in unnecessary antibiotic use, delay appropriate treatment of the underlying condition, and lead to avoidable presentations, investigations and use of health care resources.

Structured diagnostic tools, such as the Lower Limb Inflammatory Pathway (2), can support differential diagnosis and help direct appropriate care.

Assessment

Patients presenting with signs and symptoms of possible cellulitis episode – erythema, pain, induration, warmth, and swelling, possibly accompanied by fever, malaise, lymphadenopathy and systemic toxicity – should be assessed by a doctor to establish a diagnosis and baseline, followed by regular monitoring to evaluate their response to treatment. Symptomatic improvement is typically expected within 24–48 hours of initiating antibiotic therapy.

Routine assessment includes:

- Monitoring local clinical features: erythema, pain, swelling and warmth – if possible, mark or photograph the border of erythema to indicate if the infection is spreading.
- Level of systemic upset: heart rate, temperature, respiratory rate and blood pressure.
- Blood tests: C-reactive protein and full blood count for those with systemic symptoms or when diagnosis is uncertain.
- Wound or swab culture: only required if purulent discharge, ulcer, or abscess (3)

Persistent skin changes, such as discolouration, or mild local inflammation may continue for weeks to months (or longer) and do not indicate a need for ongoing antibiotic therapy.

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Recommended Treatment Setting

The appropriate treatment setting for cellulitis depends on the degree of systemic upset and the presence of comorbidities, as outlined in Table 1:

Table 1. Risk stratification and recommended treatment setting for cellulitis

Cellulitis classification*	Presentation	Treatment recommendation (refer to Figure 1)
Class 1	No or well-controlled comorbidities, systemically well	Outpatient management Oral antibiotics
Class 2	Systemically unwell with no uncontrolled comorbidities e.g., obesity, peripheral vascular disease or venous insufficiency OR Systemically well with poorly controlled comorbidities which may delay recovery.	Outpatient management GP or Hospital in the Home (HITH)
Class 3	Marked systemic inflammatory response (e.g. altered mental state, tachypnoea, tachycardia, hypotension) with poorly controlled comorbidities which may delay recovery.	Inpatient admission or supervised outpatient support (HITH). IV antibiotics may be required initially
Class 4	Septic shock or life-threatening presentations such as necrotising fasciitis requiring urgent critical care and/or surgical input	Inpatient admission IV antibiotics

Adapted from CREST cellulitis severity classification (4).

Antibiotic Therapy

The recommendations on antibiotic therapy (Figure 1) have been adopted from the *'Cellulitis and erysipelas topic'* within the *Therapeutic Guidelines* (5), with modifications based on the most current available evidence, and only apply to adult patients. It does not cover the management of facial or peri-orbital cellulitis.

Treatment should primarily target streptococci. MRSA-active therapy should be reserved for patients with defined risk factors.

There is insufficient high-quality evidence to support longer antibiotic courses in patients with chronic oedema; duration should be guided by clinical response. See further considerations around dosage in Table 2.

