PHASE I (E.D.)

Inclusion Criteria
- Suspected skin/soft tissue infection in children > 44 weeks CGA
- Hospital-acquired, surgical site & device-associated infections
- Presumed necrotizing fasciitis
- Orbital/periorbital cellulitis
- Immunodeficiency
- Pressure ulcers
- Solitary dental abscess

Exclusion Criteria
- Hospital-acquired, surgical site & device-associated infections
- Presumed necrotizing fasciitis
- Orbital/periorbital cellulitis
- Immunodeficiency
- Pressure ulcers
- Solitary dental abscess

Management if systemic illness or Necrotizing Soft Tissue Infection (NSTI) suspected
NSTI suspected

Urgently consult General Surgery, Plastic Surgery and Orthopedics
Use the ED Necrotizing Soft Tissue Infection Plan

If referral call from PMD, request perimeter line be drawn and make patient NPO.

Provider Assessment

Determine if special situation present.

Concern for:
- Deep extremity infection (e.g., tenosynovitis, septic arthritis, osteomyelitis)
- Deep puncture wound of hand/fingers/feet

Yes
- Order labs, then
- Involve Orthopedics

No

Concern for:
- Peri-anal abscess (within 1cm of anal verge)
- Breast abscess
- Perineal abscess
- Pilonidal cyst
- Large or complex abscess

Yes
- Involve General Surgery

No

Concern for:
- Neck abscess

Yes
- Involve ENT

No

Concern for:
- Facial cellulitis of dental origin

Yes
- Involve Dental; See antibiotic table

No

Determine with consultant if suitable for pathway

Off Pathway

Go to Simple Cellulitis / Abscess Phase

Consider tetanus immunization status as necessary

For questions concerning this pathway, contact: CellulitisandAbscess@seattlechildrens.org
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Last Updated: July 2018
Next Expected Review: August 2018
Cellulitis and Abscess v1.2: ED Simple Cellulitis/Abscess

Inclusion Criteria
- Suspected skin/soft tissue infection in children > 44 weeks CGA

Exclusion Criteria
- Hospital-acquired, surgical site & device-associated infections
- Presumed necrotizing fasciitis
- Orbital/periorbital cellulitis
- Immunodeficiency
- Pressure ulcers
- Solitary dental abscess

Management of Systemic Illness or Necrotizing Soft Tissue Infection (NSTI) suspected
- Urgently consult General Surgery, Plastic Surgery and Orthopedics
- Use the ED Necrotizing Soft Tissue Infection Plan

Simple cellulitis / abscess
- Perform bedside ultrasound unless clearly fluctuant or draining

Determine Disposition
- Non-purulent
- Purulent

Low Risk Criteria
- Simple abscess
- Adequate I&D
- Age ≥ 1 year
- No fever
- Well-appearing
- No significant comorbidities
- Follow up assured

Discharged patients
- Non-purulent
- Purulent

Medical Treatment
- Oral cephalaxin
- Clindamycin if failed outpatient treatment, cephalosporin allergic or if MRSA risks

Medical Treatment
- No systemic antibiotics after I&D if low risk
- Oral clinda if not low risk
- TMP/SMX (or doxycycline if ≥8 years) if presumed clindamycin-resistant MRSA

Medical Treatment
- IV cefazolin
- Clindamycin if failed outpatient treatment, cephalosporin allergic or if MRSA risks
- Consider vancomycin if systemic toxicity

Medical Treatment
- IV clindamycin
- Vancomycin if presumed clindamycin-resistant MRSA
- Consider vancomycin if systemic toxicity, failed outpatient clindamycin

Discharge Instructions
- 7-10 days total treatment
- PMD fiu within 24-48 hours

Admitted patients
- Non-purulent
- Purulent

Antibiotic selection by condition

Go to Inpatient Phase

Inpatient Admit Criteria (any one of the following)
- Systemic illness
- Not tolerating PO
- Treatment failure on >48h of appropriate antibiotics
- Rapidly progressive lesion
- Pain control / wound care
- All <2 mo; consider if <6 mo
- Inadequate F/U

Purulent Definition
- Actively draining pus
- History of drainage
- Abscess present

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Last Updated: July 2018
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**Inpatient Phase**

