Atopic Dermatitis

Emergency Department, Urgent Care & Outpatient

Nationwide Children's — When your child needs a hospital, everything matters.

Center for Clinical Excellence

Inclusion Criteria:

Patients ≥ 2 months with essential features of atopic dermatitis

- Pruritis
- Eczema (acute, subacute, chronic) with typical morphology and specific patterns:
  - Facial, neck and extensor involvement in infants and children
  - Current or previous flexural lesions in any age group
  - Sparing of the groin and axillary regions
- Chronic or relapsing history

Exclusion Criteria:

- Infants <2 months of age
- Known immunodeficiency
- Oncologic diagnosis

Clinical Features by Age

Diagnostic Features

Differential Diagnosis

Atopic Dermatitis Flare?
(signs and symptoms despite adherence to general treatment)

No → General Treatment

Yes ↓

Determine Severity and Impact on Quality of Life

Mild	Moderate	Severe
• Few patches of scaly pink to red skin • Intermittent itching • Little impact on daily activities	• Multiple patches of scaly pink to red skin • Frequent itching • Excoriation or localized areas of thickened skin may be present • Some impact on daily activities and sleep	• Widespread scaly skin • Incessant itching • Open, cracked areas of skin • Lichenified skin • Bleeding, oozing • Significant impact on sleep, daily activities or mood

Treatment of flares should be started as soon as signs and symptoms appear

- Treat flares based on severity
- Adjunctive therapies
- Evaluate for Infections
- Treat infections
- Identify & treat co-existing conditions

Continue treatment for as long as symptoms persist and for 48 hours after symptoms resolve.

Continue General Treatment

Subspecialty Referral

Allergy Introduction

Diagnostic Features

Atopic dermatitis (also known as eczema) is a condition characterized by dry, itchy and inflamed skin that tends to flare. It develops in early childhood and affects 10-20% of all children.

Typical Presentation:

- Skin is typically itchy
- Depending on the body part(s) affected, the skin may be scaly, excoriated and thickened
- Lichenification, hypo/hyperpigmentation or skin superinfection

Associated features:

- Keratosis pilaris, pityriasis alba, hyperlinear palms, ichthyosis
- Periocular changes
- Perioral changes, periauricular lesions or Dennie-Morgan lines
- Perifollicular accentuation, lichenification, prurigo-like lesions

Diagnostic Criteria
1 or more of the following:

- Chronic or relapsing history
- Early age of onset, ≥2 months
- Personal and/or family history of atopy, IGE reactivity
- Facial, neck, and extensor involvement
- Current or previous flexural lesions in any age group
- Sparing of the groin and axillary regions

Consider Differential Diagnosis when:

- Later onset
- Well defined borders
- Symmetric distribution of rash
- Palms/soles, groin, axillae involvement
- Pink/salmon patches
- Alopecia or diarrhea
- Older child with no history of eczema

Algorithm

Clinical Features by Age

Infants:

- Begins at 2-3 months of age
- Involves scalp, face, trunk and extremities
- Diaper area spared
- Pruritic
- May contribute to disturbed sleep

In patients < 2 months severe atopic dermatitis, failure to thrive or multiple infections may be related to immunodeficiency, metabolic disorders, or nutritional deficiencies. Predominant diaper or perioral involvement may suggest nutritional deficiency.

Consider referral to allergy, dermatology or immunology

Toddlers and Children:

- Rash locations:
  - Creases (elbows, knees, neck)
  - Ankles
  - Wrists
- Hypo/hyperpigmentation
- Lichenification of skin (thickening due to scratching)
- Impaired skin barrier
  - Superinfection
  - Molluscum contagiosum
  - Warts

