# Fagron Advanced Derma

## Age-Appropriate Dermatological Solutions for Pediatric Care

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personalizing medicine

## Summary

## 1. Introduction

Pediatric dermatology includes a broad spectrum of skin conditions from birth through adolescence, with a prevalence ranging from 30% to 70% globally, depending on the region and population studied.[1] Skin disorders represent a significant proportion of pediatric outpatient visits, underscoring their clinical and public health relevance.[2] As the body's largest organ, the skin plays a crucial role in immunological defense, thermoregulation, and sensory function.[3] Any disruption to its integrity, particularly in pediatric patients, can lead to secondary complications, including infections, chronic inflammation, and psychological distress.[4]

Pediatric dermatology differs significantly from adult dermatology due to the unique characteristics of developing skin.[5] Neonatal and infant skin, for instance, is structurally and functionally distinct, with increased permeability, reduced epidermal thickness, and immature barrier function, making it more susceptible to irritation, infection, and systemic absorption of topical agents.[6,7] This increased absorption potential requires careful selection of therapeutic formulations to minimize systemic toxicity and adverse effects.[8] Additionally, diagnosing pediatric skin conditions can be challenging, as their clinical presentations often differ from those in adults.[5] Treatment adherence can also be difficult, especially for young patients who may struggle with prolonged or uncomfortable regimens.[9]

Effective management of pediatric dermatological conditions requires a personalized, evidence-based approach that considers the child's skin characteristics, the severity of the condition, and potential sensitivities.[10]

While standard commercial treatments are available for many dermatological conditions, they may not always be suitable for pediatric patients, especially when specific formulation ingredients cause irritation or when dosing and formulation adjustments are needed.[11] This is where pharmaceutical compounding plays a crucial role, allowing healthcare providers to create personalized formulations tailored to the individual needs of pediatric patients.[12]

Personalized treatment approaches in pediatric dermatology involve selecting appropriate active pharmaceutical ingredients (APIs) and delivery systems that optimize efficacy while minimizing adverse effects.[13] Compounded formulations provide the flexibility to adjust concentrations, remove allergens, and enhance patient adherence through more tolerable preparations.[12] For example, lower-potency corticosteroids or barrier-repairing formulations can be compounded to balance efficacy and safety in children with atopic dermatitis.[14]

**Fagron Advanced Derma** bases offer innovative solutions for pediatric dermatological conditions, providing non-irritating and hypoallergenic bases developed with a careful selection of ingredients. These bases support personalized medicine approaches, allowing for individualized treatments that target the specific needs of pediatric patients (Figure 1). By leveraging compounding expertise, healthcare professionals can optimize therapeutic outcomes while ensuring the highest standards of safety and tolerability.

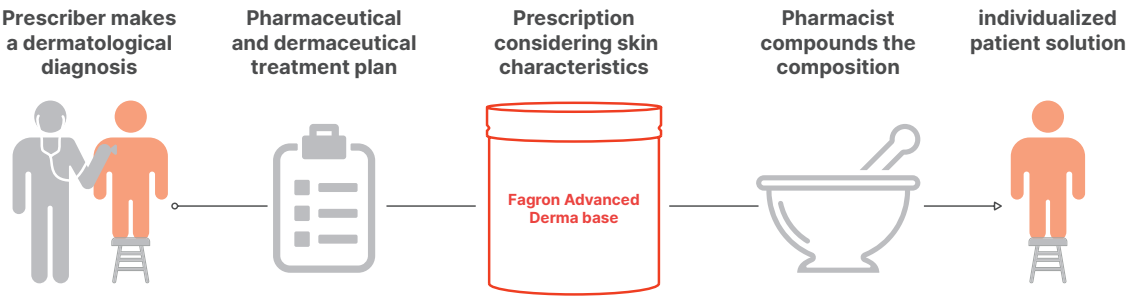


**Figure 1.** Personalized treatment approach using Fagron Advanced Derma bases.

This brochure details key pediatric skin conditions, their pathophysiology, treatment strategies, and how Fagron's innovative bases support therapeutic outcomes in pediatric dermatology.

