

Include in the pathway (Patients must be all of these):

- Patients with cellulitis or abscess
- Patients who are hemodynamically stable, without clinical signs of sepsis, toxic shock syndrome or necrotizing fasciitis (eg: crepitus, intense pain)

Exclude from the pathway (Patients may be any of these):

- Patients under 4 weeks of age
- Patient with possible concurrent septic joint or osteomyelitis
- Immunocompromised patients
- Unstable vital signs or signs of sepsis
- Significant open wound (eg: severe trauma, surgical)
- Puncture wounds
- Concern for atypical infection (eg: TB, cocci)

Patients should be considered for removal from the pathway if:

- Clinical deterioration
- No improvement within 48 hours after initiation of treatment

Criteria for Admission

- Moderate to severe pain
- Outpatient treatment failure
- Presence of lymphangitis
- Presence of regional lymphadenopathy and fever
- Rapidly advancing cellulitis
- Abscess requiring surgical incision and drainage

Criteria for Discharge

- Clinical improvement
- Taking po's and medications without difficulty
- Safe and stable home situation

Background Information:

- Cellulitis is an infection of the subcutaneous tissues and occasionally of the dermis of the skin.
- *Staphylococcus aureus* and Group A strep are the most common bacterial causes. Facial cellulitis may also be caused by non-typeable H. Flu or *S. pneumoniae* as an extension from sinusitis. Oral flora also may be causative. Infants less than 3 months of age may also have Group B Strep as the etiology.
- Community acquired MRSA (methicillin resistant *Staph. aureus*) is now a pathogen of major significance for skin and soft tissue infections at Children's Hospital Central California.
- High risk groups in the pediatric population for MRSA include children in daycare programs and athletes.
- In 2009, 100% of Children's Hospital Central California MRSA isolates were sensitive to bactrim and rifampin (synergy only). 87% of isolates were sensitive to clindamycin.
- CA-MRSA colonization is much more likely to progress to clinical infection than is MSSA colonization.
- MRSA infection is more likely to have abscesses or folliculitis (vs. cellulitis) and often presents looking like an insect bite.

Goals:

- Ensure appropriate choice of antibiotics for skin and soft tissue infections
- Limit the unnecessary use of Vancomycin
- Provide education for patient and families

Awad, Samir, et al. Increasing incidence of methicillin-resistant *Staphylococcus aureus* skin and soft tissue infections; reconsideration of empiric antimicrobial therapy. *American Journal of Surgery* Vol. 194, Issue 5.

Daum, Robert S. Skin and Soft Tissue Infections Caused by Methicillin-Resistant *Staphylococcus aureus*. *NEJM* 2007 Volume 357:380-390.

Bhumra, Nasreen A. and Sophia G. McCullough. Skin and subcutaneous infections. *Primary Care: Clinics in Office Practice* 2003 Vol. 30, number 1.

Elston, Dirk M. Community-acquired methicillin-resistant *Staphylococcus aureus*. *Journal of the American Academy of Dermatology* Vol. 56, Issue 1 2007.

Kaplan, Sheldon L. Implications of Methicillin-Resistant *Staphylococcus aureus* as a Community-Acquired Pathogen in Pediatric Patients. *Infectious Disease Clinics of North America* Vol. 19, Number 3 September 2005.

Moran, Gregory J, et al. Methicillin-Resistant *S. aureus* Infection among Patients in the Emergency Department. *NEJM* 2006 Volume 355; 666-674

Weight: _____

Allergies: _____

Time/ _____
Date: General

- 1) Diagnosis: Skin or soft tissue infection
- 2) Estimated length of stay: 3 days
- 3) Condition: Stable
- 4) Activity: Contact isolation
- 5) Vitals (including BP) and pain assessment: every 4 hrs times 3, then routine. Notify physician of hypotension and/or tachycardia. (see below)
- 6) On admit, assess discharge needs and make appropriate referrals (see pediatric admission data base)

Definition of hypotension and tachycardia:

Age	Minimum SBP mm Hg (5th percentile)	Upper limit for HR
1 month to 1 year	70	190
> 1 year	70 + (2 x age in years)	160
> 10 years	90	140

Education

- 1) Begin education materials regarding skin infections with the family on admission

