Basic Pediatric Dermatology
Leigh Ann Pansch, MSN, FNP-BC
Dermatologists of Southwest Ohio

What is Pediatric Dermatology?
- Specializing in diagnosis and treatment of infants, children, and adolescents up to age 18
- Skin needs are unique and often different (based upon current evidence and science) for children and adults
- Additional training and/or certifications apply for dermatology as well as pediatric dermatology

Objectives
After this lesson the nurse will:
- Summarize basic pediatric dermatologic conditions including pigmented lesions, vascular lesions, seborrheic dermatitis, atopic dermatitis and eczema, keratosis pilaris, pityriasis alba, psoriasis, irritant and contact dermatitis
- Compare and contrast ongoing plans of care for basic pediatric dermatology conditions
- Design a plan to educate families and students about basic pediatric dermatologic conditions
Pigmented Lesions

- Benign growths composed of “nests” of melanocytes
- More common in light/fair skin (Skin Types 1-3)
- First appear in childhood as flat (brown) macules, evolve into adulthood (dome shaped, fleshy papules/nodules); can regress
- Need ongoing monitoring/biopsy if atypical (suspect cancer)

Pigmented Lesions: RISK Factors

Melanoma in childhood extremely rare
- Developing one bad sunburn as a child or teen doubles your risk of melanoma. Five sunburns by any age also doubles your risk of melanoma.
- A tan ALWAYS follows damage to the skin
- Light Skin, Light Hair, Light-colored Eyes
- Many Melanocytic Nevi

Pigmented Lesions (continued)

Subtypes:
- Congenital/Acquired Melanocytic Nevi
- Spitz Nevi
- Blue Nevi
Pigmented Lesions (continued)

- **“Congenital”**—Present at birth or shortly after; often larger than typical melanocytic nevi; some with hair (hypertrichosis); more complex network is common
- **“Acquired”**—Develop after the first year of life
- Need monitoring (onset, size, changing, body mapping?); biopsy if suspect cancer

<table>
<thead>
<tr>
<th>Congenital/Acquired</th>
<th>Small-sized (&lt; 1 cm)/Intermediate-Sized (1-15 cm)/Giant-Sized (&gt;15 cm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pattern</td>
<td>(Network regular or atypical)</td>
</tr>
</tbody>
</table>

The ABCDE’s of Dermatology...

- **Asymmetry**
- **Border**
- **Color**
- **Diameter**
- **Evolving**

Dysplastic Nevi

- Nevi with irregular outline, variable pigmentation, indistinct borders, often > 6mm (pencil eraser)
- Multiple dysplastic nevi = increased risk for Malignant Melanoma
- Need careful monitoring; biopsy if change in size/color
Ephelides (Freckles)
- Small brown macules on sun-exposed skin; more common in skin types 1-3
- Darken in response to the sun (and hormones) and fade with UV abstinence
- No risk of melanoma if diagnosis certain

Solar Lentigines (“Liver Spots”)
- Occur in response to sunlight and persist even in absence of sunlight
- Vary in color from tan to dark brown
- Can be up to 1 cm in diameter
- Irregular shape common with “moth-eaten” borders
- Dorsal hands and face common (in the US, the left side)

Spitz Nevus/Reed’s Nevus
Spitz Nevi
- Smooth-surfaced, firm, round, brown-pink papule
- Development in childhood is typical
- Generally thought to be benign; but histologically can be confused with malignant melanoma

Reed’s Nevi
- Dark brown-black; flat with dermatoscopic “Starburst” pattern
- Clinically and histologically easily confused with malignant melanoma
Protect Yourself!

- Avoid Sunburns!
- Just one blistering sunburn when you’re a child or teenager more than doubles your risk of developing melanoma later in life.
- Use sun protection every day!

