Disorders of the Skin

Deena Garner, DNP, APRN, CPNP-PC
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
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.
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
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
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
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
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
**Petechiae & Purpura**

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

- **Purpura**
  - 4-10 mm petechiae
  - Common vasculitis

- **Bruising**
  - > 10 mm bleeding under the skin
Skin Conditions of the Newborn and Infant
<table>
<thead>
<tr>
<th></th>
<th>Milia</th>
<th>Millaria Rubra</th>
<th>Sebaceous Gland Hyperplasia</th>
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</thead>
<tbody>
<tr>
<td><strong>Key Characteristics</strong></td>
<td>pearly, yellow, 1–3 mm diameter papules</td>
<td>erythematous, 1-2 mm papules and pustules. Also called &quot;Prickly Heat&quot; or &quot;Heat Rash&quot;</td>
<td>multiple 1–2 mm diameter yellow papules</td>
</tr>
<tr>
<td><strong>Initial Eruption</strong></td>
<td>face, chin, and forehead</td>
<td>Can occur anywhere, but has a predilection for the forehead, upper trunk, and flexural or covered surfaces.</td>
<td>Clusters around the nose, may also appear on cheeks</td>
</tr>
<tr>
<td><strong>Onset</strong></td>
<td>Shortly after birth</td>
<td>After the first week of life</td>
<td>At birth or shortly after</td>
</tr>
<tr>
<td><strong>Resolves</strong></td>
<td>during the first month of life without treatment, they may persist for several months</td>
<td>may come and go throughout infancy. Cooling skin and loosening clothes may cause resolution</td>
<td>within 4–6 months</td>
</tr>
<tr>
<td></td>
<td>Erythema Toxicum</td>
<td>Neonatal Acne</td>
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<tr>
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<td>------------------------------------------------------------------------------</td>
<td></td>
</tr>
<tr>
<td><strong>Key Characteristics</strong></td>
<td>barely elevated <strong>yellowish papules or pustules</strong> measuring 1–3 mm in diameter, with a surrounding irregular macular flare or wheal of erythema measuring 1–3 cm; ‘flea-bitten’ appearance.</td>
<td>multiple, tiny, monomorphous papulopustules on an erythematous base</td>
<td></td>
</tr>
<tr>
<td><strong>Location</strong></td>
<td>appear first on the face and spread to the trunk and extremities, but may appear anywhere on the body except on the palms and soles</td>
<td>located <strong>primarily</strong> on the cheeks, but scattered over the face and often extending onto the scalp</td>
<td></td>
</tr>
<tr>
<td><strong>Onset</strong></td>
<td>between 24 and 48 h of life</td>
<td>average onset at 3 weeks of age</td>
<td></td>
</tr>
<tr>
<td><strong>Resolves</strong></td>
<td><strong>usually fade over 5–7 days</strong>, may reoccur for several weeks.</td>
<td>spontaneously within 1–3 months</td>
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</tbody>
</table>
Erythema Toxicum and Neonatal Acne
# Diaper Dermatitis

<table>
<thead>
<tr>
<th></th>
<th>Irritant Contact Dermatitis</th>
<th>Candidiasis</th>
<th>Bacterial Dermatitis</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Cause</strong></td>
<td>Contact with urine/feces; wearing diaper</td>
<td>Candida</td>
<td>Staphylococcal or streptococcal</td>
</tr>
<tr>
<td><strong>Key Characteristics</strong></td>
<td><strong>Chapped, shiny, erythematous, parchment-like skin</strong> with possible erosions on CONVEX surfaces, creases are spared</td>
<td>Shallow pustules, <strong>fiery red plaques on CONVEX surfaces</strong>, <strong>inguinal folds</strong>, labia, scrotum</td>
<td>Erythematous, denuded areas or fragile blisters, crusting, pustules in <strong>suprapubic areas and periumbilicus</strong></td>
</tr>
<tr>
<td><strong>Timing</strong></td>
<td>Peak occurrences at 9-12 months, may progress to include creases</td>
<td><strong>Satellite lesions</strong>; recent antibiotic or diarrhea</td>
<td>Usually occurs in newborns</td>
</tr>
<tr>
<td><strong>Treatment</strong></td>
<td>Frequent diaper change, gentle cleansing, barrier cream, air dry, 0.5%-1% hydrocortisone</td>
<td>Antifungal cream, frequent diaper change, gentle cleansing, barrier cream, air dry</td>
<td>Nystatin if yeast is present as well, mupirocin in minimal, Augmentin or cephalaxin if severe</td>
</tr>
</tbody>
</table>
Contact Dermatitis
- Not located in folds
- No satellite lesions
- +Shiny and Erythematous

Fungal Diaper Rash
- + located in folds
- + Satellite lesions
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
Seborrheic Dermatitis
Systemic Bacterial Skin Infections
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
# Tick Borne Illnesses

