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# **NURSE PROTOCOLS FOR CHILD HEALTH**

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## NURSE PROTOCOL FOR ACNE, MILD

<b>DEFINITION</b>	Comedones (blackheads, whiteheads), pimples and tender red bumps on the face, chest or back, or a combination of these. Usually occurs during puberty and can last until age 20-30.
<b>ETIOLOGY</b>	The primary event is the obstruction of the sebaceous follicle outlet. Due to increasingly active androgenic hormones, there is increased activity of sebaceous glands with obstruction of the sebaceous glands of the skin. This leads to rupture of the gland and release of fatty acids into the surrounding tissue resulting in an inflammatory reaction producing an acne nodule. Bacterial colonization of the trapped sebum may produce inflammation.
<b>SUBJECTIVE</b>	<ol style="list-style-type: none"><li>1. Lesions on face, back, chest.</li><li>2. Use of acne-causing medications (e.g., corticosteroids, phenytoin, greasy cleansing creams, cosmetics, oils).</li><li>3. Underlying endocrinopathy (e.g., Cushing Syndrome, Stein-Leventhol Syndrome).</li><li>4. Condition often worsens during periods of stress or cyclic menstrual flares.</li><li>5. Psychological distress caused by presence of facial lesions.</li><li>6. Family history of acne.</li><li>7. Assess pregnancy status.</li></ol>
<b>OBJECTIVE</b>	Increasing number of blackheads, whiteheads, pimples and tender red bumps on the face, chest or back are noted. Lesions may lead to pitted scars. One type of lesion may be predominant or all may be present. Determine if acne is mild, moderate or severe. Cystic acne requires prompt attention; ruptured cysts may result in scar formation. (Cysts extend deep into the dermis and are best appreciated by palpation. Papules and pustules extend primarily above the surface of the skin.)
<b>ASSESSMENT</b>	Acne, Mild <b>Inflammatory</b>
<b>PLAN</b>	<b>THERAPEUTIC</b>  <b>PHARMACOLOGIC</b>  Non-prescription products <ol style="list-style-type: none"><li>1. If 12 years of age or older, for mild acne (fewer than 20 whiteheads, blackheads, papules and nonpustular pimples): Benzoyl peroxide gel or cream, 5-10% (available</li></ol>

over-the-counter as Oxy-5, Oxy-10 and Persa-Gel) topically. **(Gel for oily skin, cream for dry skin.)** Begin with 5% gel or cream every other day. Leave initial application on for 15 minutes. Increase exposure time in 15-minute increments as tolerance allows. Once tolerated for 2 hours, it can be left on the skin overnight. If necessary, advance to 2 times a day. Increase or decrease the strength and/or frequency of application depending on tolerance and response.

#### Prescription products

- If step #1 above yields an insufficient response after a trial of at least 4-6 weeks: Each morning wash with Benzoyl peroxide, pat dry and apply a thin layer of either Clindamycin Topical Gel 1% or Erythromycin Topical Gel 2%. Each evening apply Benzoyl peroxide gel or cream as described above. May apply Clindamycin Topical Gel 1% or Erythromycin Topical Gel 2% either QD or BID depending on irritation and effectiveness.**

**OR**

**Benzoyl peroxide plus erythromycin (Benzamycin®), contains 3% erythromycin and 5% benzoyl peroxide in gel form (alcohol base), generic available. Apply 1-2 times a day to clean, dry skin.**

**OR**

**5% benzoyl peroxide plus 1% clindamycin gel (BenzaClin®). Apply 1-2 times a day to clean, dry skin.**

#### **NON-PHARMACOLOGIC**

1. Keep hands off face. Avoid picking lesions which may lead to scar formation.
2. Avoid greasy cleansing oils, mousse and cosmetics because they block oil glands. Use non-acnegenic cosmetics and moisturizers, if needed.
3. Shampoo hair regularly.

4. Wash face with water and mild soap (e.g., Dove, Basis, or Purpose) no more than 2-3 times a day to remove oil film. Follow with witch hazel as an astringent.
5. Avoid scrubbing skin, because it irritates the openings of oil glands and can cause them to be more tightly closed.
6. Always use alcohol-based sunscreen.
7. Do not expect to completely prevent any new lesions.
8. Eat a well-balanced diet. There is no evidence that certain foods can cause acne.
9. **Educate client about increased photosensitivity with use of products listed above.**

#### **REFERRAL**

1. If patient is less than 12 years of age.
2. If no improvement in mild acne in 8-12 weeks.
3. If acne is moderate, severe or cystic, refer to MD or NP.
4. If underlying condition suspected, refer to MD.
5. When blackheads are the predominant lesions use, or refer for prescription of, a topical retinoid (e.g. Retin-A, Differin).
6. In cases of psychological stress, refer for counseling.
7. Refer to Family Planning if indicated. Some adolescent girls benefit from oral contraceptives.
8. Pregnancy.
9. Secondary bacterial infection.

## REFERENCES

1. William L. Weston et al., *Color Textbook of Pediatric Dermatology*, 3rd ed., Mosby-Year Book, 2002. **(Current)**
2. American Society of Health-Systems Pharmacists, American Hospital Formulary Service, 2007, pp. **3437-3444**.
3. Constance R. Uphold and Mary Virginia Graham, *Clinical Guidelines in Family Practice*, 4<sup>th</sup> ed., Barmarrae Books, Inc., Gainesville, Florida, 2003, pp. 265-267. **(Current)**
4. "Facts and Comparisons," *Facts and Comparisons 4.0 Online*, Wolters Kluwer Health, Inc., 2007 <<http://online.factsandcomparisons.com>>.
5. **Yan AC, Current Concepts in Acne Management. Adolescent Medicine Clinics, 2006, 17(3):613-637.**

## **NURSE PROTOCOL FOR ALLERGIC REACTIONS/ANAPHYLAXIS**

Refer to Section 14 of this manual for Treatment of Allergic Reactions/Acute Anaphylaxis for Adults, Infants and Children.

## NURSING PROTOCOL FOR ALLERGIC RHINITIS (PEDIATRIC AND ADULT)

- DEFINITION** An allergic disease affecting the nasal mucosa and often the conjunctiva. It may be seasonal or perennial (non-seasonal).
- ETIOLOGY**
1. Seasonal  
Pollens that depend on wind for cross-pollination. In the eastern United States, the following are the most common causes, with pollination time varying by several months depending on location:
    - a. Ragweed, August - October.
    - b. Grasses, May - July.
    - c. Trees, March - July.
    - d. Combinations of a, b and c.
  2. Perennial
    - a. House dust/house-dust mites.
    - b. Feathers.
    - c. Mold spores.
    - d. Animal dander.
    - e. Foods. Most authorities believe that if foods are causative, other signs of hypersensitivity occur with allergic rhinitis (e.g., urticaria, asthma, gastro-intestinal symptoms).
  3. Aggravating factors:
    - a. Tobacco smoke.
    - b. Air pollutants.
    - c. Sudden temperature changes.
    - d. Wood heaters, fireplaces, carpets, etc.
- SUBJECTIVE**
1. History of onset of symptoms in childhood and young adulthood, with symptoms decreasing with age.
  2. Commonly have family history of allergic diseases.
  3. Seasonal symptoms tend to occur the same time each year and are frequently more severe than those of the perennial form.
    - a. Sneezing.
    - b. Nasal itching.
    - c. Watery rhinorrhea.
    - d. Nasal stuffiness.

- e. Occasionally may report:
  - 1) Itching of eyes, palate and throat.
  - 2) Snoring and sniffing.
  - 3) Increased tearing and photophobia.
  - 4) Non-productive cough.
  - 5) Fatigue, irritability, anorexia.

## OBJECTIVE

1. Clear, thin nasal discharge.
2. Pale, edematous nasal mucosa.
3. Enlarged nasal turbinates.
4. "Allergic salute" - rubbing of the nose upward and outward (seen especially in children) and "wrinkling" of the nose.
5. Mouth-breathing.
6. Conjunctival injection and edema. Occasionally granular, erythematous conjunctivae and dark semi-circles ("allergic shiners") under the eyes.
7. Allergic facies with perennial allergic rhinitis:
  - a. Mouth-breathing.
  - b. Prominent maxilla, high arched palate.
  - c. Dull expression.
  - d. Broad mid-section of nose, with horizontal crease across lower portion.
8. Wright's or Hansel's stain of smear of nasal secretions may reveal eosinophils, but usually is not needed to make a diagnosis.
- 9. Interference with sleep.**
- 10. Interference with school performance.**

## ASSESSMENT

Allergic Rhinitis

Seasonal - differentiate from upper respiratory tract infection and infectious conjunctivitis.

Perennial - differentiate from:

1. Recurrent upper respiratory tract infection.
2. Vasomotor rhinitis (of unknown cause, non-infectious, non-seasonal, and non-allergenic).
3. Deviated nasal septum.
4. Side effects of medications, such as overuse of vaso-constricting

- nose drops.
5. Chronic sinusitis.
  6. Chronic contact with tobacco smoke (smoke is a primary irritant, allergy not required).

## PLAN

## THERAPEUTIC

### PHARMACOLOGIC

Antihistamines, for ages  $\geq 6$  months:

1. Cetirizine/Zyrtec® Liquid 5mg/5mL, tablet 5mg or 10 mg (Not available OTC):

6 months	½ tsp every day
12-23 months	½ tsp every day or ½ tsp PO every 12h
2 yrs - 5 yrs	½ - 1 tsp PO every day or ½tsp every 12h
6 yrs - 11 yrs	1 - 2 tsp PO every day
$\geq 12$ yrs	1 tab (10 mg) PO every day
2. Loratadine/Claritin® Liquid 5 mg/5 mL, tablet 10mg (available OTC):

2 yrs - 5 yrs	1 tsp PO every day
6 yrs - 11 yrs	2 tsp PO every day
$\geq 12$ yrs	1 tab (10 mg) PO every day

NOTE: Manipulation of dosage within the prescribed ranges may be necessary to achieve symptomatic relief with a minimum of side effects (e.g., drowsiness, dry mouth, nervousness). Medication should be taken for several days/weeks at a time during symptomatic periods; intermittent single dose usage will not be as effective in controlling symptoms as regular dosing.

3. If cost is a factor then another OTC antihistamine such as diphenhydramine or chlorpheniramine may be considered. They have two major disadvantages, however. First, they must be reliably administered q4-6 hrs. Secondly, they may be substantially sedating or, in some infants/children may cause irritability and hyperactivity. Consult packaging for the appropriate dose and any contraindications. Begin with a single-drug preparation. If necessary, progress to an antihistamine/decongestant combination drug preparation.
4. **For age 6 and over with seasonal allergic rhinitis, a nasal corticosteroid may be used if unable to tolerate oral antihistamines or fail to respond adequately to oral**

**antihistamines:**

**For the following inhaled corticosteroids, it is recommended that once optimal symptomatic relief is achieved, dosage of the drug should be gradually reduced to the lowest effective dose.**

- a. **Mometasone furoate nasal spray, 50 mcg (1 spray) in each nostril once daily (total daily dose 100 mcg). For children 12 years of age and older, 100 mcg (2 sprays) in each nostril daily (total daily dose 200 mcg).**  
**OR**
- b. **Fluticasone nasal spray, 50 mcg (1 spray) in each nostril once daily (total daily dose 100 mcg). Clients not responding adequately to the 100 mcg daily dose or those with more severe symptoms may use 100 mcg (2 sprays) in each nostril daily.**  
**OR**
- c. **Triamcinolone acetonide aqueous suspension nasal spray, 55 mcg (1 spray) each nostril once daily (total daily dose 110 mcg). Clients not responding adequately to the 110 mcg daily dose may use 110 mcg (2 sprays) in each nostril daily (total daily dose 220 mcg). Children 12 years or age or older may use 110 mcg (2 sprays) in each nostril once daily (total daily dose 220 mcg).**  
**OR**
- d. **Beclamethasone dipropionate nasal spray, 42 mcg (1 spray) in each nostril twice daily (total daily dose 168 mcg). Clients not responding adequately to the 168 mcg daily dose or those with more severe symptoms may use 84 mcg (2 sprays) in each nostril twice daily (total daily dose 336 mcg).**  
**OR**
- e. **Budesonide nasal spray, 32 mcg (1 spray) in each nostril once daily (total daily dose 64 mcg). Clients not responding adequately to the 64 mcg daily dose or those with more severe symptoms may use 64 mcg (2 sprays) in each nostril once daily (total daily dose 128 mcg). In children 12 years of age or older, may use 128 mcg (4 sprays) in each nostril once daily (total daily dose 256 mcg).**

## CLIENT COUNSELING/EDUCATION

1. Identification and avoidance of the offending antigen.
2. Most antihistamines cause drowsiness. Zyrtec and loratidine are known to be the least sedating. Counsel against driving or other activities that would present a risk if drowsy.
3. **For nasal corticosteroids, educate on the importance of priming and shaking the containers before administering medication; necessity of reporting to primary care provider recurrent epistaxis, nasal septum discomfort, irritation, burning and/or stinging; females of child-bearing potential informing clinician if they are or plan to become pregnant or plan to breastfeed. Remind client to drink a few sips of water or liquid after using the nasal spray to help reduce throat irritation.**
4. Some of the OTC products contain phenylalanine, check product labeling for ingredients.
5. Take the following measures as appropriate:
  - a. Seasonal
    - 1) Avoid areas of heavy concentration of ragweed, trees or grass during pollinating season.
    - 2) Sleep with bedroom windows closed during the appropriate pollinating seasons.
    - 3) Use an air conditioner with an electrostatic precipitating filter to avoid pollen. Clean filter often.
    - 4) **Change clothes and bathe after long periods outside.**
    - 5) **Do not hang clothes or bedding outside.**
  - b. Perennial  
Create a dust-free bedroom. Use a mouth-and-nose mask when cleaning.
    - 1) Remove everything from the room, including floor coverings, curtains, drapes, and closet contents. Keep door closed at all times.
    - 2) Clean the room thoroughly - walls, woodwork, ceiling, floor and closet. Wash the floor.
    - 3) Cover the mattress, box spring, and pillows with plastic dust-proof covers.
    - 4) Make sure the room contains a minimum of furniture, washable rugs and curtains. Avoid bed pads, heavy rugs, drapes, upholstered furniture, toys and knick-knacks.

- 5) Clean the room daily using a vacuum cleaner, damp cloth or damp mop. Do not use a broom or duster.
- 6) Keep bedroom windows and doors closed. If hot-air heating is used, cover vents with coarse muslin which is changed frequently.
- 7) Change furnace air filter frequently.
- 8) Vacuum stuffed furniture and rugs frequently.
- 9) Keep pets (dogs and cats) outside, if possible.
- 10) Avoid damp and dusty places (e.g., attics, basements, closets, storerooms).
- 11) No stuffed toys if patient is dust-sensitive.
- 12) Use an air conditioner with an electrostatic precipitating filter to avoid dust.
- 13) No smoking in the house, especially in child's bedroom.

### **FOLLOW-UP**

Return visit in one week, and periodically as needed.

### **CONSULTATION/REFERRAL**

1. Failure to respond to treatment, or severe/prolonged periods of symptoms not controlled by the above treatment measures (**in particular, persistent interference with sleep or school performance**).
2. Consideration for immunotherapy (hyposensitization), intranasal steroids, or leukotriene receptor antagonist.
3. Inability to tolerate antihistamines.
4. Clients requiring almost daily medication for perennial symptoms.
5. Complications:
  - a. Otitis media.
  - b. Sinusitis.
  - c. Nasal or sinus polyps from longstanding perennial allergic rhinitis.
  - d. Asthma.

### **REFERENCES**

1. Carol K. Taketomo et al., *Pediatric Dosage Handbook, 2002-2003, 9<sup>th</sup> ed.*, Lexi-Comp, Inc., Cleveland, OH, 2002. **(Current)**
2. William Hay et al., *Current Pediatric Diagnosis and Treatment, 16<sup>th</sup> ed.*, Appleton & Lange, 1997, p. 395. **(Current)**
3. American Society of Health-Systems Pharmacists, American Hospital Formulary Service, 2007, pp. **24-29, 36-42, pp. 2816-2835.**

4. Charles F. Lacy et al., *Drug Information Handbook*, 12<sup>th</sup> ed., Lexi-Comp, Hudson, Ohio, 2004-2005, pp. 290-291, 879-880.
5. "Facts and Comparisons," *Facts and Comparisons 4.0 Online*, Wolters Kluwer Health, Inc., 2007 <<http://online.factsandcomparisons.com>>.
6. **Lai L, Casale T, Stokes J. Pediatric Allergic Rhinitis: Treatment. *Immunology and Allergy Clinics of North America*, 2005, 25:283-299.**

## NURSE PROTOCOL FOR ANIMAL BITES

<b>DEFINITION</b>	Bites of any animal, provoked or unprovoked, excluding reptile and insect bites.
<b>ETIOLOGY</b>	<p>Bites from any animal (e.g., human, cat, dog, rabbit, squirrel, rodent, bear, monkey, horse). Infection from pathogens in saliva, or introduction of pathogens from skin, soil, claws (such as the gram-negative bacillus, <i>Bartonella henselae</i>, in cat-scratch fever) may result. Pathogens that infect dog bites include <i>Pasteurella multocida</i>, streptococci, staphylococci and anaerobic organisms.</p> <p>The possibility of rabies in the offending animal must be considered. <i>Unprovoked</i> bites must be treated with more suspicion than bites from a teased or taunted animal. Bites from wild animals should be treated as rabid unless the animal is found to be free of rabies. Any mammal can potentially carry rabies. Skunks, foxes, raccoons and bats now account for almost 85% of the cases of rabies in animals. Rabbits, squirrels, chipmunks, rats and mice are seldom infected.</p>
<b>SUBJECTIVE</b>	Pain at site of the bite.
<b>OBJECTIVE</b>	<ol style="list-style-type: none"><li>1. Puncture wounds or teeth prints at the site of the bite.</li><li>2. Laceration at the site of the bite.</li></ol>
<b>PLAN</b>	<b>THERAPEUTIC</b> <ol style="list-style-type: none"><li>1. Wash the wound immediately and thoroughly with copious amounts of soap and water <b>and sterile gauze</b>. Irrigate wound with copious amount of sterile saline, if available, by high-pressure syringe irrigation (e.g., with an 18 gauge needle). Do not irrigate puncture wounds.</li><li>2. Control bleeding.</li><li>3. Assess tetanus immunization status and administer tetanus containing vaccine booster if it has been five or more years since completion of primary tetanus containing series or since last tetanus booster:<ol style="list-style-type: none"><li>a. See current Georgia Immunization Program Manual, Recommended Schedule and Guidelines, for vaccine administration guidelines and for tetanus-containing vaccines indicated for age of client. The Georgia</li></ol></li></ol>

Immunization Manual may be accessed on line at <http://www.health.state.ga.us/programs/immunization>.

- b. Tetanus Immune Globulin (TIG) should be administered and an appropriate series of tetanus containing vaccine administered if there is no history of prior vaccination. (Not available from State Immunization Program).
  - c. See current ACIP Manual, *Diphtheria, Tetanus and Pertussis: Recommendations for Vaccine Use and Other Preventive Measures*, MMWR, August 8, 1991, p.16, and *Preventing Tetanus, Diphtheria, and Pertussis Among Adolescents: Use of Tetanus Toxoid, Reduced Diphtheria Toxoid and Acellular Pertussis Vaccines*, MMWR, February 23, 2006, p.25, or the 2006 Red Book, for wound management guidelines.
4. **Suturing is not recommended for small bites, except on the face for cosmetic reasons. Wounds over 8 hrs old are rarely sutured. If suturing is indicated, refer to MD/APRN.**
  5. **(Scratches) Apply bacitracin zinc antibiotic ointment (500 units/gram) 1-3 times daily and a non-stick dressing. Re-apply and inspect with each application, for 5-7 days.**  
**OR**  
**Erythromycin ointment to the affected area twice daily, morning and evening, and a non-stick dressing. Reapply and inspect bid for 7-10 days.**
  6. **(Small lacerations that are not referred for suturing) Apply antibiotic ointment (as in 5. above), followed by saline-moistened or vaseline impregnated sterile gauze, and then cover with dry gauze. Re-apply, wash and inspect bid. The goal is to delay wound closure until the wound's bacterial flora has reverted to normal body flora. After 5 days close with steristrips if there is no sign of infection. This process is called healing by delayed primary closure or by secondary granulation.**

#### **FOLLOW-UP**

1. Coordinate with the primary care provider, so the wound can be observed for healing or complications of infection. Should be seen or at least have contact with family daily for 1-3 days.
2. Observe daily for signs of infection (which usually occurs within 3 days.)

## REFERRAL

1. Any wound that is extensive, **may need suturing (face), requires prophylactic antibiotic treatment or where there is devitalized tissue present that needs debridement.** (Antibiotic therapy is most likely indicated for: severe bites, puncture wounds, even very small bites on the face/hand/foot, immunocompromised or asplenic clients, **or wounds that were not cleansed and irrigated promptly after their occurrence.**)
2. Any suspicion of rabies. Bats have been increasingly implicated as wildlife reservoirs. Airborne transmission has been reported in bat-infested caves. Prophylaxis is recommended for all persons who have sustained bite, scratch or mucous membrane exposure to a bat unless the bat is available for testing and is negative. Prophylaxis also is appropriate in situations in which there is a reasonable probability that contact occurred (e.g., an adult witnesses a bat in a room with a previously unattended child or an individual awakes to find a bat in the room).
3. Report animal bites to Environmental Health for follow-up of the animal.
4. Consult with Georgia Poison Control (1-800-282-5846) if suspect exposure to rabies.

## REFERENCES

1. William Hay et al., *Current Pediatric Diagnosis & Treatment*, 16<sup>th</sup> ed., McGraw-Hill, 2003. **(Current)**
2. American Academy of Pediatrics, *Red Book 2006: Report of the Committee on Infectious Diseases*, 27<sup>th</sup> ed., 2006, pp. **192-195**.

