Skin and Soft Tissue Infection Clinical Pathway

Disclaimer

This clinical pathway is intended to provide general guidance and should not replace clinical judgment. It is meant to assist licensed practitioners and other health care providers in clinical decision-making by describing a range of generally acceptable approaches to the diagnosis and management of a particular condition. A particular patient's circumstances should always be taken into account when a practitioner is deciding on a course of management. This clinical pathway is current as of the date of publication and will be reviewed periodically to align with any updated best practices or evidence; however, new development may not be represented in the published version. The treating practitioner assumes all risks associated with care decisions. Phoenix Children's accepts no liability for the content of this clinical pathway or the outcomes a patient might experience where a practitioner consulted the content of this clinical pathway.

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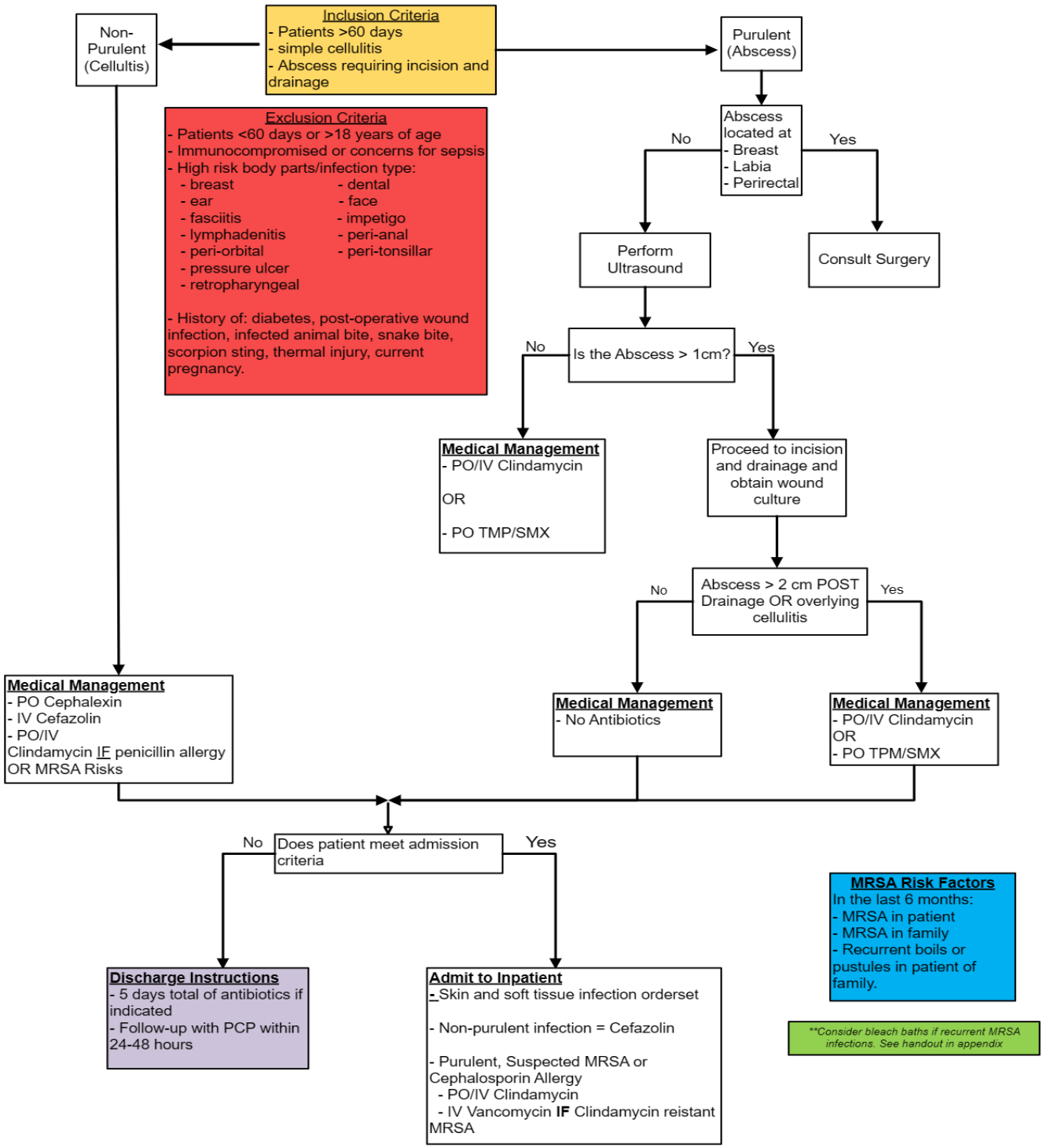
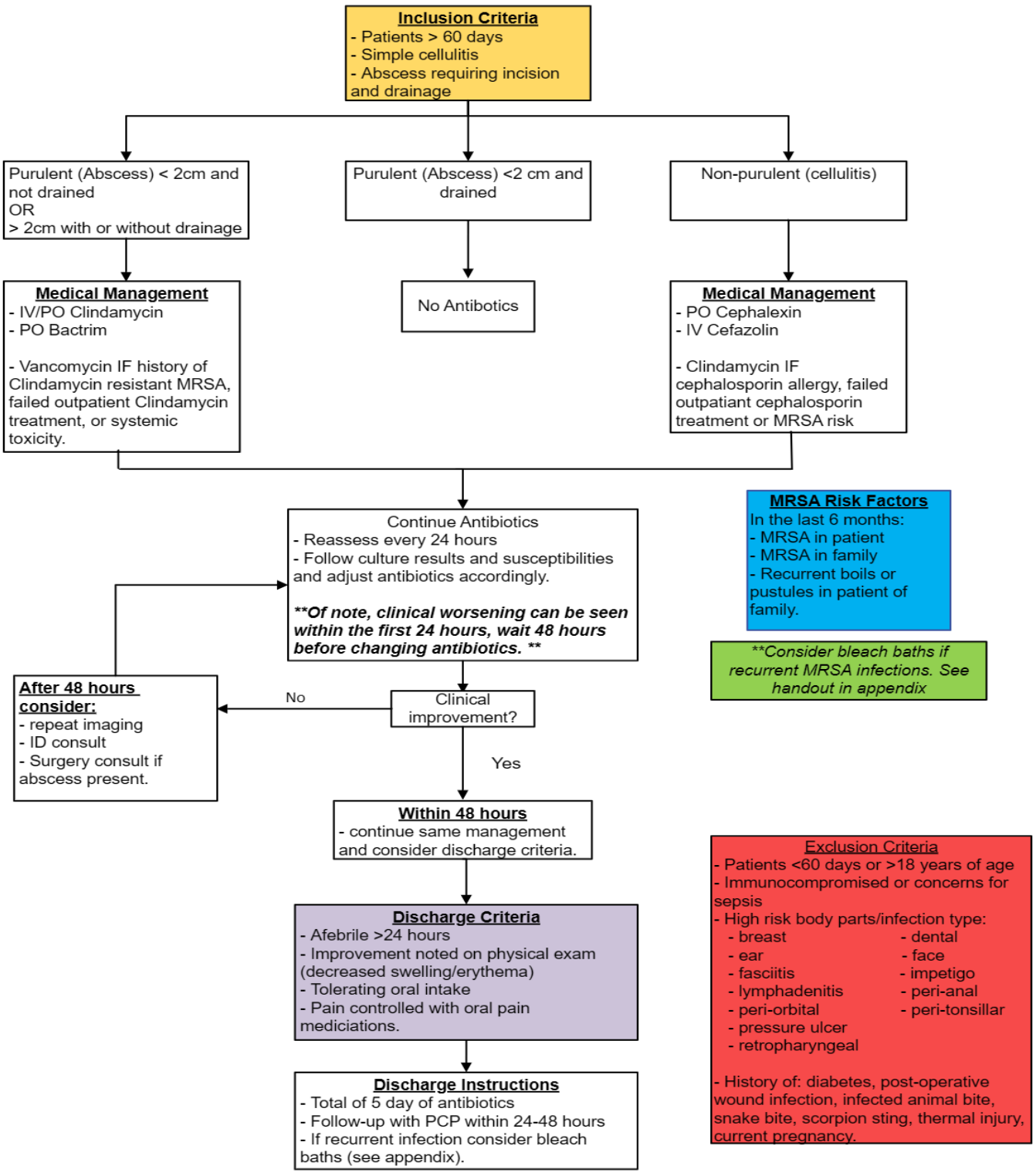
Emergency Department Pathway



INPATIENT PATHWAY



Scope

Definition

- Cellulitis: An infectious process that is relatively rapid in onset/progression and causes redness, warmth, tenderness, and swelling of the skin.
- Abscess: A skin or soft tissue infection with purulence.