Diet and Fluids

- Diet: Age-appropriate, encourage fluids.
- If poor POs or vomiting, start IV fluids at 1 times maintenance (see chart below).
- Continue IV fluids until patient is taking PO fluids well and has good urine output (> 1 ml/kg/hr averaged over shift). Then wean IV fluids as tolerated to saline lock.
- If patient appears dehydrated, discuss with physician need for additional fluid orders.
- Do not add potassium to IV fluids and **notify physician** if **serum potassium > 5.5** **or serum creatinine is:**

serum creatinine	age	sex
> 0.6	< 12	boys & girls
> 1.3	≥ 12	girls
> 1.3	≥ 12	boys

* Definition of Maintenance IV Fluids:

0-10	Kg	4 mL/kg/hr
11-20	Kg	40 mL/hr + (2 mL/kg/hr for each kg > 10)
> 20	Kg	60 mL/hr + (1 mL/kg/hr for each kg > 20)

for children ≤ 15 Kg, use D5 ¼ NS; add 20 mEq KCl/L
 for children > 15 Kg, use D5 ½ NS; add 20 mEq KCl/L

NPO at _____.

Start IVF at maintenance

Physician's Signature/ID Number: _____ Date: ____/____/____ Time: _____

Soft Tissue and Skin Infection

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Physician's Order Sheet

Interdisciplinary Patient/Family Learning Evaluation

Initial Patient/Family Learner Assessment

A learning evaluation is done with each initial teaching intervention for each learner. Teaching interventions should be documented in an ongoing manner with ongoing assessment and evaluation of readiness to learn, barriers to learning, and learning outcomes. Use your department or topic specific Interdisciplinary Patient/Family Education Documentation forms for ongoing patient/parent/family education documentation. Use this form for the initial assessment of a learner and keep this form with the ongoing patient/family education documentation forms.