Vascular Lesions

- Common
- Presentation unique to the patient
- Classification System (developed by the International Society for the Study of Vascular Anomalies- ISSVA)

Vascular Lesions (continued)

**Vascular Tumors**
- Hemangioma of Infancy
- Tufted Angioma
- Kaposiform Hemangioendothelioma
- Pyogenic Granuloma
- Hemangioendothelioma

**Vascular Malformations**
- Capillary malformation (CM)
- Port Wine Stain
- Salmon Patch
- Venous Malformation (VM)
- Lymphatic Malformation (LM)
- Arterial Malformation (AM)
- Arteriovenous Malformation (AVM)
- Complex/Combined

ISSVA, 2007
Infantile Hemangioma

- Most common benign soft tissue tumor of childhood (head and neck)
- Occurs in 1-2% of newborns; at 1 year of age 10-12% of infants with white skin have one.
- Female: Male; 3:1 / More common in premature infants / All races; less common in those of African or Asian descent
- Superficial, Deep, Mixed
- Period of Growth (Proliferative Phase) with the majority of growth occurring during the first 5 months of age; Period of Stability (Plateau Phase); Period of Spontaneous Regression (Involution Phase) marked by color change from bright red to dull

Infantile Hemangiomas (continued)

Treatment decisions incorporate:
- Size
- Location
- Age of the patient
- Growth phase
- Associated findings (PHACES)
- Perceived potential for psychological distress for the parents and patient (i.e. facial involvement)

Hemangiomas:
When to evaluate, treat, refer

- Life threatening
  - Large Facial
  - "Beard" distribution
  - Ulcerating
  - Lumbosacral
  - Multiple

- Function threatening
  - Periocular
  - Nasal tip
  - Ear (extensive)
  - Genitalia, perineum
  - Airway
  - Hepatic
Hemangiomas: Treatment Options

- Serial photography
  - Documentation of progression/involution
  - Validation of subtle changes
  - Referral to support groups and informational resources
    - Hemangioma Investigator Group (www.hemangiomaeducation.org)
    - Vascular Birthmarks Foundation (www.birthmark.org)
    - National Organization of Vascular Anomalies (www.novanews.org)

- Topical Steroids (oral form used frequently as a topical vs. Class 1 under occlusion)
  - Oral corticosteroids
  - Intra-Lesional Steroids
  - Oral Propranolol/Topical Propranolol
  - Interferon vs. Vincristine (life-threatening lesions)
  - Laser (pulsed dye)
  - Surgery

Pyogenic Granuloma (PG)

- Common, acquired lesion in infants and children (non-infectious)
- Bright red to red-brown, raised, slightly pedunculated papulo-nodule; bleeds frequently; rapidly-growing
- Etiology unknown
- Treatment with shave excision followed by electrodesiccation (curettage vs. electrocautery) for hemostasis and to prevent recurrence
Salmon Patch (nevus simplex)
- Most common vascular lesion of infancy (30-40% of all newborns)
- Flat, dull-pink, macular lesion
- No treatment necessary (95% fade within first 1-2 years of life)
- Educate families regarding common "reappearance" or accentuation during episodes of crying, breath-holding, straining with defecation, or physical exertion

Port-Wine Stain (nevus flammeus)
- Congenital capillary malformation (face most common)
- Isolated vs. associated with syndrome
- Macular (non-palpable) stains with a pink-dark red color; can darken/raise/thicken progressively over time; can develop superficial vascular "blebs" similar to pyogenic granuloma
- Early PWS may be indistinguishable from an hemangioma

Cosmetic Impact
- Consider cosmetics such as Covermark or Dermablend
- Pulsed Dye Laser Therapy (multiple treatments, weeks apart, can be painful, costly-not always 100% covered by insurance)

Syndrome Association
- Over 13 syndromes identified within the literature with association to PWS
- Location of the PWS on the body surface guides request for diagnostic imaging for assessment of syndromic association
Venous Malformation (VM)

- Common slow-flow type VM present at birth (may not be noted until later in life)
- Symmetric and proportionate with growth of the child (can rapidly enlarge initially present with trauma)
- Blue to purple Nodule with prominent surrounding veins
- Diagnosis confirmed with CT, MR imaging studies, or Doppler ultrasonography
- Complications include thromboses, disfigurement, psychosocial distress, pain, decreased ROM, functional compromise (due to location of the lesion)

VM Treatment

- Compression (elastic stockings)
- Surgery
- Physical Therapy
- Sclerotherapy
- Some combination of the above

Arteriovenous Malformation (AV)

