Skin & Soft Tissue Infection (SSTI)

Inpatient

Nationwide Children's — When your child needs a hospital, everything matters.

Center for Clinical Excellence

Inclusion & Exclusion

Diagnosis & Definition

Differential Diagnoses

Patient admitted with SSTI

Systemic signs of infection, fever >101 OR tachycardia > 8 hr?

- Yes → **Off Pathway**
- No ↓

Drainable abscess ≥1cm?

- No → Treat as cellulitis with **empiric antibiotics**
- Yes →
  - **Consult surgery**
  - Obtain recommended **testing**

  Treat with **empiric antibiotics**
- Unsure ↓

Obtain ultrasound if uncertain of drainable abscess, or with induration but no clear fluctuance

Drainable fluid collection or phlegmon?

- No → **empiric antibiotics**
- Yes → **Consult surgery**; Obtain recommended **testing**; Treat with **empiric antibiotics**

Clinically Improving?

- Yes →
  - Ensure **discharge criteria** met
  - **oral antibiotic recommendations**
  - **follow up recommendations**
  - **Pilonidal discharge instructions and antibiotics**
- No → **Treatment failure**

Inclusion & Exclusion Criteria

Inclusion Criteria:

- Patients ≥ 1 month old with suspected community-acquired skin and soft tissue infection

Exclusion Criteria:

- Non-infectious causes of swelling, erythema and pain
- Patients <1 month
- Head and neck infections
- Suspect osteomyelitis
- Suspect septic arthritis
- Device related infections
- Surgical site infections
- Pyomyositis
- Necrotizing fasciitis

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Diagnosis & Definition

The diagnosis of SSTI is usually based upon clinical manifestations of cellulitis or a soft-tissue abscess

- Cellulitis is an infection of the skin and underlying soft-tissue
- Soft-tissue abscess is a cavity filled with pus

Treatment of pediatric skin and soft-tissue infections is complex due to concern for antibiotic-resistant organisms. The leading cause of purulent infections is *S. aureus*. The leading cause of cellulitis is group A *Streptococcus* and other hemolytic streptococci, but may also be due to *Staph. aureus*.

Typical Presentation:

- Cellulitis: Manifests as areas of skin erythema, edema, pain and warmth
- Soft-tissue abscess: Manifests as a painful, fluctuant, erythematous nodule, with or without surrounding cellulitis

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Differential Diagnoses

Findings suggestive of another diagnosis include:

- **Erythema migrans** – Erythema migrans is an early manifestation of Lyme disease; it consists of a region of erythema surrounding the site of a tick bite, infrequently with central clearing. The diagnosis is based on clinical findings. A similar lesion may occur in patients with Southern tick–associated rash illness.
- **Herpes zoster** – The rash of herpes zoster begins as erythematous papules that evolve into grouped vesicles. The rash is generally limited to one dermatome but can affect two or three neighboring dermatomes. The diagnosis is established by polymerase chain reaction of vesicular fluid.
- **Septic arthritis** – Cellulitis may overlie a septic joint. Clinical manifestations include joint pain, swelling, warmth, and limited range of motion. The diagnosis of septic arthritis is established based on synovial fluid examination/culture and PCR.
- **Osteomyelitis** – Osteomyelitis may underlie an area of cellulitis. It is prudent to pursue MRI imaging for assessment of bone involvement in the setting of point tenderness and/or limitation of movement in the affected area.
- **Contact dermatitis** – Contact dermatitis may be distinguished from cellulitis in that the contact dermatitis lesions are pruritic. Clinical features include erythema, edema, vesicles, bullae, and oozing. The reaction is generally limited to the site of contact and is associated with burning, stinging; it is not or only mildly painful.
- **Insect bite** – An insect bite triggers an inflammatory reaction at the site of the punctured skin, which appears within minutes and consists of pruritic local erythema and edema. In some cases, a local reaction is followed by a delayed skin reaction consisting of local swelling, itching, and erythema. It is not painful.
- **Vaccination site reaction** – A local reaction to vaccination manifests with erythema, swelling, and tenderness at the injection site; these are typically self-limited.

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Surgical Consult

Orthopedic Surgery:

- Deep extremity infection (e.g. Tenosynovitis, Presumed necrotizing fasciitis)
- Deep puncture wound of hand/fingers/feet

Pediatric Surgery:

- Breast abscess
- Perianal abscess (within 1cm of anal verge)
- Genital abscess
- Surgical Site Infections
- External neck abscess

ENT:

- Face or deep neck abscess

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Testing

Testing

- Obtain sample for culture; culture any drainage possible.
- PBP2a assay - Call lab to run if growing *Staph aureus.*

Imaging

- An ultrasound is recommended if there is uncertainty in the physical exam of an abscess, or it is in a concerning location, such as the umbilicus, over a joint, peri-anal, or there is uncertainty in the depth of the infection.

Testing/Treatment Not Recommended

- Do NOT obtain routine blood testing (CBC, CRP, blood culture) for most children with cellulitis or abscess.

