

This decision support tool is effective as of October 2014. For more information or to provide feedback on this or any other decision support tool, email certifiedpractice@crnbc.ca

PEDIATRIC CELLULITIS

DEFINITION

An acute, diffuse, spreading infection of the skin, involving the deeper layers of the skin and the subcutaneous tissue.

Periorbital cellulitis occurs in the eyelid and skin surrounding the eye. It causes swelling and erythema of the eyelid and orbital area, and may be accompanied by fever and malaise. The average age of child affected is 21 months.

Be alert for any child who is unable to elevate or move the eyeball and any child with forward displacement of the eyeball, which indicates that the infection has extended into the orbit (orbital cellulitis). **This is an automatic referral to a physician or nurse practitioner.**

Nurses with Remote Practice Certified Practice designation (RN(C)s¹) are able to treat children with cellulitis who are **2 years of age and older.**

POTENTIAL CAUSES

- Bacteria: most commonly *Staphylococcus* or *Streptococcus* Group A β (GAS), *H. Influenzae* (periorbital cellulitis), *pasteurella multocida* (dog and cat bite)
- Facial cellulitis in children less than 3 years old may be due to *Hemophilus influenzae* or *Streptococcus pneumoniae* (this case would be an immediate referral)
- In B.C., methacillin resistant staph aureus comprises over 25% of staph aureus infections.

PREDISPOSING RISK FACTORS

- Local trauma (e.g., lacerations, insect bites, wounds, shaving)
- Skin infections such as impetigo, scabies, furuncle, tinea pedis
- Underlying skin ulcer
- Fragile skin
- Immunocompromised host

¹ RN(C) is an [authorized title](#) recommended by CRNBC that refers to CRNBC-certified RNs, and is used throughout this Decision Support Tool (DST).

CRNBC monitors and revises the CRNBC certified practice decision support tools (DSTs) every two years and as necessary based on best practices. The information provided in the DSTs is considered current as of the date of publication. CRNBC-certified nurses (RN(C)s) are responsible for ensuring they refer to the most current DSTs.

The DSTs are not intended to replace the RN(C)'s professional responsibility to exercise independent clinical judgment and use evidence to support competent, ethical care. The RN(C) must consult with or refer to a physician or nurse practitioner as appropriate, or whenever a course of action deviates from the DST.

- Diabetes mellitus
- Inflammation (e.g., eczema)
- Edema secondary to venous insufficiency or lymphedema
- Known methicillin resistant staph aureus (MRSA) positive (family or household member)

Note: If human, cat or dog bite was the original trauma, see Pediatric Bites DST

TYPICAL FINDINGS OF CELLULITIS

History

- Presence of predisposing risk factor
- Area increasingly red, warm to touch, painful
- Area around skin lesion also tender but pain localized
- Edema
- Mild systemic symptoms – low-grade fever, chills, malaise, and headache may be present
- Known MRSA positive

Physical Assessment

- Local symptoms:
 - Erythema and edema of area
 - Warm to touch
 - Possibly fluctuant (tense, firm to palpation)
 - May resemble peau d'orange
 - Advancing edge of lesion diffuse, not sharply demarcated
 - Small amount of purulent discharge may be present
 - Unilateral
- Systemic indications:
 - Increased temperature
 - Increased pulse
 - Lymphadenopathy of regional lymph nodes and / or lymphangitis
- Weigh until 12 years of age for medication calculations

Diagnostic Tests

- Swab any wound discharge for culture and sensitivity (C&S)

MANAGEMENT AND INTERVENTIONS

Note: Do not underestimate cellulitis. It can spread very quickly and may progress rapidly to necrotizing fasciitis. It should be treated aggressively and monitored on an on-going basis.

Goals of Treatment for Mild Cellulitis

- Resolve infection
- Identify formation of abscess
- Check tetanus prophylaxis

Non-pharmacologic Interventions

- Apply warm or, if more comfortable, cool saline compresses to affected areas qid for 15 minutes.
- Mark border of erythema with pen to monitor spread.
- Elevate, rest and gently splint the affected limb.

Pharmacologic Interventions

All drugs must be calculated by weight until age 12. Doses should never exceed adult doses.