- Rare, consist of both arterial and venous components with shunting (Diagnosis with Doppler, CT, MR, arteriography)
- Vary in appearance (Murmur?)
  - Flat Red
  - Thin Red
  - Large Pulsating Nodules
- Growth may be aggressive, cause functional compromise and/or cosmetic deformity
- Treatment difficult: Surgery, embolization, amputation
Seborrheic Dermatitis

- Very common (5-10% of general population), Fall/Winter Prevalence; Can mimic Atopic Dermatitis
- Diffuse, white scale; greasy, scaly, erythematous dermatitis (Scalp, eyelids, eyebrows, face, neck, trunk, body)
- Consider dermatophyte culture
- Treatment with liberal use of emollients, keratolytic shampoos (use of a soft brush toothbrush?), zinc pyrithione, coal tar, low-potency topical steroids
- May signal “sensitive skin”; Likely to recur/progress in time

Atopic Dermatitis (AD) and Eczema

- AD and Eczema often used interchangeably but AD implies associated link to Asthma and Allergies (≥ age 27)
- Common (affects 20% of children)
- Failure of the Skin to be a Barrier; may be linked to functional polymorphism or mutations in filaggrin genes (responsible for integrity of the outer epidermis)

- Begin in infancy
- Red, Disrupted, “Sensitive Skin” (Reactive to heat, harsh chemicals, frictional rubbing from clothing/scratching)
- Flexural Distribution
- NO LINK TO FOOD ALLERGY; Environmental allergens? INFECTION RISK
Atopic Dermatitis (AD) and Eczema

- Chronic, Mild Inflammation
- Deep Scratching; Pain; Bleeding
- Associated Hyper/Hypopigmentation
- Exacerbated by:
  - Xerosis
  - Sweat/Heat
  - Harsh Substances
  - Stress/Anxiety

Treatment MUST BE CONSISTENT; No “Cure”
- Basis is Good Skin Care
  - Gentle, non-soap cleansers
  - Avoid prolonged (>10 minutes) showers/baths and excessive hot water
  - Liberal application of emollients (ceramides?)
  - Daily Bathing/Showering

- Oral antihistamines (Which is best?)
- Topical Steroids (for rashed skin only!); Calcineurin Inhibitors
- Topical antibiotics to open areas
- Wet wraps (Tubifast?)
- Bleach Baths
- Referral to Allergy/Behavioral Medicine when necessary
- Define expectations early

AVOID ORAL STEROIDS
AVOID ORAL ANTIBIOTICS
**Bleach Bath and Soak Recipe**

**Chlorine Bleach Soaks**

- 2 teaspoons bleach in 1 gallon of water *
- **Tub Bath**
  - ¼ cup bleach in a standard sized tub that is half full with water. Amount may be adjusted based on water level in tub. *
  - * May use less bleach, but not more
  - * Always rinse skin with clear water

---

**Keratosis Pilaris (KP)**

- Scaling, Follicular Accentuation +/- erythema
- Exacerbated by Xerosis
- Onset in infancy; progresses into adulthood; No Cure
- Basis for treatment is good skin hygiene; Emollients vs. Keratolytics

---

**Pityriasis Alba (PA)**

- Hypopigmentation of the Skin Following Inflammatory Process (Xerosis)
- Generalized or Diffuse
- Cheeks most often affected
- Basis for treatment is good skin care; Emollients; Sunscreen!
Psoriasis Vulgaris

- Auto-immune inflammatory skin (Total Body?) disease
- Genetic links to mutations/deletions of late cornified envelope (LCE) genes LCE 3B and LCE 3C; many other susceptibility genes currently under investigation
- Familial history common

Psoriasis Vulgaris (continued)

- Clinical diagnosis:
  - Presence of thick, (silvery) scales on an erythematous base
  - Characteristic Distribution (Scalp, Extensor surfaces, Sacrum)
  - Nail involvement
  - Isomorphic (Koebner) phenomenon

Psoriasis Vulgaris (continued)

- Genital involvement in 15% children with psoriasis
- 10% all psoriasis starts before puberty
- Geographic tongue in 10%

Variants Include:
1. Palmoplantar
2. Guttate (may follow GAS)
3. Pustular
4. Inverse
5. Erythrodermic (URGEN1?)
Psoriasis Vulgaris (continued)

