Common Skin Diseases and Malignancies in Children and Adolescents

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Goals for today

- Review some common skin diseases and treatments in school age children
- Review the common types of skin cancer and modern treatments
- Interactive quiz to cement what you have [hopefully] learned
Common Skin Diseases in Childhood & Adolescence

• Eczema/Atopic Dermatitis
• Acne Vulgaris
• Sunburns
• Viral Exanthema
• Tinea Infections
• Warts/Molluscum
• Infections
• Infestations
Eczema (Atopic Dermatitis)
Eczema (Atopic Dermatitis) Treatments

- Moderate to high potency topical steroid twice daily for up to 2 weeks at a time, or until flare up resolves
- Steroid wet wraps*
- Topical antibiotics >> systemic antibiotics (same for steroids)
- MOISTURIZE, MOISTURIZE, MOISTURIZE
- Vehicles are important:
- Ointments > Creams > Lotions
- Bathe EVERY DAY (but only once daily)
- 10 min or less, luke warm water, pat to dry, then again...
Acne Vulgaris
Acne Vulgaris

- Comedonal Acne
  - Benzoyl Peroxide (BPO) wash +/- topical retinoids
  - Retinoids: Peeling/redness ~ strength/formulation
  - Some pts may get redness/edema from BPO

- Inflammatory Acne
  - Depending on severity: combo therapy with above + topical antibiotics (clindamycin, dapsone) → systemic antibiotics (doxycycline/minocycline/bactrim*/ampicillin) → systemic retinoid therapy (isotretinoin: “Accutane”)

- Inflammatory Acne

- ISOTRETINOIN
Sunburns
Sunburns

- Visible, short-term effects of UV radiation include sunburns (solar erythema) and “tanning”

- Microscopically, short-term changes: skin swelling/thickening and scaling, increased melanin content, influx of inflammatory cells, immune cell depletion, vasodilation and formation of “sunburn cells” (apoptotic cells)

- At the molecular/cellular level: induction of stress proteins, repair processes, and inflammatory mediators (cytokines)

- Exposed cells undergo either apoptosis (sunburn cells) or cell cycle arrest to undergo repair
### Effects of Ultraviolet Light on the Immune System

**Clinical Observations**

**Suggestive of proinflammatory/immune-stimulating effects**
- Sunburn
- Dermatoheliosis
- Photodermatoses (phototoxic and photoallergic)
- Photoaggravation of inflammatory skin diseases (e.g. psoriasis, atopic dermatitis, pityriasis rubra pilaris)
- Induction of autoimmune connective tissue diseases (e.g. cutaneous lupus erythematosus (LE), flares of systemic LE)
- Efficacy of UV phototherapy for the treatment of skin infections (e.g. lupus vulgaris)

**Suggestive of anti-inflammatory/immunosuppressive effects**
- Activation of recurrent orolabial herpes simplex
- Increased risk of photocarcinogenesis in the setting of immunosuppression (e.g. solid organ transplant recipients)
- Efficacy of UV phototherapy for the treatment of inflammatory skin diseases

**Cellular and molecular events in UV-irradiated skin**

**Mediating proinflammatory/immune-stimulating effects**
- Release of proinflammatory mediators by resident and non-resident skin cells (e.g. serotonin, prostaglandins, IL-1, IL-6, IL-8, TNF-α)
- Induction of antimicrobial peptides (hypothesized to explain why UV-irradiated skin is not prone to bacterial infections)

**Mediating anti-inflammatory/immunosuppressive effects**
- Depletion of Langerhans cells or modulation of their antigen-presenting function
- Release of anti-inflammatory mediators by resident and non-resident skin cells (e.g. IL-10, α-MSH)
- Induction of regulatory T cells (antigen-specific)

<table>
<thead>
<tr>
<th>Skin type</th>
<th>Reactivity to sun</th>
<th>Examples</th>
</tr>
</thead>
<tbody>
<tr>
<td>I</td>
<td>Very sensitive: always burn easily and severely, tan little or not at all</td>
<td>Individuals with fair skin; blond or red hair, blue or brown eyes, and freckles</td>
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<tr>
<td>II</td>
<td>Very sensitive: usually burn easily, tan minimally or lightly</td>
<td>Individuals with fair skin; red, blond, or brown hair; and blue, hazel, or brown eyes</td>
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<tr>
<td>III</td>
<td>Moderately sensitive: burn moderately, tan gradually and uniformly</td>
<td>Average white individuals</td>
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<tr>
<td>IV</td>
<td>Moderately sensitive: burn minimally, tan easily</td>
<td>Individuals with dark brown hair, dark eyes, and white or light brown skin</td>
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<tr>
<td>V</td>
<td>Minimally sensitive: rarely burn, tan well and easily</td>
<td>Brown-skinned (Middle Eastern and Hispanic) individuals</td>
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<tr>
<td>VI</td>
<td>Deeply pigmented: almost never burn, tan profusely</td>
<td>Blacks and others with heavy pigmentation</td>
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</table>
Dealing with Sunburns