Algorithm

Differential Diagnosis

- **Seborrheic dermatitis**
  - Scaly skin on scalp and eyebrows
  - May overlap with atopic dermatitis leading to more moderate atopic dermatitis
- **Irritant/contact dermatitis**
  - Older child with no history of eczema
  - Symmetric distribution of rash
  - Regional
  - Sudden onset
- **Ringworm**
  - Later onset
  - Multiple lesions
  - Annular, well defined lesions
  - Dorsal hands/feet
  - Expanding border
  - Does not wax and wane
- **Scabies**
  - Prefers palms/soles, groin, axillae
- **Psoriasis**
  - Pink/salmon patches
  - Occipital scalp, elbows/knees/umbilicus, gluteal cleft, fingernails
  - Well defined borders
  - Infants with severe diaper rash
- **Nutritional deficiency**
  - Diaper area, perioral
  - Dietary limitations
  - Other chronic health conditions
  - Diarrhea
  - Alopecia
  - Failing to respond to therapy

Algorithm

General Treatment

Optimal management includes:

- **Identification of triggers**
- **Elimination of exacerbating factors**
- **Restoration of the skin barrier function and hydration of the skin**
- **Treatment of skin inflammation**

Exacerbating factors that further disrupt the epidermal barrier include excessive bathing without subsequent moisturization, low humidity environments, emotional distress, dry skin, overheating of skin and exposure detergents. Anything that causes pruritis should be avoided.

Additional recommendations:

- **Daily Bath** for 5-10 minutes (to add moisture to skin and remove potential irritants from skin)
  - Use gentle, fragrance-free soap
  - Avoid bubble bath
  - General use of washcloths, sponges, loofas and baby wipes are not recommended
  - Pat dry skin after bath, leaving some moisture present
  - Apply generous amount of moisturizer immediately after bath
  - If using a steroid, use steroid before moisturizer

- **Frequent use of emollients** (to improve barrier function)
  - Twice daily apply cream or ointment (not lotion)
  - Apply within 3 minutes of bathing while skin still damp
  - Note: apply topical steroid medication 30-60 minutes before emollient

- **Avoiding irritants**
  - Irritants including dyes, perfumes, fragrances, botanical contact (cut grass, essential oils), and acidic foods touching the skin
  - Consider cotton clothing instead of wool, nylon
  - Use mild detergents without fragrance
  - Avoid fabric softeners

- **Treatment of irritation:**
  - Diphenhydramine or hydroxyzine *as needed* before bed can prevent itching and scratching while asleep

    Diphenhydramine:
    - 1 mg/kg/dose every 6 hours as needed
    - Usual dose children 12.5-25 mg/dose, adolescents 25-50 mg (max 50 mg/dose)

    Hydroxyzine:
    - Patient weight ≤40 kg: Oral: 2 mg/kg/day divided every 6 to 8 hours (max dose 25 mg/dose)
    - Patient weight >40 kg: Oral: 25 to 50 mg once daily at bedtime or twice daily
    - Children <6 years: Oral: 12.5 mg 3 to 4 times daily
    - Children ≥6 years and Adolescents: Oral: 12.5 to 25 mg 3 to 4 times daily

Algorithm

Treatment of Flares

Treatment of flares should be started as soon as signs and symptoms appear and continued for >48 hours after symptoms subside

Topical Steroids (All covered by Ohio Medicaid)

- Use topical steroids on affected areas twice a day. Only use on affected areas of skin.
- Please use topical steroids as long as needed to treat eczema flare.
- If patient does not respond after 4-6 weeks of topical steroids, consider referral to dermatology.

Steroid-free options work best for mild eczema and / or areas of thinner skin

Oral steroids for severe head-toe disease that is too extensive for adequate coverage by topical steroids (not to be used more than once/year)

Systemic therapy should be considered based on severity, chronicity, quality of life, and coexistence of other atopic diseases (asthma, allergic rhinitis)

Adjuvant therapy options for pruritis, disordered sleep and frequent infections

See **Appendix** for additional guidance on approved body parts per topical steroid class.

