By the end of the presentation, participants will be able to:

- Identify common dermatologic issues that may be seen in the school setting
- Identify primary treatments and recommendations for each diagnosis
- Discuss application of each diagnosis in the school setting

I have no disclosures relevant to this presentation.
**NODULE/TUMOR**
Larger than papule
>1 cm
Round
Tumor if >2 cm

**PLAQUE**
Palpable
Solid lesion
Width > Height
>1 cm

**VESICLE**
Fluid-filled lesion
Clear fluid
Hemorrhagic
<1 cm

**BULLA**
Large vesicle
Clear fluid
Hemorrhagic
>1 cm

**PUSTULE**
Pus-filled lesion

**WHEAL**
Elevated
Edematous
Evanescent
Variable Shape
SECONDARY LESIONS

Scale – dry or greasy laminated masses of keratin

Crust – accumulation of dried serum, pus, or blood mixed with epithelial and bacterial debris

EXCORIATION – a linear abrasion involving the epidermis produced mechanically

Fissure – linear cleft through epidermis seen in areas where skin is thickened or inelastic from dryness or inflammation

SECONDARY LESIONS

Erosion – loss of all or part of the epidermis, not extending into the dermis

Ulcer – a rounded or irregularly shaped excavation resulting from loss of epidermis and dermis

SECONDARY LESIONS

Scar – new formation of connective tissue that replaces loss of dermis or subcutis

Atrophy – loss of epidermis and/or dermis. Atrophic epidermis is thin, translucent with loss of normal skin markings.

SECONDARY LESIONS

Lichenification – thickened skin with increased skin markings resulting from chronic rubbing

Maceration – loss of epidermis due to continuous wet environment

Petechiae – pinpoint hemorrhage into the skin

Purpura – a macular or papular hemorrhage into the skin, larger than petechiae

Ecchymosis – a large area of hemorrhage into the skin
**Secondary Lesions**

**Scale** - dry or greasy laminated masses of keratin

**Crust** - accumulation of dried serum, pus, or blood mixed with epithelial and bacterial debris

**Excoriation** - a linear abrasion involving the epidermis produced mechanically

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**Petechiae** - pinpoint hemorrhage into the skin

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**Ecchymosis** - a large area of hemorrhage into the skin
**CASE #1**

7 year old female sent to your office by her teacher for rash on her arm and neck. On exam you note about 30-40, discrete, skin-colored to pink papules on her left neck and left arm. She denies any pain or itching. You note 1 or 2 of the lesions are more red, swollen and look like pustules. She cannot remember when the rash started, but says she has had it “a long time”.

**WHAT IS THE DIAGNOSIS?**

1. Staph Infection
2. Keratosis Pilaris
3. Molluscum Contagiosum
4. Warts
CASE #1 - MOLLUSCUM CONTAGIOSUM
- Caused by a large DNA poxvirus that induces epidermal cell proliferation
- Lesions can appear as flesh-colored to pink to yellow-white discrete papules
- Range in size from 1-6mm, but occasionally can get as large as 15mm (aka “giant” molluscum)
- Usually smooth, firm or dome shaped papules, but can get central umbilication, primarily in older lesions
- Can have incubation period of 2 to 7 weeks
- Child remains contagious if still have active lesions

CASE #1 - MOLLUSCUM CONTAGIOSUM
- Transmitted via direct contact and fomites (aka “water warts”), but humans are the only reservoir
- Autoinoculation is common from scratching
- Look like infected pimples/boils before they go away
- Molluscum dermatitis is common
- If untreated, may take 1-5 years to resolve
- Often heal with small, pitted scars (regardless of treatment or not)

MOLLUSCUM DERMATITIS

MOLLUSCUM DERMATITIS

CASE #1 - MOLLUSCUM CONTAGIOSUM
- Treatment options:
  - Clinical monitoring
  - Curretage
  - Cantharadin
  - Topical Retinoids
  - Cryotherapy
  - Oral Tagamet (cimetidine)