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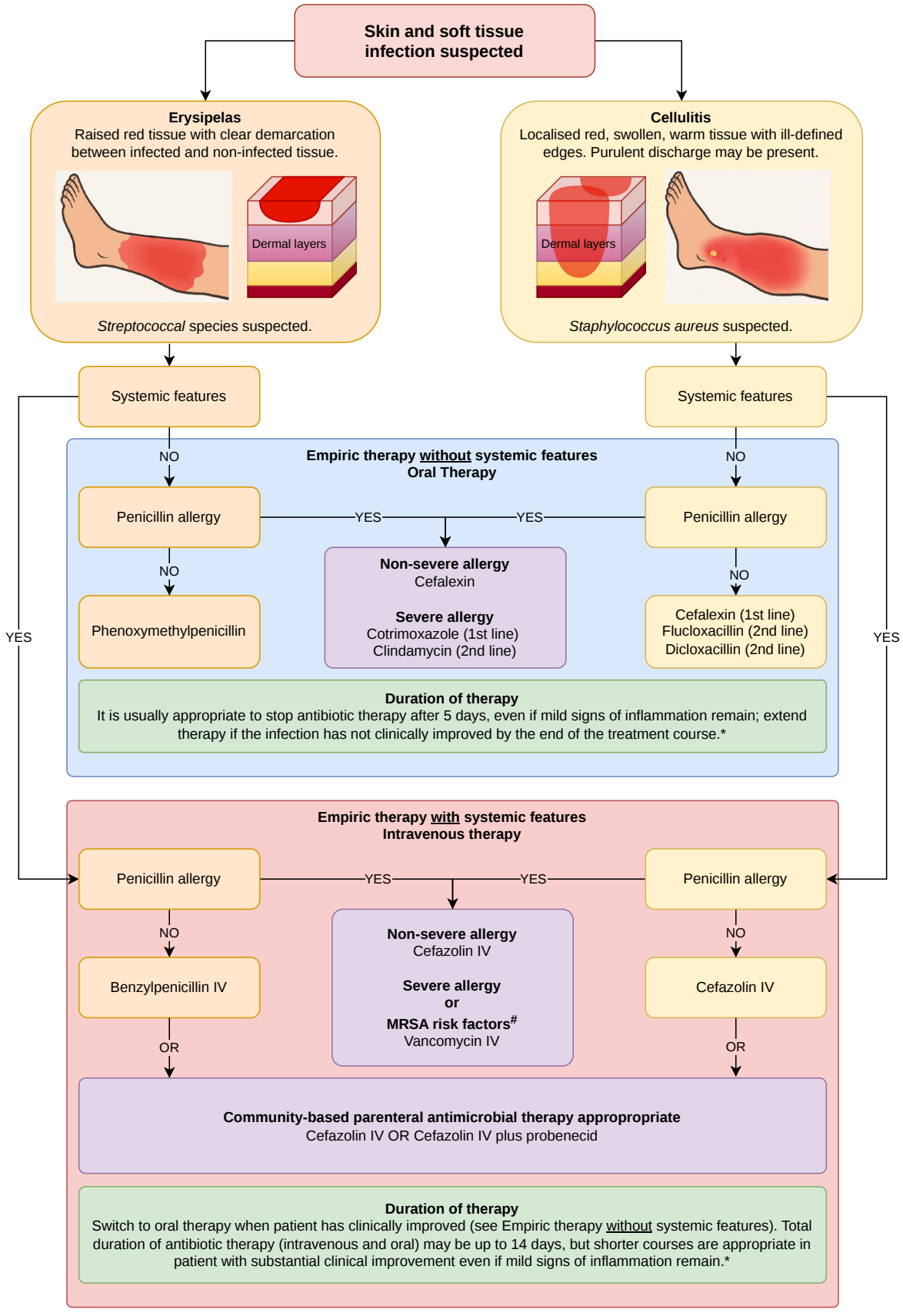
Figure 1. Antibiotic therapy for erysipelas and cellulitis in adults



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 # Methicillin-resistant *Staphylococcus aureus* (MRSA) risk factors: Risk factors for MRSA infection include previous colonisation or infection with MRSA, residing in an area with a high prevalence of MRSA (including prolonged hospital stays or aged-care residence with high prevalence of MRSA), current or recent residence in a correctional facility, and current or recent injecting drug use. For antibiotic management of this patient group, expert advice from an Infectious Disease physician should be sought.

Risk factors for other infective aetiologies: Other pathogens should be considered in patients with chronic liver disease, immune compromise, diabetic foot ulcers and people who inject drugs; or when the infection is associated with an animal or human bite, a penetrating injury, a water-immersed wound or a retained foreign body. Expert advice from an Infectious Disease physician should be sought.

Table 2. Antibiotic dosing

Antibiotic	Standard dosing	Dose adjustment[a] (see local guidelines)[b]
Phenoxymethylpenicillin	500mg orally, 6-hourly	No adjustment
Cefalexin	500mg orally, 6-hourly	Renal impairment (GFR < 10 mL/min)
Flucloxacillin	500mg orally, 6-hourly 2g intravenously, 6-hourly	Renal impairment (GFR < 10 mL/min)
Dicloxacillin	500mg orally, 6-hourly	Renal impairment (GFR < 10 mL/min)
Cotrimoxazole (Trimethoprim-sulfamethoxazole)	160+800mg orally, 12-hourly	Renal impairment (GFR < 50 mL/min)
Clindamycin	450mg orally, 8-hourly	No adjustment Caution in hepatic impairment
Benzylpenicillin	1.2g intravenously, 6-hourly	Renal impairment (GFR < 50 mL/min)
Cefazolin: Inpatient	2g intravenously, 8-hourly	Renal impairment (GFR < 40 mL/min)
Cefazolin: Community-based parenteral	6g intravenously as a 24-hour continuous infusion, daily OR 2g intravenously, daily PLUS probenecid 1g orally, daily OR 2g intravenously, 12-hourly	Renal impairment (GFR < 40 mL/min)
Vancomycin	See local dosing advice or Therapeutic Guidelines	See local dosing advice or Therapeutic Guidelines.