Initial Learner Evaluation (assess one or multiple learners)			
1. _____ Date _____ (Pt./Primary care giver)	2. _____ Date _____ learner	3. _____ Date _____ learner	4. _____ Date _____ learner
Prior Knowledge of Plan of Care or care needs: <input type="checkbox"/> Comprehensive <input type="checkbox"/> Good <input type="checkbox"/> Limited <input type="checkbox"/> None <input type="checkbox"/> Other _____	Prior Knowledge of Plan of Care or care needs: <input type="checkbox"/> Comprehensive <input type="checkbox"/> Good <input type="checkbox"/> Limited <input type="checkbox"/> None <input type="checkbox"/> Other _____	Prior Knowledge of Plan of Care or care needs: <input type="checkbox"/> Comprehensive <input type="checkbox"/> Good <input type="checkbox"/> Limited <input type="checkbox"/> None <input type="checkbox"/> Other _____	Prior Knowledge of Plan of Care or care needs: <input type="checkbox"/> Comprehensive <input type="checkbox"/> Good <input type="checkbox"/> Limited <input type="checkbox"/> None <input type="checkbox"/> Other _____
Primary Language: check <input type="checkbox"/> English <input type="checkbox"/> Spanish <input type="checkbox"/> Hmong Other _____ <input type="checkbox"/> Writes <input type="checkbox"/> Reads	Primary Language: check <input type="checkbox"/> English <input type="checkbox"/> Spanish <input type="checkbox"/> Hmong Other _____ <input type="checkbox"/> Writes <input type="checkbox"/> Reads	Primary Language: check <input type="checkbox"/> English <input type="checkbox"/> Spanish <input type="checkbox"/> Hmong Other _____ <input type="checkbox"/> Writes <input type="checkbox"/> Reads	Primary Language: check <input type="checkbox"/> English <input type="checkbox"/> Spanish <input type="checkbox"/> Hmong Other _____ <input type="checkbox"/> Writes <input type="checkbox"/> Reads
Readiness to learn: check <input type="checkbox"/> Asking pertinent questions <input type="checkbox"/> Actively Listening <input type="checkbox"/> Unreceptive <input type="checkbox"/> No interest demonstrated <input type="checkbox"/> Distracted	Readiness to learn: check <input type="checkbox"/> Asking pertinent questions <input type="checkbox"/> Actively Listening <input type="checkbox"/> Unreceptive <input type="checkbox"/> No interest demonstrated <input type="checkbox"/> Distracted	Readiness to learn: check <input type="checkbox"/> Asking pertinent questions <input type="checkbox"/> Actively Listening <input type="checkbox"/> Unreceptive <input type="checkbox"/> No interest demonstrated <input type="checkbox"/> Distracted	Readiness to learn: check <input type="checkbox"/> Asking pertinent questions <input type="checkbox"/> Actively Listening <input type="checkbox"/> Unreceptive <input type="checkbox"/> No interest demonstrated <input type="checkbox"/> Distracted
Barriers to learning: check <input type="checkbox"/> No barriers <input type="checkbox"/> Low literacy or Edu level <input type="checkbox"/> Cultural <input type="checkbox"/> Language <input type="checkbox"/> Visual, hearing, speaking <input type="checkbox"/> Religious, spiritual <input type="checkbox"/> Cognitive <input type="checkbox"/> Emotional <input type="checkbox"/> Motivation <input type="checkbox"/> Pain or fatigue <input type="checkbox"/> Other _____ Accommodation: <input type="checkbox"/> Interpreter <input type="checkbox"/> Audio <input type="checkbox"/> Visuals <input type="checkbox"/> Handouts <input type="checkbox"/> Explanations <input type="checkbox"/> Demonstrations <input type="checkbox"/> Other	Barriers to learning: check <input type="checkbox"/> No barriers <input type="checkbox"/> Low literacy or Edu level <input type="checkbox"/> Cultural <input type="checkbox"/> Language <input type="checkbox"/> Visual, hearing, speaking <input type="checkbox"/> Religious, spiritual <input type="checkbox"/> Cognitive <input type="checkbox"/> Emotional <input type="checkbox"/> Motivation <input type="checkbox"/> Pain or fatigue <input type="checkbox"/> Other _____ Accommodation: <input type="checkbox"/> Interpreter <input type="checkbox"/> Audio <input type="checkbox"/> Visuals <input type="checkbox"/> Handouts <input type="checkbox"/> Explanations <input type="checkbox"/> Demonstrations <input type="checkbox"/> Other	Barriers to learning: check <input type="checkbox"/> No barriers <input type="checkbox"/> Low literacy or Edu level <input type="checkbox"/> Cultural <input type="checkbox"/> Language <input type="checkbox"/> Visual, hearing, speaking <input type="checkbox"/> Religious, spiritual <input type="checkbox"/> Cognitive <input type="checkbox"/> Emotional <input type="checkbox"/> Motivation <input type="checkbox"/> Pain or fatigue <input type="checkbox"/> Other _____ Accommodation: <input type="checkbox"/> Interpreter <input type="checkbox"/> Audio <input type="checkbox"/> Visuals <input type="checkbox"/> Handouts <input type="checkbox"/> Explanations <input type="checkbox"/> Demonstrations <input type="checkbox"/> Other	Barriers to learning: check <input type="checkbox"/> No barriers <input type="checkbox"/> Low literacy or Edu level <input type="checkbox"/> Cultural <input type="checkbox"/> Language <input type="checkbox"/> Visual, hearing, speaking <input type="checkbox"/> Religious, spiritual <input type="checkbox"/> Cognitive <input type="checkbox"/> Emotional <input type="checkbox"/> Motivation <input type="checkbox"/> Pain or fatigue <input type="checkbox"/> Other _____ Accommodation: <input type="checkbox"/> Interpreter <input type="checkbox"/> Audio <input type="checkbox"/> Visuals <input type="checkbox"/> Handouts <input type="checkbox"/> Explanations <input type="checkbox"/> Demonstrations <input type="checkbox"/> Other
Learning Preferences: <input type="checkbox"/> Demonstration <input type="checkbox"/> Written handouts <input type="checkbox"/> Verbal or audio <input type="checkbox"/> Video or TV <input type="checkbox"/> Hands on <input type="checkbox"/> Other _____	Learning Preferences: <input type="checkbox"/> Demonstration <input type="checkbox"/> Written handouts <input type="checkbox"/> Verbal or audio <input type="checkbox"/> Video or TV <input type="checkbox"/> Hands on <input type="checkbox"/> Other _____	Learning Preferences: <input type="checkbox"/> Demonstration <input type="checkbox"/> Written handouts <input type="checkbox"/> Verbal or audio <input type="checkbox"/> Video or TV <input type="checkbox"/> Hands on <input type="checkbox"/> Other _____	Learning Preferences: <input type="checkbox"/> Demonstration <input type="checkbox"/> Written handouts <input type="checkbox"/> Verbal or audio <input type="checkbox"/> Video or TV <input type="checkbox"/> Hands on <input type="checkbox"/> Other _____
Signature _____ Date _____	Signature _____ Date _____	Signature _____ Date _____	Signature _____ Date _____
Signature _____ Date _____	Signature _____ Date _____	Signature _____ Date _____	Signature _____ Date _____

Patient Label

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Patient/Family Learner Assessment



What is “Staph”?

