Disorders of the Skin

Deena Garner, DNP, APRN, CPNP-PC

©2020

Disclosures

Deena Garner, DNP, APRN, CPNP-PC

- Has no financial relationship with commercial interests
- This presentation contains no reference to unlabeled/unapproved uses of drugs or products

National Association of Pediatric Nurse Practitioners
The Leader in Pediatric Education for Nurse Practitioners

©2020

Learning Objectives

- Describe systematic approach to evaluate skin disorders.
- Identify primary, secondary, and special skin lesions.
- Discuss clinical presentation and management of common newborn skin conditions.
- Discuss clinical presentation and management of common pediatric systemic and local bacterial conditions, fungal infections, inflammatory conditions, and systemic and local viral infections.
- Discuss clinical presentation and management of common skin infestations and insect bites.

©2020

Evaluation of Skin Disorders

- History
  - Onset, duration
  - Original appearance of lesions/treatments
  - Associated symptoms
  - Exposures, medications, allergies
- Physical examination
  - Examination of entire body
  - Good light/Wood's lamp
  - Location, type, color, pattern, distribution
- Diagnostic studies
  - Scrapings of skin for microscopic examination
  - Microbial cultures
  - Biopsies/patch testing

National Association of Pediatric Nurse Practitioners
The Leader in Pediatric Education for Nurse Practitioners
©2020

Primary Skin Lesions

Macule

- **Flat**, circumscribed change of the skin. It may be of any size, although this term is often used for **lesions <1 cm**.
- Tinea versicolor, small Café-au-lait spot, Freckles

Patch

- **Flat**, circumscribed lesion with **color change** that is **>1 cm in size**.
- Mongolian Spot, Vitiligo, Larger Café au lair spot

Papules

- **Circumscribed**, nonvesicular, nonpustular, **elevated** lesion that **measures <1 cm** in diameter. The greatest mass is above the surface of the skin.
- Milia, Molluscum contagiosum, Acne

Plaque

- Broad, **elevated**, **disk-shaped lesion** that occupies an area of **>1 cm**. It is commonly formed by a confluence of papules.
- Tinea corporis, Eczema, Psoriasis

National Association of Pediatric Nurse Practitioners
The Leader in Pediatric Education for Nurse Practitioners®
©2020

Primary Skin Lesions

Nodule

- **Circumscribed**, **elevated**, usually solid lesion that measures **0.5 to 2 cm in diameter**. It **involves the dermis** and may extend into the subcutaneous tissue with its **greatest mass below the surface of the skin**; a large nodule (greater than 2 cm in diameter) is referred to as a tumor
- Furuncle, Melanoma

Pustule

- Circumscribed **elevation <1 cm in diameter** that **contains a purulent exudate**. It may be infectious or sterile.
- Folliculitis, Acne

Abscess

- Circumscribed, elevated lesion >1 cm in diameter, often with a deeper component and filled with purulent material.
- Staphylococcal Abscess

Vesicle

- **Sharply circumscribed**, elevated, **fluid-containing** lesion that **measures ≤1 cm in diameter**.
- Chickenpox, Impetigo, Herpes Simplex

Pediatric Nurse Practitioners – National Association of Pediatric Nurse Practitioners – The Leader in Pediatric Education for Nurse Practitioners®

©2020

Primary Skin Lesions

Bulla

- **Circumscribed, elevated, fluid-containing** lesion that **measures >1 cm in diameter.**
- Fixed drug eruption

Wheal

- A **firm**, **edematous plaque** resulting from infiltration of the dermis with fluid; White to pink or pale red, compressible, and evanescent, they often disappear within a period of hours. They vary in size and shape.
- Hives, Dermographism

National Association of Pediatric Nurse Practitioners
The Leader in Pediatric Education for Nurse Practitioners

©2020

Other Skin Lesions

Secondary Skin Lesions

- Scales
- Crust
- Erosion
- Ulcer
- Fissure
- Atrophy
- Scar

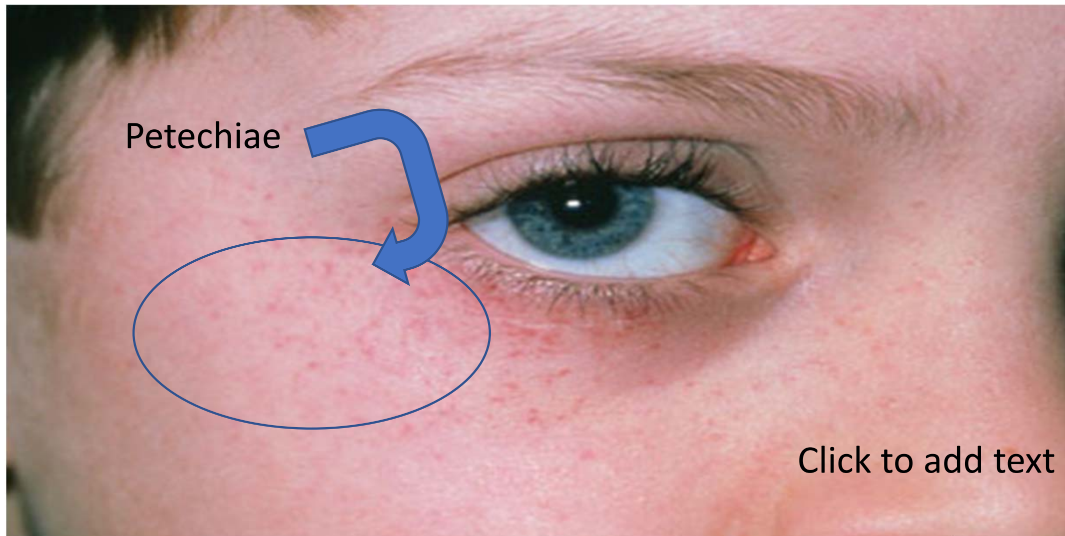
Special Skin Lesions

- Excoriation
- Comedone
- Milia
- Cyst
- Petechia
- Purpura
- Burrow
- Lichenification
- Telangiectasia

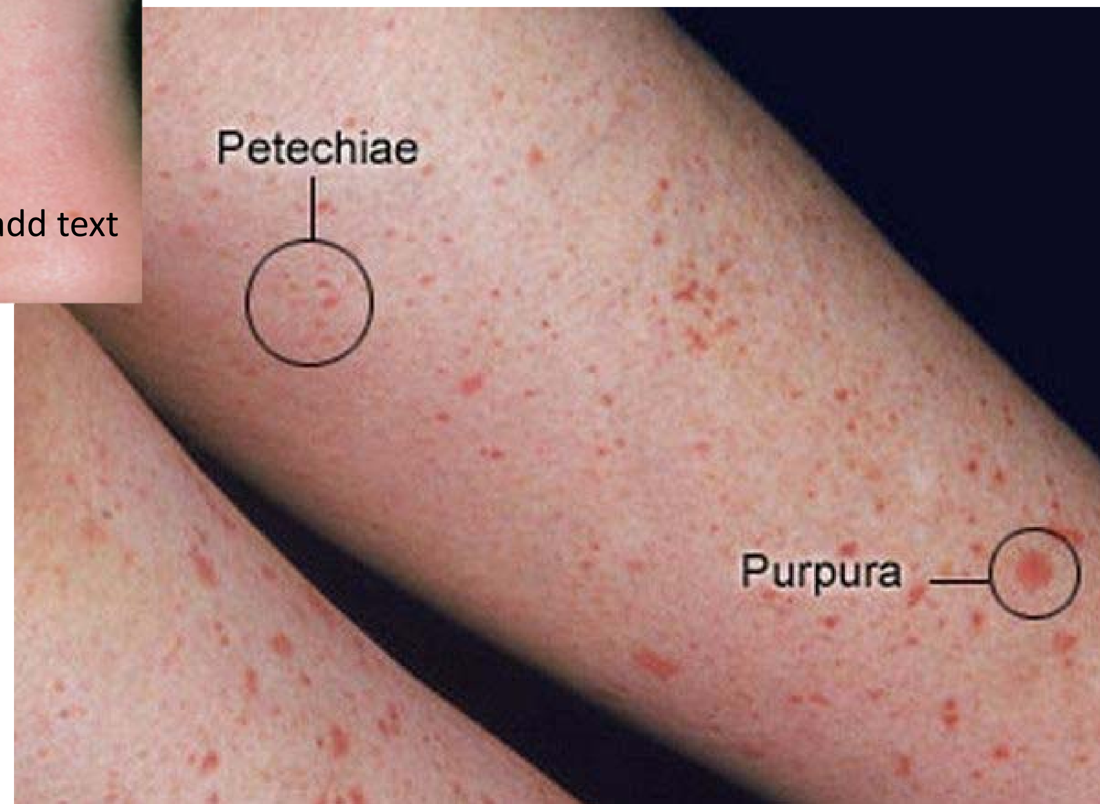
Pediatric Nurse Practitioners
The Leader in Pediatric Education for Nurse Practitioners

©2020

Petechiae & Purpura



- **Purpura**
  - 4-10 mm petechiae
  - Common vasculitis
- **Bruising**
  - > 10 mm bleeding under the skin



- **Petechiae**
  - < 4mm spots of bleeding under the skin
  - capillary instability
  - Many causes- infectious **most** worrisome

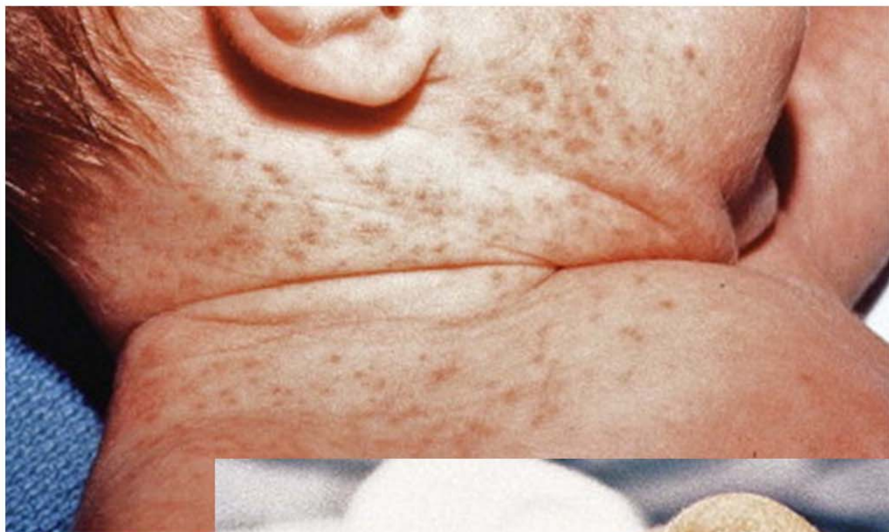
©2020

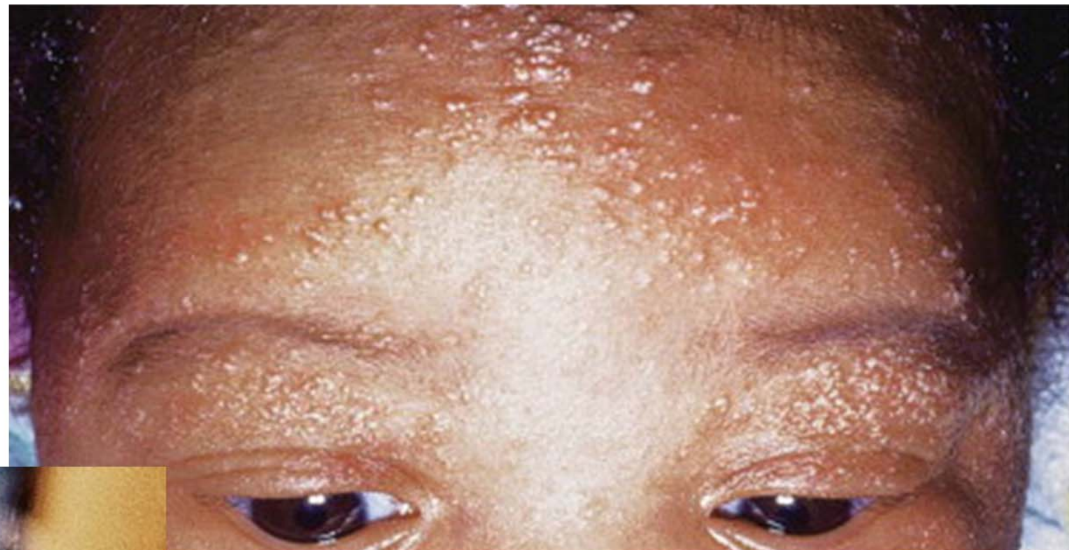
Skin Conditions of the Newborn and Infant

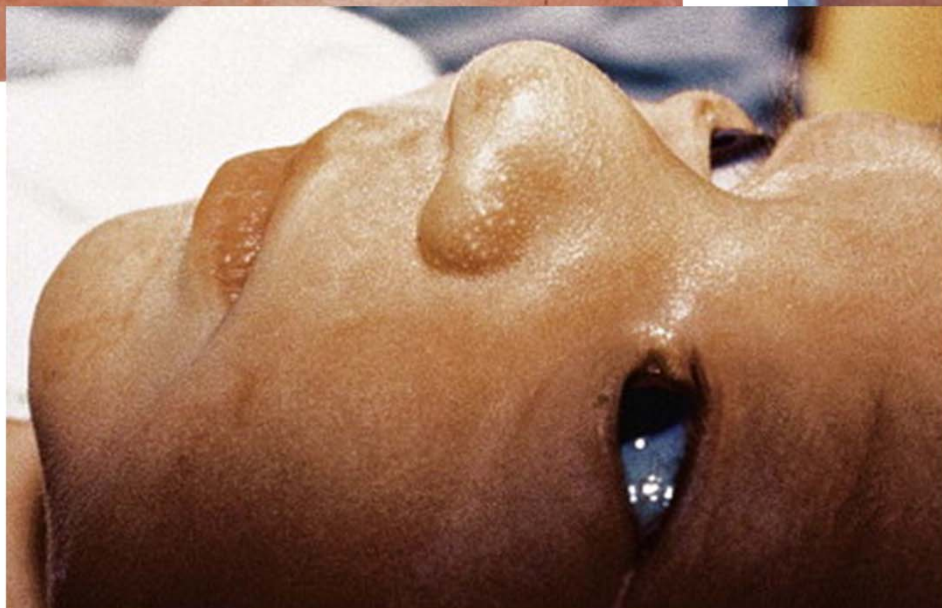
©2020

	Milia	Millaria Rubra	Sebaceous Gland Hyperplasia
Key Characteristics	**pearly, yellow**, 1–3 mm diameter **papules**	**erythematous, 1-2 mm papules and pustules.** Also called "Prickly Heat" or "Heat Rash"	multiple 1–2 mm diameter yellow papules
Initial Eruption	**face, chin, and forehead**	Can occur anywhere, but has a predilection for the **forehead, upper trunk, and flexural or covered surfaces.**	**Clusters around the nose**, may also appear on cheeks
Onset	Shortly after birth	After the first week of life	At birth or shortly after
Resolves	during the first month of life without treatment, they may persist for several months	may come and go throughout infancy. Cooling skin and loosening clothes may cause resolution	within 4–6 months

for Nurse Practitioners ©2020







Pediatric Nurse Practitioners
National Association of
The Leader in Pediatric Education for Nurse Practitioners®