## NURSE PROTOCOL FOR ASTHMA IN CHILDREN

- DEFINITION** Diffuse, obstructive lung disease with hyperactivity of the airways to a variety of stimuli and a high degree of reversibility of the obstructive process, occurring either spontaneously or as a result of treatment. Asthmatic attacks may be mild, moderate or severe.
- ETIOLOGY** An already existing hypersensitive airway is irritated by a stimulus such as exercise (exercise-induced asthma), viral respiratory infection, sinusitis, allergens (molds, pollens, dander, dust mites), irritants (heat, cold, smoke, perfumes, chemicals) and some medications (e.g., Beta-blockers, aspirin, nonsteroidal anti-inflammatory drugs [NSAIDs]). Irritation results in bronchoconstriction, inflammation and hypersecretion of mucous, mucosal edema.
- SUBJECTIVE** Client may complain of:
1. Shortness of breath or inability to “catch breath.”
  2. Constant coughing.
  3. Tight feeling in the chest.
  4. Inability to talk, walk or run without coughing or wheezing.
  5. Abdominal pain.
  6. Three episodes of wheezing in the past year that lasted more than one day and affected sleep.
- OBJECTIVE** Client may present with:
1. Increased respiratory and heart rates (heart rate over 120 beats/minute suggests a severe asthmatic attack or over medication).
  2. Abnormal breath sounds-wheezing (inspiratory and/or expiratory), prolonged expiration, decreased air movement.  
**NOTE:** In a very severe episode, air movement may be so limited that wheezing is not audible with or without a stethoscope.
  3. Dry, tight cough.
  4. Signs of respiratory distress-nasal flaring, retractions visible at suprasternal notch, between the ribs and under the rib cage, mouth breathing, sitting in a hunched over, tripod-like position.
  5. Paleness and cyanosis.
  6. Look of anxiety or fear.
  7. Sweating.
  8. Abnormal peak expiratory flow rate (PEF) rate, if client uses a peak flow meter and has it available (< 80% of predicted personal best).
  9. History (pertinent to your visit with them):
    - Time of onset of symptoms including simple cough with or without other symptoms;

- Do they have history of asthma, recurrent cough, nighttime cough, or coughing/wheezing when they exercise?
- Do they use any medications at home or have any medications with them or at the school? Compliance?
- Have they taken any medications for this attack?
- Is client aware of what triggers his/her asthma?
- If using peak flow, what have been his/her results and what are his/her zones?

**ASSESSMENT**      Mild Intermittent Asthma,  
Mild Persistent Asthma,  
(See classification below)

				For adults and children aged ≥5 years who can use a spirometer or peak flow meter	
Classification	Step	Days with symptoms	Nights with symptoms	FEV1 or PEF* % predicted normal	PEF Variability (%)
Mild Intermittent	1	≤2/week	<2/month	≥80	<20
Mild Persistent	2	≥2/week but <1 time/day	>2/month	≥80	20-30
*Percentage predicted values for forced expiratory volume in 1 second (FEV1) and percentage of personal best for peak expiratory flow (PEF).					

**PLAN**                      **THERAPEUTIC**

**PHARMACOLOGIC**

If client has medication(s) for quick relief (i.e., hand held metered dose inhaler or nebulizer (MDI)), administer medication as prescribed on prescription.

(Below are **excerpts from the** guidelines published by the National Asthma Education and Prevention Program [NAEPP] for the chronic management of asthma. These guidelines were last updated in 2002. **The NAEPP has published a DRAFT of a planned 2007 update for the purpose of obtaining public review and comment. The DRAFT document is explicit for review only and not for providing care.** Therefore, the material below remains the national standard for the chronic management of asthma with **one caveat related to the treatment of mild asthma** – inhaled corticosteroids are being used more aggressively ([in younger ages, in response to lower frequency of symptoms, and in higher doses] in order to prevent permanent lung damage for asthma in selected groups of children).

Infants and Young Children up to 5 years of age	
↓Step Down Review treatment q1-6 mos. If control is sustained for at least 3 months, a gradual stepwise reduction in treatment may be possible.	↑Step Up If control is not achieved, consider step up. First review client medication technique, adherence, and environmental control avoidance of allergens or other precipitant factors.
STEP 1: Mild Intermittent	
Long-term Control (Daily Medications)	Quick Relief
No daily medication needed.	<ul style="list-style-type: none"> <li>▪ Bronchodilator PRN for symptoms &lt; 2x week. Intensity of treatment will depend upon severity of exacerbation.</li> </ul> <p>Preferred treatment:</p> <ul style="list-style-type: none"> <li>• Inhaled short-acting beta2-agonist by nebulizer or face mask and spacer/holding chamber</li> </ul> <p>Alternative treatment:</p> <ul style="list-style-type: none"> <li>• Oral beta2-agonist for symptoms</li> </ul> <p>With viral respiratory infection:</p> <ul style="list-style-type: none"> <li>• Bronchodilator q4-6h up to 24 hrs (longer with physician consult), but in general, repeat no more than once every 6 weeks.</li> <li>• Consider systemic corticosteroid if current exacerbation is severe -OR- client has history of previous severe exacerbations.</li> </ul>

STEP 2: Mild Persistent Infants and Young Children up to 5 years of age	
Long-term Control (Daily Medications)	Quick Relief
<p>Preferred treatment: Low-dose inhaled corticosteroid (with nebulizer or MDI with holding chamber with or without face mask or dry powder inhaler [DPI]).</p> <p>Alternative treatment (listed alphabetically): Cromolyn (nebulizer is preferred or MDI with holding chamber) <b>OR</b> Leukotriene receptor antagonist.</p>	<p>Bronchodilator PRN for symptoms up to 3 times a day</p> <p>(see STEP 1)</p>

Children >5 years – adult		
<p style="text-align: center;">↓Step Down</p> <p>Review treatment q1-6 mos. If control is sustained for at least 3 months, a gradual stepwise reduction in treatment may be possible.</p>	<p style="text-align: center;">↑Step Up</p> <p>If control is not achieved, consider step up. First review client medication technique, adherence, and environmental control avoidance of allergens or other precipitant factors.</p>	
STEP 1: Mild Intermittent		
Long-Term Control (Daily Medications)	Quick Relief	Education
<p>No daily medication needed</p>	<p>Intensity of treatment will depend on severity of exacerbation</p> <ul style="list-style-type: none"> <li>• Short-acting bronchodilator: 2–4 puffs short-acting inhaled beta2-agonists as needed for symptoms.               <ul style="list-style-type: none"> <li>○ Up to 3 treatments at 20-minute intervals or a single nebulizer treatment as needed. Course of systemic corticosteroids may be needed.</li> <li>○ Use of short-acting inhaled beta2-agonists more than 2x week may indicate the need to initiate long-term control therapy.</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• Teach basic facts about asthma</li> <li>• Teach inhaler/spacer/holding chamber techniques</li> <li>• Discuss roles of medications</li> <li>• Develop self-management plan</li> <li>• Develop action plan for when and how to take rescue actions, especially for clients with history of severe exacerbations</li> <li>• Discuss appropriate environmental control measure to avoid exposure to known allergens and irritants</li> </ul>

STEP 2: Mild Persistent Children >5 years – adult		
Long-Term Control (Daily Medications)	Quick Relief	Education
<p>Anti-inflammatory:</p> <p>Preferred treatment: Low-dose inhaled corticosteroid with spacer/holding chamber with or without face mask or DPI.</p> <p>Alternative treatment (listed alphabetically): Cromolyn (children usually begin with a trial of cromolyn or nedocromil).</p> <p style="text-align: center;"><b>OR</b></p> <p>Leukotriene modifier</p> <p style="text-align: center;"><b>OR</b></p> <p>Nedocromil (children usually begin with a trial of cromolyn or nedocromil).</p> <p style="text-align: center;"><b>OR</b></p> <p>Sustained-release theophylline to serum concentration of 5–15 mcg/mL.</p>	<p>Short-acting bronchodilator: Inhaled beta2-agonists PRN for symptoms. Intensity of treatment will depend on severity of exacerbation; up to 3 treatments at 20-minute intervals or a single nebulizer treatment as needed. Course of systemic corticosteroids may be needed. Use of short-acting inhaled beta2-agonists on a daily basis, or increasing use, indicates the need for additional long-term control therapy.</p>	<p>Step 1 actions plus: Teach self-monitoring Refer to group education if available Review and update self-management plan</p>

### NON-PHARMACOLOGIC (Acute Attack)

1. Be very calm when talking with the child and others.
2. Provide interventions in a calm manner.
3. Reassure child.
4. Maintain child in a sitting position that facilitates breathing.

### CLIENT EDUCATION/COUNSELING

1. Client must have a consistent medical provider. Refer if they do not. They should get a written asthma plan from the provider.
2. If recurrent episodes occur at school, attempt to identify the trigger with child. Discuss with parents and primary care provider.

3. Client should be educated about triggers and their symptoms.
4. Client should be educated about appropriate use of their medications and peak flow meters (if they have these).
5. Client and caretaker should be aware of symptoms of child's asthma episodes/exacerbations as well as signs of respiratory distress.
6. Emphasize the importance of taking long-term medications as prescribed.
7. Emphasize the importance of starting quick relief medications early in attack. For example, with coughing even before wheezing or becoming short of breath.
8. Emphasize importance of immunizations being current. Assess immunization status and administer all vaccines indicated according to the current Advisory Committee on Immunization Practices (AIP) childhood immunization schedule (child and close contacts to child need influenza vaccine annually). See the Georgia Immunization Program Manual, Recommended Schedule and Guidelines at <http://www.health.state.ga.us/programs/immunization>.

#### **FOLLOW-UP/REFERRAL**

1. Any client with asthma or suspected asthma that does not have a primary care provider.
2. Any child with symptoms **consistent with moderate or severe asthma**.
3. Any child with any degree of asthma attack that does not have "rescue" medications or treatments.
4. Any child with a severe asthma attack or recurrent asthmatic attacks.
5. Any child receiving prolonged therapy with corticosteroids should be monitored periodically for possible adverse effects on growth and development.
6. Any child who has been maintained on  $\geq 20$  mg/day of prednisone (or its equivalent) if being considered for transfer to inhaled corticosteroids, due to risk of death from adrenal insufficiency.

7. Referral to the CMS clinic for asthma after discussion with primary care provider and parents.
8. Provide counseling or refer if needed, any client using more than one canister per month of short-acting B2-agonist drug.
9. Pregnancy.

### Usual Dosages for Short-Acting Inhaled Beta 2-agonists (Quick Relief Medication)

Medication	Dosage form	Adult dose	Child dose (2 to 12 years of age)
Albuterol  If using for exercise-induced: use 15 minutes before exercising	90mcg/puff MDI  For nebulization: 0.5% concentrated solution to mix with Normal Saline or premixed as 2.5 mg/3mL (.083%)	1-2 puffs Q 4-6 hrs  Use 3-4 times a day, prn	1-2 puffs 4 times/day with spacer with or without face mask  Nebulization: <15kg who require <2.5mg/dose (should use the 0.5% solution to prepare the appropriate dose)  ≥15 kg use 2.5 mg 3-4 times a day, prn nebulization
*Accuneb (lower dosage nebulized albuterol)	0.63mg/3mL 1.25 mg/3mL nebulization		Use 3-4 times daily, prn nebulization
Xopenex	0.31mg, 0.63mg, and 1.25 mg nebulization	Use 3-4 times daily, prn nebulization	Use 3-4 times daily, prn nebulization

\*Accuneb is usually less expensive than Xopenex and may be an alternative for those patients who experience side effects from the 2.5mg/3mL UD vials of albuterol or possibly adjust the albuterol dose using the 0.5% concentrated solution to be mixed with normal saline.

\*Accuneb has not been studied in acute attacks. A 2.5mg dose of albuterol may be more appropriate for treating acute exacerbations, particularly in children 6 yrs old and above.

### Estimated Daily Dosages for Inhaled Corticosteroid Children

**NOTE:** Consult/refer if previously maintained on  $\geq 20$  mg/day prednisone (or its equivalent) before transferring to inhaled corticosteroids.

Drug	Low Dose
Beclomethasone dipropionate 42 mcg/puff 84 mcg/puff * $\geq 6$ years of age	84-336 mcg  2-8 puffs 1-4 puffs
Beclomethasone HFA 40 mcg/puff 80mcg/puff * $\geq 5$ years of age	80-160 mcg 2-4 puffs 1-2 puffs
Budesonide turbuhaler (DPI) 200 mcg/dose * $\geq 6$ years of age	200-400 mcg  1-2 inhalations
Budesonide suspension for nebulization 0.25 mg/2ml 0.5 mg/2ml * $\geq 12$ months of age	0.5mg
Flunisolide 250 mcg/puff * $\geq 6$ years of age	500-750 mcg 2-3 puffs
Fluticasone MDI: 44 mcg/puff 110 mcg/puff 220 mcg/puff * $\geq 4$ years of age (HFA) Dry powder inhaler (DPI): 50, 100, 250 mcg/dose * $\geq 4$ years of age (DPI)	88-176 mcg  2-4 puffs ----- -----  100-200 mcg 2-4 inhalations of the 50 mcg DPI
Triamcinolone acetonide 100 mcg/puff * $\geq 6$ years of age	400-800 mcg  4-8 puffs

\* Manufacturer stated age for use

### Estimated Daily Dosages for Inhaled Corticosteroid Adolescents $\geq 70$ Kg.

**NOTE:** Consult/refer if previously maintained on  $\geq 20$  mg/day prednisone (or its equivalent) before transferring to inhaled corticosteroids.

Drug	Low Dose
Beclomethasone dipropionate  42 mcg/puff 84 mcg/puff	168 – 504 mcg  4-12 puffs 2-6 puffs
Budesonide turbuhaler  200 mcg/dose	200-600 mcg  1-3 inhalations
Flunisolide  250 mcg/puff	500-1000 mcg  2-4 puffs
Fluticasone  MDI: 44 mcg/puff 110 mcg/puff 220 mcg/puff  Dry powder inhaler: 50, 100, 250 mcg/puff	88-264 mcg  2-6 puffs 2 puffs  100-300 mcg 2-6 inhalations – 50 mcg
Triamcinolone acetonide 100 mcg/puff	400-1000 mcg  4-10 puffs

### USUAL DOSAGES FOR LONG-TERM-CONTROL MEDICATIONS

Medication	Dosage Form	Adult Dose	Child Dose*
Inhaled Corticosteroids <i>(See estimate comparative daily dosages for inhaled corticosteroids.)</i>			
Systemic Corticosteroids		<i>(Applies to all three corticosteroids.)</i>	
Methylprednisolone	2,4,8,16,32 mg tablets	7.5-60 mg daily in a single dose in a.m. or every other day as needed for control.	0.25-2 mg/kg daily in single dose in a.m. or every other day as needed for control.
Prednisolone	5 mg tablets 5 mg/5 mL 15 mg/5 mL		
Prednisone	1,2,5,5,10,20,50 mg tablets; 5 mg/mL, 5 mg/ 5 mL	Short-course "burst" to achieve control: 40-60 mg per day as single or 2 divided doses for 3-10 days.	Short-course "burst": 1-2 mg/kg/day, maximum 60 mg/day for 3-10 days
Cromolyn and Nedocromil			
Cromolyn	MDI 1 mg/puff Nebulizer 20 mg/ampule	2-4 puffs tid-qid 1 ampule tid-qid	1-2 puffs tid-qid 1 ampule tid-qid
Nedocromil	MDI 1.75 mg/puff	2-4 puffs bid-qid	1-2 puffs bid-qid
Leukotriene Modifiers			
Montelukast	4 or 5 mg chewable tablet 10 mg tablet	10 mg qhs	4 mg qhs (2-5yrs) 5 mg qhs (6-14 yrs) 10 mg qhs (>14 yrs)
Zafirlukast	10 or 20 mg tablet	40 mg daily (20 mg tablet bid)	20 mg daily (7-11 yrs) (10 mg tablet bid)
Zileuton	300 or 600 mg tablet	2,400 mg daily (give tablet qid)	
Methylxanthines <i>(Serum monitoring is important [serum Concentrations of 5-15 mcg/mL at steady state].)</i>			
Theophylline	Liquids, sustained-release Tablets, and capsules	Starting dose 10 mg/kg/day up to 300 mg max; usual max 800 mg day	Starting dose 10 mg/kg/day: usual max: <ul style="list-style-type: none"> <li>■ &lt; 1 year or age: 0.2 (age in weeks) + 5 = mg/kg/day</li> <li>■ ≥ 1 year of age: 16 mg/kg/day</li> </ul>

\*Children ≤ 12 years of age

## REFERENCES

1. Carol K. Taketomo et al., *Pediatric Dosage Handbook*, 2002-2003, 9<sup>th</sup> ed., Lexi-Comp, Inc., Cleveland, OH, 2002. **(Current)**
2. American Academy of Allergy, Asthma & Immunology, *Pediatric Asthma Promoting Best Practice: Guide for Managing Asthma in Children*, Academic Services Consortium University of Rochester. Rochester, NY, 1999. **(Current)**
3. Richard E. Behrman et al., *Nelson Textbook of Pediatrics*, 17<sup>th</sup> ed., W.B. Sanders, Philadelphia, 2003. **(Current)**
4. The National Asthma Education and Prevention Program (NAEPP), *Expert Panel Report: Guidelines for the Diagnosis and Management of Asthma—Update on Selected Topics 2002 (EPR—Update 2002)*, (NIH Publication No. 97-4051), National Institutes of Health National Heart, Lung, and Blood Institute, Bethesda, MD, NIH Publication No. 02-5075, Originally printed June 2002, Reprinted May 2003. **(Current)**
5. American Society of Health-Systems Pharmacists, *American Hospital Formulary Service*, 2007, pp. **3038-3035, 3048-3052**.
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7. Charles F. Lacy, et al., *Drug Information Handbook*, 12th ed., Lexi-comp Inc, Hudson, 2004-2005, Ohio, pp. 1752-1755. **(Current)**
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## NURSE PROTOCOL FOR BURNS, MINOR - PEDIATRIC AND ADULT

**DEFINITION** Thermal injuries to the skin which are classified as: first degree (superficial, limited to epidermis); second degree (blister formation, destruction through epidermis to dermis); and third degree (epidermis and dermis destruction with involvement of underlying tissue). Extent can be classified as major or minor. Minor burns are less than 10% of the body surface area for superficial and partial thickness burns.

Epidemiology: The U.S. has the highest incidence of burns in the industrialized world, second only in accidental deaths to motor vehicle accidents. Inhalation injury is the leading cause of burn fatalities.

**ETIOLOGY** Contact with any heat source: hot liquids, steam, wet or dry heat, chemicals, electricity, scalding water, hot solids, caustics, explosion, severe cold (liquid nitrogen), flame or sun. In children, elderly, mentally retarded or disabled persons, it may be abuse or neglect.

**SUBJECTIVE** Pain in area of involvement.

**OBJECTIVE** Triage and refer appropriately based on type and depth of burn.

1. First Degree (Superficial)
  - Erythema, swelling, and pain
2. Second Degree (Partial Thickness)
  - Vesicle and blister formation, less painful, fluid loss
3. Third Degree (Full Thickness)
  - Absence of pain and capillary refill; dryness, depression, leathery in appearance, charred or white in color

**ASSESSMENT** Burns. Indicate area(s) and degree.

Severity depends on percent surface area involved; use “rule of nines” originally established by Lund and Browder. (In adults, the percentage of surface area of most major body parts is a multiple of nine. However, surface area varies with age. In general, the surface area of the palm is equal to one percent of the client’s total body surface area.) Definition of severity varies somewhat with actual location of burn, with burns to face, hands, feet, and genitalia having greater severity for a given percent burn.

**PLAN**

**THERAPEUTIC**

**PHARMACOLOGIC**

1. **Ibuprofen for pain if not contraindicated. Cool compresses for the immediate relief of pain.**
2. For second and third degree burns:  
  
Non-pregnant clients:
  - a. Topical bacitracin/xeroform gauze with kling, applied to the affected area 1-3 times daily  
**OR**
  - b. Silver sulfadiazine 1% cream twice daily. The cream should be applied 1/16 inch thick. The burn area should be covered with cream at all times. If necessary, the cream should be reapplied to any area from which it has been removed by patient activity. Therapy should continue until healing is progressing well. Use of this product in some cases of glucose-6-phosphate dehydrogenase-deficient individuals may be hazardous, as hemolysis may occur.  
Pregnant clients, except those approaching or at term:
  - a. Silver sulfadiazine 1% cream twice daily. The cream should be applied 1/16 inch thick. The burn area should be covered with cream at all times. If necessary, the cream should be reapplied to any area from which it has been removed by patient activity. Therapy should continue until healing is progressing well. Use of this product in some cases of glucose-6-phosphate dehydrogenase-deficient individuals may be hazardous, as hemolysis may occur.
3. Tetanus containing vaccine booster if it has been five or more years since completion of primary tetanus containing series or since last tetanus booster:
  - a. See current Georgia Immunization Program Manual, Recommended Schedule and Guidelines, for vaccine administration guidelines and for tetanus containing vaccines indicated for age of client.

The Georgia Immunization Program Manual may be accessed online at

<http://www.health.state.ga.us/programs/immunization>.

- b. Tetanus Immune Globulin (TIG) should be administered and an appropriate series of tetanus containing vaccine administered if there is no history of prior vaccination. (Not available from State Immunization Program.)
- c. See current ACIP Manual, "Diphtheria, Tetanus, and Pertussis: Recommendations for Vaccine Use and Other Preventive Measures," MMWR, August 8, 1991, p. 16 and "Preventing Tetanus, Diphtheria, and Pertussis Among Adolescents: Use of Tetanus Toxoid, reduced Diphtheria Toxoid and Acellular Pertussis Vaccines", MMWR, February 23, 2006, p.25, or 2006 Red Book for wound management guidelines.

### NON-PHARMACOLOGIC

Refer to Figure 11-8 on page 10.31 for Berkow's scale for estimating the extent of burns.

1. First degree – Remove clothing to stop burning process. Immerse in cold water or apply cold damp towels if less than 45 minutes have elapsed. Clean gently with soap and water. Encourage oral fluids. Do not apply ice.
2. Second degree - same as first degree and leave blister intact; simple debridement of opened blisters followed by cleaning of the wound with soap and water. **Debridement will be better tolerated 60 minutes after ibuprofen administration and after soaking the wound in cool water.** Then apply topical silver sulfadiazine 1% cream, non-adherent gauze and bulky dry sterile dressing or bacitracin xeroform gauze with sterile kling.
3. Third degree - refer to MD or hospital emergency room.

