

# Rashes and Skin Infections For the Illinois Association of School Nurses, October 20, 2018

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Goals for this session:

- Clues to recognize common skin conditions in school aged humans.
- Know what could be contagious and what is NOT contagious.
- Understand the impact chronic skin disease has on individual children.

*“Rash is not a specific diagnosis. Instead it refers to any sort of inflammation and/or discoloration that distorts the skin's normal appearance. .(<https://www.medicinenet.com/rash/article.htm>)*

*Common **rashes** include eczema, poison ivy, hives, and athlete's foot.*

*Infections that cause **rashes** may be fungal, bacterial, parasitic, or viral*

Rashes and Infections are not mutually exclusive and Some rashes have no KNOWN cause

## Classic Exanthems

**First Disease: measles “morbilliform”**

**Second Disease: scarlet fever “scarletinaform” (Strep)**

**Third Disease: rubella**

Fourth Disease: described by Duke, thought to be a non-entity, but possibly coexistent rubella and scarlet fever

**Fifth Disease: erythema infectiosum (Parvovirus)**

\*\*\*\* another Parvovirus rash\*\*\*\* Papular Purpuric Gloves and Socks Syndrome

**Sixth Disease: roseola infantum (HHV 6, 7)**

\*\*\*\* *a look alike* \*\*\*\* **Mucocutaneous Lymph Node Syndrome (Kawasaki)**

Infectious etiology suggested – but never found

Fever x 5d and 4/5 of the following:

Bilateral conjunctival injection – no exudate

Oral mucosal chgs

Pharyngeal erythema

Strawberry tongue

Cheilitis

Acute hand/foot edema

w/ convalescent desquamation

Cervical adenopathy – unilateral nonfluctuant

Erythematous polymorphous generalized skin eruption

80% < 5 years (usually < 2 yr); Late winter, early spring

Primary cause of acquired heart disease in children

Skin manifestations vary

Vasculitis of small to medium sized arteries; Coronary artery aneurysms

## **Non-Specific Viral Exanthems**

Causes include:

Coxsackie, Echo, other Enteroviruses (>67 types)

Respiratory viruses (winter): Adeno, Influenza, Rhino, Parainfluenza, RSV

Incubation: 4-7 days

Contagion: fecal-oral, respiratory

Season: summer, fall

Prodrome: fever, malaise

Young children manifest exanthem, older may manifest more CNS changes

Diagnosis: viral cell culture from multiple sites (stool, urine, throat, nose, CSF) - serology not helpful

## Hand Foot and Mouth Disease

Coxsackie A16+, B2+, Enterovirus 71

< 50% have fever, malaise

90% have dysphagia (erosions in mouth)

66% have vesiculopustules on hands, feet, buttocks

Morphology: (oval) grayish vesicles/pustules on an erythematous base

Location: concentrated on hand, feet, mouth, but extremities as well

Incubation: 3-5d, lesions resolve within 2 weeks

Treatment: none required

*Atypical Hand Foot and Mouth Disease – Coxsackie A6*

## Rashes that may look infectious \*\*\*\*look alike\*\*\*\*\*

Urticaria (hives)

- Transient swellings due to plasma leakage
  - Superficial dermal = wheals (pink, pruritic)
  - Deep dermal and subcutaneous = angioedema (pale, painful)
- Hallmark = individual lesions come and go rapidly (usually within 24 hours)
- PRURITUS!

Urticaria Multiforme (acute annular erythema)

- Urticaria: Itchy but Not-fixed
- Respond to antihistamines
- Targetoid / dusky
- Angioedema present
- Feet, hands, face

Erythema Multiforme

Drug eruptions

## Back to Viral Skin Diseases

### **Herpes Simplex Virus (HSV)**

HSV Complications (eczema herpeticum, erythema multiforme)

**Varicella-Zoster Virus**

Varicella-Zoster Virus

WARTS (Verruca)– **Human Papilloma Virus (HPV)**

- 150 subtypes (determined by DNA hybridization)
- Subtypes show tendency for certain **morphology** and body **sites**
- Inoculation - weeks to years, **autoinoculation** is common
- Spread is by direct contact, especially in small abrasions/cracks in the skin
- Verruca ARE common
- No cure – but often self-limited; Especially in kids; Treatment is not necessary
- Keep covered if on exposed body parts
- Treatments
  - Destructive – chemical, liquid nitrogen, burning, laser
  - Attempts at Immune modulation – Candida protein injections, imiquimod, sinecatechins, DCP
- **Some HPV types are oncogenic (16,18,31,33,34) >>>>>SCCa**