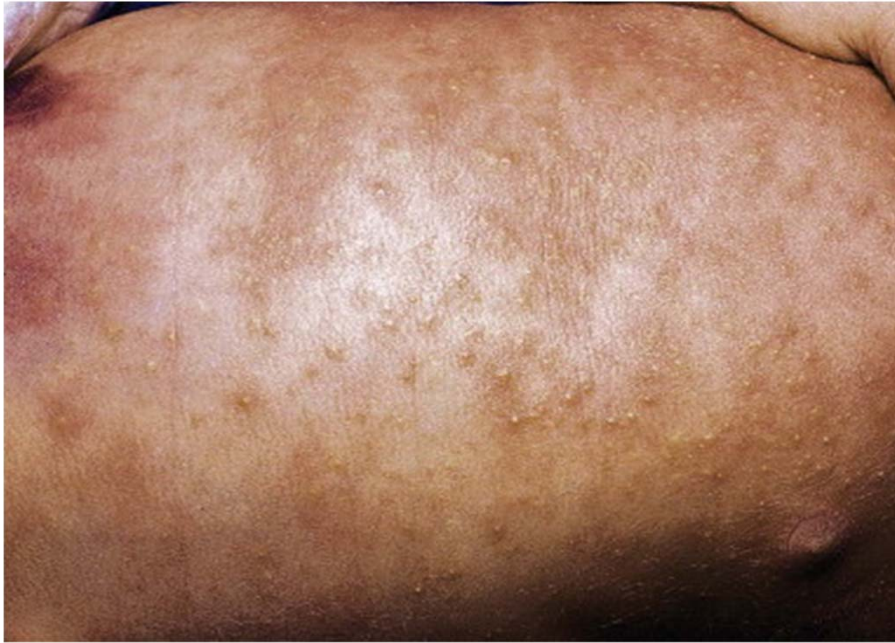
©2020

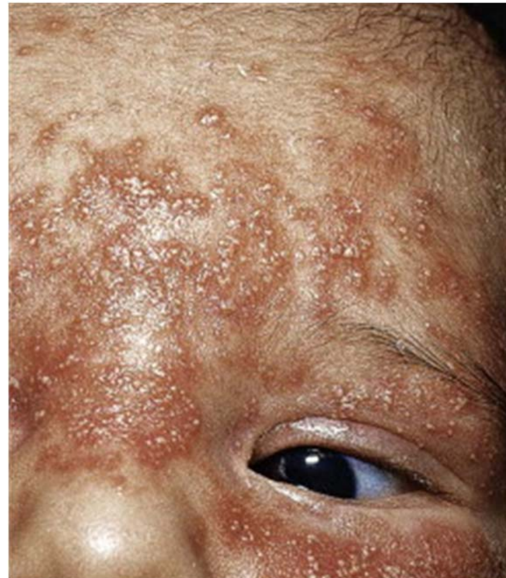
	Erythema Toxicum	Neonatal Acne
Key Characteristics	barely elevated **yellowish papules or pustules** measuring 1–3 mm in diameter, with a **surrounding irregular macular flare or wheal of erythema** measuring 1–3 cm; 'flea-bitten' appearance.	**multiple, tiny, monomorphous papulopustules on an erythematous base**
Location	**appear first on the face and spread to the trunk and extremitie**s, but may appear anywhere on the body except on the palms and soles	located **primarily** on the **cheeks**, but scattered over the face and often extending onto the scalp
Onset	between 24 and 48 h of life	average onset at 3 weeks of age
Resolves	**usually fade over 5–7 days**, may reoccur for several weeks.	spontaneously within 1–3 months

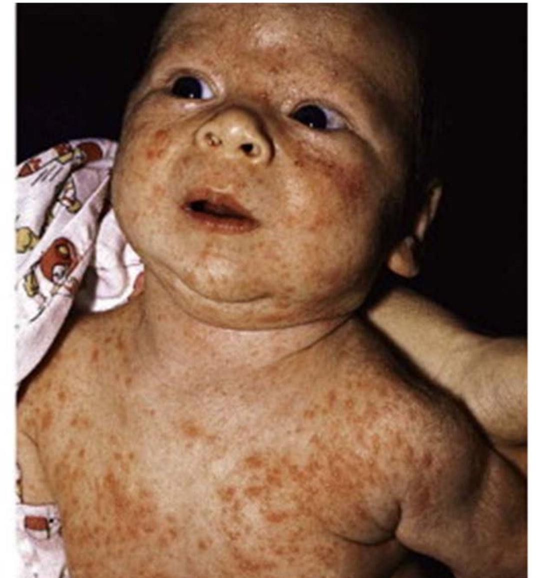
Pediatric Nurse Practitioners
The Leader in Pediatric Education for Nurse Practitioners

©2020

Erythema Toxicum and Neonatal Acne







Pediatric Nurse Practitioners
National Association of
The Leader in Pediatric Education for Nurse Practitioners

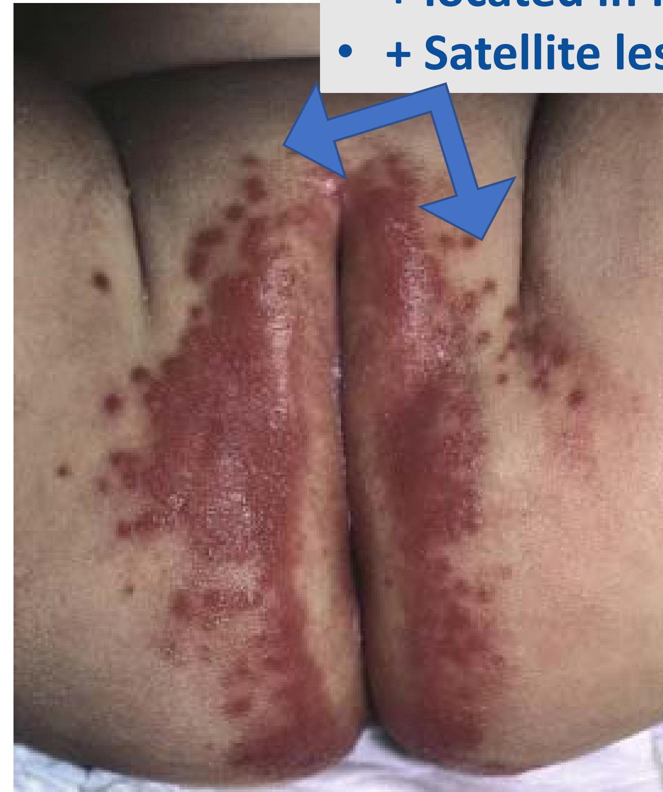
©2020

Diaper Dermatitis

	Irritant Contact Dermatitis	Candidiasis	Bacterial Dermatitis
Cause	Contact with urine/feces; wearing diaper	Candida	Staphylococcal or streptococcal
Key Characteristics	**Chapped, shiny, erythematous, parchment-like skin** with possible erosions on CONVEX surfaces, **creases are spared**	Shallow pustules, **fiery red plaques on CONVEX surfaces, inguinal folds**, labia, scrotum	**Erythematous, denuded areas or fragile blisters**, crusting, pustules in **suprapubic areas and periumbilicus**
Timing	Peak occurrences at 9-12 months, may progress to include creases	**Satellite lesions**; recent antibiotic or diarrhea	Usually occurs in newborns
Treatment	Frequent diaper change, gentle cleansing, barrier cream, air dry, 0.5%-1% hydrocortisone	Antifungal cream, frequent diaper change, gentle cleansing, barrier cream, air dry	Nystatin if yeast is present as well, mupirocin in minimal, Augmentin or cephalexin if severe

The Leader in Pediatric Education for Nurse Practitioners®

©2020



Pediatric Nurse Practitioners
National Association of Pediatric Nurse Practitioners
The Leader in Pediatric Education for Nurse Practitioners

©2020

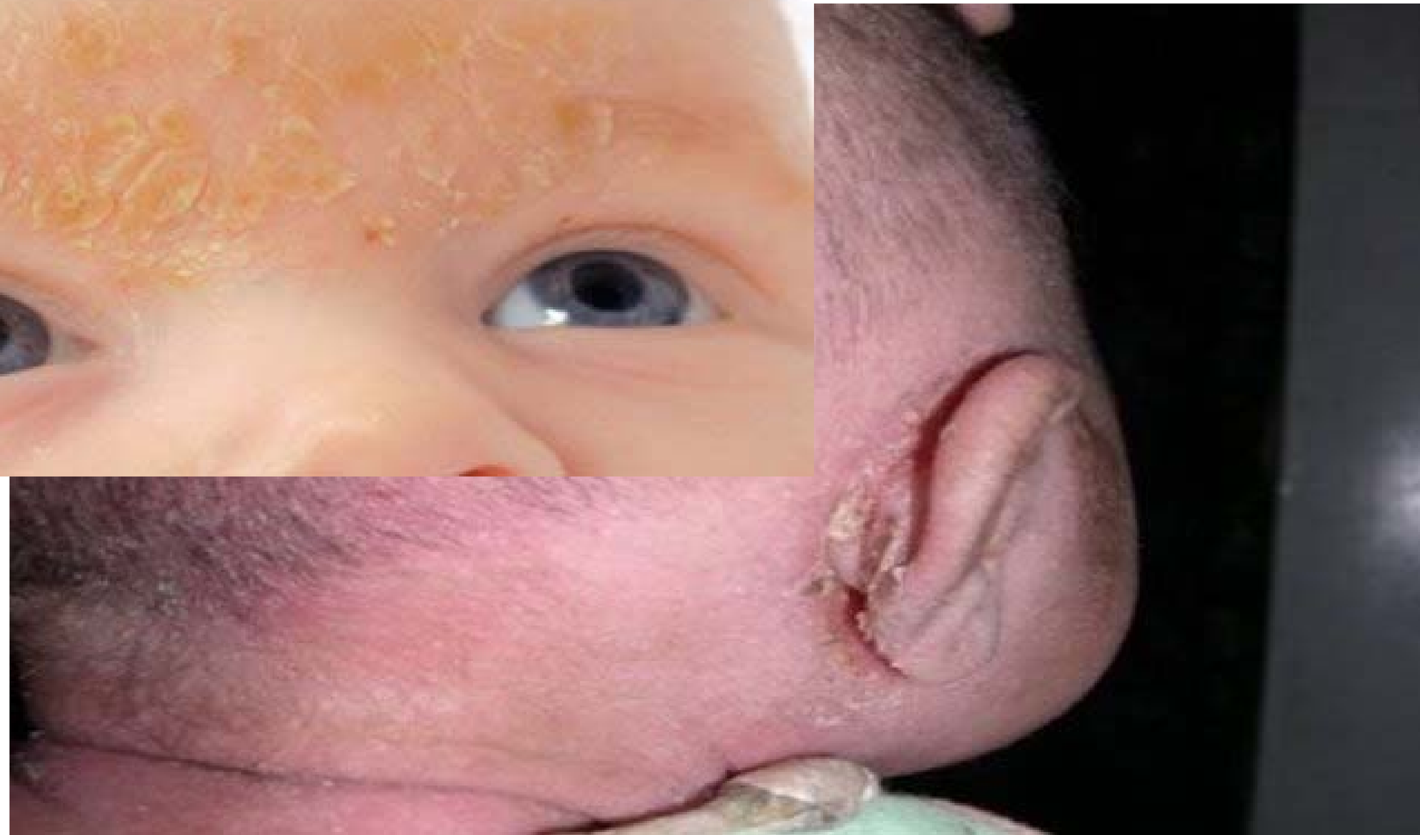
Seborrheic Dermatitis

- Key Characteristics:
  - Chronic inflammatory dermatitis
  - Cradle cap in infants; dandruff in adolescents
  - Overproduction of sebum and perhaps a saprophytic yeast
- S/S: erythematous, **flaky crusts of yellow**, **greasy scales on scalp, face, diaper area**; mild flakes with dandruff; **not pruritic**
- Management:
  - Antifungal agents: azoles, selenium sulfide
  - Anti-inflammatory agents: topical steroids, calcineurin inhibitors
  - Keratolytic agents: salicylic acid, urea
  - Facial dermatitis: ketoconazole topical preparation
  - Scalp dermatitis: medicated shampoos/steroids

Pediatric Nurse Practitioners
The Leader in Pediatric Education for Nurse Practitioners

©2020

Seborrheic Dermatitis



Pediatric Nurse Practitioners
The Leader in Pediatric Education for Nurse Practitioners

©2020

Systemic Bacterial Skin Infections

©2020

Scarlet Fever

- Key Characteristics:
  - Scarlet fever is caused by group A β-hemolytic *Streptococcus*.
  - Illness begins with **fever and pharyngitis** followed by **enanthem and exanthem** in 24 to 48 hours.
- S/S
  - Face appears flushed, except for circumoral pallor.
  - Tongue initially has a white coating (**white strawberry tongue**) that fades by the fourth day, leaving a very erythematous tongue with prominent papillae (**red strawberry tongue**).
  - Cervical and submandibular lymphadenopathies are noted.
  - **diffuse erythema;** small fine papules give it a **sandpaper like** quality.
    - Begins on the neck and spreads rapidly to the trunk and extremities.
    - Greater intensity of erythema in the axillae and antecubital, inguinal, and popliteal creases.
    - The palms and soles are spared.
  - The rash resolves in 4 to 5 days with **fine peeling** of the skin.
- Evaluation and Management
  - Culture or rapid test of a pharyngeal swab
  - Same as Strep Pharyngitis

Pediatric Nurse Practitioners
The Leader in Pediatric Education for Nurse Practitioners
©2020

Tick Borne Illnesses

- Three most common: Rocky Mountain Spotted Tick Fever, Lyme Disease, Erlichiosis

	RMSF	Lyme Disease	Erlichiosis
Location	Throughout most of the contiguous United States, five states (North Carolina, Oklahoma, Arkansas, Tennessee, and Missouri) account for over 60% of RMSF cases.	Upper Midwestern and northeastern United States.	Southeastern and south-central United States, from the East Coast extending westward to Texas
Incubation	3–12 days	3-30 days	5–14 days
Early common Signs and Symptoms	• High fever • Severe headache • Malaise • Myalgia • Edema around eyes and on the back of hands • Gastrointestinal symptoms (nausea, vomiting, anorexia)	• Erythema migrans (EM) • Flu-like symptoms—malaise, headache, fever, myalgia, arthralgia • Lymphadenopathy	• Fever, chills • Headache • Malaise • Muscle pain • Gastrointestinal symptoms nausea, vomiting, diarrhea, anorexia) • Altered mental status • Rash (more commonly reported among children)

©2020

<table>
<tr><th></th><th>RMSF</th><th>Lyme</th><th>Ehrlichiosis</th></tr>
<tr><td>Key Characteristics</td><td>A fever followed by a rash on the fourth day.
Early Rash
Small, flat, pink, non-itchy spots (macules) initially appear on the wrists, forearms, and ankles then spread to the trunk and within 2 days is generalized with involvement of the palms and soles.
Late Rash
Red to purple spots (petechiae) are usually not seen until day 6 or later after onset of symptoms.Petechial rash is considered a sign of progression to severe disease.
generalized periorbital edema, severe muscle tenderness, GI symptoms and hyponatremia.</td><td>Erythema migrans (EM)—red ring-like or homogenous expanding rash; classic rash not present in all cases.
"Bull's Eye"
Flu-like symptoms—malaise, headache, fever, myalgia, arthralgia
Lymphadenopathy</td><td>Tick bites or exposure, fever, severe headache, malaise, myalgia.
Skin rash is not considered a common feature of ehrlichiosis and should not be used to rule in or rule out an infection. E chaffeensis infection can cause rash in up to 60% of children
Physical are minimal.
Splenomegaly is not uncommon, but some patients develop hepatomegaly. Lymphadenopathy is very uncommon.</td></tr>
<tr><td>Evaluation</td><td>RMSF IgG -The first sample should be taken within the first week of illness and the second should be taken 2 to 4 weeks later.</td><td>Sensitive enzyme immunoassay (EIA) or immunofluorescence assay (IFA) should be performed first; if positive or equivocal, it is followed by a Western blot*</td><td>Detection of DNA by PCR of whole blood most sensitive during the first week of illness</td></tr>
<tr><td>Management</td><td>Doxycycline:
Under 45 kg (100 lbs.): 2.2 mg/kg body weight given twice a day
Over 45 kg: 100 mg every 12 hours
Maximum dose 100mg/dose</td><td>Amoxicillin: 50 mg/kg/day orally TID for 14-21 days; Max Dose 500 mg/dose
Doxycycline: 4 mg/kg/day orally BID for 10-21 days; Max Dose 100 mg/dose</td><td>Same as RMSF; Pt should be treated for 3 days after fever subsides. Minimal course is 5-7 days</td></tr>
</table>

Practitioners
The Leader in Pediatric Education for Nurse Practitioners®

©2020

Question 1

A school-age child has an abrupt onset of sore throat, nausea, headache, and a temperature of 102.3°F. An examination reveals petechiae on the soft palate, beefy-red tonsils with yellow exudate, and fine erythematous papules that are sandpaper like. A Rapid Antigen Detection Test (RADT) is negative. What is the next step in management for this child?