[a] Dose adjustment of beta-lactam therapy should be considered in patients at the extremes of weight.

[b] If renal function is impaired review locally available resources for dose adjustment

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Compression therapy during acute cellulitis

Emerging, although limited, evidence suggests that compression therapy (e.g. compression bandaging or compression wraps) during acute cellulitis, may reduce pain, swelling, symptoms and length of hospital stay, without increasing complications. Therefore, provision of compression therapy during acute cellulitis can be considered where it is tolerated and can be safely applied by appropriately trained staff.

For patients who are currently managing their chronic oedema with compression, garment wear can continue. However, if compression is removed during an acute episode due to pain, increased swelling or skin breakdown, it should be reintroduced as soon as the patient is able to tolerate it and can safely fit into their usual compression. If swelling is worsened post infection, referral to a lymphoedema practitioner to review the compression garments is recommended.

Prevention of recurrent cellulitis: Non-pharmacological strategies

Recurrent cellulitis is common, with up to 50% of patients experiencing recurrence within 3 years (6). Patients should be educated about cellulitis, including early identification, management of future infections, and strategies to prevent recurrence based on their personalised risk factors.

Predisposing risk factors:

Conditions that impair the skin, vasculature, or immune system increase the risk of cellulitis. Evidence is limited for obesity management and skin care interventions to prevent cellulitis; however, there is sound clinical reasoning and broad expert consensus for the practical recommendations below.

Oedema

- Strong evidence shows that management of lymphoedema and chronic oedema using compression therapy significantly reduces the risk of recurrent cellulitis (7).
- All patients with a history of cellulitis should be assessed for chronic oedema.
- Acute oedema (lasting days to weeks) is common during cellulitis and may not fully resolve following treatment.
- Once the infection has resolved, assess for chronic oedema using the pitting test (a visible indentation remains after applying thumb pressure for at least 30 seconds). If chronic oedema is identified, either during the infection (e.g. known pre-existing oedema) or after infection resolution, patients should be referred to a lymphoedema therapist for assessment and management, including compression therapy.
- In selected patients, surgical management of lymphoedema alongside conservative treatment may help prevent cellulitis, although access to these procedures is limited.

Skin integrity

- Maintaining intact skin is essential as a barrier to infection.
- Conditions that impair the skin barrier, particularly macerated or fissured interdigital skin, dermatitis, and wounds or ulcers, are known to provide a point of entry for infection. Treatment of tinea pedis, fungal nail infections, dermatitis, eczema, ulcers and wounds should be prioritised.

Educate patients on proper skin care and hygiene, including daily use of emollients and the prompt cleaning and covering of any skin breaks in at-risk areas.

Obesity

- Obesity is a strong risk factor for both cellulitis and chronic oedema.
- Education and support for weight management strategies should be provided.

Antibiotic prophylaxis for recurrent cellulitis

Antibiotic prophylaxis is recommended to prevent recurrence of cellulitis in patients experiencing at least two separate episodes of cellulitis per year, after implementation of other prevention strategies (Table 3).

Before initiating antibiotic prophylaxis, a shared decision-making process with the patient is encouraged, taking into consideration the following factors:

- the severity and frequency of previous symptoms
- the risk of developing complications
- underlying conditions (such as lymphoedema, obesity or venous insufficiency) and their management
- the risk of resistance with long-term antibiotic use.

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Table 3. Prophylactic antibiotic recommendations for recurrent cellulitis

Strategy	Antibiotic recommendation
Antibiotic prophylaxis	Phenoxymethylpenicillin 250 mg orally, 12-hourly; review every 6 months.
Stand-by prescription	Prescription as per *"Empiric therapy without systemic features"* to start as soon as symptoms develop.

Stand-by Antibiotics

For those who have had recurrent cellulitis and are able to recognise the signs, it is common practice for patients to have a supply of antibiotics on stand-by, particularly when travelling. Antibiotics should be commenced immediately when familiar symptoms of cellulitis start, and a medical opinion should be sought as soon as possible. If cellulitis recurs, it is recommended to have a management plan discussed with and documented by your doctor in case of future episodes.

*This position statement was developed on behalf of ALA by: Dr Robyn Sierla, Dr Blake Nield, Dr Elizabeth Webb, Professor Warwick Britton, Associate Professor Helen Mackie, Janette Jacka, Dr Debbie Geyer, and Professor Elizabeth Dylke.

An earlier version of this position statement was published in June 2008; reviewed June 2010, March 2012, and March 2015.

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