- Pain management:
 - acetaminophen 10-15mg/kg per day po q4-6hours. Do not exceed 75mg/kg per 24 hours, OR
 - ibuprofen 5-10mg/kg, po q6-8h prn. Do not exceed 40mg/kg/24hr
- Oral antibiotics if no known MRSA or non-purulent cellulitis:
 - cephalexin 40mg/kg per day po divided qid for 7-10 days (usually first choice due to taste)OR
 - cloxacillin 40mg/kg per day po divided qid for 7-10 days
- Clients with penicillin allergy:
 - erythromycin 40 mg/kg/day divided bid for 7-10 days. If treatment failure, consult with a physician or nurse practitioner.
- Clients with known community acquired MRSA or purulent cellulitis:
 - trimethoprim-sulfamethoxazole 8-12 mg / kg per day po bid for 7 days (dosing is based on trimethoprim.)

Pregnant or Breastfeeding Women (dosing as above)

- Cephalexin, cloxacillin, erythromycin and acetaminophen may be used as listed above.
- DO NOT USE trimethoprim-sulfamethoxazole or ibuprofen

POTENTIAL COMPLICATIONS

- Extension of infection
- Abscess formation

- Sepsis
- Necrotising fasciitis
- Recurrent cellulitis

CLIENT/CAREGIVER EDUCATION AND DISCHARGE INFORMATION

- Advise on condition, timeline of treatment and expected course of disease process.
- Counsel client about appropriate use of medications (dose, frequency, compliance).
- Encourage proper hygiene of all skin wounds to prevent future infection.
- Stress importance of close follow-up.
- If shaving is the cause, educate the client about shaving with the hair growth.

MONITORING AND FOLLOW-UP

- Follow-up daily to ensure that infection is controlled.
- Instruct parent or caregiver to return for reassessment immediately if lesion becomes fluctuant, if pain increases, if cellulitis spreads or if fever develops.

CONSULTATION AND/OR REFERRAL

- Consult with or refer to a physician or nurse practitioner if:
 - systemic symptoms present or progression of disease is rapid,
 - no improvement after 48 hours of antibiotics,
 - client is diabetic and /or immunocompromised,
 - pain is out of proportion to the clinical findings,
 - cellulitis is over or involves a joint, or
 - any facial cellulitis.

DOCUMENTATION

As per agency policy

REFERENCES

For help obtaining any of the items on this list, please contact CRNBC Helen Randal Library at circdesk@crnbc.ca

More recent editions of any of the items in the Reference List may have been published since this DST was published. If you have a newer version, please use it.

- Anti-Infective Review Panel. (2012). *Anti-infective guidelines for community-acquired infections*. Toronto, ON: MUMS Guideline Clearinghouse.
- Blondel-Hill, E., & Fryters, S. (2012). *Bugs and drugs: An antimicrobial infectious diseases reference*. Edmonton, AB: Alberta Health Services.
- Breen, J. O. (2010). Skin and soft tissue infections in immunocompetent patients. *American Family Physician*, 81(7), 893-899. Retrieved from <http://www.aafp.org/afp/2010/0401/p893.pdf>
- British Columbia Centre for Disease Control. (2011). *Antimicrobial resistance trends in the Province of British Columbia 2011*. Vancouver, BC: Author. Retrieved from http://www.bccdc.ca/NR/rdonlyres/4F04BB9C-A670-4A35-A236-CE8F494D51A3/0/AntimicrobialResistanceTrendsInBC_2011.pdf
- British Columbia Centre for Disease Control. (2014). *Guidelines for the management of community-associated methicillin-resistant Staphylococcus aureus (CA-MRSA)-related skin and soft tissue infections in primary care*. Vancouver, BC: Author. Retrieved from <http://www.bccdc.ca/NR/rdonlyres/C85DFF3A-DB43-49D6-AEC7-2C1AFD10CD69/0/MRSAguidelineFINALJuly7.pdf>
- Canadian Pharmacists Association. (2011). *Therapeutic choices* (6th ed.). Ottawa, ON: Author.
- Chen, Y. A., & Tran, C. (Eds.). (2011). *The Toronto notes 2011: Comprehensive medical reference and review for the Medical Council of Canada Qualifying Exam Part 1 and the United States Medical Licensing Exam Step 2* (27th ed.). Toronto, ON: Toronto Notes for Medical Students.
- DynaMed. (2012, November 13). *Preseptal cellulitis*. Retrieved from <http://search.ebscohost.com/login.aspx?direct=true&AuthType=cpid&custid=s5624058&db=dme&AN=113841>
- DynaMed. (2014, August 7). *Cellulitis*. Retrieved from <http://search.ebscohost.com/login.aspx?direct=true&AuthType=cpid&custid=s5624058&db=dme&AN=116794>
- DynaMed. (2014, August 12). *Treatment of MRSA skin and soft tissue infections*. Retrieved from <http://search.ebscohost.com/login.aspx?direct=true&AuthType=cpid&custid=s5624058&db=dme&AN=900862>
- DynaMed. (2014, August 21). *Orbital cellulitis*. Retrieved from <http://search.ebscohost.com/login.aspx?direct=true&AuthType=cpid&custid=s5624058&db=dme&AN=115737>
- Esau, R. (Ed.). (2012). *British Columbia's Children's Hospital pediatric drug dosage guidelines* (6th ed.). Vancouver, BC: Children's & Women's Health Centre of B.C.
- Herchline, T. E. (2014, August 19). *Cellulitis*. Retrieved from <http://emedicine.medscape.com/article/214222-overview>

