# Acute cellulitis and erysipelas in adults: Treatment

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# SKIN AND SOFT TISSUE INFECTIONS

Cellulitis (an acute inflammation of the skin and subcutaneous fat) is characterized by local tenderness, pain, swelling, warmth, and erythema with or without a definite entry point.

Cellulitis is most often caused by β-hemolytic streptococci and, less often, Staphylococcus aureus.

# SKIN AND SOFT TISSUE INFECTIONS

Methicillin-resistant S. aureus (MRSA) may be a causative pathogen, especially in high-risk patients:

children, prisoners, soldiers, intravenous drug users, men who have sex with men), and empiric treatment should have activity against CA-MRSA.

# ERYSIPELAS

**Erysipelas** is a relatively common bacterial infection of the superficial layer of the skin (upper dermis).

- It is extending to the superficial lymphatic vessels within the skin, characterized by a raised, well-defined, tender, bright red rash, typically on the face or legs, but which can occur anywhere on the skin.

# DIFFERENTIATING CELLULITIS FROM ERYSIPELAS

Effective treatment of cellulitis and erysipelas depends on determining the most likely microorganism causing the infection.

**Beta-hemolytic streptococci** cause the vast majority of erysipelas infections and most cellulitis infections, but cellulitis is sometimes caused by *Staphylococcus aureus.*

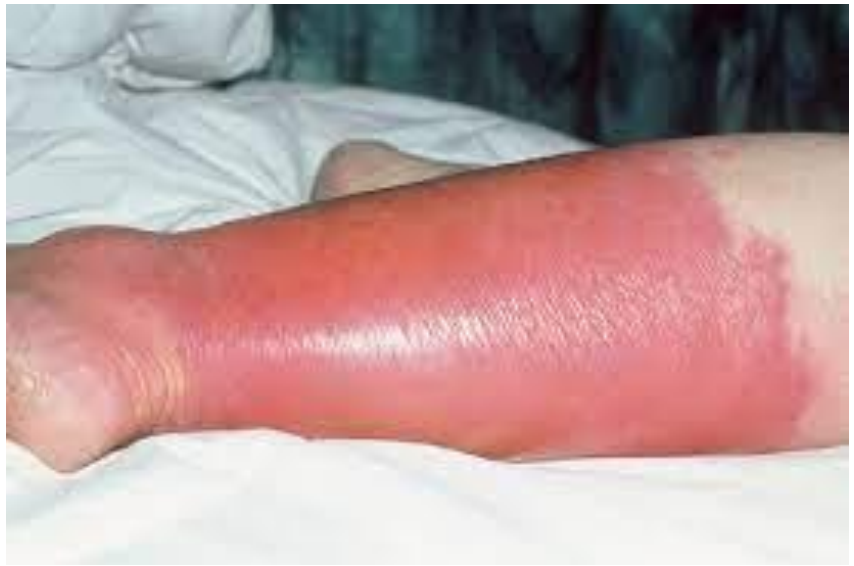
Examination and clinical features cannot always differentiate erysipelas from cellulitis, so we treat for cellulitis whenever we are uncertain.

Both erysipelas and cellulitis manifest as areas of skin erythema, edema, and warmth.

On physical examination, classic **erysipelas** presents as a bright red patch of skin with a clearly demarcated raised border.

**Cellulitis** involves deeper layers of the skin, so it classically presents with indistinct borders that are ~~not raised~~.

Cellulite



Erysipelas

# DETERMINING THE SITE OF CARE

Cellulitis and erysipelas can both cause rapidly progressive and severe illness.

- ✓ **Initial assessment** of these infections should focus on determining the severity of illness and whether hospitalization is indicated.

**Hospitalization** is indicated for most individuals who warrant parenteral antibiotics.

# Indications for parenteral therapy

The decision to initiate parenteral therapy is typically based on the extent and severity of infection and patient comorbidities.

Patients who meet criteria for **parenteral** therapy are usually admitted to the **hospital** to ensure prompt administration and close observation.

# For individuals with cellulitis or erysipelas, we suggest initial treatment with parenteral antibiotics in the following circumstances:

- Systemic signs of toxicity such as fever >100.5°F/38°C, hypotension, or sustained tachycardia (refractory hypotension should prompt consideration of toxic shock syndrome)
- Extensive erythema

- Immunocompromising condition (eg, neutropenia, immunosuppressive drugs such as chemotherapy for malignancy)

- Inability to tolerate or absorb oral therapy

For patients with lymphangitis accompanying cellulitis, some UpToDate contributors would administer parenteral antibiotics because they believe that lymphangitis may be indicative of imminent bacteremia; there are minimal published data to support or refute this notion.

# ACUTE CELLULITIS

- **Considerations prior to selecting antibiotics**

At the time of presentation, selection of empiric antibiotic therapy is based on determining the most likely pathogen.

In most cases, the causative pathogen is never identified.

If a pathogen is identified, antibiotics should be narrowed to target the pathogen.

Factors that should be considered when choosing antibiotics for acute cellulitis include the severity of the cellulitis and whether coverage for methicillin-resistant *S. aureus* (MRSA).

- **Pathogens to always cover**

Empiric antibiotics for cellulitis should always cover **beta-hemolytic streptococci** and **methicillin-sensitive *S. aureus* (MSSA)**, which are the two most common pathogens of cellulitis.