- **Daily re-evaluation**
  - Clinical exam
  - Culture data

**Discharge Criteria (Meets all)**
- Lesion(s) show signs of improvement
- Tolerating PO
- Pain controlled
- Afebrile >24 hours
- F/U assured within 48 hours

**Management if systemic illness or Necrotizing Soft Tissue Infection (NSTI) suspected**

- Urgently consult General Surgery, Plastic Surgery and Orthopedics
- Use the ED Necrotizing Soft Tissue Infection Plan

**Exclusion Criteria**
- Hospital-acquired, surgical site & device-associated infections
- Peri-anal or pilonidal abscesses
- Presumed necrotizing fasciitis
- Orbital/periorbital cellulitis
- Pts admitted to surgical service
- Immunodeficiency
  - Deep结构 infections
  - Pressure ulcers

**Inclusion Criteria**
- Suspected skin/soft tissue infection in children > 44 weeks CGA

**Antibiotic selection by condition**

- Tailor antibiotics if culture results are available
- Use narrowest-spectrum agent possible

**Discharge Instructions**
- 7-10 days total treatment
- PMD f/u within 48 hours

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Last Updated: July 2018
Next Expected Review: August 2018
### Cellulitis and Abscess Antibiotic Table

<table>
<thead>
<tr>
<th>Condition</th>
<th>Non-purulent cellulitis</th>
<th>Purulent SSTI/ abscess</th>
<th>Bite wounds</th>
<th>Facial cellulitis of dental origin</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>IV choice</strong></td>
<td>Cefazolin</td>
<td>Clindamycin</td>
<td>Ampicillin/sublactam</td>
<td>Penicillin OR Ampicillin/sublactam</td>
</tr>
<tr>
<td><strong>IV Alternatives</strong></td>
<td>Clindamycin if cephalosporin allergic</td>
<td>Vancomycin if presumed clindamycin resistant MRSA; rapidly progressive lesion; hemodynamic instability; ill-appearing; failed oral clindamycin as outpatient; abscess in an area difficult to drain completely such as face/hand/genitals</td>
<td>Cefoxitin (transition to clindamycin AND ciprofloxacin at discharge) if penicillin allergic</td>
<td>Clindamycin if penicillin allergic</td>
</tr>
<tr>
<td><strong>PO choice</strong></td>
<td>Cephalexin</td>
<td>No antibiotics if low risk criteria* met and abscess adequately drained</td>
<td>Amoxicillin/clavulanate</td>
<td>Penicillin OR Amoxicillin/clavulanate</td>
</tr>
<tr>
<td><strong>PO Alternatives</strong></td>
<td>Clindamycin if cephalosporin allergic</td>
<td>TMP/SMX if presumed clindamycin resistant MRSA</td>
<td>Doxycycline if age &gt;8 years and penicillin allergy</td>
<td>Clindamycin if penicillin allergic</td>
</tr>
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<td></td>
<td></td>
<td>Doxycycline if age &gt;8 years and prior clindamycin and TMP/SMX resistant MRSA OR presumed clindamycin resistance and sulfa allergy</td>
<td>Clindamycin AND ciprofloxacin for penicillin allergic patients</td>
<td>Call ID for other scenarios</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Call ID if linezolid desired</td>
<td>Call ID if linezolid desired</td>
<td></td>
</tr>
</tbody>
</table>

*Low risk criteria: Age ≥1 year; no fever; well-appearing; adequate I&D; no significant comorbidities*

---

**Alternate antibiotic choices**
- If fresh or saltwater contact, or other special circumstance, discuss with ID

---

**Low Risk Criteria**
- Simple abscess
- Adequate I&D
- Age ≥1 year
- No fever
- Well-appearing
- No significant comorbidities
- Follow up assured

* For use in determining the need for PO antibiotics for purulent infection post I&D, outpatient treatment (see above)
# Tetanus Table

Tetanus prophylaxis in routine wound management  
(Adapted from the Red Book: 2012 report of the Committee on Infectious Diseases, p. 709)