1. Obtain an anti-streptococcal antibody titer
2. Perform a follow-up throat culture
3. Prescribe amoxicillin for 10 days
4. Send to the ED for further evaluation

Question 1

A school-age child has an abrupt onset of sore throat, nausea, headache, and a temperature of 102.3°F. An examination reveals petechiae on the soft palate, beefy-red tonsils with yellow exudate, and fine erythematous papules that are sandpaper like. A Rapid Antigen Detection Test (RADT) is negative. What is the next step in management for this child?

Answer: Perform a follow-up throat culture

Question 2

A school-age child has an abrupt onset of headache and fatigue 4 days ago. An examination reveals small erythematous macules on the wrists and ankles which is reported to have to developed today. How will the PNP proceed?

1. Encourage systematic treatment is needed as the illness is most likely viral
2. Order RMSF IgG titer
3. Prescribe Amoxicillin
4. Prescribe Erythromycin

Question 2

A school-age child has an abrupt onset of headache and fatigue 4 days ago. An examination reveals small erythematous macules on the wrists and ankles which is reported to have to developed today. How will the PNP proceed?

Answer: Order RMSF IgG titer

Localized Bacterial Skin Infections

©2020

Impetigo

- Key Characteristics:
  - Caused by *Staphylococcus aureus* and/or *Group A beta hemolytic streptococcus;* MRSA
  - **Non-Bullous vs. Bullous**
    - Often starts as a bug bite or skin injury
  - Spread through autoinoculation via hands, towels, clothing, nasal discharge, droplets
  - "**Honey Colored Crusts**"

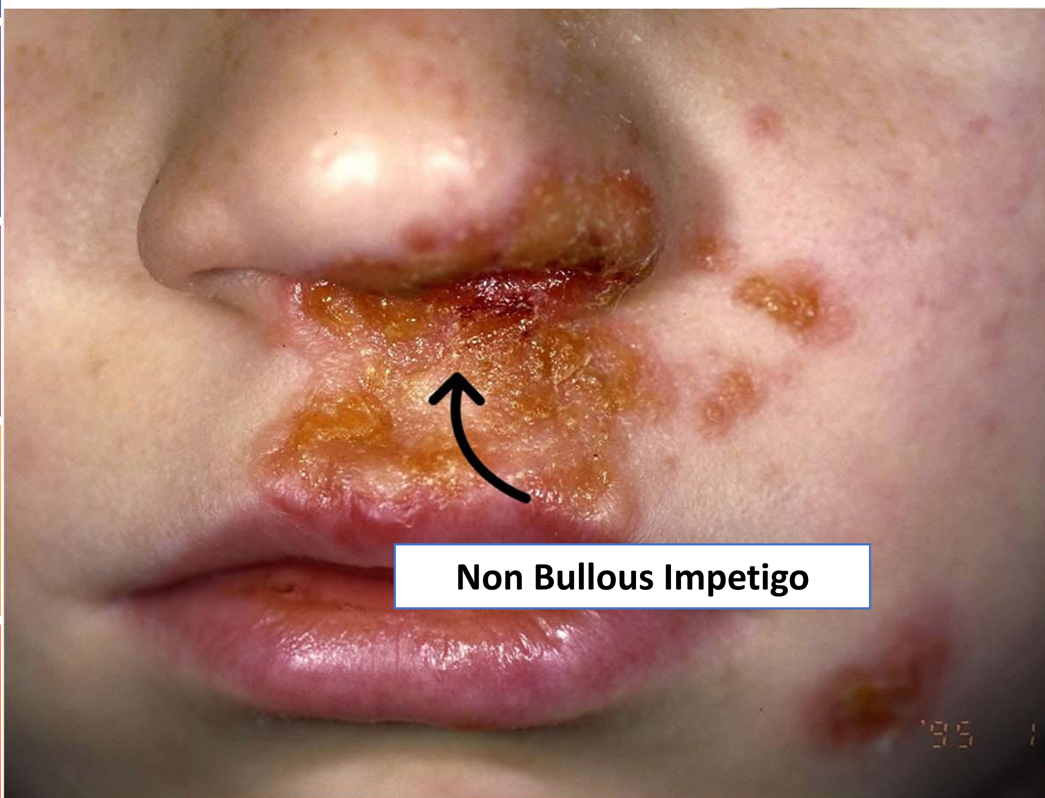
©2020

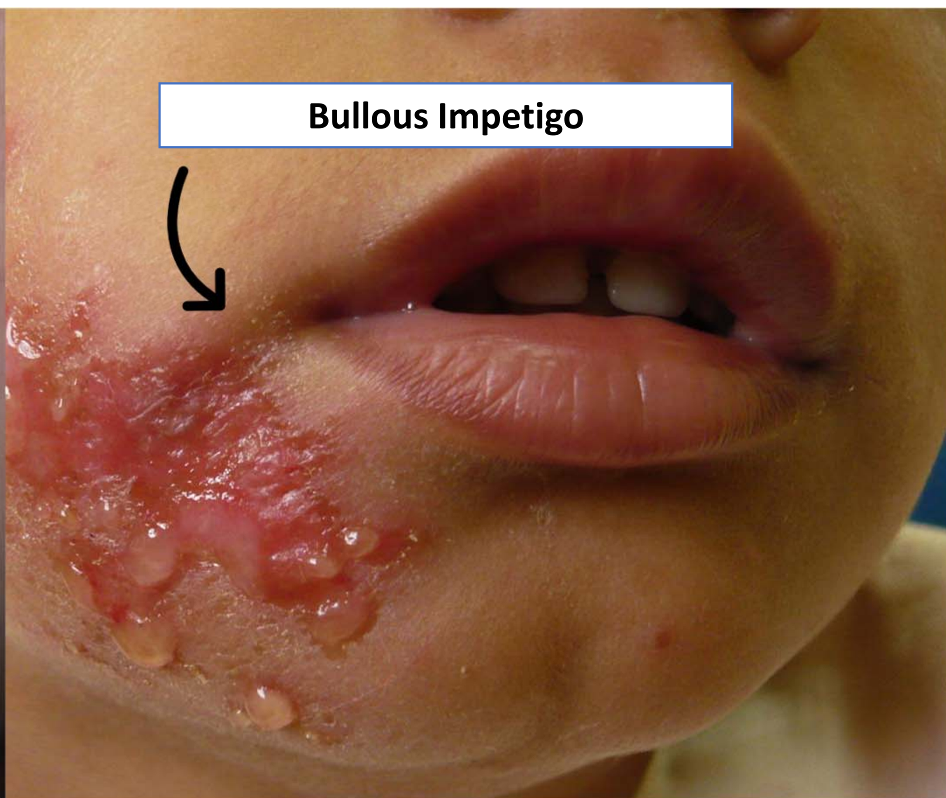
Impetigo

- S/S
  - Pruritus; spread of lesion to surrounding skin
  - Non-bullous: **1-2 mm erythematous papules or pustules, progress to vesicles or bullae which rupture – honey-colored crusts**
  - Bullous: large, flaccid, thin-wall, superficial, annular or oval blisters/bullae
  - Weakness, fever, diarrhea
  - Lesions common on face, hands, neck, extremities, perineum
  - Regional lymphadenopathy

©2020

Impetigo





Pediatric Nurse Practitioners
The Leader in Pediatric Education for Nurse Practitioners

©2020

Impetigo

- **Management**
  - Topical antibiotics if superficial, nonbullous, localized
    - topical mupirocin
  - Oral antibiotics for multiple, nonbullous lesions and widespread infections
    - Augmentin, cephalexin, clindamycin, or dicloxacillin
  - Obtain culture if no response in 7 days
    - clindamycin, trimethoprim-sulfamethoxazole
      - Follow-up in 2-3 days if no improvement
  - Educate about hygiene
  - Exclude from school/daycare until treated for 24 hours

©2020

Folliculitis

Key Characteristics:

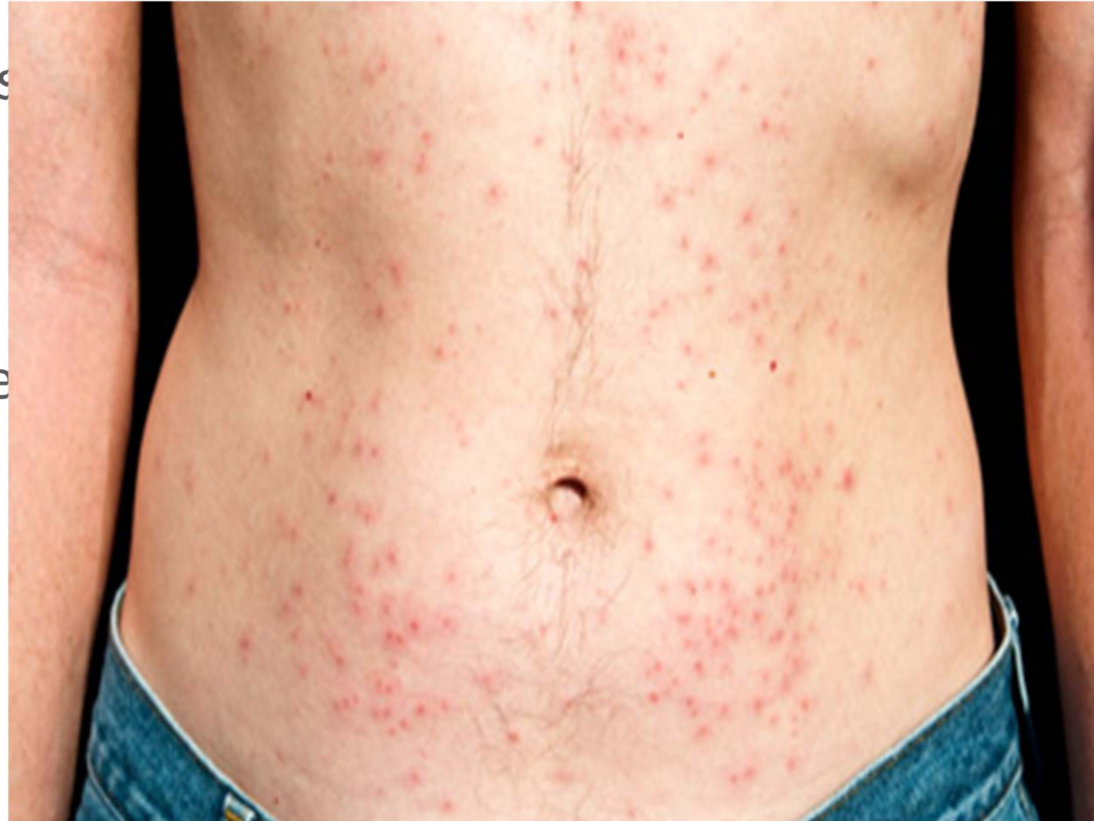
- Superficial bacterial inflammation of **hair follicle**
  - *S. aureus*- scalp and face
  - P aeruginosa- usually below the neck
  - Hot tub exposure
- S/S
  - **Pruritus**
  - **Follicular pustules & follicular erythematous papules**
  - Discrete, erythematous 1-2 mm **papules or pustules on inflamed base near follicl**e
  - Face, scalp, extremities, buttocks, back
  - **Pruritus papules, pustules, deep red/purple nodules in areas under swimsuit**

Pediatric Nurse Practitioners
The Leader in Pediatric Education for Nurse Practitioners

©2020

Folliculitis

- Management
  - May not require any antibiotics
  - Topical antibiotic therapy is usually sufficient
    - mupirocin or clindamycin
  - Extensive disease or moderate illness
    - Cephalexin
    - SMP-TMX
    - Clindamycin



Pediatric Nurse Practitioners
The Leader in Pediatric Education for Nurse Practitioners

©2020

Abscess (Furuncle)

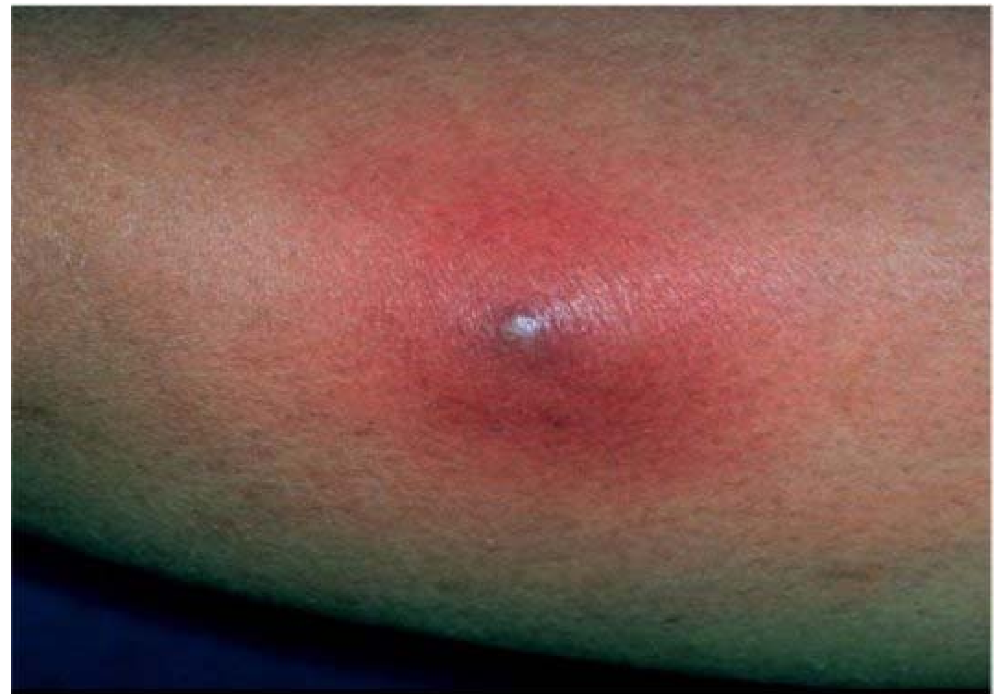
Key Characteristics:

- Deeper infection of base of follicle and deep dermis (boil)
  - **Collection of pus within the dermis and surrounding soft tissues**
  - *S. aureus* monoinfection (either MSSA or MRSA) in up to 75% of cases
- S/S
  - **Painful, tender, fluctuant, and erythematous nodules that eventually will have a pustule**
  - Spontaneous drainage may occur
  - Regional lymphadenopathy possible
  - Rare systemic symptoms
  - Deep red/purple nodules, painful