It is a common bacteria that can be found on the skin or in the nose of healthy people. “Staph” is short for **Staphylococcus aureus**.

What is “MRSA”?

It is a type of Staph that doesn't respond to certain antibiotics. **MRSA** is short for **methicillin-resistant Staphylococcus aureus**.

Where does Staph or MRSA come from?

- Many people carry the Staph bacteria on their skin or in their nose, but it doesn't make them sick
- Most skin infections from Staph or MRSA are minor. It may look like pimples or boils
- Some Staph or MRSA infections are serious and may require your child to be in the hospital

How do you get Staph or MRSA infections?

Things that can cause the spread of these infections include:

- Close skin to skin contact with someone who has Staph or MRSA
- Openings in the skin such as cuts or abrasions
- Contact with items and surfaces with the bacteria on them
- Crowded living conditions
- Not keeping yourself and personal items clean

What does a Staph or MRSA infection look like?

- Skin infections begin as a pimple or look like a spider bite or mosquito bite.
- The skin becomes -
 - red
 - swollen
 - painful
 - may have pus or other drainage
- More serious infections may cause:
 - Pneumonia (infection in the lungs)
 - Infections in the blood
 - Surgical wound infections
 - Bone or joint infections
 - Central nervous system infections



What is Children's Hospital doing to prevent MRSA infections?

To prevent MRSA infections, your doctor, nurses and other healthcare providers will:

- **Clean their hands** with soap and water or an alcohol-based hand gel (such as Purell®) before and after caring for your child
- Carefully clean hospital rooms and medical equipment
- Use **Contact Precautions** when caring for your child with MRSA. **Contact Precautions** mean:
 - Whenever possible, children with MRSA will have a single room or will share a room only with someone else who has MRSA
 - Healthcare providers will put on gloves and wear a gown over their clothing while taking care of your child with MRSA
 - In order to protect all children in the hospital, if your child is on contact precautions, he will not be allowed to leave the room

How can I keep from getting or giving Staph or MRSA infections?

- Keep your hands clean by washing often with soap and water, or using an alcohol-based hand gel (like Purell®)
- Keep cuts and scrapes clean and covered with a bandage until healed
- Keep from touching other people's sores or bandages
- Don't share personal items such as towels or razors with other people
- Keep your bathrooms, kitchen, all other rooms and personal items clean

How are Staph and MRSA infections treated?

- Special antibiotics are given to treat serious Staph or MRSA infections
 - These antibiotics may be taken by mouth or given in the vein through an IV or as an antibiotic skin ointment
 - Antibiotics are usually given for skin infections
 - Your doctor may need to make a cut in the area of the skin that is infected, so the fluid and pus can run out
- This is done:
- To help with pain relief
 - To determine what is causing the infection and how to treat it
- Your doctor may give you more instructions for things you can do at home.

Where can I find out more information?

From the Centers for Disease Control and Prevention National MRSA Education Initiative: Preventing MRSA Skin Infections http://www.cdc.gov/mrsa/mrsa_initiative/skin_infection/. This website has some pictures that show what MRSA infections look like.

Discharge Sheet

For Hospital Use Only

Dictation:

1-800-411-1001 (#963)

Discharge sheet FAXed to primary care physician (initial/date) _____

D/S Job #: _____

Follow-up appointment SCHEDULED with primary care physician (initial/date) _____

Patient's Name: _____ Discharge date: _____

Dx: Cellulitis Abscess (site) _____

Hospital Course

Patient admitted with skin/soft tissue infection. Treated with IV and/or PO antibiotics.

Required I & D Date: _____

Treated with: Clindamycin Vancomycin
 TMP-SMX (Bactrim®) Rifampin (for synergy only)
 Cefazolin Cefotaxime

Blood culture: Positive Negative Not done

Wound culture: _____ Not done

Complications during hospitalization: _____

Discharge condition: _____ Discharge weight: _____

Instruction to Patient

Activity: Keep wound covered until no further drainage, unless otherwise instructed.

Diet: Regular

Medications: See Medication Reconciliation Form

Additional instructions: See Patient Education Sheet

Signed: _____ M.D./D.O.

Signature of Parent or Guardian

Attending Physician

Attending Resident

Primary Care Physician

City

Soft Tissue and Skin Infection

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Children's
Hospital
Central California 

Patient Label

Discharge Instructions