Severity	Topical Steroid (covered by Ohio Medicaid)	Potency/Class	Approved Body Parts
Mild Atopic Dermatitis	Desonide cream 0.05%	Low/Class VI	Hands, feet, scalp, trunk, arms, legs, face, groin, periorbital
	Triamcinolone acetonide cream, lotion 0.025%		
	Betamethasone valerate 0.1% lotion		
	Fluocinolone acetonide 0.01% oil		
Moderate Atopic Dermatitis	Betamethasone valerate 0.1% cream	Lower-mid/Class V	Hands, feet, scalp, trunk, arms, legs, face, groin
	Triamcinolone acetonide ointment 0.025%, lotion 0.1%		
	Desonide ointment 0.05%		
	Fluticasone propionate cream 0.05%		
	Triamcinolone ointment, cream 0.1%	Medium/Class IV	Hands, feet, scalp, trunk, arms, legs
	Mometasone furoate cream 0.1%		
	Fluticasone propionate ointment 0.005%	High/Class III	
	Triamcinolone acetonide ointment 0.05%		
	Mometasone furoate ointment 0.1%		
Severe Atopic Dermatitis	Clobetasol propionate cream 0.025%	High/Class II	Hands, feet, scalp, trunk, arms, legs
	Fluocinonide cream, gel, ointment, solution 0.05%		
	Clobetasol propionate cream, ointment, gel 0.05%	Super-high/Class I, special consideration in peds for a limited time	Hands, feet

Algorithm

Steroid-Free Options

Steroid-free options work best for mild eczema and / or areas of thinner skin:
(Specialists may use this for areas of chronic eczema)

Topical Calcineurin Inhibitors

- Not approved for kids under 2 years of age
- Great for face, groin, axilla which are thinner skin areas
- Tacrolimus 0.03% ointment children 2-15 years
- Tacrolimus 0.1% ointment children ≥ 16 years
- Pimecrolimus 1% cream children > 2 years of age

Eucrisa (Crisaborole 2% ointment) consider in:

- Children older than 3 months
- Areas of skin involvement are thin (neck, face, groin, armpit)

Algorithm

Treatment of Flares

Oral Steroids

Oral steroids may be used in severe disease to facilitate more rapid improvement in symptoms while waiting for topical steroids to take effect.

Indication:
Severe head-toe disease that is too extensive for adequate coverage by topical steroids

Considerations:
- Address infectious etiologies or co-existing conditions contributing to severity
- Oral steroids should not be given more than once per year
- Treatment is tapered over 10 days:
  - 1 mg/kg (max 60 mg) Prednisolone Q day x 2 days
  - 0.8 mg/kg Prednisolone Q day x 2 days
  - 0.6 mg/kg Prednisolone Q day x 2 days
  - 0.4 mg/kg Prednisolone Q day x 2 days
  - 0.2 mg/kg Prednisolone Q day x 2 days

Algorithm

Treatment of Flares

Systemic Therapy

Systemic Therapy

- Dupixent
- Methotrexate
- Cyclosporine
- Azathioprine
- Narrowband Ultraviolet Light Therapy

Vaccine administration and management of illness may be impacted while on systemic medications

Systemic medications should be managed by dermatology or allergy specialists. *Patients on these medication are selected based on severity, chronicity, quality of life, and coexistence of other atopic diseases (asthma, allergic rhinitis). The decision of which medication your patient is treated with can be based on response to treatment, insurance, contact allergen triggers, skin type, among others. Despite systemic medications, patients are encouraged to maintain topical skin care routine, avoidance of allergens, and may still require topical treatments or allergy shots.*

Algorithm

Treatment of Flares

Adjuvant Therapy Options

Sedating, 1st Generation Antihistamine

- Consider as needed in children with disordered sleep
- Hydroxyzine:
  - Patient weight ≤40 kg: Oral: 2 mg/kg/day divided every 6 to 8 hours (max dose 25 mg/dose)
  - Patient weight >40 kg: Oral: 25 to 50 mg once daily at bedtime or twice daily
  - Children <6 years: Oral: 12.5 mg 3 to 4 times daily
  - Children ≥6 years and Adolescents: Oral: 12.5 to 25 mg 3 to 4 times daily
- Consider referral to allergy or dermatology if patient requiring frequent use of 1st generation antihistamines