Pediatric Nurse Practitioners
The Leader in Pediatric Education for Nurse Practitioners
©2020

Abscess (Furuncle)

- Management
  - I & D alone is treatment of choice for deep abscess
  - Antibiotics
    - MSSA- cephalexin
    - MRSA- SMX-TMP or clindamycin



Pediatric Nurse Practitioners
National Association of Pediatric Nurse Practitioners
The Leader in Pediatric Education for Nurse Practitioners

©2020

Question 3

A child has developed honey colored crusts around his nose, mouth, and buttocks that are not getting any better. The best treatment would be:

1. Cephalexin
2. Hydrocortisone
3. Mupirocin
4. Triple antibiotic ointment

Question 3

A child has developed honey colored crusts around his nose, mouth, and buttocks that are not getting any better. The best treatment would be:

Answer: Cephalexin

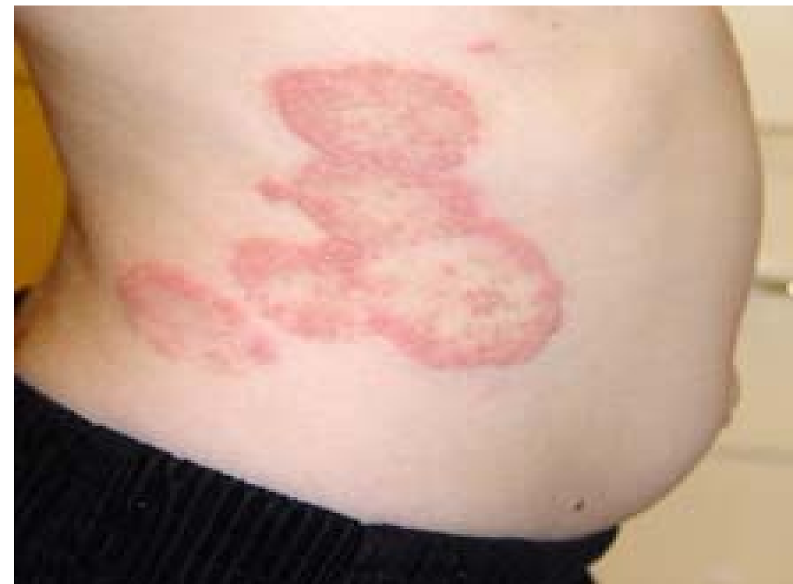
Fungal Skin Infection

©2020

Tinea Capitis/Corporis

- Key Characteristics:
  - Complaint of a "Ringworm" of "Wingworm"
  - Recent hair cut
  - **Erythematous, defined borders with central clearing**

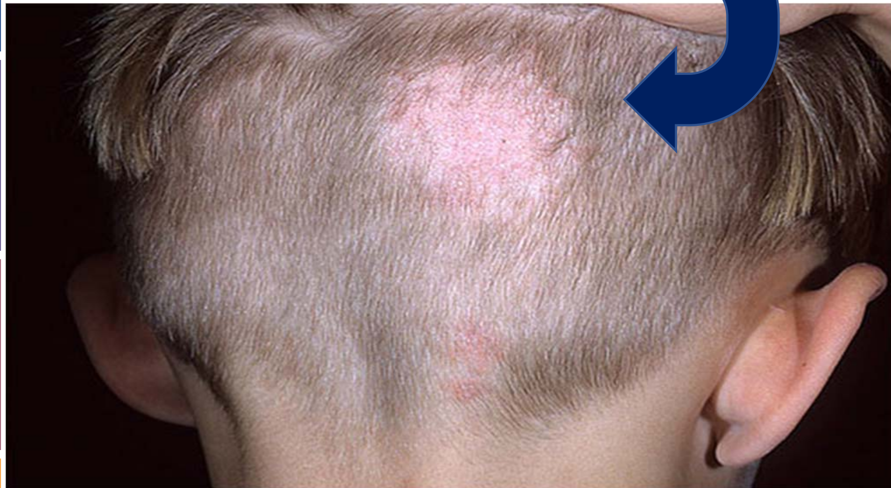
- S/S
  - **Annular, oval**, circinate lesions with red, scaly borders
  - Lesions spread peripherally; **clear centrally**
  - Often prominent over hair follicles
    - Hair loss
  - Multiple secondary lesions may merge



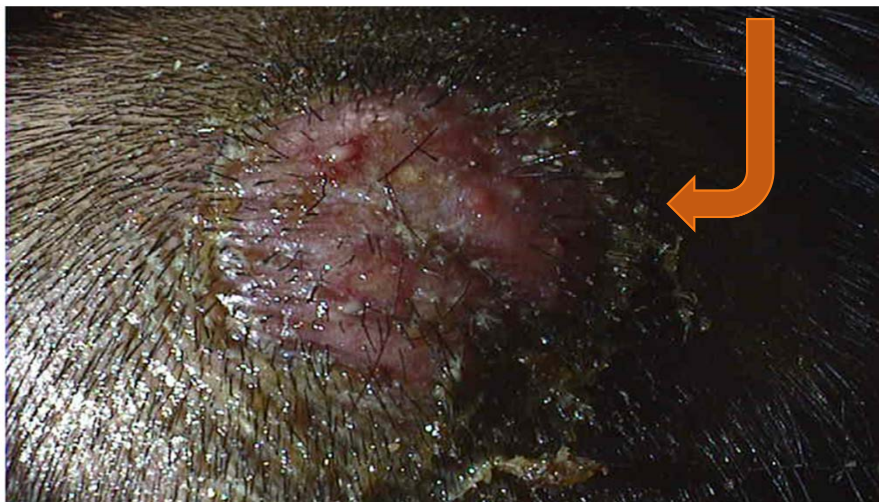
National Association of Pediatric Nurse Practitioners
The Leader in Pediatric Education for Nurse Practitioners

©2020

Tinea Capitis



Kerion



- **Evaluation**
  - KOH-treated scrapings: hyphae/spores
  - Fungal culture
  - Wood's lamp does not fluoresce most tinea
- Kerion occurs during the inflammatory stage
  - Pustular, boggy mass (pus is sterile)
    - Diffuse scaling to the scalp without much hair breakage around the kerion
  - NO STEROIDS OR ANTIBIOTICS FOR KERION

©2020

Tinea Capitis/Corporis

- **Management**
  - Topical antifungals (skin surface outside of hair line)
    - Use until lesion has resolved + 2-3 days
    - Treat 1 inch beyond edge (Do not cover lesion)
  - Griseofulvin: tinea capitis, tinea faciei, extensive infection, immunosuppression
  - Typical treatment time is at least 4 weeks
      - Eat fatty foods
      - Check CBC, LFTs every 4 weeks on therapy
  - Identify/treat contacts
  - Exclude from day care/school until 24 hours of treatment

©2020

Tinea Versicolor

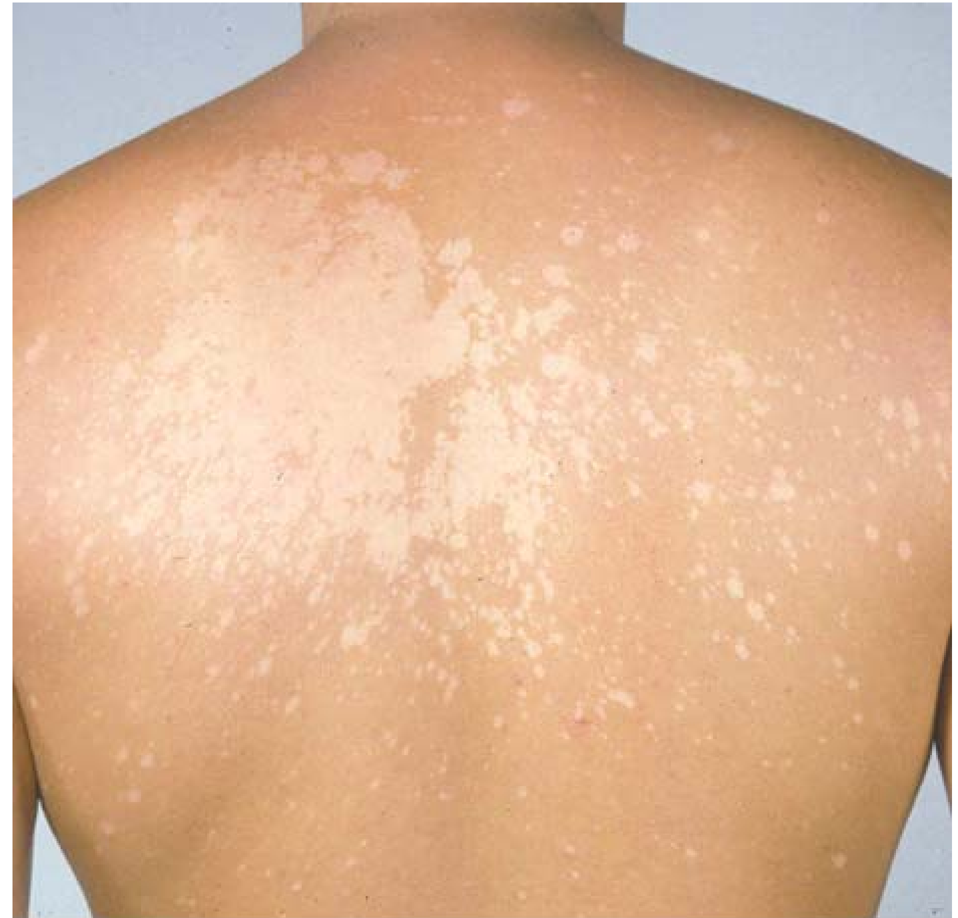
- Key Characteristics
  - Superficial fungal infection; predominantly on the trunk
  - Caused by yeast-like organism: *Malassezia furfur*
  - **warm, humid weather**
  - **Occurs mostly on back and upper shoulders**
- S/S
  - **Multiple annular, scaling macules/patches**
  - **Hypopigmented in dark-skinned**
  - **Hyperpigmented in light-skinned**
  - **Raindrop pattern**

National Association of Pediatric Nurse Practitioners
The Leader in Pediatric Education for Nurse Practitioners

©2020

Tinea Versicolor

- Evaluation: KOH scraping
- Management
  - Selenium sulfide lotion or shampoo
  - Oral antifungal if resistant



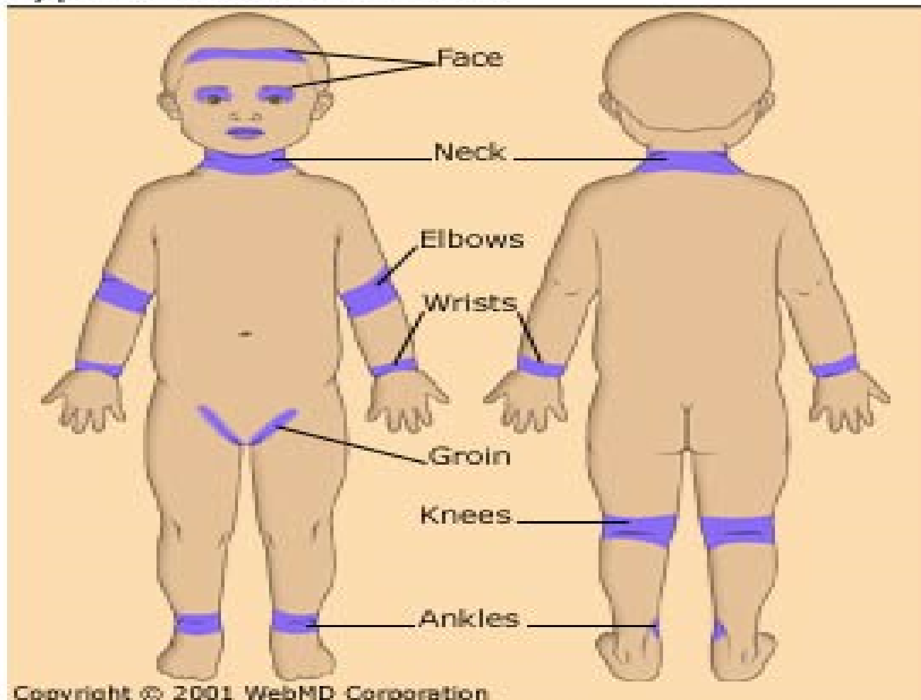
© MAYO FOUNDATION FOR MEDICAL EDUCATION AND RESEARCH. ALL RIGHTS RESERVED

©2020

Inflammatory Conditions of the Skin

©2020

Eczema (atopic dermatitis)



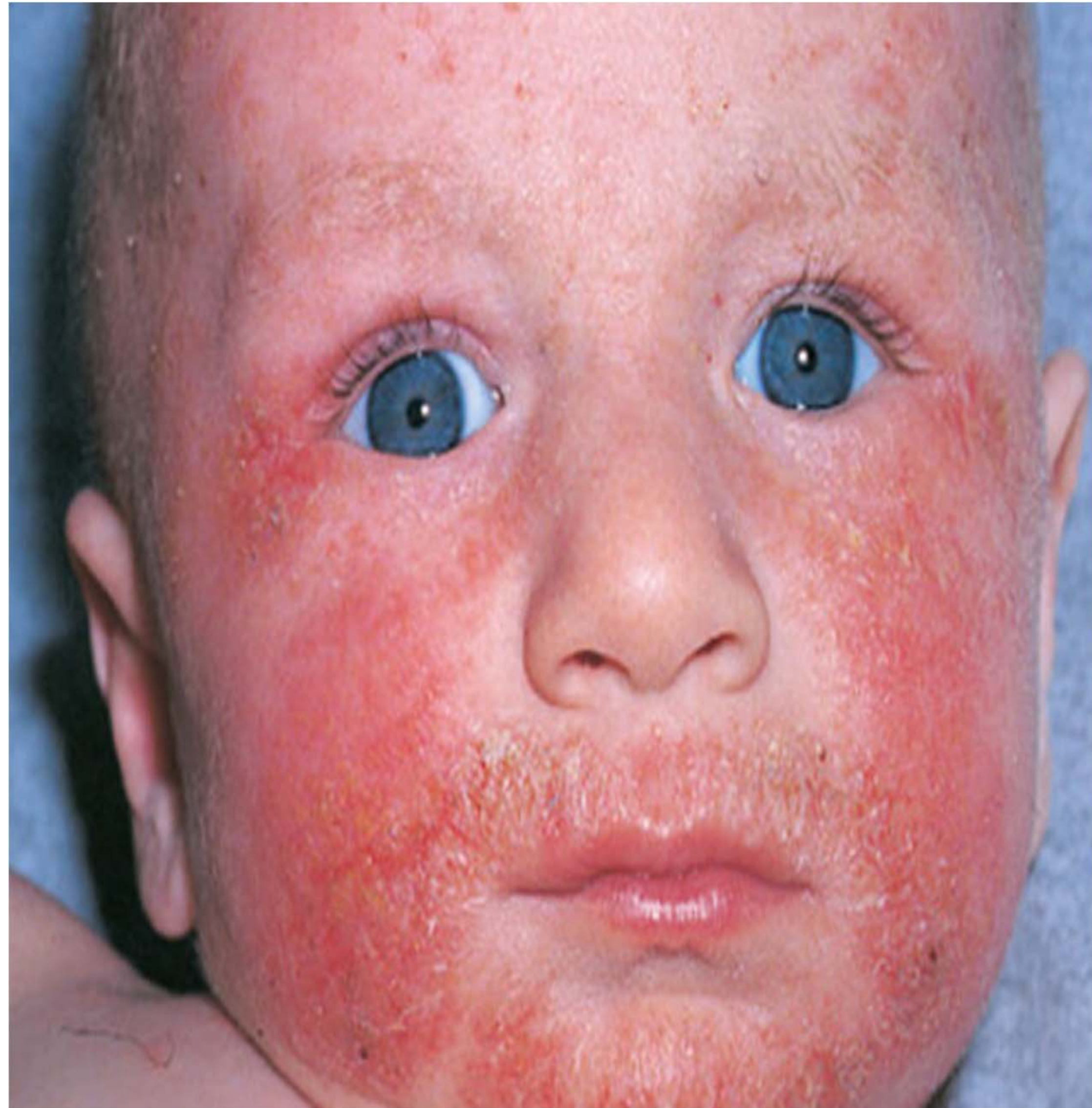
- Key Characteristics:
  - Chronic, pruritic, inflammatory skin disorder
  - “THE ITCH THAT RASHES”
- S/S:
  - **Pruritus**/eczematous changes
  - **Dry skin**
  - Acute manifestations (more common in infants)
    - Intense itching/redness
    - **Papules, vesicles, edema, serous discharge/crusts**
    - Generalized dry skin
  - Chronic manifestations (in older children)
    - **Lichenification**
    - Scratch marks
    - Generalized xerosis