## 2. Skin Characteristics

Pediatric dermatology requires understanding the unique properties of developing skin and their impact on diagnosis and treatment.[1] Although the infant's skin barrier is competent at birth, several skin properties mature throughout the first years of life (Figure 2).[15] Changes in skin structure and function, including epidermal thickness, lipid composition, hydration levels, and immune responses, can significantly influence the skin's permeability and susceptibility to irritation and infection.[5]

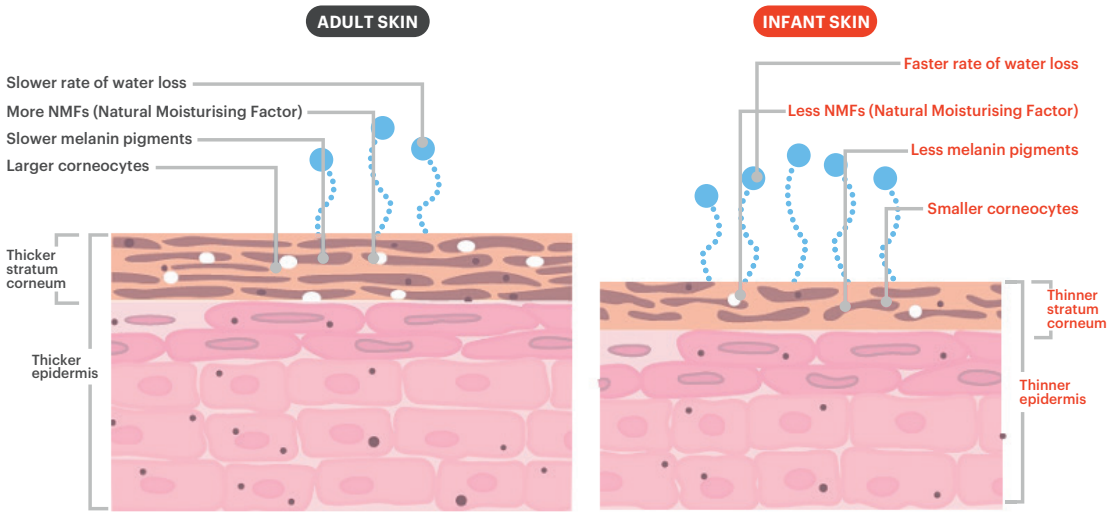


**Figure 2.** Difference between adult (left) and infant (right) skin.

### 2.1. Neonates (0–28 days)

Neonates have an immature epidermal barrier with increased permeability, higher transepidermal water loss (TEWL), and a higher skin pH, making them prone to dehydration and infections.[7,8] Their underdeveloped sebaceous and sweat glands reduce protective lipid secretion.[16]

***Dermatological Considerations:***

• Use occlusive and hydrating formulations: barrier repair is essential (zinc oxide, shea butter, or hyaluronic acid).

• Limit irritants and allergens: fragrance-free and preservative-free bases.

• Avoid high-potency corticosteroids: increased systemic absorption can lead to adrenal suppression.

### 2.2. Infants (1–12 months)

The epidermal barrier continues to mature but remains thin.[17] It has a higher water content but is still prone to TEWL.[3] The developing immune system increases the risk of contact dermatitis and irritant reactions.[18]

***Dermatological Considerations:***

• Use gentle emollients to support barrier function: hydration is crucial.
• Mild corticosteroids can be used in small amounts for eczema.
• Avoid strong irritants, such as glycolic or lactic acid in formulations.

### 2.3. Toddlers and Preschool children (1–5 years)

The skin barrier becomes more resilient but remains thinner than in adults.[19] Increased sweating and sebaceous gland activity begin but remain immature.[20] Higher susceptibility to viral and bacterial infections.[21]

***Dermatological Considerations:***

• Urea-based formulations can help mild keratosis pilaris or dry skin: barrier protection remains key.

• Antifungals (clotrimazole, ketoconazole) and topical antibiotics may be needed for infections.