Treatment contingent on location and severity of disease

- Topical steroids (moderate-high potency)
- Anthralin (tricyclic hydrocarbon)
- Vitamin D3 (maintenance)
- Retinoids (potent)
- Emollients (Good Skin Care)

- Methotrexate (SQ, oral; bone marrow/hepatic toxicity)
- Cyclosporine (renal toxicity/HTN)
- Acitretin (only males/post-menopausal women)
- Phototherapy (UVB, PUVA)
- Biologic Agents (alefacept, efalizumab, etanercept, infliximab, adalimumab)

Must understand the chronicity/long-standing inflammatory effects

- Avoid smoking
- Avoid alcohol
- Maintain healthy lifestyle (weight management)
- Teach coping skills for stress/anxiety
- Evaluate for oligoarticular disease (joint pain/arthralgias) common in adults

Acne Vulgaris (continued)

Multiple Causes:

- Androgenic stimulation
  - Increased sebum production
- Hyper-keratinization
  - Microcomedo formation
- Presence of Propionibacterium acnes
- Bacterial infection
- Inflammation

- Methotrexate (SQ, oral; bone marrow/hepatic toxicity)
- Cyclosporine (renal toxicity/HTN)
- Acitretin (only males/post-menopausal women)
- Phototherapy (UVB, PUVA)
- Biologic Agents (alefacept, efalizumab, etanercept, infliximab, adalimumab)
Acne Vulgaris (continued)

Symptoms:
- Microcomedones enlarge (early puberty)
  - Open comedone - “blackhead”
  - Closed comedone - “white head”
- Inflammation: (often later in puberty)
  - Papule, pustule, cyst, nodule
- Post-inflammatory hyperpigmentation
- Irreversible scars: pits or hypopigmented patches

Acne Vulgaris (continued)

Goals of Medical Therapy:
- Comedolytic/keratolytic
- Anti-androgenic
- Antibacterial
- Anti-inflammatory

Acne Vulgaris (continued)

Basic Skin Hygiene:
- Gentle non-soap cleanser twice daily
- Avoid astringents, harsh exfoliates, manipulation (increases risk of scarring)
- Avoid irritants/occlusives: friction, sweating, cosmetics, ointments
- *Sun protection
Acne Vulgaris (continued)

Topical treatments:
- Benzoyl Peroxide (5-10%)
- Salicylic Acid
- Topical Antibiotics (Sulfacetamide, Clindamycin, Erythromycin)
- Retinoids
- Combination Products (Duac, BenzaClin)

Oral: (Should Not be Dispensed as monotherapy!)
- Doxycycline
- Erthromycin
- Minocycline
- Tetracycline
- Oral contraceptives
- Isotretinoin

New evidence suggests side-effects of long-term (>6 months) antibiotics too risky!

Acne Vulgaris (continued)

Classification Helpful in determining treatment:
- Comedonal Acne
- Inflammatory Acne
  - Mild
  - Moderate
  - Severe
- Nodulocystic Acne

Treatment ALWAYS includes good skin hygiene
Address psychosocial well-being
Avoid permanent scarring
Address expectations early

Acne Vulgaris (continued)

Comedonal Acne
- Skin Hygiene (Sweat?)
- +/- Benzoyl Peroxide (Small molecule; Irritation/ Tightness common first two weeks of use)
- Retinoid (Sunscreen!); Irritation common first two weeks; Takes 4-6 months to reach peak performance
Topical Retinoids
Mainstay of acne treatment!
- Topical vitamin A (cream, gel, lotion)
- Normalize keratinization process within follicle to reduce obstruction; both comedolytic and anticomedogenic; Reduce lifecycle of keratinocyte
- Photosensitive (apply at night)
  ▶ Cause photosensitivity (Wear Sunscreen!)
  ▶ Start low, Go slow!
  ▶ Irritation (scaling, erythema) common first two weeks of treatment; consider adding a non-comedogenic moisturizer before/after application
  ▶ Peak effectiveness reached between 4-6 months

