

Atopic Dermatitis/Eczema: its Peculiarities

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Raise your hand if you don't know what "eczema" is

- **Hint: A syndrome characterized by pruritus*, erythema (pale to violaceous hues), scaling, thickening (macules to patches, to plaques), fissuring, lichenification, vesiculation ("mini" to bullae), erosion, oozing, crusting and excoriations.**

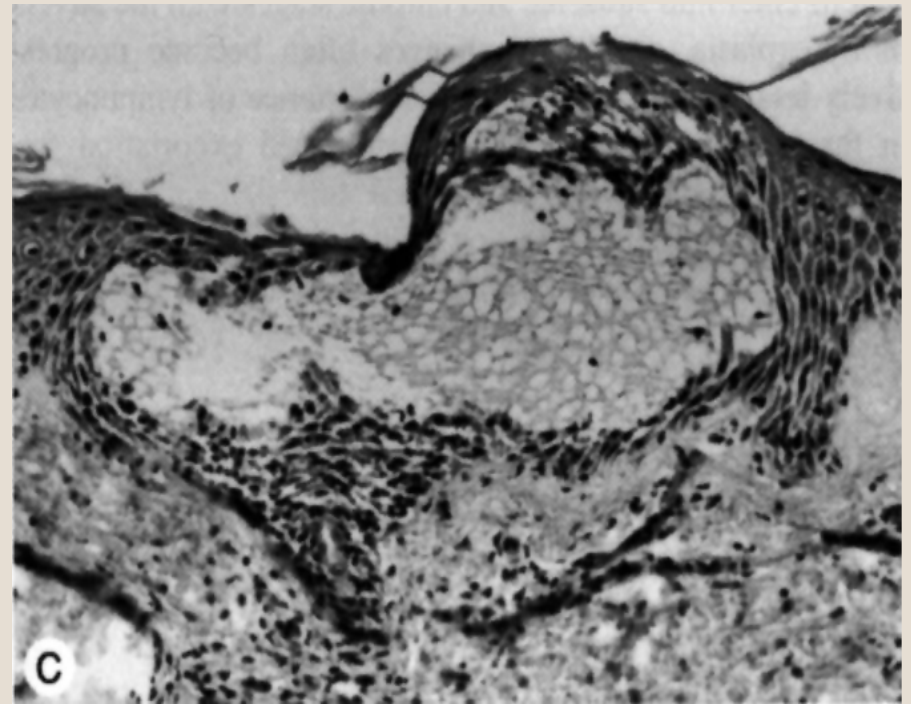
Eczema Histology

- **The hallmark is spongiosis (epidermal intercellular edema)**
- **Microvesiculations (that translate into “minivesicles” clinically).**
- **Dermal infiltration characterized, during the acute phase, by T-lymphocytes (a few macrophages; rare eosinophils, basophils and neutrophils).**



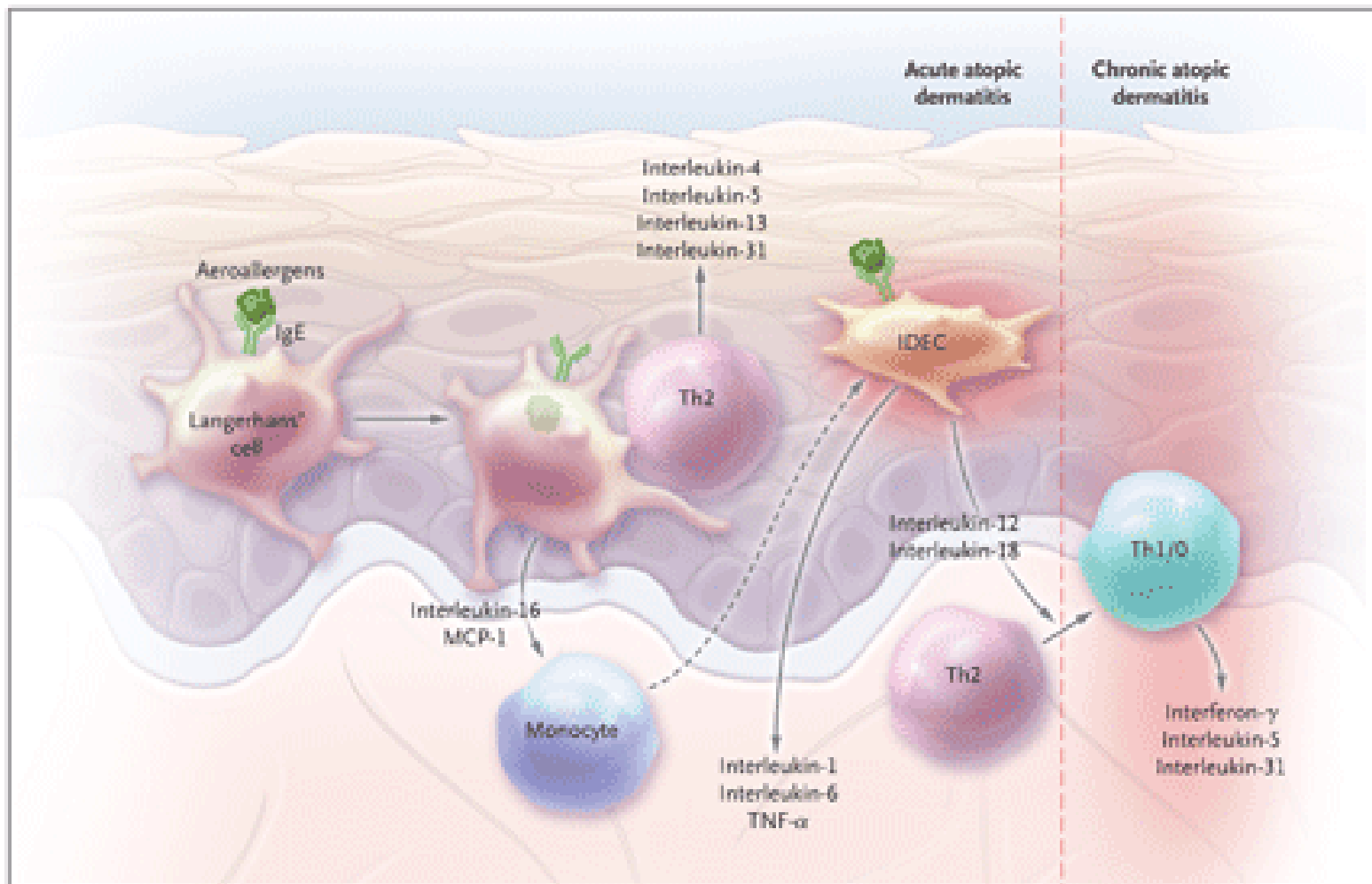
Histopathology of Acute AD

- Spongiosis
- Perivenular T-cell infiltrate with few macrophages
- Rare eosinophils, basophils and neutrophils



AD: Immunopathogenesis

- **An IgE dependent late phase reaction ensues: eosinophils, neutrophils, and mononuclear cells are recruited by adhesion molecules to infiltrate perivenules.**
- **Scratching releases of auto-antigens from keratinocytes, to which atopics react with IgE, perpetuating the reaction.**



Eczematous Dermatitis: 1/4

- **Atopic Dermatitis**
- **Intrinsic or Constitutional Eczema**
- **Infantile Eczema (& plantar Dermatitis)**
- **Discoid / Nummular / Patchetoid Eczema**
- **Lichen Simplex Chronicus**
- **Prurigo Nodularis**

