SASKATCHEWAN REGISTERED NURSES' ASSOCIATION

RNs WITH ADDITIONAL AUTHORIZED PRACTICE
CLINICAL DECISION TOOL
AUGUST 2017

CUTANEOUS INFECTIONS ADULT & PEDIATRIC (FOLLICULITIS, FURUNCLE, CARBUNCLE, ECTHYMA)

DEFINITION

Cutaneous infections include:

- Folliculitis: a superficial inflammation of the epidermis around a hair follicle. This acute lesion usually consists of a dome-shaped pustule at the mouth of the hair follicle. Primary sites include the scalp, shoulders, anterior chest, upper back, and other hair-bearing areas.
- Furuncle (Boil): infection of the hair follicle involving surrounding subcutaneous tissue leading to abscess formation. Primary sites include thigh, neck, face, axillae, perineum, and buttocks. Usually caused by *Staphylococcus aureus (S. aureus).*
- Carbuncle: a deep-seated abscess formed by multiple coalescing furuncles, usually caused by *S. aureus*. The lesions drain through the follicular orifice to the surface.
- Ecthyma: a skin infection characterized by crusted sores beneath which ulcers form.

Both furuncles and carbuncles evolve from folliculitis.

IMMEDIATE CONSULTATION REQUIRED IN THE FOLLOWING SITUATIONS

- Signs and symptoms of sepsis (e.g., fever, tachycardia, hypotension, tachypnea, altered mental status)
- Immunocompromised client
- Streaking from the infection site
- Crepitus
- Necrosis
- Rapid spread of inflammation over a period of hours
- Large area of cellulitis
- Area difficult to drain (e.g., face and neck)

CAUSES

Folliculitis:

- Infectious:
  - *S. aureus* (most common)

  - *Streptococcous pyogenes*
  - *Pseudomonas aeruginosa*
  - Proteus
  - Klebsiella
  - Syphilis
  - Fungi (Tinea and *Candida albicans*)
  - Parasites
- Non-infectious:
  - Drug induced folliculitis
  - Nutritional deficiencies
  - Occupational acne from exposure to certain chemicals
  - Actinic folliculitis
- Other causes:
  - Acne vulgaris
  - Rosacea
  - Perioral dermatitis
  - Chronic folliculitis
  - Pruritic folliculitis in pregnancy

Furuncles and Carbuncles:

- *S. aureus*
- Methicillin-resistant *S. aureus* (MRSA)

Ecthyma

- *Streptococcus pyogenes*
- *S. aureus*

PREDISPOSING AND RISK FACTORS

- Obesity
- Immunocompromised state
- Carrier of staphylococcus
- Streptococcus infection
- Complicated pruritic skin disorder
- Exposure to oils or chemicals
- Pinworm infestation

- Shaving against the direction of hair growth
- Exposure to heated contaminated water (e.g., whirlpool tubs, swimming pools, and hot tubs)
- Diabetes mellitus
- Existing skin conditions such as atopic eczema, scabies, pediculosis, abrasions, wounds, and excoriations
- Poor hygiene and overcrowded living conditions
- Excessive friction or perspiration
- Participation in body contact sports such as wrestling
- Seborrhea
- Malnutrition
- Blood dyscrasias and anemia
- Male gender
- Adolescence
- Close personal contact with an infected person
- Local trauma (e.g., from plucking hairs)
- Use of immunosuppressive drugs (e.g., systemic steroids)
- Exposure to infected individual

HISTORY

- Pain, swelling, redness at infected site
- Fever may be present
- Itching
- Enquire about:
  - Underlying immunodeficiency
  - Substance abuse
  - Exposure to contaminated water
  - Animal exposure
  - Occupational exposure to oils or chemicals

Suspect 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 the last 6 months
- Invasive procedures/devices (e.g., dialysis, indwelling catheter); advanced age, young adults

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) (Appendix attached)

PHYSICAL FINDINGS

Furuncles and Carbuncles

- Localized redness, swelling
- Pustules and papulopustules
- Lesion may be draining, crusted
- Localized induration
- Tenderness
- Fever and malaise may be present
- Fluctuance (may be difficult to palpate if abscess is deep)
- Regional lymph nodes may be enlarged and tender
- Heart rate may be elevated

Ecthyma

- Begins as a vesicle or pustule on an inflamed area of skin which evolves to a hard crust.
- With difficulty, the crust can be removed to reveal an indurated ulcer that may be red, swollen and oozing with pus.

