Assessment and Diagnostic Guideline: Integumentary

Registered Nurses who hold **Remote Nursing** Certified Practice designation are authorized to manage, diagnose, and/or treat the following integument conditions:

- Abscess and Furuncle (Adult only)
- Cellulitis (Adults & **children 6 months of age and older**)
- Impetigo (Adults & **children 2 years of age and older**)
- Bites (Adults & **children 1 year of age and older**)

This Guideline is for RN(C)s when conducting assessments and diagnostic tests related to integumentary conditions that can be managed and/or treated under the Certified Practice framework. RN(C)s maintain an RN scope of practice which is expanded for the RN(C) to diagnose and treat specific conditions listed above.

RN(C)s must ensure they complete and document their clinical reasoning through assessments according to regulatory practice standards and their practice setting requirements. Upon arriving at a diagnosis, RN(C)s should consult the relevant *Care and Treatment Plans* to inform the management and treatment of the condition.

Visual Summary of Guideline

1

Integument: Physical Assessment (pages 2-5)

- Symptoms requiring urgent referral
- General appearance and vital signs
- Physical integument assessment
  - Inspection
  - Palpation
- Major types of skin lesions
- Major arrangements of skin lesions
- Associated system assessments

2

Typical Findings of Cellulitis (pages 5-6) and **Impetigo** (pages 6-7), **Bites and Scratches** (pages 7-8), **Abscess and Furuncle** (pages 9)

- Potential causes/risk factors
- History
- Physical assessment

3

Refer to the appropriate *Care and Treatment Plan* based on findings from the assessment and diagnostic tests:

- *Care and Treatment Plan: Abscess and Furuncle*
- *Care and Treatment Plan: Cellulitis*
- *Care and Treatment Plan: Impetigo*
- *Care and Treatment Plan: Bites and Scratches*

1) Integumentary: Physical Assessment and Review of System

*Refer to the Assessment and Diagnostic Guideline: General as needed.

In addition to the health history and review of system questions outlined in the *Assessment and Diagnostic Guideline: General*, for a client who has symptoms affecting their integumentary system, review this list to ask about additional signs and symptoms to aid your clinical reasoning process in ruling conditions in or out that can be treated by one of the DSTs.

Note: The Assessment and Diagnostic Guideline General does not include the physical assessments.

Symptoms Requiring Urgent Referral

The first step is to differentiate a major skin eruption, infection, or event from a minor one that can be managed by nurses with certified practice designation.

The following require consultation and/or referral to a physician or nurse practitioner:

- Petechiae or widespread purpura
- Unusual bruising
- Palmer erythema
- Spider angioma
- Caput medusae
- Jaundice
- Butterfly rash
- Skin presentation in the presence of systemic disease
- Known or suspected MRSA
- Any cellulitis covering or involving a joint
- Suspicious pigmented lesions
- *Urgent referral/consultation*: Facial, periorbital, and orbital cellulitis are particularly worrisome as they can lead to meningitis

Vision Review of System Questions

- See *Assessment and Diagnostic Guideline: General* – 'Review of system: Eyes' section if not already done.

General Appearance and Vital Signs

- Apparent state of health
  - Acutely or chronically ill
- Match between appearance and stated age
  - Appearance of comfort or distress
- Position of comfort
  - Diaphoresis
  - Ability to speak in full sentences without stopping to take a breath
  - Skin colour
- Nutritional status
- Hydration status (older adults at risk)
- Hygiene
- Gait and mobility status

- Piercings and tattoos
- Vital signs
  - Temperature
  - Pulse
  - Respiration
  - SpO_2
  - Blood pressure (BP)

Physical Assessment of the Eye

Inspection and Palpation

General Skin Examination

- Colour
- Temperature, texture, turgor, tenderness
- Dryness or moisture
- Scaling
- Pigmentation
- Vascularity (erythema, abnormal veins)
- Bruises, petechiae
- Edema
- Induration
- Skin folds
- Hair, nails, mucous membranes

Individual Lesions

- Colour
- Type
- Texture
- General pattern of distribution
- Shape of single lesions, including the character of lesion edge (whether raised or flat)
- Joint involvement

Note: Examination of patients with darker skin colour requires awareness that pigmentation influences the colour of the lesion and how certain lesions manifest clinically.