Eczematous Dermatitis: 2/4

- **Eczema Craquelée / Cannalée**
- **Exudative Disciform Dermatitis**
- **Stasis Dermatitis**
- **Auto-eczematization**
- **Frictional Eczema (Jogger's Nipples, etc.)**
- **Dyshydrotic Eczema / Pompholyx**

Eczematous Dermatitis: 3/4

- **Palmar / Plantar Dermatitis**
- **Eyelid Dermatitis**
- **Follicular Eczema**
- **Xerosis / Ichtyosis Vulgaris**
- **Pruritus Senilis / Winter Itch**
- **Esteatotic / Xerotic Eczema**
- **Pityriasis Alba**
- **Keratosis Pilaris**

Eczematous Dermatitis: 4/4

- **Seborrheic Dermatitis**
- **Tineas**
- **Contact Dermatitis - Allergic**
- **Contact Dermatitis - Irritative**
- **Chronic Irritant Dermatitis**
- **Actinic Reticuloid**
- **Mycosis Fungoides / CTCL**
- **PsEma (Psoriasis / Eczema Overlap)**

Eczematous Dermatitis: Genetic & Metabolic

- Trisomy 21
- Anhidrotic epidermal dysplasia
- Netherton syndrome
- Genetic hearing loss
- Agammaglobulinemia
- Hyper IgE syndrome
- Wiskott-Aldrich synd.
- Ataxia-telangiectasia
- Nephrotic synd.
- Celiac disease
- Cystic fibrosis
- Histidine depletion (experimental)
- Phenylketonuria
- Hurler syndrome
- Jung's disease

Ecematous Dermatitis: Drug-Induced

- Antimalarials
- Barbiturates
- Captopril
- Carbamazepine
- Chlorpropamide
- Cimetidine
- Furosemide
- Gold
- Isoniazid (INH)
- Lithium
- Methyldopa
- NSAIDs
- Penicillamine
- Phenothiazines
- Phenytoin
- Quinidine
- Sulfas
- Thiazides
- Tolazamide
- Anti TNF- α

Atopic Dermatitis (AD)

Definition

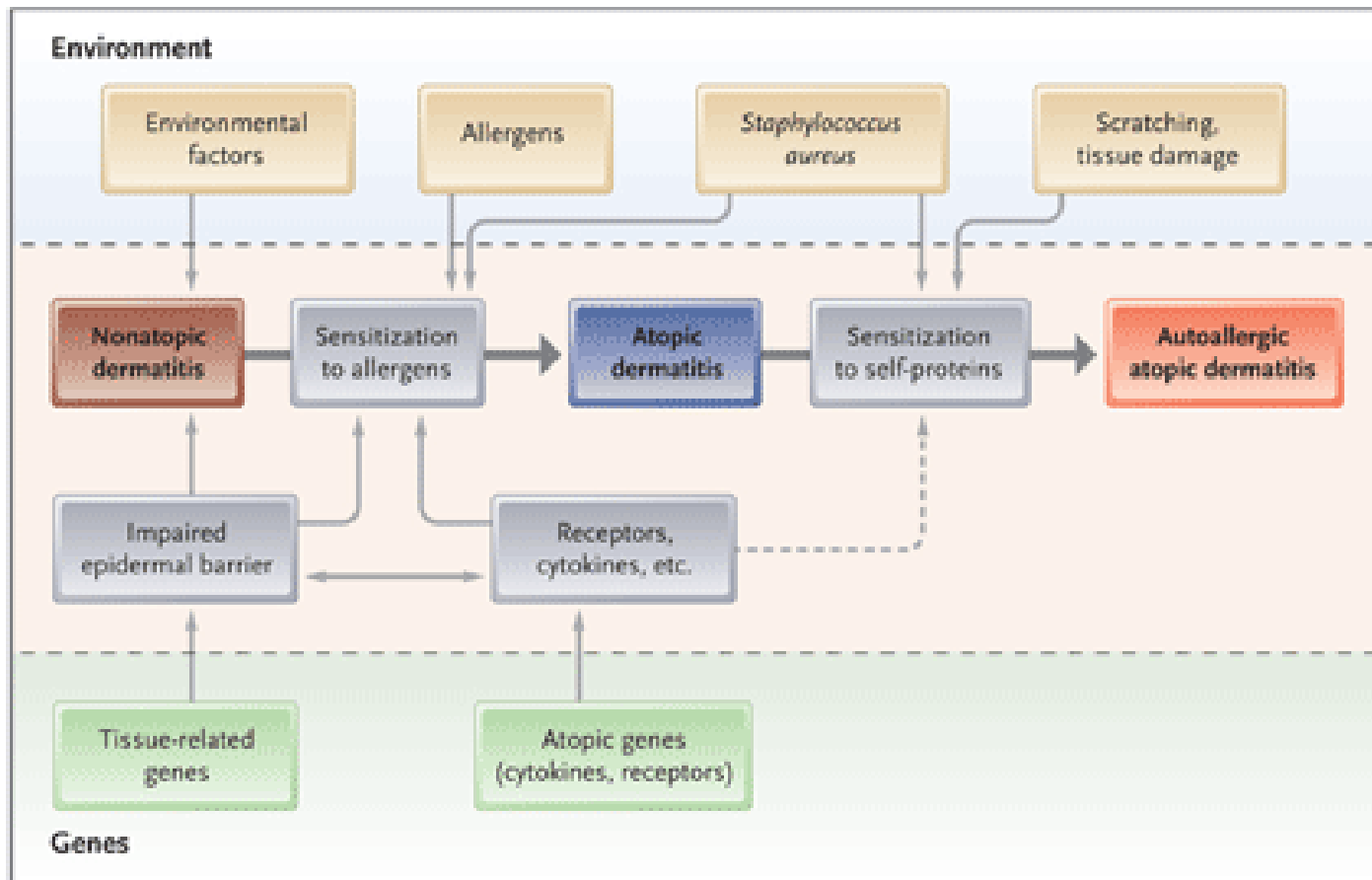
- A genotypic diathesis where minor skin stimulation is distortedly perceived as itch, which when scratched or rubbed elicits the dysregulated immune response that leads to the development of “eczema”.

“The itch that rashes”

Raise your hand if you don't know what AD is

- **Hint: a disease characterized by chronic or relapsing eczema in a distribution pattern that varies with age (facial in children and the elder, flexural in younger adults), in those with a personal or familial history of atopy; who usually meet some of 23 minor criteria.** Hanifin & Rajka

Atopic vs. Non-Atopic Dermatitis



Is “Pruritis” one of the major criteria for AD?

- No, but pruritus is.

