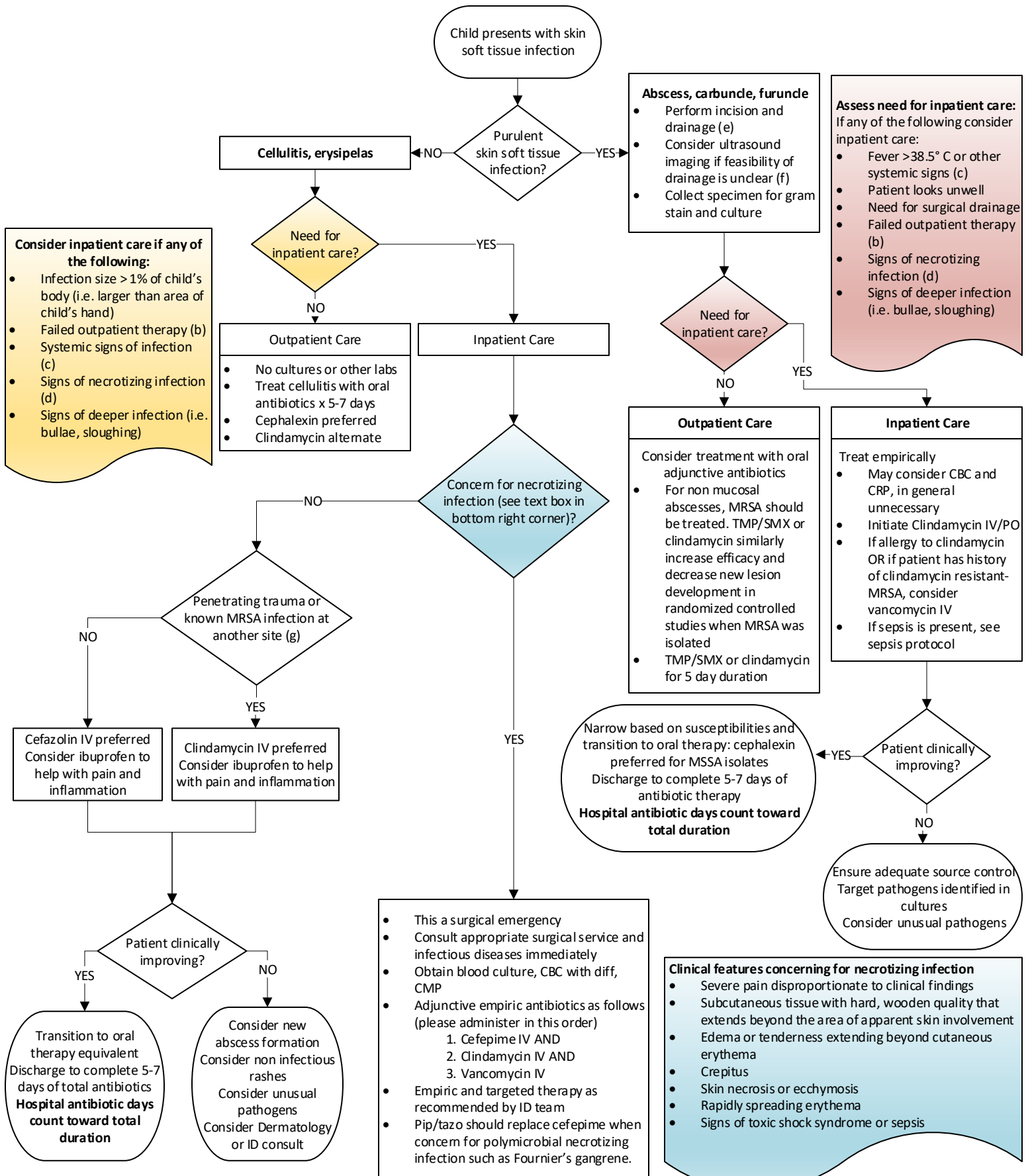


# Skin and soft tissue infection and animal bite wound management, immunocompetent > 3 months of age



Child presents with mammalian bite wound (e.g. dog, cat, human) for other animals consider discussion with infectious diseases

Notify appropriate animal control authority for animal bites. Contact local health department for information on rabies risk and need for prophylaxis

- Criteria for antibiotic prophylaxis**
- Immunocompromised
  - Asplenic
  - Advanced liver disease
  - Injury >2.5 cm with significant gaping
  - Suturable wound on face
  - Wound on hand of any size
  - Injury that may have punctured periosteum or joint capsule

Infected?

