A PEDIATRIC DERMATOLOGY PRIMER

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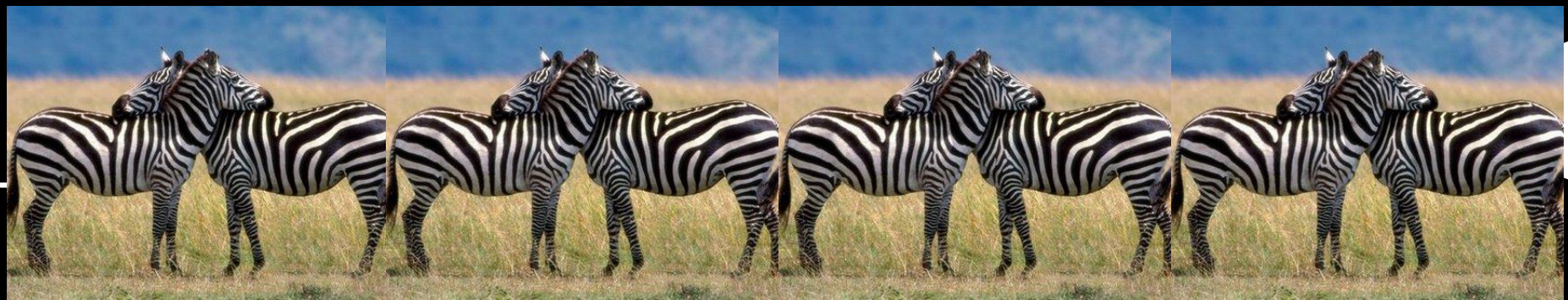
I HAVE NO FINANCIAL RELATIONSHIPS OR CONFLICTS OF INTEREST TO DISCLOSE.

I will discuss off-label use of various medications.

- Descriptions: The most important part
- Common: When to treat, when to refer
- Pearls for Not-to-miss diagnoses
- Some Zebras you should know about

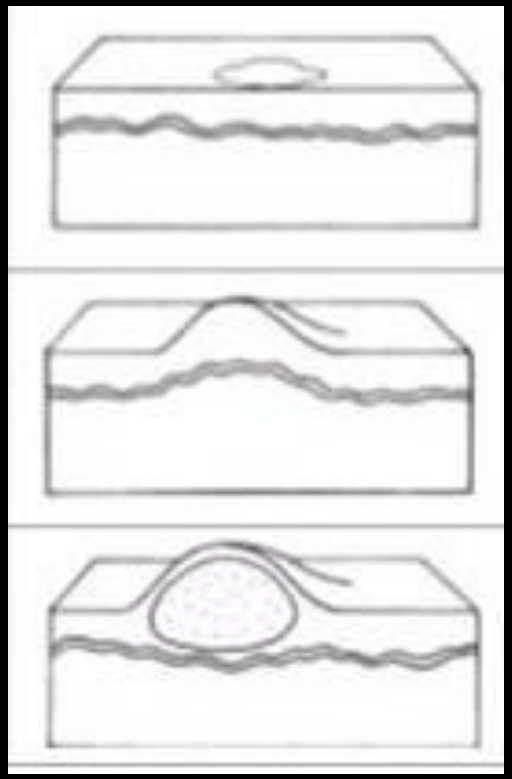


Descriptions –

- The most important thing you can do WELL when talking with your Dermatology colleagues

- You will lose us at "maculopapular"…

Primary Lesions

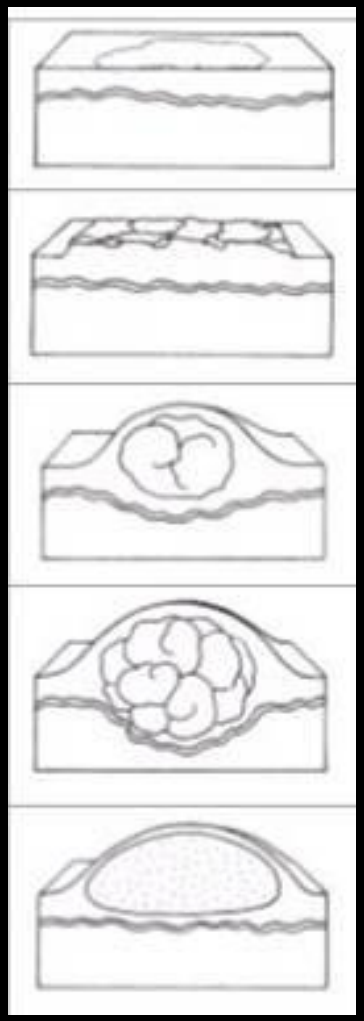


MACULE:
Flat < 1 cm

PAPULE:
Raised < 1 cm

VESICLE:
Clear fluid-filled < 1 cm

PUSTULE:
White fluid-filled



PATCH:
Flat > 1 cm

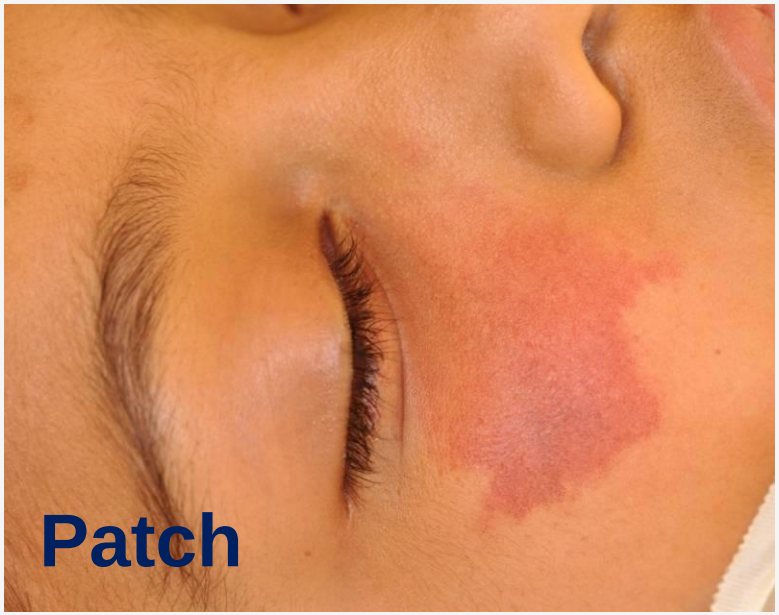
PLAQUE:
Raised > 1 cm

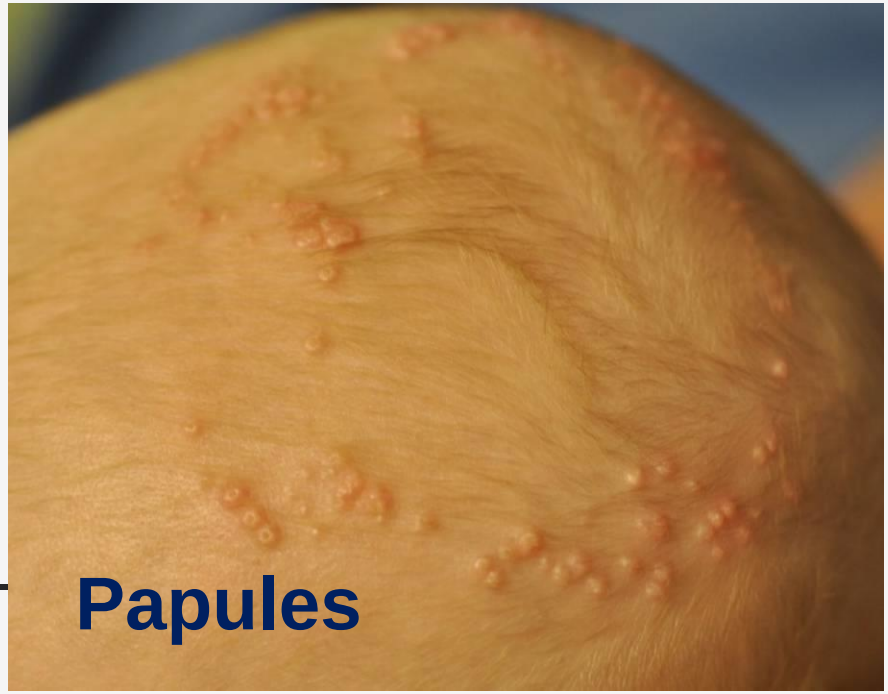
NODULE:
Raised + Deep > 1cm

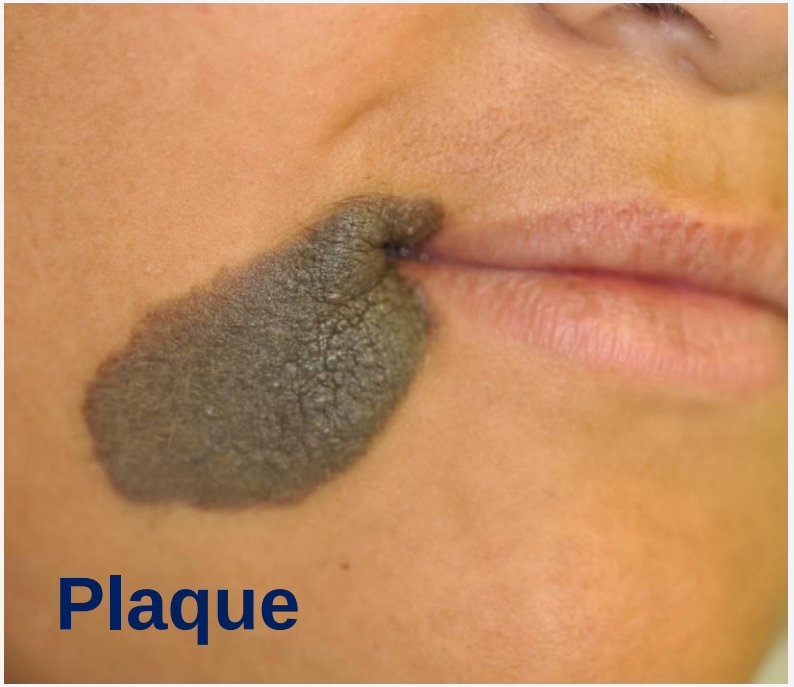
TUMOR:
Raised + Deep > 2cm

BULLA:
Clear fluid-filled > 1c


Macules

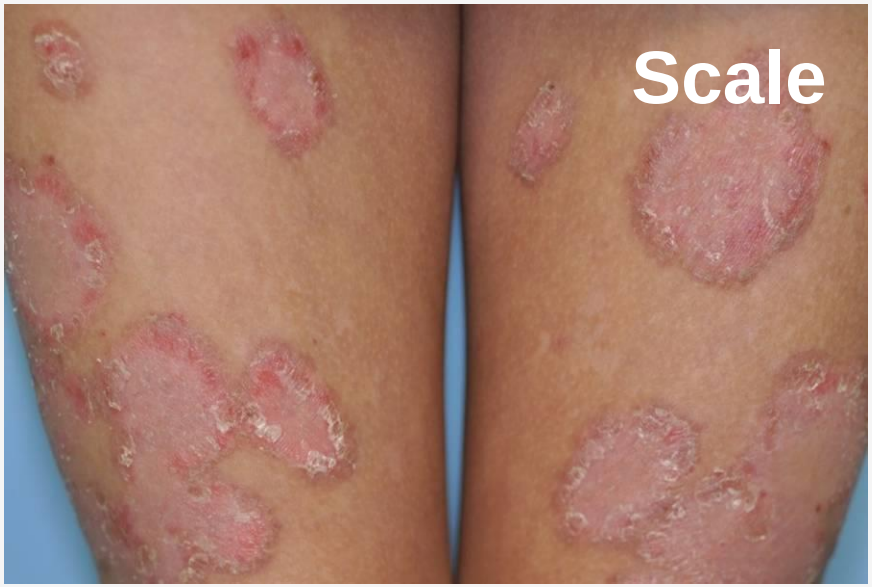

Patch

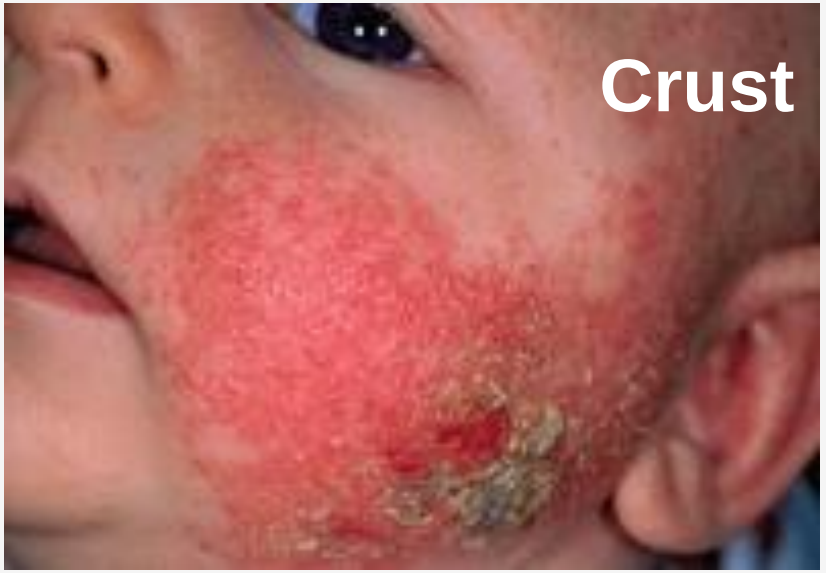

Papules

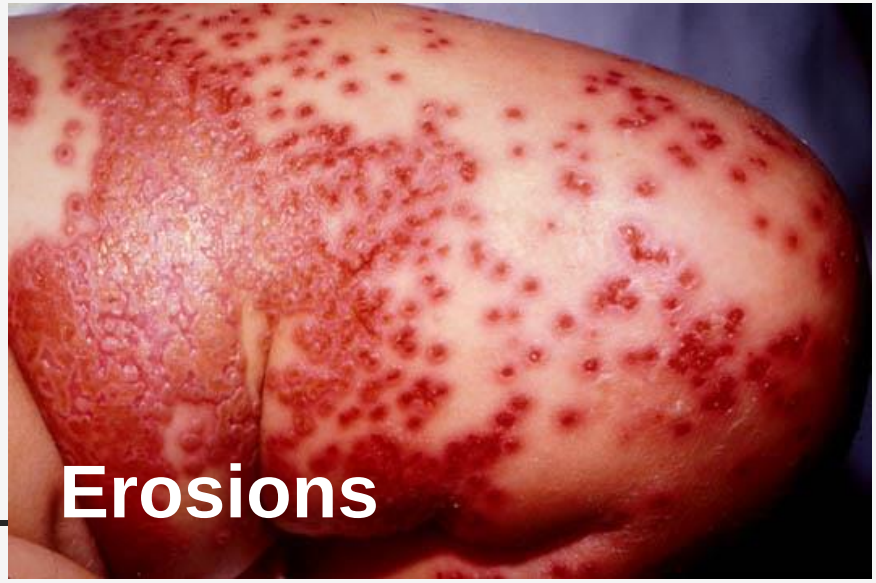

Plaque

Secondary Changes

- CRUST: Dried exudate: blood, serum, pus
- SCALE: Accumulated skin (stratum corneum)
- EXCORIATION: Traumatized due to scratching
- FISSURE: Linear cleavage
- EROSION: Depression with loss of epidermis (superficial)
- ULCER: Depression with loss of epidermis & dermis (deeper)
- LICHENIFICATION: Thickening, accentuated skin lines
- ATROPHY: Depression, thinning & wrinkling
- SCAR: Permanent fibrotic change


Scale


Crust

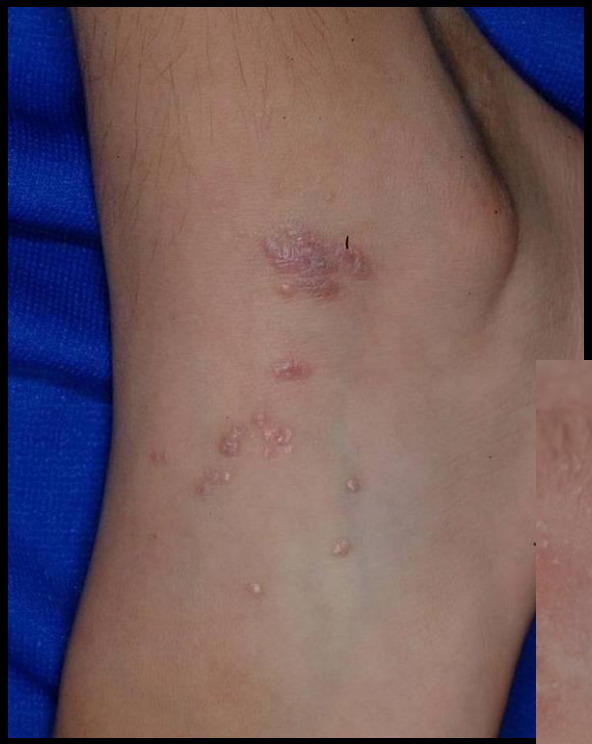

Erosions

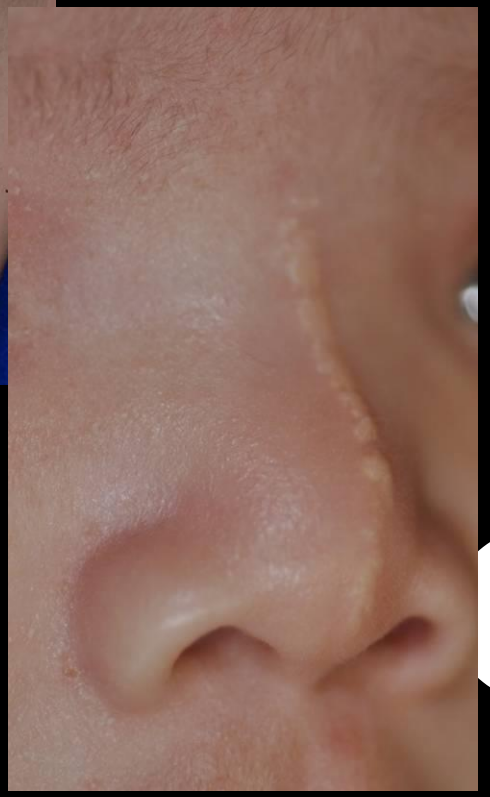

Lichenification

Putting it all together…

- Location
- Solitary vs Multiple
- Configuration
- Size*
- Color
- Primary lesion
- Secondary changes

* Measure if in question!