Pediatric Nurse Practitioners
The Leader in Pediatric Education for Nurse Practitioners

©2020

Eczema

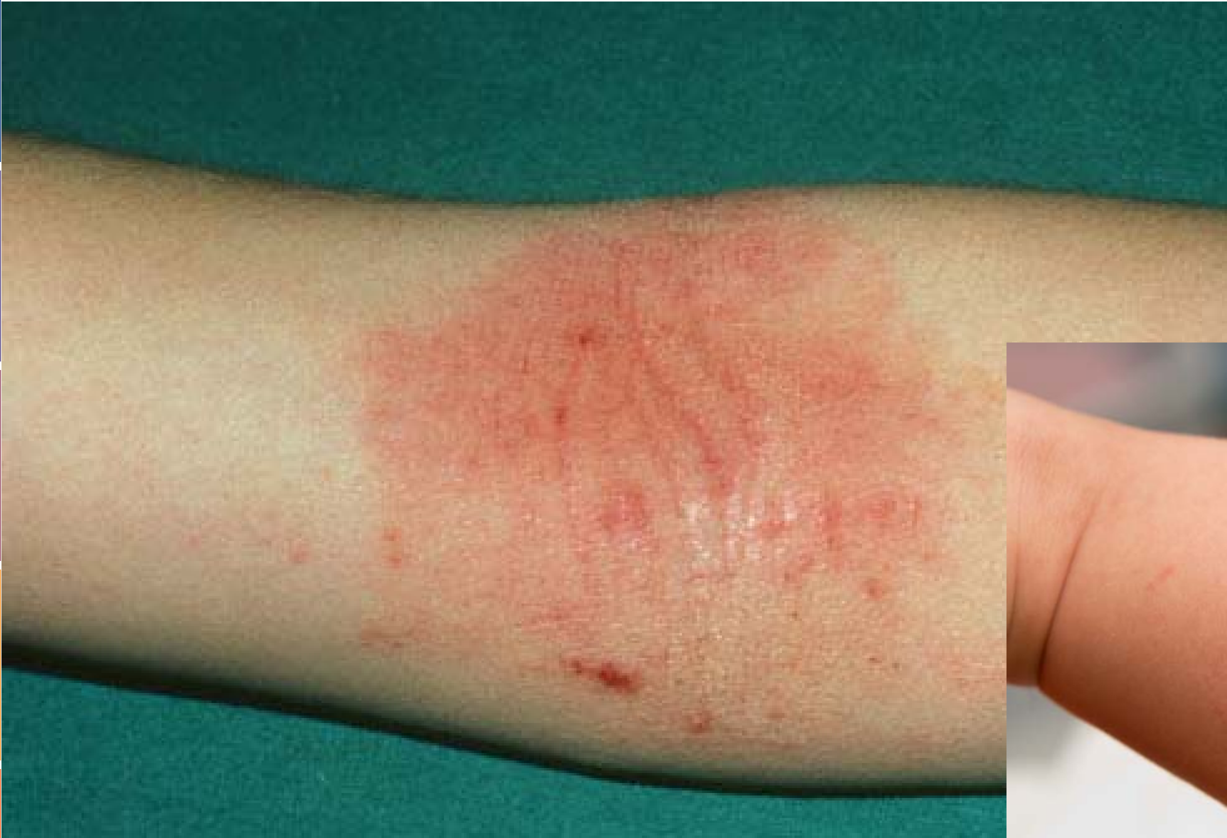
- **Management:**
  - Avoid known irritants
  - MOISTURIZE, MOISTURIZE, MOISTURIZE
    - Vaseline, Cetaphil, Crisco, Aquaphor, Eucerin
    - Mild or mild-moderate topical corticosteroids
    - Antihistamines
    - Wet wrap therapy
    - No topical antibiotics
      - Unless secondary bacterial infection
    - No systemic steroids



Pediatric Nurse Practitioners — National Association of
The Leader in Pediatric Education for Nurse Practitioners

©2020

Eczema



Pediatric Nurse Practitioners
The Leader in Pediatric Education for Nurse Practitioners

©2020

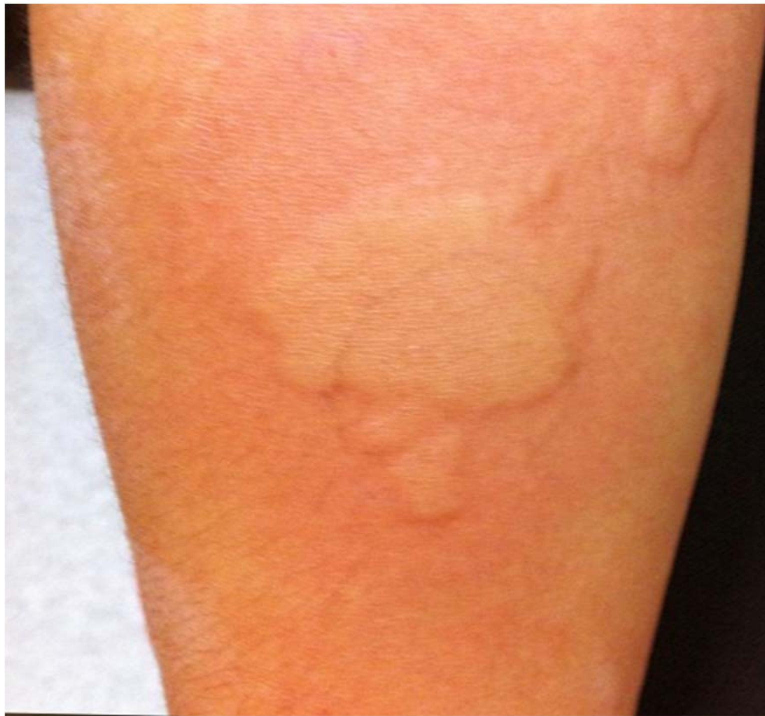
Allergic Rashes

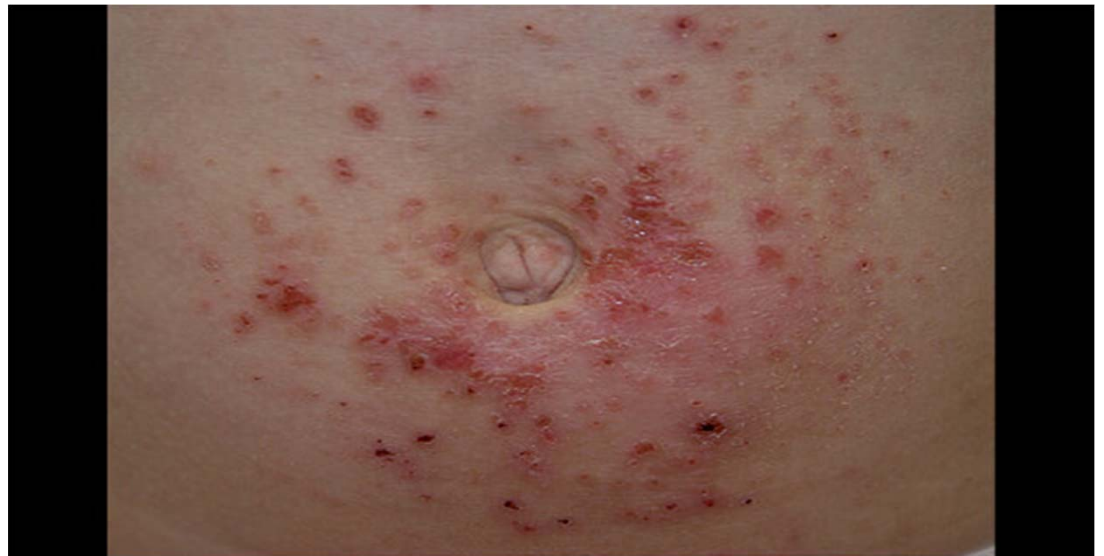
- Key Characteristics:
  - **Allergic/ Contact Dermatitis**
    - Erythema, vesicles
    - Oozing in the area of contact
  - Distribution may be a clue to what caused it
    - Nickel dermatitis; lip-licker; poison ivy
  - **id reaction**
    - Widespread papulovesicular rash
    - From repeat exposures to a substance the child is already sensitized

- Management:
- Treatment for allergic or contact dermatitis is the same as eczema
  - Avoid the cause
  - Break the habit
  - Stop the itching
  - Moisturizer
  - Mild to mild-moderate topical steroids
  - Once the original rash is gone the rest will clear also.

Pediatric Nurse Practitioners
The Leader in Pediatric Education for Nurse Practitioners®
©2020

Allergic Rashes

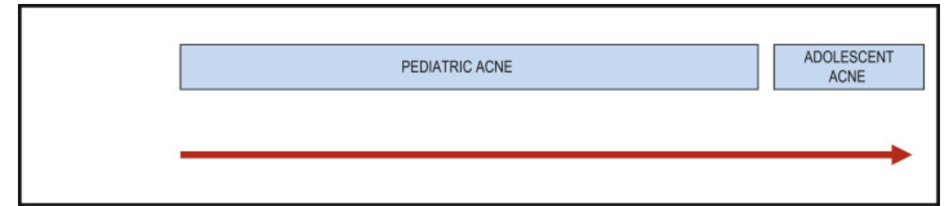




Pediatric Nurse Practitioners
The Leader in Pediatric Education for Nurse Practitioners

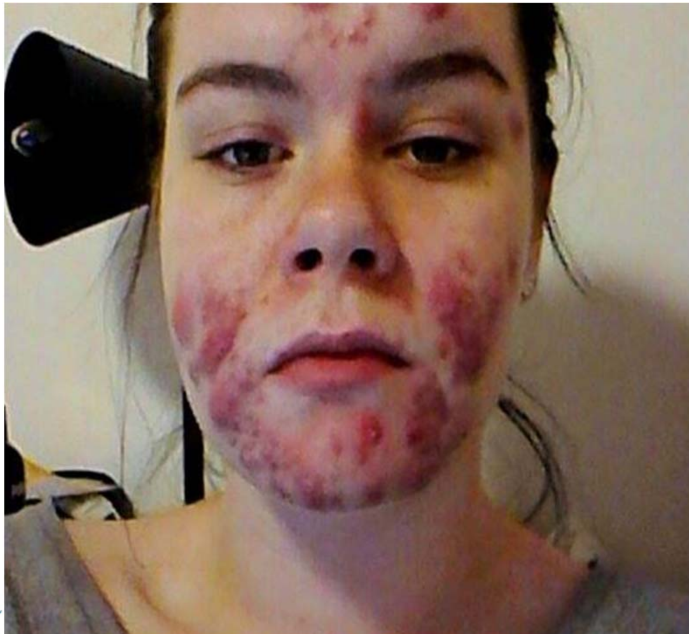
©2020

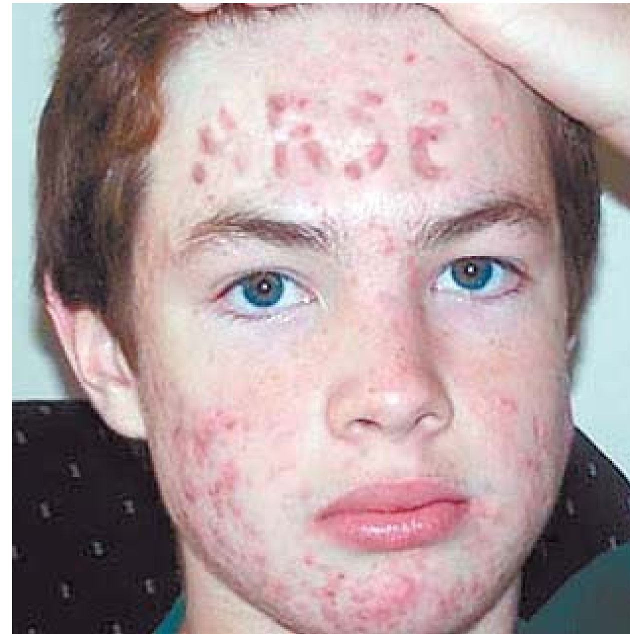
Acne Vulgaris



Key Characteristics

- Inflammatory disorder – excess sebum, keratinous debris, bacteria accumulate
  - Produce inflamed or noninflamed microcomedones
  - May cause permanent scarring/decreased self-esteem





Pediatric Nurse Practitioners
The Leader in Pediatric Education for Nurse Practitioners

©2020

Acne Vulgaris

- S/S
  - Noninflammatory lesions
    - **Microcomedone:** follicular plug; localized on face and trunk
    - **Open comedone** (blackhead): papule; blockage at mouth of follicle; face, upper back, shoulders, chest
    - **Closed comedone** (whitehead): semisoft; precursor to inflammatory acne
  - Inflammatory lesions
    - Secondary to rupture of noninflamed lesions
    - Papules, pustules, excoriation, crusting, nodules, cysts, scars, sinus tracts

National Association of Pediatric Nurse Practitioners
The Leader in Pediatric Education for Nurse Practitioners®

©2020

Acne Vulgaris

Management:

- Education
  - Wash face BID with mild soap
  - Only use noncomedogenic products
  - Identify aggravating causes
- Medications
  - Topical keratolytic/comedolytic agents: minimize follicular obstruction
    - Topical retinoids – tretinoin, adapalene, tazarotene
    - Antibacterial/keratolytics – benzoyl peroxide (BPO), azelaic acid
  - Topical antibiotics: control inflammatory process
    - Topical *clindamycin, erythromycin, sulfacetamide
    - Topical erythromycin or *clindamycin with BPO
  - Oral antibiotics: to decrease bacteria; use for 3-6 months
    - Tetracycline
    - Erythromycin
    - *Minocycline
    - Doxycycline
  - Oral retinoids: severe, recalcitrant acne; contraindicated in pregnancy; refer to dermatologist.
  - Hormonal/other therapies: in females to oppose effects of androgens on sebaceous glands
  - Noncomedogenic moisturizers: for dryness common with treatment

Follow up:

- **Every 4-6 weeks until control is established**

Refer for severe or non responsive cases

Pediatric Nurse Practitioners
The Leader in Pediatric Education for Nurse Practitioners