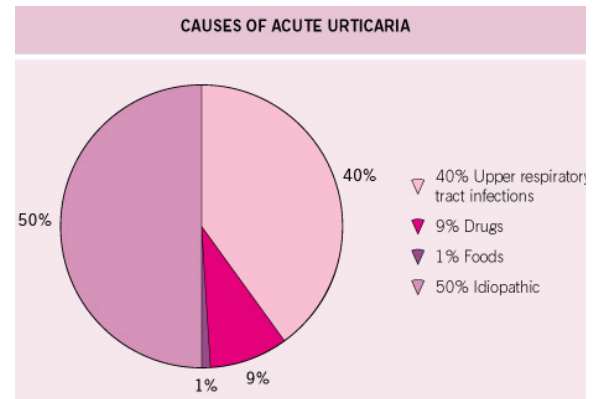


Table 21.1 Differences between erythema multiforme and urticaria.

DIFFERENCES BETWEEN ERYTHEMA MULTIFORME AND URTICARIA	
Urticaria	Erythema multiforme
Central zone is normal skin	Central zone is damaged skin (dusky, bullous or crusted)
Lesions are transient, lasting several hours New lesions appear daily Associated with swelling of hands and feet (angioedema)	Lesions 'fixed' for at least 7 days All lesions appear within first 72 hours No edema

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## HPV Vaccine

- ~ 20 million currently infected w/ genital HPV in the U.S.
  - 40 HPV types that infect human mucosal surfaces
- Most infections asymptomatic and transient
- Nonavalent (Gardasil 9) approved in F ages 9 - 26 M ages 9 – 15
- for prevention of cervical, vulvar, vaginal and anal CA by types 16, 18, 31, 33, 45, 52 and 58, and prev of genital warts caused by types 6 or 11.
- These vaccines have no therapeutic effect on HPV-related disease, so they will not treat existing diseases or conditions caused by HPV!
- The vaccines are made from non-infectious HPV virus-like particles (VLPs) and do not contain thimerosal or mercury as a preservative.

## Molluscum Contagiosum

- self-limited cutaneous infection with DNA poxvirus
- umbilicated, dome-shaped, flesh-colored papules (“water warts”)
- face, trunk and extremities in children (genitalia in adults)
- transmission via skin-skin contact or fomites
- peak age 2 yr, but also seen frequently in Adolescents; athletes
- Self-limited, treatment is optional; should be innocuous; Most pediatric dermatologists do not treat
- But....TREAT the ATOPIC DERMATITIS!

## On to some Bacterial Skin Diseases

### Impetigo

- Honey-colored crusts overlying erosions
- Bullae (more often, circular erosions with collarette )
- Face, intertriginous skin
- Mixed *Strep pyogenes* and *Staph aureus*
- Bullous = only: *S. aureus*, group II phage type 71, which produces a toxin
- Treatment: *po* antibiotics vs. *Staph* or *topical* mupirocin or retapamulin (TID vs BID)

### Bullous Impetigo

- *S aureus* phage group II (Strain types 71 & 55) produce Exfoliative Toxins A and B
- Often in Neonates
- Start as small vesicles that can rapidly enlarge to flaccid bullae; Usually no erythema
- Usually no systemic sx
- Occas weakness, F, diarrhea
- Untreated, complications: osteomyelitis, septic arthritis, sepsis, pneumonia
- Can tx isolated lesions with topicals only
- Complicated or widespread involvement requires oral  $\beta$ -lactamase resistant antibiotic

## SUPERFICIAL FUNGAL INFECTIONS

### Tinea Versicolor

- hypo OR hyperpigmented OR pink, slightly scaly patches
- upper trunk, neck, proximal upper extremities
- *Malassezia furfur* (normal skin inhabitant) formerly *pityrosporum*
- KOH prep is diagnostic
- selenium sulfide topically, topical imidazoles,
- oral fluconazole