CASE #1 - MOLLUSCUM CONTAGIOSUM
- Application in school setting:
  - Contagious, but child cannot be kept out of school
  - Treatment is optional, therefore parents may opt not to treat and child may have lesions for years
  - Encourage good hand-washing and may request parent to cover lesions if child scratching
  - Pustular molluscum do not require antibiotics and are usually not infected

CASE #1 - MOLLUSCUM CONTAGIOSUM
- Pustular molluscum do not require antibiotics and are usually not infected
Case #2

9 year old male sent to your office from his teacher for rash on his upper chest. You see a small, red, circular, scaly patch on upper chest. On further exam, you notice total of 6 similar looking lesions on trunk varying in size from 2-4 cm and a few with pustules on the border. Child says they are mildly pruritic, but denies any other symptoms. He claims lesions have been present for a “few weeks”, but keeps forgetting to tell mom.

What is the diagnosis?
1. Atopic Dermatitis
2. Tinea Corporis
3. Pityriasis Rosea
4. Psoriasis

Case #2 - Tinea Corporis
- Superficial dermatophyte infection
- Dermatophytes are fungi that use keratin for growth
- Infects keratin-containing body parts:
  - Hair (Tinea Capitis)
  - Skin (Tinea Corporis)
  - Nails (Tinea Unguium)
- Dermatophyte invades only stratum corneum, not remainder of epidermis or dermis
- Exact mechanism of inflammation is not known, but may be related to toxins released by dermatophyte

Case #2 - Tinea Corporis
- May be one or several circular, erythematous patches
- Varying appearance
  - Papular, scaly, annular border with clear center
  - Nummular plaque with pustules
  - Scaly patch with partial clearing and follicular pustules
- Three major reservoirs:
  - Humans
  - Animals
  - Soil
- Can be spread via fomites
TREATMENT AND RECOMMENDATIONS

If hair and nails not involved, treatment with topical antifungal
- May take 2-4 weeks of treatment to clear
- Cream to be applied to affected areas as well as 1 cm surrounding border
- If hair and nails involved, treatment with oral antifungal is required
- Other family members, pets etc must be treated as well to prevent reinfection

APPLICATION IN SCHOOL SETTING:
- Recognition and advisement of parents to seek treatment
- If involvement of hair/scalp: avoid sharing of hats, combs, jackets, hair accessories
- Medication should be given at home
- Topical emollients may be applied at school if itchy (e.g. vaseline kept in fridge)
CASE #3

5 year female sent to your office by teacher for rash on her arm. Upon further inspection she has scaly erythematous and hyperpigmented plaques to antecubital fossae, wrists, and popliteal fossae with numerous open, weeping areas. She is tearful and cannot stop scratching while she is in your office. She said she has “always had” this rash and it doesn’t go away.

CASE #3 - HISTORY & EXAM

WHAT IS THE DIAGNOSIS?

1. Seborrheic Dermatitis
2. Scabies
3. Poison Ivy
4. Atopic Dermatitis

CASE #3 - ATOPIC DERMATITIS

Hereditary disorder characterized by:
- Presence of a dermatitis
- Dry skin
- Onset under age 2 years
- History of flexural dermatitis
- Disruption of the skin surface caused by inflammation of the superficial dermis and epidermis
- Characteristic disruption: excoriations, weeping, crusting and fissures
- Often associated with asthma and hay fever
- Exact pathogenesis is unknown

CASE #3 - ATOPIC DERMATITIS

Distribution varies with age
- Infants: face, scalp, trunk and extensor surfaces of extremities
- Toddlers & School-age: neck, flexural surfaces of extremities and feet
- Preteens, Adolescents & Adults: hands and feet
- Itching is significant feature and is worse in evening...may scratch during sleep without wakening
- Threshold for itching is lowered and itching is more prolonged than in normal child
- Numerous factors may aggravate:
  - Drying of the skin
  - Contact sensitivity
  - Stress & anxiety
  - Secondary infections (bacterial, viral)
Treatments and Recommendations

