College of Registered Nurses of Saskatchewan

Cutaneous Infections: Adult & Pediatric

Skin and Integumentary

Clinical Decision Tools for RNs with Additional Authorized Practice [RN(AAP)s]

Effective Date: February 1, 2022

Background

Cutaneous infections include folliculitis, furuncle, carbuncle, and ecthyma (Garnett, Winland-Brown, & Porter, 2019). Folliculitis is a superficial inflammation of the epidermis around a hair follicle (Garnett et al., 2019). This acute lesion usually consists of a dome-shaped pustule at the mouth of the hair follicle (Garnett et al., 2019). Primary sites include the scalp, shoulders, anterior chest, upper back, and other hair-bearing areas (Garnett et al., 2019). Folliculitis can be infectious (e.g., *Staphylococcus aureus, Streptococcus pyogenes*) and non-infectious (e.g., drug induced) (Garnett et al., 2019). A furuncle is an infection of the hair follicle involving surrounding subcutaneous tissue leading to abscess formation (Garnett et al., 2019). Primary sites include thigh, neck, face, axillae, perineum, and buttocks and is usually caused by *S. aureus* (Garnett et al., 2019). Carbuncle is a deep-seated abscess formed by multiple coalescing furuncles, usually caused by *S. aureus* (Garnett et al., 2019). The lesions drain through the follicular orifice to the surface. Both furuncles and carbuncles evolve from folliculitis and methicillin-resistant *S. aureus* (MRSA) should be considered if the condition recurs (Garnett et al., 2019). Ecthyma is a skin infection characterized by crusted sores beneath which ulcers form (Garnett et al., 2019). Causes include *S. aureus* (most common) and *Streptococcus pyogenes* (Garnett et al., 2019).

Immediate Consultation Requirements

The RN(AAP) should seek immediate consultation from a physician/NP when any of the following circumstances exist:

- signs and symptoms of sepsis (e.g., fever, tachycardia, hypotension, tachypnea, altered mental status),
- immunocompromised client,
- lymphangitis (streaking) from the infection site,
- crepitus when palpating lesion,
- necrosis of tissue surrounding the lesion,
- rapid spread of cellulitis over a period of hours (refer to the Cellulitis CDT),
- large area of cellulitis, and/or

- an area that is difficult to drain (e.g., face and neck, perirectal area) (Interprofessional Advisory Group [IPAG], personal communication, October 20, 2019).

Predisposing and Risk Factors

Predisposing and risk factors for cutaneous infections include:

- obesity;
- immunocompromised state (e.g., diabetes mellitus);
- Staphylococcus colonization;
- Streptococcus infection;
- complicated pruritic skin disorder;
- exposure to oils or chemicals (occlusive to pores);
- shaving against the direction of hair growth;
- exposure to heated contaminated water (e.g., whirlpool tubs, swimming pools, and hot tubs);
- existing skin conditions such as atopic dermatitis, scabies, pediculosis, abrasions, wounds, in-grown hairs 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;
- adolescence;
- close personal contact with an infected person; and/or
- local trauma (e.g., from plucking hairs) (Garnett et al., 2019).

Health History and Physical Exam

Subjective Findings

Clients may present with the following complaints:

- pain, swelling, and redness at the affected site;
- fever; and/or itching (Garnett et al., 2019).

The RN(AAP) should enquire about:

- underlying immunodeficiency (e.g., human immunodeficiency virus [HIV]);
- substance abuse;
- exposure to contaminated water;
- animal exposure;
- occupational exposure to oils or chemicals;
- history of MRSA;

- invasive procedures/devices (e.g., dialysis, indwelling catheter); and/or
- advanced age and young adults (Garnett et al., 2019).

Objective Findings

Cutaneous infections are delineated by type and may include:

Folliculitis

- initially small pustules over the pilosebaceous orifice surrounded by 1 to 3 millimeter of erythema,
- resolving lesions progress to red macules which in some cases fade to hyperpigmented scars (Anti-Infective Review Panel, 2019; Garnett et al., 2019).