- Liu, C., Bayer, A., Cosgrove, S.E., Daum, R.S., Fridkin, S.K., Gorwitz, R.J.,...Chambers, H.F. (2011). Clinical practice guidelines by the Infectious Diseases Society of America for the treatment of methicillin-resistant *Staphylococcus aureus* infections in adults and children. *Clinical Infectious Diseases*, 52(3), e18-e55. Retrieved from <http://cid.oxfordjournals.org/content/52/3/e18.full.pdf+html>
- Long, C. B., Madan, R. P., & Herold, B. C. (2010). Diagnosis and management of community-associated MRSA infections in children. *Expert Review of Anti-Infective Therapy*, 8(2), 183-195.
- Methicillin-resistant *Staphylococcus aureus* in First Nations communities in Canada. (2005). *Pediatrics and Child Health*, 10(9), 557-559. Retrieved from <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC2722643/pdf/pch10557.pdf>
- Moran, G. J., Krishnadasan, A., Gorwitz, R. J., Fosheim, G. E., McDougal, L. K., Carey, R. B., Talan, D.A. (2006). Methicillin-resistant *S. aureus* infections among patients in the emergency department. *New England Journal of Medicine*, 355(7), 666-674. Retrieved from <http://www.nejm.org/doi/pdf/10.1056/NEJMoa055356>
- Napierkowski, D. (2013). Uncovering common bacterial skin infections. *Nurse Practitioner*, 38(3), 30-37. Retrieved from <http://search.ebscohost.com/login.aspx?direct=true&AuthType=cpid&custid=s5624058&db=ccm&AN=2012023989&site=ehost>
- NeVille-Swensen, M., & Clayton, M. (2011). Outpatient management of community-associated methicillin-resistant *Staphylococcus aureus* skin and soft tissue infection. *Journal of Pediatric Health Care*, 25(5), 308-315.
- Rockwell, F., Goh, S. H., Al-Rawahi, G., Hoang, L., Isaac-Renton, J., Gilbert, M.,...Patrick, D. (2005). A report on the emergence of Community-Acquired Methicillin-Resistant *Staphylococcus aureus* (CA-MRSA) in British Columbia. Retrieved from http://www2.canada.com/vancouver/news/extras/mrsa_report.pdf
- Stevens, D., Bisno, A. L., Chambers, H. F., Dellinger, E. P., Goldstein, E. J. C., Gorbach, S. L.,...Wade, J. C. (2014). Practice guidelines for the diagnosis and management of skin and soft tissue infections: 2014 update by the Infectious Diseases Society of America. *Clinical Infectious Diseases*, 59(2), e10-e52. Retrieved from <http://cid.oxfordjournals.org/content/59/2/e10.full.pdf+html>
- Watkins, J. (2012). Differentiating common bacterial skin infections. *British Journal of School Nursing*, 7(2), 77-78. Retrieved from <http://search.ebscohost.com/login.aspx?direct=true&AuthType=cpid&custid=s5624058&db=ccm&AN=2011519936&site=ehost-live>
- Wolff, K., & Johnson, R. A. (2009). *Fitzpatrick's color atlas and synopsis of clinical dermatology* (6th ed.). New York: McGraw-Hill Medical.