And so are:

- Eczemas of typical morphology and distribution
- Chronic or relapsing
- Personal or family history of asthma, allergic rhinitis and atopic dermatitis

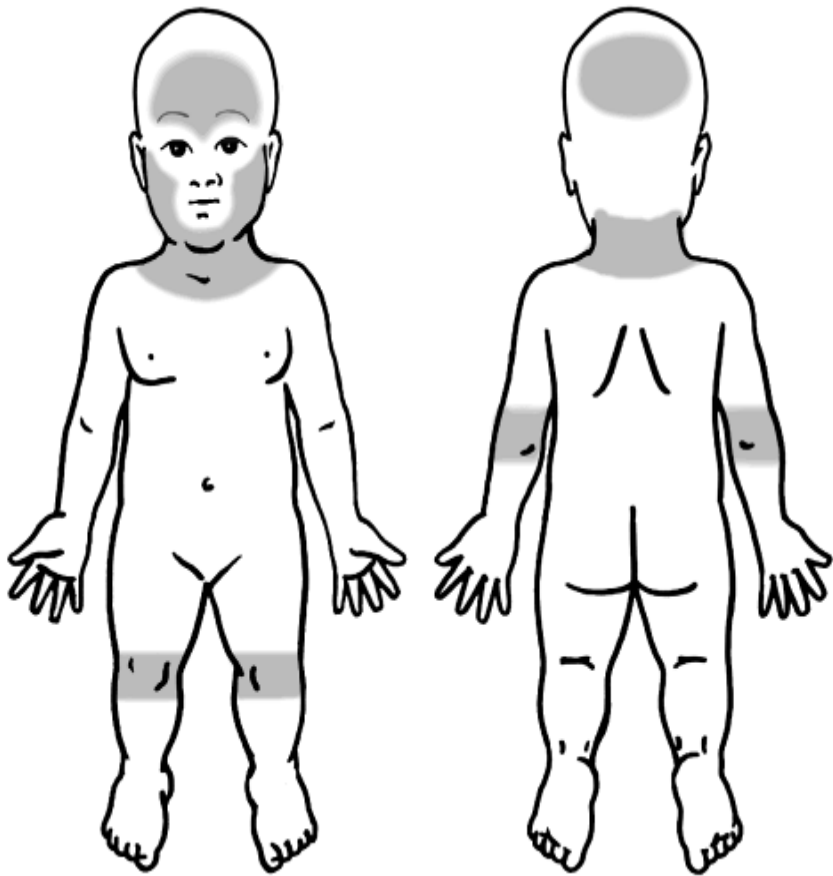
AD: Diagnostic Criteria 1/4

- **Essential Features: (Formerly “Major”)**
(Must be present and, if complete, are sufficient)
 - Pruritus
 - Eczematous changes
 - i. Typical & age-specific patterns*
 - ii. Chronic or relapsing course

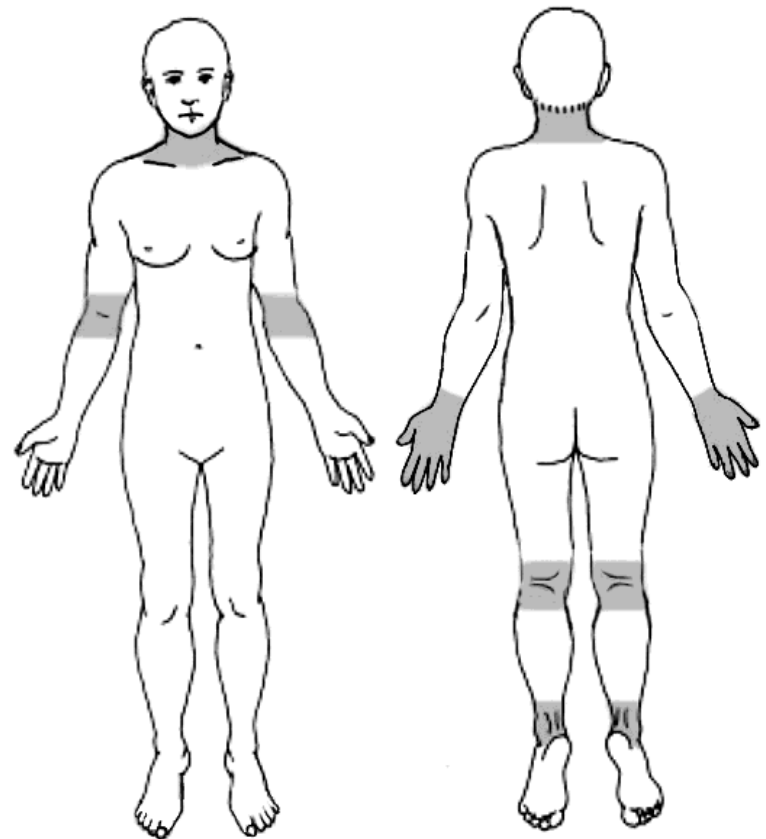
*Facial, neck and extensor involvement in infants & children.
Current or prior flexural lesions in adults and any age.
Sparing of the groin and axillary regions

AD: Age-specific distribution

Infancy and Childhood



Adolescents and Adults



AD: Diagnostic Criteria 2/4

- **Important Features:**
(Seen in most cases, add support to the diagnosis)
 - **Early age of onset**
 - **Atopy (IgE reactivity)**
 - **Xerosis**

AD: Diagnostic Criteria 3/4

- **Associated Features (Clinical Associations):**
(Suggestive but too non-specific to define or detect AD for research or epidemiologic studies)
 - Keratosis pilaris / ichthyosis / palmar hyperlinearity
 - Atypical vascular responses
 - Perifollicular accentuation / lichenification / prurigo
 - Ocular / periorbital changes
 - Perioral / periauricular lesions