<table>
<thead>
<tr>
<th>History of tetanus toxoid (doses)</th>
<th>Clean, minor wounds</th>
<th>All other wounds</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>DTaP, Tdap, or Td</td>
<td>TIG</td>
</tr>
<tr>
<td>Fewer than 3 or unknown</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>3 or more</td>
<td>No - if &lt; 10 years since last tetanus-containing vaccine dose.</td>
<td>No</td>
</tr>
<tr>
<td></td>
<td>Yes if ≥ 10 years since last tetanus-containing vaccine dose</td>
<td>No</td>
</tr>
</tbody>
</table>

TIG = Tetanus immune globulin  
Other wounds = Such as, but not limited to, wounds contaminated with dirt, feces, soil, and saliva; puncture wounds; avulsions; and wounds resulting from missiles, crushing, burns, and frostbite  

Note: DTaP is used for children <7 years of age. Tdap is preferred to Td for underimmunized children 7 years of age or older who have not received Tdap previously.
We used the GRADE method of rating evidence quality. Evidence is first assessed as to whether it is from randomized trial, or observational studies. The rating is then adjusted in the following manner:

Quality ratings are *downgraded* if studies:
- Have serious limitations
- Have inconsistent results
- If evidence does not directly address clinical questions
- If estimates are imprecise OR
- If it is felt that there is substantial publication bias

Quality ratings can be *upgraded* if it is felt that:
- The effect size is large
- If studies are designed in a way that confounding would likely underreport the magnitude of the effect OR
- If a dose-response gradient is evident

**Quality of Evidence:**
- ✮✮✮✮ High quality
- ✮✮✮ O Moderate quality
- ✮✮ O Low quality
- ✮ O Very low quality

Expert Opinion (E)

Studies were identified by searching electronic databases using search strategies developed and executed by a medical librarian, Susan Klawansky. Searches were performed in November 2012 in the following databases – on the Ovid platform: Medline and Cochrane Database of Systematic Reviews; elsewhere: Embase, Clinical Evidence, National Guideline Clearinghouse and TRIP. Retrieval was limited to 2004 to current, humans, and English language. In Medline and Embase, appropriate Medical Subject Headings (MeSH) and Emtree headings were used respectively, along with text words, and the search strategy was adapted for other databases as appropriate. Concepts searched were soft tissue infections, cellulitis and many other related conditions, some of which are skin abscess, bites and stings, impetigo, carbuncle, infectious skin diseases and penetrating wounds. All retrieval was further limited to certain publication types representing high order evidence.

Susan Klawansky, MLS, AHIP    April 9, 2013

Identification

383 records identified through database searching
13 additional records identified through other sources

Screening

396 records after duplicates removed

396 records screened
340 records excluded

Eligibility

55 full-text articles assessed for eligibility
11 full-text articles excluded, did not answer clinical question did not meet quality threshold

Included

44 studies included in pathway

Flow diagram adapted from Moher D et al. BMJ 2009;339:bmj.b2535


3) JL Robinson, MI Salvadori; Canadian Paediatric Society Infectious Diseases and Immunization Committee, Management of community associated methicillin-resistant Staphylococcus aureus skin abscesses in children. Paediatr Child Health 2011; 16(2):115-6


5) Paydar, K Z, Hansen, SL, Charlebois, ED, Harris, HW, Young, DL. Inappropriate antibiotic use in soft tissue infections. Archives of Surgery 2006; 141(9), 850-856.


10) Chen AE et al. Randomized Controlled Trial of Cephalexin Versus Clindamycin for Uncomplicated Pediatric Skin Infections. Pediatrics 2011;127(3);e573.


Approved by the CSW Cellulitis and Abscess team for August 15, 2013 go-live.

CSW Cellulitis and Abscess Team:

<table>
<thead>
<tr>
<th>Role</th>
<th>Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>CSW Owner</td>
<td>Lauren Wilson, MD</td>
</tr>
<tr>
<td>CSW Owner</td>
<td>Derya Caglar, MD</td>
</tr>
<tr>
<td>Stakeholder</td>
<td>George Drugas, MD</td>
</tr>
<tr>
<td>CNS</td>
<td>Wendy Murchie, MN</td>
</tr>
<tr>
<td>CNS</td>
<td>Elaine Beardsley</td>
</tr>
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</table>

Clinical Effectiveness Team:

<table>
<thead>
<tr>
<th>Role</th>
<th>Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>Consultant</td>
<td>Boots (Matthew) Kronman, MD</td>
</tr>
<tr>
<td>Project Manager</td>
<td>Pauline O’Hare, RN, MBA</td>
</tr>
<tr>
<td>CE Analyst</td>
<td>James Johnson</td>
</tr>
<tr>
<td>CIS Informatician</td>
<td>Mike Leu, MD</td>
</tr>
<tr>
<td>Librarian</td>
<td>Susan Klawansky</td>
</tr>
<tr>
<td>Program Coordinator</td>
<td>Asa Herrman</td>
</tr>
</tbody>
</table>

Executive Approval:

<table>
<thead>
<tr>
<th>Role</th>
<th>Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sr. VP, Chief Medical Officer</td>
<td>Mark Del Beccaro, MD</td>
</tr>
<tr>
<td>Sr. VP, Chief Nursing Officer</td>
<td>Madlyn Murrey, RN, MN</td>
</tr>
<tr>
<td>Surgeon-in-Chief</td>
<td>Bob Sawin, MD</td>
</tr>
</tbody>
</table>


Please cite as:
Summary of Version Changes

- **Version 1 (08/15/2013):** Go live
- **Version 1.1 (11/6/2013):** Clarified which patients should receive Orthopedic consultation in the ED; recommended laboratory studies to be performed prior to Orthopedic consultation; excluded patients with solitary dental abscess from the ED phase
- **Version 1.2 (7/3/18):** Clarified management for Necrotizing Soft Tissue Infections (NSTI) and emphasized importance of surgical urgency
Medical Disclaimer

Medicine is an ever-changing science. As new research and clinical experience broaden our knowledge, changes in treatment and drug therapy are required.

The authors have checked with sources believed to be reliable in their efforts to provide information that is complete and generally in accord with the standards accepted at the time of publication.

However, in view of the possibility of human error or changes in medical sciences, neither the authors nor Seattle Children’s Healthcare System nor any other party who has been involved in the preparation or publication of this work warrants that the information contained herein is in every respect accurate or complete, and they are not responsible for any errors or omissions or for the results obtained from the use of such information.

Readers should confirm the information contained herein with other sources and are encouraged to consult with their health care provider before making any health care decision.
Background

Many patients present to their health care providers, urgent care clinics, or the emergency department for evaluation and treatment of soft tissue infections. Some have a simple cellulitis that is often easily treated with antibiotics, while others have more complicated infections that require extensive incision and drainage or hospitalization. In addition to *Streptococcus pyogenes* and methicillin-sensitive *Staphylococcus aureus* (MSSA), methicillin-resistant *Staphylococcus aureus* (MRSA) has also become a real consideration in these types of infections.

This pathway’s intent is to standardize – to the extent possible – the diagnosis and management of such soft tissue infections at Seattle Children’s.
Introduction – Cellulitis and Abscess

This clinical standard work pathway is meant to guide the diagnosis and management of patients with cellulitis and/or abscess.

- **Inclusion criteria:** Suspected community-acquired skin and soft tissue infection in a child > 44 weeks CGA

- **Exclusion criteria:**
  - Hospital-acquired, surgical site and device-associated infections
  - Pressure ulcers
  - Orbital/periorbital cellulitis
  - Immunodeficiency
  - Presumed necrotizing fasciitis
  - Solitary dental abscesses
  - *Note: For the inpatient phase, we additionally exclude peri-anal abscesses, pilonidal abscesses, deep structure infections, and patients admitted to surgical services. Initial ED management is provided in the ED phase, however.*
**Definition: Cellulitis and Abscess**

**Cellulitis** is an infection of the skin and underlying soft tissue. It is characterized by pain, erythema, edema, and warmth.

- **Purulent cellulitis** is cellulitis associated with drainage or exudate, currently or by history. A drainable abscess may or may not be present.
- **Nonpurulent cellulitis** has no drainage, exudate, or abscess present.

An **abscess** is a cavity filled with pus that results from a bacterial infection. An abscess in the subcutaneous tissues can be present with or without surrounding cellulitis.