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

<table>
<thead>
<tr>
<th>Location</th>
<th>RMSF</th>
<th>Lyme Disease</th>
<th>Erlichiosis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Throughout most of the contiguous United States, five states (North Carolina, Oklahoma, Arkansas, Tennessee, and Missouri) account for over 60% of RMSF cases.</td>
<td>Upper Midwestern and northeastern United States.</td>
<td>Southeastern and south-central United States, from the East Coast extending westward to Texas</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Incubation</th>
<th>3–12 days</th>
<th>3-30 days</th>
<th>5–14 days</th>
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</table>

<table>
<thead>
<tr>
<th>Early common Signs and Symptoms</th>
<th>RMSF</th>
<th>Lyme Disease</th>
<th>Erlichiosis</th>
</tr>
</thead>
<tbody>
<tr>
<td>High fever</td>
<td></td>
<td>Erythema migrans (EM)</td>
<td>Fever, chills</td>
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<tr>
<td>Severe headache</td>
<td></td>
<td>Flu-like symptoms—malaise, headache, fever, myalgia, arthralgia</td>
<td>Headache</td>
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<tr>
<td>Malaise</td>
<td></td>
<td>Lymphadenopathy</td>
<td>Malaise</td>
</tr>
<tr>
<td>Myalgia</td>
<td></td>
<td></td>
<td>Muscle pain</td>
</tr>
<tr>
<td>Edema around eyes and on the back of hands</td>
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<td></td>
<td>Gastrointestinal symptoms nausea, vomiting, diarrhea, anorexia</td>
</tr>
<tr>
<td>Gastrointestinal symptoms (nausea, vomiting, anorexia)</td>
<td></td>
<td></td>
<td>Altered mental status</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Rash (more commonly reported among children)</td>
</tr>
<tr>
<td><strong>Key Characteristics</strong></td>
<td><strong>RMSF</strong></td>
<td><strong>Lyme</strong></td>
<td><strong>Ehrlichiosis</strong></td>
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<tr>
<td></td>
<td>• A fever followed by a rash on the fourth day.</td>
<td>• Erythema migrans (EM)—<strong>red ring-like</strong> or homogenous <strong>expanding rash</strong>; classic rash not present in all cases.</td>
<td>• Tick bites or exposure, <strong>fever</strong>, <strong>severe headache</strong>, malaise, myalgia.</td>
</tr>
<tr>
<td></td>
<td>• Early Rash</td>
<td>• &quot;Bull’s Eye&quot;</td>
<td>• <strong>Skin rash is not considered a common feature</strong> 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.</td>
</tr>
<tr>
<td></td>
<td>• 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.</td>
<td>• Flu-like symptoms—malaise, headache, fever, myalgia, arthralgia</td>
<td>• Physical are minimal.</td>
</tr>
<tr>
<td></td>
<td>• Late Rash</td>
<td>• Lymphadenopathy</td>
<td>• Splenomegaly is not uncommon, but some patients develop hepatomegaly. Lymphadenopathy is very uncommon.</td>
</tr>
<tr>
<td></td>
<td>• 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.</td>
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<tr>
<td></td>
<td>• generalized <strong>periorbital edema</strong>, severe muscle tenderness, GI symptoms and hyponatremia.</td>
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<tr>
<td><strong>Evaluation</strong></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><strong>Management</strong></td>
<td>• Doxycycline:</td>
<td>• Amoxicillin: 50 mg/kg/day orally TID for 14-21 days; Max Dose 500 mg/dose</td>
<td>Same as RMSF; Pt should be treated for 3 days after fever subsides. Minimal course is 5-7 days.</td>
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<tr>
<td></td>
<td>• Under 45 kg (100 lbs.): 2.2 mg/kg body weight given twice a day</td>
<td>• Doxycycline: 4 mg/kg/day orally BID for 10-21 days; Max Dose 100 mg/dose</td>
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<tr>
<td></td>
<td>• Over 45 kg: 100 mg every 12 hours</td>
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</tr>
<tr>
<td></td>
<td>• Maximum dose 100mg/dose</td>
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</table>
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
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"
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
Impetigo

Non Bullous Impetigo

Bullous Impetigo
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
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 follicle
    – Face, scalp, extremities, buttocks, back
    – Pruritus papules, pustules, deep red/purple nodules in areas under swimsuit
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
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
Abscess (Furuncle)

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

• 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
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
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
Tinea Versicolor

• Evaluation: KOH scraping
• Management
  • Selenium sulfide lotion or shampoo
  • Oral antifungal if resistant
Inflammatory Conditions of the Skin
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
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
Eczema
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.
Allergic Rashes
Acne Vulgaris