YES

Abscess suspected or confirmed?

YES

Drain and culture (e)

NO

NO

Does patient meet any of the criteria for prophylaxis?

NO

YES

Systemic signs of infection (c) OR failed prophylactic antibiotic therapy?

YES

NO

**Treat as outpatient**

- Clean the wound: copious irrigation (h), cautious debridement.
- Give Tdap or DTaP vaccine as needed. (i)
- NO antibiotics are needed.

**Treat as outpatient**

- Clean the wound: copious irrigation (h), cautious debridement.
- Do NOT close the wound, unless it's on the child's face. For other locations, cover and consider loose closure for cosmetic reasons (especially large wounds).
- Do NOT use tissue adhesives (e.g., Dermabond).
- Give Tdap or DTaP vaccine as needed. (i)
- Give a 3- to 5-day course of preemptive antibiotics:
  - amoxicillin/clavulanate PO
  - If allergic to amoxicillin/clavulanate: TMP/SMX AND clindamycin PO

**Treat as outpatient**

- Open and clean wound with copious irrigation and cautious debridement
- Give Tdap or DTaP vaccine as needed (i)
- Give antibiotics
- Amoxicillin/clavulanate PO preferred
- If allergic to amoxicillin: TMP/SMX plus clindamycin
- See dosing guidelines page 4
- Duration: 7-10 days of therapy (continue for 1-2 days after signs and symptoms have resolved)

**Admit inpatient**

- Open and clean wound with copious irrigation and cautious debridement
- Give Tdap or DTaP vaccine as needed (i)
- Give antibiotics
- Ampicillin/sulbactam IV preferred
- If allergic to amoxicillin: ceftriaxone plus clindamycin
- See dosing guidelines page 4
- Oral transition is appropriate when patient is improving
- Duration: change to oral therapy to complete 7-14 days of therapy (continue for 1-2 days after signs and symptoms have resolved)

## Algorithm notes

### NOTES

(a) Nonpurulent cellulitis is generally caused by streptococci. *Staphylococcus aureus* rarely causes cellulitis— except when associated with penetrating trauma.

(b) Outpatient therapy should be considered failed if:

- The patient has not responded to “appropriate” antibiotic therapy after 3 days
- Systemic signs or symptoms have developed
- Infection has progressed beyond expectations
- The patient cannot take antibiotics

(c) Systemic infection

- Systemic signs include fever, chills, nausea, vomiting, and weakness.
- Note that a child with SIRS (abnormal HR, RR, temp, WBC), hypotension, or organ dysfunction must be stabilized (per the Pediatric Sepsis Protocol)

(d) Necrotizing infection: Infection is more likely to be necrotizing if any of the following are present:

- Severe pain disproportionate to clinical findings
- Subcutaneous tissue with a hard, wooden quality that extends beyond the area of apparent skin involvement
- Edema or tenderness extending beyond cutaneous erythema
- Crepitus, indicating Group A *Streptococcus*
- Skin necrosis or ecchymosis
- Rapidly spreading erythema

Treatment recommendations for necrotizing infection:

- ID team and surgical consult
- Emergent surgical evaluation/debridement (obtain culture from OR, routine/anaerobic)
- MRI or CT may also be helpful but should not delay surgical intervention.

(e) Incision and drainage In general, skin abscesses should be drained. Compared to ultrasound-guided aspiration, incision and drainage is much more likely to result in successful resolution at 7 days.

For small (<1–2 cm), more superficial abscesses, application of heat may lead to spontaneous drainage.

Wound packing is associated with increased pain and probably does not significantly improve outcomes. For larger abscesses, a wick can be placed. An acceptable alternative is placement of two incisions with a loop of flexible sterile material (a vessel loop or thin rubber catheter) between the incisions and tied outside the skin. See image below.

This has comparable success as traditional incision and drainage with daily packing.

Loop can be removed by family or PCP after 3-4 days.

Local anesthesia can be suboptimal for incision and drainage, as the procedure may require a deep incision or breaking of abscess loculations. Procedural sedation is a useful adjunct for many children with abscesses.