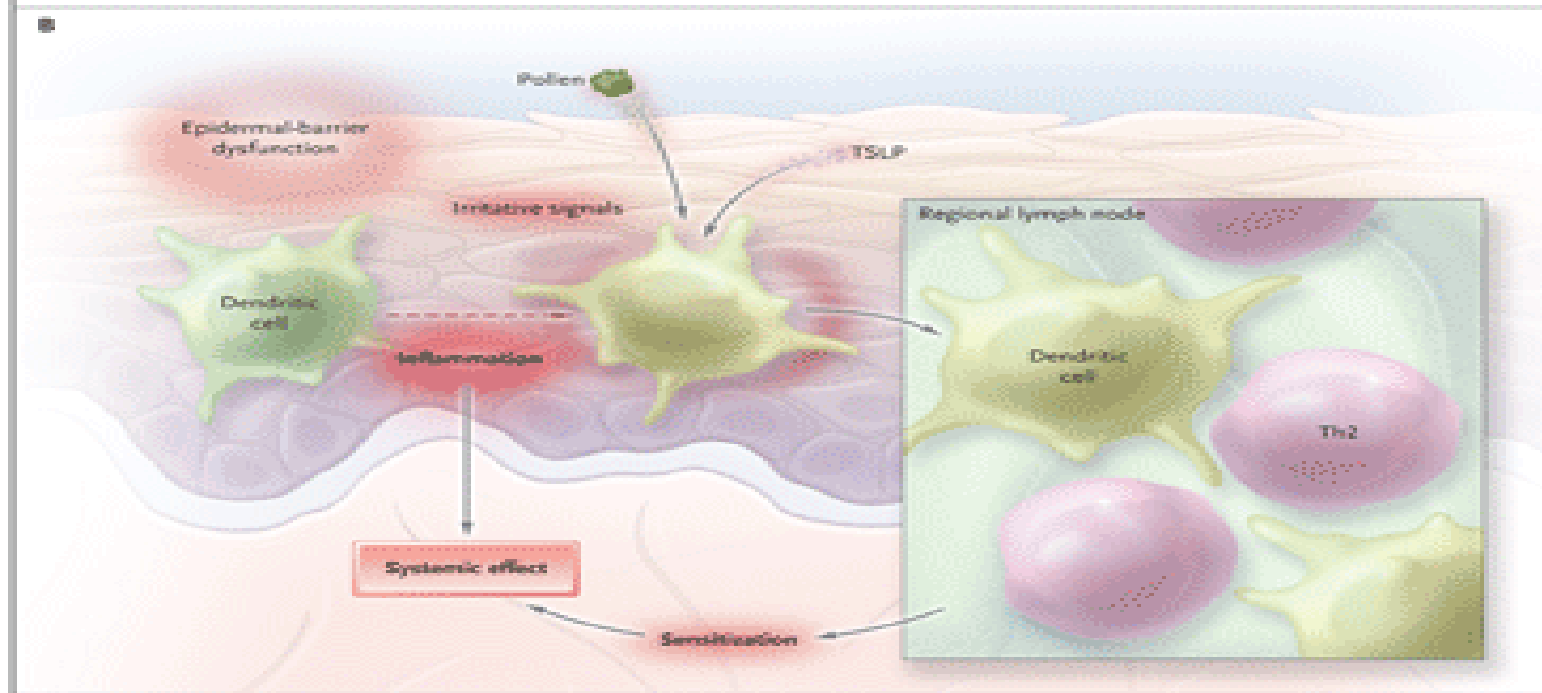
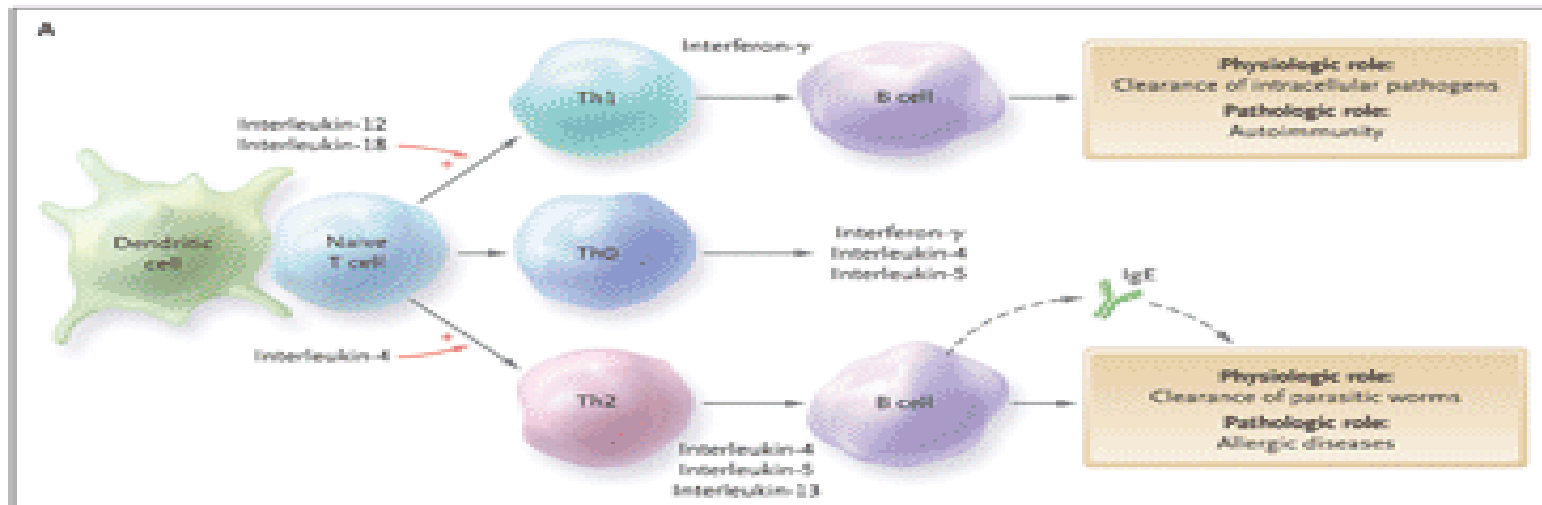
AD: Diagnostic Criteria

(Expanded) ^{4/4}

- + Prick test
- ↑ serum IgE
- ↑ skin infections
- Impaired CMI
- Hand eczema
- Foot eczema
- Nipple eczema
- Cheilitis
- Conjunctivitis
- Keratoconus & anterior sub-capsular cataracts
- Facial pallor
- Facial erythema
- Pityriasis Alba
- Neck folds involvement
- Itch when sweating
- Wool intolerance
- Solvent intolerance
- Skin reaction to food
 - ingested
 - by contact
- Environmental factors
- Emotional factors
- White dermographism:
 - lesional
 - non-lesional
- Delayed blanching
- Angular cheilitis
- Digital pulpitis
- Juvenile plantar dermatitis
- Scalp dermatitis

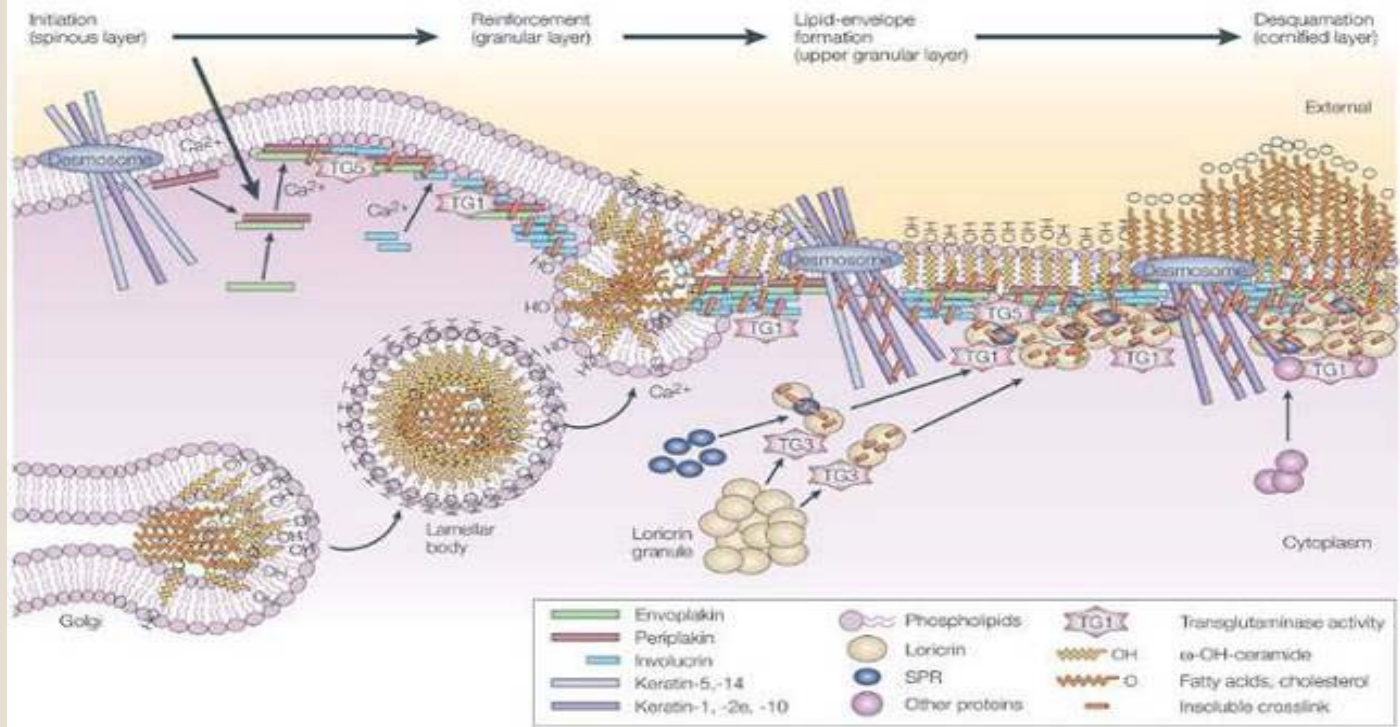
Raise your hand if you don't know what "atopy" is