Furuncles and Carbuncles

- pustules and papulopustules with localized redness and erythema with localized induration,
- lesion may be draining and/or crusted,
- tender to palpation,
- fever and malaise,
- tachycardia,
- fluctuance (may be difficult to palpate if abscess is deep),
- regional lymph nodes may be enlarged and tender (Anti-Infective Review Panel, 2019; Garnett et al., 2019).

Ecthyma

- begins as a vesicle or pustule on an inflamed area of skin which evolves to a hard crust that is difficult to remove;
- crust removal reveals an indurated ulcer that is typically red, swollen and oozing purulent discharge (Anti-Infective Review Panel, 2019; Garnett et al., 2019).

Differential Diagnosis

The following should be considered as part of the 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, or
- malignancy (e.g., squamous cell carcinoma (Garnett et al., 2019).

Making the Diagnosis

The diagnosis is based on history and physical findings (Garnet et al., 2019).

Investigations and Diagnostic Tests

Investigations and diagnostic tests are typically not indicated.

Management and Interventions

Goals of Treatment

The primary goals of immediate treatment are to identify the underlying cause, provide pain relief as needed, prevent complications, and prevent recurrence (Garnett et al., 2019).

Non-Pharmacological Interventions

The RN(AAP) should recommend, as appropriate, non-pharmacological options:

- gentle cleansing of the area with an antiseptic cleanser bid as necessary, and
- warm compresses to the area qid as necessary (Anti-Infective Review Panel, 2019; Garnett et al., 2019).

If a large pustular lesion needs to be incised and drained, the RN(AAP) should refer to a physician/NP or perform the incision and drainage as directed by an applicable RN Clinical Protocol within RN Specialty Practices (Anti-Infective Review Panel, 2019; Comer & Campo, 2021).

Pharmacological Interventions

The pharmacological interventions recommended for the treatment of cutaneous infections are in accordance with the *RxFiles Drug Comparison Charts* (RxFiles Academic Detailing Program, 2021), *Anti-infective Guidelines for Community-acquired Infections* (Anti-infective Review Panel, 2019), and the *Northern Saskatchewan Guidelines (2014) for Skin and Soft Tissue Infections including suspect MRSA in the Community Setting* (Population Health Unit, Northern Saskatchewan, 2014).

Cutaneous Infections (Folliculitis, Furuncle, Carbuncle and Ecthyma)

Folliculitis and furuncle cutaneous infections are typically self-limited. A topical antibiotic ointment is appropriate for mild localized infections which are unresponsive to non-pharmacological measures. Consider using oral antibiotics for carbuncles greater than five centimeters in diameter, if there are multiple lesions, there is extensive cellulitis surrounding the lesion, the lesion is located on the face, or the client has a fever and feels unwell. A topical antibiotic ointment can be effective for ecthyma. If the infection is extensive or proving slow to respond to topical antibiotics, consider one of the oral antibiotics used to manage carbuncles.

	Drug	Dose	Route	Frequency	Duration
Pediatric and Adult					
	Mupirocin ointment	based on surface area to be covered	topical	t.i.d.	7-10 days
OR	Fusidic acid cream or ointment	based on surface area to be covered	topical	t.i.d. or q.i.d.	7 days
OR	Polysporin triple therapy	based on surface area to be covered	topical	t.i.d.	7-10 days
Pediatric (without penicillin allergy)					
	Cephalexin	50-100 mg/kg/day (maximum 2 g/day)	p.o.	divided q6h	5-7 days
OR	Cloxacillin	50 mg/kg/day (do not exceed adult dose)	p.o.	divided q6h	5-7 days
Adult (without penicillin allergy)					
	Cephalexin	500 mg	p.o.	q.i.d.	5-7 days
OR	Cloxacillin	500 mg	p.o.	q.i.d.	5-7 days
Pediatric (with penicillin allergy)					
	Sulfamethoxazole - Trimethoprim (SMX-TMP)	8-12 mg/kg/day (TMP is used for calculations; do not exceed adult dose)	p.o.	divided q12h	5-7 days