DIFFERENTIAL DIAGNOSIS

- Cellulitis
- Abscess
- Herpes zoster
- Herpes genitalis
- Impetigo

- Pseudofolliculitis barbae
- Keratosis pilaris
- Acne vulgaris
- Erysipelas
- Sebaceous cyst
- Myiasis
- Acute HIV infection
- Syphilis second stage
- Hepatitis
- Hidradenitis suppurativa
- Kerion
- Osteomyelitis
- Drug eruptions
- Malignancy

COMPLICATIONS

- Cellulitis
- Abscess
- Spread of infection (e.g., lymphangitis, lymphadenitis, endocarditis, osteomyelitis, cavernous sinus thrombosis)
- Sepsis
- Scarring
- Recurrence

INVESTIGATIONS AND DIAGNOSTIC TESTS

Usually testing is not required.

Consider taking a swab of the pus from the lesion if the boil or carbuncle:

- is not responding to treatment.
- is persistent or recurrent.
- if there are multiple lesions.
- if the client is:
  - Immunocompromised
  - Diabetic

Determine blood glucose level if the infection is recurrent or if the symptoms suggest diabetes mellitus.

MAKING THE DIAGNOSIS

- Diagnosis is usually made by history and physical examination.
- The result of a culture may aid in the identification of the infectious agent.

MANAGEMENT AND INTERVENTIONS

Goals of Treatment

- Control infection
- Prevent complication
- Identify predisposing underlying conditions (e.g., diabetes mellitus)

Appropriate Consultation

Consult a physician/RN(NP) if:

- the client is febrile or appears acutely ill.
- extensive cellulitis, lymphangitis, or adenopathy is present.
- infection is suspected or detected in a critical region (e.g., perirectal area or facial lesions).
- the client is immunocompromised (e.g., diabetic).

These are more complicated infections and require guidance around treatment such as the initiation of IV antibiotic treatment.

Non-Pharmacological Interventions

Folliculitis

- Clients rarely consult for this condition except for an infection that becomes recurrent or persistent.
- Gentle cleansing of the area bid using regular soap assists to reduce pathogens.
- Large pustular lesions can be incised and drained and then an antibiotic ointment can be applied (e.g., fusidic acid 2%, Bactroban).
- Counsel client/caregiver about appropriate use of medications (dose, frequency, compliance, etc.) and if on antibiotics, reinforce the need to complete the course despite feeling better within days.

- Counsel the client/caregiver about prevention of future episodes.
- Advise the client/caregiver to return if the infection becomes fluctuant as it may need incision and drainage.

Furuncle and Carbuncle

- Application of warm compresses will promote the localization and rupture/drainage of a furuncle.
- Fluctuant furuncles are ideally treated with incision and drainage. After incision, the client/caregiver should be instructed to use warm compresses bid to hasten drainage of pus.

Ecthyma

- Application of warm compresses to loosen crusts and aid in removal.

Pharmacological Interventions

Folliculitis and Furuncle

Adults and Children:

- Clearance of nasal colonization of *S. aureus* by mupirocin or fusidic acid 2% bid for 5 days has been shown to significantly reduce the incidence of recurrent folliculitis.
- A topical antibiotic ointment (e.g., mupirocin, fusidic acid 2%) can be effective if applied tid to qid for 10 days.
- Systemic antibiotics are not advantageous over topical treatments.
- In communities with high incidence of MRSA, consider use of Polysporin Triple.

Carbuncle

- Topical antibiotics are not indicated for draining lesions.
- Systemic antibiotics are typically required to manage the infection and should be initiated prior to transfer for incision and drainage.