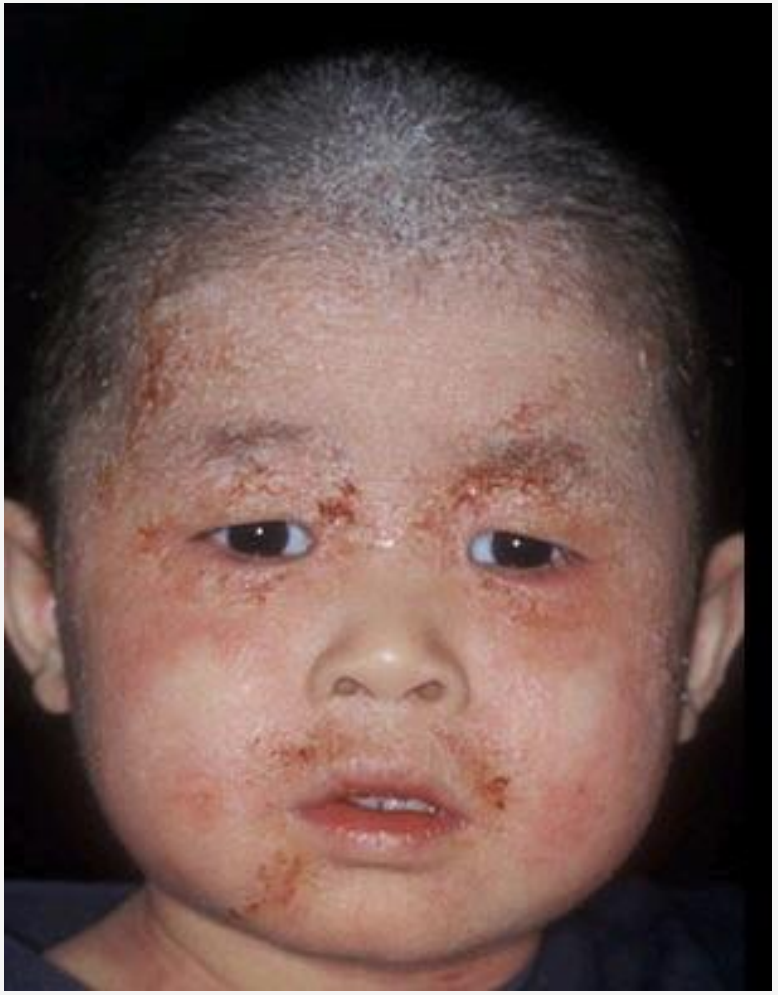


Common Peds Derm:
When you should handle, when you should refer

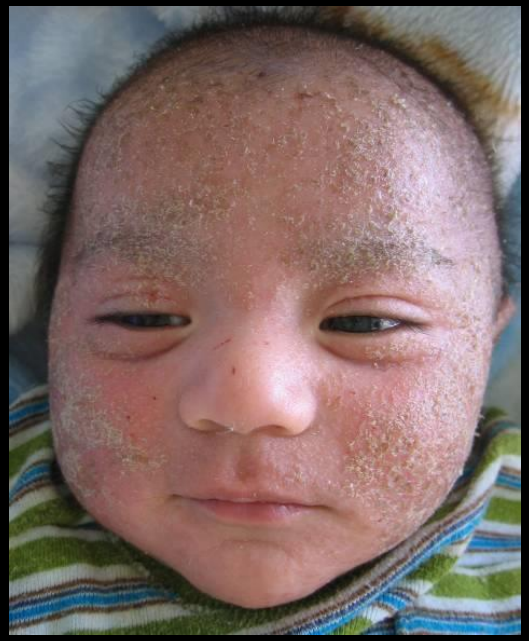
- Atopic Dermatitis
- Hemangiomas
- Nevi
- Molluscum
- Verruca
- Acne

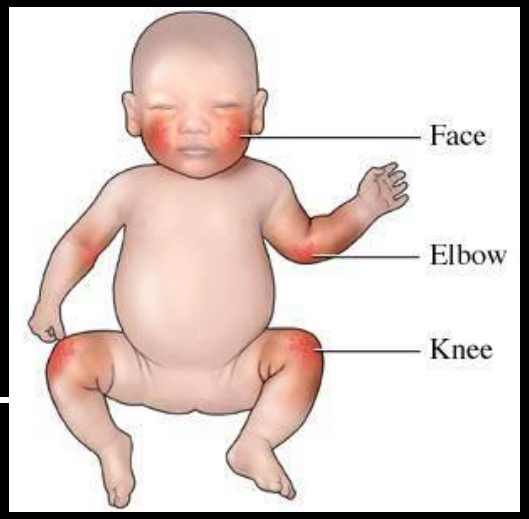
This patient has suffered from chronic, itchy rashes since infancy. His parents bring him today because he is flaring worse than usual.
Appropriate treatment now would include:

A) Topical steroids
B) Oral hydroxyzine
C) Oral antibiotics
D) Oral steroids
E) A, B, C
F) All of the above



Atopic Dermatitis





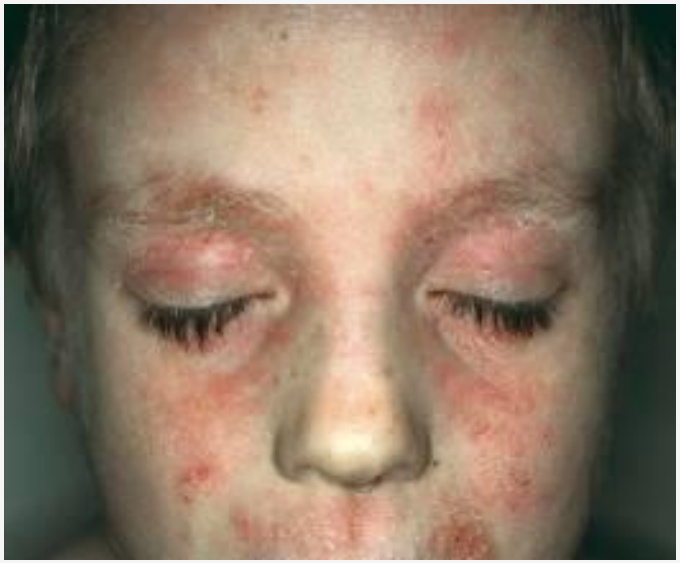
- Common in infancy
- Regresses by school age in most children
- Typical distribution changes with age

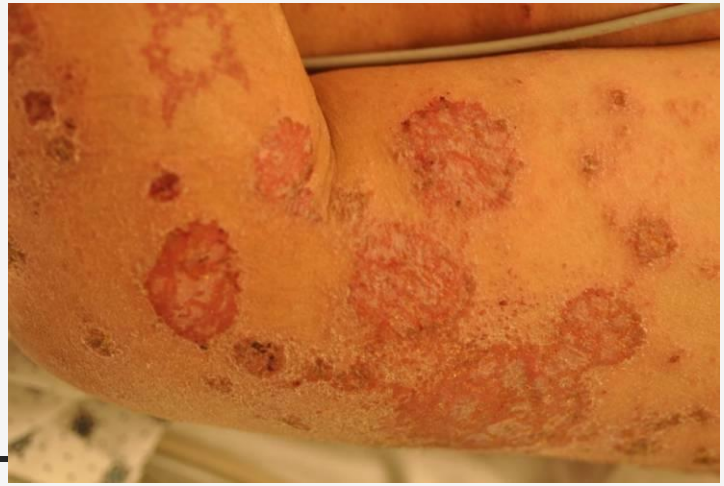
- Associated with food allergies (30%) but usually NOT direct cause & effect

- <u>DRY SKIN CARE RECOMMENDATIONS</u>:
- Gentle skin care
  - Daily or every other day lukewarm bath
  - Dove soap, Cetaphil cleanser

- Emollient/moisturizer BID+
  - CREAM best, not lotion
  - Cerave, Eucerin, Cetaphil, Aveeno cream
  - Vaseline, Aquaphor ointment
  - Applied after bathing

Atopic Dermatitis





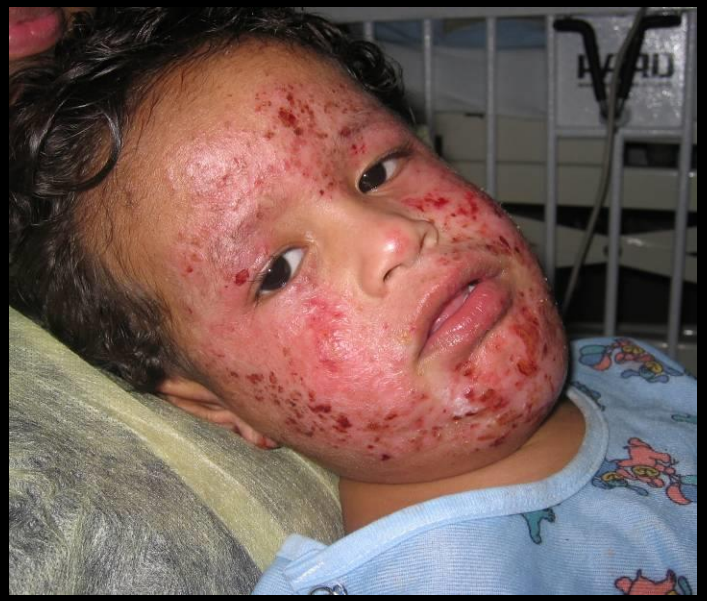
- Topical steroids (ointments) BID
- Topical non-steroidals:
  - Tacrolimus (Protopic ointmt)
  - Pimecrolimus (Elidel crm)
  - Crisaborole (Eucrisa)
- Oral sedating antihistamine
  - Hydroxyzine 1 mg/kg/dose Nightly
- Monitor (culture) for infection as cause for flares
- Dilute bleach baths
- Inquire about allergies (foods) but NOT usually cause and effect, ASSOCIATION

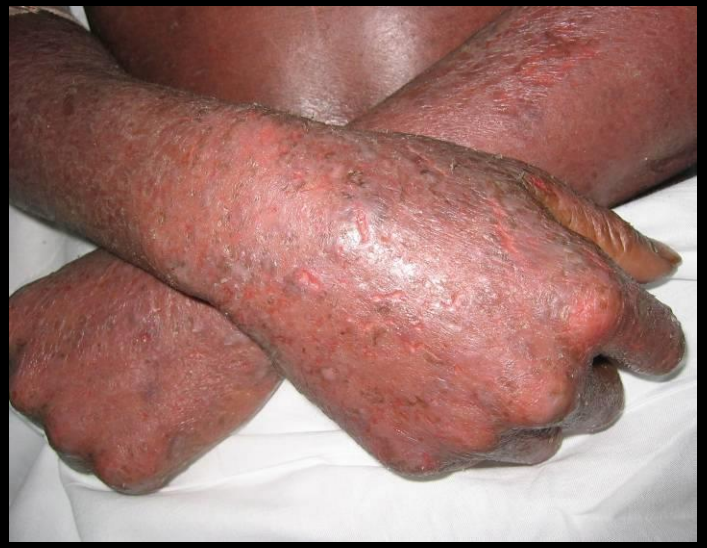
Atopic Dermatitis: Topical Steroids

- LOW for Face, Diaper, Skin Folds
  - Hydrocortisone 2.5%
  - Alclometasone
  - Fluocinolone OIL
- MEDIUM for Body
  - Triamcinolone 0.1%
  - Fluocinolone
- HIGH for Extremities, Hands, Feet
  - Mometasone
  - Fluocinonide
- SUPER-HIGH for certain circumstances
  - Clobetasol
  - Betamethasone diproprionate
- Give parents enough! 60 gm or more
- Consider households
- OINTMENTS preferred
  - Creams for adolescents
  - Oil or lotions for scalp

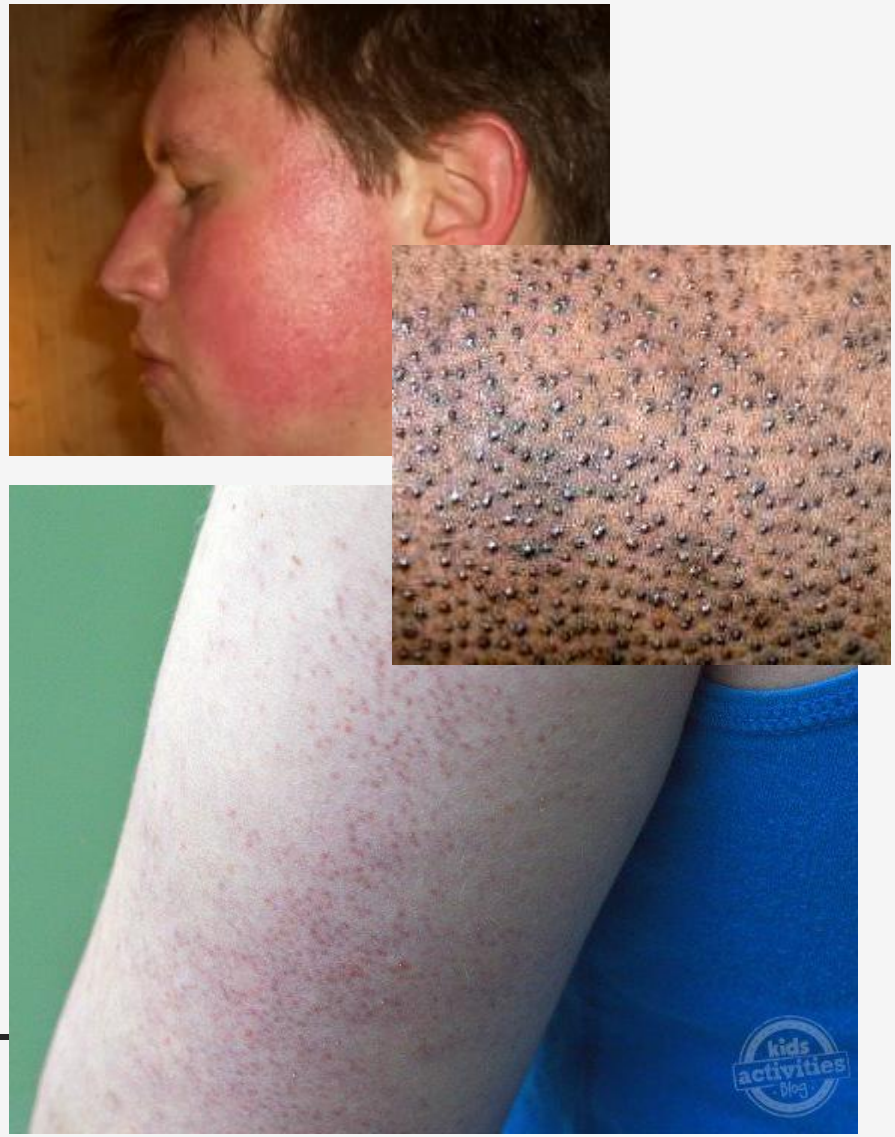
Atopic Dermatitis: When to Refer

- Not responsive to traditional therapy
- Moderate to severe
- Frequent bad flares or infections (MRSA)
- Failure to thrive (Immunodeficiency)
- Localized or recalcitrant areas
- Atypical lesions