Non-sedating, 2nd Generation Antihistamines

- Consider in children with other symptoms of allergic rhinitis or urticaria
- Consider in children with constant pruritis (weak evidence)
  - Cetirizine 2.5 mg daily as needed (children 6-23 months of age)
    Or
    2.5-5 mg daily as needed (children 2-6 years)
    Or
    5-10 mg daily as needed (children > 6 years)

Bleach Baths

- Consider in children with frequent flares of super-infected atopic dermatitis
- Dilute bleach: Recipe: ¼ cup of bleach in ½ bath of water

Algorithm

Treatment of Flares

Evaluate for Infections

Determination of infection is a clinical diagnosis
May need to consider treatment for both viral and bacterial infections

Bacterial

Impetigo bullous vs nonbullous, cellulitis, folliculitis, ecthyma
Common causes: S. aureus, S. pyongenes

- Different characteristics will be observed depending on the location of the infection
- Findings include: cracking, honey crusting, excoriation, pustules, bullae, ulceration/erosions, induration/ warmth
- Can be painful and may have associated pruritis

Testing:

- Not recommended to swab atopic dermatitis patients for Gram stain/wound cultures routinely as there can be colonization
- Recurrent or severe flares with poor response to atomic dermatitis therapies may benefit from obtaining Gram stain/wound culture
  - Obtain Aerobic Wound Culture and Gram stain by swabbing over crust drainiage or pustules

Viral

Eczema herpeticum, *Herpes Simplex Virus 1*

- HSV lesions are typically clustered, with vesicles, hemorrhagic crusting, most classically recognized by punched-out erosions.
  - *HSV PCR*
    Obtain by swabbing skin with cotton tip applicator and placing in viral culture medium.

Eczema coxsackium *coxsackievirus*

- Child may have fever, overall malaise and ill-appearance.
- Vesiculobullous lesions seen in Hand Foot Mouth disease, as well as the lesions seen in Eczema herpeticum, will concentrate in regions of atopic dermatitis that are currently or formerly flared.
  - *Enterovirus PCR, if available and unable to clinically diagnose.*
    Obtain by swabbing skin with cotton tip applicator and placing in viral culture medium.

Fungal

Dermatophyte infections

- Annular (ring-shaped) plaque with central clearing and raised border. May have coalescing plaques.
  - *KOH prep*

Malassezia furfur

- May be exacerbating factor in head and neck atopic dermatitis.
  - *IgE specific to Malassezia*

Algorithm

Treatment of Infections

Treatment of Infections

Bacterial
Staphylococcus, Streptococcus
- Small region, localized:
  - Apply Mupirocin ointment BID for 5 days (50% of staphylococcus patients resistant to Mupirocin)
- More extensive region:
  - Cephalexin 25-50mg/kg/day (max 500 mg/dose) divided every 8 hours for 7-10 days

  OR
  - Clindamycin PO 10mg/kg/dose (max 450 mg/dose) every 8 hours for 10 days
- Tailor treatment to pathogen identification and sensitivities.

Viral
Herpes Simplex Virus (HSV), Eczema Herpeticum
- Very mild, localized cases, child is well-appearing:
  - Acyclovir PO 20mg/kg/dose (max 800 mg/dose) 4 times daily for 7 days.
- More generalized skin involvement, child ill-appearing, recurrent infection, failed oral therapy, not tolerating liquids:
  - Acyclovir IV 5mg/kg/dose every 8 hours. Continue IV until lesions show regression, then may continue PO until resolution, 7-10 days.
- Consider maintenance therapy if more than 6 outbreaks in a year.