- Cool compresses or cool tub baths in colloidal oatmeal (Aveeno), baking soda or corn starch
- Topical formulations with pramoxime or menthol (Sarna or Sarna sensitive lotions → mainly help with pruritus)
- Mild topical steroid formulations, emollient creams/ointments
- Systemic antiinflammatory/analgesics: NSAIDS
- Only if symptoms are severe: oral steroids (prednisone) at dose of 1mg/kg/day tapering after 4-8 days to abort severe reactions
Photodermatoses, Phototoxicity, and Photoallergy

- Immunologically-Mediated
- Polymorphous Light Eruption (PMLE)
- Actinic Prurigo
- Solar Urticaria
- Phototoxicity
  - The result of direct cellular and tissue injury following UVR-induced activation of a substance (medication)
- Photoallergy
  - Delayed-type hypersensitivity response consisting of a sensitization phase and subsequent exposure
<table>
<thead>
<tr>
<th>Common phototoxic agents</th>
<th>Common photoallergic agents</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Antiarrhythmics</td>
<td>Topical agents:</td>
</tr>
<tr>
<td>- Amiodarone</td>
<td>- Sunscreens (e.g., oxybenzone [benzophenone-3])</td>
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<tr>
<td>- Quinidine</td>
<td>- Fragrances</td>
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<tr>
<td>- Triazole antifungals</td>
<td>- 6-Methylcoumarin</td>
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<tr>
<td>- Voriconazole</td>
<td>- Musk ambrette</td>
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<tr>
<td>- Diuretics</td>
<td>- Sandalwood oil</td>
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<tr>
<td>- Furosemide</td>
<td>- Antimicrobial agents</td>
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<tr>
<td>- Thiazides</td>
<td>- Bithionol</td>
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<tr>
<td>- Nonsteroidal anti-inflammatory drugs</td>
<td>- Chlorhexidine</td>
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<tr>
<td>- Nabumetone</td>
<td>- Fenticon</td>
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<tr>
<td>- Naproxen</td>
<td>- Hexachlorophene</td>
</tr>
<tr>
<td>- Piroxicam</td>
<td>- Nonsteroidal anti-inflammatory drugs</td>
</tr>
<tr>
<td>- Phenothiazines</td>
<td>- Diclofenac</td>
</tr>
<tr>
<td>- Chlorpromazine</td>
<td>- Ketoprofen</td>
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<tr>
<td>- Prochlorperazine</td>
<td>- Phenothiazines</td>
</tr>
<tr>
<td>- Psoralens</td>
<td>- Chlorpromazine</td>
</tr>
<tr>
<td>- 5-Methoxypsoralen</td>
<td>- Promethazine</td>
</tr>
<tr>
<td>- 8-Methoxypsoralen</td>
<td>Systemic agents:</td>
</tr>
<tr>
<td>- 4,5',8-Trimethylpsoralen</td>
<td>- Antiarrhythmics</td>
</tr>
<tr>
<td>- Quinolones</td>
<td>- Quinidine</td>
</tr>
<tr>
<td>- Ciprofloxacin</td>
<td>- Antimalarials</td>
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<tr>
<td>- Lomefloxacin</td>
<td>- Quinine</td>
</tr>
<tr>
<td>- Nalidixic acid</td>
<td>- Antifungals</td>
</tr>
<tr>
<td>- Sparfloxacin</td>
<td>- Griseofulvin</td>
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<tr>
<td>- St. John’s wort</td>
<td>- Antimicrobials</td>
</tr>
<tr>
<td>- Hypericin</td>
<td>- Quinolones (e.g., enoxacin, lomefloxacin)</td>
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<tr>
<td>- Sulfonamides</td>
<td>- Sulfonamides</td>
</tr>
<tr>
<td>- Sulfonylureas</td>
<td>- Nonsteroidal anti-inflammatory drugs</td>
</tr>
<tr>
<td>- Tar (topical)</td>
<td>- Ketoprofen</td>
</tr>
<tr>
<td>- Tetracyclines</td>
<td>- Piroxicam*</td>
</tr>
<tr>
<td>- Doxycycline</td>
<td></td>
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<td>- Demeclocycline</td>
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Photodermatoses