- **Hint: A genetic predetermination to develop asthma, allergic rhinitis or AD, based on the ability to mount IgE mediated immune responses to common allergens. It implies that the reactions occur beyond the site of the exposure. (cont)**



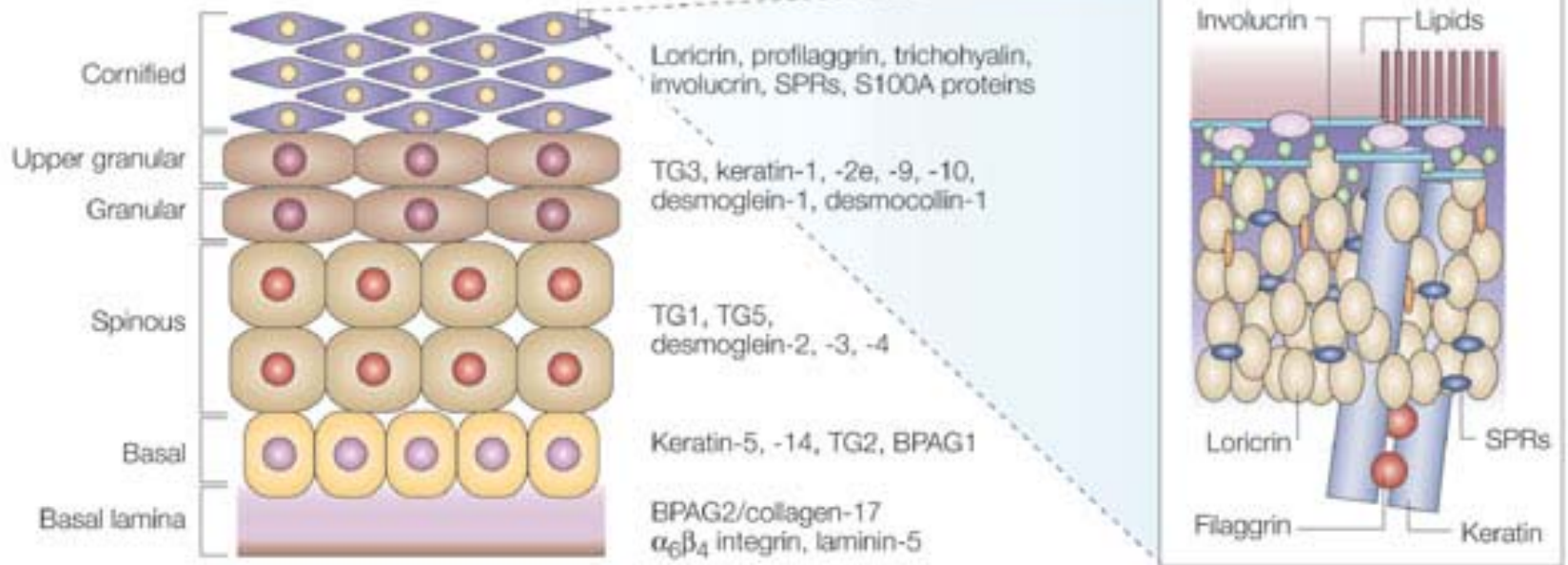
Atopy: Definition (by the AAAAI)

- This reflects the many dynamic processes of inflammation, tissue injury and repair triggered by the interaction of IgE with its high-affinity receptor on mast and other effector cells.



Nature Reviews | Molecular Cell Biology

Formation of the cornified envelope: The initiation stage takes place in the spinous layer, and involves the synthesis of the cornified-envelope structural proteins and the synthesis and extrusion into the intercellular space of specific lipids. Transglutaminase (TG)1 and TG5 crosslink envoplakin and periplakin under the cell membrane, thereby anchoring them to the desmosome. The second step is the reinforcement phase, it takes place in the granular layer, and entails the covalent attachment of some lipids to cornified-envelope proteins, and the crosslinking of loricrin to small proline-rich proteins (SPRs) by TG3 and TG1. Heavy crosslinking occurs on the desmosome, where these proteins function as substrates for TGs. Next, the formation of the lipid envelope, also in the granular layer, lipids from the lamellar body, derived from the Golgi, are attached and crosslinked by TG5 and TG1 on the already crosslinked proteins (envoplakin, periplakin, involucrin) and exposed on the outside of the membrane. The reinforcement and lipid-envelope-formation steps take place concomitantly. Finally, the desquamation phase takes place in the cornified layer, involves further crosslinking of loricrin and other proteins by TG1 on the protein scaffold, and the extrusion of α -OH-ceramides, fatty acids and cholesterol. The physical properties of the cornified envelope depend on the nature of the substrates and on the crosslinks, as well as the lipid deposition. (With permission from Macmillan Publishers Ltd: Nature Reviews. 2005 Apr (6): 328-40.)



Nature Reviews | Molecular Cell Biology

Terminal differentiation and apoptosis in the epidermis: Proteins expressed in particular locations in the epidermis during skin differentiation are shown. Apoptosis is restricted to the basal layer. Cornification occurs in the supra-basal layers, to form a cornified envelope (inset). At the molecular level, the cornified envelope is formed by proteins [highly crosslinked by transglutaminases], with specific lipids on the outside, to guarantee specific physical properties. Bullosus Pemphigoid Antigen; Small Proline-Rich proteins; Transglutaminase. (With permission from Macmillan Publishers Ltd: Nature Reviews. 2005 Apr (6): 328-40.)

Pathogenesis of Eczema

Multifactorial

- Activation of multiple immunologic and inflammatory pathways¹
- Transepidermal water loss²
- Changes in the pH of the stratum corneum²
- Impaired lipid metabolism²

Genetics

- Role in epidermal barrier defect³
- Moderate to severe eczema
 - $\geq 50\%$ of children carry filaggrin gene mutations³

1. Leung DYM, et al. *J Clin Invest.* 2004;113:651-657. 2. Lipozenčić J, Wolf R. *Dermatol Clin.* 2007;25:605-612.
3. Irvine AD, McLean WHI. *J Invest Dermatol.* 2006;126:1200-1202.