Enterovirus, Eczema Coxsackium
- No treatment necessary, unless considering HSV infection
  - In which case, may start acyclovir while awaiting available PCR results

Fungal
Malassezia furfur
- Selenium sulfide shampoo/lotion for 7 days or clotrimazole cream topical twice daily for 2-3 weeks.
  - If not controlled by topical treatment, consider referral to dermatology

Algorithm

Co-Existing or Exacerbating Conditions & Treatment

Contact Dermatitis

- Infants/Children with atopic dermatitis are more likely to develop contact dermatitis.
- Consider when children are not responding to routine treatment for atopic dermatitis or when spreads beyond typical distribution.
- **Consider referral to dermatology**
- Consider changing topical steroid (prefer desoximetasone 0.05% or 0.25% if contact dermatitis is suspected).
- Consider changing moisturizer (prefer Vani cream if contact dermatitis is suspected).
- Eliminate fragrances, detergents, irritants.

Seborrhea

- Infants with scaly lesions in scalp and eyebrows.
- Application of emollient or non-medicated shampoo to soften scales and removal with soft brush (such as toothbrush).
- Topical steroids (topical 1% hydrocortisone).
- Selenium sulfide (Selsen Blue) shampoo 2% 2 times per week for 2-4 weeks.

Algorithm

Allergen Introduction

Allergen Introduction

- Most children do not need testing or an allergy referral prior to the introduction of allergenic foods.
- Allergy testing is not indicated for children with atopic dermatitis unless they have had a reaction concerning for an IgE mediated allergy. An IgE mediated allergic reaction typically involves cutaneous, respiratory or GI symptoms that are rapid in onset and resolve within 1-2 hours. Typically these reactions are not limited to mild contact reactions around the mouth. IgE mediated allergic reactions do not cause chronic or delayed symptoms.
- False positive food allergy tests are frequent, so strongly consider referring to an allergy specialist in the event of a positive food allergy test for a formal food challenge.
- For all infants < 11 months, encourage early introduction of peanut and other allergenic foods including eggs, milk, tree nuts and wheat. This recommendation is essential for infants with moderate to severe eczema. It is also important to ensure infants with moderate to severe eczema maintain these allergenic foods in their diet.
- If patient's family is not comfortable with introduction, consider a referral to Early Peanut Introduction Clinic for further discussion.

Instructions for first introducing peanuts for very young children/infants

- The developmental readiness of the infant must always be considered prior to introduction of any peanut containing foods and they should be eating other solid foods prior to introducing peanut.
- Whole or divided peanuts should never be given to an infant due to risk for choking.

There are several sources that can be used to offer 2 grams of peanut protein per feeding

- Thinned smooth peanut butter:
  - Measure 2 teaspoons of peanut butter and slowly add 2-3 teaspoons of hot water
  - Stir until dissolved and well blended
  - Let cool
  - Increase water amount if necessary or add to previously tolerated infant cereal to achieve consistency comfortable for the infant

- Smooth peanut butter puree:
  - Measure 2 teaspoons of peanut butter
  - Add 2-3 tablespoons of pureed tolerated fruit or vegetables to peanut butter
  - Volume of puree can be adjusted to achieve desired consistency

- Peanut flour and peanut butter powder:
  - Measure 1 teaspoon of either product (both interchangeable)
  - Add 2 tablespoons of pureed tolerated fruits or vegetables to flour or powder
  - Volume of puree can be adjusted to achieve desired consistency

- Peanut-containing puffs or sticks:
  - 21 sticks = ~2 g of peanut protein
  - Infants < 7 months of age: soften with 4-6 teaspoons of water
  - Older infants can eat unmodified but can also soften, if desired