(f) Ultrasound imaging

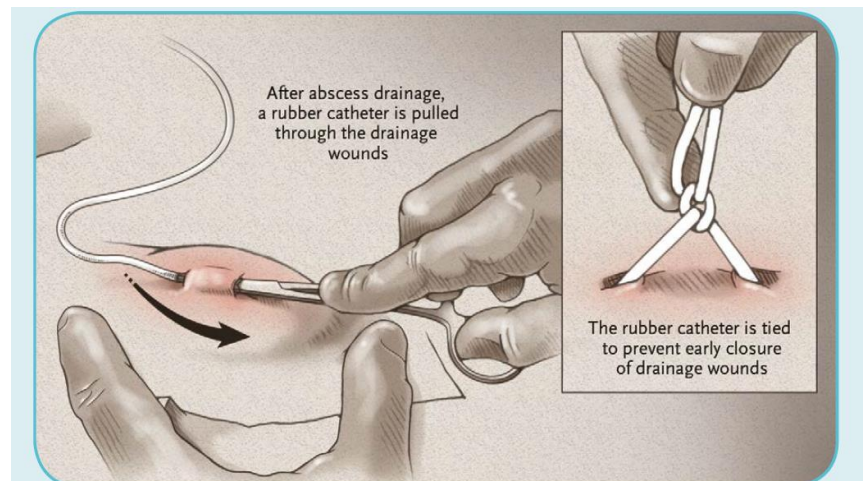
Ultrasound is more sensitive than clinical exam alone and is most useful when the clinical exam is equivocal. In a study of adult patients without a clear physician finding of abscess, ultrasound altered clinical management more than 50% of the time.

(g) MRSA risk factors in the pediatric population include contact with an infected person, recurrent skin infections, attendance at a child care facility or other group care setting, and participation in a contact sport.

(h) About irrigation

- Goals: Clean the wound while avoiding trauma to wound bed.
- Irrigate with a minimum of 200 cc per cm of wound.
- Use a 19-gauge blunt syringe or a ZeroWet splash guard or similar device.

(i) For a guide to tetanus prophylaxis in routine wound management, see [health.state.mn.us/divs/idepc/diseases/tetanus/hcp/tetwdmgmtc.pdf](http://health.state.mn.us/divs/idepc/diseases/tetanus/hcp/tetwdmgmtc.pdf)



1. Hemostat inserted between 2 small incisions after loculations are disrupted.

2. The 2 ends of the loop drain are affixed to each other without tension.

Reprinted with permission from Singer AJ, Talan DA. Management of Skin Abscesses in the Era of Methicillin-Resistant *Staphylococcus aureus*. *New England Journal of Medicine*. 2014;370(11):1042.

**Table 1. Antibiotic dosing for skin and soft tissue infections**

<b>Inpatient dosing</b>	
<b>Drug</b>	<b>Route and dose by patient weight</b>
Cefazolin	33 mg/kg/dose (max 2000 mg) IV q 8 hrs
Clindamycin	10-13 mg/kg/dose (max 600 mg) IV q 8 hrs
Vancomycin	20 mg/kg/dose (max 1000 mg) IV q 8 hrs
Ampicillin/sulbactam	50 mg/kg/dose (max 2000 mg ) IV q 6 hrs
Ceftriaxone	50-75 mg/kg (max 2000 mg) IV q 24 hrs
Metronidazole	10 mg/kg/dose (max 500 mg) IV/PO q 8 hrs
Piperacillin/tazobactam	75 mg/kg/dose (max 4,000 mg) IV q 6 hrs
<b>Outpatient dosing</b>	
<b>Drug</b>	<b>Route and dose by patient weight</b>
Cephalexin	15-20 mg/kg/dose (max 750 mg) PO TID. Pills available as 250 mg and 500 mg. Suspension available as 125 mg/5 ml or 250 mg/5 ml concentrations
Clindamycin	10-13 mg/kg/dose (max 450 mg) PO TID. Pills available as 150 mg and 300 mg. Solution is available as 75 mg/5 ml concentration
Trimethoprim/sulfamethoxazole	6 mg/kg/dose (max 320 mg) PO BID. Pills available as 400 mg/80 mg and DS = 800 mg/160 mg. Solution available as 40 mg/5 ml of trimethoprim
Amoxicillin/clavulanate	25 mg/kg/dose (max 875 mg) PO BID. Pills available as 250 mg/125 mg, 500 mg/125 mg or 875 mg/125 mg. Suspension is available as 250 mg/5 ml, and 400 mg/5 ml concentrations of amoxicillin

Ampicillin/sulbactam dosing is based on ampicillin component

Piperacillin/tazobactam dosing is based on the piperacillin component

Amoxicillin/clavulanate dosing is based on the amoxicillin component