*Abscess, not yet draining*

Purulent cellulitis due to MRSA
http://depts.washington.edu/
• Nonpurulent cellulitis is usually due to group A streptococci (although studies are limited due to the difficulty culturing from these infections)

• Purulent cellulitis may be caused by MSSA, MRSA, or group A streptococci (GAS).
  • Approximately 27% of S aureus isolates from wounds are MRSA at Seattle Children’s (2012-13 data)

S. pyogenes (GAS)
http://textbookofbacteriology.net/
Risk factors for MRSA

History in the last 6 months of:

- MRSA in the patient
- MRSA in the family
- Recurrent boils, pustules, “spider bites”, etc. that required antibiotics, in patient or family
Examining a soft tissue infection

- Erythema, warmth, edema universally present
- Induration or fluctuance (the latter diagnostic of fluid collection) may be present
- Signs of possible necrotizing infection:
  - Very rapid spread
  - Bluish discoloration, blistering, pain out of proportion or beyond the edges of the lesion, skin anesthesia, rapid progression, or gas in the tissue
  - These signs sometimes appear late in course
- When first examining, draw a line (mark date/time) around lesion’s borders, if not already present
Necrotizing Fasciitis (NSTI)

Suspect necrotizing soft tissue infection (NSTI) if any of the following:

- Systemic toxicity
- Skin anesthesia
- Crepitus
- Rapid spread
- Exquisite tenderness
- Shock
- Pain outside affected area

**NOTE:** NSTI Scoring Systems for adults are NOT validated in children. Management should NOT be delayed to obtain imaging or labs. Patient outcomes are improved with prompt surgical management.

Diagnostic testing

- Use bedside ultrasound where available to improve the accuracy in diagnosis of subcutaneous abscesses (Squire ☆☆☆☆☆, Tayal ☆☆☆)
- Obtain wound cultures when possible; i.e., in patients who have spontaneously draining lesions and in patients who undergo I&D procedures (Liu ☆☆☆☆, local consensus [LC])
- Routine blood testing (CBC, CRP, blood culture) is not necessary for most children with SSTI (Stevens ☆☆☆☆, LC)
- Obtain a CBC, CRP, and blood cultures in children with signs of systemic toxicity, including ill-appearance, rapidly spreading lesions, persistent fevers, and age <1yo (Liu ☆☆☆☆, Stevens ☆☆☆☆☆, LC)
Specific locations of cellulitis/abscess warrant subspecialist consultation to evaluate for deeper and more serious/complicated extension of infection.

- **Orthopedics:** Infections over joints, infections of hand/fingers/feet
- **General surgery:** Peri-anal abscess (within 1 cm of anal verge), pilonidal abscess, perineal abscess, breast abscess
- **ENT:** Neck abscess
- **Dental:** Facial cellulitis of dental origin

Note: Also consult General Surgery if an inpatient develops any abscess requiring drainage (LC)
Laboratory studies prior to Orthopedic consultation

Prior to consulting Orthopedics, obtain the following:

- **Blood work**: Complete blood count with differential, C-reactive protein, and erythrocyte sedimentation rate. Consider blood culture for ill-appearing or febrile patients.

- **Radiographs**: Obtain appropriate films of the affected area; typically more than one view is required (LC)

Note: The above studies will need to be ordered as needed from outside the Cellulitis and Abscess PowerPlan.
Incision and drainage (I&D)

- No drainage is needed for abscesses <1 cm on bedside ultrasound; these patients may be discharged home on antibiotics alone with close PCP follow-up (Tayal ☺☺☺☺, LC)

- Larger abscesses require thorough I&D of purulent material with adequate sedation and analgesia
  - Ketamine sedation is frequently needed in pediatric patients, though local anesthesia will also provide some pain relief
  - Consider surgical consultation for very large or complicated abscesses that may require extensive exploration or prolonged sedation time

- All patients who have had an I&D procedure should have reliable follow-up for re-evaluation with their PCP in 24 - 48 hours
Correct incision and drainage technique is the cornerstone of treating abscesses. If you perform I&D, the following video is a good reminder of proper techniques:

No oral antibiotics are needed for **simple abscesses that have been incised and drained completely**, (Duong, Chen, Paydar, and Hankin) unless the patient has one of the following:

- Severe or extensive disease
- Rapid progression in presence of associated cellulitis
- Signs and symptoms of systemic illness
- Associated comorbidities or immunosuppression
- Extremes of age (<1 year old)
- Abscess in area difficult to drain (face, hand, and genitalia)
- Associated septic phlebitis
- Lack of response to I &D alone (Liu)
Prescribe oral clindamycin for outpatient treatment of abscesses that **could not have an adequate I&D**, or **do not meet low-risk criteria** as summarized below (Liu 💫💫💫)

### Low Risk Criteria
- Age ≥1 year
- No fever
- Well-appearing
- Adequate I&D
- No significant comorbidities
Antibiotics for nonpurulent cellulitis

- Prescribe an oral beta lactam (cephalexin) for outpatient treatment of simple cellulitis without an abscess, drainage, history of drainage, or failure of outpatient antibiotic course (>48 h on appropriate antibiotics) (Liu 三星, Stevens 三星, Elliott 三星, and Williams 三星)
- Prescribe an IV beta lactam (cefazolin) for inpatient treatment of simple cellulitis without an abscess, drainage, history of drainage, or failure of outpatient antibiotic course (>48 h on appropriate antibiotic) (Liu 三星 and Stevens 三星)
- Prescribe oral clindamycin for cellulitis that has not responded to anti-MSSA therapy (beta lactam, >48 hours) (Liu 三星, LC)
- Consider IV vancomycin for inpatient treatment of cellulitis in patients who are systemically ill (fever >38, tachycardia, vomiting) or have failed an outpatient antibiotic course that covers MRSA (Liu 三星)

Antibiotics for purulent cellulitis

- Prescribe oral clindamycin for outpatient treatment of purulent cellulitis or cellulitis that has not responded to anti-MSSA therapy (beta lactam, >48 hours) (Liu 三星, LC)
- Prescribe IV clindamycin for inpatient treatment of purulent cellulitis or cellulitis that has not responded to anti-MSSA therapy (beta lactam, >48 hours) (Liu 三星, LC)
- Prescribe IV vancomycin for inpatient treatment of cellulitis in patients who are systemically ill (fever >38, tachycardia, vomiting) or have failed antibiotic therapy that covers MRSA (Liu 三星)
ED Cellulitis / Abscess pathway – Antibiotic selection

Discharged patients

- Non-purulent
  - Medical Treatment
    - Oral capsaicin
    - Clindamycin if failed outpatient treatment, cephalosporin allergic or if MRSA risk

- Purulent
  - Medical Treatment
    - No systemic antibiotics after I&D if low risk
    - Oral clinda if not low risk
    - TMP/SMX (or doxycycline if >8 years) if prior clindamycin-resitant MRSA

Antibiotic selection by condition

Discharge Instructions
- 7-10 days total treatment
- PMD f/u within 24-48 hours

Admitted patients

- Non-purulent
  - Medical Treatment
    - IV cefazolin
    - Clindamycin if failed outpatient treatment, cephalosporin allergic or if MRSA risk
    - Consider vancomycin if systemic toxicity

- Purulent
  - Medical Treatment
    - IV clindamycin
    - Vancomycin if prior clindamycin-resistant MRSA
    - Consider vancomycin if systemic toxicity, failed outpatient clindamycin

Go to Inpatient Phase

Return Initial ED phase  Return to ED Simple Cellulitis / Abscess Phase  Return to Inpatient Phase
### Empiric Antibiotic Selection

<table>
<thead>
<tr>
<th></th>
<th>Non-purulent Cellulitis</th>
<th>Purulent SSTI/ Abscess</th>
<th>Bite Wounds</th>
<th>Facial Cellulitis of Dental Origin</th>
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<td>IV Alternatives</td>
<td>Clindamycin if cephalosporin allergic</td>
<td>Vancomycin if presumed clindamycin resistant MRSA; rapidly progressive lesion; hemodynamic instability; ill-appearing; failed oral clindamycin as outpatient; abscess in an area difficult to drain completely such as face/hand/genitals</td>
<td>Cefoxitin (transition to clindamycin AND ciprofloxacin at discharge) if penicillin allergic</td>
<td>Clindamycin if penicillin allergic</td>
</tr>
<tr>
<td>PO choice</td>
<td>Cephalexin</td>
<td>No antibiotics if <strong>low risk criteria</strong> met and abscess adequately drained</td>
<td>Amoxicillin/clavulanate</td>
<td>Penicillin OR Amoxicillin/clavulanate</td>
</tr>
<tr>
<td>PO Alternatives</td>
<td>Clindamycin if cephalosporin allergic</td>
<td>TMP/SMX if presumed clindamycin resistant MRSA</td>
<td>Doxycycline if age &gt;8 years and penicillin allergy</td>
<td>Clindamycin if penicillin allergic</td>
</tr>
</tbody>
</table>