Keratosis Pilaris

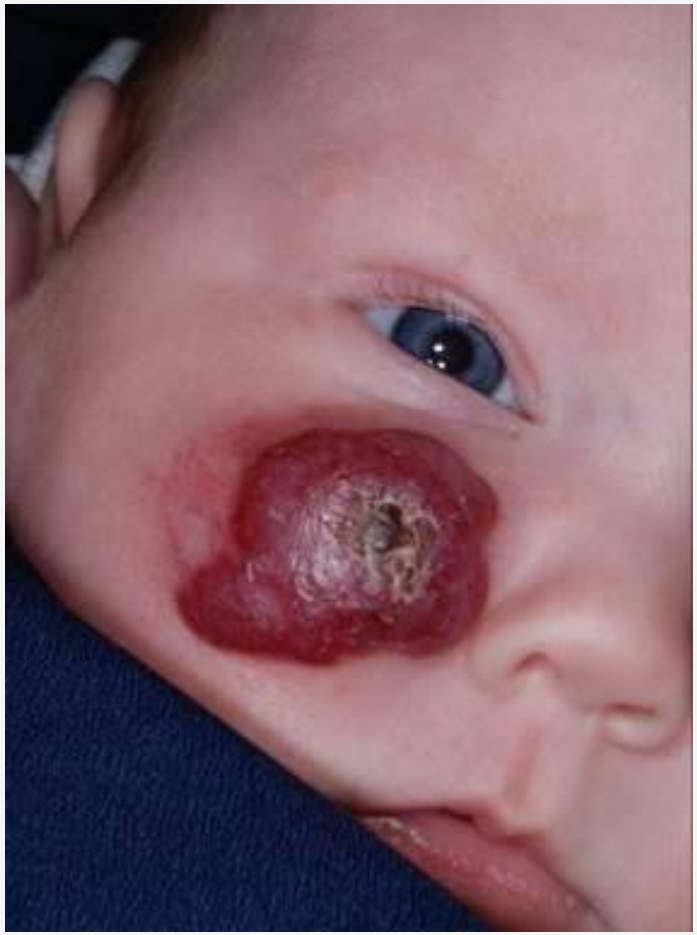


- Benign skin "type"
- Associated w atopy, dry skin, ichthyosis

Treatments:

- No need for referral!
- Reassurance
- Gentle cleansing (no scrubs/loofah!)
- Laser if erythema but cosmetic
- Keratolytics:
  - Salicylic acid (eg Cerave SA, Eucerin Plus)
  - Urea (eg Carmol, Excipial)
  - Lactic acid (eg AmLactin)
  - Glycolic acid ($$)

This child presents at his 3-month check with these findings. You tell the parents:



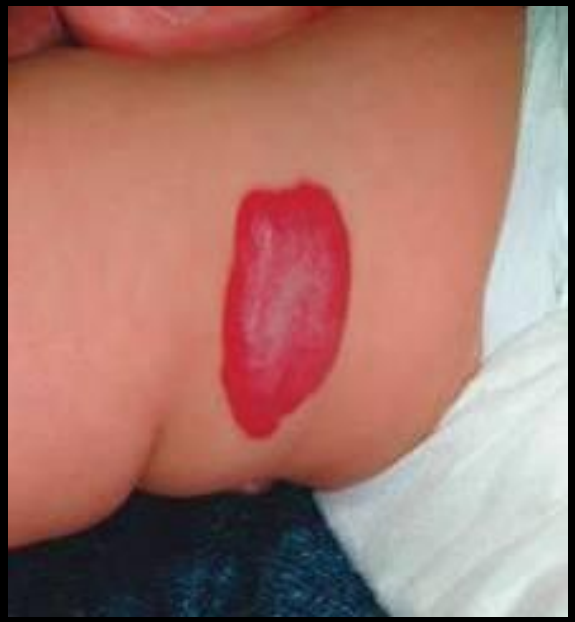
A) No treatment is necessary; the lesion will regress on its own

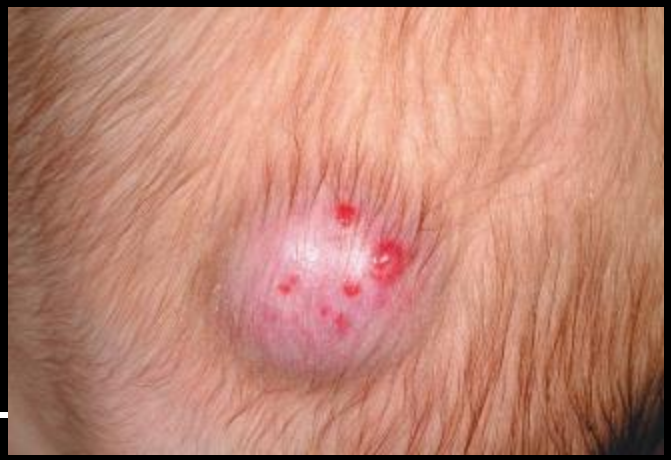
B) You will begin treating with topical steroids

C) You will refer to Derm for further management

D) You will put in a referral to Plastic Surgery for excision

Hemangiomas

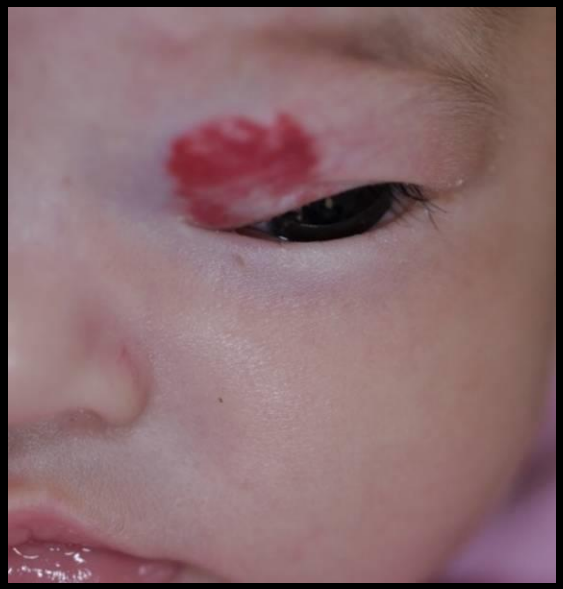


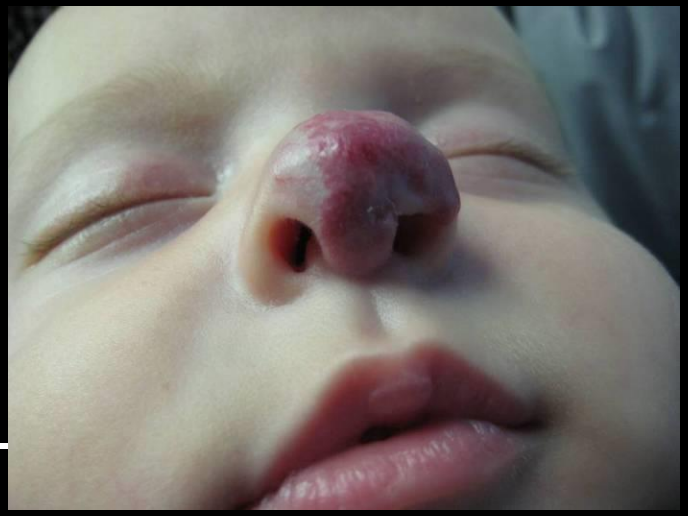


- Up to 5-10% healthy infants
- Benign vascular tumor
- Localized vs Segmental
- Superficial, Combined, Deep

- Typical time course
  - Present at few wks of age
  - Grow rapidly in first 3(-6) months
  - Slower growth until 1 year
  - Plateau phase followed by regression by school age

Hemangiomas: When to Refer

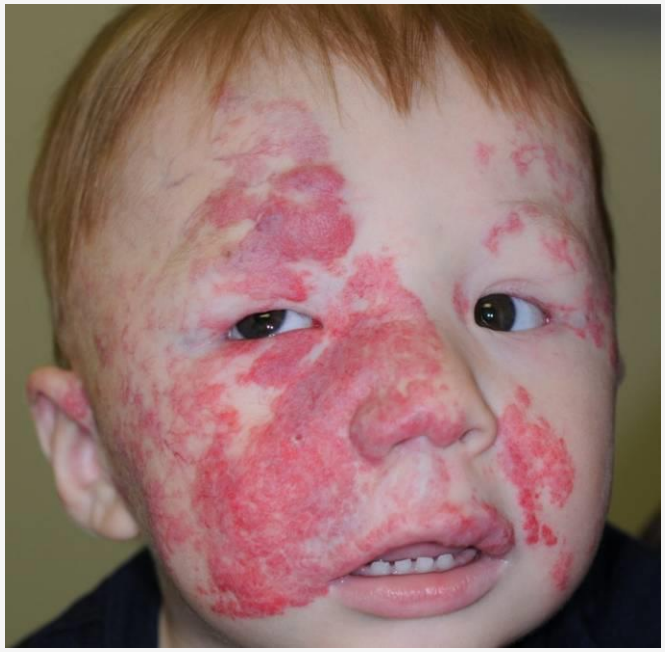


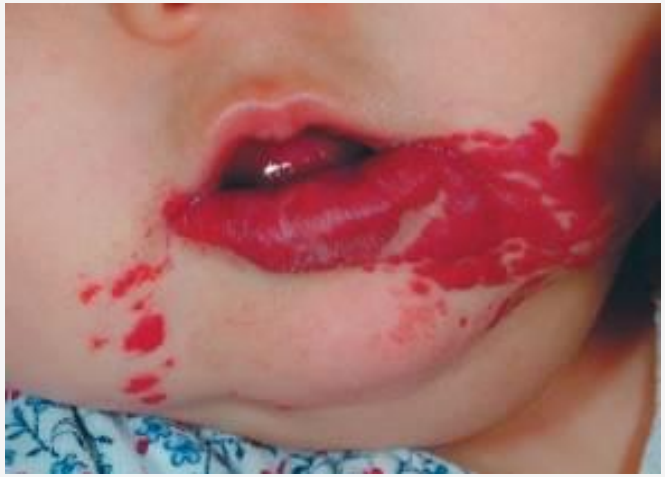


- Function or Life-Threatening:
  - Periorbital
  - Lips
  - Nasal tip
  - Perineum
  - Ear (if extensive)
  - Airway
  - Hepatic

Hemangiomas: When to Refer

- Cosmetic/Psychosocial
- Large Facial (PHACES)
- "Beard" distribution
- Ulcerating
- Multiple (>5)
- Lumbosacral
- Atypical History or Appearance



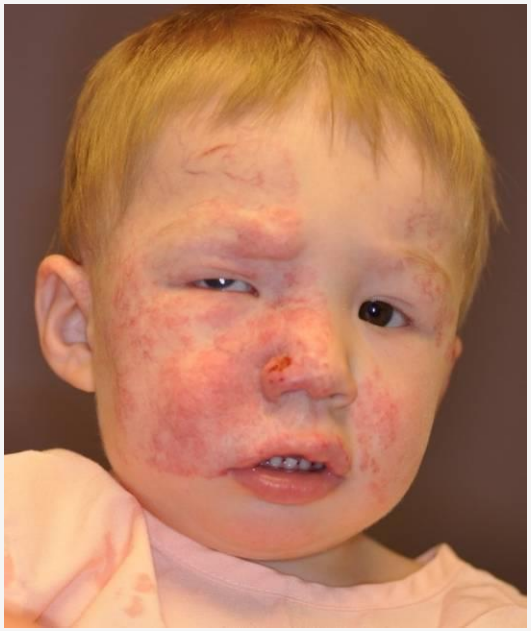


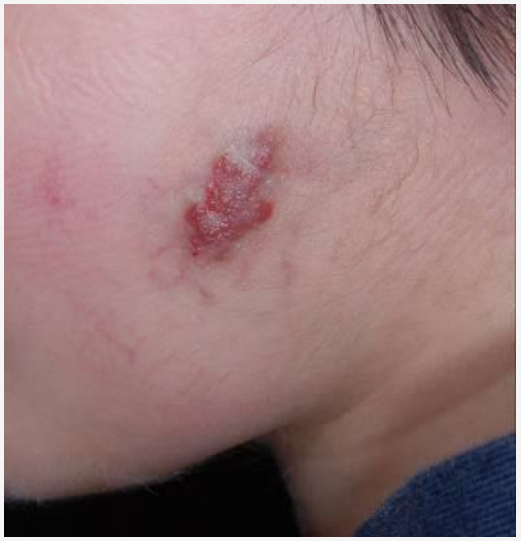
Hemangiomas: Treatment

- Appropriate treatment in many:
  - "Active nonintervention"
- Emphasize regression, not necessarily complete resolution
- Laser appropriate for residual/stable lesions, not actively growing ones

- Topical timolol
  - 0.5% ophtho (gel-forming) solution BID
- Oral propranolol
  - 1-3 mg/kg/day div BID

- Topical steroids
- IL steroids
- Oral steroids
- Surgery
- (Vincristine, IFN-alpha)





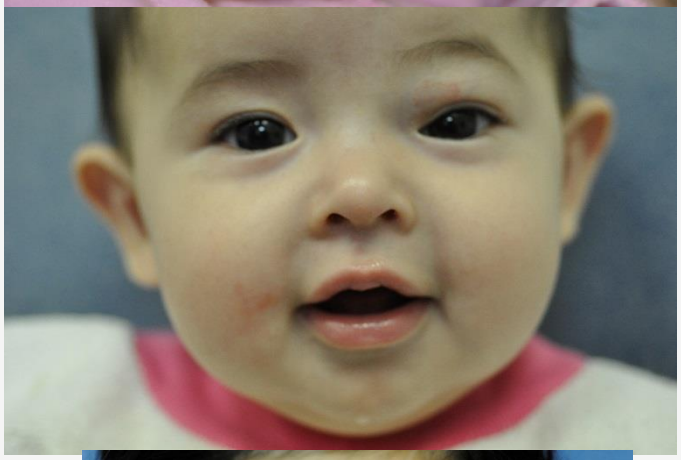
Propranolol for Infantile Hemangiomas

- Indications:
  - Function-threatening/severe disfigurement
  - Risk of complications (ulceration)
- Outpatient if >5 wks old (corrected)
- Screen for risk cardiac dz or asthma (EKG <u>not</u> required if none)
- Baseline + 1st dose HR/BP

- <u>ALWAYS w feeds</u>, hold if ill (risk hypoglycemia)

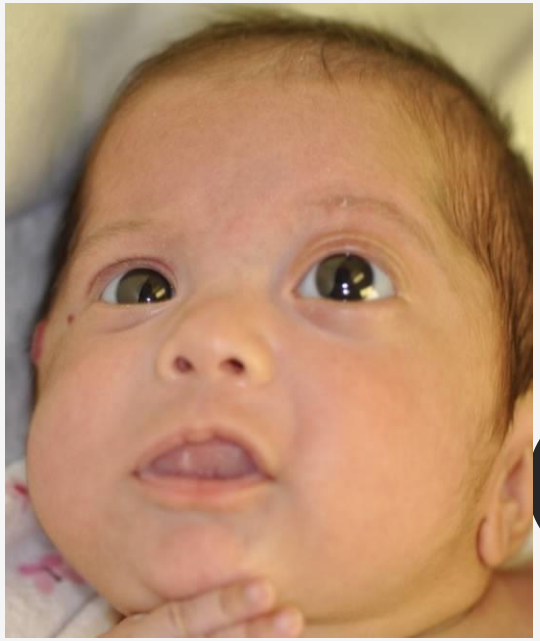
- Different dosing guidelines
  - Start at 1 mg/kg div BID-TID
  - Increase to 2 mg/kg (if needed) after 3-5 days

- http://pedsderm.net/site/assets/files/1028/12_spd_propranolol_color_web-final.pdf

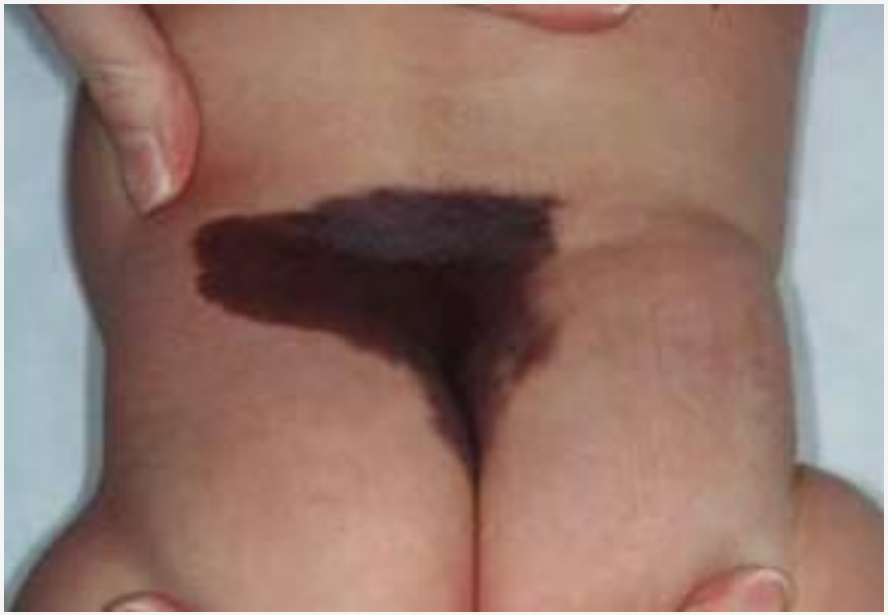


Hemangiomas: When to Refer

- If any concern, refer early!
- Most of the significant growth probably done by 2-3 months!