### CLIENT EDUCATION/COUNSELING

1. Teach regarding degree of burns and care.
2. Wash wound twice daily with bland soap and water prior to applying fresh dressing.

3. In healing phase, discuss:
  - a. How to check wound.
  - b. Avoiding overly-tight gauze dressing.
  - c. Avoiding hot showers.
  
4. Instruct on prevention of burns:
  - child-proofing the home
  - smoke detectors
  - hot water temperature at 49-52°C or 120°F
  - to prevent sunburns, use U-V screens of SPF 30 or greater
  - do not use hot water vaporizers
  
5. Teach emergency self-help measures.
  
6. Teach signs of secondary infection.
  
7. If the client is nursing an infant, the possibility of kernicterus is present when using silver sulfadiazine and it is unknown whether bacitracin is excreted in breast milk. Take into account the importance of the drug to the mother and advise on the discontinuation of nursing during treatment.

#### **FOLLOW-UP**

1. First degree - none.
  
2. Second degree - One (1) day (after 24 hours) for dressing change; serially thereafter, depending on course, until epithelialization without infection.

#### **REFERRAL**

1. All third-degree burns.
  
2. Second-degree burns that involve an area larger than the palm of a child's hand.
  
3. Facial burns.
  
4. Prompt referral of wounds with a potential for causing loss of function or scarring, especially wounds of the hand or digits.

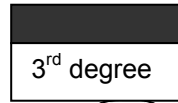
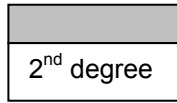
5. Any suspicion of patient abuse and neglect, to the Division of Family and Children Services (DFCS). Scrutinize particularly the following: circumferential burns of arms/legs or large round burn of the buttocks (dunking burns), multiple small round burns (cigarette-but caution not to misdiagnose bullous impetigo which may have a similar appearance), and a burn in the shape of an object such as a grate or kitchen utensil.
6. Any infant less than 6 months of age.
7. Second degree burns for any pregnant **female** approaching or at term.
8. Referral for consideration of hospital admission:
  - a. Full-thickness burn.
  - b. Partial-thickness burn if covers 15% of body surface area in adult or 10% in a child.
  - c. If burn includes head, neck, eyes, feet, hands, genitalia.
  - d. If patient has diabetes, cardiovascular disease, is immunosuppressed or has conditions with poor wound healing.
  - e. Poor social situation or infants less than 3 months of age.

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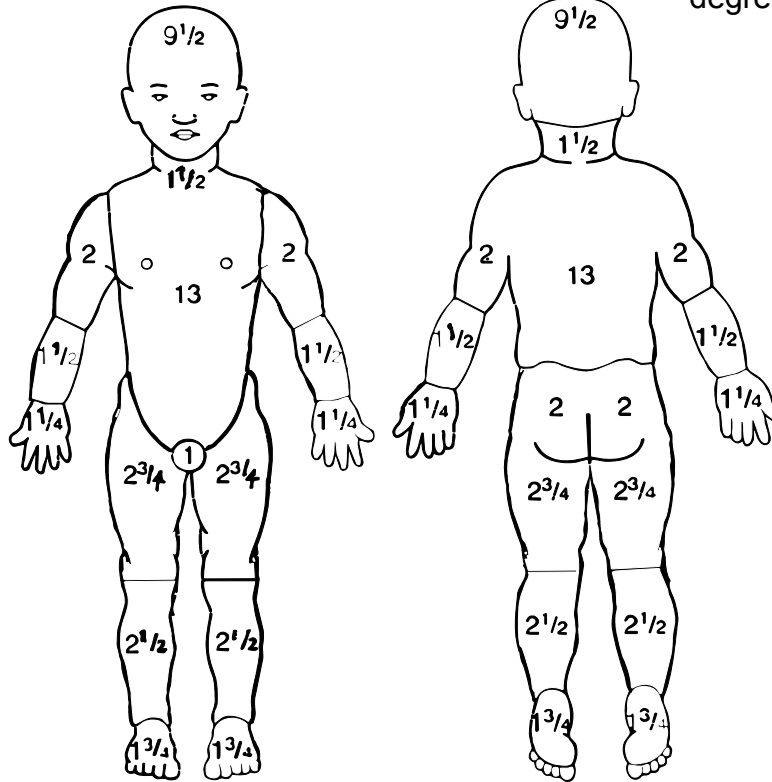
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**INFANT LESS THAN ONE YEAR OF AGE**

1<sup>st</sup> degree erythema  
not to be included



Shade in affected  
areas on the diagram  
to indicate 2<sup>nd</sup> or 3<sup>rd</sup>  
degree burns



Variations From Adult Distribution  
in  
Infants and Children (in Percent).

	New-born	1 Year	5 Years	10 Years
Head	19	17	13	11
Both thighs	11	13	16	17
Both lower legs	10	10	11	12
Neck	2			
Anterior trunk	13			
Posterior trunk	13			
Both upper arms	8			
Both lower arms	6			
Both hands	5			
Both buttocks	6			
Both feet	7			
Genitalia	1			
	100			

These percentages remain constant at all ages

Figure 11-8. Lund and Browder modification of Berkow's scale for estimating extent of burns (the table under the Illustration is after Berkow).

## **NURSE PROTOCOL FOR IMPACTED CERUMEN/EARWAX**

**DEFINITION** A mixture of sebum from sebaceous glands and from apocrine sweat glands produced in the ear canal. The purpose of ear wax is unknown, but is suspected to be to carry foreign matter away from the tympanic membrane and avoid damage to that area.

**ETIOLOGY** Excessive production of sebum by the sebaceous glands and apocrine sweat glands which may cause occlusion in the external auditory canal.

**SUBJECTIVE** Patient/care-giver may have:

1. Observed soft, yellow wax or a drier, black and brown wax on the outer surface of the external auditory canal.
2. Noticed hearing impairment.

**OBJECTIVE**

1. Yellow wax or a drier, black and brown wax on the outer surface of the ear, or in the auditory canal.
2. May or may not detect hearing impairment.
3. May not be able to see/examine tympanic membrane.

**ASSESSMENT** Excess Cerumen or Impacted Cerumen

**PLAN** **THERAPEUTIC**

### **PHARMACOLOGIC**

1. Instill Cerumenex (triethanolamine polypeptide oleate-condensate) to soften hard, dry cerumen. Allow to remain in the ear 15 to 30 minutes. Do not allow to remain in the ear longer than 30 minutes because of potential caustic or allergenic effects.

### **OR**

2. Instill 4 to 5 drops of Colace, Debrox, hydrogen peroxide, or mineral oil. Allow the drops to remain in the ear for 15 minutes.

### **THEN**

3. Gently irrigate the ear with water at body temperature (important) using an ear syringe or a 25 cc. syringe with a butterfly attachment. (Cut off needle, insert tube no more

than ¼ inch into the ear). May need to repeat after 24 hours. Do not irrigate an ear with an ear tube in place or an ear where there is any suspicion of ear drum perforation (e.g., draining ear). **If Cerumenex was used, wash the external skin that may have come into contact with Cerumenex during irrigation of the ear.**

### CLIENT COUNSELING/EDUCATION

1. Instruct to clean the ears properly, preferably with a washcloth.
3. Instruct not to insert Q-tips or other objects in ears; explain that this can cause impaction or injury.
4. Offer reassurance that cerumen production is a normal process.
5. Excessive cerumen production does not equal impaction. If any portion of the eardrum can be visualized or if there is no hearing impairment or discomfort, there is no need to be aggressive about cerumen removal.
6. Occasionally, it may be necessary to instill peroxide 1-2x/wk to manage recurrent cerumen impaction or to facilitate examination of the middle ear in a child with recurrent ear infections.

### REFERRAL

If ear remains impacted, refer to MD/NP for dry technique removal and examination of the tympanic membrane.

### REFERENCE

1. Carol K. Taketomo et al., *Pediatric Dosage Handbook, 2002-2003*, 9<sup>th</sup> ed., Lexi-Comp, Inc., Cleveland, OH, 2002. **(Current)**
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## NURSE PROTOCOL FOR CHICKEN POX (Varicella)

- DEFINITION** A usually benign, acute, highly contagious viral disease with a generalized, pruritic, vesicular rash spread by direct and airborne contact. Incubation is 10-21 days with an average of 14-16 days. Client is contagious one to two days before rash is apparent and until all vesicles have crusted, usually five (5) days after rash onset. Although most children are now vaccinated against the disease, chickenpox can sometimes occur even after immunization. If an immunized child does get chickenpox, also called breakthrough disease, it is usually a mild case with a generalized rash that is more maculopapular than vesicular, few lesions (less than 50), a low grade or no fever, and a shorter duration. In some people, the virus lies dormant in their body and is reactivated for unknown reasons as shingles. In neonates, immunocompromised persons, adolescents and adults, this condition may be more severe, with increased risk of mortality. AIDS clients may develop chronic chickenpox.
- ETIOLOGY** Varicella zoster (V-Z) virus
- SUBJECTIVE**
1. May have history of exposure.
  2. Generalized, pruritic vesicular rash.
  3. Fever.
  4. Headache.
  5. Malaise.
  6. Anorexia.
  7. URI symptoms.
- OBJECTIVE**
1. Macules, papules, vesicles, crusts, scars, in various stages of development in same body location. (With smallpox, all lesions are in the same stage of development in a given location.)
  2. May have signs of complications including:
    - a. Bacterial superinfection.
    - b. Cellulitis.
    - c. Conjunctivitis.
    - d. Arthritis.

- e. Meningitis/encephalitis.
  - f. Varicella pneumonia.
3. Edema of the glottis may occur due to lesions in the vicinity of the glottis.

## ASSESSMENT

Chickenpox

## PLAN

Report outbreak and clusters of varicella to the State Notifiable Disease Unit at 404-657-2588.

**NOTE:** Vaccination of susceptible persons  $\geq 12$  months of age within 3-5 days of exposure is effective in preventing illness or modifying varicella severity.

## PREVENTION

See the current Georgia Immunization Program Manual for vaccine information and vaccination guidelines. The Georgia Immunization Manual may be accessed on line at <http://www.health.state.ga.us/programs/immunization>.

## THERAPEUTIC

### PHARMACOLOGIC

1. For relief of itching:
  - a. Calamine Lotion or Cetaphil Lotion
  - b. Nonprescription antihistamine (e.g., diphenhydramine) as appropriate for age.

**NOTE:** Do not use Caladryl or any topical lotion with Benadryl-like products, due to potential to cause toxic psychosis in children.

2. Acetaminophen (e.g., Tylenol) for symptomatic relief, in dose appropriate for age.
3. Acyclovir may be given in an attempt to decrease complications of varicella:

If client is seen within 24 hours of the first sign or symptom of chickenpox and is

1. **Older than 12 years of age**
- OR**
2. **Older than 12 months of age and**

**contracted the disease from a sibling or other household contact.**

<u>Age</u>	<u>Dose</u>	<u>Frequency/Duration</u>
12 months – 11 yrs	20 mg/Kg PO Max dose of 800mg/dose	qid for 5 days
≥12 yrs/>40 Kg	800 mgPO	qid for 5 days

**NON-PHARMACOLOGIC**

1. In a healthy child, usually only symptomatic treatment is needed.
2. Skin care:
  - a. Keep skin clean with soap and water.
  - b. May add baking soda or oatmeal (e.g., Aveeno) to bath water to relieve itching.
  - c. Keep bed clothes and sheets clean.
3. Keep finger nails short and clean; wash hands with antibacterial soap frequently.
4. Isolate until vesicles have dried and no new vesicles occur, usually about 6-7 days after initial eruption.
5. Return to school is usually permitted not sooner than 7 days after onset.
6. Avoid use of aspirin or any salicylates due to risk of Reyes Syndrome. Acetaminophen is preferred over ibuprofen because of the theoretical risk of increased severity of varicella disease with the use of ibuprofen.
7. Encourage fluids; provide guidance as to what are adequate liquids to give during fever.

**REFERRAL**

1. Fever lasting over 4 days.
2. Infants less than 6 months of age.

3. All clients with history of steroid (including inhaled steroids for asthma or allergic rhinitis) or immunosuppressive therapy, immunologic deficiency or malignant disease.
4. All clients with suspected complications or secondary bacterial infections (e.g., listlessness, confusion, cellulitis, stiff neck, hyperirritability, trouble walking, difficulty breathing, pneumonia, encephalitis, Reyes Syndrome, hemorrhagic or disseminated varicella). **NOTE: Cellulitis has become an increasingly dangerous complication of varicella because of the increasing incidence of cellulitis secondary to MRSA. Refer suspected cellulitis (diffuse erythema, diffuse pain or swelling even without erythema) promptly.**
5. **Those** with chronic cutaneous or pulmonary disorders, those receiving chronic salicylate therapy, and persons using inhaled/aerosolized sprays.
6. Pregnant females.

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## NURSE PROTOCOL FOR COLIC (IRRITABLE BABY SYNDROME)

<b>DEFINITION</b>	A complex of symptoms consisting of paroxysmal abdominal pain and crying, sometimes accompanied by abdominal distention, spasms and/or passing of gas. Colic begins between ages 2-3 days and three weeks. Colic may last until 3-5 months of age and usually occurs at the same time every day. One common definition of colic is the "Rule of 3's:" more than 3 hours of crying, 3 or more days a week, for at least 3 weeks in an infant that is otherwise healthy and growing appropriately.
<b>ETIOLOGY</b>	The actual cause of colic is unknown.
<b>SUBJECTIVE</b>	Caretaker description: <ol style="list-style-type: none"><li>1. Attack begins suddenly.</li><li>2. Crying is loud and continuous, may last for hours.</li><li>3. Legs are drawn up toward abdomen during the crying spell.</li><li>4. Fists are clenched.</li><li>5. Sometimes accompanied by flushed face, circumoral pallor, distended/tense abdomen and cold feet.</li></ol>
<b>OBJECTIVE</b>	<ol style="list-style-type: none"><li>1. Abdominal distention.</li><li>2. Legs drawn toward abdomen during the crying spells and clenched fists.</li><li>3. Passage of gas (this may be secondary to crying, not the cause of crying.)</li><li>4. May have normal exam findings.</li></ol>
<b>ASSESSMENT</b>	Colic

**PLAN**

**THERAPEUTIC**

**PHARMACOLOGIC**

**There is no pharmacologic treatment of colic that has been proven to be both safe and effective. In particular, there is no evidence to support the use of any of the following: antihistamines, acetaminophen, hyoscyamine (Levsin), or simethicone.**

**NON-PHARMACOLOGIC**

Management is directed at eliminating factors that might worsen infant's irritability, and giving support to the parents. No single method of treatment works consistently. Suggestions for helping are:

1. Hold baby upright when feeding to decrease air swallowing.
2. Frequent burping.
3. Hold baby in prone position across the lap **when crying**.
4. Place a warm hot water bottle on the lap and hold the baby in prone position on top.
5. Positive attitude about mothering and good parenting skills.
6. Wrap baby (swaddling).
7. Warm baths.
8. Exposure to sounds such as a vacuum cleaner, washing machine, clothes dryer, hair dryer, dishwasher, music.
9. Offer feeding if last feeding was more than 2 hours prior.
10. Nursing (breastfeeding-because colic occurs less frequently in breastfed vs. bottle fed infants).
11. Swing ride, rocking.
12. **Trial** formula change to a hypoallergenic formula such as Progestimil or Nutramigen.
13. Avoid apple juice and other juices/foods high in sorbitol.

## CLIENT EDUCATION/COUNSELING

1. Reassurance that colic is common, self-limiting and rarely persists beyond five months of age.
2. Reinforcement of basic nutritional practices for age.
3. Reassure caregiver that physical findings are normal and colic is not her fault.
4. **Assist caregiver in identifying assistance with the infant during periods of crying. Reassure caregiver that it is OK to leave the crying infant in a safe crib environment for short periods of time in order to provide the caregiver with a few moments of relief if/when the crying becomes very upsetting.**

## REFERRAL

To physician or nurse practitioner if:

1. Presence of fever, vomiting, history of no stool, or a history of blood in the stool; do not assume the infant has colic.
2. None of the treatment and comfort measures are effective **and the caregiver is becoming very stressed.**
3. Failure to return to normal between episodes of crying.
4. Failure to gain weight.

## REFERENCES

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3. M. M. Garrison, *A Systematic Review of Treatments for Colic*, *Pediatrics*, 106:184, 2000. **(Current)**
4. American Society of Health-Systems Pharmacists, *American Hospital Formulary Service*, 2007, pp. 1276.

## NURSE PROTOCOL FOR CONJUNCTIVITIS

### DEFINITION

Conjunctivitis is an inflammation and infection of the eyelid and/or conjunctiva. It is the most common of all pediatric ocular disorders, usually due to a bacterial or viral infection. Less commonly it may result from an allergic reaction, physical or chemical irritation, or as a manifestation of a systemic infection.

Bacterial agents include pneumococcus, staphylococcus aureus, *H. influenzae* and streptococcus. Gonococcal infection in the eye of the newborn is usually apparent at 5-6 days of life, having been contracted during birth. Discharge is a prominent feature of bacterial conjunctivitis and is purulent or mucopurulent in character.

Viral conjunctivitis is frequently due to adenoviruses and is highly contagious. It may be spread by the fingers of the examiner; therefore, careful hand washing before and after examination is essential. The most striking feature is conjunctiva hyperemia, with or without a watery or mucopurulent discharge.

### ETIOLOGY

1. Bacterial infection (incubation period: 2-3 days; 80% of non-allergic conjunctivitis in children)
  - a. *Streptococcus pneumoniae*
  - b. *Hemophilus influenzae*
  - c. *Staphylococcus aureus*
  - d. *Pseudomonas aeruginosa*
  - e. *Neisseria gonorrhoeae*
  - f. *Chlamydia trachomatis*.
2. Viral infection (incubation period: 5-14 days; 20% of non-allergic conjunctivitis in children)
  - a. Adenovirus
  - b. May be associated with upper respiratory-tract infection, sore throat, adenopathy, oral herpes simplex
3. Allergic reaction. Usually associated with such allergens as pollen, molds, animal dander and dust.
4. Foreign body or trauma.
5. Chemical irritants (in newborns may be the result of Silver Nitrate Drops or Erythromycin Ointment).
6. Systemic infections.
7. Drug-induced.
8. Contact lenses over-wear.

### SUBJECTIVE

1. Irritation and sensation of foreign body in eye.
2. Watery eyes.

3. Itching of eyes.
4. Mild photophobia.
5. Eyelids stick together.
6. No complaints of decreased vision.
7. May have history of contact lens use.

**OBJECTIVE**

1. Infected conjunctivae.
2. Discharge (cannot be used as sole criterion for differentiating viral from bacterial allergy):
  - a. Purulent in bacterial infection (often unilateral at onset).
  - b. Mucoïd or watery in viral infection (often unilateral at onset).
  - c. Stringy or watery in allergic reaction (usually bilateral at onset).

**ASSESSMENT**

Conjunctivitis. Specify type of discharge, probably (viral) or (bacterial).

**NOTE:** Conjunctivitis may be the first sign of a number of potentially serious illnesses, including the following:

1. Uveitis.
2. Stevens-Johnson Syndrome (a serious autoimmune condition).
3. Kawasaki Disease.
4. Glaucoma.
5. Periorbital or orbital cellulitis.
6. Acute otitis media (check ears).
7. Herpes conjunctivitis.

Recheck in 24 hours if not considerably improved, or if worse. If no improvement, refer to a physician.

One method of distinguishing common infectious/allergic conjunctivitis from more severe systemic causes such as uveitis is to compare inflammation of the palpebral (eyelid) and bulbar (eyeball) conjunctiva. With infectious/allergic the palpebral conjunctiva are more heavily inflamed than the bulbar conjunctiva. With more systemic causes the bulbar conjunctiva are more inflamed, particularly the limbal area (area immediately adjacent to the cornea).

## PLAN

## DIAGNOSTIC STUDIES

Gonorrhea and chlamydia cultures of exudate in an infant less than 1 month of age.

## THERAPEUTIC

### PHARMACOLOGIC

#### Bacterial:

#### Non-pregnant

1. Polytrim Ophthalmic Solution, if  $\geq 2$  months of age:  
Instill 1-2 drop in affected eye(s) q 4-6h while awake,  
(maximum of 6 doses/day) for 7-10 days.

#### OR

2. Polymixin B/Bacitracin (e.g. Polysporin) Ophthalmic ointment: Instill  $\frac{1}{2}$ " ribbon in the affected eye(s) tid for 7-10 days.

#### Pregnant

Erythromycin ointment (e.g., Emycin). Instill  $\frac{1}{2}$ " ribbon in the affected eye four times daily for 7 –10 days.

#### Allergic:

#### Non-pregnant

Olopatadine HCL 0.1%, (e.g., Patanol) Ophthalmic Solution:  
For  $\geq 3$  years of age. Instill 1 drop in affected eye(s) bid.  
**May be better tolerated when refrigerated before use.**

#### Pregnant

Nedocromil (Alocril): Instill 1-2 drops in affected eye(s)  
bid. May be better tolerated when refrigerated before use.

**NOTE: If topical agents are not tolerated or not effective, then oral antihistamines, as recommended in the Allergic Rhinitis nurse protocol, may be used.**

## NON-PHARMACOLOGIC

Cold compresses to relieve discomfort, if mild non-purulent conjunctivitis associated with an upper respiratory infection or allergic conjunctivitis.

## CLIENT EDUCATION/COUNSELING

1. Viral conjunctivitis may last up to 12-14 days, but commonly for 3-5 days.
2. Bacterial conjunctivitis should respond to treatment within 2-3 days.
3. Hands must be washed before and after application of ophthalmic ointment or solution. Instruct in hand washing technique and disposal of contaminated tissues.
4. Do not share bath cloths/towels.
5. Seek care or return to clinic in 24 hours if no improvement.
6. School or daycare attendance: Check with school. AAP position is that children with infectious conjunctivitis under treatment may attend school provided reasonable precautions are taken to avoid close contact such as wrestling in physical education class. Children with allergic conjunctivitis may attend school.
7. May use cold, wet compresses. To clean eyes, use cotton balls moistened with water. Use a fresh cotton ball with each wipe.
8. Do not use the child's eye medicine for anyone else.