## Dermatophyte Infections

- scaly, erythematous patches with slightly raised border, occasionally with central clearing, may have pustules or “boggy” inflammation
- Locations: head = tinea capitis; body = corporis, groin = cruris; feet = pedis; face = faciei

## \*\*\*\* *a look alike* \*\*\*\* Granuloma Annulare (GA)

- non-scaling, pink-tan dermal papules
- grouped into annular plaques; mimics “ring warts” or “ring worm”
- asymptomatic
- most commonly dorsal hands/feet
- F:M = 2-2.5:1
- several clinical variants
- 50% solitary lesions
- 60% limited to hands & wrists
- 50-75% spontaneous resolution in 2 years
- 40% recurrence

## Infestations / Bites

### Pediculosis Two Species Of Parasitic Lice In Humans

- *Pediculus humanus*
  - *P. humanus capitis* (head lice)
  - *P. humanus humanus* (or *P. humanus corporis*) (body louse)
- *Pthirus pubis* (pubic louse)
- “maddening” itch, pruritic papules, nits on hair or seams of clothing

### Pediculosis Capitis: look postauricular, occipital scalp and neck

- Nits attach to base of hair
- Hair growth indicates duration of infection
- 1. No known immunologic explanation for itch.
- 2. secondary infection due to scratching, poor hygiene.
- 3. Sharing bed more likely to transmit.
- 4. One study showed ↑ communicability by sharing lockers or clothes hooks @ school

### Pediculosis Corporis

- Increased incidence with war, unemployment, homelessness
- Clinical presentation: pyoderma in covered areas
- Bites may be noted: excoriations, ulceration and infection more common
- Diagnosis from exam of garments
- Bathing with soap and water
- Laundering garments with hot water
- Insecticides helpful in wartime, heavy infestation (but not necessary)

### “Crab Lice”

- Limited to areas of short hairs
- Pubic area most common, also eyelashes, beard, occipital scalp, body hair
- Pruritus may be present; nits attach to hairs
- “mobile freckles”

### Scabies *Sarcoptes scabiei*

- barely detectable primary lesions (vesicles and burrows)
  - Papules, pustules, burrows, nodules, occasionally urticarial lesions
- marked secondary eczematization

- Location: Wrists, finger webs, antecubital fossae, axillae, areolae, periumbilical region, lower abdomen, genitals, and buttocks; Infants – face, scalp, FEET
- intense pruritus (especially at night)
- Treatment – many options to kill mites and eggs, but be aware that itching may last > 1 month due to the immunologic reaction to the mite in the skin even if the mites are dead
- Sulfur compounds have been used for centuries; Benzyl benzoate (first used in 1931); Crotamiton (used since the late 1970s); Gamma benzene hexachloride or lindane (since 1948); Malathion (used since the mid 1970s) Permethrin (first licensed in 1985 by the US food and drug administration); Oral ivermectin.

### ***Cimex lectularius* – Bed Bugs**

Bug bites: “breakfast, lunch, dinner”

## **Common Chronic Skin Conditions in Children**

**Eczema** – many types but all have:

- Inflammation: Redness; Warmth; Edema; Tenderness
- Epithelial disruption: Serum crusts; Erosions/fissures
- Lichenification: Skin thickening, scale; Due to chronic rubbing

Cause of the clinical findings determines the specific type

- Allergic Contact: Allergens: Poison ivy
- Irritant Contact: Irritants: Chemicals, detergents
- Asteatotic Eczema: Environmental factors: Arid, cold
- Venous stasis
- **Atopic dermatitis = Genetic + environmental**

“Atopic March” = atopic dermatitis > asthma > allergic rhinitis

What’s New in Atopic Dermatitis?

### **Defective Epidermal Barrier**

Gene mutation(s): Filaggrin

Educate!

Address skin barrier dysfunction early; then Address inflammation

### **Keratosis Pilaris (KP)**

- autosomal dominant keratotic dermatitis
- increased frequency in atopic dermatitis & xerosis
- usually starts by age 5
- minute, spiny follicular papules (“gooseflesh” or sandpaper-like) on lateral arms, dorsal/lateral thighs, lateral cheeks
- facial usually resolves spontaneously by late childhood
- extremity KP persists

### **Psoriasis in kids**