Algorithm

Subspecialty Referral

Referral to allergy

- Known or suspected food allergy
- Families with questions or hesitation about early allergen introduction
- Infants with severe atopic dermatitis
- Atopic dermatitis coexistent with moderate to severe asthma
- Environmental triggers suspected (eyelid eczema)
- Strong family history of atopy in older children with developing symptoms
- Referrals are not indicated solely because there is a sibling or family history of food allergy

Referral to dermatology

- Moderate or severe atopic dermatitis
    - High body surface area
    - Multiple body surface areas resulting in multiple different strengths of topical steroids
    - Failing to respond to routine therapy over 1-2 months
    - Frequent secondary infections
    - History of requiring oral steroids more than once per year
    - Affecting quality of life
- Questionable or unclear diagnosis
- Suspicions for contact dermatitis
- Need for additional treatment (systemic medication including biologics)

Differential Diagnosis

Referral to immunology

- Severe atopic dermatitis in a young infant with other concerning symptoms
- Frequent or unusual infections
- Poor weight gain or diarrhea in an infant
- Unusual distribution of atopic dermatitis (for example, in the diaper area)

Algorithm

Infants Under 2 Months

- Aggressive use of emollient to improve skin barrier is recommended.
- Treatment with topical steroids (hydrocortisone 1% for infants under 1 month, hydrocortisone 2.5% for infants 1-2 months).
- Consider treatment of **seborrhea** when there is extensive forehead, central facial and chest dermatitis.
- Consider differential diagnosis and refer to dermatology.
- Consider referral to immunology if atopic dermatitis is severe, especially if baby has other GI symptoms such as poor weight gain or diarrhea.

Algorithm

References

1. Rangerl SM, Paller AS. Bacterial colonization, overgrowth, and superinfection in atopic dermatitis. *Clin Dermatol.* 2018;35(5):641-647.

2. Mooney E, et al. Adverse effects of topical corticosteroids in paediatric eczema: Australian consensus statement. *Aust J Dermatol*. 2015;56(4):241-251.

3. Togias A, Cooper SF, Acebal ML, et al. Addendum guidelines for the prevention of peanut allergy in the United States: report of the National Institute of Allergy and Infectious Diseases-sponsored expert panel. *J Allergy Clin Immunol.* 2017;139(1):29-44.

4. ASCIA. ASCIA guide for introduction of peanut to infants with severe eczema and/or food allergy. Available from: www.allergy.org.au.

5. Du Toit G, Roberts G, Sayre PH, et al. Randomized trial of peanut consumption in infants at risk for peanut allergy. *N Engl J Med*. 2015;372(9):803-813.

6. Sidbury R, Davis DM, Cohen DE, et al. Guidelines of care for the management of atopic dermatitis: Section 3. *J Am Acad Dermatol*. 2014;71:327-349.

7. Schneider L, Tilles S, Lio P, et al. Atopic dermatitis: a practice parameter update 2012. *J Allergy Clin Immunol*. 2013;131(2):295-299.e1-27.

8. National Institute for Health Care and Excellence (NICE). Atopic eczema in under 12s: diagnosis and management. *NICE Clinical Guidelines*, No. 57. March 2021.

Algorithm

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Clinical Pathway Development

This clinical pathway was developed using the process described in the NCH Clinical Pathway Development Manual Version 6, 2022. Clinical Pathways at Nationwide Children's Hospital (NCH) are standards which provide general guidance to clinicians. Patient choice, clinician judgment, and other relevant factors in diagnosing and treating patients remain central to the selection of diagnostic tests and therapy. The ordering provider assumes all risks associates with care decisions. NCH assumes no responsibility for any adverse consequences, errors, or omissions that may arise from the use or reliance on these guidelines. NCH's clinical pathways are reviewed periodically for consistency with new evidence; however, new developments may not be represented, and NCH makes no guarantees, representations, or warranties with respect to the information provided in this clinical pathway.