## CONSULTATION/REFERRAL

1. Infants less than three months of age (because of *Chlamydia trachomatis* concern). Refer urgently if purulent discharge started between 2 and 5 days of age. This could represent gonorrhea and may require systemic antibiotics without delay. **NOTE:** If the discharge started in the first 24 hours this is typical of chemical conjunctivitis secondary to the instillation of drops at birth to prevent gonorrhea infection and does not require referral or treatment.
2. If a physician's note is necessary to re-enter school.
3. No improvement in 24 hours after initiation of treatment.

4. Foreign body, trauma or chemical injury.
5. Moderate to severe eye pain; any visual disturbance, including blurring.
6. Any conjunctivitis that might be gonococcal, regardless of age, (very copious discharge, gonococcus exposure).
7. Any irregularities of pupil size or reaction to light.
8. All contact lens wearers (**possible infected corneal abrasion**).
9. Any redness of eyelids.
10. Marked photophobia.
11. Acting sick, with significant lethargy.
12. A vesicular rash near the eye (Herpes).

## REFERENCES

1. **David L. Heymann**, *Control of Communicable Diseases in Man*, 18th ed., American Public Health Association, 2004, p. 124. **(Current)**
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6. Sarah Long: *Principles and Practice of Pediatric Infectious Diseases*, 2<sup>nd</sup> edition. Elsevier, 2003. **(Current)**
7. *American Academy of Pediatrics: Report of the Committee of Infectious Diseases (Red Book)*, 27<sup>th</sup> ed., 2006, pg 149. **(Current)**
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## NURSE PROTOCOL FOR CONSTIPATION

**DEFINITION** Bowel movements which are associated with the passage of small, hard, dry, often painful, stools. A decrease in the frequency, bulk and liquid content of the stool.

**ETIOLOGY** Acute Constipation

1. Insufficient amount of fiber and/or fluid in the diet.
2. Acute illnesses usually associated with decreased activity and diet.
3. Emotional upset.
4. Uncomfortable circumstances for defecating.
5. Disruption of usual daily routine.
6. Aggressive toilet training techniques.

Chronic Constipation

1. Psychogenic stool-holding.
2. Chronic neuromuscular disorders.
3. Hirschsprung's disease.
4. Hypothyroidism.

**SUBJECTIVE** Acute Constipation

1. Pain on defecation.
2. Stools are hard, dry.
3. Straining on defecation.
4. History of blood-tinged stools.
5. Mild abdominal pain.
6. Decrease in frequency of defecation from usual pattern.

### Chronic Constipation

1. Psychogenic stool-holding:
  - a. Onset in infancy or early childhood.
  - b. Large bowel movements at long intervals.
  - c. Fecal incontinence (encopresis).
  - d. Behavior problems.
2. Chronic neuromuscular disease:
  - a. Other developmental problems.
  - b. Mild abdominal pain.
3. Hirschsprung's disease:
  - a. Rare, spontaneous passage of formed stool.
  - b. Diarrhea (overflow type).
  - c. May occur at birth or in early infancy.
  - d. Anorexia and vomiting in early infancy.
  - e. First stool > 24 hours after birth.
4. Hypothyroidism:
  - a. Poor feeding.
  - b. Vomiting.

### OBJECTIVE

#### Acute Constipation

1. Physical exam may be normal.
2. Anal fissure, marked diaper dermatitis or perianal abscess.
3. Mild abdominal distention with a palpable firm stool apparent on abdominal and rectal exam.

#### Chronic Constipation

1. Physical exam may be normal.
2. Abdominal distention with a palpable firm stool apparent on abdominal and rectal examination.
3. Muscle weakness, sluggish reflexes (hypothyroidism), dimple on lower back.

### ASSESSMENT

1. Can be a normal child with a variation of defecation patterns that is within normal limits. (If normal variation is in pattern only, then BMs should be soft and not painful.)

2. Intestinal obstruction (usually associated with abdominal pain and vomiting).
3. Constipation, acute or chronic.

## PLAN

## THERAPEUTIC

### PHARMACOLOGIC

Acute constipation (With symptoms such as pain, irritability, malaise)

1. Age 1mo – 2 years:  
Fleet BabyLax 2mL or ½ Pediatric Glycerin Suppository;  
may also use gentle rectal stimulation using a Q-Tip© and Vaseline©.
2. Age 2 – 5 years:  
½ Fleet Enema for Children (do not repeat within 12 hours)  
[66 mL per enema]  
**OR**  
Fleet Glycerin Rectal Suppository for Children (1gm glycerin).
3. Age 5 - 12 years:  
Fleet Enema for Children, (do not repeat within 12 hours)  
[66 mL per enema]  
**OR**  
½ Fleet Laxative Rectal Suppository (5 mg Bisacodyl).
4. Over 12 years:  
Fleet Enema for adults (do not repeat)  
**OR**  
Fleet Laxative Rectal Suppository (10 mg Bisacodyl).

**NOTE:** Enema is usually more effective – must retain 10 minutes.

Acute constipation without symptoms OR for use after initial relief from above

1. Docusate sodium (Colace) 5 mg/kg/day.
  - a. Age <3 years: Orally 10-40 mg/day, divided from 1-4 times a day.
  - b. Ages 3-6 years: Orally 20-60 mg/day, divided from 1-4 times a day.

- c. 6-12 years: Orally 40-150mg/day, divided from 1-4 doses a day.

**NOTE:** This softens and prevents excessive drying of the stool. It is effective unless there is voluntary stool retention. Effect should be apparent 1-3 days after first dose.

2. Maltsupex (no prescription needed), a nonabsorbable oral carbohydrate. Stir into warm water, then add milk, formula, water or fruit juice until dissolved.
- a. Breastfed infants >1 month old
- 1) Liquid: 1-2 teaspoonfuls in 2-4 oz. water or fruit juice 1-2 times/day PO for 3-4 days.  
**OR**
  - 2) Powder: 4 gm in 2-4 oz of water or fruit juice daily PO for 3-4 days.
- b. Bottle-fed infants >1 month old
- 1) Liquid: ½ to 2 tablespoonsful/day in formula PO for 3-4 days, then 1-2 teaspoonful/day.  
**OR**
  - 2) Powder: 8-16 gm/day in formula PO for 3-4 days, then 4-8 gm/day.
- c. Children 2-6 years of age
- 1) Liquid: 7.5 mL 1-2 times/day PO for 3-4 days.  
**OR**
  - 2) Powder: 8 gm bid PO for 3-4 days.
- d. Children 6-12 years of age
- 1) Liquid: 15-30 mL 1-2 times/day PO for 3-4 days.  
**OR**
  - 2) Powder: up to 16 gm/day PO for 3-4 days.
- e. >12 years of age
- 1) Liquid: 30mL bid PO for 3-4 days, then 15-30mL at bedtime.  
**OR**
  - 2) Powder: Up to 32 gm bid PO for 3-4 days, then 16-32gm at bedtime  
**OR**
  - 3) Tablets: 4 tablets PO qid, maximum dose 64gm/day.

Chronic Constipation: Refer to MD/NP.

### **NON-PHARMACOLOGIC**

1. Encourage water intake between, or following, feedings for infants. Increase fluid intake for all other ages.
2. If anal fissure, suggest warm Sitz baths, gentle cleansing, petroleum jelly to anus.
3. Increase in the diet the amount of fruits and vegetables and other high fiber foods such as whole grains. Restrict milk to normal volume for age.

### **CLIENT EDUCATION/COUNSELING**

1. Infants
  - a. Explain the need for adequate fluid intake. May use 4-6 ounces of water to an infant's diet or temporary use of apple or prune juice daily for 2-3 days.
  - b. Do not use laxatives such as Castoria or Fleets enemas.
  - c. Counsel on overall quality of diet and dietary needs appropriate for the age of the infant. Whole grain cereal (barley), fruits (constipating types such as banana, apple sauce, pears, and non-constipating types such as plums, peaches, apricots, prunes), and vegetables can help alleviate and prevent constipation in the older infant.
  - d. Discontinue solids if introduced too early.
  - e. Honey, corn syrup, or homegrown herbal teas should not be served to an infant under 1 year of age since it may contain botulism spores that may cause infantile botulism.
  - f. Controlled trials with infant formula have not shown a relationship between iron in the formula and constipation.
  - g. Infrequent soft stools may be normal for some infants.
  - h. Explain vicious cycle: constipation enlarges the colon, an enlarged colon is weaker leading to more constipation. If the cycle is not interrupted the result can be debilitating for a child and family.
2. Children
  - a. Increase fluid (especially water and fruit juices) and fiber intake.
  - b. If milk or dairy products are thought to be a problem, limit the number of daily servings.
  - c. Increase intake of whole grains/cereals, dried beans, raw/dried fruits and vegetables, nuts/seeds (if age-appropriate). Add high fiber foods gradually. Encourage a

- wide variety of foods. Consume fruits and vegetables with peel or skin whenever possible.
- d. Follow-up for several weeks. Acute constipation can evolve into a major problem if not treated properly. (Explain 'vicious cycle' as described above for infants.)

### CONSULTATION/REFERRAL

1. Acute constipation **without symptoms**: Refer to MD/NP if no improvement in 2-3 days.
2. **Acute constipation with symptoms should be referred to MD/NP promptly (same day) if there is not relief of symptoms with the acute therapy described above. Pain or other symptoms, if secondary to constipation, should be entirely relieved with the passage of stool. If this is not the case, then the cause of the child's symptoms may not be constipation and needs prompt diagnosis.**
3. Chronic constipation.
4. Signs of emotional/family issues.
5. Infants with any of the following: recurrent constipation, history of first bowel movement after 24 hours of age, any systemic signs such as vomiting or failure to gain weight.

### REFERENCES

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5. American Society of Health-Systems Pharmacists, *American Hospital Formulary Service*, 2007, pp. **2925-2930.**
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## NURSE PROTOCOL FOR CRADLE CAP

<b>DEFINITION</b>	A form of seborrheic dermatitis that most babies show at some time during infancy. It is a result of excessive discharge from the sebaceous glands, but the cause is not really understood. The lesions are usually multiple, discrete, circumscribed oval or nummular patches covered with fine, yellowish, slightly-oily scales on an erythematous base.
<b>ETIOLOGY</b>	The actual cause is unknown.
<b>SUBJECTIVE</b>	As described by the parent/care-giver: <ol style="list-style-type: none"><li>1. Rash on scalp.</li><li>2. Dry, scaly flakes that do not resolve with normal shampooing of the head.</li></ol>
<b>OBJECTIVE</b>	<ol style="list-style-type: none"><li>1. Dry, scaly, sometimes greasy flakes on the scalp.</li><li>2. Running the finger firmly across the scalp surface will loosen the flakes.</li><li>3. Thick, yellowish, crusted lesions on the scalp, with scaling.</li><li>4. Papules or fissuring behind the ears and on the face.</li></ol>
<b>ASSESSMENT</b>	Cradle Cap
<b>PLAN</b>	<b>THERAPEUTIC</b> <ol style="list-style-type: none"><li>1. Mild Cases:<ol style="list-style-type: none"><li>a. Shampoo head daily with warm water and mild soap using firm pressure on the scalp. Mineral oil massaged into scalp before shampoo may help loosen the scales.</li><li>b. Rinse well and pat dry after each shampooing.</li></ol></li><li>2. Severe or Unresolved Cases:<ol style="list-style-type: none"><li>a. Use antiseborrheic/antidandruff shampoo <b>containing selenium sulfide</b> (e.g., Head and Shoulders) 2 times weekly.</li><li>b. If lesions persist, topical steroids may be used. In infants and small children, use topical hydrocortisone lotion 1% bid for 2 weeks.</li></ol></li></ol>

- c. Antibiotic therapy may be indicated for secondary infection.

### **CLIENT EDUCATION/COUNSELING**

1. The parents should be reassured that vigorous rubbing of the infant's scalp and fontanel area will not harm the infant or the skull.
2. Review instructions for management.
3. Reassure parents that if proper washing is done faithfully for one week, the scalp should clear.

### **REFERRAL**

1. For antibiotic therapy (for secondary infection) or stronger topical steroids if condition does not improve with proper management.
2. Presence of secondary infection.

### **REFERENCE**

1. William W. Hay, et al., *Current Pediatric Diagnosis and Treatment*, 16<sup>th</sup> Edition, McGraw-Hill, 2003. **(Current)**
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## NURSE PROTOCOL FOR CUTANEOUS LARVA MIGRANS

<b>DEFINITION</b>	A skin lesion caused by serpiginous burrowing of the dog or cat hookworm. This condition is also called “ground itch,” “sandworm,” or “creeping eruption.”
<b>ETIOLOGY</b>	<i>Ancylostoma braziliens</i>
<b>SUBJECTIVE</b>	<ol style="list-style-type: none"><li>1. History of skin exposure to areas likely to be contaminated with dog or cat feces (e.g., sandboxes).</li><li>2. Intense local pruritis.</li></ol>
<b>OBJECTIVE</b>	<ol style="list-style-type: none"><li>1. Serpiginous, erythematous, thread-like lesions that advance about 1 cm/day.</li><li>2. Lesions are usually located on feet, hands, buttocks or thighs.</li><li>3. Excoriation from scratching may obscure the underlying lesion.</li><li>4. <b>(Differentiate from Scabies) Scabies burrows are rarely longer than 1cm. Scabies lesions usually involve multiple body areas and there are multiple lesions within an area. CLM generally involves one body area and only one or a few lesions in that area that may be several centimeters in length.</b></li></ol>
<b>ASSESSMENT</b>	Cutaneous larva migrans
<b>PLAN</b>	<b>THERAPEUTIC</b>  <b>PHARMACOLOGIC</b>  <b>Non-pregnant clients only</b> <ol style="list-style-type: none"><li>1. a. Topical application –<ol style="list-style-type: none"><li>1) Thiabendazole (Mintezol) 10% - 15% suspension, <b>OR</b></li><li>2) A 10% <b>thiabendazole ointment in white petrolatum (mixed by the pharmacist using the thiabendazole suspension)</b>, applied topically to lesions 4-6 times a day until lesions are inactivated in 7 to 10 days. Apply in a wide area around the advancing point of the lesion.</li></ol></li></ol>

**OR**

- b. Oral thiabendazole, in patients weighing less than 70kg the dose is 25mg/kg twice daily for 2 days and in patients weighing over 70 kg the dose is 1.5gm twice daily for 2 days. A second course of treatment should be administered if active lesions are still present 2 days after completion of therapy.

**OR**

If patient weighs **more** than 15 kg:

- c. Ivermectin 200mcg/kg once daily for 1-2 days.

**OR**

- d. Albendazole 400mg once daily for 3 days.

**NOTE:** Contraindications to these medications include: pregnancy, hematopoietic and hepatic disorders, and CNS disorders. Please consult the package insert for each medication prior to use.

- 2. OTC diphenhydramine (e.g., Benadryl) orally or topical steroids may be used for symptomatic relief of pruritus.

**CLIENT EDUCATION/COUNSELING**

- 1. Reassure that, even untreated, the lesion will resolve in 4-6 weeks.
- 2. Children should avoid playing in potentially contaminated areas, especially sandboxes.
- 3. Lesions are not contagious to other children.
- 4. The drugs may impair the ability to perform activities requiring mental alertness or physical coordination.

**CONSULTATION/REFERRAL**

- 1. If scratching has resulted in infection of the skin.
- 2. Lesion unresponsive to treatment after 7 days.
- 3. Cough (with large infestations, pneumonia can be a complication).
- 4. Pregnant clients.

## REFERENCES

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## **NURSE PROTOCOL FOR ATOPIC DERMATITIS (ECZEMA)**

- DEFINITION** A chronic inflammatory disorder of the skin manifested by pruritic, erythematous, papular, vesicular, weeping lesions with scaling or crusting. It tends to occur in patients with an inherited allergic predisposition.
- ETIOLOGY** In part, it is an atopic allergic response. The exact etiology is unknown. It is probably the most common problem in pediatric dermatology. It is not present at birth and usually does not occur before the age of three months. In many cases, eczema secondary to food allergies is transient; as children get older the food intolerance resolves itself. Manifestations are usually secondary to pruritus and scratching of the sensitive skin. The following may initiate and aggravate the itching and inflammation:
1. Dry skin/cold weather.
  2. Perspiration/hot humid weather.
  3. Highly-allergenic foods in infants and children include: citrus fruits, chicken, cow's milk, egg whites, nuts and wheat.
  4. Irritating clothing (wool, silk).
  5. Certain soaps, detergents or cosmetics.
  6. Respiratory infections.
- SUBJECTIVE**
1. Pruritus, rash.
  2. Often, family history of allergic diseases (asthma, allergic rhinitis, urticaria) or atopic dermatitis.
  3. Ask about age of onset.
  4. History of asthma or allergic rhinitis (about 50% of cases).
  5. Ask about routine skin care, including frequency of bathing and products used.
- OBJECTIVE** Infancy (0 – 24 months)  
(Incidence of food allergies is greatest during infancy. Children whose parents have allergic reactions to foods are at a greater risk of having food allergies.)
1. Rough, erythematous, papular, and occasionally vesicular or scaling eruption, which frequently progresses to weeping and crusting.
  2. Onset after two months of age.
  3. Location: commonly on cheeks, scalp, postauricular area, neck,

and extensor surface of forearms and legs; occasionally trunk and diaper area.

4. Fairly rapid alternation between quiescent periods and exacerbations.
5. Frequent rubbing of involved areas by infant.
6. Highly-allergenic foods: wheat, egg whites, citrus fruits, cow's milk.

#### Childhood

1. Less weeping and crusting, and more dry, papular, scaling eruption with hyperpigmentation.
2. Intensely pruritic and excoriated lesions with lichenification due to scratching.
3. Location: Commonly on flexor surfaces of wrist and neck and on antecubital and popliteal areas.

#### Adolescence and Adulthood

1. Dry, thickening skin, with accentuation of normal lines and folds; often hyperpigmentation.
2. Location: commonly on flexor areas of extremities, eyelids, back of neck and dorsum of hands and feet.

### **ASSESSMENT**

Atopic Dermatitis (eczema)

Consider for differential diagnosis:

1. Seborrheic dermatitis (sometimes impossible to differentiate in infancy).
2. Fungal infections of the skin.
3. Contact dermatitis (e.g., poison ivy).
4. Irritant dermatitis (e.g., diaper dermatitis).
5. Xerotic dermatitis (dry skin).
6. Rare systemic diseases of infancy associated with atopic dermatitis-type rash.
7. Scabies.

**PLAN THERAPEUTIC**

**PHARMACOLOGIC**

1. **Apply 1% hydrocortisone cream or ointment BID (cream during hot humid weather, otherwise ointment is best). Apply to face, axillae, groin and very small minor lesions in other areas that are causing minimal or no discomfort. Apply until controlled.**
2. Use an over-the-counter antihistamine such as diphenhydramine (e.g., Benadryl) orally, as appropriate if needed for itching.

**NON-PHARMACOLOGIC**

1. For infants:
  - a. When adding a new food, try it for 2-3 days and check reactions before going on to another new food.
  - b. If suspect food(s), avoid that food for two weeks and then do a “challenge,” feeding that food to the child one time. If it does cause flare-ups, the eczema should become itchy, or child will develop hives two (2) hours after ingesting the food. In the future, avoid foods that cause this.
  - c. Dietary restrictions are controversial in atopic dermatitis. Infants should not be given cow’s milk, egg whites, chocolate, spiced foods, fish, and nuts during the first 12 months of life. Use caution with wheat, tomatoes, and citrus fruits.
2. For mild cases: bathe in mild soap (Dove or Cetaphil) using 1/2 to 1 capful of bath oil (Alpha-Keri or Aquaphor) in water. Apply moisturizer to wet skin after bath. Apply lubrication cream to skin TID.

**CLIENT EDUCATION/COUNSELING**

1. The intestine develops resistance to large protein molecules as baby gets older. Resistance significantly improves by 7-9 months and continues to improve until 12-24 months of age.

2. Avoid factors that initiate pruritus and irritate skin; the key is to reduce or eliminate factors that promote dryness or increased scratching so a severe rash can be prevented.
  - a. An environment that is slightly cool and well-humidified is best.
  - b. Spend time indoors in warm weather. Humidify home in winter if heating system dries air.
  - c. Use warm water for brief baths or showers; hot water causes itching.
  - d. Use soft cotton clothing and bedding. Avoid wool, starched or rough clothing.
  - e. Place a cotton pad under the bed sheets to further separate an infant from a plastic mattress.
  - f. Keep fingernails short.
  - g. Recognize that emotional stress can worsen but not cause the disease.
  - h. **Use liquid detergent when washing clothes plus a second rinse cycle.**
  
3. Instructions for topical care of atopic dermatitis:
  - a. Wet the skin for 5-20 minutes twice a day.
  - b. Avoid excessive exposure to soap. Use a mild soap (e.g., Dove or Cetaphil) for cleaning dirty areas.
  - c. Pat dry and quickly apply the steroid preparation to the wet skin. Apply the steroid only on the areas of dermatitis.
  - d. Apply lubricant (Aquaphor, Vaseline Intensive Care) to the entire body immediately after the topical steroid. (The lubricant may be applied over the steroid if the steroid is a cream.) Apply the lubricant while the skin is still wet, twice a day.
  - e. Reapply the lubricant throughout the day if the skin appears dry.
  - f. As the skin improves, continue the lubricant twice a day, or more frequently. Decrease the topical steroid to once a day, or less frequently, as needed. May also be able to decrease the potency of the topical steroid.
  - g. Wash hands after applying steroid and lubricant.
  
4. Emphasize to child and family that this is a chronic condition and exacerbating factors must be controlled for successful management. **Also emphasize that good skin care, as described above, will decrease flare-ups and the need for topical steroids.**

## FOLLOW-UP

Return in one week, or periodically as needed.