You evaluate this baby at a 2-week check. You are concerned that:



A) There is an increased risk of melanoma

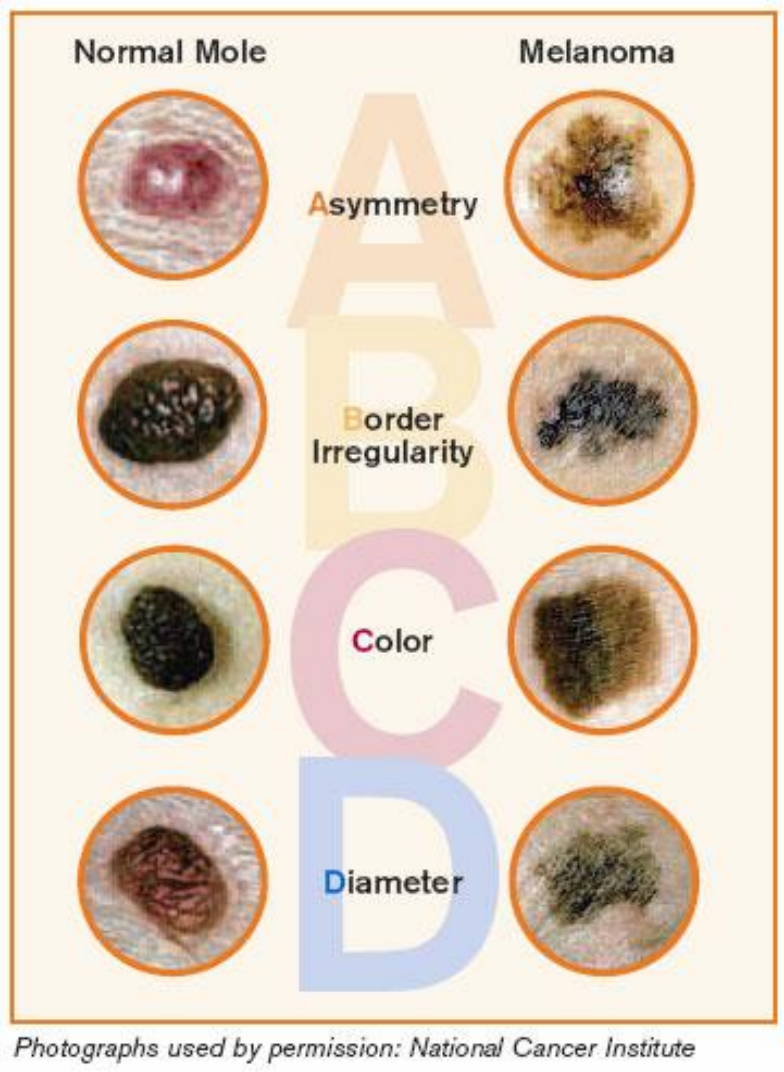
B) There is an increased risk of neurologic involvement

C) The family may want to consult Plastic Surgery

D) All of the above

E) None of the above

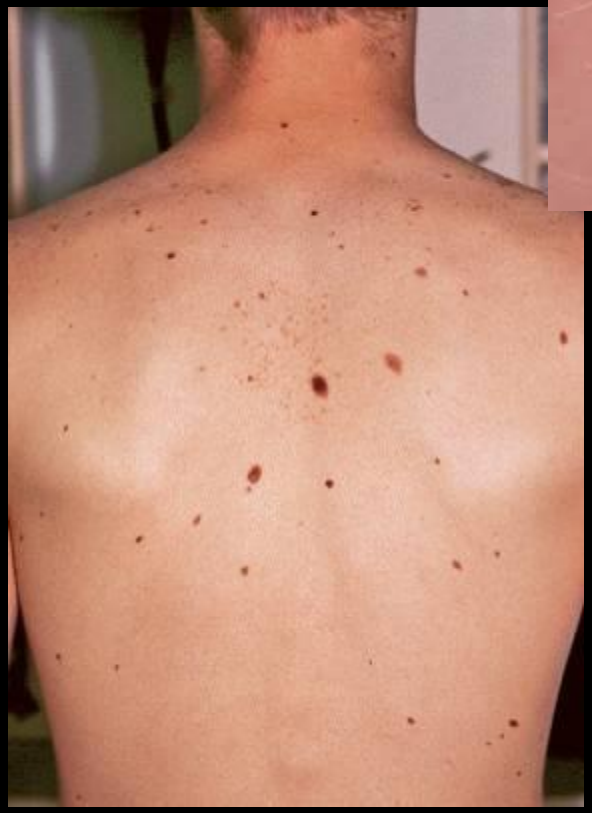
Nevi (Moles)

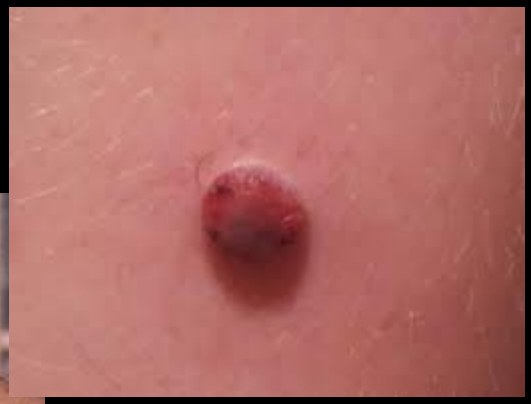


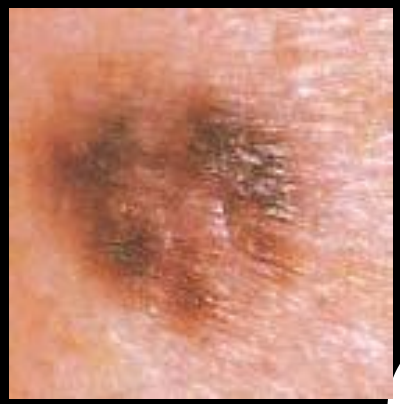
- Benign growths of pigmented cells (melanocytes)
- Congenital when appear within 1st year
- Most arise in school-age, continue through adulthood
- Increased # associated with sun exposure, family history
- ABCDEs & Ugly duckling rule
- Reassurance!
- Self-monitoring, sun protection

Nevi: When to refer

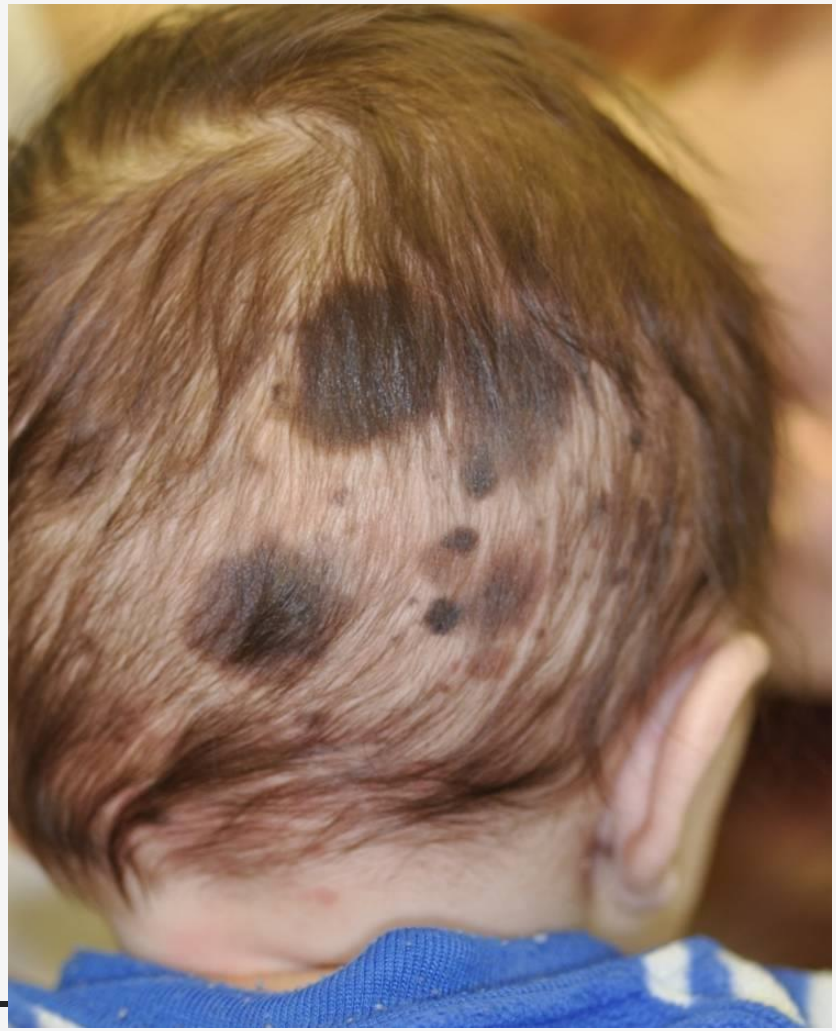
- Rapid change
- "Ugly duckling" or atypical nevus
- Too many nevi to track
- Disfiguring appearance
- Medium to large congenital
- Family history of melanoma (1st degree)
- Heavy sun exposure, tanning bed history







Congenital Nevi: When to refer

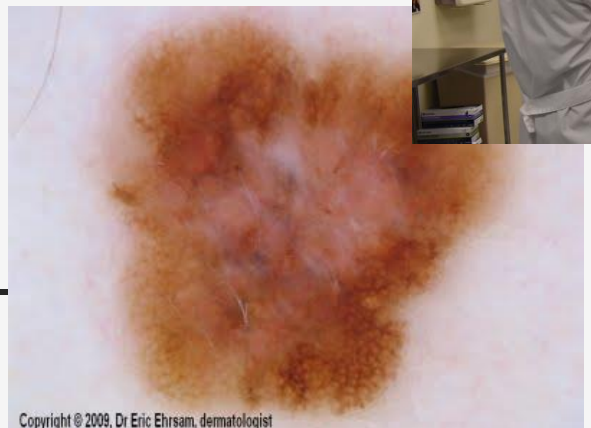


- Small (<2cm)
  - Essentially NO elevated risk
  - Hair is normal!
- Medium (2-20 cm)
  - ? Risk of melanoma
  - Often disfiguring, especially facial
- Large or Giant (>20 cm)
  - Disfiguring
  - ++Risk of melanoma

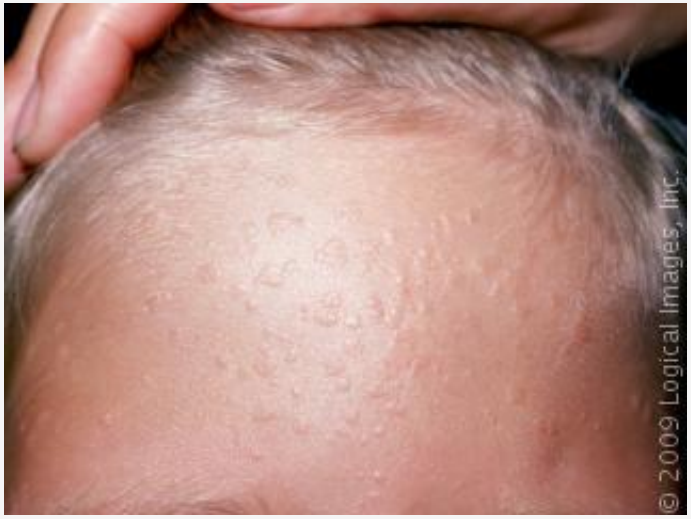
- Risk of occult spinal dysraphism:
  - Midline lumbosacral location
- Risk of neurocutaneous melanosis:
  - Posterior axial location
  - Multiple (20+) satellites

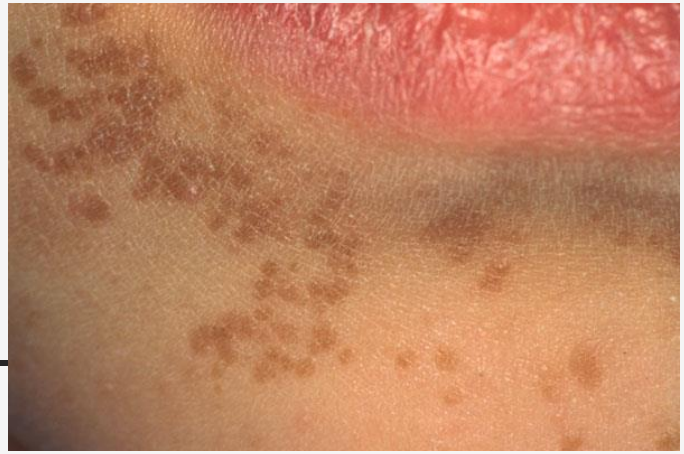
Nevi: Dermatoscopy & Confocal Microscopy

- Clinical exam techniques
- Allows greater appreciation for pattern, network of melanocytic and non-melanocytic lesions
- Can often give presumptive diagnosis
- Biopsy may still be necessary in some cases



This teenage boy is new to your practice. You note these findings. You should:





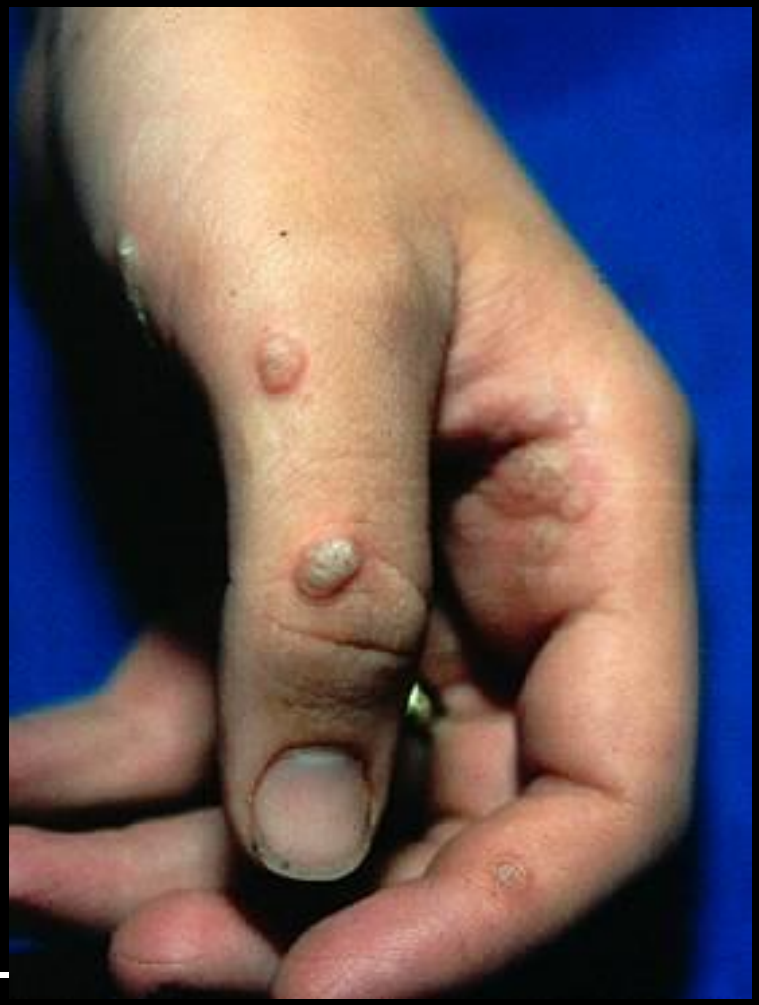
A) Inquire about potential causes of immunosuppression

B) Prescribe benzoyl peroxide-clindamycin and topical retinoid

C) Reassure that they will spontaneously resolve

D) Treat them with cryotherapy

Verruca (Warts)



- Human Papillomavirus
- Common, any location
- Problematic in immunosuppressed
  - Transplant
  - HIV+

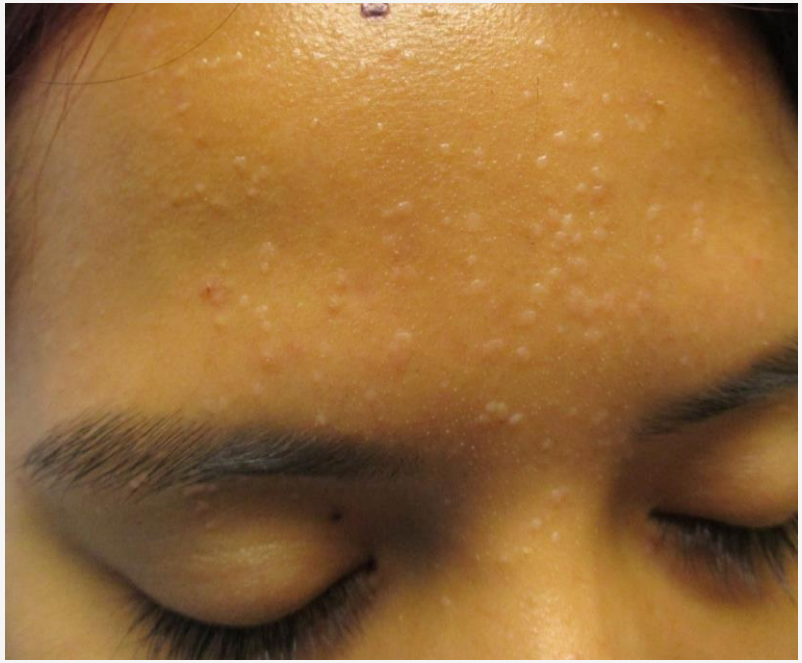
- 1st Line Treatment:
  - OTC salicylic acid daily
  - Occlusion
  - Paring (blade/pumice)
  - Liquid nitrogen cryotherapy