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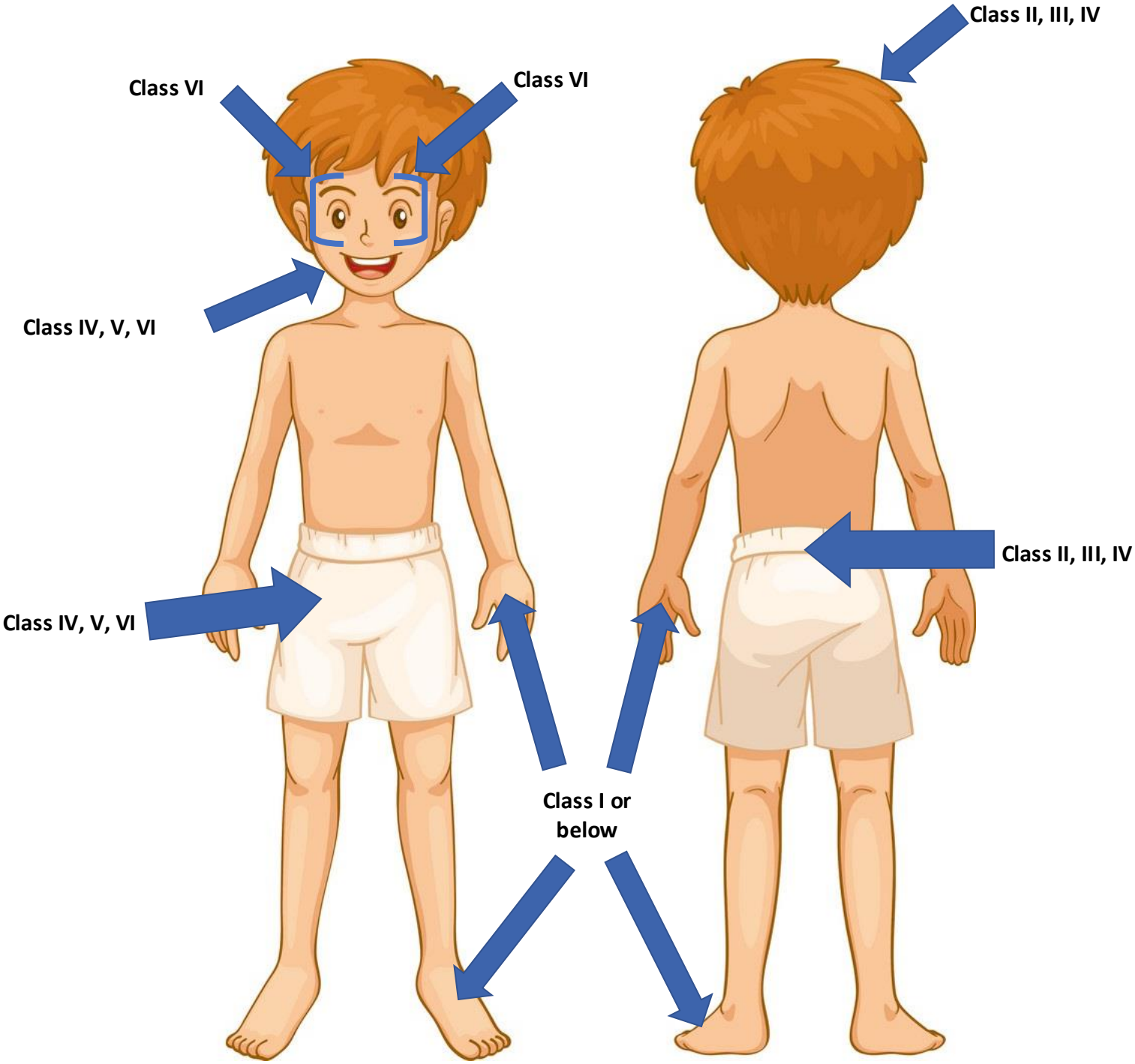
Algorithm

Atopic Dermatitis: Appropriate Steroid Class for Anatomic Location



Algorithm