©2020

Treatment Based on Severity

	Mild	Moderate	Severe
Description	Fewer than 20 whiteheads or blackheads, fewer than 15 inflamed bumps, or fewer than 30 total lesions.	Between 20 to 100 whiteheads or blackheads, 15 to 50 inflamed bumps, or 30 to 125 total lesions	multiple inflamed **cysts** and **nodules.** The acne may turn deep red or purple. It often leaves scars.
Treatment	Benzoyl peroxide (BP) or topical retinoid ~OR~ a topical combination therapy: 1. BP + antibiotic 2. Retinoid + BP 3. Retinoid + BP + antibiotic	Topical combination therapy: 1. BP + antibiotic 2. Retinoid + BP 3. Retinoid + BP + antibiotic ~OR~ 1. Oral antibiotic + topical retinoid + BP 2. Oral antibiotic + topical retinoid + BP + topical antibiotic	Oral antibiotic plus topical combination therapy: 1. BP + antibiotic 2. Retinoid + BP 3. Retinoid + BP + antibiotic ~OR~ Oral isotretinoin

Pediatric Nurse Practitioners
The Leader in Pediatric Education for Nurse Practitioners

©2020

Topical Keratolytic or Comedolytic Agents	Topical Antibiotics	Oral Antibiotics	Combination Oral Contraceptions

• **Retinoids:**
  • Tretinoin: 0.01%-0.025% gel; 0.025%-0.1% cream; 0.1% microgel
  • Tretinoin/clindamycin (combination topical)
  • Tazarotene: 0.05%-0.1% cream; 0.05%-0.1% gel
  • Adapalene: 0.1% gel or cream; 0.3% gel; 0.1% with 2.5% BP gel
• **Benzoyl peroxide**: 2.5%-20% gel; 5% and 10% cream; 5%-20% lotion or wash
• **Azelaic acid**: 20% cream; 15% gel
	• **Clindamycin:** 1% solution, lotion, gel, pledget, foam
	• **Clindamycin:** 1% with 5% benzoyl peroxide
	• **Erythromycin:** 1.5% to 2% solution, 3% gel or swabs
	• **Erythromycin:** 3% with benzoyl peroxide 5% gel
		• **Tetracycline:** 250-500 mg per dose twice a day
		• **Minocycline:** 50-100 mg per dose twice a day (associated with more side effects)
		• **Doxycycline:** 50-100 mg per dose twice a day
		• **Erythromycin:** 250-500 mg per dose twice a day Ethinyl
			• Ethinyl estradiol/norgestimate
			  • Ortho Tri-Cyclen Lo
			• Ethinyl estradiol/norethindrone acetate/ferrous fumarate
			  • Lo Loestrin Fe
			• Ethinyl estradiol/drospirenone
			  • Yasmin, Yaz
			• Ethinyl estradiol/ drospirenone/ levomefolate
			  • Beyaz

National Association of Pediatric Nurse Practitioners
The Leader in Pediatric Education for Nurse Practitioners®

©2020

Question 4

A child with boggy nasal mucosa has voluminous clear discharge, dark circles under his eyes and a very itchy erythematous papular red rash behind his knees, on his wrists and in his antecubital areas. The diagnosis is

1. Psoriasis
2. Atopic dermatitis
3. Tinea corporis
4. Poison ivy

Question 4

A child with boggy nasal mucosa has voluminous clear discharge, dark circles under his eyes and a very itchy erythematous papular red rash behind his knees, on his wrists and in his antecubital areas. The diagnosis is

Answer: Atopic dermatitis

Systemic Viral Skin Infections

©2020

Rubeola: Measles

- Rash **preceded** by fever, cough, **red eyes, Koplik's spots**
- Begins **as pink then evolved to erythematous**. First **face, then chest and abdomen; then arms and legs**

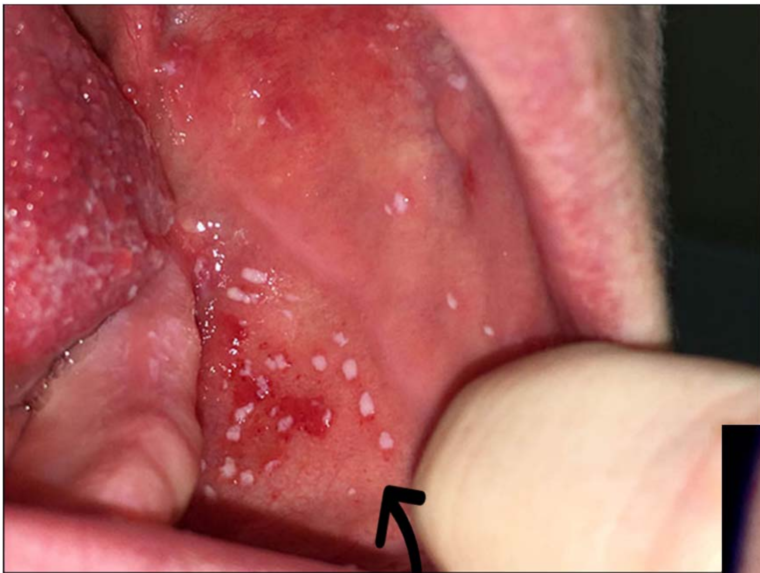
Rubella: Three-Day Measles, German Measles

- **Rose-pink, maculopapular rash begins on face, spreads to trunk and extremities lasting less than 72 hours**
- Malaise, joint pain, lymphadenopathy

Roseola Infantum: Sixth Disease, Herpesvirus 6

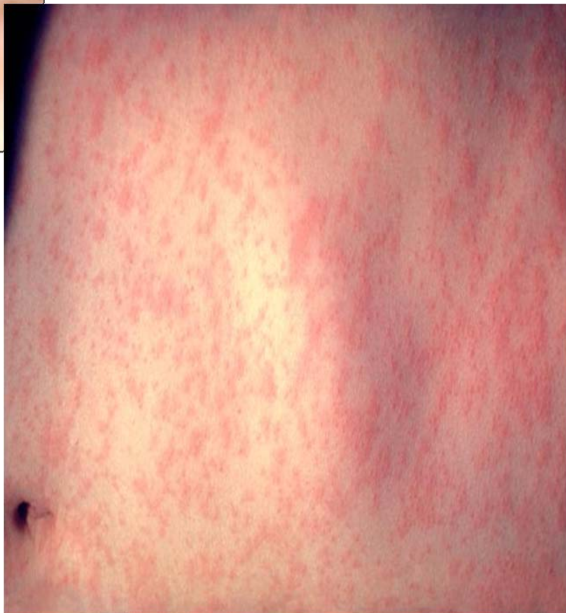
- **3 days of high fever with rapid decline**
- **After** the fever abates, a **diffuse, faint, blanchable, erythematous reticulated rash** appears

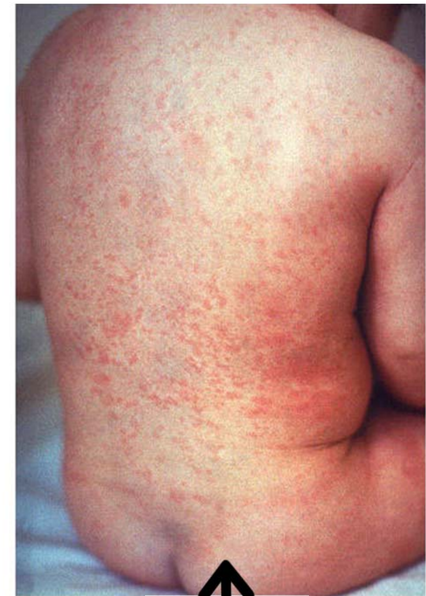
©2020



Koplick Spots

Rubeola (Measles)
3-days after the onset of a measles infection





Rash of Rubella on skin of child's back. Distribution is similar to that of measles, but the lesions are less intensely red.

Pediatric Nurse Practitioners
The Leader in Pediatric Education for Nurse Practitioners

©2020

Erythema Infectiosum:

Fifth Disease

- Fever, pharyngitis, malaise, coryza
- Then: “slapped cheek” erythema then **lacy, reticulated, erythematous exanthem**

Coxsackie Virus:

Hand-Foot-Mouth

- Fever, malaise, headache, pharyngitis, or diarrhea
- Small **gray-white vesicles** and **erosions with an erythematous ring on the hard palate, buccal mucosa, tongue, and gingiva**
- Small oval **vesicles with an erythematous ring are seen on the lateral aspects of the hands and feet, as well as on the palms and soles.**

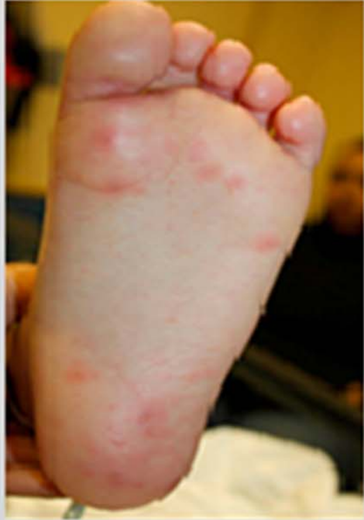
Varicella:

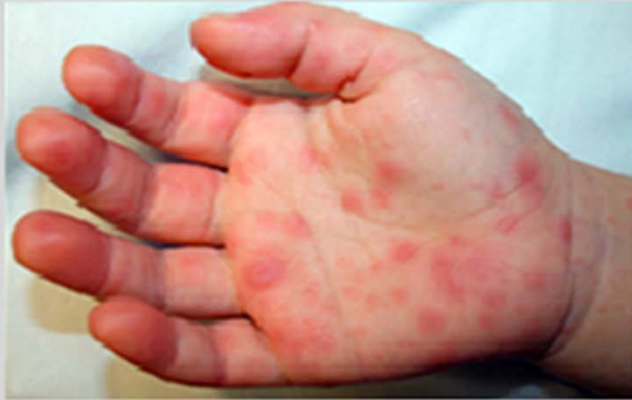
Chicken Pox

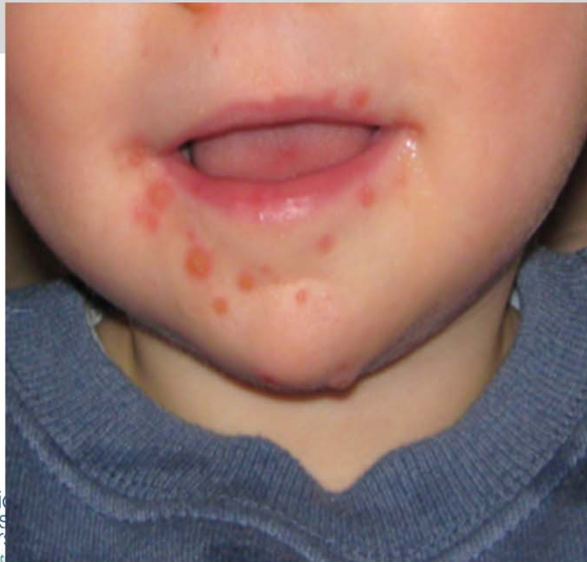
- **Progression of lesions from erythematous macules, to papules, to fluid-filled vesicles, and to crusted lesions, and fever/malaise**
- **Pruritic** crops of lesions appear on the **face, trunk, and scalp,** with minimal involvement of the distal extremities

for Nurse Practitioners®

©2020

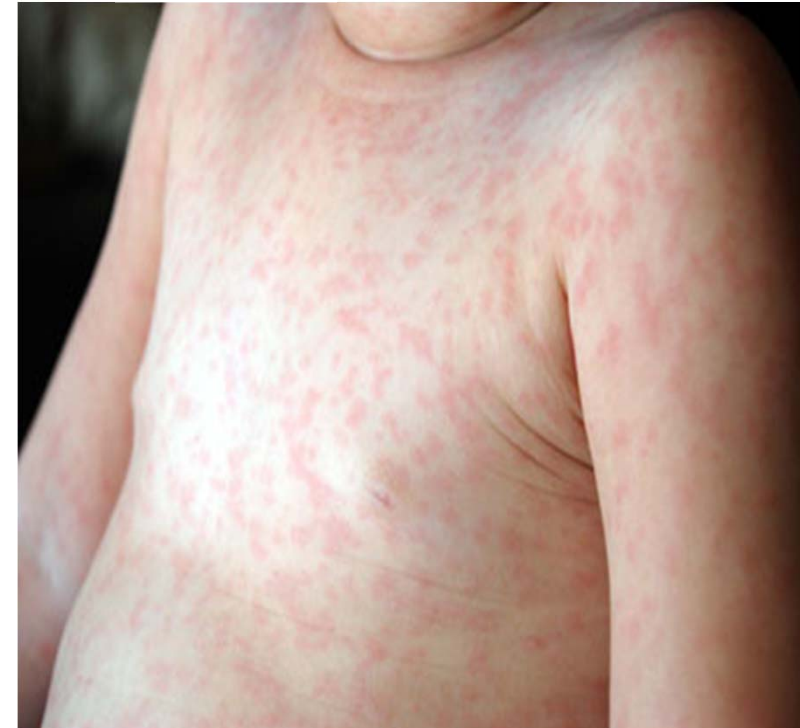






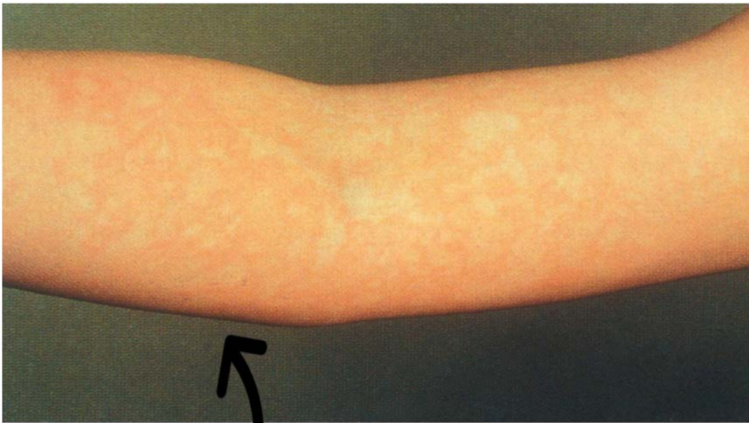
Hand Foot Mouth Disease

Roseola



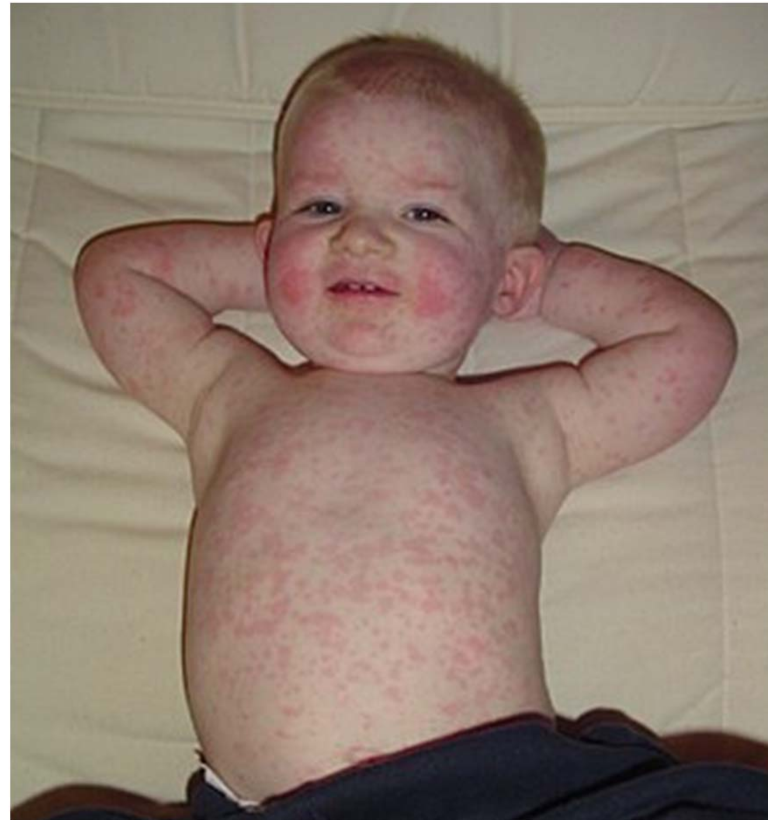
Pediatric Nurse Practitioners
The Leader in Pediatric for Nurse Practitioners

