SASKATCHEWAN REGISTERED NURSES' ASSOCIATION

RNs WITH ADDITIONAL AUTHORIZED PRACTICE
CLINICAL DECISION TOOL
DECEMBER 1, 2016

CELLULITIS PEDIATRIC

DEFINITION

Cellulitis is an acute, spreading inflammation of the dermis and subcutaneous tissue, often complicating a wound or other skin condition.

Cellulitis may be further classified by the unique area of the body it affects (e.g., periorbital or orbital, peritonsillar, etc.).

IMMEDIATE CONSULTATION REQUIRED IN THE FOLLOWING SITUATIONS

- Extensive cellulitis (including signs of abscess formation)
- Toxic appearing child: Toxic appearing infants and children may be pale or cyanotic and are often lethargic or inconsolably irritable. In addition, they may have tachypnea and tachycardia with poor capillary refill.
- Diminished arterial pulse in a cool swollen, infected extremity
- Cutaneous necrosis
- Rapidly progressing cellulitis (may indicate invasive streptococcal infection)
- Cellulitis of the face or a joint
- Immunocompromised client
- Diabetic client
- Suspected foreign body
- < 6 years of age

CAUSES

- *Staphylococcus aureus* (*S. aureus*)
- Group A - hemolytic streptococci (*Streptococcus pyogenes*)
- *Streptococcus pneumoniae:* less common since the advent of childhood vaccination with heptavalent pneumococcal conjugate vaccine (Prevnar)
- *Haemophilus influenzae* type B (HIB): rare due to childhood immunization
- *Pseudomonas aeruginosa,* anaerobic bacteria: immunocompromised children
- Pasteurella species*:* from cat and dog bites
- *Eikenella corrodens*: from human bites

PREDISPOSING AND RISK FACTORS

- Increase risk in clients with venous or lymphatic compromise, diabetes mellitus, and prior skin lesion
- Local trauma

- Bites
- Furuncle
- Carbuncle
- Surgery
- Underlying skin condition (e.g., atopic dermatitis)

HISTORY

- An expanding, red, painful area of swelling is the most common presentation.
- Surrounding area may also be firm and indurated.
- Mild constitutional symptoms (with or without fever) are commonly associated with cellulitis.

Enquire about:

- Pre-existing recent wound
- Recent surgery
- Pre-existing skin condition (psoriasis, decubitus ulcer)
- Symptom onset usually over several days
- Previous medical history (trauma, surgery, dermatitis)
- Immunization status
- Visual changes, proptosis, painful or limited eye movements are worrisome for orbital cellulitis
- Painful swallowing, pain with opening mouth (trismus), muffled ("hot potato") voice are classic presenting symptoms of peritonsillar cellulitis/abscess.

Suspect methicillin-resistant *S. aureus* (MRSA) in any client who presents with the following:

- A skin or soft tissue infection in a community where > 10-15% of all *S. aureus* isolates are MRSA
- Clients from high risk groups (e.g., contact sports, institutionalized, homeless, parenteral drug user, HIV, malnutrition)
- Any client who has not responded to treatment with a β-lactam antibiotic; prior antibiotic therapy (especially broad spectrum) in last 6 months
- Invasive procedures/devices (e.g., dialysis, indwelling catheter); advanced age, young adults

CELLULITIS PEDIATRIC

Refer to *Northern Saskatchewan guidelines (2014) for skin and soft tissue infections including suspect MRSA in the community setting*. (Population Health Unit, Northern Saskatchewan, 2014) (Refer to Appendix)

PHYSICAL FINDINGS

- Temperature may be elevated
- Heart rate may be elevated
- Redness, swelling, tenderness, warmth
- Advancing edge of lesion diffuse, not sharply demarcated (mark the area for comparison on follow-up)
- Small amount of purulent discharge may be present
- Induration
- Regional lymph nodes may be enlarged and tender

Classification

Mild Cellulitis

- Localized limited cellulitis
- Small area of erythema, warmth, and induration
- Tenderness
- May or may not be exudative

Moderate Cellulitis

- Spreading area of erythema, warmth, and induration
- Pain
- Lymphadenopathy
- Fever
- Swelling of the effected limb
- May or may not be exudative

Severe Cellulitis

- Extensive cellulitis
- Rapidly spreading
- Fever
- Lymphadenopathy
- Diminished arterial pulse in a cool swollen infected extremity
- Cutaneous necrosis

CELLULITIS PEDIATRIC

DIFFERENTIAL DIAGNOSIS

- Folliculitis
- Foreign body
- Abscess
- Contact dermatitis
- Necrotizing fasciitis (ill client, severe local symptoms, bullae, crepitus, or anesthesia of the involved skin)
- Osteomyelitis
- Allergic angioedema can be excluded by its lack of tenderness and absence of fever

COMPLICATIONS

- Local or distant spread of infection is possible.
- Suppuration and abscess formation may occur.
- Extremity cellulitis may extend into deep tissues to produce an arthritis or osteomyelitis, or it may extend proximally as a lymphangitis.
- Orbital cellulitis may be complicated by visual loss and/or cavernous sinus thrombosis.
- Prior to widespread immunization against HIB, the bacteremia associated with facial cellulitis was associated with pneumonia, meningitis, pericarditis, epiglottitis, arthritis, and osteomyelitis.

INVESTIGATIONS AND DIAGNOSTIC TESTS

- Swabs for cellulitis are not routinely recommended.
- Refer to Northern Saskatchewan guidelines (2014) – attached.