Inclusion Criteria

- Patients >60 days to <18 years of age
- Uncomplicated cellulitis not requiring drainage
- Abscess requiring incision and drainage

Exclusion Criteria

- Patients < 60 days or >18 years of age
- Immunocompromised or concern for sepsis or shock.
- High risk body parts/infection type: dental, ear, face, breast, peri-tonsillar, retropharyngeal, peri-orbital, orbital, peri-anal, impetigo, fasciitis, lymphadenitis, pressure ulcers
- History of: diabetes, post-operative wound infection, infected animal bite, snake bite, scorpion sting, thermal injury, current pregnancy, history of prior MRSA infections

Pathway Goals

- Reduce the use of broad spectrum antibiotics
- Reduce the use of MRSA directed therapy in uncomplicated cellulitis
- Reduce the prescription of antibiotics post incision and drainage of an abscess
- Improve the timeliness of incision and drainage upon diagnosis
- Reduce unnecessary imaging

Key Clinical Recommendations with Evidence Based Supporting Material

Diagnosis

1. Cellulitis is redness, warmth, tenderness and swelling of the skin. It is relatively rapid in onset and progression. It is almost always unilateral. [3]
2. A skin abscess is a collection of pus within the dermis or subcutaneous space. It manifests as a painful, fluctuant, erythematous nodule with or without cellulitis[2].

Treatment

1. Incision and drainage is the recommended treatment for inflamed epidermoid cysts, carbuncles, abscesses, and large furuncles [1].
2. Typical cases of cellulitis without systemic signs of infection should receive an antimicrobial agent active against streptococci as most non-purulent cellulitis is caused by beta hemolytic streptococci. All are penicillin susceptible (Clindamycin resistance 10-20%). In non-purulent cellulitis treatment of choice is Penicillin G IV or amoxicillin PO, cefazolin or ampicillin/sulbactam IV, oral first-generation cephalosporin or amoxicillin/clavulanate PO [7].
3. Systemic symptoms such as fever should improve by 48-72 hours after start of antimicrobial therapy [1].
4. An antibiotic active against MRSA is recommended for patients with carbuncles or abscesses who have failed initial antibiotic treatment or have markedly impaired host defenses or in patients with shock[1].
5. If prescribing antibiotics, the recommended duration of antimicrobial therapy is 5 days, but treatment should be extended if the infection has not improved within this time period [1].
6. Soft tissue ultrasound can be used to distinguish normal skin from cellulitis and abscesses and whether a drainable abscess is present[15].

Medication Recommendations

Antibiotic	Route	Dosing
Cephalexin	Oral	50-75 mg/kg/day divided q 8 hours. Max dose: 500 mg/dose
Trimethoprim/Sulfamethoxazole	Oral	8-12mg TMP/kg/day divided q 12 hours Max dose 160mg TMP/dose
Cefazolin	IV	25 mg/kg/dose q 8 hours Max dose 1 gram/dose
Clindamycin	Oral IV	PO/IV: 13 mg/kg/dose q 8 hours Max dose 600mg/dose
Vancomycin	IV	15 mg/kg/dose q 8 hours Max dose 1 gram/dose

Admission Criteria

- Systemic Illness
- Poor oral intake
- Inadequate pain control with oral pain medication
- Outpatient treatment failure (>72 hours)
- Rapidly progressing lesion

Discharge Criteria

- Improvement in lesion
- Tolerating oral intake
- Pain control with oral pain medication
- Afebrile for 24 hours

Patient and Family Education/Discharge Planning

- Discharge with 5 days of total antibiotics
- Follow up with PMD within 24-48 hours