• Avoid overuse of topical antibiotics: it can lead to resistance.

### 2.4. School-Age Children (6–12 years)

The skin becomes more resistant, and sebaceous activity increases.[22] Prepubertal changes may begin, leading to early signs of acne or body odor.[23]

***Dermatological Considerations:***

• Mild keratolytics (salicylic acid, glycolic acid) can be introduced for early acne in gentle bases.

• Avoid strong exfoliants or chemical peels, as irritation risk remains high.

• Avoid unnecessary long-term topical steroids to prevent skin thinning.

### 2.5. Adolescents (13–18 years)

The epidermal barrier reaches full maturity with increased sebum production, making acne and seborrheic dermatitis common.[24,25]

***Dermatological Considerations:***

• Acne management with retinoids (tretinoin, adapalene) and benzoyl peroxide.

• Stronger keratolytics (salicylic acid, azelaic acid) for hyperpigmentation or acne-prone skin.

• Mild to moderate corticosteroids (mometasone, triamcinolone) for inflammatory skin diseases.[9]

All these developmental differences must be carefully considered when selecting treatment options, as pediatric patients are more vulnerable to systemic absorption and adverse effects from topical therapies.[9] Understanding age-specific differences in skin properties enables dermatologists to optimize treatments, ensuring efficacy and safety for pediatric patients.[12] In this context, tailored formulations are crucial in addressing pediatric dermatological needs.[13] The **Fagron Advanced Derma** bases offer innovative solutions to support personalized, safe, and effective topical treatments.

# 3. Fagron Advanced Derma

**Fagron's Advanced Derma** bases are designed to optimize the delivery of APIs while ensuring safety, tolerability, and efficacy for pediatric skin. These bases are formulated without controversial ingredients (e.g., parabens, benzyl alcohol, petrolatum, sodium lauryl sulfate, propylene glycol, phthalates, artificial colorants, and fragrances) to ensure compatibility with the delicate nature of pediatric skin while addressing diverse dermatological needs. With a wide range of formulations, the **Fagron Advanced Derma** line offers personalized and flexible solutions to support effective pediatric dermatological care.

## 3.1. Bases for all pediatric age groups

### Emolivan™

**Emolivan™** is a deeply hydrating and protective emollient base. It's ideal for managing dry, sensitive skin conditions such as atopic dermatitis and eczema. Its formulation increases the skin's moisture barrier, reducing TEWL, itchiness, and discomfort.


DRY SKIN

SENSITIVE/ AFFECTED SKIN

### Fitalite™


**Fitalite™** is a lightweight, non-greasy base designed for improved absorption, making it ideal for acne-prone and seborrheic skin. Its fast-absorbing, non-comedogenic formula delivers APIs effectively without clogging pores.

NORMAL SKIN

OILY SKIN

COMBINATION SKIN

SENSITIVE/ AFFECTED SKIN

### Nourisil™

**Nourisil™** is a silicone-based formulation offering superior skin barrier protection, particularly useful for hypertrophic or keloid scar from injuries, burns, surgeries (post-surgical scar management), and irritant dermatitis. Its quick-drying texture forms a protective film that helps prevent water loss and protects against external irritants.


SENSITIVE/ AFFECTED SKIN

## Occluvan™

**Occluvan™** is an occlusive base for conditions requiring increased moisture retention, such as xerosis and psoriasis. By creating a protective barrier on the skin, Occluvan™ promotes prolonged hydration and supports skin healing.


DRY SKIN

SENSITIVE/ AFFECTED SKIN


## Seraqua™

**Seraqua™** is a water-based, lipid-free formulation that offers lightweight, non-greasy application. It is perfect for sensitive and acne-prone pediatric skin. It is gentle and well-tolerated, providing a cooling effect upon application.

NORMAL SKIN

DRY SKIN

OILY SKIN

COMBINATION SKIN

## Versatile™

**Versatile™** is a cream base excellently compatible with various APIs, making it suitable for a wide range of dermatological treatments. Its balanced composition supports both hydrophilic and lipophilic active ingredients.