©2020



Lacy rash on arm

Erythema Infectiosum

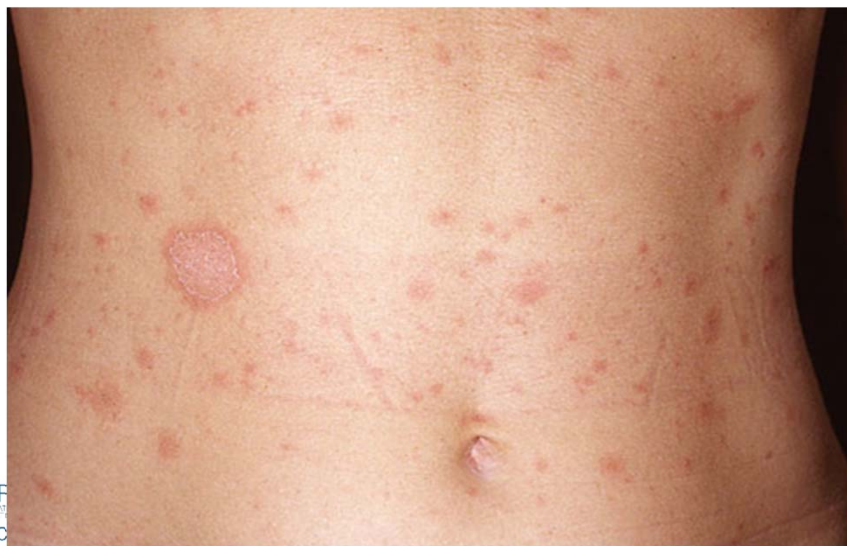


Pediatric Nurse Practitioners
NATIONAL ASSOCIATION OF
The Leader in Pediatric Education for Nurse Practitioners

©2020

Pityriasis Rosea

- Key Characteristics:
- Common, mild, self-limiting
- Isn't' well understood but thought to be triggered by a virus
- **Herald Patch**



- S/S
  - Prodrome of mild symptoms
  - **Herald patch** – 2-5 cm ovoid lesion
  - Symmetric, small macular/papular, pale pink lesions
  - Christmas tree pattern, itching
- Management
  - Calamine lotions; Aveeno, antihistamines, emollients
  - Minimal sun exposure
  - Oral erythromycin may hasten resolution of rash

The Leader in Pediatric Education for Nurse Practitioners®

©2020

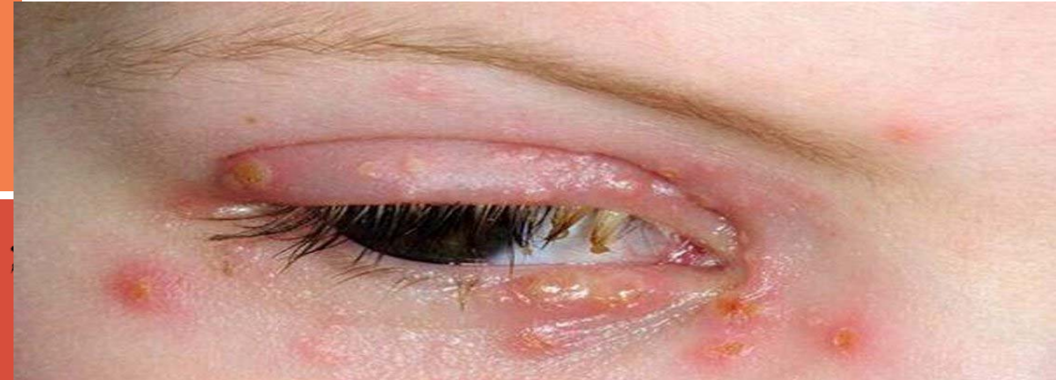
Herpes Simplex

- Key Characteristics
  - Primary **herpetic gingivostomatitis** begins with **extensive perioral vesicles and pustules, and intraoral vesicles and erosions**
- S/S:
  - Gingivae become edematous, red, friable, and bleed easily.
  - Fever, irritability, and cervical adenopathy
  - Lesions may also be scattered on the face and upper trunk.
    - Finger: Herpes whitlow

©2020

Herpes Simplex

- **Evaluation:**
  - Diagnosis initially made clinically
  - Tzanck smear
  - Viral cultures (Gold Standard)
  - ELISA serology
  - PCR tests (highly effective and specific)



- **Management**
  - Cool compresses
  - Oral analgesics
  - Acyclovir if severe or immunocompromised
  - Oral anesthetics for comfort
    - Diphenhydramine/magnesium hydroxide 1:1 rinse
  - Exclude from day care if child cannot control secretions

©2020

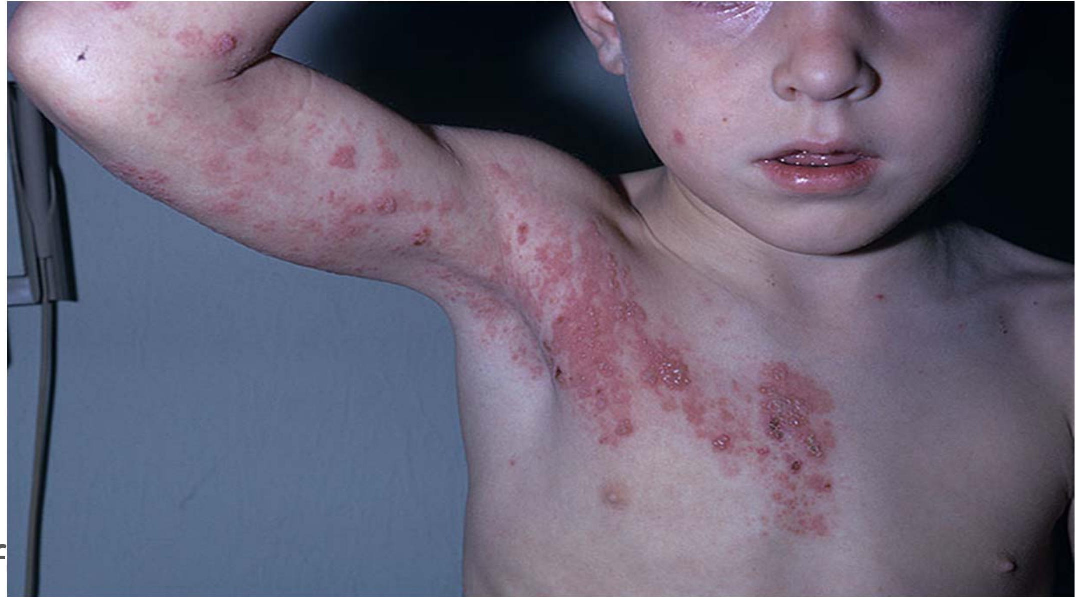
Herpes Zoster

- Key Characteristics
  - **Burning**, **stinging pain**, hyperesthesia, tingling
    - Children report more itching than burning
  - Commonly follow dermatomes; **does not cross midline**
- S/S
  - 2-3 **clustered groups of macules/papules progressing to vesicles**
  - Develop over 3-5 days; last 7-10 days

Pediatric Nurse Practitioners
The Leader in Pediatric Education for Nurse Practitioners

©2020

Herpes Zoster



- **Evaluation:**
  - Clinical diagnosis
  - Viral culture if needed
- **Management**
  - Warm, soothing baths
  - Antihistamines/analgesics for comf
  - Moisturizing ointment
  - Antiviral medications not recommended unless immunosuppressed
- Refer if eyes, forehead, nose involved for ophthalmologic exam

Pediatric Nurse Practitioners
The Leader in Pediatric Education for Nurse Practitioners

©2020

Question 5

An 18 month old presents a rash faint but covering the face, trunk, and extremities. Prior to getting the rash, the child had a 103. F temperature for a "a few days" that "all of a sudden went away. The most likely diagnosis is:

1. Hand-foot-and-mouth disease
2. Erythema Infectiosum
3. Roseola Infantum
4. Scarlet fever

Question 5

An 18 month old presents a rash faint but covering the face, trunk, and extremities. Prior to getting the rash, the child had a 103. F temperature for a "a few days" that "all of a sudden went away. The most likely diagnosis is:

Answer: Roseola Infantum

Question 6

A 6-year old boy presents a rash that started on his face then appeared on his arms. The rash on his arms is lacy in appearance. The child is well-hydrated, and afebrile. The most likely diagnosis is:

1. Hand-foot-and-mouth disease
2. Erythema Infectiosum
3. Herpetic gingivostomatitis
4. Scarlet fever

Question 6

A 6-year old boy presents a rash that started on his face then appeared on his arms. The rash on his arms is lacy in appearance. The child is well-hydrated, and afebrile. The most likely diagnosis is:

Answer: Erythema Infectiosum

Question 7

A 2-year old girl presents with erythematous, macules and papules on her hands and feet in addition to oral ulcerations with erythematous bases. The child is irritable, well-hydrated, and afebrile. The most likely diagnosis is:

1. Hand-foot-and-mouth disease
2. Aphthous stomatitis
3. Herpetic gingivostomatitis
4. Scarlet fever

Question 7

A 2-year old girl presents with erythematous, macules and papules on her hands and feet in addition to oral ulcerations with erythematous bases. The child is irritable, well-hydrated, and afebrile. The most likely diagnosis is:

Answer: Hand-foot-and-mouth disease

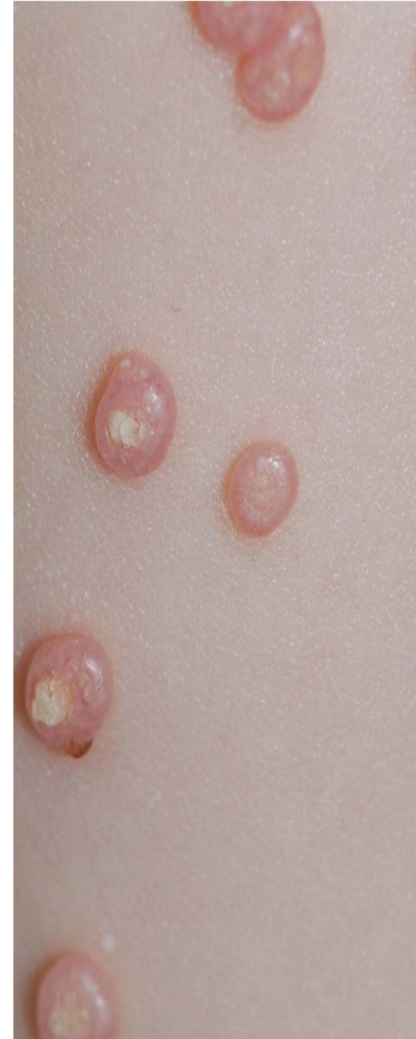
Localized Viral Skin Infections

©2020

Molluscum Contagiosum

- Key Characteristics:
  - **umbilicated** with c**heesy core/surrounding dermatitis**

- S/S
  - Small, firm, **pink-flesh-colored papules**
  - Become **umbilicated** with c**heesy core/surrounding dermatitis**
  - Single papule to numerous, clustered papules
  - Can be severe in children with eczema, HIV
  - Itching at site



Pediatric Nurse Practitioners National Association of
The Leader in Pediatric Education for Nurse Practitioners

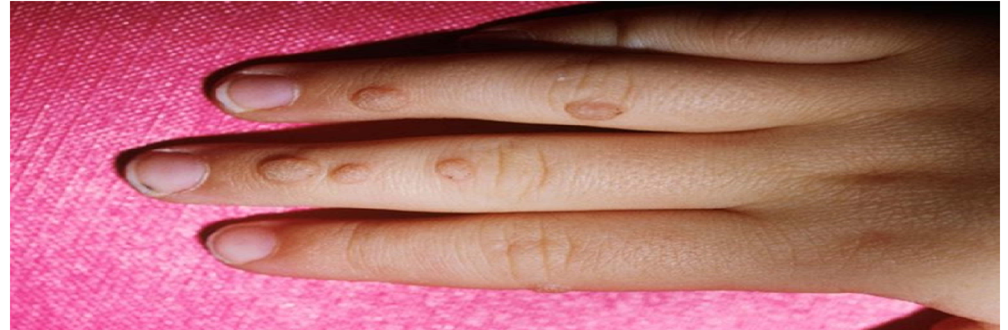
©2020

Molluscum Contagiosum

- **Management**
  - Lesions resolve over time
  - Therapy for comfort, to reduce itching, minimize autoinoculation, cosmetic reasons
  - Mechanical removal of central core
  - Irritants (surgical tape) may cause resolution
  - Topical medications may be beneficial
  - Cimetidine orally if treatment fails
  - Evaluate for HIV if hundreds of lesions

National Association of Pediatric Nurse Practitioners
The Leader in Pediatric Education for Nurse Practitioners
©2020

Warts



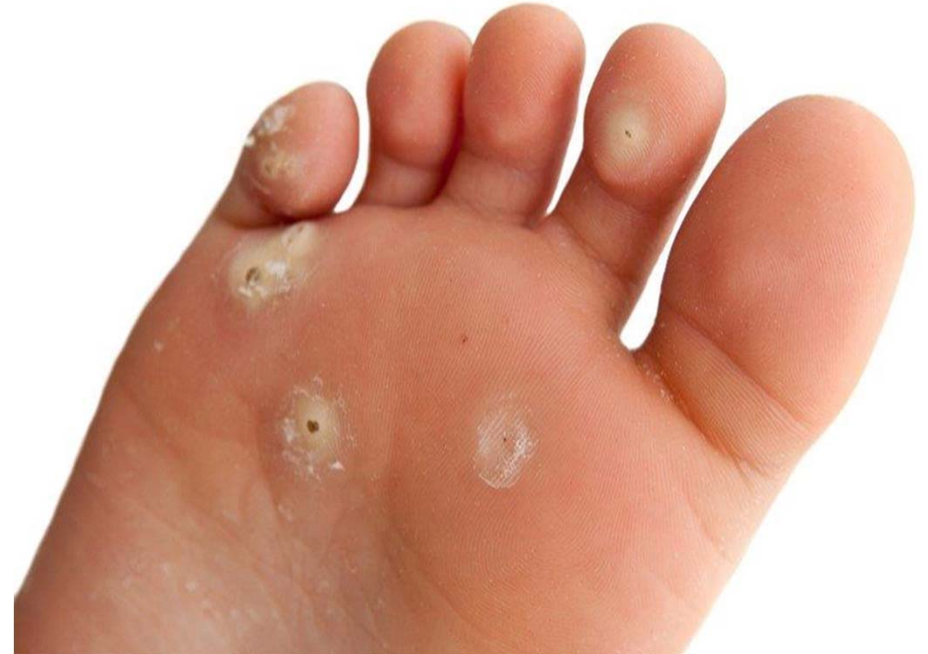
- Key Characteristics:
  - Human papillomavirus lesions
  - Trauma promotes inoculation
  - Incubation 1-3 months, up to several years
  - Lesions disappear within 3-5 years
  - Most warts on hands, fingers, elbows, plantar surfaces of feet
- S/S
  - Verruca vulgaris: common warts – elevated, flesh-colored papules
  - Plantar warts: weight-bearing surfaces; grow inward
  - Flat warts: face, neck, extremities
  - Condylomata acuminata: genital mucosa