Key Characteristics

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

<table>
<thead>
<tr>
<th>Description</th>
<th>Mild</th>
<th>Moderate</th>
<th>Severe</th>
</tr>
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<tbody>
<tr>
<td>Fewer than 20 whiteheads or blackheads, fewer than 15 inflamed bumps, or fewer than 30 total lesions.</td>
<td>Between 20 to 100 whiteheads or blackheads, 15 to 50 inflamed bumps, or 30 to 125 total lesions</td>
<td>multiple inflamed <strong>cysts</strong> and <strong>nodules</strong>. The acne may turn deep red or purple. It often leaves scars.</td>
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<tr>
<td>Topical Keratolytic or Comedolytic Agents</td>
<td>Topical Antibiotics</td>
<td>Oral Antibiotics</td>
<td>Combination Oral Contraceptions</td>
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<tr>
<td><strong>Retinoids:</strong></td>
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<tr>
<td>• Tretinoin: 0.01%-0.025% gel; 0.025%-0.1% cream; 0.1% microgel</td>
<td><strong>Clindamycin:</strong> 1% solution, lotion, gel, pledget, foam</td>
<td><strong>Tetracycline:</strong> 250-500 mg per dose twice a day</td>
<td><strong>Ethinyl estradiol/norgestimate</strong></td>
</tr>
<tr>
<td>• Tretinoin/clindamycin (combination topical)</td>
<td><strong>Clindamycin:</strong> 1% with 5% benzoyl peroxide</td>
<td><strong>Minocycline:</strong> 50-100 mg per dose twice a day (associated with more side effects)</td>
<td><strong>Ortho Tri-Cyclen Lo</strong></td>
</tr>
<tr>
<td>• Tazarotene: 0.05%-0.1% cream; 0.05%-0.1% gel</td>
<td><strong>Erythromycin:</strong> 1.5% to 2% solution, 3% gel or swabs</td>
<td><strong>Doxycycline:</strong> 50-100 mg per dose twice a day</td>
<td><strong>Ethinyl estradiol/norethindrone acetate/ferrous fumarate</strong></td>
</tr>
<tr>
<td>• Adapalene: 0.1% gel or cream; 0.3% gel; 0.1% with 2.5% BP gel</td>
<td><strong>Erythromycin:</strong> 3% with benzoyl peroxide 5% gel</td>
<td><strong>Erythromycin:</strong> 250-500 mg per dose twice a day</td>
<td><strong>Lo Loestrin Fe</strong></td>
</tr>
<tr>
<td>• Benzoyl peroxide: 2.5%-20% gel; 5% and 10% cream; 5%-20% lotion or wash</td>
<td></td>
<td></td>
<td><strong>Ethinyl estradiol/drospirenone</strong></td>
</tr>
<tr>
<td>• Azelaic acid: 20% cream; 15% gel</td>
<td></td>
<td></td>
<td>• Yasmin, Yaz</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td><strong>Ethinyl estradiol/ drospirenone/levomefolate</strong></td>
</tr>
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<td></td>
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<td>• Beyaz</td>
</tr>
</tbody>
</table>
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
**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
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.
**Erythema Infectiosum:**
- 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
Lacy rash on arm

Erythema Infectiosum
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
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
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
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
Herpes Zoster

• **Evaluation:**
  - Clinical diagnosis
  - Viral culture if needed

• **Management**
  - Warm, soothing baths
  - Antihistamines/analgesics for comfort
  - Moisturizing ointment
  - Antiviral medications not recommended unless immunosuppressed

• Refer if eyes, forehead, nose involved for ophthalmologic exam
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
Molluscum Contagiosum

- Key Characteristics:
  - *umbilicated* with *cheesy core/surrounding dermatitis*

- S/S
  - Small, firm, *pink-flesh-colored papules*
  - Become *umbilicated* with *cheesy core/surrounding dermatitis*
  - Single papule to numerous, clustered papules
  - Can be severe in children with eczema, HIV
  - Itching at site
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
**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
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
<table>
<thead>
<tr>
<th>WART</th>
<th>OTHER NAME</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>Common</td>
<td>Verruca vulgarus</td>
<td><strong>Solitary papule, irregular, rough</strong>, can be anywhere</td>
</tr>
<tr>
<td>Periungual</td>
<td>Verruca vulgarus</td>
<td><strong>Around the cuticles of fingers and toes</strong>; spread by trauma. Refer to dermatologist</td>
</tr>
<tr>
<td>Filiform</td>
<td></td>
<td><strong>Spiny projections</strong> from the skin surface with a <strong>stalk</strong>. Usually eyes, lips, nose, or eyelids</td>
</tr>
<tr>
<td>Flat</td>
<td></td>
<td><strong>Flat-topped, smooth surface</strong>, usually many, <strong>skin or tan colored</strong>. Common in sites of trauma</td>
</tr>
<tr>
<td>Plantar</td>
<td>Weight-bearing warts</td>
<td><strong>Rough papule</strong> that disrupt the dermal ridges; <strong>painful</strong>, may be grouped together (mosaic)</td>
</tr>
<tr>
<td>Venereal</td>
<td>Condylemata acuminate</td>
<td>Discrete or confluent papules with a rough surface that can be on the genitals, oral mucosa, respiratory tract. <strong>Cauliflower like lesions.</strong></td>
</tr>
</tbody>
</table>
Infestations and Insect Bites
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
Bed Bugs
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
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
Pediculosis
Scabies

- Key Characteristics:
  - *Sarcoptes scabiei*
  - 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 wrists**
  - 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
Scabies
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