PMLE

Actinic Prurigo
Viral Management

- Pityriasis Rosea
  - Topical steroids, phototherapy, erythromycin 250mg QID x 10 days, acyclovir 800mg 5x/day x 10days

- Hand Foot and Mouth
  - Antipyretics, analgesics, hydration
Tinea Infections

- Tinea corporis (ringworm)

- Tinea capitis
Tinea Infections

- Tinea (pityriasis) versicolor
Tinea Infection Treatment

- Tinea corporis & versicolor
- Topical antifungals (creams, shampoos)
- Systemic antifungals if severe or resistant:
  - Fluconazole, Itraconazole, Terbinafine, Griseofulvin
- Tinea Capitis
  - Systemic antifungals: Griseofulvin, terbinafine
Warts & Molluscum

- HPV (warts)

- Pox (Molluscum)
Wart & Molluscum Treatment

- **Warts**
  - Nothing is great, but a lot of mediocre treatments
  - Cryotherapy, sal acid, lactic acid, cantharidin, chemical peels, duct tape, lasers, green tea catechins, immunotherapy, curettage, zinc

- **Molluscum**
  - First-line: do nothing!
  - If you must: topical retinoids +/- topical steroid, cantharidin, curettage
Other Infections

- Impetigo
  - Treat with topical antibiotic (mupirocin) or oral antibiotic after wound culture

- Herpes Simplex
  - Treat with oral antiviral (acyclovir or valacyclovir)
Infestation

- Pediculosis
  - Spinosad 0.9% cream rinse: one application to dry hair for 10 min, repeat 1 week later.
  - Malathion lotion/gel 0.5%: apply to dry hair for 8-12 hrs, then repeat 1 week later
  - Ivermectin 0.5% lotion: one application to dry hair for 10 min, repeat 1 week later.
  - Ivermectin 3mg tablet: 200mcg/kg once, then repeat 1 week later

- Scabies
  - Permethrin 5% cream: apply from head to toes leave on for 8 hrs then rinse off. Repeat 1 week later
Infestations

- Bedbugs
- CALL THE EXTERMINATOR!
Dealing with Psycho-Social Concerns in Skin Disease

- May require some detective work
- Make sure the student/patient's emotional well-being is not just a symptom of a bigger underlying issue
- Strongly recommend referral to mental health professional if this is suspected, particularly with regard to depression or suicidal ideation
- Encourage the parents to be vigilant and consistent participants in their child's care
- An involved parent is a caring parent, which will help with treatment adherence and more efficacious control of the underlying skin condition
Dealing with Psycho-Social Concerns in Skin Disease

- Strive to make the student feel comfortable to share their concerns with both you as the provider.
- Encourage a frequent, open dialogue between parents and student.
- Discussed with parents and student that MOST skin conditions due improve with time, AND with proper and CONSISTENT treatment.
- For acne patients, if the patient or their parent own a cosmetic/magnifying mirror, THROW IT AWAY!
What is skin cancer?

Skin cancer, like other forms of cancer, is when cells of the body begin to grow in an uncontrolled fashion.

When cancer cells grow out of control they begin to compromise the function of normal cells of the body, and this is what causes harm.
What causes skin cancer?

- The vast majority of skin cancer is caused by UV radiation from the sun.
- Sunlight impacts skin cells and damages the DNA.
What are the different types of skin cancer?

- Basal Cell Carcinoma (BCC)
- Squamous Cell Carcinoma (SCC)
- Melanoma

Rare forms of skin cancer

- Merkel Cell Carcinoma
- Atypical Fibroxanthoma
- Dermatofibrosarcoma Protuberans
- Adnexal Carcinomas
- Soft tissue sarcomas
Skin cancer statistics

- Skin cancer is the most common cancer in the United States
- More than 8,500 people in the US are diagnosed with skin cancer every day
- The majority of diagnosed skin cancers are non-melanoma skin cancer, which are basal cell and squamous cell carcinoma
- Non-melanoma skin cancers have a much better prognosis than melanoma, but still require prompt treatment to prevent spread
Skin cancer statistics

- Melanoma rates have doubled in the United States in the last 30 years
- One American dies of melanoma every hour
- The 5-year survival from melanoma detected and treated before it reaches the lymph nodes is 98%
- 5-year survival decreases to 40-60% if lymph nodes are involved
Basal cell carcinoma