NORMAL SKIN

DRY SKIN

## Versatile™ Anhydrous

**Versatile™ Anhydrous** is a water-free formulation designed for maximum stability with lipophilic APIs. It is particularly suitable for chronic skin conditions requiring long-lasting effects and protection against moisture loss.

DRY SKIN

SENSITIVE/ AFFECTED SKIN



## Versatile™ Rich

**Versatile™ Rich** is an enriched formulation that provides deep hydration and barrier repair. It is ideal for severe eczema and other chronic skin conditions. Its rich texture offers intensive care for extremely dry and affected skin.

DRY SKIN

SENSITIVE/ AFFECTED SKIN

### 3.2. Bases for adolescents

## Cleoderm™

**Cleoderm™** is a skin-rebalancing, dermatologically tested, non-comedogenic cream base designed for patients with sensitive, inflamed, or acne-prone skin. Its key ingredients, including *Cleome gynandra L.* extract, bisabolol, hyaluronic acid, and functional oils, provide anti-inflammatory properties while helping regulate sebum production. This lightweight, highly spreadable base is ideal for compounding treatments for acne, and hyperpigmentation in adolescents.

OILY SKIN

COMBINATION SKIN

SENSITIVE/ AFFECTED SKIN

## Nourivan™ Antiox

**Nourivan™ Antiox** is a highly stable, antioxidant-rich base that protects against oxidative stress and environmental damage. It is suitable for conditions involving inflammation, such as contact dermatitis and post-inflammatory hyperpigmentation, helping to reduce redness and supporting skin recovery.


NORMAL SKIN

DRY SKIN


## Espumil™

**Espumil™** is a foaming base designed to improve the penetration of APIs, particularly for scalp and follicle-related hair disorders. Its light texture allows for easy application and even distribution over large or hard-to-reach areas, such as the scalp.

NORMAL SKIN

OILY SKIN

COMBINATION SKIN

SENSITIVE/ AFFECTED SKIN

# 4. Dermatological Skin Conditions

Pediatric dermatological conditions are among the most common reasons for visits to dermatologists and pediatricians.[1] Skin disorders in children can significantly impact their quality of life, causing discomfort, sleep disturbances, and emotional distress.[26] These conditions range from inflammatory and infectious diseases to congenital and autoimmune disorders.[2,27] Therefore, early diagnosis and treatment are essential to prevent complications and promote healthy skin development.[27]

## 4.1. Birthmarks (Vascular and Pigmented)

Birthmarks are common skin anomalies in neonates, with vascular birthmarks occurring in up to 10% of infants.[28] Vascular birthmarks include hemangiomas and port-wine stains, while pigmented birthmarks include café-au-lait spots and congenital nevi (Figure 3).[29] Vascular birthmarks may regress spontaneously, but persistent lesions may require topical therapies or laser treatments.[30,31] Sun protection is crucial for pigmented birthmarks to prevent discoloration and malignancy risk.[28]

**Figure 3.** Facial hemangioma in an infant.

### Prescription examples

*Vascular Birthmarks (Hemangiomas, Port-Wine Stains)*

| **Propranolol 1% in Versatile™ Anhydrous** |
|---|
| Apply a thin layer to affected areas. |
| Doses per day: 2 (every 12 hours) |
| Duration of treatment: at the doctor's discretion. |

| **Timolol maleate 0.5% in Fitalite™** |
|---|
| Apply a thin layer to affected areas. |
| Doses per day: 1 (every 24 hours) |
| Duration of treatment: at the doctor's discretion. |

*Pigmented Birthmarks (Café-au-lait spots, Melanocytic Nevi)*

| **Kojic acid 2% in Fitalite™** |
|---|
| Apply a thin layer to affected areas. |
| Doses per day: 2 (every 12 hours) |
| Duration of treatment: at the doctor's discretion |