Other Aspects

- Examine lymph nodes
- Examine area distal to enlarged lymph nodes

Major Types and Characteristics of Skin Lesions

- The major types and characteristics of skin lesions are presented in Tables 1 and 2
- Jaundice, spider angioma, palmar erythema or a necklace of telangiectasia may indicate liver disease, particularly associated with alcohol or viral infection
- Petechiae or purpura may suggest a coagulation problem

Table 1: Major Types of Skin Lesions

Type of Lesion	Characteristics
Primary Lesions	**Physical changes caused directly by the disease process**
Atrophy (may be secondary)	Skin thin and wrinkled
Macule and patches	Flat, circumscribed, discoloured spot; size and shape variable (e.g., freckle, mole, port-wine stain). Macules less than 1cm, patches greater than 1cm.
Nodule	Palpable, solid lesion that may or may not be elevated (e.g., keratinous cyst, small lipoma, fibroma). Usually greater than 1cm.
Papule	Solid elevated lesion (e.g., wart, psoriasis, syphilitic lesion, pigmented mole). Less than 1cm in diameter.
Petechiae, ecchymosis and purpura	Extravasation of blood into skin causing non-blanching red macules and patches. Petechiae less than 2mm. Ecchymosis more than 2mm. Purpura are groups of petechiae and or ecchymosis that may be confluent, macular, or raised.
Plaque	Well-defined plateau-like elevation compared to its height above the skin. For example: eczema, psoriasis.
Pustule	Superficial elevated lesion containing pus (e.g., impetigo, acne, furuncle, carbuncle)
Telangiectasia	Fine, often irregular red line produced by dilatation of a normally invisible capillary. Blanch with pressure.
Ulcer (may be secondary)	Loss of epidermis and at least part of the dermis
Vesicle and bulla	Circumscribed, elevated lesion <5mm in diameter containing clear fluid; larger vesicles are classified as bullae or blisters (e.g., insect bite, allergic contact dermatitis, sunburn).
Wheal	Transient, irregularly shaped, elevated, indurated, changeable lesion caused by local edema (e.g., allergic reaction to a drug, a bite, sunlight).
Secondary Lesions	**May evolve from primary lesions, or be caused by external sources such as trauma, infection, and scratching**
Crust	Dry exudate, e.g., a 'scab'
Erosion	Loss of part/ all of the epidermis
Excoriation	Superficial linear or hollowed-out crusted area, caused by scratching, rubbing, or picking
Exudative: Dry (crust or scab)	Dried serum, blood, or pus
Exudative: Wet (weeping)	Draining serum, blood, or pus
Lichenification	Skin thickened, skin markings accentuated (e.g., atopic dermatitis)
Pigmentation changes	Hyperpigmentation (increased skin pigment); hypopigmentation (decreased skin pigment); depigmentation (complete loss of skin pigment)

Scales	Heaping-up of the horny epithelium (e.g., psoriasis, seborrheic dermatitis, fungal infection, chronic dermatitis)
Scar	Various skin manifestations of healed process. (e.g., keloid or acne cicatrisation)

Sources: Suneja, M., Szot, J.F. LeBlond, R.F. & Brown, D. D. (2020); Wolff, K., Johnson, R., Saavedra, A.P. Roh, E.K. (2017); Health Canada, First Nations and Inuit Health Branch (2009) and Leblond, Degowin, and Brown (2009).

Table 2: Major Arrangements of Skin Lesions

Arrangement of Lesion	Characteristics of Lesion
Annular	Arranged in a circular pattern
Confluent	Merge and run together (e.g., exanthema)
Discrete	Individual, separate and distinct (e.g., insect bites)
Generalized	Scattered over the body (e.g., measles)
Grouped	Clustered (e.g., herpes simplex)
Linear or serpiginous	Forms a line or snakelike shape (e.g., poison ivy, dermatitis)
Polycyclic	Concentric circles resembling a "bullseye" (e.g., drug reactions, urticaria)
Zosteriform	Linear arrangement along a nerve foot (e.g., shingles)

Sources: Estes, M. E. Z. (2014); Suneja, M., Szot, J.F. LeBlond, R.F. & Brown, D. D. (2020); Estes (2014). Health Canada, First Nations and Inuit Health Branch (2009); Leblond, DeGowin, and Brown (2009).