**PO** Choice:
- **Clindamycin if cephalosporin allergic**:
  - TMP/SMX if presumed clindamycin resistant MRSA
  - Doxycycline if age >8 years and prior clindamycin and TMP/SMX resistant MRSA OR presumed clindamycin resistance and sulfa allergy
  - Call ID if linezolid desired
- **Clindamycin if penicillin allergic**:
  - Doxycycline if age >8 years and penicillin allergy
  - Clindamycin AND ciprofloxacin for penicillin allergic patients
  - Call ID for other scenarios

**IV** Choice:
- **Cefazolin**:
  - Clindamycin if cephalosporin allergic
  - Vancomycin if presumed clindamycin resistant MRSA; rapidly progressive lesion; hemodynamic instability; ill-appearing; failed oral clindamycin as outpatient; abscess in an area difficult to drain completely such as face/hand/genitals
  - Cefoxitin (transition to clindamycin AND ciprofloxacin at discharge) if penicillin allergic
  - Clindamycin if penicillin allergic

**PO** Choice:
- **Cephalexin**:
  - No antibiotics if **low risk criteria** met and abscess adequately drained
  - Clindamycin otherwise
- **Amoxicillin/clavulanate**:
  - Penicillin OR Amoxicillin/clavulanate

**PO Alternatives**:
- **Clindamycin if cephalosporin allergic**:
  - TMP/SMX if presumed clindamycin resistant MRSA
  - Doxycycline if age >8 years and prior clindamycin and TMP/SMX resistant MRSA OR presumed clindamycin resistance and sulfa allergy
  - Call ID if linezolid desired
- **Clindamycin if penicillin allergic**:
  - Doxycycline if age >8 years and penicillin allergy
  - Clindamycin AND ciprofloxacin for penicillin allergic patients
  - Call ID for other scenarios
Patients who should be admitted:

- Are systemically ill (ill-appearance, persistent fevers, hemodynamic instability etc.)
- Are unable to tolerate oral therapy
- Fail appropriate outpatient therapy (48 hours of treatment and not showing signs of improvement)
- Have rapidly progressive lesions
- Need pain control or wound care
- Consider if < 6 months of age
- Adequate follow up not available (LC)
Reevaluate lesion daily or with significant changes

Follow microbiology cultures, and change to the narrowest spectrum antibiotic once sensitivities are available

Consult general surgery if an abscess develops that necessitates drainage
Treatment failure

- Treatment failure occurs if there is:
  - **Significant or rapid expansion** of cellulitis at any point in the course of treatment (i.e. more than just one or two centimeters beyond margins), or
  - Cellulitis is **not showing improvement after 48 hours** of effective antibiotic treatment (LC)
  - The development of a new abscess within an area of previous infection while on antibiotics does not in and of itself constitute treatment failure

**Note:** Referring physicians will be asked to outline lesions with permanent marker if possible before sending patients to the ED and make the patient NPO; lesions will be outlined in ED triage if not already done
Switching to oral antibiotics

- Conversion from an IV to oral antibiotic prior to discharge is not necessary (LC)
- If worries about palatability or concerns about administration exist, a single oral antibiotic dose may be given prior to discharge (LC)
Discharge criteria

A patient is ready for discharge when:

• Lesion(s) show signs of improvement
• Tolerating PO
• Pain well controlled
• No fever > 24 hours
• Follow up assured within 48 hours

(LC)

Patients should complete 7-10 total days of antibiotic treatment. (LC, Liu ○○○○).

Antibiotic treatment can be extended by the PCP if the lesion is not completely resolved at the end of this course.