- Basal Cell Carcinoma is the most common type of skin cancer (75-80%)
- Basal cell carcinoma is the most common type of cancer in the USA
- Like all forms of skin cancer, it is caused by UV light from the sun
- It is most commonly found on sun exposed surfaces of the body (face, ears, scalp, neck, shoulders)
- Depending on size and duration, can be treated with topical chemo, dessication and curettage, or surgery
Examples of Basal Cell Carcinoma

Shiny pink growth

Non-healing sore

Shiny pink growth that bleeds

Can be dark color = pigmented BCC
Squamous cell carcinoma

- Squamous Cell Carcinoma is the 2\textsuperscript{nd} most common type of skin cancer (25-30\%).
- Just like basal cell carcinoma, it is caused by UV damage from the sun.
- In general, SCC behaves more aggressively than BCC, with higher likelihood of spread.
- It is most commonly found on sun exposed surfaces of the body (face, ears, scalp, neck, arms, hands).
- Locations on the lip, ear and temple are higher risk for metastasis.
- Treated with surgery, intralesional or topical chemo.
Examples of Squamous Cell Carcinoma

- Large growth on cheek
- Scaly sore on the shin
- Crusty growth that bleeds
- Crusty sore of the lower lip
Melanoma

Melanoma is the least common type of skin cancer in adults, but the MOST COMMON IN ADOLESCENTS.

Accounts for 7% of all cancers in children 15 to 19 yrs

Melanoma accounts for <3% of all skin cancer, but 75% of skin cancer deaths

Early stage melanoma is usually curable with surgical excision (removal)

Much progress has been made since 2012 for therapies for advanced disease (immunotherapy)
More on melanoma

- Melanoma can appear suddenly without warning, but it can also develop from or near an existing mole.
- Melanoma can occur anywhere on the body, but is most common in sun-exposed areas.
- It frequently travels to lymph nodes and internal organs, making early detection and treatment essential.
- As in adults, kids with lighter skin/eyes, blonde/red hair, many freckles, many sunburns, or high # of or abnormal moles are at higher risk.
Examples of Melanoma

Irregular borders and black/brown/pink/white color

Asymmetry and color changes

Melanoma that started in a pre-existing mole

Large irregular brown growth
ABCDEs of Melanoma

A = Asymmetry
One half is unlike the other half.

B = Border
An irregular, scalloped or poorly defined border.

C = Color
Is varied from one area to another; has shades of tan, brown or black, or is sometimes white, red, or blue.

D = Diameter
Melanomas are usually greater than 6mm (the size of a pencil eraser) when diagnosed, but they can be smaller.

E = Evolving
A mole or skin lesion that looks different from the rest or is changing in size, shape or color.
Skin cancer is dangerous

Sun protection prevents skin cancer and saves lives
Sun Protection Tips

• Seek shade during peak daylight hours, 10am-4pm
• Wear sun-protective clothing and apply sunscreen daily
• Unfortunately, there is no such thing as a “healthy tan”
• Tanning outside and in tanning beds has been shown to dramatically increase risk for melanoma
More Sun Protection Tips

• Use a broad spectrum (UVA and UVB) sunscreen with SPF30+ every day, and reapply every 2 hours if planning to be outside all day, or after swimming

• Use extra caution near sun, snow, or sand

• 1 oz (30g), enough to fill a shot glass, is the amount of sunscreen needed for 1 application to entire body

• Don’t forget your lips, find a lip balm with SPF30+
The Vitamin D Conundrum

- Sunscreens that are effective at blocking UVB photons would therefore be expected to decrease levels of vitamin D, and studies have shown that this does in fact occur.

- However, the majority of human studies that measured serum vitamin D levels in sunscreen users (as compared to non-users) found that the levels, though reduced, were within the normal range.

- Scientists cannot agree on what constitutes the “normal” range for serum 25-OH vitamin D levels and similarly cannot agree on the minimum suggested daily intake for the vitamin.

- Sufficient, active vitamin D levels can be maintained with proper diet and supplementation as necessary.
Summary

- Skin cancer is the most common cancer in the United States.
- Melanoma is the most dangerous form of skin cancer.
- Early detection and treatment of skin cancer saves lives.
- You can lower your risk for skin cancer by using regular sun protection and avoiding tanning beds.
Don’t take any chances with your skin!

If a spot doesn’t seem right, come see your friendly neighborhood dermatologist to have it checked.
And when you have time... watch this video

• Dear 16 year old me
• https://www.youtube.com/watch?v=_4jgUcxMezM