## REFERRAL

1. Children and adolescents with severe skin eruptions.
2. Client with dermatitis with crusting or weeping lesions. Antibiotics may be necessary to treat secondary infection.
3. Any client with intense itching that may require prescription for antihistamine and/or topical steroids.
4. Client with mild dermatitis that worsens or does not improve after two weeks of treatment.
5. Any client with suspected bacterial or viral infection should be referred immediately to MD.
6. Any client with suspected underlying condition.
7. Consult nutritionist for food-related issues.

## REFERENCES

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## NURSE PROTOCOL FOR CONTACT DERMATITIS

### DEFINITION

Acute or chronic inflammatory reaction to substances that come in contact with the skin.

### ETIOLOGY

Irritant contact dermatitis is caused by local absorption of an irritant through a break in the skin. The inflammatory response may result from a single exposure to a caustic agent, or because of repeated minor damage to the skin, such as frequent handwashing. Common offending agents include soaps, detergents and oral solvents. Everyone is at risk for developing irritant contact dermatitis, but people vary in their response to the irritant. One form common in infants is irritant diaper dermatitis, caused by trapped moisture and friction at the site of contact with the diaper.

Allergic contact dermatitis is a delayed cell-mediated hypersensitivity reaction to an offending agent. During the sensitization phase, an allergen penetrates the epidermis and produces proliferation of T-lymphocytes. The T-lymphocyte cells enter the blood circulation, so that all the skin becomes hypersensitive to the allergen. This phase may take days or months, depending on the individual's sensitivity, the amount and concentration of the allergen, and the amount of penetration. In the elicitation phase, the antigen specific T-lymphocytes react to subsequent allergen exposure and produce the inflammatory response.

Poison ivy, oak and sumac produce many cases of allergic dermatitis. Other allergens include: fur; leather; nickel; topical antibiotics, antihistamines and anesthetics; shoe dyes or glue; hair dyes; adhesive tape; parabens (found in sunscreens and lotions); and latex.

### SUBJECTIVE

1. May have history of exposure to chemicals, detergents, medications, plants, lubricants, cleansers or rubber gloves, **metal jewelry (zinc)**, at home or at work.
2. May have previous history of contact dermatitis.
3. Itching, swelling, rash of varying severity and duration.
4. Ask about response to any treatment used.

### OBJECTIVE

1. Note character of eruption. Irritant contact dermatitis usually causes an erythematous dry, scaling eruption with an indistinct margin. Fissures sometimes occur. Chronic exposure may cause weeping lesions.

Allergic contact dermatitis usually causes more erythema and edema. Vesicles, characteristic in response to poison ivy, oak and sumac, often weep and form crusts.

2. Note location and pattern of the eruption, which suggest the cause:
  - a. Scalp/ears: hair care products, jewelry.
  - b. Eyelids: cosmetics, contact lens solutions.
  - c. Face/neck: cosmetics, cleansers, medications, jewelry.
  - d. Trunk/axilla: deodorants, clothing.
  - e. Arms/hands: poison ivy/oak/sumac, soaps, detergents, chemicals, jewelry, rubber gloves.
  - f. Legs/feet: clothing, shoes.

**ASSESSMENT** Contact Dermatitis

**PLAN** **DIAGNOSTIC STUDIES**

Scraping of lesion for microscopic exam if scabies is suspected.

**THERAPEUTIC**

**PHARMACOLOGIC**

1. **If client is not pregnant, and lesions occupy less than 2% body surface area (< 2x size of client's palm) and do not involve the face, apply triamcinolone 0.1% tid until clear. Use ointments on dry or cracked skin and creams on inflamed or weeping lesions. Most patients prefer creams. May need to taper application BID and QD to avoid flare-up.**
2. Topical astringents such as calamine or lotions with menthol, camphor or zinc may be applied.
3. Wet dressings using gauze soaked in Domeboro astringent. Change every 2-3 hours.
4. For relief of itching:
  - a. Adults: Diphenhydramine 25-50 mg orally 3 or 4 times a day (not to exceed 300 mg/day). **Do not give in third trimester of pregnancy.**
  - b. Infants and Children: Diphenhydramine hydrochloride elixir 12.5 mg/5 mL. May give up to 5 mg/kg/day orally in 4 divided doses (not to exceed 300 mg/day). Dosing should be based on severity of symptoms.

### NON PHARMACOLOGIC

1. Apply cold, wet compresses for 15-20 minutes 3-4 times a day during the blistering and weeping stage.
2. Cool tub baths, with or without colloidal oatmeal (e.g., Aveeno), to decrease inflammation and itching.

### CLIENT EDUCATION/COUNSELING

1. Remove or avoid the irritant/allergen. Wear protective clothing and gloves.
2. For poison ivy, oak, etc:
  - a. As soon as possible after exposure, wash the skin with lots of cold water and soap. To wash within 15 minutes is the most effective. If soap and water are not available, alcohol may be used.
  - b. Poison ivy dermatitis is not spread elsewhere on the body or to another person, by fluid in the blister. It is spread by any oil from the plant still on the skin, clothes or tub. (Taking a shower rather than a bath is less likely to leave resin around the tub.)
  - c. A rash will appear first on areas of skin which are thinner, or where the plant oil was more concentrated.
  - d. Teach how to identify poison ivy, oak and sumac.
  - e. Topical steroids do not work well on vesicles or weeping rashes, but may be used after the blistering stage.
3. Avoid use of topical preparations with benzocaines or other -caines.
4. Advise that patch testing may be required to identify the irritant or allergen if more than one is possible.

### FOLLOW-UP

Re-evaluate in 2-3 days, if no improvement or signs of bacterial infection occur.

### REFERRAL

1. If moderate to severe dermatitis (**> 2% body surface area**) or significant involvement of the face, oral steroids can bring about dramatic improvement. The sooner oral steroids are started, the more effective they will be.

2. For secondary bacterial infection.
3. If no response to treatment.

## REFERENCES

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**NURSE PROTOCOL FOR  
DIAPER DERMATITIS  
(Diaper Rash)**

<b>DEFINITION</b>	Inflammation of the skin within the area usually covered by the diaper.
<b>ETIOLOGY</b>	It can be caused, and aggravated by, many factors acting separately or in combination. Contact irritants such as urine, stool and chemicals may be involved. Bacterial, fungal or viral infections may also cause a diaper dermatitis. Other causes include seborrheic dermatitis or atopic dermatitis.
<b>SUBJECTIVE</b>	<ol style="list-style-type: none"><li>1. May be no symptoms.</li><li>2. Pruritis.</li><li>3. Irritability.</li></ol>
<b>OBJECTIVE</b>	<ol style="list-style-type: none"><li>1. Irritant contact diaper dermatitis will show mild erythema, especially on the buttocks, genitalia and lower abdomen with sparing in the creases.</li><li>2. Bacterial infection will show vesicles and/or pustules in the diaper area.</li><li>3. Monilial (candidal) infection will show smooth, shining, “fire-engine” red, papular and nummular rash, with well-circumscribed borders, that extends into creases, and satellite lesions that are outside the margin of the erythema. Oral thrush may also be present. Small pustules are often present on the periphery.</li><li>4. Affected area may be moist and exudative.</li><li>5. During healing of moderate to severe dermatitis, skin may be dry and scaly.</li></ol>
<b>ASSESSMENT</b>	Diaper dermatitis.
<b>PLAN</b>	<b>THERAPEUTIC</b>  General Treatment and Prevention <ol style="list-style-type: none"><li>1. Keep diaper area dry and free from urine and stool:<ol style="list-style-type: none"><li>a. Change diapers frequently.</li></ol></li></ol>

- b. Cleanse diaper area with warm water with each diaper change. Use mild, non-perfumed, non-medicated soap sparingly to avoid irritation.
  - c. Air drying is useful.
  - d. Avoid starch, other powders and petroleum jelly.
2. Apply bland ointment (e.g., A&D ointment) or a barrier cream (e.g., zinc oxide or Desitin©) after each diaper change.
  3. Avoid the use of commercial diaper wipes, which are often perfumed and irritating.
  4. Infants using super absorbent disposable diapers have a significantly lower frequency and severity of diaper rash when compared with infants using cloth diapers. These should be recommended if the dermatitis is recurrent or severe.
  5. Hydrocortisone cream 1% (available OTC) should be applied four times a day for rashes with moderate-to-severe inflammation, for 1 to 2 days only.
  6. The fixed-combination medications, Mycolog II and Lotrisone, should not be used.

Candidiasis – In 80% of cases of diaper dermatitis lasting more than three days, the affected area is colonized with *Candida albicans* even before the classic signs appear.

1. Use good general hygiene (see above).
2. Apply nystatin 100,000 **units**/gm (e.g., Mycostatin©) cream lightly to affected area 3 times a day for 7-10 days. (May repeat cycle once.)
2. Hydrocortisone 1% cream or ointment may help decrease erythema and inflammation and can be applied at the same time as the nystatin for the first 2 days of treatment.
3. Allow air exposure of diaper area for short periods during the day.
4. Treat for oral thrush, if evident, or with second course of nystatin even if typical lesions of oral thrush are not present. Nystatin oral suspension, 100,000 **units** in each side of mouth qid, as adjunct to topical therapy.

## CLIENT EDUCATION/COUNSELING

Assure that parent/caregiver knows how to treat, as above.

## REFERRAL

1. Failure to respond to treatment.
2. If signs of bacterial infection are present.
3. Any rash that is unusual or severe.

## REFERENCES

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## NURSE PROTOCOL FOR ENURESIS

### DEFINITION

Enuresis is an involuntary passage of urine during the day or night. Nocturnal enuresis occurs in: about 10-15% of five year olds; 5% of ten year olds; and 1% of 15 year olds. Boys are affected somewhat more frequently than girls, and there is a familial tendency.

Primary enuresis exists when a child has never achieved consistent urinary bladder control. Secondary enuresis exists when there is a recurrence of urinary incontinence after 3 to 6 months of consistent dryness.

### ETIOLOGY

1. Unknown cause - This is the most common category. Numerous etiologic theories have been suggested, but there is no unanimous agreement among authorities. These theories include the following:
  - a. Psychological factors.
  - b. Limited bladder capacity.
  - c. Delayed neurologic maturation.
  - d. Profound sleep state.
2. Variations of normal - Under five years of age, enuresis can be considered normal unless there are signs and symptoms suggesting a specific cause. This is particularly true if there is a family history of enuresis.
3. Urinary tract infection.
4. Obstructive lesions/abnormalities of the urinary tract.
5. Primary neurological disorder.
6. Disorders associated with decreased urine-concentrating ability and increased volume.
7. Child abuse.
8. Allergies.
9. Pinworms.
10. Antidiuretic hormone insufficiency.
11. Diabetes or other endocrine problems.
12. Seizure disorders.
13. Stressful event in life of child, such as a family discord, significant loss or birth of sibling.

### SUBJECTIVE

1. Report of involuntary passage of urine, occurring from rarely to several times daily, day or night.
2. Child may have achieved good control, but there are periodic lapses at night.
3. May be a history of enuresis in other family members.

- OBJECTIVE**
1. Results of a complete physical examination are usually normal.
  2. May have:
    - a. Evidence of psychological and behavioral problems.
    - b. Lumbosacral skin abnormalities.
    - c. Abnormalities of the genitalia, include the urethral meatus.
    - d. Poor rectal sphincter tone.
    - e. Decreased perineal sensation to pinprick.

**ASSESSMENT** Enuresis

**PLAN**

**DIAGNOSTIC STUDIES**

(Not necessary under age 5 years, or under age 6 years with a family history, unless other factors are present.)

1. Urinalysis, to include measurement of specific gravity. Ideally test the first morning specimen to assess concentrating ability.
2. Urine culture.

**CLIENT/FAMILY EDUCATION/COUNSELING**

1. Reassure that for children **less than** five years of age enuresis is still normal, unless symptoms or signs suggest a specific cause. For children under six years of age, enuresis is normal if there is a family history of enuresis.
2. Avoid punishment or ridicule for enuresis, as it is not voluntary. Secondary psychological problems can result if enuresis is managed inappropriately by the family.
3. Reassure that even if nothing is done, enuresis is most often a self-limiting condition if no specific underlying cause can be found.
4. Treatment for children over 5 years, or 6 years if positive family history (after examination and lab studies reveal no specific cause):
  - a. Have child or parent keep a diary of wet and dry days and nights for one month.
  - b. If daytime enuresis occurs, consult physician.
  - c. If only nocturnal enuresis occurs, suggest the following measures (the efficacy of these suggestions has not been proven, but each has support of some clinicians):

- 1) Limit fluid intake after the evening meal. Also limit **caffeinated** beverages and salty foods during the day.
- 2) Suggest that before the parents go to bed, they awaken the child to urinate.
- 3) Encourage the child to become involved in the therapeutic process:
  - a) Have child keep a diary of wet and dry nights.
  - b) Have parents give praise and small rewards for dry nights.
  - c) Suggest that child retain urine for progressively longer periods during the day.
  - d) Have child participate in the clean up in a non-punitive way.
- d. Punishment or ridicule by family or others should be strictly prohibited.
- e. Moisture sensors with alarms may be an appropriate initial therapeutic modality. **In controlled studies up to 60% success rates are reported. However, they are not without problems that need to be discussed with the family before considering this therapy. These problems include: frequent night awakenings that can be problematic for both child and family, may frighten the child, may not wake the child, and auditory alarm may awaken a sibling.**

## **FOLLOW-UP**

Schedule return visit in one month to assess progress.

1. If enuresis has not decreased, consult the physician.
2. If enuresis has decreased, give praise and continue to see the client periodically on the basis of degree of improvement and need for counseling.

## **REFERRAL**

1. If secondary psychological problems develop because of punitive or ridiculing family attitude.
2. If secondary psychological problems develop because of child's inability to participate in social activities such as camp or overnight visits.
3. Daytime enuresis or secondary enuresis.

4. Evidence of an organic cause.
5. Severe psychological problems.
6. Failure to improve after treatment.
7. For consideration of desmopressin (DDAVP) by physician or nurse practitioner. This is an intranasal preparation to be given at bedtime and is successful in 50% of children as long as they continue the treatment. **Relapse rates are high.** It is most useful for sleep-overs. Moisture sensors have better long-term success.

## REFERENCES

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## NURSE PROTOCOL FOR EPISTAXIS

**DEFINITION** The spontaneous discharge of blood from the nares. It is important to remember that the nose is very vascular.

- ETIOLOGY**
1. Spontaneous rupture of blood vessels in the nose (usually in the anterior septum) occurring most frequently in children and in the elderly.
  2. Higher incidence in winter when heating causes drying and cracking of nasal mucosa.
  3. Trauma from a blow to the nose.
  4. Picking of dry, crusted nostrils.
  5. Allergies/colds in which the individual vigorously rubs or blows nose.
  6. Rarely, hypertension.
  7. Rarely, a blood disorder (less than 5% of the children with recurrent epistaxis have a bleeding disorder).

**SUBJECTIVE** Usually no symptoms other than the awareness of blood dripping down the posterior nasopharynx and external bleeding.

- OBJECTIVE**
1. Bleeding from the nares and down the posterior nasopharynx.
  2. Localized bleeding point. This may or may not be seen in the anterior nasal septum.
  3. Usually no evidence of bleeding or clotting disorder, such as petechiae or bruises.
  4. No evidence of foreign body in the nares.

**ASSESSMENT** Epistaxis

**PLAN** **DIAGNOSTIC STUDIES**

Check hematocrit or hemoglobin if history indicates significant or recurrent bleeding.

Check for dizziness or decrease in BP when going from lying to standing if there is concern that much blood has been lost.

## **THERAPEUTIC**

### Acute Bleeding

1. Keep patient in an erect sitting position with the head tilted slightly forward to prevent blood from going down the posterior nasopharynx (unless child is dizzy from excessive blood loss – rare).
2. To decrease venous pressure, try to keep child from crying.
3. With thumb or forefinger, apply continuous external compression on both sides of the nose for 15 minutes. Do not release intermittently to check on blood stoppage.
4. An ice pack may be placed over the bridge of the nose.

## **CLIENT/CARE-GIVER EDUCATION/COUNSELING**

### To prevent nosebleeds:

1. Discourage picking of the nose. (Keep fingernails neatly trimmed.)
2. Increase the humidity in the home, especially in sleeping areas, by means of a humidifier or pot of water on a heater. (Be careful to instruct on the safety aspects of using a pot on the heater.)
3. The friability of the nasal vessels can be decreased with a daily application of petroleum-based or water-based ointment to the irritated mucous membranes with a cotton-tip applicator for five days past the bleeding episode or when nose is dry/crusted. Do not stick large amounts of ointment into the nostrils, since it can be aspirated. Do not push the applicator into the nose. Place Vaseline at opening of nares, and massage up with fingers outside nose.
4. Avoid use of aspirin and nonsteroidal anti-inflammatory drugs (NSAIDS).
5. Avoid vigorous blowing or rubbing of the nose.

## REFERRAL

1. When bleeding is not controlled by 15 minutes of compression.
2. Evidence of massive bleeding. (A nasopharyngeal angiofibroma may present as recurrent nose bleeds. Adolescent males are almost exclusively affected.)
3. Recurrent bleeding within the first hour.
4. Second episode within a week.
5. Family history of bleeding disorders.
6. Onset of nosebleeds before age two.
7. Evidence of bleeding/clotting disorder.
8. Hypertension.

## REFERENCES

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**NURSE PROTOCOL FOR  
ERYTHEMA INFECTIOSUM  
(Fifth Disease)**

**DEFINITION** Erythema Infectiosum (EI), or Fifth disease, is characterized by mild systemic symptoms including fever (15-30%) and a distinctive rash. These infections are ubiquitous, and cases can occur sporadically or as community outbreaks. Respiratory-spread outbreaks frequently occur in elementary and junior high schools in winter to spring months, with secondary spread among susceptible household contacts.

**ETIOLOGY** *Parvovirus B-19*

- SUBJECTIVE**
1. History of exposure during past 4-28 days.
  2. Rash on face or body.
  3. Mild itching.
  4. Arthralgia or arthritis.

- OBJECTIVE**
1. Facial rash with intensely red “slapped cheeks” appearance.
  2. Maculopapular, lace-like rash on arms and extending to trunk, buttocks and thighs. A gloves-socks distribution has been recently described and includes substantial edema.
  3. Rash may recur and fluctuate in intensity with environmental changes, such as temperature and exposure to sunlight, for weeks or even months.
  4. Signs of arthralgia and arthritis recurring infrequently in children but commonly in adults, especially women.

**ASSESSMENT** Erythema infectiosum/Fifth disease

**PLAN** For most clients, only supportive care is indicated.

**CLIENT EDUCATION/COUNSELING**

1. Children may attend childcare or school, since they are most infectious before the onset of illness and are unlikely to be infectious after onset of the rash and other symptoms.

2. Parvovirus B-19 infection that occurs during pregnancy can, rarely, cause fetal hydrops and death. Pregnant women who have been in contact with children who were in the incubation period of EI should contact their obstetrician.

### REFERRAL

1. Children with chronic hemolytic anemias such as Sickle Cell Disease (the infection may briefly interfere with red cell production).
2. Pregnant women who are exposed or infected.
3. Clients with arthralgia or arthritis.
4. Children who are immune deficient.

### REFERENCES

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3. Carol D. Berkowitz, *Pediatrics: A Primary Care Approach*, 2<sup>nd</sup> ed., W.B. Saunders, 2000, pp. 460-464. **(Current)**
4. Anne A. Gershon, Peter J. Hotez, Samuel L. Katz, *Gershon: Krugman's Infectious Diseases of Children*, 11<sup>th</sup> ed., Mosby, 2004. **(Current)**

## NURSE PROTOCOL FOR FEVER

- DEFINITION** Fever is an elevation in normal body temperature. It is a defense mechanism indicating physiological changes in the body in response to a pathologic process. Fever is traditionally defined as body temperature  $>38^{\circ}\text{C}$  ( $100.4^{\circ}\text{F}$ ) rectally,  $37.8^{\circ}\text{C}$  ( $100^{\circ}\text{F}$ ) orally, or  $37.2^{\circ}\text{C}$  ( $99^{\circ}\text{F}$ ) axillary.
- ETIOLOGY** Varied. Most fevers in children are seen in conjunction with an acute, infectious process. Fever control is of secondary importance to identification and control of its underlying cause.
- SUBJECTIVE**
1. May have history of exposure to other ill children or adults.
  2. May be lethargic and irritable.
  3. May have symptoms of illness, such as rhinorrhea, cough, tachypnea, ear pain, dysuria, pain, chills, rash, urinary frequency and sudden enuresis.
  4. Fever pattern may be continuous, remittent, intermittent or recurrent.
  5. May have history of recent immunization. **However, caution is advised when attributing fever to an immunization. Immunized infants can also harbor an infectious process.**
  6. May have decreased activity level and appetite.
  7. May complain of pain or discomfort.
- OBJECTIVE**
1. Elevated temperature:  
 $\geq 37.2^{\circ}\text{C}$  ( $99^{\circ}\text{F}$ ) axillary (less reliable than rectal/oral)  
 $\geq 38^{\circ}\text{C}$  ( $100.4^{\circ}\text{F}$ ) rectally or  $37.8^{\circ}\text{C}$  ( $100^{\circ}\text{F}$ ) orally.  
**NOTE: Rectal is the preferred route for infants <12 months old (<24 months old if immunizations are not up to date or if the infant is in a high-risk category for a urinary tract infection). Ear and skin temperatures are not reliable.**
  2. Variations in fever during the day; lowest temperature occurs between 2:00 a.m. - 6:00 a.m.; highest occurs between 4:00 p.m. and 8:00 p.m.
  3. Elevated pulse and respiratory rate.
  4. Level of sensorium may be decreased.

5. Examine for stiff neck, rash, pharyngitis, otitis media, rales on auscultation.

**ASSESSMENT** Fever/Elevated body temperature.

**PLAN** **DIAGNOSTIC STUDIES**

Laboratory tests as indicated by history and physical findings.