2) Typical Findings

Cellulitis

Potential Causes

- Bacteria: most commonly *Staphylococcus* species
- In B.C., methicillin resistant staph aureus comprises over 25% of staph aureus infections

Predisposing Risk Factors

- Local trauma (e.g., lacerations, burns, insect bites, wounds, shaving)
- Skin infections such as impetigo, scabies, furuncle, tinea pedis
- Underlying skin ulcer
- Fragile skin
- Immunocompromised host
- Diabetes
- 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 *DST 603: Care and Treatment Plan: Bites and Scratches.*

History

- Presence of predisposing risk factor(s)
- 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 (movable and compressible – fluid-
- 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

Additional Pediatric Considerations

- Weigh until 12 years of age for medication calculations. Doses should not exceed recommended adult doses.

Diagnostic Tests

- Swab any wound discharge for culture and sensitivity.
- Determine blood glucose level if infection is recurrent or if symptoms are suggestive of diabetes mellitus.

Impetigo

Potential Causes

- *S. aureus* is the principal pathogen.
- *Group A Beta-hemolytic strep* presents alone or in conjunction with *S. aureus* in a minority of cases.

Predisposing Risk Factors

- Local skin trauma such as insect bites, wounds
- Skin lesions from other disorders such as eczema, scabies, pediculosis
- Age: more common in pre-school and young children (2-5 years)
- Crowded living conditions
- Poor hygiene
- Warm, moist climate

Additional Pediatric Considerations

- Children in close contact, e.g., daycare, school
- Known carrier of S. aureus and/or GAS

History

- More common on face, scalp, and hands, but may occur anywhere
- Involved area is usually exposed
- Usually occurs during summer
- New lesions usually due to autoinoculation
- Rash begins as tiny red lesions, which may be itchy
- Lesions rapidly become small vesicles, progressing to pustules, which rupture and drain to form yellow crusts
- Lesions painless
- Fever and systemic symptoms rare – mild fever may be present in more generalized infections
- Known methicillin-resistant staphylococcus aureus (MRSA) positive (client or household member)

Physical Assessment

- Thick, golden yellow, crusted lesion on a red base
- Numerous skin lesions at various stages present (vesicles, pustules, crusts, serous or pustular drainage, ulcers, healing lesions)
- Bullae may be present, but more common in children
- Lesions and surrounding skin may feel warm to touch
- Regional lymph nodes may be enlarged, tender

Additional Pediatric Considerations

- Weigh until 12 years of age for medication calculations. Doses should not exceed recommended adult doses.
- In infants and young children, the bullous form of impetigo may occur. In this case the vesicles continue to enlarge and form flaccid bullae (blisters) with a clear yellow fluid that slowly darkens. When these rupture, they leave thin golden- to brown-yellow-coloured crusts.

Diagnostic Tests

Identification of impetigo may be made upon consideration of clinical features and presentation.

- Culture and Sensitivity of exudate if widespread or treatment failure at 48 hours
- Determine blood glucose level if infection is recurrent or if symptoms suggestive of diabetes mellitus are present.

Bites and Scratches

Potential Causes

- Animal bites are common. 60–80% are caused by dogs, and 20–30% by cats; bites by other animals (rabbits, guinea pigs, hamsters, rats, mice) are much rarer.
  - Victims tend to be children
- Human bites account for as many as 20% of all bite injuries in some urban areas. Indirect human "bite" wounds caused by a blow from the fist to another person's teeth have their own specific pattern of injury (known as reverse bite injury, clenched fist injury, or fight bite).
- The spectrum of injury is broad. Infectious complications are common due to unusual pathogens.

History

- Determine cause of injury (human, animal)
- For animal bites: determine if bite was caused by a provoked or unprovoked animal
- Determine vaccination status of the animal (if possible) Refer to *BCCDC, Communicable Disease Control, Management of Specific Diseases, Rabies* (May 2017).