## 4.2. Angiofibromas

Angiofibromas are benign, highly vascular tumors most commonly associated with tuberous sclerosis complex (TSC) and juvenile nasopharyngeal angiofibroma (JNA).[32] In children with TSC, angiofibromas typically present as facial lesions, particularly on the nose and cheeks.[33] These lesions are composed of a mixture of vascular and interstitial cells and can cause significant psychosocial issues due to their appearance and potential for bleeding and pruritus.[34]

For juvenile nasopharyngeal angiofibroma (JNA), the lesions are typically located in the nasopharynx and are almost exclusively found in adolescent boys.[35] These tumors can cause nasal obstruction, epistaxis, and, in advanced cases, facial swelling and visual or neurological disturbances.[36]

Standard treatment options for angiofibromas include surgical resection, laser therapy, and radiotherapy.[37] Topical rapamycin has shown efficacy in reducing the size and appearance of facial angiofibromas in TSC.[38,39] Topical β-blockers like timolol have also been explored for their potential benefits.[40]

### Prescription examples

| **Sirolimus (rapamycin) 0.4% in Emolivan™** |
|---|
| Apply a thin layer to the affected area at night. |
| Doses per day: Once a day, 3 to 5 days a week |
| Duration of treatment: at the doctor's discretion. |

| **Timolol maleate 0.5% in Fitalite™** |
|---|
| Apply a thin layer to the affected areas. |
| Doses per day: 2 or 3 (every 12 or 8 hours, respectively) |
| Duration of treatment: at the doctor's discretion. |

### 4.3. Atopic Dermatitis (Eczema)

Atopic dermatitis, also known as eczema, is a chronic inflammatory condition that affects approximately one in ten people during their lifetime, with onset typically in early childhood.[41] The disease results from a complex interaction of immune dysregulation, epidermal gene mutations, and environmental factors, leading to epidermal barrier dysfunction and intensely pruritic skin lesions.[42] Scratching exacerbates the condition by creating a self-perpetuating itch-scratch cycle, significantly affecting the patient's quality of life (Figure 4).[43] Maintenance therapy consists of emollients and daily bathing with soap-free cleansers.[44] Topical corticosteroids (e.g., hydrocortisone) are the first-line treatment for atopic dermatitis flare-ups to reduce inflammation.[41] Pimecrolimus and tacrolimus are topical calcineurin inhibitors that can be used with topical corticosteroids as first-line treatment.[44]

**Figure 4.** Atopic dermatitis in a preschool-age child.

#### Prescription examples

*Emollients and Barrier Repair (Daily use)*

| **Nicotinamide 2-4% + Glycerol 2-5% in Fitalite™** |
|---|
| Apply a thin layer to affected areas. |
| Doses per day: 2 (every 12 hours) |
| Duration of treatment: at the doctor's discretion. |

| **Borage seeds oil (*Borago officinalis*) 3-5% + Urea 5% + Nicotinamide 2-4% in Versatile™ Rich** |
|---|
| Apply a thin layer to affected areas. |
| Doses per day: 2 (every 12 hours) |
| Duration of treatment: at the doctor's discretion. |

| **Urea 5% + Shea butter 5% Vitamin E 5% + Alfa-bisabolol 0.5% in Versatile™ (or Fitalite™)** |
|---|
| Apply a thin layer to affected areas. |
| Doses per day: 2 (every 12 hours) |
| Duration of treatment: at the doctor's discretion. |

*Emollient and non-steroidal anti-inflammatory cream*

| **Dexpanthenol 5% in Fitalite™** |
|---|
| Apply a thin layer to affected areas. |
| Doses per day: 2 (every 12 hours) |
| Duration of treatment: at the doctor's discretion. |

*Anti-inflammatory treatment containing a low potency corticosteroid (Flare-Ups)*

| **Hydrocortisone 1% in Versatile™** |
|---|
| Apply a thin layer to affected areas. |
| Doses per day: 1 (every 24 hours) |
| Duration of treatment: usually up to 7 days. |