- Daily bath, 5-10 minutes, lukewarm water
- Dye free, fragrance free products
- Thick emollient (cream or ointment) to all skin twice daily and throughout the day as needed
  - Lotion: weak moisturizer, okay for normal skin only
  - Creams: better than lotions, requires frequent reapplication (Cetaphil, Eucerin, Vanicream, Cerave)
  - Ointments: preferred moisturizer, occlusive, more moisturizing than others (Aquaphor, Vaseline, Vaniply)

Topical steroid to affected areas twice daily when red, rough
- I - Ultra potent
- II-III - Super potent
- IV-V - Moderately potent
- VI-VII - Mildly potent (okay for face/groin)

Oral antihistamines prn itching
- H1 - 1st Generation - Sedating (q6-8 hours)
  - Benadryl (diphenhydramine)
  - Atarax (hydroxyzine)
- H1 - 2nd Generation - Mild to Non-Sedating (once daily)
  - Zyrtec (cetirizine) (mildly sedating)
  - Claritin (loratadine) (non sedating)

Tricks for Itch:

- Topical steroids
  - Only true “itch” relief
- Antihistamines
  - Control “allergic” symptoms not eczema “itch”
- Refrigeration/ Cold spray
- Medications
- Moisturizers
- Spray fan
- Distraction
- Clothing/ damp clothing

Application in school setting

- Itching can affect school performance
- Drowsiness common with antihistamines and sleep deprivation
- Topical steroids should be applied at home only
- Topical emollients may be reapplied frequently at school - keep in fridge to help with itching if possible
- Cool compresses and ice packs may help temporarily alleviate pruritus
- Stress may increase itching: illness, new teacher, tests/finals
Secondary Bacterial Infection (Impetigo)
- Prevention: Bleach Baths
- Common pathogens:
  - Staph aureus (MSSA & MRSA)
  - Streptococcus
- Treatment:
  - Topical antibiotics
    - Mupirocin 2% ointment
    - Gentamicin 0.1% ointment
  - Oral antibiotics
    - Keflex (cephalexin)
    - Clindamycin

Secondary Viral Infection
- Eczema Coxsackium
  - Hand, foot, mouth (Coxsackie virus)
- Eczema Herpeticum
- Herpes Simplex Virus- HSV superimposed on skin
  - HSV-1 or HSV-2
- Risk for development: Skin with poor barrier
- Atopic Dermatitis
- History:
  - Close contact with recent cold sore
  - Rapid spreading of lesions
  - Fever, malaise, irritability, lymphadenopathy

Skin findings:
- Vesicles
- Erosions
- Pustules
- Crust
- PAIN!
**ECZEMA HERPETICUM**
- **Treatment**
  - Viral Culture
  - Bacterial Culture- optional
- Oral acyclovir 40-80 mg/kg/day divided 3-4 x daily
- IV acyclovir 10mg/kg/dose q8h
- Get an ophthalmology consult if near the eyes
- Do not use topical steroids on suspected HSV
- Topical ointment Emollients- Vaseline or Aquaphor
- Consult Dermatology

**HAND, FOOT, AND MOUTH**
- Presents with fever, malaise, poor appetite, ST x 1-2 days
- Vesicles or erosions begin as small red spots in palate, tongue, uvula, gingiva and tonsils. Advance to ulcers, painful.
- Small red spots, some with blisters on palms, soles, hands, feet, or random other locations
- Transmitted through nose and throat secretions, blister fluid, and feces.
- Supportive treatment

**CASE #4**

**CASE #4 - HISTORY & EXAM**
- 12 year old male presents to your office complaining of itchy bumps on hands. On exam, you see several erythematous papules and excoriations to the dorsal hands, wrists and ankles. He says he cannot stop scratching and his teenage brother with whom he shares a room has the same bumps.
WHAT IS THE DIAGNOSIS?
1. Scabies
2. Bed bugs
3. Atopic Dermatitis
4. Contact Dermatitis

CASE #4 - SCABIES
- aka “The Seven Year Itch”
- Eight legged human mite: Sarcoptes scabiei
- Humans are only reservoir
- Transmission via human contact, can be casual contact
- Newly infested person may not experience itching for the first 3 weeks of infestation
- Female mites can live 2-3 days without human contact
- Female mites remain in stratum corneum and move 0.5-5mm per day laying eggs
- Female lives 15-30 days, lays 1-4 eggs per day, which hatch in 3-4 days