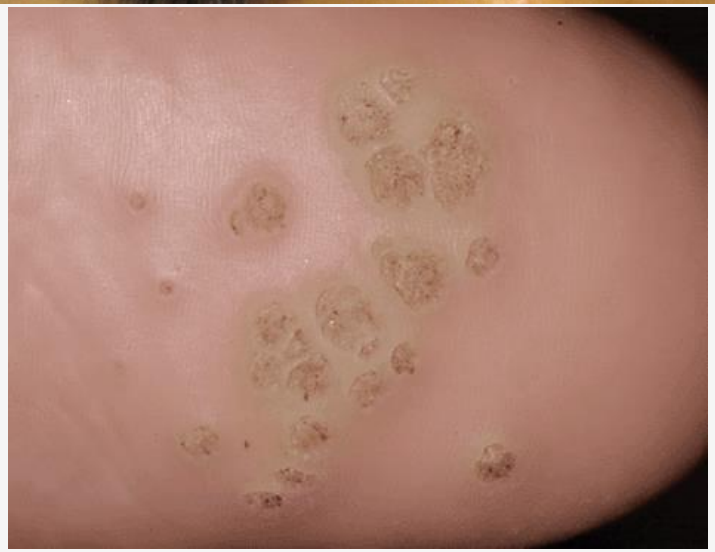
Verruca (Warts)

- Refer if:
  - Extensive
  - Difficult location or significant pain
  - Not responsive to *consistent* 1st line therapy

- 2nd Line Treatment:
  - Topical 5-FU (ideally w SA)
  - Topical imiquimod
  - ?Topical tretinoin
  - Oral cimetidine (30-40 mg/kg/day)

- 3rd Line Treatment:
  - Injectables: Candida, Bleomycin, Cidofovir, HPV Vaccine
  - Immunotherapy: Squaric acid
  - Laser/Surgery





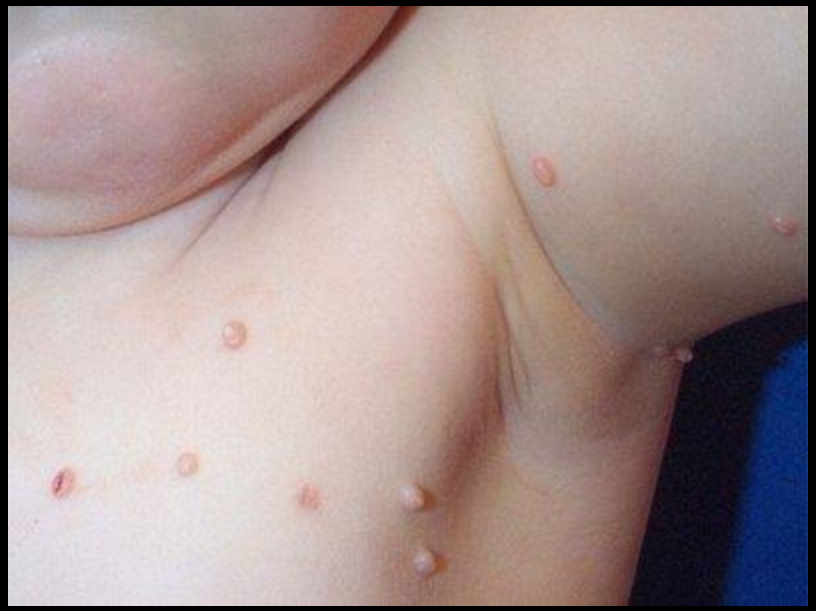
Molluscum Contagiosum

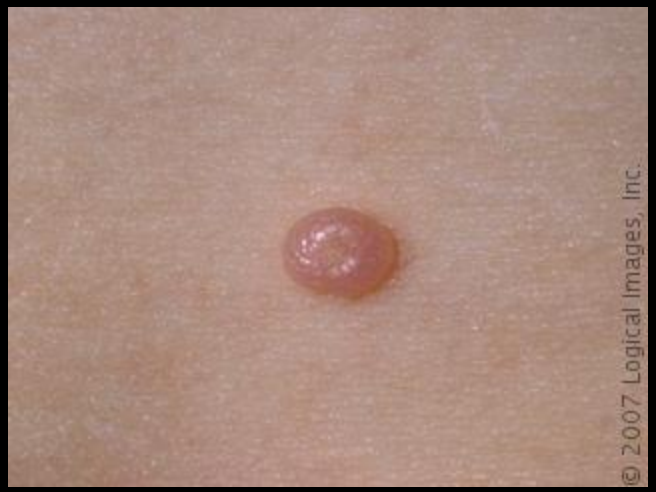
- DNA Poxvirus
- Common in preschool
- ? Spread in water/barrier dysfunction
- Any location including genitals

- 1st Line Treatment:
  - WATCHFUL WAITING
  - Cantharidin application
  - (Low strength topical steroid)
  - Cryotherapy

- When to Refer:
  - Extensive, large or atypical lesions
  - Facial or genital
  - Severe associated dermatitis
  - Immunosuppression

- 2nd Line Treatment:
  - Curettage
  - Topical retinoid
  - Topical imiquimod (Aldara)
  - Topical/IL Cidofovir





This adolescent girl comes to you because she is very frustrated by acne. She has used "every" OTC product with no improvement. You recommend:

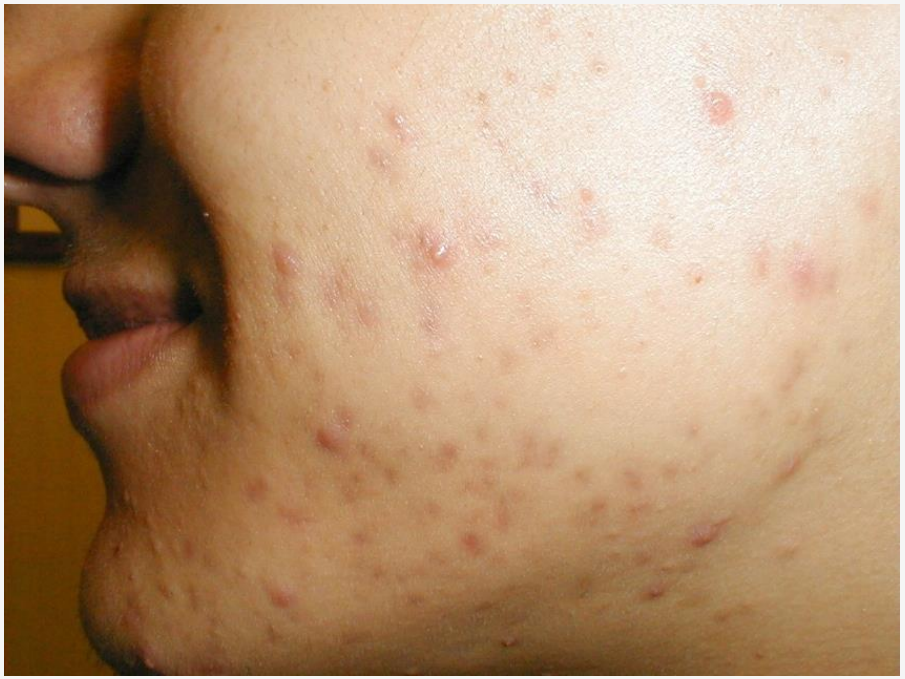
A) Topical benzoyl peroxide-clindamycin

B) Topical retinoid

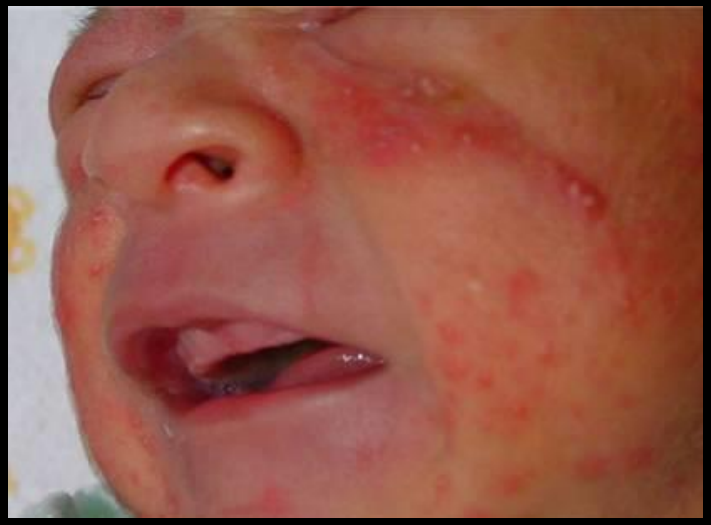
C) Consideration of OCP

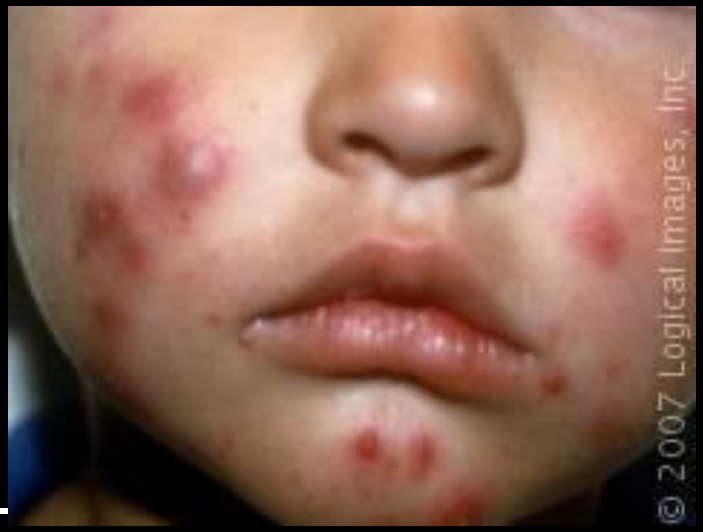
D) A and B

E) A, B, and C



Acne





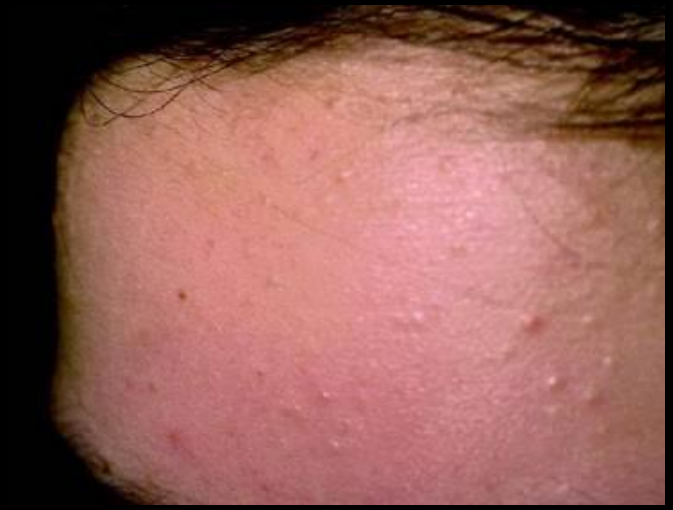
- Very common in adolescents
- Neonatal (first wks – months) usually self-resolving, not really "acne"
- Childhood (months – yrs) more likely to need treatment
- Monitor for potential scarring

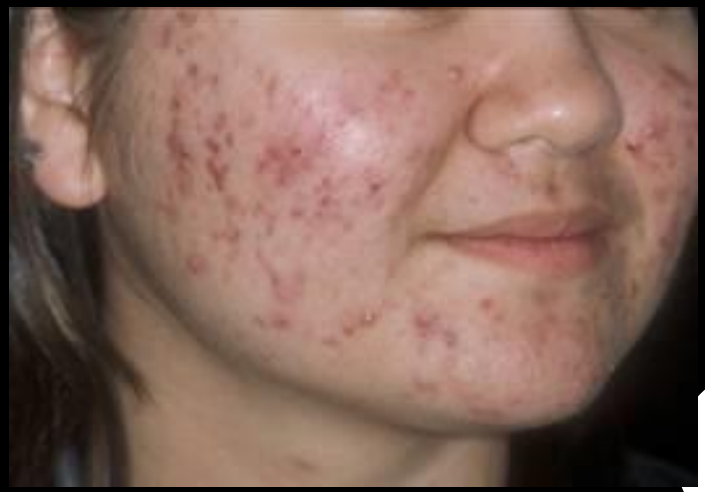
TREATMENT

- Topicals (Always 1st Line)
- Oral antibiotics
  - Doxy, mino, or tetracycline
  - Cephalexin, TMP-SMX
  - Erythromycin, (Dapsone)
- Oral contraceptives, spironolactone
- Oral isotretinoin
- ? Blue Light/Laser

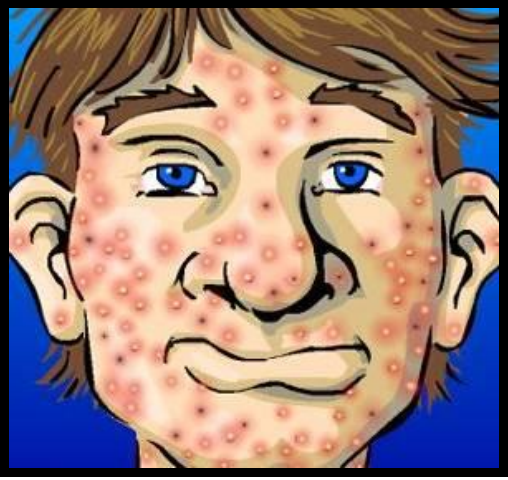
Acne: Comedonal, Inflammatory or Both?

- COMEDONAL (Typically early, T-zone)
  - Topical retinoid
- INFLAMMATORY
  - BP, Sal acid, Topical antibiotic or combo
  - Oral antibiotic
- BOTH (Most common)
  - BP, Sal acid, Topical antibiotic or combo
  - Topical retinoid
  - Oral antibiotic
  - Consider oral isotretinoin
- HORMONAL (Cyclical, lower face)
  - Oral contraceptive, spironolactone
- SEVERE OR CYSTIC
  - All of the above
  - Oral isotretinoin





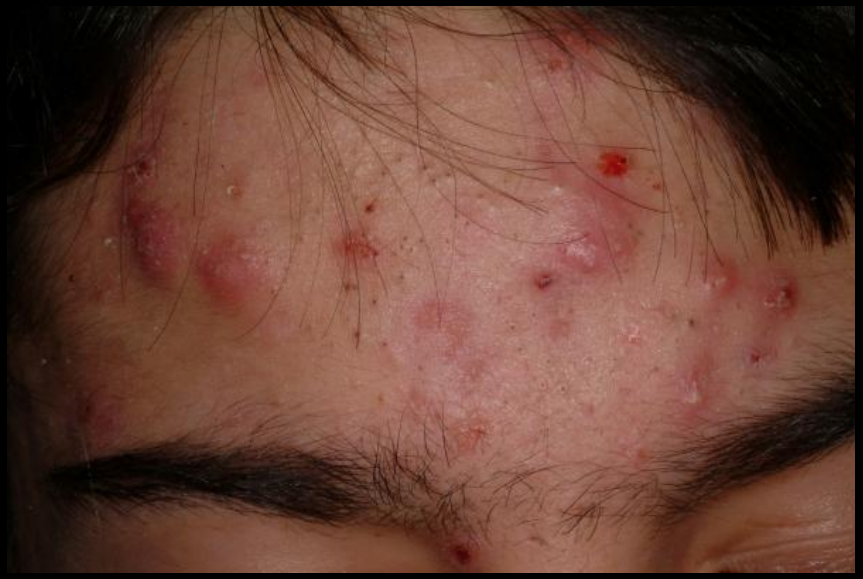
Acne: Topical Medications

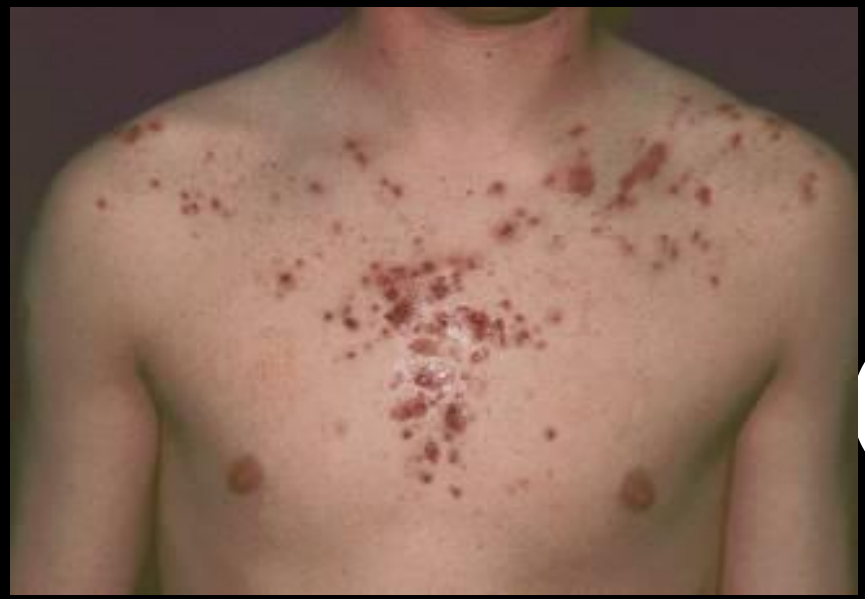


- BENZOYL PEROXIDE: cream, gel or wash
  - Anti-inflammatory and antibiotic
  - Can be drying/irritating, bleaches
- SALICYLIC ACID: cream, wash
  - Helps with skin turnover, pigmentation
- ANTIBIOTICS: Clindamycin, Erythromycin
  - Anti-inflammatory properties
  - Need to be used in combination!
- RETINOIDS
  - Apply pea-size amount nightly, start out slow!
  - Low: Differin (Adapalene)
  - Medium: Retin-A micro (Tretinoin)
  - High: Tazorac (Tazarotene)
- COMBINATION PRODUCTS
  - Newer, so more expensive…
  - Duac gel: BP + Clindamycin
  - Ziana gel: Tretinoin + Clindamycin
  - Epiduo: BP + Adapalene