Raise your hand if you don't know what intrinsic eczema is

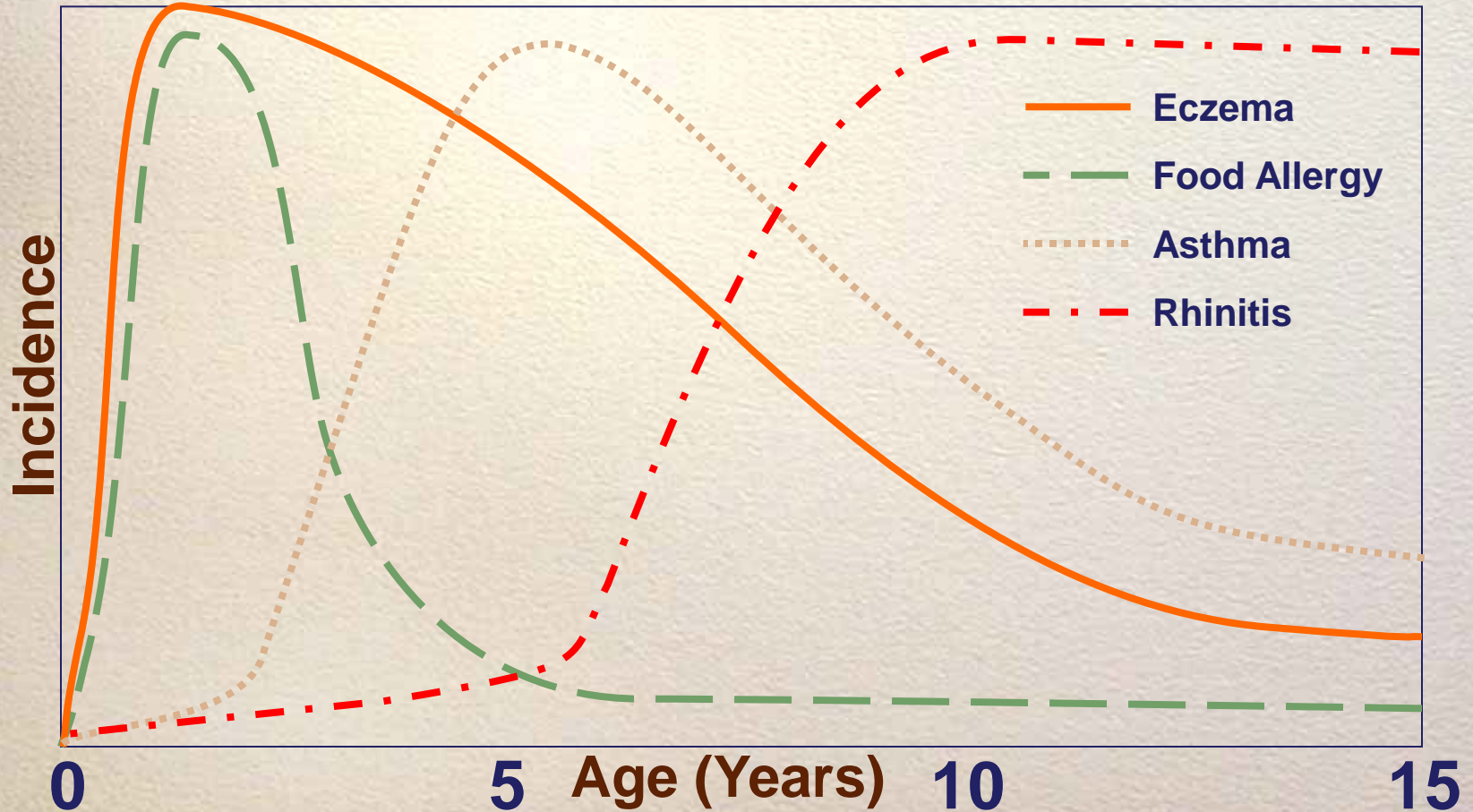
- **Hint: Eczema in patients with normal IgE levels, a lack of sensitization to environmental allergens, and absence of associated respiratory allergies (asthma & hay fever/rhinitis).**
- **It represents 5.4 to 20% of “AD” patients diagnosed on clinical grounds**
 - Fölster-Holz R, et al. Allergy 2006;61(5):629-32

Is the “atopic march” the natural progression of AD?

- AD starts at age 2 years in boys and 2.5 in girls.
- Scalp > forehead > ears > neck > extensor sides & trunk > flexor sides of the extremities.
- From a prospective study of 411 infants of asthmatic mothers.

– Halkjaer LB, et al. Arch Dermatol. 142(5):633-7

Is the “atopic march” a gait peculiar to atopics?



With permission from Barnetson RSC, et al. *BMJ*. 2002; 324:1376-1379.

Is the “atopic march” is a guy thing?

- AD in the first 2 years is associated with an increased risk of childhood asthma in boys but not in girls.
- 620 with family Hx. Prospective study.
- An intervention then may prevent asthma in as many as 28%.

– Lowe AJ, et al. 2008;121(5):1190-5

How does “old” AD look?

- Among 16 77(+/-6) y/o, 3/1 M/F ratio, the mean age of onset was 67(+/-15).
- Erythroderma / chronic eczema: 3/1.
- IgE range: 5-53605. 51% to *D. farinae*.
- Most common on the face, neck, trunk, and extensor sites of extremities. Not on the antecubital or popliteal fossae.

– Tanei R, et al. J Dermatol. 2008; 35(9):562-9

Eczema (& AD) Timelines?

- Hint: Urticaria becomes “chronic” at week 6
- Acute (day 0 to ___)
- Sub-acute (day ___ to ___)
- Chronic (day ___ to ___)
- Relapsing (day 0 to ___) +
(day 0 to ___) x n ???

Eczema (& AD) Timelines?

- **Acute: Red, weepy, etc.**
- **Sub-acute: Something in between acute and chronic**
- **Chronic: Purplish, lichenified, etc.**
- **Relapsing: You know.**

AD comorbidities

- **Schizophrenia**
- **Lupus**
- **Celiac Disease**
- **Hypertension**
- **Ank. Spondylitis**
- **RA**
- **Psoriasis**
- **Alopecia areata**
- **Kawasaki**
- **Cataracts/keratoconus/retinal detachment**

How should we measure the severity of the AD?

- **The answer is EASI
(SCORAD or POEM).**

– Schmitt J, et al. J Allergy Clin Immunol.
2007;120(6):1389-98

Eczema Area and Severity Index (EASI)

A composite scoring system assessing:

I. The severity of the four key signs of AD:

- erythema**
- infiltration/papulation**
- lichenification**
- excoriations**

on a 4-point scale (0 [none] – 3 [severe])

II. The BSA affected in four body regions:

- head/neck**
- trunk**
- upper extremities**
- lower extremities**

The EASI score can range from 0 (no disease anywhere) to 48 (severest possible disease [3 x 4] on all 4 body regions)

Investigator's (Lesional) Global Severity Score (IGSS)

Score	Grade	Definition
0	Clear	No inflammatory signs of AD
1	Almost Clear	Just perceptible erythema and just perceptible papulation/induration
2	Mild	Mild erythema and mild papulation/induration
3	Moderate	Moderate erythema and moderate papulation/induration
4	Severe	Severe erythema and severe papulation/induration
5	Very Severe	Severe erythema and severe papulation/induration with oozing/crusting

Tools to Assess AD Severity

- **EASI** (Eczema Area & Severity Index)
- **SCORAD** (Scoring AD)
- **SASSAD** (Six Areas Six Signs of AD)
- **IGA** (Investigator's Global Assessment)
- **IGSS** (Investigator's Global Severity Score)
- **IASS** (Investigator's Assessment of Severity by Sign)

Tools to Assess AD Severity

- **mLEASI** (modified Local EASI)
- **TIS** (Tree-Item Severity score)
- **ADASI** (AD Area and Severity Index)
- **W-AZS** (Something in Croatian)
- **HARD** (the EASI made complicated by WA)
- **ETC.** (and the rest)
- **VAS** (visual analog scale - for itch)

How can one tell if PSEMA is psoriasis or AD?

- IL-22 expressing T cells (CD8+) = AD
- IL-17 expressing T cells (T_H 17) = PS
 - Although most of the time seemingly very different clinically sometimes the two conditions have similar morphology.
 - A T_H 2/T_H 22 bias in AD and a T_H 1/T_H 17 bias in Psoriasis
 - Nograles KE et al. J Allergy Clin Immunol 2009 Jun 123:1244.

Any other markers for AD?

- **IgE is present in Japanese children AD (8-10%) > dry skin > normal skin.**
- **The levels of total and HDMS IgE prognosticated other atopies even among those with dry or normal skin**

**– Wakamori T et al. Int Arch Allergy Immunol.
2009;149(2):103-10**

Which antibiotics are OK to give to AD patients on yr. 1?