National Association of Pediatric Nurse Practitioners
The Leader in Pediatric Education for Nurse Practitioners®

©2020

Warts

- Management
  - Watchful waiting
  - No treatment necessary if asymptomatic
  - Avoid harm/scarring if treating
  - Topical irritants
    - salicylic acid and lactic acid
  - Liquid nitrogen and electrocautery



Pediatric Nurse Practitioners
National Association of
The Leader in Pediatric Education for Nurse Practitioners®

©2020

WART	OTHER NAME	DESCRIPTION
Common	Verruca vulgarus	**Solitary papule, irregular, rough**, can be anywhere
Periungual	Verruca vulgarus	**Around the cuticles of fingers and toes**; spread by trauma. Refer to dermatologist
Filiform		**Spiny projections** from the skin surface with a **stalk**. Usually eyes, lips, nose, or eyelids
Flat		**Flat-topped, smooth surface,** usually many, s**kin or tan colored**. Common in sites of trauma
Plantar	Weight-bearing warts	**Rough papule** that disrupt the dermal ridges; **painful**, may be grouped together (mosaic)
Venereal	Condylemata acuminate	Discrete or confluent papules with a rough surface that can be on the genitals, oral mucosa, respiratory tract. **Cauliflower like lesions.**

Infestations and Insect Bites

©2020

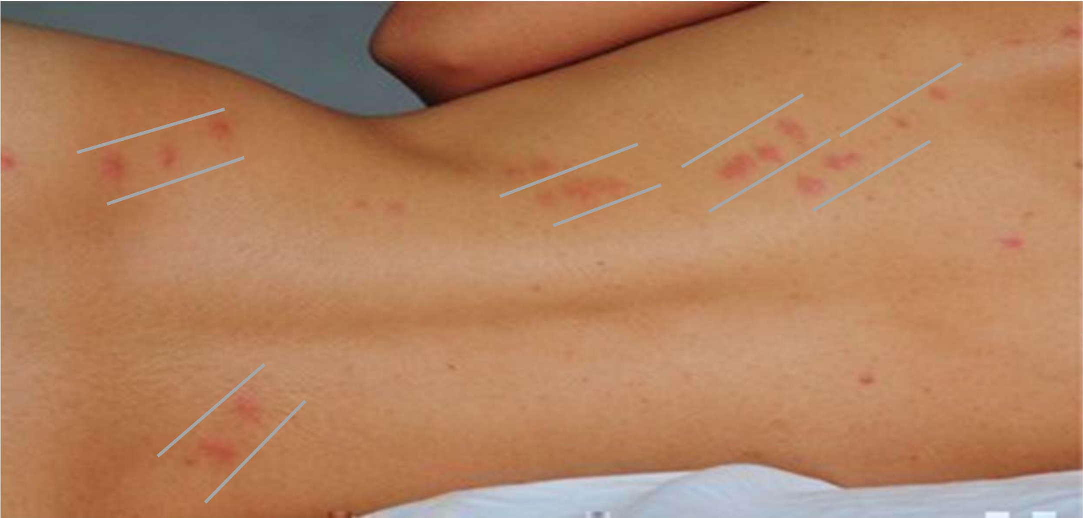
Bed Bug Bites

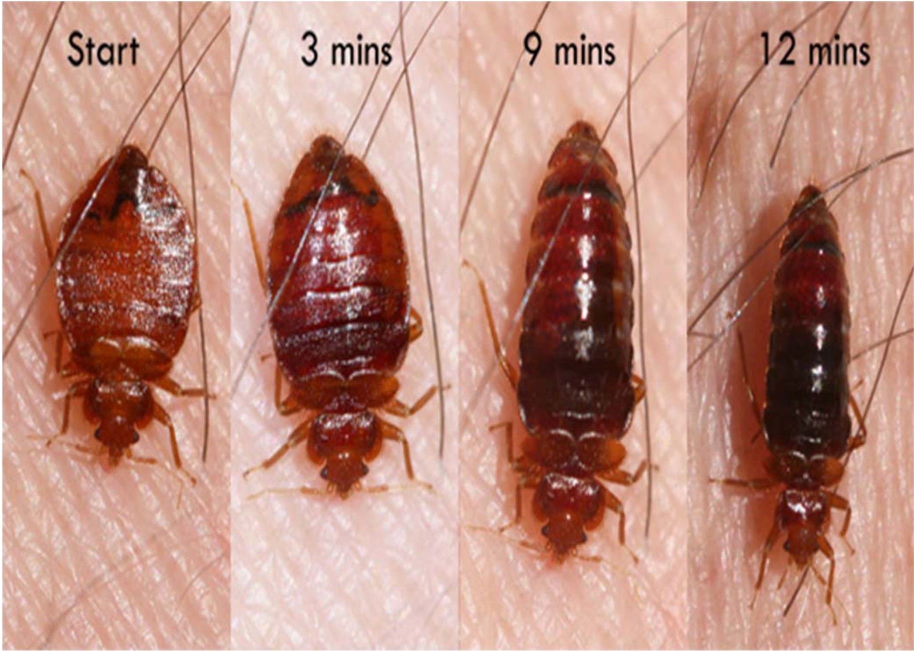
- Key Characteristics:
  - Most commonly occur on exposed areas of the face, neck, arms, or hands.
  - Breakfast, Lunch, and Dinner Sign
    - **3 linear, erythematous papules in a row**
- S/S
  - **pruritic**, erythematous-edematous papules in a **linear array**
- Management:
  - Antihistamines to control itching
  - Exterminator to control pests

Pediatric Nurse Practitioners
The Leader in Pediatric Education for Nurse Practitioners

©2020

Bed Bugs





Pediatric Nurse Practitioners
The Leader in Pediatric Education for Nurse Practitioners

©2020

Pediculosis

- Key Characteristics:
  - can affect scalp, body, pubic area
  - Head lice can live 30 days on a single host and lay over a hundred nits.
  - Transmission is by direct or indirect contact: DOES NOT JUMP
  - May cause intense itching behind ears and at neck
  - **“Flakes” that DO NOT wipe away easily!**
- S/S
  - Lice can be visualized; nits are **small white** (...not always) **oval cases attached to hair shaft**
  - Common sites: back of head, nape of neck, behind ears
  - Body lice: excoriated macules/papules; belt line, collar, underwear areas/regional lymphadenopathy

National Association of Pediatric Nurse Practitioners
The Leader in Pediatric Education for Nurse Practitioners
©2020

Pediculosis

- Management
  - Pediculicides are first-line treatments
    - Permethrin – first choice
  - Then remove nits – use special comb
  - Then cleanse environment
  - Wash sheets, towels, clothing, headgear
  - Place items that cannot be washed/dry-cleaned in plastic bag for 2 weeks
  - Vacuum carpeted play areas
  - Soak brushes, combs, hair accessories in pediculicide

©2020

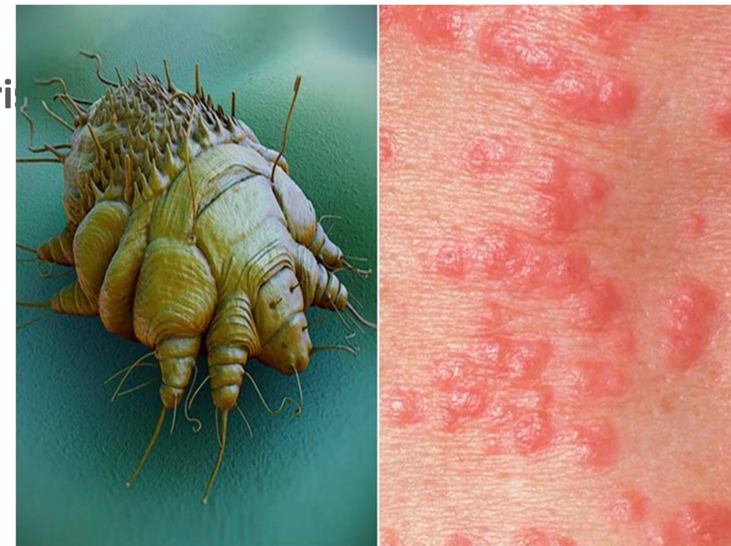
Pediculosis

Pediatric Nurse Practitioners
National Association of
The Leader in Pediatric Education for Nurse Practitioners®

©2020

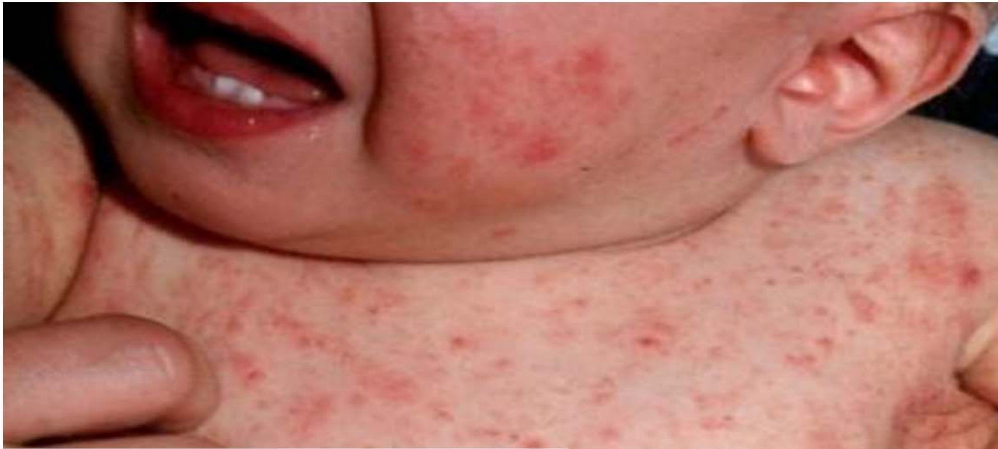
Scabies

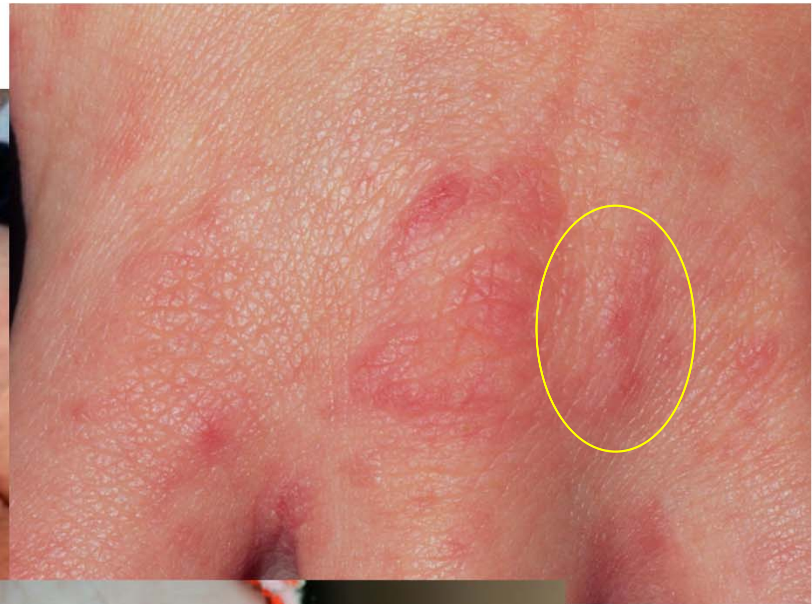
- Key Characteristics:
  - *Sarcoptes scabii*
  - Mites burrow into epidermis, feed off human blood, and there is intense itching
  - Itching is caused by antibody sensitization that occurs in about 3 weeks
  - **Itching; worse at night; progressively intense**
  - **Multiple erythematous papules**
- S/S
  - Itching; worse at night; progressively intense
  - Fitful sleep, crankiness
  - **S-shaped burrows**; **webs of fingers**; **sides of hands; folds of wri**
  - Vesiculopustular lesions in infants/young children
  - Secondary lesions – itchy papules, red-brown nodules
- Evaluation
  - Microscopic exam of scrapings; do not use KOH
  - Burrow ink test to stain burrow-very quick and easy

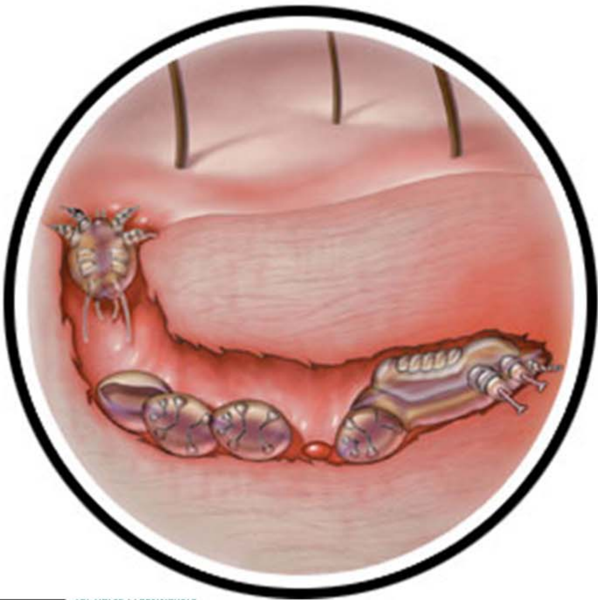


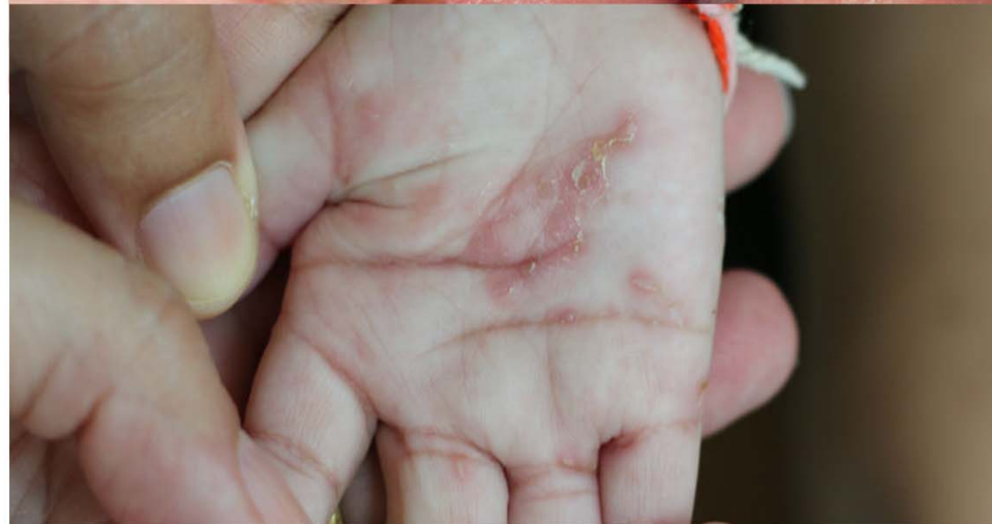
National Association of Pediatric Nurse Practitioners
The Leader in Pediatric Education for Nurse Practitioners

Scabies









©2020

Scabies

- **Management**
  - Pharmacological treatment: scabicide
    - Permethrin (5%) – apply from neck down; rinse off in 8-14 hours
      - Repeat in 1 week
    - Antihistamines PRN
  - Simultaneous treatment of close contacts
  - Wash linens, clothing in hot water; vacuum house
  - Store non-washable items in sealed plastic bags

Pediatric Nurse Practitioners
The Leader in Pediatric Education for Nurse Practitioners

©2020