Acne: When to Refer

- Any concern for scarring
- Childhood onset or other associations in a young patient
- Not responsive to 1st line treatment
- Psychological disturbance (even if mild)

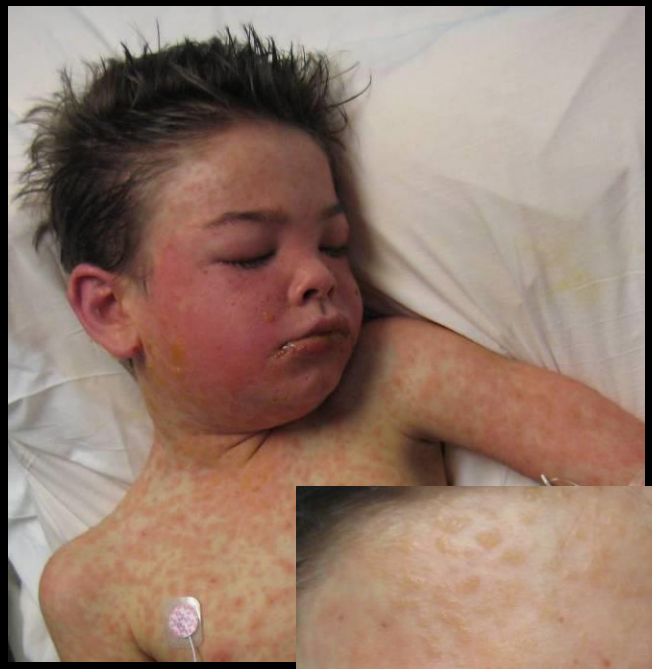


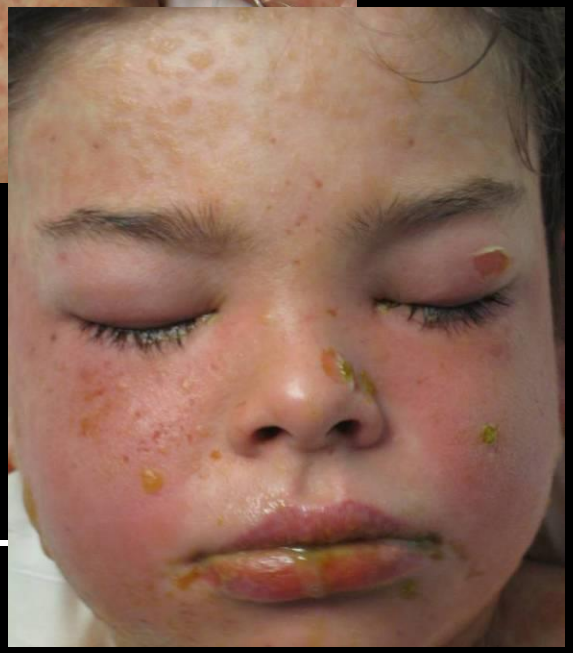


Pearls for not-so-common Peds Derm (That you shouldn't miss)

- Stevens-Johnson/TEN
- Staph scalded skin
- Kawasaki disease
- DRESS syndrome
- HSV
- Deep fungal infections

Stevens-Johnson Syndrome/ Toxic Epidermal Necrolysis

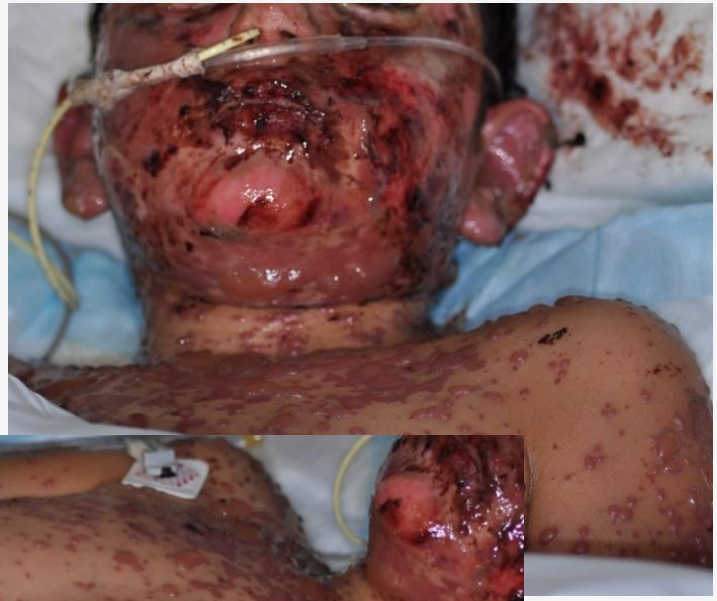


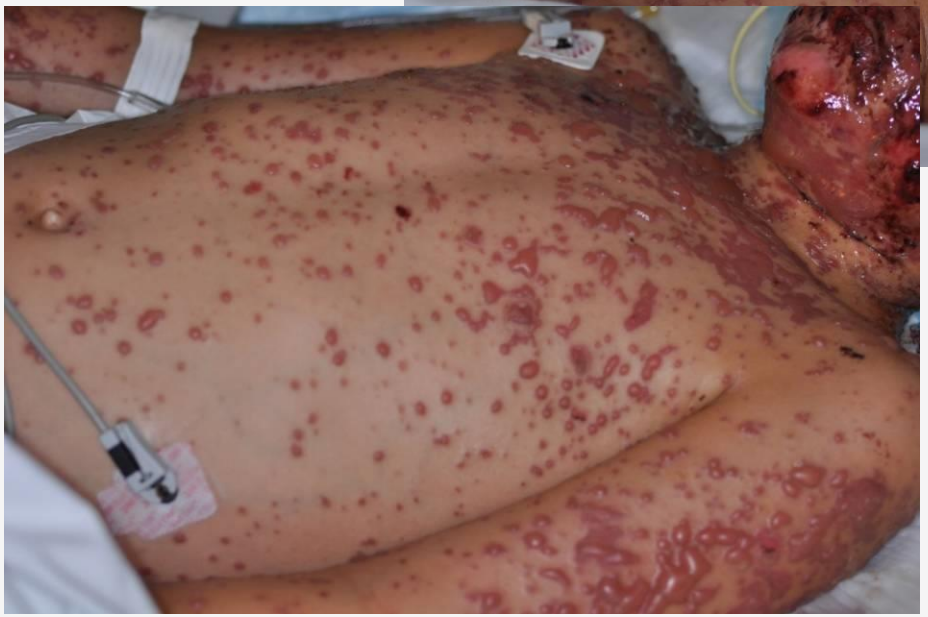


- Hypersensitivity disorder
- In kids, SJS > TEN
- Secondary to viral illness, *Mycoplasma*, medication, other
- Fever, systemic sx, mucosal erosions + epidermal detachment:
  - <10% SJS
  - 10-30% Overlap
  - >30% TEN
- Presenting signs: fever, malaise, mucosal pain/swelling, photophobia, erythematous macular eruption
- Most common meds for TEN:
  - Anti-epileptics
  - Sulphonamides
  - PCNs
  - Allopurinol
  - NSAIDs

Stevens-Johnson Syndrome/ Toxic Epidermal Necrolysis

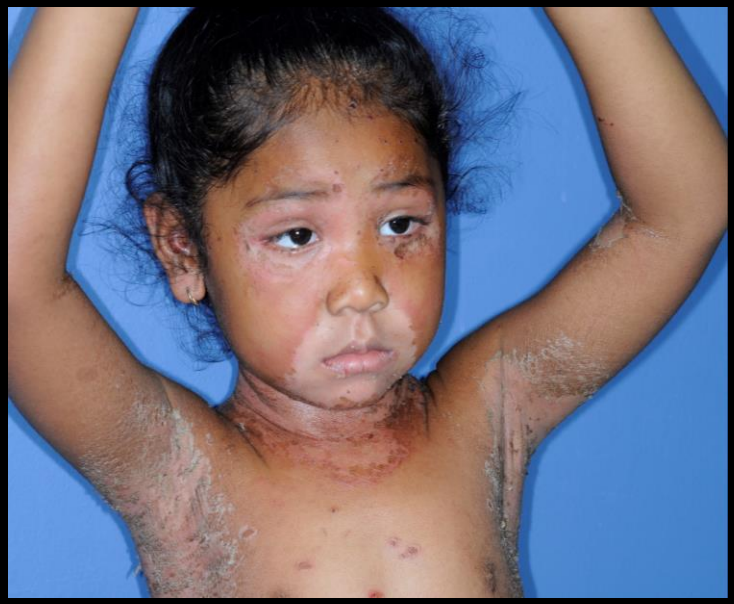
- Can evolve rapidly!
- Needs ICU monitoring
- Ophtho/Gyn/Uro evaluation
- Fluid management
- Dressings
- Pain control
- Treatment controversial
  - IVIG
  - Cyclosporine
  - Etanercept?
  - Steroids?

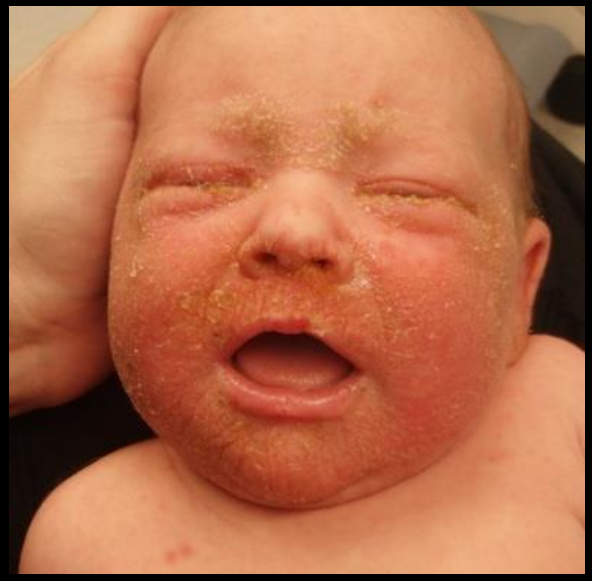




Staph Scalded Skin Syndrome

- Epidermolytic-toxin producing *S aureus*
- Infants, decreased renal function, immunocompromised
- Starts with localized infxn → generalized, systemic sx
- Peeling accentuated at perioral, folds
- Diff Dx: TEN, EB, Burn





- Must culture primary site!
- NO mucosal involvement
- Treatment: Systemic anti-staphylococcal antibiotic (PO or IV)

Kawasaki Disease: Diagnostic Criteria

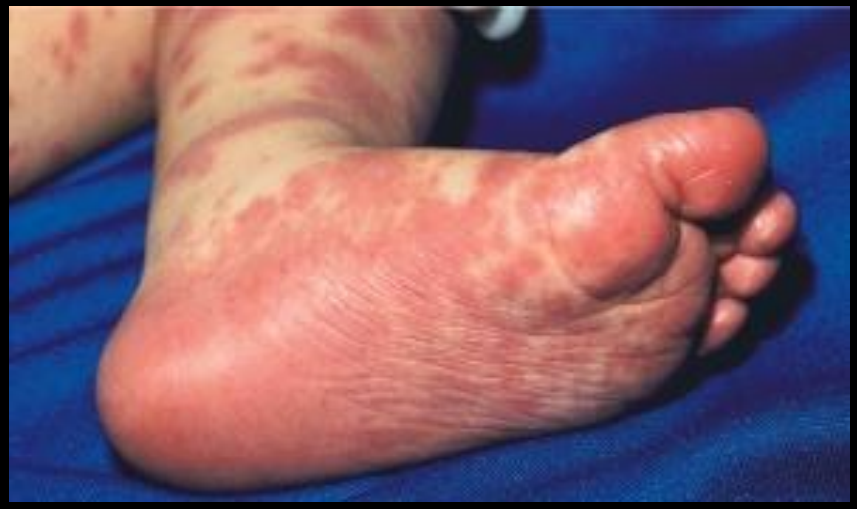
- Fever for 5+ days
- Plus at least 4:
  - Bilateral conjunctival injection
  - Oral changes: injected pharynx, injected or fissured lips, strawberry tongue
  - Peripheral extremity changes: erythema or edema (acute), desquamation (convalescent)
  - Polymorphous rash
  - Cervical lymphadenopathy (>1.5 cm)

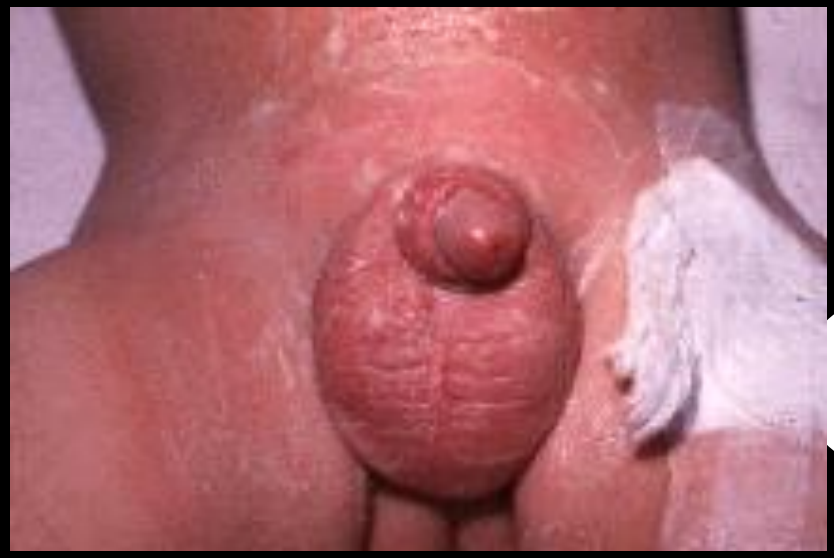
High index of suspicion for "incomplete KD"

Kawasaki Disease: Mucocutaneous Findings

- Dry, red, fissured crusted lips
- Nonpurulent conjunctival injection
- Peripheral edema
- Erythematous or urticarial eruption
- Desquamation (late finding)
- Variants: Scarlet fever-like, Erythema multiforme-like, Psoriasiform, Pustular
- Should NOT see blistering or purpura

- Diff Dx: Viral, SSSS, TEN, etc
- Pearls: Irritabiliity, persistent fever, perineal or acral accentuation





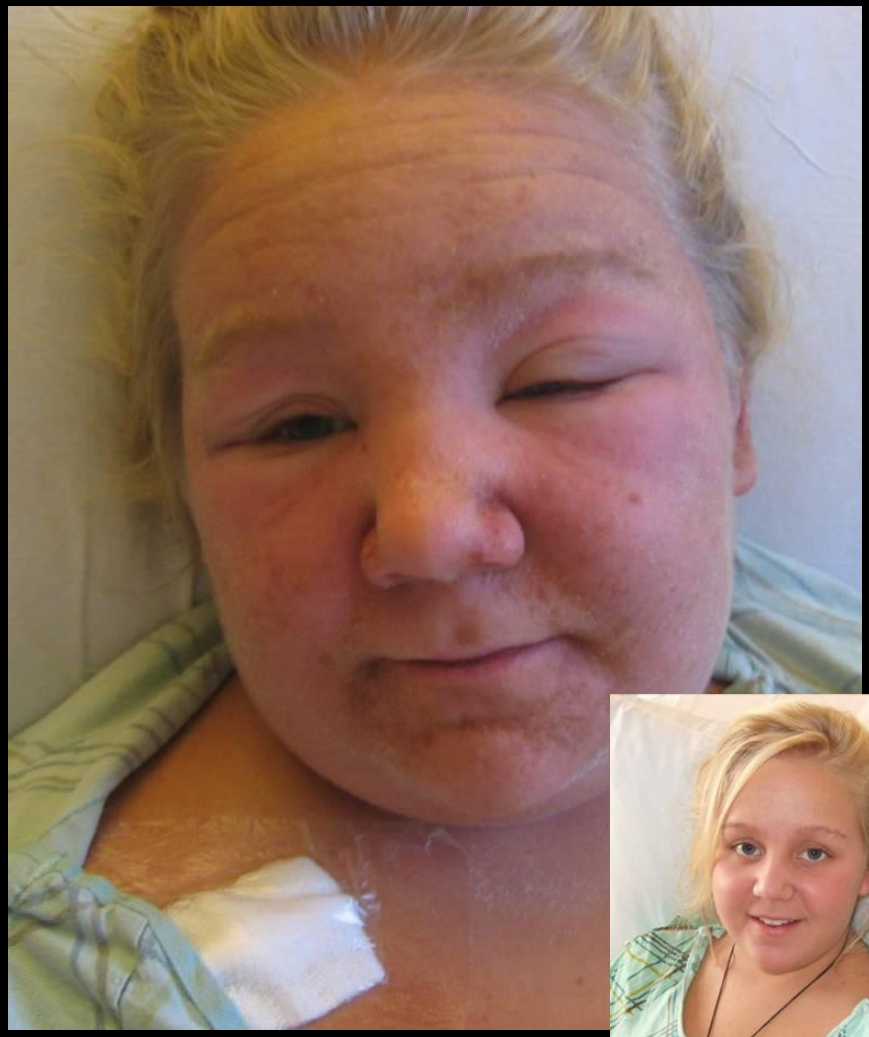
DRESS Syndrome:

Drug Rash (Reaction) with Eosinophilia & Systemic Symptoms

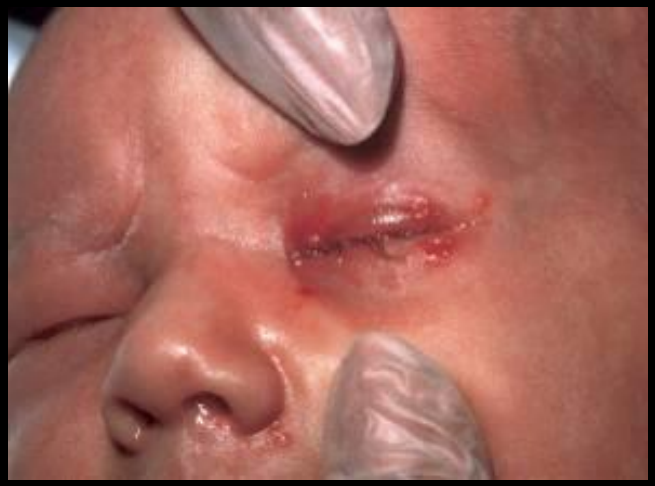
- Aka Drug Hypersensitivity Syndrome
- 2-6 wks after starting medication

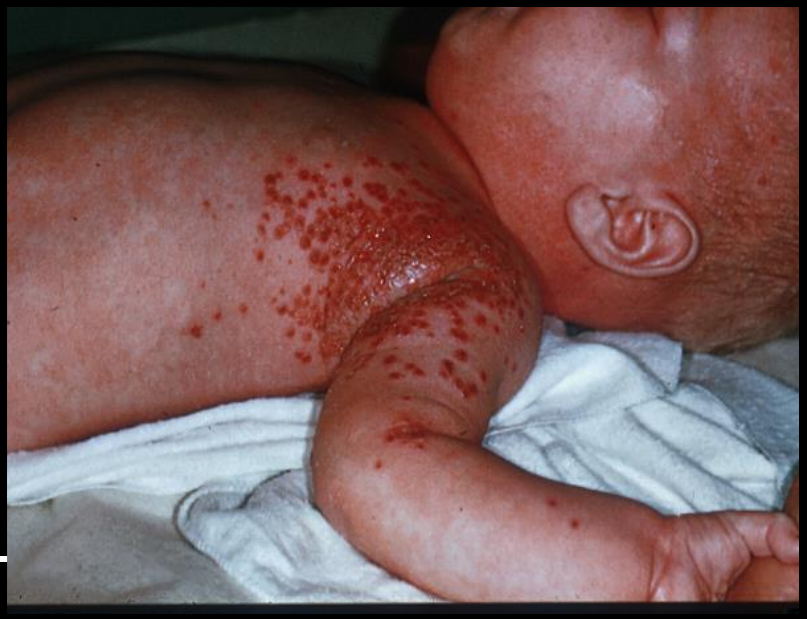
- Fever, malaise, LAD
- Edema → erythema, pruritus
- Can also resemble TEN
- Most common systemic = Hepatitis
- Atypical lymphocytosis, eos

- Common offending agents: Aromatic anticonvulsants, sulfonamides, minocycline
- Discontinue medication
- +/- Systemic steroids



Herpes Simplex Virus

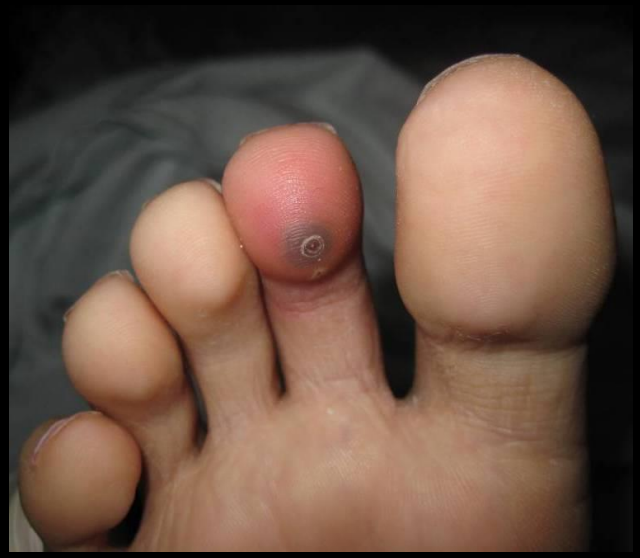




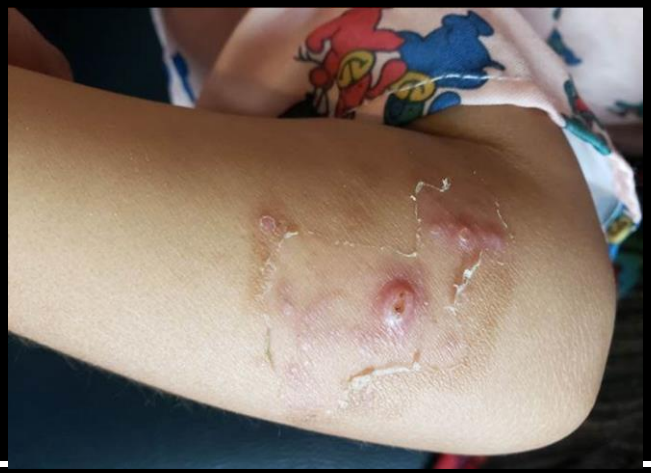
- Typically grouped vesicles on erythematous base, but have high index of suspicion in neonates
- Can become pustular within 1-2 days, widespread
- Traditionally divided, but overlap:
  - Skin, eyes, mouth (SEM)
  - CNS
  - Disseminated

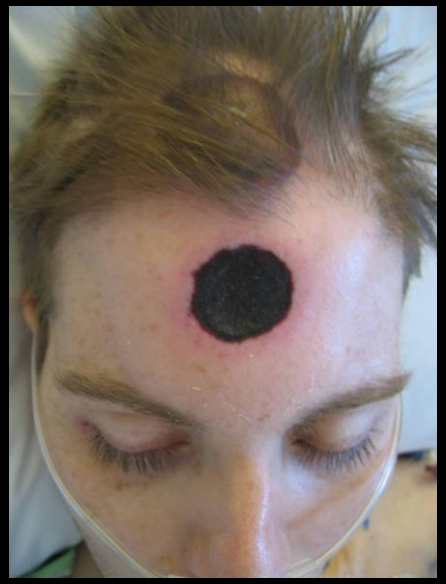
- In children with atopic dermatitis, consider eczema herpeticum if atypical flare
- "Punched-out erosions"
- Often secondary bacterial infxn requiring antibiotics
- Continue to treat eczema with steroids around sites of HSV

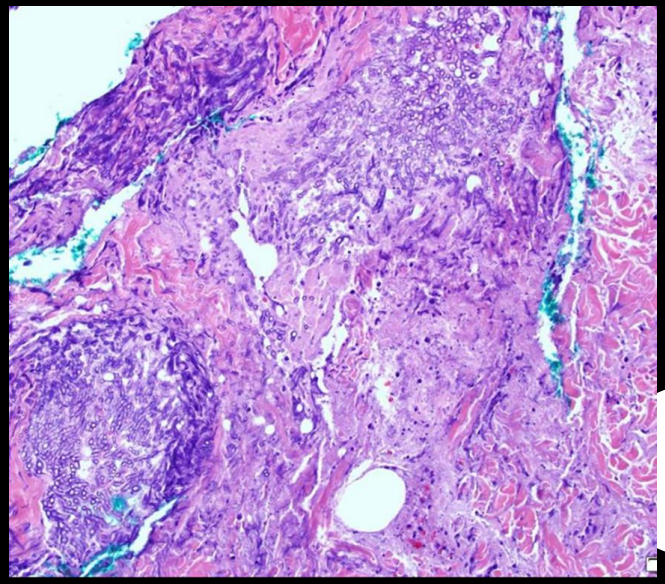
Deep Fungal Infections



- Candida, Aspergillus, Mucor, Fusarium
- Major risk factors:
  - Immunocompromise
  - Cutaneous trauma
- Erythema with necrosis, eschar formation
- Diff Dx: Ecthyma (Pseudomonas), vasculitis
- LOW threshold for biopsy!







Peds Derm Quiz Cases: What's the Diagnosis?

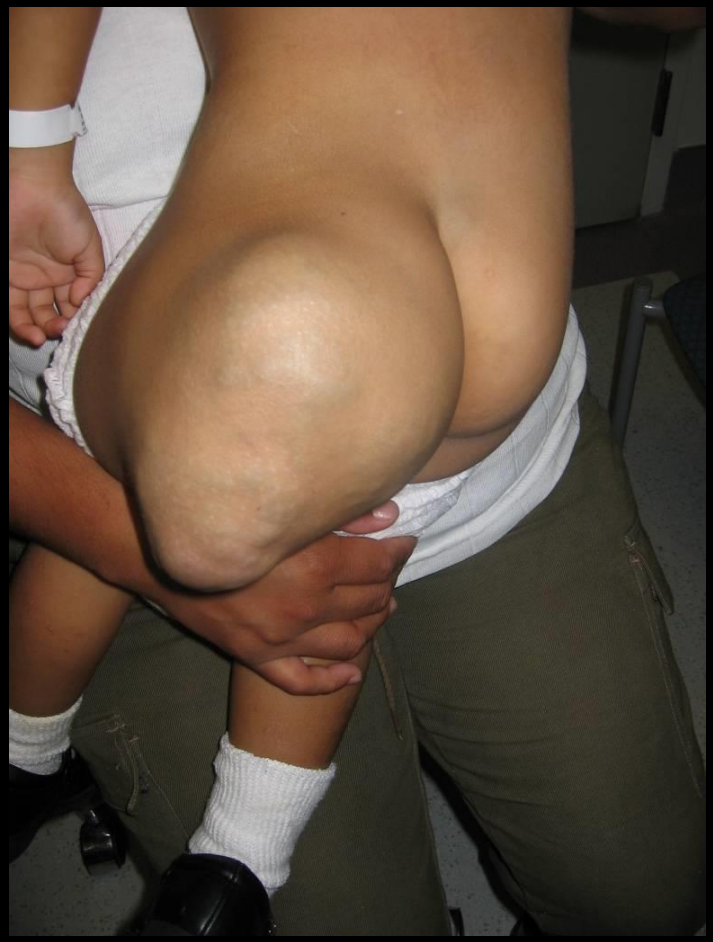
A 4 yo girl has had this large, firm mass since birth. The mass has never changed in size, but intermittently becomes swollen and painful. What is the diagnosis?

A) Hemangioma

B) Lipoma

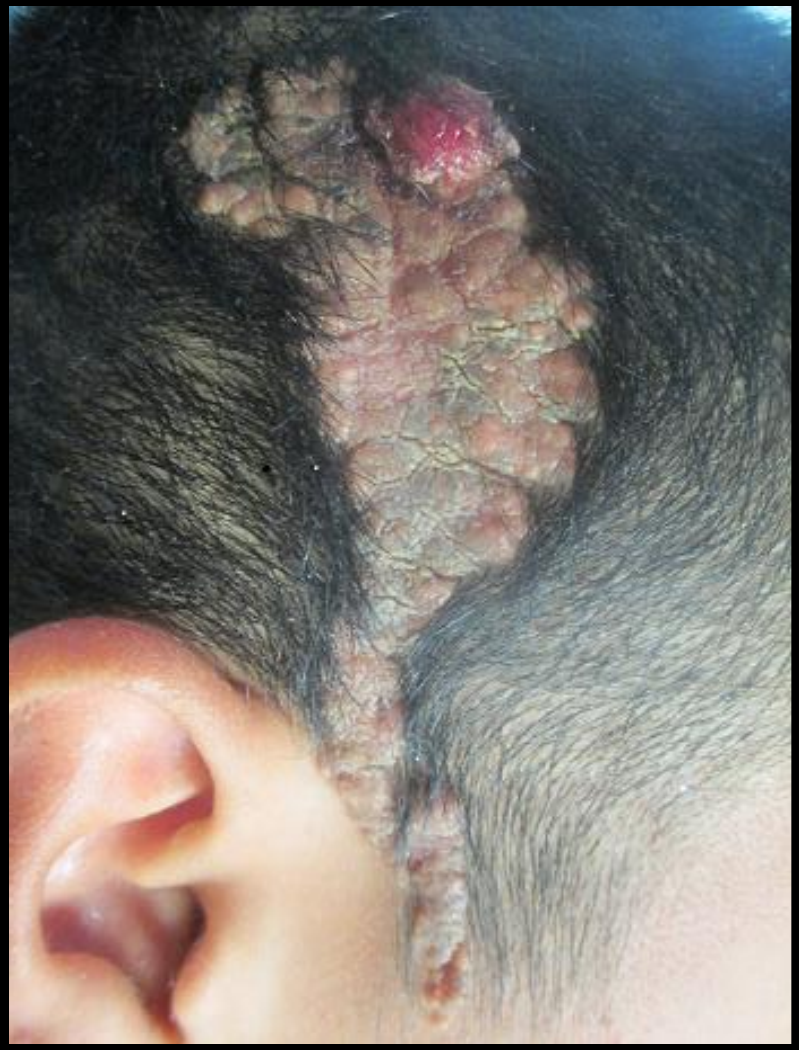
C) Rhabdomyosarcoma

D) Vascular (venous) malformation

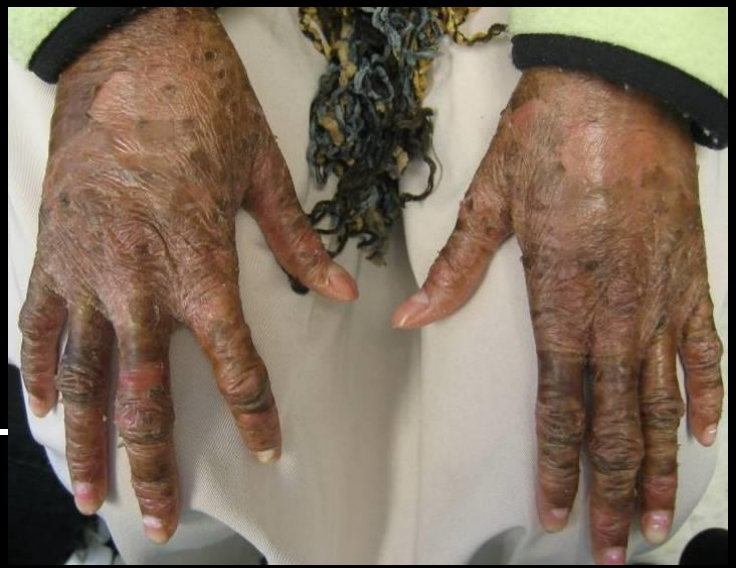


This patient was born with a smooth hairless plaque at her scalp, which has been thickening in adolescence. What is the diagnosis?

A) Aplasia cutis
B) Epidermal nevus
C) Nevus comedonicus
D) Nevus sebaceus



These siblings, immigrants from Somalia, have a lifelong history of diffuse scale and xerosis (dryness) over their entire bodies, accentuated at their faces, hands and feet, with ectropion. What is the diagnosis?