Acne Vulgaris (continued)
- Inflammatory Acne-Mild
  ▪ Skin Hygiene
  ▪ Benzoyl Peroxide
  ▪ Retinoid
  ▪ +/- Azealic Acid
  ▪ +/- Topical Antibiotic
  Consider Combination products to improve compliance!
- Inflammatory Acne-Moderate
  ▪ Skin Hygiene
  ▪ Benzoyl Peroxide and/or Topical Antibiotic
  ▪ Retinoid
  ▪ +/- Azealic Acid
  ▪ +/- Oral Contraceptives
  ▪ +/- Oral Antibiotics

Acne Vulgaris (continued)
- Inflammatory Acne-Severe
  ▪ Skin Hygiene
  ▪ Benzoyl Peroxide and/or Topical Antibiotic
  ▪ Retinoid
  ▪ +/- Oral Antibiotic
  ▪ +/- Oral Contraceptives
  Consider Oral Isotretinoin
- Nodulocystic Acne
  ▪ Isotretinoin
  ▪ +/- Oral contraceptives
Oral Isotretinoin

- Derivative of Vitamin A (Lipid Soluble)
- “Cure,” “Sledge Hammer,” “Miracle”
- Permanently shrinks oil glands; inhibits sebum synthesis and *p. acnes* concentration, anti-inflammatory effects; keratinocyte turnover rapidly increased
- Side effects while on therapy common and include: dry skin, dry eyes, cheilitis, photosensitivity, headache, elevated Tg/lipids, rhabdomyolysis among others
- **Potent teratogen** (Pregnancy Category X); Patients receiving this medication cannot share medications/donate blood

Oral Isotretinoin (Continued)

- iPLEDGE (www.ipledgeprogram.com) created by the FDA in 2006; pregnancy prevention; control of education for prescribers, monitoring controls for dispensers, and adherence to patients receiving the medication
- Usually started at 0.5 mg/kg/day; gradually increased to about 1 mg/kg/day; 16-24 weeks; Cumulative Dose Goal of 120-150 mg/kg (to prevent relapse)
- Highly publicized potential links to depression, suicidal ideation, and inflammatory bowel diseases (assess patient/family history prior to initiating therapy)
- Overall (assuming pregnancy is avoided) risks low

Allergic Contact Dermatitis
Allergic Contact Dermatitis (ACD)

- T-lymphocyte mediated immunity dependent upon allergens that can penetrate intact skin
- By age 5 years, 10-20% children sensitized to a contact antigen
- Presents with blisters and erythema; pattern dependent on site of contact
- Body Location of “ rash” heralds causative agent
- Feet: shoe dermatitis (leather, rubber, etc.)
- Subumbilical and/or earlobes: Nickel allergy (snaps, buttons, costume jewelry)
- Eyelids and/or face: cosmetic allergy (likely an ingredient of)
- Perioral face-toothpaste or lip balm (likely an ingredient of)

Body Location of “ rash” heralds causative agent

Feet: shoe dermatitis (leather, rubber, etc.)

Subumbilical and/or earlobes: Nickel allergy (snaps, buttons, costume jewelry)

Eyelids and/or face: cosmetic allergy (likely an ingredient of)

Perioral face-toothpaste or lip balm (likely an ingredient of)

- Treatment
  - Moderate-potency topical steroids; twice daily; under occlusion?
  - Consider patch testing
  - Allergen avoidance critical!
Irritant Dermatitis

- Common sources:
  - Harsh soaps
  - Bleaches
  - Detergents
  - Solvents
  - Acids
  - Alkalis
  - Bubble bath
  - Food
  - Saliva
  - Urine/Feces
  - Intestinal secretions

Treatment:

- Avoid substance, distract/divert habit
- Frequent (4-8 times daily; before meals; before bedtime) and liberal application of emollients to provide a barrier against the “agent” involved
- Consider referral to Behavioral Medicine

Summary

What would you include in a plan of care for a patient with:

- Pigmented lesion(s)
- Vascular lesion(s)
- Seborrheic Dermatitis
- Atopic Dermatitis/Eczema
- Keratosis Pilaris
- Pityriasis Alba
- Psoriasis
- Acne
- Irritant/Contact Dermatitis
How will this change your practice?

- What strategies for improving skin can you implement in your setting?
  - Immediately?
  - Next Month?
  - Next Year?

References