- And the correct answer is: all indicated.
- Systematic and careful (prospective) monitoring of antibiotic (and URI) use did not increase the incidence of AD by yr. 5 among 198 at high risk for atopy

– Kusel MM, Clin Exp Allergy 2008;38(12):1921-8

Is it safe to smoke during pregnancy & post delivery?

- **Sure!**
Unless mom cares about the risk for asthma on her baby; but for eczema it's OK. And we are dermatologists.
- **Among 763 infants prospectively followed.**

– Tanaka K. et al. J Asthma. 2008;45(9):633-8

Is it safe to drink alcohol during pregnancy?

- **Nope!**
- **First, mom can end up in a car wreck.**
- **Second, if she consumes 4 or more drinks/wk. the baby's relative risk for early AD increases 4.2 times.**

– Linneberg A, et al. Clin Exp Allergy.
2004;34(11):1678-83

What's the role of MRSA (& MSSA) in AD?

- **Less than many previously thought.**
- **Although 80% or more AD patients are colonized with S. aureus only about 15% of those have MRSA. Particularly if previously hospitalized or on combined TCIs + TCSs.**

– Suh L. *Pediatr Dermatol.* 2008;25(5):528-34

What is the role of AD in MRSA?

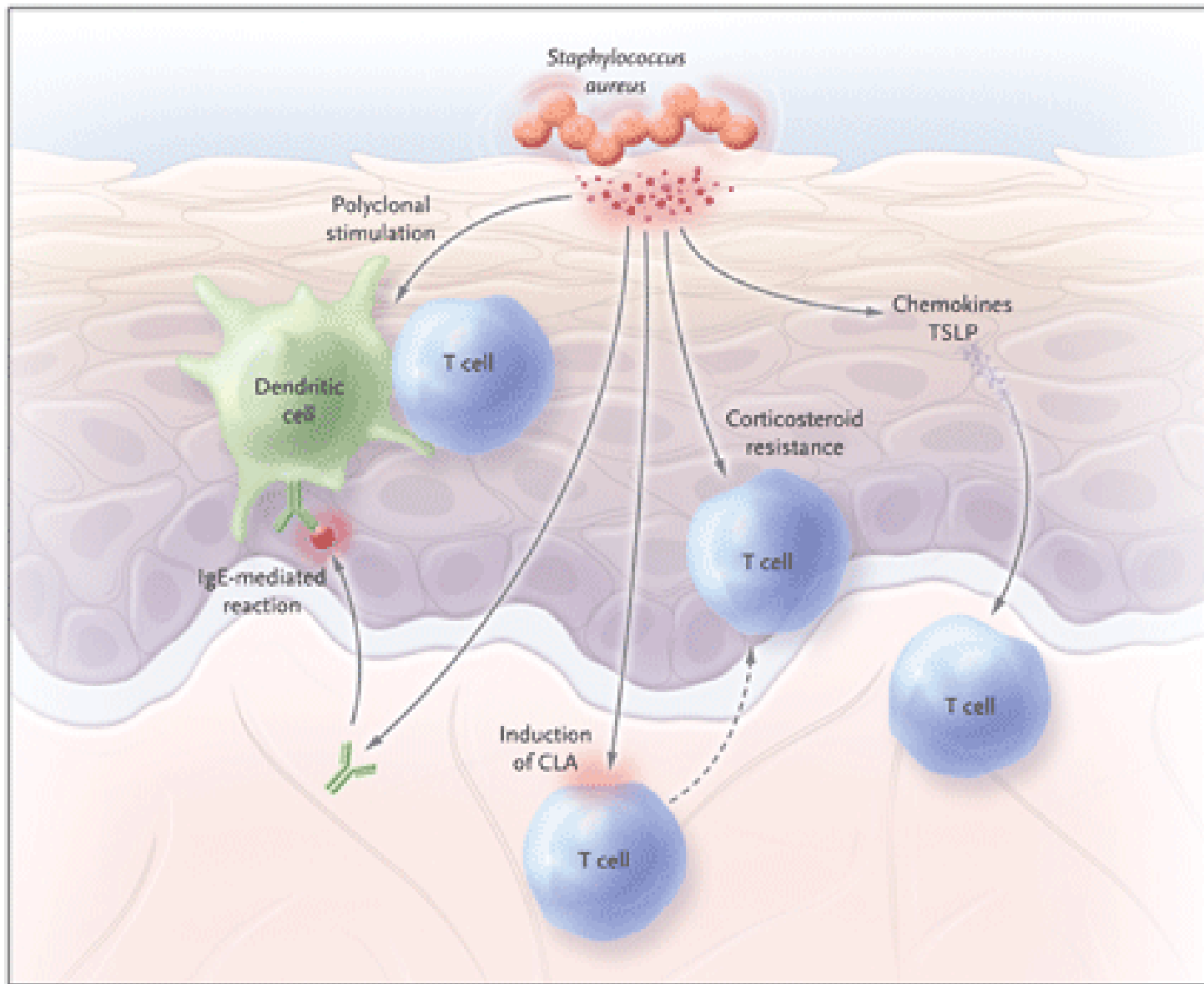
- The skin of children with AD may be a reservoir for MRSA in the community.
- 75% of 115 AD patients grew Sta. 18% of which was MRSA, only one patient had been hospitalized and 2 treated with antibiotics.

– Chung HJ. J Clin Microbiol. 2008;46(3):991-5

Why *S. aureus* recurs in atopic children?

- Because the parents become intra-family reservoirs. Check the nose!
- Of 29 families studied at least one parent carried *S. aureus* in 19 (66%).
- 85% of *Sta.* were of the same type.

– Bonness S, et al. *J Clin Microbiol.*
2008;46(2):456-61



Stubborn AD?

Check the teeth! (& brows)

- Odontogenic infections were found in 30% of patients with unresponsive AD.
- Dental care improved their EASI.
 - Igawa K, et al. Intl J Dermatol. 2007;46(4):376-9
- (The brows you check to rule out Netherton's in case you were about to prescribe tacrolimus ointment).

Check the exhaust pipe too!

- Of 126 patients (7 to 82 y/o) with “anal eczema” 6.3% had AD.
- 46% were patch test positive.
- 43% had intertrigo/candidiasis.
- 3.2 % had psoriasis.

– Kränke B, et al. Wien Klin Wochenshr.
2006;118(3-4):90-4

Candida has a role in AD?

- **None!**
- **Specimens from axillae, groin and tongue of 100 AD patients did not show prevalence increases v. normal or psoriatic.**

– Leibovici V, et al. *Mycoses* 2008;51(1):63-9

How about other fungi?

- **Malassezia IgE antibodies are more common among adults with face and neck AD (12% severe).**
 - Sandström-Falk HM, et al. *Acta Derm Venereol.* 2006;86(2):135-9
- **Mold on house walls too.**
 - Wang, IJ. *Pediatr Allergy Immunol.* 2007;18(5):441-7

ICIs or ICSs. Which increase the risk of lymphoma in AD?

- **The correct answer is:
Corticosteroids (potency related!)**
- **AD is associated with increased lymphoma risk; particularly of the cutaneous type (OR 1.83; [3.72 if referred to dermatology. - more severe?])**

– Arellano et al. J Allergy Clin Immunol. 2009;123(5) 1111-6.

Environmental factors flaring eczema in children:

- **Nylon clothing**
- **Dust**
- **Unfamiliar pets**
- **Sweating**
- **Shampoo**

– Lanagan SM, Silcocks P, Williams HC. Centre of Evidence Based Medicine UK. BJD Online June 5th, 2009.

Where are the house dust mites? On the AD patient.