**THERAPEUTIC**

**PHARMACOLOGIC**

1. Aspirin should not be administered to children with influenza-like illness or chicken pox or to alleviate fever following receipt of an immunization. Also, nonsteroidal anti-inflammatory drugs (NSAIDs, i.e., ibuprofen) may increase risk of more severe varicella. **NOTE:** Pepto-Bismol© and Alka-Seltzer© contain aspirin; do not give them to a child with a fever.
2. Use non-aspirin antipyretics such as acetaminophen (e.g., Tylenol©, Tempra©) or ibuprofen (e.g., Advil©, Motrin©) only if fever is >100° F and/or child is uncomfortable, or is 5 years old or less and has a history of febrile seizures. Refer to recommendations in the following dosage charts. **Alternating ibuprofen and acetaminophen is controversial and is discouraged.**

**NOTE:** Children with phenylketonuria (PKU) should not take Children's Anacin-3©, Children's Tylenol©, Double Strength Tempra©, Junior Strength Tylenol© and Tempra© in the chewable form. These products, in this dosage form, contain aspartame, which is metabolized in the GI tract to phenylalanine following oral administration.

Many children's hospitals have modified their approach to the febrile infant over the past year or two. The reasons are two-fold. First, the *pneumococcal* vaccine has now clearly been shown to have a dramatic effect on the incidence of *pneumococcal* disease in infancy. Secondly, there is increasing concern regarding missed UTIs in infancy. These infections are now known to cause significant renal scarring and to be the cause of kidney problems later in life. For these reasons the new fever guidelines at children's hospitals have been de-emphasizing blood cultures for high fever in infants immunized against *pneumococcus* and have

been emphasizing urinalyses and cultures on infants with moderate fevers and selected high-risk criteria for UTI.

### DOSAGE RECOMMENDATIONS FOR RELIEF OF FEVER AND PAIN IN CHILDREN

#### ACETAMINOPHEN

**NOTE:** Dose may be repeated every 4 hours, as needed, but do not give more than 5 doses in 24 hours.

Age	Weight	Acetaminophen (80 mg/0.8mL): Infant's Anacin - 3 Drops; Panadol Drops; Tempra Drops; Tylenol Drops.	Acetaminophen (160 mg/5 mL): Children's Anacin - 3 liquid; Panadol Liquid; Childrens Tempra Syrup; Children's Tylenol Suspension.
0-3 Months	6-11 lbs. (2.5-5.4 kg)	1/2 dropperful <b>0.4 mL</b> (40 mg)	
4-11 months	12-17 lbs. (5.5-7.9 kg)	1 dropperful <b>0.8 mL</b> (80 mg)	1/2 teaspoon (80 mg)
12-23 months	18-23 lbs. (8.0-10.9 kg)	1 1/2 droppersful <b>1.2 mL</b> (120 mg)	3/4 teaspoon (120 mg)
2-3 years	24-35 lbs. (11-15.9 kg)	2 droppersful <b>1.6 mL</b> (160 mg)	1 teaspoon (160mg)
4-5 years	36-47 lbs. (16 –21.4 kg)		1 1/2 teaspoons (240 mg)
6-8 Years	48-59 lbs. (21.8-26.7 kg)		2 teaspoons (320 mg)
9-10 Years	58-71 lbs. (26.6-32.5 kg)		2 ½ teaspoons (400mg)
11 Years	72-95 lbs. (32.6-43 kg)		3 teaspoons (480mg)

**IBUPROFEN CHILDREN'S SUSPENSION**  
(100 mg/5 mL in 4 and 16 oz bottles, fruit flavored)

(5 mg/kg/dose q 6-8 hrs if temp is <102.5° F; 10 mg/kg/dose q 6-8 hrs if temp is >102.5° F)

**NOTE:** Dose may be given every 6 hours.

Age	Weight	Temp <102.5° F	Temp >102.5° F
6-11 mos	13-17 lbs (6 – 8 kg)	1/4 tsp (25 mg)	1/2 tsp (50 mg)
12-23 mos	18-23 lbs (8 – 10 kg)	1/2 tsp (50 mg)	1 tsp (100 mg)
2-3 yrs	24-35 lbs (11–16 kg)	3/4 tsp (75 mg)	1 1/2 tsp (150 mg)
4-5 yrs	36-47 lbs (16 – 21 kg)	1 tsp (100 mg)	2 tsp (200mg)
6-8 yrs	48-59 lbs (22 – 27 kg)	1 1/4 tsp (125 mg)	2 1/2 tsp (250 mg)
9-10 yrs	60-71 lbs (27 – 32 kg)	1 1/2 tsp (150 mg)	3 tsp (300 mg)
11-12 yrs	72-95 lbs (33 – 43 kg)	2 tsp (200 mg)	4 tsp (400 mg)

**NON-PHARMACOLOGIC**

1. Dress child lightly.
2. Optional: For comfort and better evaluation of mental status when temperature is down - sponge bathe with tepid water if temperature is 104° F for greater than 30 minutes after antipyretic has been given. Do not use alcohol for sponging. Do not allow child to become chilled.
3. Give extra clear liquids such as Pedialyte, Enfalyte, water, juices and popsicles to prevent dehydration. (See “Assessment of the Signs and Symptoms of Infantile Dehydration and Fluid Deficit” chart following Gastroenteritis Nurse Protocol.)

**CLIENT EDUCATION/COUNSELING**

1. Comfort measures.
2. How to take rectal temperature in infants, oral or axillary temperature in older children and to observe for other signs and symptoms which may develop.

3. Safety measures and keeping all medications out of reach of children at all times.
4. A child with fever should act close to normal at least briefly every 4 hours.
5. Infants and children with fever should not attend daycare or school.

## REFERRAL

1. Fever greater than **102.2° F (39° C)** and any of the following (high-risk UTI and bacteremia criteria:
  - a) **Age 3-6 months**
  - b) **Age 6-12 months, uncircumcised male**
  - c) **Age < 12 months and female**
  - d) **Age 12-24 months, female and temperature >48hrs**
  - e) **Age 6-24 months and less than 2 pneumococcal immunizations.**
2. All infants under 3 months old with a temperature elevation.
3. Any child with signs of acute illness accompanying the fever, such as meningeal signs, alteration in neurologic status, lethargy, pain, **rash, or tachypnea after fever control or other signs of respiratory distress.**
4. Child appears ill and toxic or lethargic.
5. Child has a history of febrile seizures.
6. Any child who has a fever that lasts more than 3 days.
7. Child with history of chronic conditions such as heart disease or Sickle Cell disease.
7. Note that failure of fever to respond to antipyretics is not predictive of severity of illness.
8. **Child with an unusual exposure history (examples: tick bite, foreign travel, unusual animal exposure, etc.).**

## REFERENCES

1. Rose W. Boynton, *Manual of Ambulatory Pediatrics*, 5<sup>th</sup> ed., Lippincott Williams & Wilkins, 2003. **(Current)**
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## NURSE PROTOCOL FOR GASTROENTERITIS

**DEFINITION** An acute, generally self-limiting inflammation of the gastrointestinal (GI) tract associated with vomiting, diarrhea and dehydration secondary to vomiting and diarrhea. It is the most common cause of upper gastrointestinal tract hemorrhage in older children.

**ETIOLOGY** Viruses are the most common cause of acute gastroenteritis in developing and developed countries. Viral agents that are more common in winter include rotaviruses that affect all age groups, but predominantly children 6-24 months of age. Gastroenteritis due to adenoviruses occurs during most of the year.

Bacterial gastroenteritis is more common in summer. *Campylobacter jejuni* is the most common cause of bacterial gastroenteritis in children 1-5 years of age in the United States. Salmonella may occur at any age, but the highest incidence is in children less than 5 years old. Shigella is most common in children 1-4 years old and is prevalent in poor-hygiene environments. Enteropathogenic *E. coli* is more frequent in the winter, and most common in newborns. Enterohemorrhagic *E. coli* (O157:H7) infection can cause a bloody diarrhea and can lead to Hemolytic Uremic Syndrome. It can occur at any age and is most commonly linked to the ingestion of undercooked beef. *Yersinia enterocolitica* is more frequent in children less than 3 years old.

Parasites include: *Entamoeba histolytica* and *Giardia lamblia*.

Diarrhea may be related to recent antibiotic use or associated bacterial infection (otitis media, respiratory tract infection).

Other causes may be: stress, idiopathic, caustic ingestions, drug-induced, ethanol, protein sensitivity, eosinophilic gastroenteritis or Crohn's disease.

- SUBJECTIVE**
1. Vomiting: Assess duration, frequency, character and amount.
  2. Diarrhea: Assess duration, frequency, consistency of stools, presence of blood or mucus.
  3. May have history of exposure to others with similar symptoms.
  4. May have history of similar illness in the community.
  5. May have decreased frequency and amount of urinary output.

6. Elevated temperature.
7. Crampy abdominal pain NOT aggravated by movement.
8. Weight loss.
9. Assess type and amount of feedings prior to and since onset.
10. Assess for history of exposure to: reptiles (salmonella); birds; food outside the home; ingestion of drugs, toxic substances or home-canned, or undercooked foods; or stress.

**OBJECTIVE**

1. May have signs of fever and dehydration (e.g., no tears, dry mouth).
2. Hyperactive bowel sounds.
3. Diffuse, mild abdominal tenderness. Assess for signs of acute abdomen: decreased or absence of bowel sounds, severe abdominal pain, rigid abdomen to palpation, and tenderness in right lower quadrant or peri-umbilical area.
4. Assess for signs of specific processes that may cause secondary diarrhea: otitis, URI, UTI, lactose intolerance, inflammatory bowel disease, cystic fibrosis, celiac disease, pharyngitis and appendicitis.
5. Assess for signs of specific processes that may cause secondary vomiting: trauma, ingestion of toxic substances, appendicitis, congestive heart failure, increased intracranial pressure, and hepatitis. (With the exception of appendicitis, the presence of diarrhea tends to rule out these possibilities.)

**ASSESSMENT**

Inflammation of the gastrointestinal tract/Gastroenteritis.

**PLAN**

**THERAPEUTIC**

1. Manage existing dehydration; restore and maintain fluid and electrolytes and acid-base balance. (Infants are particularly at risk for rapid dehydration; concomitant fever accelerates risk of dehydration.)
2. Initiate gastroenteritis diet. (See Pediatric Diets for Gastroenteritis on page 10.91.)

3. Maintain hydration by use of oral hydration products such as Pedialyte and Ricelyte. Replacement volume: Give over a 4 hr. period 50-80 mL/kg  
**PLUS**  
Replacement for ongoing loss: 5-10 mL/kg for each diarrheal stool, and 2 mL/kg for each vomiting episode.
4. Most home remedies (e.g., Jell-O, Gatorade, soft drinks) contain inappropriately high concentrations of carbohydrates and low sodium concentrations.
5. Nursing mothers may continue to breastfeed.
6. Use of antidiarrheal agents is discouraged.
7. If vomiting is present, start with small amounts of liquid (5-15 mL) frequently (as often as every 5-10 minutes depending upon tolerance – smaller more frequent feedings when vomiting is more frequent) and advance as tolerated.
8. If there is no vomiting, do not restrict volume of liquids.

#### **CLIENT EDUCATION/COUNSELING**

1. Explain that most diarrhea and vomiting is benign and self-limiting. The usual duration of illness is 5-7 days and the aim of treatment is to keep child well hydrated. The vomiting typically lasts less than 24 hours, with proper diet.
2. Monitor temperature and urinary output.
3. Gastroenteritis may occur in the entire family. It is highly communicable. Careful hand-washing technique must be followed to prevent spread. Do not let children drink from the sick child's glass or use the same utensils.

#### **REFERRAL**

1. Infants under 3 months of age.
2. Vomiting persisting over 12 hours.
3. Diarrhea persisting over 3 days in a child 1 year or older, or persisting more than 24 hours in an infant less than 1 year with signs of dehydration.

4. Frequent diarrhea with stools more than 7-10 times a day.
5. Any signs or symptoms of dehydration; poor oral intake.
6. Abdominal pain with movement or abdominal tenderness on examination.
7. Blood in stools.
8. Symptoms suggesting other infection such as pneumonia.
9. Bile in emesis.
10. Isolated vomiting without diarrhea. (This is more likely to be a diagnosis other than gastroenteritis.)

### ASSESSMENT OF THE SIGNS AND SYMPTOMS OF INFANTILE DEHYDRATION AND FLUID DEFICIT

Assessment	Mild Dehydration	Moderate Dehydration	Severe Dehydration
General appearance	Thirsty, alert, restless	Thirsty, restless or lethargic but irritable when touched	Drowsy, limp, cold, sweaty, cyanotic extremities; may be comatose
Radial pulse	Normal rate and volume	Rapid and weak	Rapid, feeble, sometimes impalpable
Respiration	Normal	Deep, may be rapid	Deep and rapid
Anterior fontanel	Normal	Sunken	Very sunken
Skin elasticity	Pinch retracts immediately	Pinch retracts slowly	Pinch retracts slowly (2 sec.)
Eyes	Normal	Sunken	Deeply sunken
Mucous membranes	Moist	Dry	Very Dry
Urine flow	Normal or slightly reduced	Reduced amount and dark	None passed for several hours; empty bladder
Body weight loss	4-5%	6-9%	10% or more
Estimated fluid deficit (ml/kg)	40-50	60-90	100-110

$$\frac{\text{Pre-illness weight} - \text{today's weight}}{\text{Pre-illness weight}} \times 100 = \text{Fluid deficit as \% of body weight loss}$$

**AMOUNTS OF FORMULA TYPICALLY TAKEN  
ON A SELF-DEMAND SCHEDULE**

Age (months)	Amount per Feeding (ounces)	Number of Feedings (per 24 hours)	Total Consumed Per 24 Hours (ounces)
0-1 month	3-4	6	18-24
1-2 months	3-5	6	18-30
2-3 months	4-6	5	20-30
4-5 months	5-7	5	25-35
6-7 months	6-8	5	30-38
8-12 months	8	3	24*

\* plus solids

### RECOMMENDED DAILY INTAKE OF WATER, CALORIES AND PROTEIN FOR FULL-TERM INFANTS AND CHILDREN

Total water includes the water in breastmilk, formula, juices and beverages:

Range of Average Water Requirements of Children at Different Ages Under Ordinary Conditions			
Age	Average Body Weight (kg)	Total Water in 24 Hours (mL)*	Water per kg Body Weight in 24 hours (mL)*
3 days	3.0	250-300	80-100
10 days	3.2	400-500	125-150
3 months	5.4	750-850	140-160
6 months	7.3	950-1,100	130-155
9 months	8.6	1,100-1,250	125-145
1 year	9.5	1,150-1,300	120-135
2 years	11.8	1,350-1,500	115-125
4 years	16.2	1,600-1,800	100-110
6 years	20.0	1,800-2,000	90-100
10 year	28.7	2,000-2,500	70-85

Source: R.E.Behrman, et al., *Nelson Textbook of Pediatrics*, Philadelphia, PA, W.B. Sanders Co., 17<sup>th</sup> ed., 2004. **(Current)**

Protein and calories (kilocalories) from 1989 Recommended Dietary Allowances		
Age	Kcal/kg*	gm Protein/kg*
0-6 months	108	2.2
6-12 months	98	1.6
1-3 years	103	1.2
4-6 years	90	1.1
7-10 years	70	1.0

**\*NOTE:** Conversion Factors: 1 kg = 2.2 lbs; 30 mL = 1 oz.

### PEDIATRIC DIETS FOR GASTROENTERITIS

**PURPOSE:** Pediatric diets for gastroenteritis provide adequate oral fluids and electrolytes during a diarrhea and/or vomiting episode. The diets are planned in four stages which provide a progression from the initial high diarrhea and/or vomiting volume output and reduced oral intake through intermediary stages of less frequent diarrhea and/or vomiting then a return to a normal eating pattern for age.

The dietary treatment is in four stages according to age and severity of diarrhea/vomiting:

- Stage 1 Use only at the initiation of the diarrhea and/or vomiting episode and should not be used longer than 24 hours. This stage tests the child's ability to tolerate hypotonic fluids. If vomiting is present fluid should initially be given in small amounts frequently (5-15 mL every 5-10 minutes depending upon tolerance).
- Stage 2 Should be attempted within 24 hours and be used until the frequency and volume of diarrhea and/or vomiting begins to diminish. If there is no vomiting then this stage can begin as soon as adequate fluid intake (stage 1) is established.
- Stage 3 Gradual addition of plain baby foods or soft foods as diarrhea and/or vomiting decreases. The introduction of these foods should be done slowly and in small amounts with a gradual increase in amounts with increasing tolerance.
- Stage 4 Cessation of diarrhea and/or vomiting and a return to an age-appropriate diet.

	Infants (Not on solid food)	Infants (On solid food)	Children (Over 1 year)
Stage 1	Breastmilk (if breastfed) <b>OR</b> Pedialyte (Infalyte or Rehydralyte).	Breastmilk (if breastfed) <b>OR</b> Pedialyte or Pedialyte Pops (Infalyte or Rehydralyte).	Pedialyte or Pedialyte Pops (Infalyte or Rehydralyte) <b>OR</b> Clear Liquid Diet.
Stage 2	Breastmilk <b>OR</b> Full-Strength Infant Formula alternating with Pedialyte.	Breastmilk <b>OR</b> Full-Strength Infant Formula alternating with Pedialyte, <b>PLUS</b> Baby rice cereal, Cream of Wheat, applesauce, Strained peaches or pears, mashed bananas or potatoes.	Above liquids, <b>PLUS:</b> Dry toast, plain crackers, applesauce, mashed bananas, strained soup or broth, plain pasta or rice.
Stage 3	As above, decreasing Pedialyte with decreasing diarrhea and/or vomiting.	As above, <b>PLUS</b> Bland strained foods.	Soft diet. Limit milk or milk product IF milk products appear to worsen diarrhea.
Stage 4	Breastmilk or Infant Formula.	Breastmilk or Infant Formula. Additional foods as tolerated.	Add additional milk and milk products. Return to normal diet for age.

Clear liquid diet:

1. Only Vomiting – Water, flat dilute soft drinks without caffeine, Kool Aid.
2. Only Diarrhea – Pedialyte, ½-strength sports drinks.
3. Diarrhea and Vomiting – As for diarrhea.

## REFERENCES

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## NURSE PROTOCOL FOR GIARDIASIS

<b>DEFINITION</b>	A protozoan infection of the small bowel. It is classically associated with drinking contaminated water. Fecal-oral contamination allows person to person spread. Giardiasis is seen in children and adults. Recovery of organisms through ova/parasite exam may be difficult; therefore, in an adult or child with a diarrheal syndrome as defined below, presumptive treatment for giardiasis may be appropriate. Children, especially in diapers, who are excreting trophozoites or cysts and attending daycare can spread infection to classmates, caretakers and family members.
<b>ETIOLOGY</b>	<i>Giardia lamblia</i> , a flagellate protozoa.
<b>SUBJECTIVE</b>	<ol style="list-style-type: none"><li>1. Often asymptomatic.</li><li>2. Flatulence.</li><li>3. Abdominal cramps or achiness, especially after meals.</li><li>4. Acute, chronic or intermittent diarrhea.</li><li>5. Night-time vomiting.</li><li>6. No fever.</li><li>7. Fatigue.</li><li>8. May have history of drinking possibly-contaminated water.</li></ol>
<b>OBJECTIVE</b>	<ol style="list-style-type: none"><li>1. Loose, watery, pale, greasy, malodorous stools; blood is rare.</li><li>2. Stool positive for <i>Giardia lamblia</i>.</li><li>3. Weight loss, abdominal distension.</li><li>4. Low hemoglobin/hematocrit, if chronic infection.</li><li>5. Trophozoites or cysts in stool – 90% positive identification rate if &gt; 3 stools examined. <b>Identification rate deteriorates significantly if the stool examined in the laboratory is not fresh or transported in an inappropriate preservative (check with local laboratory). Antigen tests are now available for the identification of <i>Giardia</i> that have a high degree of reliability.</b></li></ol>

**ASSESSMENT**      Giardiasis

**PLAN**                      **THERAPEUTIC  
PHARMACOLOGIC**

1.      Metronidazole (e.g., Flagyl)
  - a.      Children: 15mg/kg/24 hrs in three divided doses PO for 5 - 7 days (Maximum dose 750 mg/day).
  - b.      Adult (unless in first trimester of pregnancy): 250 mg tablet PO three times a day for 5-7 days, OR a single daily dose of 2 gm for 3 days.

**OR**

2.      Nitazoxanide (Alinia) suspension 100mg/5mL or tablets 500mg PO
  - a.      12 - 47 months of age 100mg q 12h for 3 days.
  - b.      4 - 11 years of age 200mg q12h for 3 days.
  - c.      12 years of age or older: 500mg q12h for 3 days.

**CLIENT EDUCATION/COUNSELING**

1.      The importance of sanitation and good personal hygiene habits.
2.      Hand-washing after diaper changes and after personal toilet use by caregivers. In day-care settings, persons with diarrhea (workers and children) should be excluded from centers until problem resolves.
3.      Return in one month after completion of treatment for stool exam for ova and parasites.
4.      Increase fluid intake for as long as diarrhea persists. Provide information on adequate water intake.
5.      Give instructions on boiling of water. Bringing water to a rolling boil for one minute will kill most organisms.
6.      No alcohol use, including alcohol-containing products (e.g., mouthwash) with metronidazole.
7.      If taking metronidazole:
  - a.      Side affects: nausea, urticaria, metallic taste may occur.
  - b.      May discolor urine.
  - c.      Do not take if liver or kidney disease is present.

- d. Do not take with phenytoin, lithium, warfarin, phenobarbital or rifampin.
8. If taking Nitazoxanide:
- a. Take with food; nausea or vomiting may occur.
  - b. Shake suspension well prior to administration.
  - c. Advise diabetic patients and/or their caregivers that the suspension contains sucrose.
  - d. Use with caution in patients taking highly protein bound drugs with a narrow therapeutic window such as warfarin. May discolor urine or eyes .
9. Campers should avoid drinking water directly from streams. Boiling of water will kill the infective cysts.