Evidence Based Supporting Material

- Cellulitis is redness, warmth, tenderness and swelling of the skin. It is relatively rapid in onset and progression. It is almost always unilateral. It is associated with fever in 22-71% of patients, elevated inflammatory markers in 60-90%, and leukocytosis in 35-50% of patients [3].
- Gram stain and culture of pus from carbuncles and abscesses are recommended, but treatment without these studies is reasonable in typical cases [2].
- Blood cultures are positive in <5% of cases and therefore it is not routinely recommended. Blood cultures are recommended in severely ill patient, immunocompromised or neutropenic patient, or certain exposures (saltwater leading to possible Vibrio) [2].
- Typical cases of cellulitis without systemic signs of infection should receive an antimicrobial agent active against streptococci as most non-purulent cellulitis is caused by beta hemolytic streptococci. All are penicillin susceptible (Clindamycin resistance 10-20%) [7].
- In non-purulent cellulitis, MSSA causes only ~10% of cases [7].
- In non-purulent cellulitis treatment of choice is Penicillin G IV or amoxicillin PO, Cefazolin or Ampicillin/Sulbactam IV, Oral first-generation cephalosporin or amoxicillin/clavulanate PO [7].
- Gram negative organisms are generally not the cause of purulent or non-purulent cellulitis. However, indications for gram negative coverage include: a severely ill patient, neutropenic or severely immunocompromised, concern for necrotizing infection, peri-rectal infection, animal bites, injury in an aquatic environment, or severe surgical site infections of the groin or abdominal wall [2].
- Incision and drainage is the recommended treatment for inflamed epidermoid cysts, carbuncles, abscesses, and large furuncles [1].
- An increase or lack of change in the size of the margins of erythema is not indicative of antibiotic failure. Since toxin production can cause extensive local inflammation [10].
- The decision to administer antibiotics directed against *S. aureus* as an adjunct to incision and drainage should be made based upon presence or absence of SIRS (temperature>38C, tachypnea >24 breaths per minute, tachycardia >90 bpm, or WBC >12,000 or <400 cells/µL) [1].
- Systemic symptoms such as fever should improve by 48-72 hours with start of antimicrobial therapy [1].
- An antibiotic active against MRSA is recommended for patients with carbuncles or abscesses who have failed initial antibiotic treatment or have markedly impaired host defenses or in patients with SIRS and hypotension [1].
- If prescribing antibiotics, the recommended duration of antimicrobial therapy is 5 days, but treatment should be extended if the infection has not improved within this time period [1].
- Outpatient therapy is recommended for patients who do not have SIRS, altered mental status, or hemodynamic instability. Hospitalization is recommended if there is concern for a deeper or necrotizing infection, for patients with poor adherence to therapy, for infection in a severely immunocompromised patient, or if outpatient treatment is failing [1].
- Soft tissue ultrasound can be used to distinguish normal skin from cellulitis and abscesses and whether a drainable abscess is present. Although point of care ultrasound (POCUS) cannot distinguish between inflammatory and infectious fluid, an abscess usually appears as an irregular anechoic or hypoechoic structure. If an incision and drainage is performed, POCUS can help identify and avoid surrounding neurovascular structures. After incision and drainage is performed, POCUS can be used to ensure the entire abscess is drained without any remaining fluid or loculations[15, 16].
- In adult patients, [studies] showed that abscess identification by clinical examination had a sensitivity and specificity of 86% (95% CI: 76% to 93%) and 70% (95% CI: 55% to 82%), respectively. When the physical examination is combined with POCUS, the sensitivity and specificity increased to 98% (95% CI: 93% to 100%) and 88% (95% CI: 76% to 96%), respectively[15, 17].
- POCUS can be particularly useful when an underlying abscess may not be clinically apparent and can change management in 36% to 48% of cases[15, 18].
- Patients with an abscess who had POCUS done on initial presentation failed therapy less often than those who did not have a POCUS performed (4.4% vs 14.6%; P < .005)[15, 19].

Appendix

How to Give Your Child a Bleach Bath

What is a bleach bath and what does it do?

A bleach bath is water with a **tiny bit** of household bleach added. The water thins out (dilutes) the bleach so that the bath water becomes like the water in a swimming pool.

Bleach baths help fight germs on the skin. These germs, or bacteria, can keep skin from healing. A bleach bath can also calm inflamed skin even if it's not infected. Bleach baths are safe for almost everyone as long as you **don't** use too much bleach.

What kind of bleach should I use?

- Use **plain bleach**—the same kind you use to clean your clothes. Most store or generic plain bleach brands are okay.

- Make sure it's **unscented** household bleach.
  - **DON'T** use bleach with Cloromax technology or fabric protection.
  - **DON'T** use bleach with words like "splash free," "splashless" or "colorsafe."
  - **DON'T** use bleach with added fragrance, like lavender.

How do I make a bleach bath?

Bleach baths work best when your child can soak in the water. You'll need at least **4 to 6 inches of lukewarm water**. Add the bleach as the tub fills.

For REGULAR bleach:

- Adult size tub: Add ¼ to ½ cup of bleach.
- Baby tub: Add 2 tablespoons of bleach.

For CONCENTRATED bleach:

- Adult size tub: Add 3 tablespoons to ⅓ cup of bleach.
- Baby tub: Add 4 teaspoons of bleach.

How do I give a bleach bath?

1. Give your child a bath just like you usually do. But do **NOT** add any soap or other products to the water.
2. Let your child play while you bathe their body, face and scalp with the water. This is safe.
3. After about 10 minutes, you may use a gentle cleanser to wash your child if you wish.
4. Rinse off the bleach water with plain water.
5. Dry your child as usual.

Repeat bleach baths as your care team tells you.

What else do I need to know?

- **DON'T** pour bleach directly onto the skin.
- **DON'T** let your child drink the bleach bath water.
- Keep the bleach bottle out of your children's reach.

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