MAKING THE DIAGNOSIS

Diagnosis is usually made by history and clinical assessment. Cellulitis is characterized by local area of diffuse inflammation with the following:

- Redness
- Warmth
- Edema
- Tenderness
- Poorly demarcated margins

MANAGEMENT AND INTERVENTIONS

Goals of Treatment

- Control infection
- Identify abscess formation

Appropriate Consultation

- Treatment failure
- Secondary bacterial cellulitis from a pre-existing wound or trauma (e.g., post-surgery site, burns)
- Moderate to severe cellulitis

Non-Pharmacological Interventions

Mild Cellulitis

- Treat on an outpatient basis
- Apply cool sterile saline compresses to affected areas qid to remove any purulent exudates
- Elevate, rest, and gently splint an affected limb

Adjuvant Therapy

- Update tetanus vaccination

Pharmacological Interventions

Mild Cellulitis

- Oral antibiotics (choose one of the following):
  - Cephalexin (Keflex) 50-100 mg/kg/day orally divided q6h for 10 days (maximum 4 g/day)
  - Cloxacillin 50 mg/kg/day orally divided q6h for 7-10 days
  - Note: Penicillin and amoxicillin are never good empiric choices for even superficial cellulitis (poor *S. aureus* coverage).
- For children who are allergic to penicillin:
  - Azithromycin 10 mg/kg/day orally first day, then 5 mg/kg/day orally for remaining 4 days
  - Clarithromycin 15 mg/kg/day orally divided q12h for 7-10 days
- Consider treatment for MRSA depending on regional prevalence, clinical

judgment, or if no response to initial therapy, use one of the following:
  - Sulfamethoxazole-Trimethoprim (SMX-TMP) 40-60 mg/kg/day SMX & 8-12 mg/kg/day TMP orally divided q12h for 10 days
  - Doxycycline (children > 8 years of age) 100 mg bid for 10 days
  - Clindamycin 10-30 mg/kg/day divided into 3 or 4 doses for 7-10 days
  - Refer to Northern Saskatchewan guidelines (2014) - attached
- Analgesic and antipyretic for pain and temperature control:
  - Acetaminophen (Tylenol) 15 mg/kg orally qid prn (maximum dose 75 mg/kg/day)
    Or
  - Ibuprofen (Motrin) 10 mg/kg orally qid prn (maximum dose 40 mg/kg/day).

Moderate to Severe Cellulitis [Consult a physician/RN(NP)]
- Start IV therapy with normal saline to keep vein open; adjust rate according to state of hydration and age.
- Administer IV antibiotics only as directed by a physician/RN(NP).

Client and Caregiver Education
- Counsel parent/caregiver about appropriate use of medications (dose, frequency, compliance, etc.).
- Encourage proper hygiene of all skin wounds to prevent future infections (e.g., keeping fingernails short, avoid scratching lesions).
- Stress importance of close follow-up.

Monitoring and Follow-Up
- The client should return to the clinic in 24-48 hours and again in 10 days for evaluation of therapeutic response.
- The fever should respond in 24-48 hours but the tissue swelling does not resolve for 1-2 weeks.
- Mark area of erythema and induration to assess effectiveness of treatment.
- Instruct parents or caregiver to bring child back for reassessment immediately if lesion becomes fluctuant, if pain increases, or if fever develops or worsens.

Referral

- Treatment failure
- Disseminated infection (i.e., periorbital abscess)

DOCUMENTATION

- As per employer policy

REFERENCES

Anti-Infective Review Panel. (2013). *Anti-infective guidelines for community-acquired infections*. Toronto, ON: MUMS Guideline Clearinghouse.

Bedwell, J., & Bauman, N. M. (2011). Management of pediatric orbital cellulitis and abscess: *Current Opinion in Otolaryngology & Head and Neck Surgery*, *19*(6), 467–473. http://doi.org/10.1097/MOO.0b013e32834cd54a

Fanella, S., & Embree, J. (2015). Pediatric Staphylococcus aureus infections: Impact of methicillin resistance at a Canadian center. *Southern Medical Journal*, *108*(5), 254–257. http://doi.org/10.14423/SMJ.0000000000000274

Health Canada. (2009). *First Nations & Inuit health: Clinical practice guidelines for nurses in primary care:* Ottawa, ON: Author. Retrieved from http://www.hc-sc.gc.ca

Population Health Unit, Northern Saskatchewan. (2014). *Northern Saskatchewan guidelines (2014) for skin and soft tissue infections including suspect MRSA in the community setting.* LaRonge, SK: Author.

Tsarouhas, N. (2014). *Cellulitis: 5 Minute Pediatric Consult.* Retrieved from Lexi-Comp Inc.

SASKATCHEWAN REGISTERED NURSES' ASSOCIATION

RNs WITH ADDITIONAL AUTHORIZED PRACTICE
CLINICAL DECISION TOOL
DECEMBER 1, 2016

CELLULITIS PEDIATRIC

NOTICE OF INTENDED USE OF THIS CLINICAL DECISION TOOL

This SRNA Clinical Decision Tool (CDT) exists solely for use in Saskatchewan by an RN with additional authorized practice as granted by the SRNA. The CDT is current as of the date of its publication and updated every three years or as needed. A member must notify the SRNA if there has been a change in best practice regarding the CDT. This CDT does not relieve the RN with additional practice qualifications from exercising sound professional RN judgment and responsibility to deliver safe, competent, ethical and culturally appropriate RN services. The RN must consult a physician/RN(NP) when clients' needs necessitate deviation from the CDT. While the SRNA has made every effort to ensure the CDT provides accurate and expert information and guidance, it is impossible to predict the circumstances in which it may be used. Accordingly, to the extent permitted by law, the SRNA shall not be held liable to any person or entity with respect to any loss or damage caused by what is contained or left out of this CDT.

Appendix

MRSA Guidelines 2014