### REFERRAL

- 1. If symptoms persist with negative diagnostic studies.
- 2. If repeat stool is positive after treatment and client is still symptomatic.
- 3. If client has contraindications to the use of the medication.
- 4. Refer to the District Office of Infectious Disease for an epidemiologic investigation when an outbreak is suspected, to identify and treat all symptomatic children, child-care workers, and family members infected with *Giardia*. Persons with diarrhea should be excluded from the child-care center until they become asymptomatic. Treatment of asymptomatic carriers has not been demonstrated to be effective in outbreak control. Exclusion of carriers from child-care is not recommended. **Treatment of asymptomatic toddlers to prevent household transmission to pregnant women may be recommended.**

## REFERENCES

1. Frederic D. Burg et al., Gellis and Kagan's Current Pediatric Therapy, 17<sup>th</sup> ed., W. B. Saunders, 2002. **(Current)**
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3. American Academy of Pediatrics, *Red Book 2006: Report of the Committee on Infectious Diseases*, 27<sup>th</sup> ed., 2006. **(Current)**
4. American Society of Health-Systems Pharmacists, American Hospital Formulary Service, 2007, pp. **865-877**.
5. Richard F. Lacy, et al. *Drug Information Handbook*, Lexi-Comp Inc, Hudson, OH, 2004-2005, pp. 964, 1049.
6. **D. B. Huang, "An updated review on Cryptosporidium and Giardia," *Gastroenterology Clinics of North America*, 2006, Volume 35, pp. 291-314.**
7. Richard E. Behrman et al., Nelson Textbook of Pediatrics, 17<sup>th</sup> ed., W.B. Saunders, 2003. **(Current)**
8. Facts and Comparisons, *Facts and Comparisons 4.0 Online*, Wolters Kluwer Health, Inc., 2007 <<http://online.factsandcomparisons.com>>.

## NURSE PROTOCOL FOR HUMAN BITES

<b>DEFINITION</b>	A bite wound inflicted by another human.
<b>ETIOLOGY</b>	<p>Most human bites, especially if they are deep or penetrating, are extremely dangerous because of the high infection rate. Cultures of human bites most commonly grow <i>streptococci</i>, <i>anaerobes</i>, <i>staphylococci</i> and <i>Eikenella corrodens</i>.</p> <p>Only severe lacerations involving the face should be sutured. Other wounds can be managed by delayed primary closure or healing by granulation.</p> <p>A major complication of human bite wounds is infection of the metacarpophalangeal joints. "Clenched-fist" injuries from human bites should be evaluated by a hand surgeon.</p>
<b>SUBJECTIVE</b>	<ol style="list-style-type: none"><li>1. Client reports bite by a human.</li><li>2. Pain at site of bite.</li></ol>
<b>OBJECTIVE</b>	<ol style="list-style-type: none"><li>1. Puncture wound or teeth prints; document location, size, depth of each wound.</li><li>2. Redness or swelling; may be bleeding.</li></ol>
<b>ASSESSMENT</b>	Human bite
<b>PLAN</b>	<b>THERAPEUTIC</b>

### PHARMACOLOGIC

Administer tetanus containing vaccine booster if it has been five or more years since completion of primary tetanus containing series or since last tetanus booster:

1. See current Georgia Immunization Program Manual, Recommended Schedule and Guidelines, for vaccine administration guidelines and for tetanus-containing vaccines indicated for age of client. The Georgia Immunization Manual may be accessed on line at <http://www.health.state.ga.us/programs/immunization>.
2. Tetanus Immune Globulin (TIG) should be administered and an appropriate series of tetanus containing vaccine administered if there is no history of prior vaccination (not available from State Immunization Program).
3. See current ACIP Manual, "Diphtheria, Tetanus, and

Pertussis: Recommendations for Vaccine Use and Other Preventive Measures,” MMWR, August 8, 1991, p. 16 and “Preventing Tetanus, Diphtheria, and Pertussis Among Adolescents: Use of Tetanus Toxoid, Reduced Diphtheria Toxoid and Acellular Pertussis Vaccines”, MMWR, February 23, 2006, p.25 or 2006 Red Book for wound management guidelines.

### **NON-PHARMACOLOGIC**

1. Irrigate wound for at least 5 minutes before applying any pressure to stop bleeding, unless bleeding is pulsatile.
2. **Wash wound with soap and water and sterile gauze and sterile q-tips. For scratches that do not gape, apply Bacitracin antibiotic ointment on the area 3 times a day for 5-7 days. The affected area may be covered with a sterile bandage. Check and reapply dressing 3 times a day for 5-7 days. For wounds that gape but will not be referred for sutures, apply Bacitracin antibiotic ointment followed by sterile gauze moistened with sterile saline or Vaseline® impregnated gauze. Cover with dry gauze. Check and re-apply dressing 3 times a day for 5-7 days. The goal is to delay wound closure for several days until the bacterial flora of the wound migrates to the child’s normal body flora before closure. After 5 days the wound may be closed with steri-strips if there is no sign of infection. This is called healing by delayed primary closure or by secondary granulation.**
3. If the bite drew blood and either the inflictor of the bite, or the person bitten, is considered at risk for transmitting Hepatitis B or C, or possibly HIV, follow local policy for appropriate intervention.
4. **Suturing is not recommended for small bites, except on the face for cosmetic reasons. Wounds over 8 hours old are rarely sutured. If it is indicated, refer to MD/APRN.**

### **CLIENT/CARE-GIVER EDUCATION/COUNSELING**

1. Signs of infection.
2. Keep wound clean and dry. Wash wound twice daily with soap and water. Change dressing at least daily.

3. If bite drew blood, discuss the possibility of transmission of Hepatitis B or C, and the smaller chance of HIV, if either the inflictor of the bite or the person bitten, has one or more of those infections. If a risk of transmission is ascertained, consult with the District Health Director.
4. Instruct to contact personal physician or primary care provider promptly if deep enough to cause bleeding.

### **FOLLOW-UP**

Recheck within 48 hours for signs of infection.

### **REFERRAL**

1. **Large bite or a bite with devitalized tissue that requires debridement.**
2. **Signs of infection or bite not properly cleansed/irrigated promptly after occurrence.**
3. Facial or hand bite, or any bite occurring over a joint.
4. If child is at risk for Hepatitis B or C, or HIV, after being bitten by a person with known or possible infection (most adults).
5. Any immunocompromised or asplenic client; clients with sickle cell disease or other major hemoglobinopathy.
6. If the bitten person is HIV-infected, refer for administration of tetanus immune globulin (TIG) regardless of immunization status (refer to 2003 Red Book, pp. 612-614).

### **REFERENCES**

1. William W. Hay et al., *Current Pediatric Diagnosis and Treatment*, 16<sup>th</sup> ed., McGraw-Hill, 2003. **(Current)**
2. American Academy of Pediatrics, *Red Book 2006: Report of the Committee on Infectious Diseases*, 27<sup>th</sup> ed., Elk Grove Village, IL, 2006.

## NURSE PROTOCOL FOR IMPETIGO

### DEFINITION

A condition involving the superficial layer of the skin and characterized by honey-colored, crusted lesions or seropurulent vesicles surrounded by a narrow margin of erythema. It occurs in two forms: bullous and nonbullous.

Impetigo may be a complication of insect bites, abrasions or dermatitis. Peak incidence is in late summer and early fall. Impetigo is most common in infants and children.

### ETIOLOGY

Currently, the most common organism in crusted and bullous impetigo is *Staphylococcus aureus*. Earlier research suggested that most crusted impetigo was streptococcal in origin. Occasionally, both organisms may be found. Streptococcal impetigo is always crusted; bullous impetigo is virtually never streptococcus. Secondary impetigo is nearly always staphylococcal. Severe cellulitis may be a common complication of impetigo.

**MRSA impetigo has been reported but, at this time, is an uncommon presentation of MRSA.**

Impetigo may be spread by direct contact with infected persons or it may be secondary to infections of the upper respiratory tract. The incubation period is 2-10 days. The untreated patient is contagious until lesions are healed; treatment shortens the period of contagiousness.

Acute glomerulonephritis (AGM) can follow streptococcal infections of either the skin or pharynx. It can occur at any age and the incidence is variable, ranging from 0 to 28%. The median latent period between infection and the development of AGM is 10 days. It is characterized by hematuria and hypertension.

### SUBJECTIVE

1. Superficial lesions, anywhere on the body.
2. Itching is common, which may spread the infection.
3. Often a history of minor trauma such as insect bites or scratches, or scabies or herpes simplex lesions, provide an entry for the organism.

### OBJECTIVE

1. Superficial clear vesicles are present, containing serous fluid that becomes purulent. The base is erythematous and lesions are surrounded by areas of erythema. May also observe ruptured pustules that have dried centrally and formed a honey-colored crust.

2. Lesions may vary in size from a few millimeters to several centimeters.
3. May have regional lymphadenopathy, which occurs more often in streptococcal than in staphylococcal infections.
4. Bullous impetigo is characterized by very large vesicles (bullae) that rupture and form circular, raw lesions resembling a second degree burn; these eventually form a crust.

**ASSESSMENT** Impetigo

**PLAN** **DIAGNOSTIC STUDIES**

1. Check urine for blood and protein.
2. Check blood pressure.
3. **Consider skin culture if there is reason to suspect MRSA: cellulitis, history of MRSA infection in the household, history of a local MRSA outbreak, failure to respond promptly to treatment.**

**THERAPEUTIC**

**PHARMACOLOGIC**

1. Local treatment may be adequate when only one or two lesions are present and there is no fever present.
  - a. Remove crusts by gentle washing with warm water and antiseptic soap.
  - b. Bactroban 2% ointment (prescription required) should be applied to bullous lesions 3 to 5 times a day for 7-10 days.
  - c. Trim fingernails to prevent further spread. Place small amount of topical antibiotic under nails bid.
  - d. Reevaluate patients not showing a response in 3 to 5 days.

2. Systemic treatment is used for multiple lesions, widely separated lesions or lesions that are not showing rapid response to local therapy.
  - a. Cephalexin (Keflex), suspension of 125 or 250 mg/5 mL, or 500 mg capsules. Give 25-50 mg/kg/24 hours orally, divided into 2 doses for 10 days or if younger than 1 year of age divided into 3-4 doses. For severe infections, dosages may be increased to 50-100 mg/kg/day, divided into 2 doses for 10 days. Maximum dose is 3gm/day.  
If >15 years of age, 500 mg orally **bid** for 10 days. Severe infections may require higher doses 250-1000 mg every 6 hours; maximum 4 g/day.  
**NOTE:** Do not use keflex if allergic to penicillin or cephalosporins.  
**OR**
  - b. Cefadroxil (Duricef), 125, 250, or 500 mg/5 mL suspension or 500 mg capsules. Give 30 mg/kg divided into two daily oral doses for 10 days. Maximum dose 2 gm/day. Adult dose is 1 gm **bid** for 10 days. Do not use if allergic to penicillin or cephalosporins.  
**OR**
  - c. Erythromycin ethylsuccinate (EryPed, EES, Pediamycin) 200 or 400 mg/5 mL suspension or 200 mg chewable or 400 mg film-coated tablets. Give 30-50 mg/kg/24 hours, orally given in 3 equally divided doses for 10 days. For more severe infections, the dose may be doubled but not to exceed 4 gm/day.  
**NOTE:** Give after meals to decrease gastric upset.
3. Treat all family/household members in close contact who also have impetiginous lesions, to avoid reinfection and further spread.

## CLIENT EDUCATION/COUNSELING

1. Instruct family and child in hand-washing techniques.
2. Instruct in handling of linen and clothing separate from the rest of household.
3. Instruct in trimming and keeping nails clean.
4. Instruct in soaking and washing of lesions and application of ointment. Soaking is not indicated if treatment is an oral antibiotic.
5. Give parent information about symptoms of glomerulonephritis to observe for: hematuria; periorbital edema; headache; fever; malaise; or “smokey”-colored urine.
6. May return to school after 24 hours of start of oral or IM antibiotic treatment. No PE until fully resolved.

## FOLLOW-UP

- 1, Reevaluate if not showing a response in 3 to 5 days.
2. Recheck in 14 days, or sooner if rash/infection gets worse while on treatment. Note any signs or symptoms of glomerulonephritis (hematuria, periorbital edema, headache, malaise). Check blood pressure. If indicated, check urine for blood and protein (dipstick adequate).

## REFERRAL

1. If rash is not completely resolved at end of medication regimen.
2. Infants under the age of 2 months.
3. Noncompliance with medication or instructions.
4. If extensive local inflammation or cellulitis.
5. If any signs/symptoms of glomerulonephritis.
6. If multiple recurrences, to evaluate child for nasopharyngeal carriage state of *S. aureus*
7. **Progression after 24 hours of treatment or a culture positive for MRSA.**

## REFERENCES

1. Constance R. Uphold and Mary V. Graham, *Clinical Guidelines in Family Practice*, 4<sup>th</sup> ed., Barmarrae Books, Gainesville, FL, 2003. **(Current)**
2. Rose W. Boynton, et al., *Manual of Ambulatory Pediatrics*, 5<sup>th</sup> ed., Lippincott Williams & Wilkins, Philadelphia, PA, 2003. **(Current)**
3. Richard E. Behrman et al., *Nelson Textbook of Pediatrics*, 17<sup>th</sup> ed., W.B. Saunders, 2003. **(Current)**
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6. American Pharmaceutical Association, *Infectious Disease Handbook*, 4<sup>th</sup> ed. Lexi-Comp, Inc., Hudson, OH, 2001. pp. 668, 698, 762. **(Current)**
7. Charles F. Lacy, et al., *Drug Information Handbook*, Lexi-Comp Inc., Hudson, OH, 2004-2005, pp. 266, 288, 523, 602.
8. **S. Lyer, "CA-MRSA skin infection: a retrospective analysis of clinical presentation and treatment of a local outbreak," *Journal of American Academy of Dermatology*, 2004, Volume 50, pp. 854-8. (Current)**

## NURSE PROTOCOL FOR INFLUENZA

<b>DEFINITION</b>	Acute viral disease of the respiratory tract.
<b>ETIOLOGY</b>	<p>Causal agent is influenza virus of 3 antigenic types (A, B, and C). Mode of transmission: Spread from person to person by direct contact, by large droplet infection, or by articles recently contaminated with nasopharyngeal secretions; during an outbreak, airborne transmission by small-particle aerosols may occur.</p> <p>The incubation period ranges from 1-3 days. The period of communicability is probably from 3-5 days from clinical onset; clients are most infectious in the first 24 hours before onset of symptoms and during the period of peak symptoms; viral shedding in nasal secretions usually stops within 7 days of onset of infection.</p>
<b>SUBJECTIVE</b>	<p>Client may complain of the following:</p> <ol style="list-style-type: none"><li>1. Abrupt onset of fever, malaise, diffuse myalgia, headache, and nonproductive cough; later, sore throat, nasal congestion, and cough become more prominent.</li><li>2. Severe malaise may linger for days.</li><li>3. Cough is usually the most frequent and troublesome symptom and may be associated with substernal discomfort.</li><li>4. Symptoms usually last about 3-4 days, but cough and malaise may persist for 1-2 weeks.</li><li>5. Gastrointestinal tract manifestations such as nausea, vomiting, and diarrhea occur in children, but are less common in adults.</li><li>6. May be a close contact to a case of influenza.</li><li>7. May or may not have had an influenza vaccination.</li><li>8. Obtain medication history; especially ask about <b>aspirin</b>.</li></ol>
<b>OBJECTIVE</b>	<ol style="list-style-type: none"><li>1. Fever.</li><li>2. May be difficult to differentiate from an acute respiratory illness caused by any of a variety of respiratory viruses.</li></ol>

**ASSESSMENT** Influenza

Epidemiologic data are usually sufficient to make the diagnosis in uncomplicated cases (i.e., when it is known that a certain influenza type is prevalent in a community, most persons with acute febrile respiratory illness with myalgia can cautiously be assumed to have influenza).

**PLAN**

**DIAGNOSTIC TESTS**

Consider cultures or **antigen testing** of nasopharyngeal secretions; must collect within 72 hours of illness.

**PREVENTION**

All healthy children ages 6 through **59** months should be immunized every year with influenza vaccine. Children 6 months and older with certain risk factors (including but not limited to asthma, cardiac disease, sickle cell disease, HIV, and diabetes) should also receive vaccine annually. Healthy **persons** ages **5** and older who are household contacts **or out of home care givers** of individuals with the above medical risks should also be immunized. Children under the age of 9 receiving the vaccine for the first time should receive 2 doses, a minimum of 4 weeks apart. See the Georgia Immunization Program Manual for further details and administration guidelines. **The Georgia Immunization Manual may be accessed on line at** <http://www.health.state.ga.us/programs/immunization>.

**THERAPEUTIC**

**PHARMACOLOGIC**

1. Fever is treated for comfort and to reduce the risk of dehydration. Children and adolescents should not receive salicylates because of increased risk of developing Reye syndrome. Recommend acetaminophen, ibuprofen (see the nurse protocol for fever). Ibuprofen is preferred if myalgias are present.
2. **Treatment of cough is discouraged because cough is a protective mechanism that helps clear the lung of infectious particles.**

**CLIENT EDUCATION/COUNSELING**

1. Recommend rest and increased fluids.
2. Encourage cessation of smoking in household.

3. Return to clinic if chest pain, dyspnea, signs of dehydration, wheezing, moist **frequent** cough, persistent abdominal pain or vomiting, persistent lethargy, agitation, behavioral changes, or confusion occur.

### **FOLLOW-UP**

1. No follow-up needed if symptoms resolve within one week.
2. Reevaluate if symptoms persist beyond 7-10 days  
**OR**  
if there is deterioration with return of fever after apparent improvement after 4-6 days of illness (suspect pneumonia).

### **REFERRAL**

1. Complications of influenza which include:
  - a. Primary influenza pneumonia.
  - b. Secondary bacterial pneumonia.
  - c. Myositis (calf tenderness, refusal to walk, in children).
  - d. Central nervous system problem.
  - e. Reye syndrome (associated primarily with influenza B).
2. **Consider referral to primary care provider for antiviral therapy those at least 1 year of age, and within 2 days of illness onset, in whom shortening of clinical symptoms may be beneficial, such as children with increased risk of complicated influenza infection; healthy children with severe illness; and children with special environmental, family or social situations for which ongoing illness would be detrimental.**

## REFERENCES

1. Constance R. Uphold, and Mary V. Graham, *Clinical Guidelines in Family Practice*, 4<sup>th</sup> ed., Barmarrae Books, Gainesville, FL, 2003. **(Current)**
2. Carol K. Taketomo et al., *Pediatric Dosage Handbook 2002-2003*, 9<sup>th</sup> ed., Lexi-Comp, Inc., Cleveland, OH, 2002. **(Current)**
3. Eugene Braunwald, et al., *Harrison's Principles of Internal Medicine*, 16<sup>th</sup> ed., McGraw-Hill, 2005.
4. American Society of Health-Systems Pharmacists, American Hospital Formulary Service, 2007, pp. **769-774**..
5. "Facts and Comparisons," *Facts and Comparisons 4.0 Online*, Wolters Kluwer Health, Inc., 2007 <<http://online.factsandcomparisons.com>>.
6. **Centers for Disease Control and Prevention, Antiviral Medications for Influenza, November 16, 2006, <<http://www.cdc.gov/flu/professionals/treatment/>>(April 5, 2007).**
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**NURSE PROTOCOL FOR INTESTINAL PARASITIC WORMS:  
ROUNDWORMS (*Ascariasis*)  
WHIPWORMS (*Trichuriasis*)  
HOOKWORMS**

<b>DEFINITION</b>	Long worms of species as indicated above which live in the intestinal tract.
<b>ETIOLOGY</b>	(a) <i>Ascaris lumbricoides</i> , and (b) whipworms ( <i>Trichuris trichiurs</i> ) are transmitted through ingestion of fecally contaminated soil. Children with pica (a tendency to ingest dirt) are more likely to become infested. Mature eggs may survive in the soil for months in temperate climates. (c) Hookworms ( <i>Ancylostoma duodenale</i> and <i>Necator americanus</i> ) are transmitted through contact with infective larvae in soil, usually through penetration of skin of bare feet, or, more rarely, through ingestion of fecally contaminated soil.
<b>SUBJECTIVE</b>	<ol style="list-style-type: none"><li>1. Many are asymptomatic.</li><li>2. Long worms seen in bowel movement; no blood loss or diarrhea.</li><li>3. Nausea, vomiting.</li><li>4. Complaints of abdominal cramps or pain.</li><li>5. Cough and fever may be present during the lung migration phase of the life cycle.</li><li>6. Child may have a history of ingesting dirt.</li><li>7. (Hookworm only): Initial skin penetration of larvae usually involving feet can cause a stinging or burning sensation followed by pruritus and papulovesicular rash that may persist 1 – 2 weeks.</li></ol>
<b>OBJECTIVE</b>	<ol style="list-style-type: none"><li>1. Weight loss.</li><li>2. Positive lab studies for intestinal parasite, or ova or worms observed in stool.</li><li>3. Bronchopneumonia may be seen during the migrational stage, producing fever, cough, wheezing, eosinophilia and pulmonary infiltrates.</li><li>4. Rarely, signs of bowel or biliary duct obstruction (e.g., pain, nausea, vomiting, clay-colored stools).</li></ol>
<b>ASSESSMENT</b>	Infestation with any species noted in subtitle above.

**PLAN**

**DIAGNOSTIC**

1. If the child has a hookworm or a history of pica, evaluate for possible anemia and for lead poisoning.
2. Monitor weight to assure that the child achieves normal growth patterns.
3. Stool studies for ova/cysts/parasites should be done on all household members of patients diagnosed with any of the above parasite species.

**THERAPEUTIC**

**PHARMACOLOGIC**

1. For ascariasis (roundworms) only:

If not pregnant or lactating, not taking piperazine or theophylline, not <2 years old, and does not have liver disease:

Pyrantel pamoate (Pyrantel pamoate suspension, Pin-X) 11 mg/kg/dose (maximum 1 gram) or 1 cubic centimeter (50 mg) per 5 kg (11 lbs) of body weight as a single dose PO.

Suspension available as 250 mg/5 mL (shake well) and a caplet form containing 62.5 mg per caplet.