TREATMENT AND RECOMMENDATIONS
- Elimite Cream (5% permethrin cream)
  - Apply head to toe, leave on overnight, wash off in morning, repeat in 1 week
  - All family members treat same time; only repeat if also affected
- 5% Sulfur in white petrolatum
  - For use in pregnant women and infants 1-2 mo of age
  - Apply twice daily for 3-5 days
- Ivermectin (oral)
- Topical steroids for itching
- Oral antihistamines for itching
- Topical emollients
- Sterilize bedding/clothing
  - Wash and dry hot or enclose in plastic bag for 3-5 days

APPLICATION IN SCHOOL SETTING
- Recognition and discussion with parents to seek treatment
- Monitor classroom for other children affected
- Itching may interfere with concentration at school
- Itching is worse at night, so child may be sleep deprived and drowsy in class
- Itching may continue for weeks after infestation
- Provide emollients, antihistamines, cool compresses, ice packs prn itching

SCABIES - DIFFERENTIAL DX
- Scabies
- Atopic Dermatitis
Chronic, papular eruption due to hypersensitivity to bug bites

Highly pruritic

High risk of secondary infection due to scratching.

Summer & Late Spring

Treatment

- Insect Repellent
  - Unscented OFF
- Low potency topical steroids
  - Hydrocortisone 2.5% ointment
  - Desonide ointment
- Topical antibiotic
  - Mupirocin 2% ointment
- Antihistamines- aid sleep, relieve itch
  - Benadryl

14 year female presents to your office complaining of pain and burning on her upper lip three days in a row. Nothing is noted on the first two days. When she arrives the third day, she has crusted vesicles with surrounding erythema and shallow erosions on upper lip. No other lesions are present and no-one at home has similar lesions.
Herpes Simplex virus 1 & 2 are complex DNA viruses
Productive viral infection occurs within keratinocyte
Incubation period can be 2-12 days
Child may complain of pain or burning in the days before vesicles appear
HSV-1 primarily associated with oral and labial lesions
HSV-2 primarily associated with genital lesions

Infection classified as primary or recurrent
Primary
- Occur in individuals without circulating antibodies
- Result from direct contact with infected secretions or mucocutaneous lesions
Recurrent
- Occurs in patients who were previously infected (clinically or subclinically)
- Repeated episodes of mucocutaneous lesions at the same site or sites
HSV in nerve ganglia may be reactivated by number of factors:
- Fever
- UV light
- Trauma
- Menses

Classification:
- Gingivostomatitis - lesions involve palate, tongue and gingivae
- Herpes labialis - lesions involve lip
- Herpes keratitis - lesions involve cornea
- Herpes facialis - lesions involve cheek or forehead
- Herpetic whitlow - lesions involve the fingers
- Herpes genitalis - lesions involve genitals
- Eczema herpeticum - disseminated HSV infection in individuals with chronic skin disease
- Herpes gladiatorum - widespread primary inoculation in contact sports players; lesions most commonly on head, neck and arms

Treatment and Recommendations
- Oral acyclovir, famciclovir or valacyclovir are recommended for localized cutaneous HSV
- Oral acyclovir has been used in children safely
- If outbreak is localized to small area, systemic therapy not required
- No medication will prevent recurrence of HSV, but prophylaxis may prevent transfection to others or adjacent skin
- Prophylaxis considered if patient experiencing frequent, severe recurrences
CASE #5 - HERPES SIMPLEX

- Application in school setting
- Recognition and recommendation for treatment to parents
- Infected patients shed the virus and therefore are considered contagious
- Some oral medications may be prescribed 4x/day, so may need to give dose during school
- Herpes Gladiatorium
  - Lesions on head, neck and arms
  - May also have fever, malaise, sore throat, anorexia, headache, weight loss, and regional lymphadenopathy
- Duration of therapy needed before returning to competition is controversial and evidence-based recommendations do not exist
- Discourage sharing of towels/equipment
- Encourage appropriate cleaning of wrestling mats

REFERENCES