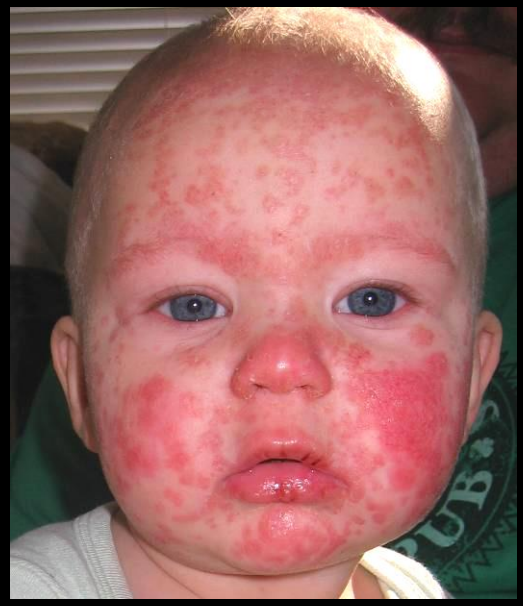
A) Allergic contact dermatitis

B) Congenital ichthyosis

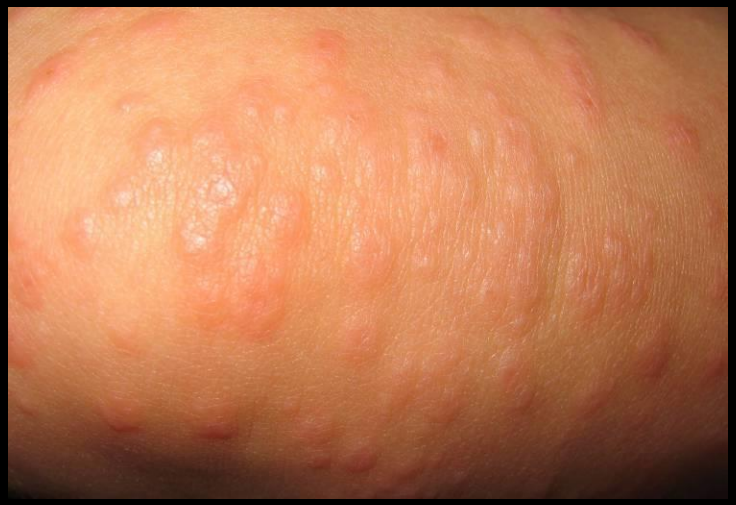
C) Difficult adjustment to desert climate

D) Severe atopic dermatitis

A well-appearing boy is hospitalized for this progressive asymptomatic eruption, present for 3 weeks. It involves the face, extensor arms, buttocks and legs, sparing the trunk. What is the most likely diagnosis?

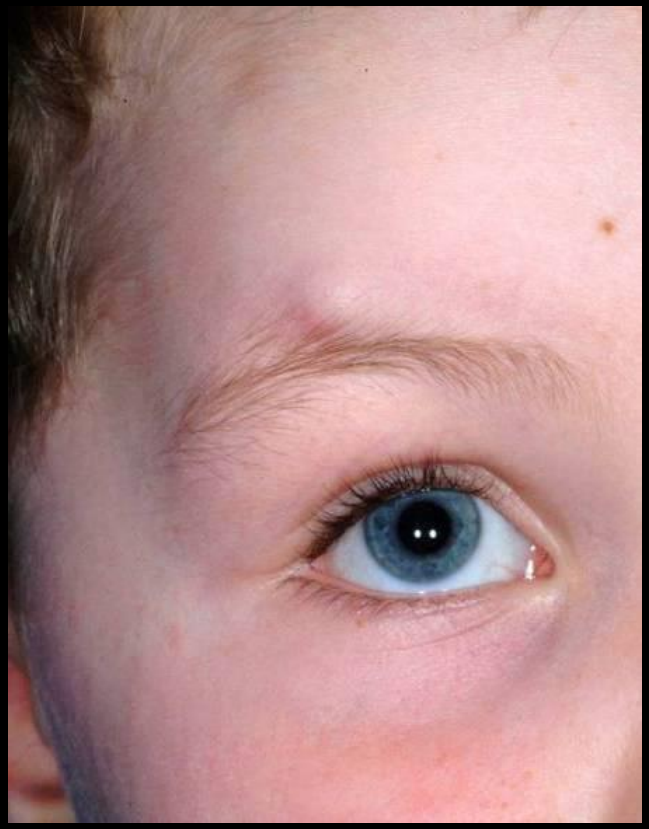


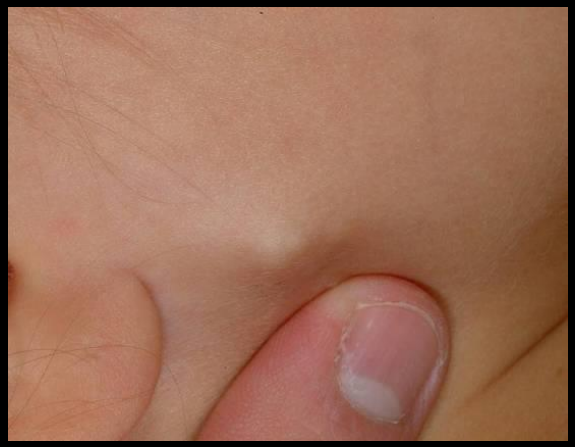
A) COVID-19 Infection
B) Gianotti-Crosti syndrome (Papular acrodermatitis)
C) Pustular Psoriasis
D) Urticaria
E) Varicella



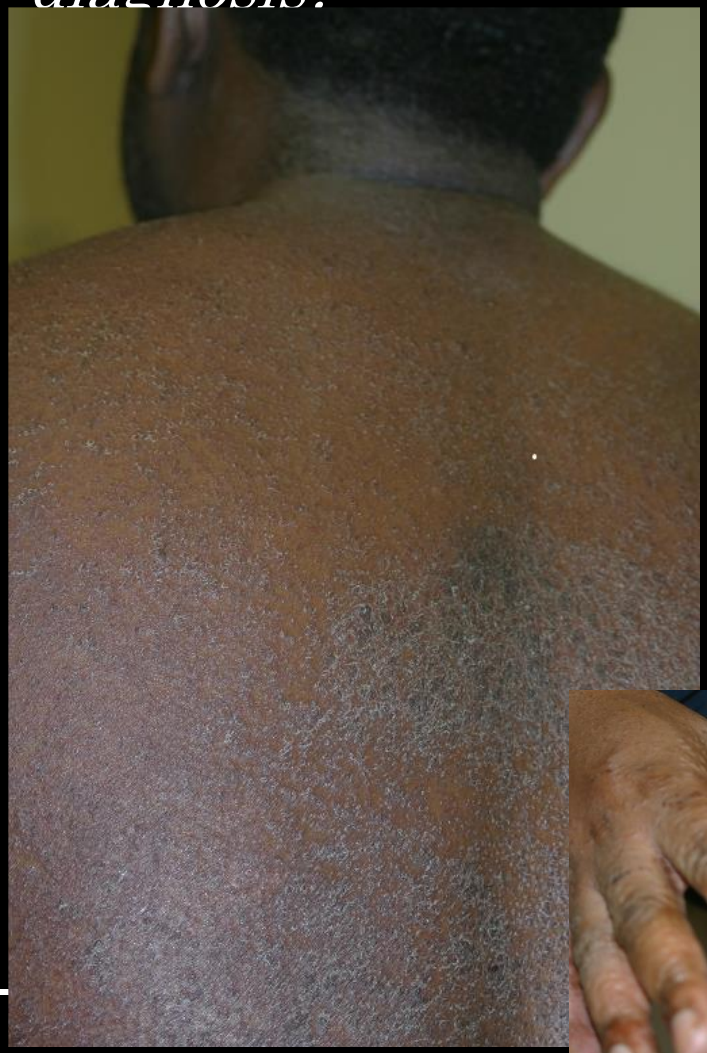
This healthy boy presents with a slightly tender bluish nodule enlarging over several months. It is rock-hard on palpation, and exhibits a "see-saw" sign. What is the diagnosis?

A) Cystic acne
B) Dermoid cyst
C) Epidermal cyst
D) Pilomatricoma





An 8-year-old boy presents with this diffuse pruritic (itchy) eruption. On exam, you also note what looks like allergic contact dermatitis to his belt buckle. What is the diagnosis?

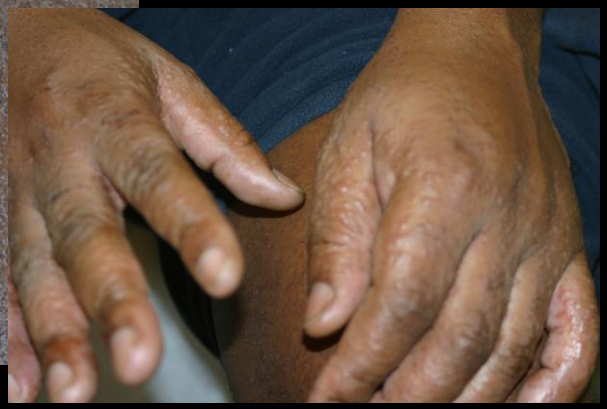


A) Dermatophytid ("Id") Reaction

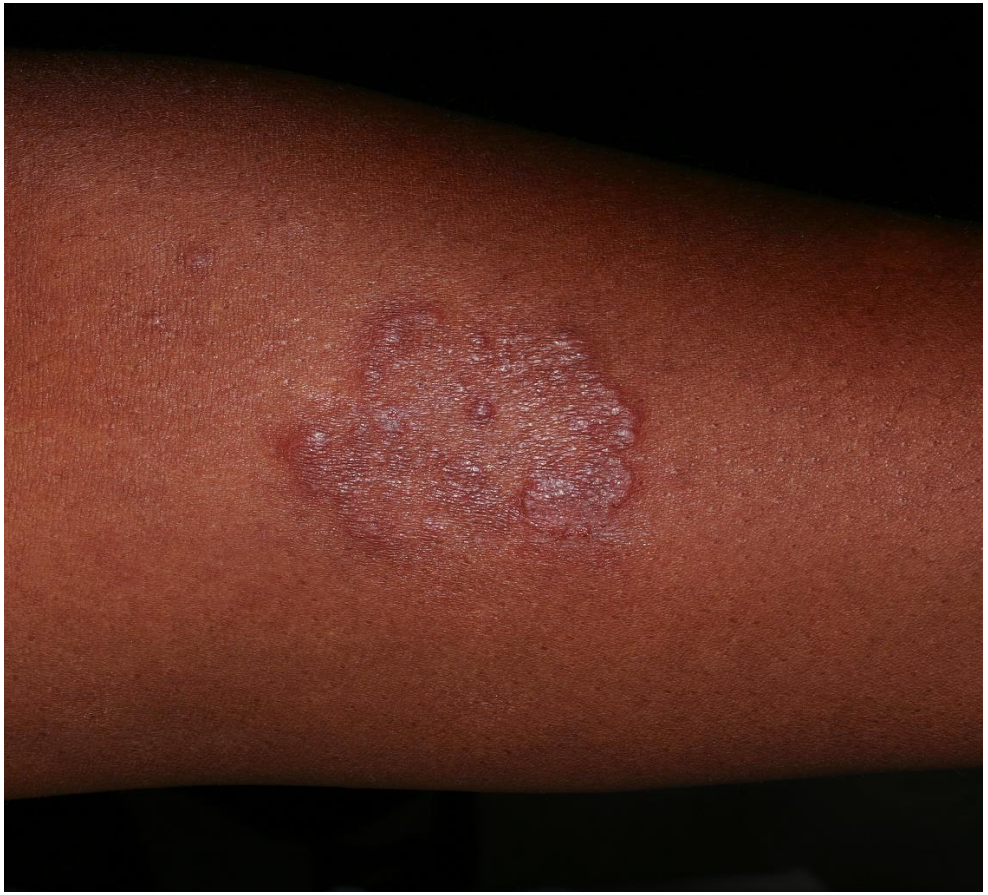
B) Flat warts

C) Molluscum contagiosum

D) Urticaria



This ring-shaped dermal plaque has been present for several months in a healthy preteen. It is asymptomatic, firm, but not rock-hard. What is the diagnosis?



A) Abscess

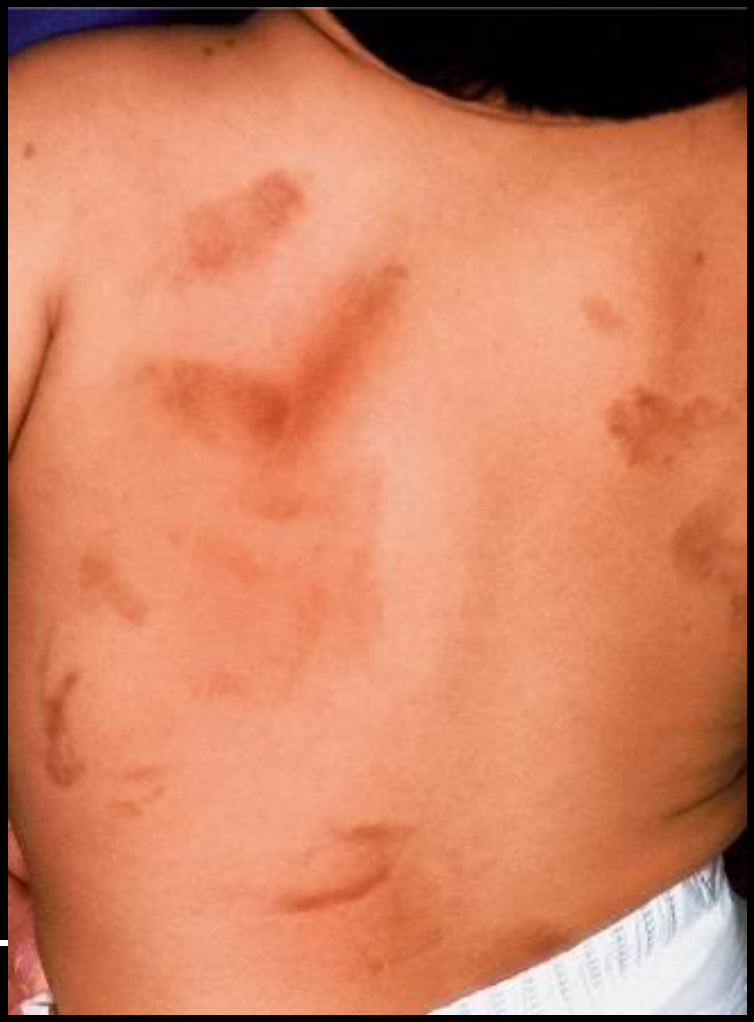
B) B-cell lymphoma

C) Discoid lupus

D) Granuloma annulare

E) Tinea corporis

This 9-month-old girl developed bizarre tan patches on her back after returning from a vacation with her parents in Mexico. What is the diagnosis?



A) Child abuse
B) COVID-19 infection
C) Cupping
D) Phytophotodermatitis
E) The magic marker sign (ie just wash it off)

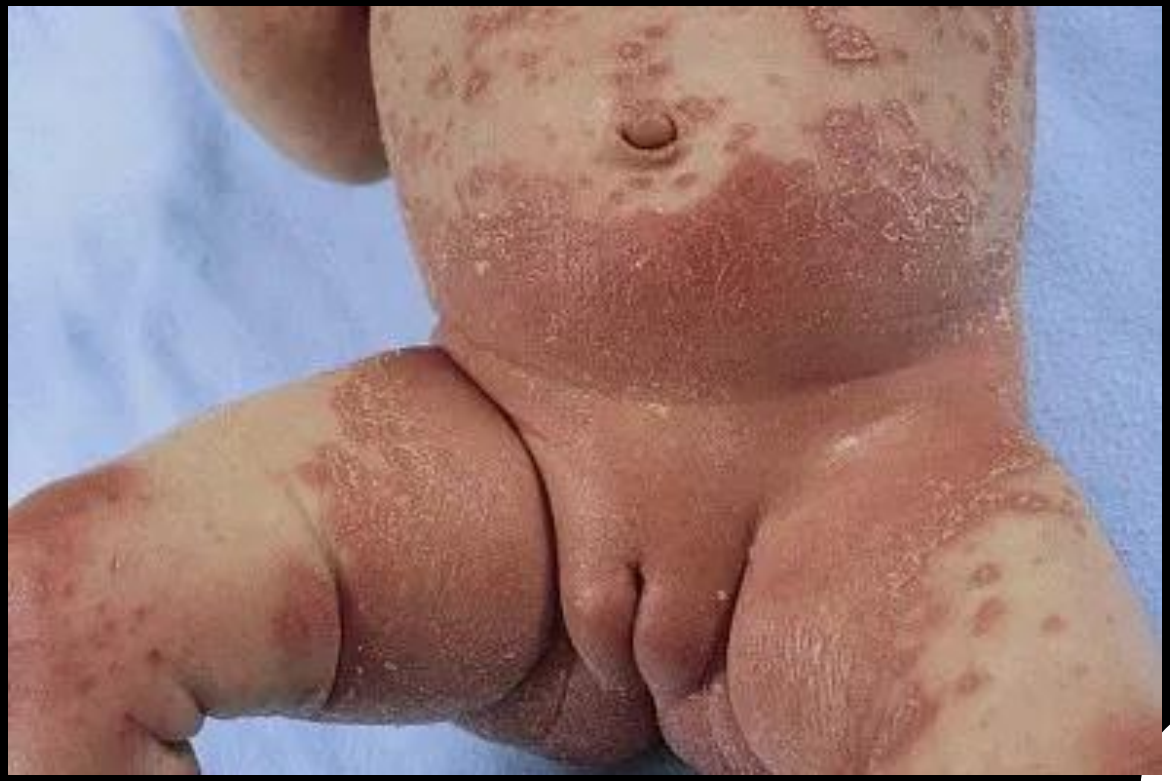
This healthy infant presents with a progressive scaly eruption which started in the diaper area. There is a history of "flaky scalp" in several close family members. What is the diagnosis?

A) Atopic dermatitis

B) Langerhans cell histiocytosis

C) Psoriasis

D) Scabies



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THANK YOU!