OR	Doxycycline (≥ 8 years of age)	4 mg/kg/day (maximum single dose of 100 mg)	p.o.	divided b.i.d.	5-7 days
Adult (with penicillin allergy)					
	Sulfamethoxazole - Trimethoprim (SMX-TMP)	1-2 DS tabs (800/160 mg)	p.o.	b.i.d.	5-7 days
OR	Doxycycline	100 mg	p.o.	b.i.d.	5-7 days
Pediatric [with Methicillin-resistant *S. aureus* (MRSA)]					
	Sulfamethoxazole - Trimethoprim (SMX-TMP)	8-12 mg/kg/day (dosage is calculated using TMP component; do not exceed adult dose)	p.o.	divided q12h	5-7 days
OR	Doxycycline (≥ 8 years of age)	4 mg/kg/day (maximum single dose of 100 mg)	p.o.	divided b.i.d.	5-7 days
OR	Clindamycin	20-40 mg/kg/day (do not exceed adult dose)	p.o.	divided into 3 or 4 doses	5-7 days
Adult [with Methicillin-resistant *S. aureus* (MRSA)]					
	Sulfamethoxazole - Trimethoprim (SMX-TMP)	1-2 DS tabs (800/160 mg)	p.o.	b.i.d.	5-7 days
OR	Doxycycline	100 mg	p.o.	b.i.d.	5-7 days
OR	Clindamycin	300 mg	p.o.	q.i.d.	5-7 days
OR	Clindamycin	450 mg	p.o.	t.i.d.	5-7 days

Analgesics and Antipyretics

	Drug	Dose	Route	Frequency	Duration
Pediatric					
	Acetaminophen	15 mg/kg/dose (maximum dose 75 mg/kg/day)	p.o.	q4-6h prn	5-7 days
AND/ OR	Ibuprofen	10 mg/kg/dose (maximum dose 40 mg/kg/day)	p.o.	q6-8h prn	5-7 days
Adult					
	Acetaminophen	500-1000 mg (maximum dose of 4 g/day)	p.o.	q4-6h prn	5-7 days
AND/ OR	Ibuprofen (preferred)	400 mg (maximum dose of 1600 mg/day)	p.o.	q6-8h prn	5-7 days

Client and Caregiver Education

The RN(AAP) provides client and caregiver education as follows:

- Counsel about the appropriate use of medications (dose, frequency, application, compliance, side effects, etc.).
- Educate about prevention including personal hygiene, washing hands after contact with lesions, and dedicated personal care items (e.g., face cloth and towel).
- Advise clothing that is loose-fitting, lightweight, and porous.
- Advise to keep wounds covered with sterile gauze until they heal and educate about how to discard used gauze or dressings (Garnett et al., 2019).

Monitoring and Follow-Up

The RN(AAP) should:

- arrange for the client to return in 24-48 hours and again in 10 days to evaluate therapeutic response.
- understand that the fever, if present, should decrease in 24-48 hours but the tissue swelling is not likely to resolve for one to two weeks.
- mark the area of erythema and induration with a pen to be able to later assess the effectiveness of treatment.

- advise to return for reassessment immediately if lesion becomes fluctuant, if pain increases, or if fever develops or worsens.
- consider obtaining a culture and sensitivity swab if the lesion is not responding to treatment, is persistent, or recurrent (Garnett et al., 2019).

Complications

The following complications may be associated with cutaneous infections:

- spread of infection (e.g., lymphangitis, lymphadenitis, endocarditis, osteomyelitis, cavernous sinus thrombosis),
- sepsis,
- scarring, and
- recurrence (Garnett et al., 2019).

Referral

Refer to a physician/NP if client presentation is consistent with those identified in the *Immediate Consultation Requirements* section or if the client does not respond to treatment (IPAG, personal communication, October 20, 2019).

References

Anti-Infective Review Panel. (2019). *Anti-infective guidelines for community-acquired infections*. MUMS Guideline Clearinghouse.

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