- **Indications for MRSA coverage**

Empiric coverage for MRSA is indicated for patients with MRSA risk factors and those who have increased morbidity if suboptimal antibiotics are administered.

## ✓ Conditions that warrant MRSA coverage include the following:

- Systemic signs of toxicity (eg, fever >100.5°F/38°C, hypotension, sustained tachycardia)
- Cellulitis with purulent drainage or exudate
- **Immunocompromising** condition (eg, neutropenia, immunosuppressive drugs such as chemotherapy for malignancy)
- Presence of **risk factor**(s) for **MRSA** infection (eg, known MRSA colonization or past infection, recent health care exposure, recent antibiotic use, intravenous drug use)

- ✓**Selecting an antibiotic regimen**

**A) Patients with severe sepsis or an immunocompromising condition** — In the setting of severe sepsis or immunocompromise, rapid administration of empiric broad-spectrum antibiotics is indicated because delay or lack of adequate coverage increases mortality.

- **Initial therapy –** We suggest the following antibiotic regimen

    - Intravenous vancomycin

        **PLUS**

    - Cefepime 2 g intravenously (IV) every eight hours

- **Oral step-down therapy**

- Once clinical improvement and resolution of sepsis occur, it is generally appropriate to transition to an oral regimen. If a pathogen is identified during the course of therapy, antibiotics should be narrowed to coverage specific for that pathogen.

- For immunocompromised patients without an identified pathogen, we suggest:

- amoxicillin-clavulanate (875 mg orally every 12 hours)

- plus either

- doxycycline (100 mg orally twice daily) or trimethoprim-sulfamethoxazole (TMP-SMX; one to two double-strength tablets orally twice daily).

# B) Immunocompetent patients without severe sepsis

We typically divide this group of patients into those who warrant MRSA coverage and those who do not. Indications for MRSA coverage are described above.(1,2)

1) **Without an indication for MRSA coverage** — For most patients, antibiotic regimens that cover beta-hemolytic streptococci and MSSA are effective, and coverage for MRSA is not necessary.

**Oral antibiotic regimens** – Many patients with cellulitis of the lower extremity can be managed with oral antibiotics in the outpatient setting.

For such patients, we suggest one of the following regimens:

- Dicloxacillin 500 mg orally every six hours
- Cephalexin 500 mg orally every six hours

**Parenteral antibiotic regimens**

Parenteral antibiotics are recommended for higher risk patients.

For such patients, we suggest one of the following regimens:
•Cefazolin 1 to 2 g IV every eight hours
•Nafcillin 1 to 2 g IV every four hours
•Oxacillin 1 to 2 g IV every four hours

For cefazolin, nafcillin, and oxacillin, we usually favor the higher dosages listed above (ie, 2 g) for treatment of these infections.

Once there is evidence of clinical improvement, parenteral antibiotics should be switched to one of the oral regimens listed above.

## 2) With an indication for MRSA coverage

MRSA coverage is indicated if certain conditions are present. We suggest one of the following regimens:

### Oral antibiotic regimens

For many patients, treatment in the outpatient setting with oral antibiotics is effective.

We suggest one of the following regimens:

- TMP-SMX (one to two double-strength tablets orally twice daily; for patients who weigh more than 70 kg and have normal renal function, we favor two double-strength tablets twice daily).
- Amoxicillin (875 mg orally twice daily) plus doxycycline (100 mg orally twice daily).

TMP-SMX has activity against both *Streptococcus* and *S. aureus*, including MRSA.

Doxycycline provides coverage for *S. aureus*, including MRSA; amoxicillin is added to it for streptococcal coverage.

Linezolid (600 mg orally every 12 hours) is acceptable if the above agents cannot be used.

Clindamycin: we generally avoid it due to risk for *Clostridioides difficile* infection.

**Parenteral antibiotic regimen**

- Intravenous vancomycin

For patients who cannot take vancomycin:

- Daptomycin 4 to 6 mg/kg IV once daily
  or
- Linezolid 600 mg IV twice daily

Once there is evidence of clinical improvement, parenteral antibiotics should be switched to one of the oral regimens listed above.

## ✓ Duration of antibiotic therapy

The duration of therapy should be individualized depending on clinical response.

In general, five to six days of therapy is appropriate for patients with uncomplicated cellulitis whose infection has improved.

Extension of antibiotic therapy (up to 14 days) may be warranted in the setting of severe infection, slow response to therapy, or immunosuppression.

# TREATMENT OF ERYSIPELAS

- **Oral antibiotics for erysipelas**

Most cases of erysipelas can be managed with oral antibiotics in the outpatient setting.

- Penicillin V potassium 500 mg orally every six hours
- Amoxicillin 875 mg orally every 12 hours
- Cephalexin 500 mg orally every six hours

- **Parenteral antibiotics for erysipelas**

We suggest antibiotics that cover beta-hemolytic streptococci and *S. aureus* for patients with erysipelas who have an indication for parenteral therapy. Differentiating erysipelas from cellulitis is not always straightforward, so we believe that adding staphylococcal coverage is prudent in individuals who are ill enough to warrant parenteral therapy.
For such patients, appropriate regimens include those described in the above discussion about antibiotic therapy for cellulitis.

## Duration of antibiotic therapy

In general, the duration of therapy for erysipelas is analogous to the duration used for cellulitis.

THANK
YOU