- Human bite: assess to determine exposure risk to the bloodborne viruses' hepatitis B virus (HBV), hepatitis C virus (HCV), syphilis, and Human Immunodeficiency Virus (HIV). bloodborne viruses.' Refer to *BCCDC, Communicable Disease Control, Blood and Body Fluid Exposure* (August 2016).
- Determine time elapsed since injury (after 3 hours, the bacterial count in a wound increase dramatically)
- Determine potential contaminants:
  - wound contact with manure, rust, dirt, etc., will increase risk of infection and tetanus
  - wounds sustained in barnyards or stables should be considered contaminated (*Clostridium tetani* is indigenous in manure)
- Amount of blood lost
- Loss of function in nearby tendons, ligaments, nerves (sensation)
- Immunization status including tetanus and hepatitis
- Assess if client or household contacts have tested positive for methicillin resistant staphylococcus aureus (MRSA)

Physical Assessment

- Findings may be tachycardia, hypotension if significant blood loss
- General
- Assess wound for:
  - Dimensions and depth
  - Lacerations versus punctures
  - Tissue loss
  - Infection (erythema, warmth, tenderness, discharge, local lymphadenopathy)
  - Foreign bodies: inspect the area
- Assess integrity of underlying structures (nerves, ligaments, tendons, blood vessels):
  - Vascular injury: capillary refill should be checked distally
  - Neurologic injury: check distal muscle strength, movement distal to wound and sensation
  - Always check sensation before administering anaesthesia
  - For hand and finger lacerations, check two-point discrimination (Two-point discrimination measures the individual's ability to perceive two points of stimuli presented simultaneously. The health care practitioner is interested in the smallest distance between the points that can still be perceived as two points by the individual being tested.) This should be less than 1cm at the fingertips.
  - Tendons: can be evaluated by inspection, but individual muscles and tendons must also be tested for full range of motion and full strength
  - Assess range of motion of all body parts surrounding the wound site
  - Bones: check for open fracture or associated fractures, based on mechanism of injury

Additional Pediatric Considerations

- Weight children until 12 years of age for medication calculations. Doses should not exceed recommended adult doses

Diagnostic Tests

- Swab discharge for Culture and Sensitivity (C&S) if infected
- For animal bite injuries follow the British Columbia Centre for Disease Control (BCCDC) *Rabies Protocol* (see references)
- For human bite injuries follow the British Columbia Centre for Disease Control (BCCDC) *Blood and Body Fluid Exposure Management*.

Abscess and Furuncle

Potential Causes

- Infection with *Staphylococcus aureus* (25-50% of cases), anaerobes, other microorganisms
- In B.C., Methicillin Resistant Staphylococcus Aureus (MRSA) comprises over 25% of *Staphylococcus Aureus* infections

Predisposing Risk Factors

- Diabetes mellitus
- Immunocompromised or use of systemic steroids
- Previous skin colonisation of client or family with MRSA
- Cellulitis
- Seborrhea
- Trauma such as surgery, cuts, burns, insect or animal bites, slivers, injection drug use, plucking hair
- Excessive friction or perspiration
- Obesity
- Poor hygiene

History

- Possibly known MRSA positive (client and household members)
- Possible history of injury or trauma
- Local redness, progressing to deep red, swelling, pain, tenderness
- Fever usually absent unless systemic infection
- If opened, purulent, sanguineous material drains
- Folliculitis and carbuncles:
    - Usually found on the neck, axilla, breasts, face, and buttocks
    - Begins as a small nodule, quickly becomes a large pustule 5-30mm diameter
    - May occur singly (folliculitis) or in groups (carbuncles)
    - May be recurrent

Physical Assessment

- Localized area of erythema, swelling, warmth, and tenderness
- Lesions often indurated and may be fluctuant (may be difficult to palpate if abscess is deep)
- Lesion may spontaneously drain purulent discharge
- Size of abscess often difficult to estimate; abscess usually larger than suspected
- Carbuncle may be present as a red mass with multiple draining sinuses in area of thick, inelastic tissue (i.e., posterior neck, back, thigh)
- Regional lymph nodes usually *not* tender or enlarged. If enlarged and tender, consider increased risk for systemic infection
- Fever, chills, and systemic toxicity are unusual.

Note: If client appears toxic, consider the potential for bacteremia and a systemic infection.

Diagnostic Tests

- Swab discharge for Culture and Sensitivity (C&S)
- Determine blood glucose level if infection is recurrent or if symptoms suggestive of diabetes mellitus are present

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