- **Samples from affected and clinically normal skin of AD patients were obtained over 2 years. And from their bedding and clothing.**
- **82% of AD patients v.14% of controls had at least 1 positive skin sampling.**
- **No correlation with bedding/clothing.**

– Teplitsky V, et al. Intl J Dermatol. 2008;47(8):790-5

AD & location, location, location

- The closer a child lives to a busy street the higher his/her risk for AD.
- Due to NO₂ and pollution particulates
- Worst if home is within 50 m.

– Morgenstern V, et al. Am J Resp Crit Care Med.
2008;177(12):1331-7

Phototherapy for a photosensitive disease?!

- 3% of AD patients are photosensitive
- 2.5 / 1 female v. male
- Reaction patterns:

PMLE v. eczematous

- Ten Berge O, et al. Am J Clin Dermatol 2009;10(2): 219-23

Why did this (AD) child get worse with my treatment?

- **Hint: Contact Dermatitis**
- **Among 641 children patch tested with 7 agents used in France for AD 6% reacted (45% to emollients, 42% to chlorhexidine, 7% to hexamidine, 5% to budesonide and tixocortol).**
- **Risk factors: Early onset, severity, IgE**
 - Maihol C, et al. Allergy 2009;64(5):801-6

Need more?

- **Of 79 children, suspected to have ACD, budesonide, tixocortol, TRUE™ + 3 emollients tested 51% had at least one + response. 55% of these had AD.**
- **Nickel was #1.**
- **Inform caregivers on avoidances.**
 - De Waard-van der Spek FB, et al. *Dermatology* 2009;218(2):119-25.

Further more?

- Percutaneous sensitization to oat, in emollients/moisturizers occurred in 15 to 32% of users (v. 0 for non users).
- Avoidance of topical oat containing topicals is suggested.
 - Boussault P, et al. Allergy. 2007;62(11):1251-6
- Sesame too!
 - Cohen A, et al. Pediatr Allergy Immunol. 2007; 18(3):217-23

Are preemies at higher risk for AD?

- Nope!.
- Of 512 children prospectively followed for 2 years, 20% premature and 18% term babies developed AD.
- 17% of those were delivered by C-section (v. 19% vaginally).
- ✓ via IgE, prick test, diet, SCORAD.

– Kvenshagen B et al. Arch Dis Child. 2009;94(3): 202-5

Cesarean-born risk for AD

- **None.**
- **From a meta-analysis of 26 studies on atopy (6 AD specific).**
- **C-sections cannot be blamed for the AD epidemic.**
 - Bager P, et al. Clin Exp Allergy. 2008;38(4):634-42

So, what can be blamed for the current AD epidemic?

- Hygiene?
- Old moms?
- Sibs #?
- Obesity?
- GI parasites?
- Stress?
- Smoking?
- Diet?
- Pets?

The hygiene theory story

- Robust data indicates that being a first-born in small, affluent household, increases the risk for AD.
- Infections with Hep. A, H. pylori, toxoplasma and geo-helmyths, have protective effects.
- But, this may end-up as BS.
 - Sheikh A, et al. Curr Opin Otorolaringol Head Neck Surg. 2004;12(3):232-6.
 - Gibbs S, et al. Int J Epidemiol. 2004;33(1):199-207.

Old farmers suffer less AD

- True (not just for children).
- Lifelong exposure may be required.
- From a comparison between 4228 (dairy, sheep, beef, horticulture) farmers v. 1328 non-farmers.

– Douwes J, et al. Allergy. 2007;62(10):1158-65

Would you allow your AD at risk baby in the pool?

- **Yes! Unless you are concerned with ear infections.**
- **In terms of developing AD no detrimental effect could be detected among 2192 babies followed x 6 yrs.**

– Schoefer Y, et al. Intl Hyg Environ Health. 2008;211(3-4):367-73

More on pet cohabitation

- **Neither dog nor cat “ownership” increases the prevalence of AD.**
- **In fact, they may be protective (pun)**
 - Kurosaka F, et al. *Pediatr Allergy Immunol.* 2006;17(1):22-8
 - Gern JE, et al. *J Allergy Clin Immunol.* 2004;113(2):307-14
- **Boxers, Bullterriers and West Highland white terriers are prone to AD.**

What about a role for food in AD?

- **>80% of AD children of moderate severity have high levels of IgE to foods.**
- **High IgE to milk, eggs and peanuts was greatest among those who developed AD before age 3 months and relates to severity.**

– Hill DJ, et al. Clin Exp Allergy. 2008;38(1):161-8

Hold the Cow's milk?

- **Delaying the introduction of cow's milk in the diet did not prevent AD development among 2558 infants.**
- **Longer delays were associated with higher risk for atopy at 2 years.**
 - Snijders BE, et al. Pediatrics 2008;122(1):e115-22
- **Elimination is unnecessary**
 - Sinagra JL, et al. Pediatr Dermatol 2007;24(1):1-6

What?! Breastfeeding does not protect for AD?

- **Meta-analysis of many epidemiologic studies now fail to support the “conventional wisdom”.**
- **Breastfeeding is still recommended for multiple benefits on child’s health.**
 - Duncan JM, et al. *Curr Opin Allergy Clin Immunol.* 2008;8(5):398-405
 - Karino S, et al. *Ann Allergy Asthma Immunol.* 2008;101(2):153-9

Dannon? Yoplait? Activia?™

- **Lactobacillus rhamnosus but not Bifidus animalis in the diet of pregnant mothers of infants at risk showed a preventive effect for AD.**
 - Wickens K, et al. J Allergy Clin Immunol. 2008; 122(4):788-94

But, (still on probiotics for AD)

- **Lactobacillus GG cannot be generally recommended to pregnant or nursing mothers for AD prevention.**
- **From a DB placebo controlled prospective study of 94 pregnancies.**

– Kopp MV, et al. Pediatrics. 2008;121(4)e850-6

Early introduction of fish decreases AD in children

- In a prospective longitudinal study where 4921 infants out of 8176 selected families 1 of 5 developed AD by 1 year.
- Fish in the diet and bird keeping reduced the risk. Eggs, milk, nor breastfeeding affected the risk.

– Alm B, et al. Arch Dis Child. 2009;94(1):11-5

How about the introduction of solid food and AD?

- **In a study where almost 6000 infants were recruited and almost 5000 were followed x 4 years, delaying the introduction of solid foods had no effect in the development of AD**

– Filipiak B, et al. J Pediatr. 2007;151(4):331-3

So, what's first, the eczema or the egg?

- In some infants sensitization precedes and predicts the development of eczema, in others eczema precedes and predicts the sensitization
- Food sensitivity < 6 mo.: OR = 1.63
- Eczema < 6 mo.: OR = 2.34 (at 1 yr.)
 - Lowe AJ, et al. Clin Exp Allergy. 2007;37(4):536-42
- The egg precedes the chicken
 - SciAm 9/2009:77

But, the US AD “guru”, Jon Hanifin, MD. says:

- Food challenge studies show that food-induced eczematous reactions are rare
- Allergy testing in AD results in high number of false positive reactions.
- This is often done to appease parents.
- The result is costlier health care.

– Thompson MM, et al. Dermatol Ther. 2006;19(2)91-9

AD from stress?

- **Divorce/separation was associated with increases the risk of developing AD (OR: 3.59)**
 - Bockelbrink A, et al. Allergy. 2006;61(12):1397-402
- **So did the number of fallen walls at home after the Kyoto earthquake.**
 - Ask Kuo Tong, MD.