First Line:

Adults:

- Cephalexin 500 mg orally q6h for 7-10 days

Children:

- Cephalexin (Keflex) 50-100 mg/kg/day orally divided q6h for 10 days (maximum 4

g/day)

Second Line:
Adult:

- Cloxacillin 500 mg orally q6h for 7-10 days

Children:

- Cloxacillin 50 mg/kg/day orally divided q6h for 7-10 days

For clients with allergy to penicillin or MRSA positive:
Adult:

- Clindamycin 300 mg orally q6h for 10 days
  Or
- Sulfamethoxazole/Trimethoprim (SMX/TMP) 1-2 DS tabs (800/160 mg) orally q8-12h for 10 days

Children:

- Clindamycin 10-30 mg/kg/day divided into 3 or 4 doses for 7-10 days
  Or
- Sulfamethoxazole/Trimethoprim (SMX-TMP) 40-60 mg/kg/day SMX & 8-12 mg/kg/day TMP orally divided q12h for 10 days

Ecthyma

- A topical antibiotic ointment (e.g., mupirocin, fusidic acid 2%) can be effective if applied tid to qid for 10 days. The ointment should be applied after removing the crusts.
- If the infection is extensive or proving slow to respond to topical antibiotics, consider one of the following oral antibiotics:
  Adult:
  - Cloxacillin 125-500 mg orally q6h for 10 days
    Or
  - Cephalexin 500 mg orally q6h for 10 days

  Children:
  - Cephalexin (Keflex) 50-100 mg/kg/day orally divided q6h for 10 days (maximum 4 g/day)
    Or
  - Cloxacillin 50 mg/kg/day orally divided q6h for 7-10 days

Antipyretics and Analgesia
Adult:

- Ibuprofen (Motrin) 400-600 mg orally q8h prn (maximum dose 3.2 g per day)
  Or
- Acetaminophen (Tylenol) 500-1000 mg orally q4-6h prn (maximum dose 4 g/day)

Children:

- Acetaminophen (Tylenol) 15 mg/kg/dose orally q4-6h prn (maximum dose 75 mg/kg/day)
  Or
- Ibuprofen 10 mg/kg/dose orally q6h prn (maximum dose 40 mg/kg/day)

Client and Caregiver Education

- Take acetaminophen or ibuprofen as required for pain relief.
- Maintenance of good personal hygiene.
- Wash hands carefully after contact with lesions.
- Wash underclothes, bed linen, and towels at a high temperature daily to prevent spreading the infection to other parts of the body, or to other people.
- Use a separate face cloth and towel.
- Wear loose-fitting, lightweight, porous clothes as much as possible.
- Keep wounds or grazes clean and covered with sterile gauze until they heal.
- Seal and discard used gauze or dressings immediately. If purulent drainage collects, gauze or dressings should be changed frequently.

Monitoring and Follow-Up

- Follow-up daily until infection resolves.

Referral

- Refer when lesions are refractory to treatment or diagnosis is in doubt.
- For furuncles and carbuncles in immunocompromised clients (or one who is at risk for bacteremia because of a pre-existing condition), systemic antibiotics are needed and a physician/RN(NP) referral is recommended.
- A client with a furuncle located on the upper lip or central area of the face or a carbuncle located on the neck, face, or scalp should be referred to a physician/RN(NP). Because of its proximity to the cavernous sinus, a furuncle

located on the face can spread via venous drainage and result in cavernous sinus thrombosis or meningitis.

- Carbuncles frequently need incision, drainage, and systemic antibiotics. A physician referral is required for incision and drainage of carbuncles.

DOCUMENTATION

- As per employer policy

REFERENCES

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

Dunphy, L. M., Winland-Brown, J. E., Porter, B. O., & Thomas, D. J. (2015). *Primary care: The art and science of advanced practice nursing.* (4th ed.). Philadelphia: F.A. Davis Company.

DynaMed. (2013 July 18). *Skin abscesses, furuncles, and carbuncles*. Retrieved from www.ebscohost.com

DynaMed. (2013 July 18). *Folliculitis*. Retrieved from www.ebscohost.com

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

John, W., & Ely, M. D. (2013 October 14). *Furuncles*. Retrieved from http://www.essentialevidenceplus.com

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. http://doi.org/10.1093/cid/ciq146

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.

Rx Files Academic Detailing Program. (2014). *Rx Files: Drug comparison charts.* Saskatoon, SK: Saskatoon Health Region.

Stollery, N. (2014). Skin infections. *Practitioner*, *258*(1770), 32–33.

Watkins, J. (2012). Differentiating common bacterial skin infections...part of a series on dermatology. *British Journal of School Nursing*, *7*(2), 77–78.

Appendix

MRSA Guidelines 2014