

**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 2006, 100% of Children's Hospital Central California MRSA isolates were sensitive to bactrim and rifampin (synergy only). 83% 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.

Bhumbra, 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.
- 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 heplock.
- 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
> 0.7	≥ 12	girls
> 0.9	≥ 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

**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
<b>Prior Knowledge of Plan of Care or care needs:</b> <input type="checkbox"/> Comprehensive <input type="checkbox"/> Good <input type="checkbox"/> Limited <input type="checkbox"/> None <input type="checkbox"/> Other _____	<b>Prior Knowledge of Plan of Care or care needs:</b> <input type="checkbox"/> Comprehensive <input type="checkbox"/> Good <input type="checkbox"/> Limited <input type="checkbox"/> None <input type="checkbox"/> Other _____	<b>Prior Knowledge of Plan of Care or care needs:</b> <input type="checkbox"/> Comprehensive <input type="checkbox"/> Good <input type="checkbox"/> Limited <input type="checkbox"/> None <input type="checkbox"/> Other _____	<b>Prior Knowledge of Plan of Care or care needs:</b> <input type="checkbox"/> Comprehensive <input type="checkbox"/> Good <input type="checkbox"/> Limited <input type="checkbox"/> None <input type="checkbox"/> Other _____
<b>Primary Language:</b> check <input type="checkbox"/> English <input type="checkbox"/> Spanish <input type="checkbox"/> Hmong Other _____ <input type="checkbox"/> Writes <input type="checkbox"/> Reads	<b>Primary Language:</b> check <input type="checkbox"/> English <input type="checkbox"/> Spanish <input type="checkbox"/> Hmong Other _____ <input type="checkbox"/> Writes <input type="checkbox"/> Reads	<b>Primary Language:</b> check <input type="checkbox"/> English <input type="checkbox"/> Spanish <input type="checkbox"/> Hmong Other _____ <input type="checkbox"/> Writes <input type="checkbox"/> Reads	<b>Primary Language:</b> check <input type="checkbox"/> English <input type="checkbox"/> Spanish <input type="checkbox"/> Hmong Other _____ <input type="checkbox"/> Writes <input type="checkbox"/> Reads
<b>Readiness to learn:</b> 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	<b>Readiness to learn:</b> 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	<b>Readiness to learn:</b> 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	<b>Readiness to learn:</b> 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
<b>Barriers to learning:</b> 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	<b>Barriers to learning:</b> 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	<b>Barriers to learning:</b> 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	<b>Barriers to learning:</b> 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
<b>Learning Preferences:</b> <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 _____	<b>Learning Preferences:</b> <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 _____	<b>Learning Preferences:</b> <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 _____	<b>Learning Preferences:</b> <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 _____

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**Patient/Family Learner Assessment**



# “Staph” (Staphylococcus aureus) & MRSA (Methicillin-resistant Staphylococcus aureus)

Education Information for Patients and Families

## What is Staph?

- It is a bacteria that is common on the skin or in the nose of healthy people. The bacteria is *Staphylococcus aureus* but is commonly called “Staph”.

## What is MRSA?

- It is a type of Staph that is resistant (does not respond to) certain antibiotics (such as penicillin & Keflex®). MRSA is methicillin-resistant *Staphylococcus aureus* but is commonly called MRSA.

## Where does Staph or MRSA come from?

- 25-30% of people are colonized with Staph (the bacteria is on the skin, but not causing an infection). Staph are one of the most common causes of skin infections in the U.S.
- 1% of people are colonized with MRSA (they have the bacteria on their skin, but are not sick).
- Most skin infections from Staph or MRSA are minor (such as pimples & boils)
- Some Staph or MRSA infections are serious (such as infections of surgical wounds, the blood, bones, central nervous system, & lungs [pneumonia]).

## Who gets Staph or MRSA infections?

- In the past, Staph infections occurred most among people in hospitals.
- In the past few years, many people who have never been in a hospital have had the infections.
- Infections happen most in areas where crowding & close contact with others occurs (such as jails, certain sports teams like wrestling, locker rooms, and the military).
- Things that cause the spread of these infections include:
  - Close skin-to-skin contact
  - Openings in the skin such as cuts or abrasions
  - Contact with items & surfaces with the bacteria on them
  - Crowded living conditions
  - Poor hygiene & not keeping items clean

## What does a Staph or MRSA infection look like?

- Skin infections begin as a pimple or spider bite or mosquito bite.
- The skin becomes:
  - Red
  - Swollen
  - Painful
  - May have pus or other drainage

- More serious infections may cause:
  - Pneumonia
  - Infections in the blood
  - Surgical wound infections
  - Bone infections
  - Central nervous system infections

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

- Keep your hands clean by washing thoroughly with soap & water, or using an alcohol-based hand sanitizer like Purell® .
- Keep cuts & scrapes clean & covered with a bandage until healed.
- Keep from touching other people’s wounds or bandages.
- Don’t share personal items such as towels or razors with other people.

How are Staph or MRSA infections treated?

- For serious infections (such as pneumonia, infections in the blood, surgical wound infections, bone infections, or central nervous system infections), antibiotics are given. These antibiotics may be taken by mouth or by vein (intravenous).
- For skin infections, antibiotics may be given. You may be sent to have an incision (a cut made in the area of the skin that is infected), so the fluid and pus will be allowed to run out. The reason for doing this includes:
  - Pain relief
  - A culture can be taken (swab rubbed into the lesion to gather the pus to determine what type of bacteria is causing the lesion). This test helps your health care provider choose the right antibiotic.

What can be done about Staph or MRSA colonization?

- An ointment may be prescribed called “Bactroban.” This ointment is for use in each nostril twice a day for the certain amount of time that your health care provider will tell you.
- Bleach baths may be suggested for everyone living in the house to decrease skin bacteria. This method is used by the military with some success.
  - 1 Tablespoon of bleach is added to every gallon of bath water.
  - Anyone living in the house with skin lesions can take these baths 3 times a week as long as they have skin lesions.
  - Anyone living in the house without skin lesions can take these baths 1 time a week as long as anyone in the house has skin lesions present.
  - Once all lesions are gone by everyone living in the house, the baths may be stopped.
- The above steps may be repeated. Other suggestions may be given by your health care provider if the lesions return.

# 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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### Discharge Instructions