Dosage for pyrantel pamoate suspension 250mg/5mL (less than 25 lbs. or <2 yr. – consult with physician):

Weight	Dosage	
	Suspension	Caplet
25-37 lbs. (11-16 kg)	2.5 cubic centimeter = ½ tsp.	2 caplets
38-62 lbs. (17-28 kg)	5 cubic centimeter = 1 tsp.	4 caplets
63-87 lbs. (29-39 kg)	7.5 cubic centimeter = 1 ½ tsp.	6 caplets
88-112 lbs. (40-50 kg)	10 cubic centimeter = 2 tsp.	8 caplets
113-137 lbs. (51-62 kg)	12.5 cubic centimeter = 2 ½ tsp.	10 caplets
138-162 lbs. (63-73 kg)	15 cubic centimeter = 3 tsp.	12 caplets
163-187lbs. (74-84 kg)	17.5 cubic centimeter = 3 ½ tsp.	14 caplets
188 lbs. and over	20 cubic centimeter = 4 tsp.	16 caplets
<b>NOTE:</b> Do not use with history of liver disease		

2. For ascariasis, trichuriasis, and/or hookworms:

If not pregnant, lactating, taking carbamazepine, cimetidine, or phenytoin, or not a child <2 years old:

Mebendazole (Vermox) 100 mg chewable tablet PO twice daily for three days, with food.

### **CLIENT EDUCATION/COUNSELING**

1. Instruct family in hand-washing and personal hygiene. Avoid nail biting, sharing towels or other toilet articles.
2. Counsel on elimination of pica.
3. Instruct family to thoroughly wash vegetables, fruits and any uncooked food.
4. To avoid hookworm: wear shoes outdoors.
5. Report medication side-effects, such as abdominal pain, diarrhea, anorexia, nausea, and vomiting (not expected with Vermox).

### **FOLLOW-UP**

Repeat stool examination 3 weeks after treatment. If there is still evidence of worms or ova, a second course of treatment is advised.

### **REFERRAL**

1. If suspected pulmonary involvement.
2. If patient has signs or symptoms of bowel or biliary obstruction (vomiting, abdominal pain, jaundice).
3. For drug contraindications or side effects.
4. Pregnant women and breastfeeding mothers.
5. Infants less than 2 years of age or under 25 lbs.
6. If symptoms persist after 2<sup>nd</sup> treatment.

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2. William W. Hay et al., *Current Pediatric Diagnosis and Treatment*, 16<sup>th</sup> ed., McGraw-Hill, 2003. **(Current)**
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## **NURSE PROTOCOL FOR IRON DEFICIENCY ANEMIA IN CHILDREN**

**DEFINITION** A condition in which there is a reduction in the number of circulating red blood cells secondary to an insufficient amount of body iron stores.

**ETIOLOGY** Anemia may result from excessive blood loss, excessive blood cell destruction, or decreased blood cell formation. The latter anemia may result from inhibition of, or loss of, bone marrow function, defective nucleoprotein synthesis (as in pernicious anemia) or deficiency of iron in the diet. The most common anemia in children is iron deficiency anemia. US statistics: Ages 1-2 yrs - 9% iron deficient of which 1/3 or 33% of total population will have anemia secondary to iron deficiency; teenage females - 9% iron deficient and 2% anemic.

**There is evidence that substantial iron deficiency during infancy and early childhood can have long term neurocognitive implications. It is, therefore, imperative that iron deficiency be prevented, and if not prevented then diagnosed early and treated aggressively.**

**SUBJECTIVE**

1. May be asymptomatic.
2. May report:
  - a. Poor appetite or inadequate diet.
  - b. Irritableness or fussiness.
  - c. Excessive aspirin or antacid consumption.
  - d. History of intestinal parasites.
  - e. History of blood loss including GI bleeding or nose bleeds.
  - f. History of sickle cell anemia or thalassemia.
  - g. Listlessness decreased social interaction, poor attention to tasks, developmental delays.
  - h. Pica (in itself a sign of iron deficiency anemia; however may also be a sign of lead poisoning - also a cause of iron deficiency anemia).
  - i. Excessive milk/dairy intake.

**OBJECTIVE**

1. Skin pallor; pale mucous membranes.
2. Elevated blood lead level. (Obtain lead level if history of pica or possible exposure to lead in a toddler. "Possible" exposure includes living near a factory that might be emitting lead or dumping materials containing lead, or living in a home that could contain walls with a paint layer applied to walls more than 25 years ago.)

3. Hemoglobin/hematocrit below acceptable values (see chart on pp. 10.117–10.118).
4. Premature or low birth weight.
5. Check stool for occult blood if abnormal stool history (tarry, bloody, chronic diarrhea).

## ASSESSMENT

1. Iron deficiency anemia, presumptive if:
  - a. No suggestion of sickle cell, thalassemia or other chronic illness including recurrent nosebleeds;
  - b. Normal lead level (if checked per indications)

**AND**

  - c. 3 negative stools for occult blood (if performed)
2. A diagnosis of iron deficiency anemia can be made with certainty, following a presumptive diagnosis, if the hemoglobin increases after iron supplementation.

**NOTE:** Iron deficiency anemia may coexist when there is GI bleeding, chronic nosebleeds, lead poisoning or other chronic illness. However, these underlying causes should be addressed, usually by a referral, and the diagnosis of iron deficiency studies will commonly include a full CBC and reticulocyte count and, possibly, a serum iron measurement.

**Simple dietary iron-deficiency anemia is most common under 30 months of age. When iron deficiency anemia is identified after 30 months of age more aggressive efforts should be made to identify causes other than simple dietary deficiency such as occult GI blood loss or malabsorption.**

## PLAN

### THERAPEUTIC

#### PHARMACOLOGIC

1. Elemental iron, orally, between meals. See accompanying chart (pp. 117-118) for age-appropriate dose. **If compliance is a problem, the entire daily dose may be given as a single dose, with a meal.**
2. Ideally, take iron supplement on an empty stomach to increase absorption. If gastric upset occurs, may take supplement after a meal or on a full stomach.
3. Recheck hemoglobin/hematocrit after 4 weeks of treatment.

- a. An increase in hgb of  $\geq 1\text{g/dL}$  or of hct  $\geq 3\%$  confirms the diagnosis of iron deficiency anemia.
- b. If confirmed, reinforce dietary counseling, continue iron treatment for 2 more months (girls ages 12-18 years for 2-3 months) then recheck hemoglobin or hematocrit.

### NON-PHARMACOLOGIC

1. Dietary counseling for iron deficiency anemia in children. Give list of iron-rich and vitamin C-rich foods. Reduce excessive dairy intake.
2. Refer to WIC if child is under 5 years old and meets criteria.

### CLIENT EDUCATION/COUNSELING

1. Poison control safety counseling; large doses of iron are poisonous. Store all medications out of reach of children.
2. The appropriate dose should be taken on an empty stomach; if GI upset occurs, advise to take after meals. with 4 oz. of vitamin C-rich juice (orange, pineapple, tomato, grapefruit or apple juice fortified with vitamin C) to increase absorption of iron and decrease gastric irritation. Taking iron with food can decrease the iron absorption by at least 50%. **However, this may be preferred if compliance becomes a problem because of gastric discomfort when taking iron between meals.**
3. Avoid tea, cola and KoolAid, and milk or milk products at the same time as the iron supplement; they interfere with the absorption of iron.
4. Eat nutritious meals and snacks; do not eat low nutrient density foods at meals.
5. Due to the availability of multiple salt forms of iron, close attention is warranted. Substitution of one salt for another without proper adjustment may results in over- or under-dosing.
6. Iron containing liquids may temporarily stain the teeth (enamel is not affected). Can drink liquid iron preparations in water or juice and through a straw to prevent tooth staining.
7. Iron can cause black stools, constipation or diarrhea.

### **FOLLOW-UP**

1. Repeat hemoglobin/hematocrit levels at two-month intervals.
2. Reassess approximately 6 months after successful treatment is completed.

### **REFERRAL**

1. Refer to physician if treatment has been given as directed and hgb/hct levels have not returned to normal values after two months.
2. Consult with physician for any irregularity in response to therapy.
3. Chronic nosebleeds and/or GI bleeding.

Georgia Department of Human Resources - Children's Health Services Unit  
Recommended Guidelines for Iron Supplementation (a)

Age	Weight Range at 50th Percentile(b)							Referral
High risk infant Birth through 5 months	Variable	Premature and low birth-weight Infants, infants of multiple birth, and infants with suspected blood losses should be screened before 6 months of age, preferably at 6-8 weeks postnatal.						Infants less than 6 months of age should be referred to a physician.
	7 lbs - 17 lbs	Routine screening for iron deficiency anemia is not recommended in the first six months of life.						
		Hemoglobin		Hematocrit		Treatment Regimen (c), (d)		Refer to a physician for diagnostic evaluation of cause and medical management of the following:  1) All ages with hemoglobin less than 9 gms or hematocrit less than 27%.  2) Presence of sickle cell condition and other hemoglobin variants.  3) Failure to respond after two treatment periods of six to eight weeks using medical iron.  4) Evidence of other medical problems.
Age	Weight Range at 50th Percentile(b)	Acceptable Value	Treatment Value	Acceptable Value	Treatment Value	Dosage	Daily Elemental Iron (Milligrams)	
6 mos. through 11 mos.	16 lbs - 22 lbs	≥11.0 gms	10.9 gms or lower	≥ 32.9%	32.8% or lower	<b>15mg/0.6</b> cubic centimeter Ferrous Sulfate Drops bid	15 mg bid (30 mg daily)	
12 mos. through 23 mos.	21 lbs - 28 lbs	≥11.0 gms	10.9 gms or lower	≥ 32.9%	32.8% or lower	<b>15mg/0.6</b> cubic centimeter Ferrous Sulfate Drops bid	15 mg bid (30 mg daily)	
2 Years through 4 Years	26 lbs - 42 lbs	≥11.1 gms	11.0 gms or lower	≥ 33.0%	32.9% or lower	1.2 cubic centimeter <b>of 15mg/0.6cc</b> Ferrous Sulfate Drops bid or ----- 1 Ferrous Fumerate <b>Chewable</b> Tabs bid	30 mg bid (60 mg daily) or ----- 33 mg bid (66 mg daily)	
5 Years through 7 Years	40 lbs – 56 lbs	≥11.5 gms	11.4 gms or lower	≥ 34.5%	34.4% or lower	1 Ferrous Sulfate Tab <b>every day</b>	60 mg every day (60 mg daily)	
8 Years through 11 Years	54 lbs – 90 lbs	≥11.9 gms	11.8 gms or lower	≥ 35.4%	35.3% or lower	1 Ferrous Sulfate Tab <b>every day</b>	60 mg every day (60 mg daily)	

a) Source: Centers for Disease Control and Prevention, Morbidity and Mortality Weekly Report. April 3, 1998, Vol. 47, No. RR-3.

b) Source: Growth Charts, Standardized. Department of Health and Human Services, National Center for Health Statistics.

c) Refer to the package insert of iron preparation to correctly calculate the appropriate dosage of elemental iron. Most pediatric chewable preparations (i.e. Foestat, 100 mg) contain 33 mg elemental iron per tablet as ferrous fumarate. Non-chewable preparations for older patients (i.e. Feosol, 300 mg) contain 60-65 mg of elemental iron per tablet or capsule as ferrous sulfate. There are many dosage forms of iron, make sure that the correct amount of elemental iron is prescribed. Many different concentration products are available in all forms (liquid, tablet). The doses for the liquid product referred to in the chart are based on the solution concentration of 15mg/0.6ml.

d) Treatment of iron deficiency anemia is 3 mg per kilogram per day.

**Georgia Department of Human Resources - Children's Health Services Unit  
Recommended Guidelines for Iron Supplementation (a)**

Age	Weight Range at 50th Percentile(b)	Hemoglobin		Hematocrit		Treatment Regimen (c),(d)		Referral
		Acceptable Value	Treatment Value	Acceptable Value	Treatment Value	Dosage	Daily Elemental Iron (Milligrams)	
12 Years through 14 Years (Male)	88 lbs – 125 lbs	≥12.5 gms	12.4 gms or lower	≥37.3%	37.2% or lower	1 Ferrous Sulfate Tabs bid	60 mg bid (120 mg daily)	Refer to a physician for diagnostic evaluation of cause and medical management of the following:  1) All ages with hemoglobin less than 9 gms or hematocrit less than 27%.  2) Presence of sickle cell condition and other hemoglobin variants.  3) Failure to respond after two treatment periods of six to eight weeks using medical iron.  4) Evidence of other medical problems.
12 Years through 14 Years (Female)	92 lbs – 118 lbs	≥11.8 gms	11.7 gms or lower	≥35.7%	35.6% or lower	1 Ferrous Sulfate Tabs bid	60 mg bid (120 mg daily)	
15 Years through 17 Years (Male)	125 lbs – 152 lbs	≥13.3 gms	13.2 gms or lower	≥39.7 %	39.6% or lower	1 Ferrous Sulfate Tabs bid	60 mg bid (120 mg daily)	
15 Years through 17 Years (Female)	118 lbs – 125 lbs	≥12.0 gms	11.9 gms or lower	≥35.9 %	35.8% or lower	1 Ferrous Sulfate Tabs bid	60 mg bid (120 mg daily)	
18 Years or older (Male)	152 lbs and above	≥13.5 gms	13.4 gms or lower	≥39.9 %	39.8% or lower	1 Ferrous Sulfate Tabs bid	60 mg bid (120 mg daily)	
18 Years or older (Female)	125 lbs and above	≥12.0 gms	11.9 gms or lower	≥35.7 %	35.6% or lower	1 Ferrous Sulfate Tabs bid	60 mg bid (120 mg daily)	

a) Source: Centers for Disease Control and Prevention, Morbidity and Mortality Weekly Report. April 3, 1998, Vol. 47, No. RR-3.

b) Source: Growth Charts, Standardized. Department of Health and Human Services, National Center for Health Statistics.

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d) Treatment of iron deficiency anemia is 3 mg per kilogram per day.

## REFERENCES

1. American Society of Health-Systems Pharmacists, American Hospital Formulary Service, 2005, pp. **1407-1416**.
2. Marcel E. Conrad, "Iron Deficiency Anemia", *EMedicine.com Inc.*, March 19, 2003. <<http://www.emedicine.com>> (March, 25, 2005).
3. "Facts and Comparisons," *Facts and Comparisons 4.0 Online*, Wolters Kluwer Health, Inc., 2007 <<http://online.factsandcomparisons.com>>.
4. **S. Zlotkin, et al, "Randomized Controlled Trial of Single Versus 3-Times Daily Ferrous Sulfate Drops For Treatment of Anemia," *Pediatrics*, 2001, Volume 108, pp. 613-616. (Current)**
5. **C. Sandoval, et al, "Trends In the Diagnosis and Management of Iron Deficiency Anemia of Infancy and Early Childhood," *Hematology/Oncology Clinics of North America*, 2004, Volume 18, pp. 1423-38. (Current)**

## NURSE PROTOCOL FOR LABIAL ADHESIONS

<b>DEFINITION</b>	A membrane or agglutination of epithelium of the labia minora of prepubertal females. A thin, pale anteroposterior line down the middle of the vulva marks the site of agglutination. This is usually found in girls between the ages of 4 months and 6 years, and is not present in teenagers who have begun their menses.
<b>ETIOLOGY</b>	The adhesions usually result from an irritation or inflammation that has caused superficial denudation of the labia.
<b>SUBJECTIVE</b>	<ol style="list-style-type: none"><li>1. May be reported by a concerned mother.</li><li>2. May have history consistent with pinworm infestation, candidiasis or other causes of vulvovaginitis.</li><li>3. May have history of urinary tract infections (UTI).</li></ol>
<b>OBJECTIVE</b>	<ol style="list-style-type: none"><li>1. Occasionally found on routine examination.</li><li>2. Rarely, obstruction of the urethral opening is found.</li><li>3. Signs of vulvovaginitis or poor perineal hygiene on exam.</li></ol>
<b>ASSESSMENT</b>	Labial adhesion (Differentiate from vaginal agenesis or imperforate hymen)
<b>PLAN</b>	<b>THERAPEUTIC</b>  <b>PHARMACOLOGIC</b>  For adhesions that prevent vaginal and/or urinary drainage, or are associated with a UTI: <ol style="list-style-type: none"><li>1. Estrogen cream (Premarin .625 %) applied topically to the adhesion at bedtime for 2 to 4 weeks, <b>FOLLOWED BY</b> After the labia have separated, an inert cream (A&amp;D ointment or petroleum jelly) to the vaginal area at bedtime for an additional 2 weeks to keep the labia apart while healing to prevent recurrence. <b>NOTE:</b> Premarin cream is only available in a large tube. Please warn the caregiver not to overuse the cream or systemic absorption could occur that could stimulate breast development.</li></ol>

### NON-PHARMACOLOGIC

1. For thin adhesions, apply a small amount of A&D ointment or petroleum jelly at bedtime for several weeks to gradually release the adhesion and/or prevent its recurrence.
2. Advise parent/caretaker not to pull the labia apart.
3. Treat the underlying condition, as needed.

### CLIENT/CAREGIVER EDUCATION/COUNSELING

1. True adhesions are benign unless associated with UTIs, and resolve spontaneously in 6-18 months, or at puberty with the rise in estrogens.
2. If labial adhesions are noted on a routine examination, the parent should be told about the problem, even if it was not mentioned in the history, and treatment was not given.
3. Counsel on the importance of good perineal hygiene, including proper bathing and wiping techniques.

### REFERRAL

1. Client with urethral obstruction and/or dysuria.
2. If the parents are very concerned and ask for treatment not covered by this protocol.
3. Recurrent adhesions.

### REFERENCES

1. Constance R. Uphold and Mary V. Graham, *Clinical Guidelines in Child Health*, 4<sup>th</sup> ed., Barmarrae Books, Gainesville, FL, 2003. **(Current)**
2. Frederic D. Burg et al., *Gekki and Kagan's Current Pediatric Therapy*, 17<sup>th</sup> ed., W. B. Saunders, 2002. **(Current)**
3. Richard E. Behrman et al., *Nelson Textbook of Pediatrics*, 17<sup>th</sup> ed., W.B. Saunders, Philadelphia, PA, 2003. **(Current)**
4. Gary R. Fleisher, et al. *Textbook of Pediatric Emergency Medicine*, 4<sup>th</sup> ed., Lippincott Williams & Wilkins, 2000, p. 1048. **(Current)**

## NURSE PROTOCOL FOR NASOLACRIMAL DUCT OBSTRUCTION

<b>DEFINITION</b>	Obstruction of the nasolacrimal duct in young infants. It is usually unilateral.
<b>ETIOLOGY</b>	Many neonates are born with a non-patent or partially-patent duct. Fluid becomes trapped in the nasolacrimal drainage system. The fluid, but not the duct itself, becomes infected.
<b>SUBJECTIVE</b>	Caregiver reports constant tearing and mucus discharge from the infant's eye, or pooling of tears in the eye.
<b>OBJECTIVE</b>	<ol style="list-style-type: none"><li>1. Watery or mucopurulent discharge from the eye.</li><li>2. Conjunctivitis and redness of the nasolacrimal sac are not present.</li></ol>
<b>ASSESSMENT</b>	Nasolacrimal duct obstruction
<b>PLAN</b>	<b>THERAPEUTIC</b>

### PHARMACOLOGIC

If discharge is purulent then use one of the following topical antibiotics in addition to massage

1. If the child is >8 wks of age, Polytrim ophthalmic solution: Instill 1 drop in affected eye(s) q3h (maximum: 6 doses/day) for 7-10 days.

**OR**

2. If the child is >8 wks of age, sodium sulfacetamide 10% ophthalmic solution: Instill 1-2 drops in affected eye(s) tid for 7 days.

**OR**

3. Erythromycin ophthalmic ointment: Instill 0.5cm strip of ointment in lower conjunctival sac qid for 7 days.

## NON-PHARMACOLOGIC

After washing hands, massage the tear sac 2-3 times/day to attempt to force fluid downward through the tear duct. Be gentle and very careful not to injure the child's eye.

## CLIENT EDUCATION/COUNSELING

1. The delayed canalization of the nasolacrimal duct, which occurs in 6% of neonates, usually resolves spontaneously in the first month of life.
2. **Massage the tear sac downward BID, except when the eye becomes infected (purulent discharge).**
3. Recognizing the signs and symptoms of nasolacrimal duct infection.

## REFERRAL

1. Yellow or green discharge from the eye.
2. The infant reaches 1 year of age and the eye is still watering.
3. Redness of the nasolacrimal duct (dacryocystitis).

## REFERENCE

1. Richard E. Behrman et al., Nelson Textbook of Pediatrics, 17th ed., W.B. Saunders, Philadelphia, PA, 2003. **(Current)**
2. Constance R. Uphold and Mary V. Graham, Clinical Guidelines in Child Health, 4<sup>th</sup> ed., Barmarrae Books, Gainesville, FL, 2003, pp 324-325. **(Current)**
3. American Society of Health Systems Pharmacists, American Hospital Formulary Service, 2007. pp. **2799,2801.**
4. Charles F. Lacy, et al., Drug Information Handbook, 12<sup>th</sup> ed., Lexi-Comp Inc., Hudson, OH, 2004-2005, pp. 524-525, 1354-1355,1469.
5. **M. K. Kapadia, et al, "Evaluation and Management of Congenital Nasolacrimal Duct Obstruction," *Otolaryngology Clinics of North America*, 2006, 39:959-977.**

## NURSE PROTOCOL FOR NASOLACRIMAL DUCT INFECTION (DACROCYSTITIS)

**DEFINITION** Obstruction of the nasolacrimal duct occurs in young infants. It is usually unilateral. The fluid that pools in the duct often becomes infected. When the infection spreads to the duct itself the result is dacrocystitis.

**ETIOLOGY** See above.

**SUBJECTIVE**

1. Redness at the inner corner of the eye.
2. Fever, irritability.

**OBJECTIVE**

1. Redness, swelling, and warmth of the nasolacrimal duct.
2. Fever, irritability.

**ASSESSMENT** Nasolacrimal duct infection (dacrocystitis).

### PLAN

#### DIAGNOSTIC STUDIES

Gram stain and culture of exudate, if available.

#### REFERRAL

Immediate referral to a physician, for possible systemic antibiotics, and hospital admission. Surgical intervention could be needed to open the obstructed duct.

### REFERENCE

Richard E. Behrman et al., Nelson Textbook of Pediatrics, 17th ed., W.B. Saunders, Philadelphia, PA, 2004. **(Current)**