- No incision and drainage is needed for abscesses <1 cm on ultrasound and/or physical examination; these patients may be discharged home on antibiotics alone based on risk factors.

- Do not unroof or needle aspirate any abscess greater than 1cm, instead perform an I&D.

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Antibiotics

Empiric IV Antibiotics*		
Name	Dosing	Notes
Cefazolin	75mg/kg/day (max 1000mg/ dose) divided q8h	• Appropriate abscess therapy if history of clindamycin resistant MSSA • First line empiric cellulitis therapy
Clindamycin	30mg/kg/day (max 600mg/ dose) divided q8h	First line empiric abscess therapy
Vancomycin	60mg/kg/day divided q6h	Appropriate abscess therapy if history of clindamycin-R MRSA
Ampicillin–Sulbactam	200 mg/kg/day (max 2g/dose) divided q6h	First line therapy specific for pilonidal abscesses

**oral forms are acceptable if tolerated and not an extensive or rapidly progressing infection*

Oral Empiric Antibiotics		
Name	Dosing	Notes
Cephalexin	50 mg/kg/day (max 500 mg/ dose) divided TID	• Appropriate abscess therapy if history of clindamycin resistant MSSA • First line empiric cellulitis therapy
Clindamycin	30mg/kg/day (max 600mg/ dose) divided q8h	First line empiric abscess therapy
TMP/SMX	8-10 mg/kg/day (max 320 mg TMP) divided BID	Also considered first line empiric abscess therapy; consider for clindamycin resistant MRSA
Amoxicillin–Clavulanate	45 mg/kg/day (max 875 mg/ dose) divided BID	First-line therapy specific for pilonidal abscesses

Treatment Notes

- May consider discontinuing antibiotics upon discharge if ≤ 5cm and fully drained abscess with no residual cellulitis
- Treat simple cellulitis and drained abscesses 5 days from drainage
- Treat undrained abscesses for 7 days
- Use sensitivities to tailor antibiotic choice beyond empiric options

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Treatment Failure

- After 24 hours of appropriate treatment, consider treatment failure on admitted patients if:
  - Enlarging
  - Increased pain
  - There is increased induration and erythema
  - New fluctuance
  - Persistent fever
  - Or no change after 48 hours

- In that case, consider repeating the ultrasound and/or switching antibiotics
- Consider ID consult
- If rapid progression, consult surgery

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Follow-up

- PCP follow up is recommended in all patients and especially if symptoms worsen or persist
- If surgery places a drain that is not a ring drain and is attached with a dissolvable suture, it should fall out on its own in 7 days. Patient should follow-up with PCP in 7 days if drain has not fallen out.
- If surgery places a ring drain (a Penrose or vessel loop sutured to itself in a circular fashion), follow-up with the surgery clinic in 5-7 days for evaluation and removal.

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Discharge Instructions

- Discharge once the patient can tolerate oral antibiotics; additionally if an abscess was present, discharge once it has been adequately drained
- Fever curve improving/down-trending
- Clinical signs of improvement

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Pilonidal Abscess

Antibiotics:

- **First time pilonidal abscess:** Amoxicillin/clavulanate for 5 days
- **Recurrent pilonidal abscess:** Amoxicillin/clavulanate for 5 days unless wound culture is positive for MRSA (let sensitivities guide antibiotic choice if MRSA positive).

Discharge Information:

- Refer to Pilonidal Clinic for follow up; suggest family ask for first available appointment
  Located in the Surgery and Burn Clinic
  OCC 6D
  555 S 18th St
  2-3900

- Provide Helping Hand on **Pilonidal Disease**

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Helping Hands

- **MRSA decolonization**
- **MRSA Infection in the Community (Methicillin Resistant Staphylococcus Aureus)**
- **Pilonidal Disease**

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Metrics

Pathway goals

- To improve the quality and safety of care for uncomplicated community acquired soft tissue infections/abscesses in children older than 30 days of life
- Increase the use of bacterial cultures that will allow for targeted antimicrobial therapy
- Reduce the use of inappropriate antibiotics for cellulitis and abscess

Quality measures

Process measures:

- Time to administration of antibiotic

Outcome measures:

- Decrease inpatient length of stay
- Decrease antibiotic duration

Balance measures:

- Readmission rate

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Team & Process

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Clinical Pathway Development

This clinical pathway was developed using the process described in the NCH Clinical Pathway Development Manual Version 6, 2022. Clinical Pathways at Nationwide Children's Hospital (NCH) are standards which provide general guidance to clinicians. Patient choice, clinician judgment, and other relevant factors in diagnosing and treating patients remain central to the selection of diagnostic tests and therapy. The ordering provider assumes all risks associates with care decisions. NCH assumes no responsibility for any adverse consequences, errors, or omissions that may arise from the use or reliance on these guidelines. NCH's clinical pathways are reviewed periodically for consistency with new evidence; however, new developments may not be represented, and NCH makes no guarantees, representations, or warranties with respect to the information provided in this clinical pathway.

For more information about our pathways and program please contact:
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