*Anti-inflammatory treatment containing a moderate potency corticosteroid (Acute atopic dermatitis - Flare-Ups)*

| **Prednicarbate 0.25% + Borage seeds oil (*Borago officinalis*) 4% in Versatile™ Rich** |
|---|
| Apply a thin layer to affected areas. |
| Doses per day: 1 (every 24 hours) 3 days per week or as advised by the doctor |
| Duration of treatment: at the doctor's discretion. |

*Anti-inflammatory Treatment containing high potency corticosteroid (Acute atopic dermatitis - Flare-Ups)*

| **Triamcinolone acetonide 0.1% + Gentamycin 0.1% (or fusidic acid 2%) + Dexpanthenol 0.1-1% + Nicotinamide 5% in Versatile™ Rich** |
|---|
| Apply a thin layer to affected areas. |
| Doses per day: 1 (every 24 hours) 3 days per week or as advised by the doctor |
| Duration of treatment: at the doctor's discretion. |

*Calcineurin inhibitors*

| **Tacrolimus 0.03% in Versatile™ Rich or or Fitalite™** |
|---|
| Apply a thin layer to affected areas. |
| Doses per day: 2 (every 12 hours) |
| Duration of treatment: at the doctor's discretion. |

| **Tacrolimus 0.03% + Prednicarbate 0.25% in Emolivan™ or Fitalite™** |
|---|
| Apply a thin layer to affected areas. |
| Doses per day: 2 (every 12 hours) |
| Duration of treatment: at the doctor's discretion. |

*Reduction of inflammation, nitric oxide production, and improving skin barrier function*

| **Vitamin B12 (Cyanocobalamin) 0.07% in Fitalite™** |
|---|
| Apply a thin layer to affected areas. |
| Doses per day: 2 (every 12 hours) |
| Duration of treatment: at the doctor's discretion. |

## 4.4. Diaper Dermatitis

Diaper dermatitis is an inflammatory reaction of the skin of the perineal and perianal areas.[45] It is the most common skin disorder seen in young infants, peaking between 9 and 12 months of age.[46] The most common cause of diaper dermatitis is irritant contact dermatitis.[47] However, other causes, such as atopic dermatitis and seborrheic dermatitis, can also present as a diaper rash.[44] Another common reason is infection with *Candida albicans*, which can be primary or secondary.[45] Diaper dermatitis is usually a mild and self-limited condition that requires minimal intervention.[46] Topical skin barrier repair products are the first-line treatment (Figure 5).[48] A pharmacological approach is generally indicated in more severe forms, especially when secondary infections occur.[47]

**Figure 5.** Topical treatment for diaper dermatitis in an infant.

### Prescription examples

*Barrier Protection and Healing*

| **Zinc Oxide 10% in Nourisil™** |
|---|
| Apply a thin layer to affected areas. |
| Doses per day: Every diaper change |
| Duration of treatment: at the doctor's discretion. |

*Barrier Protection, and antifungal treatment*

| **Zinc Oxide 10% + Nystatin 100,000 IU/g (or Clotrimazole 1%) in Occluvan™ (or Versatile™)** |
|---|
| Apply a thin layer to affected areas. |
| Doses per day: 3 or 4 (every 8 or 6 hours, respectively) |
| Duration of treatment: at the doctor's discretion. |

*Barrier Protection, and bile acid sequestrant*

| **Cholestyramine resin 6.5% in Occluvan™** |
|---|
| Apply a thin layer to affected areas. |
| Doses per day: Every diaper change |
| Duration of treatment: at the doctor's discretion. |

*Anti-inflammatory Treatment (If Severe Redness and Inflammation)*

| **Hydrocortisone 0.5% in Fitalite™** |
|---|
| Apply a thin layer to affected areas. |
| Doses per day: 1 (every 24 hours) |
| Duration of treatment: at the doctor's discretion (usually up to 5 days). |

*Antifungal (For Candida-Associated Diaper Rash)*

| **Clotrimazole 1% in Fitalite™** |
|---|
| Apply a thin layer to affected areas. |
| Doses per day: 2 (every 12 hours) |
| Duration of treatment: at the doctor's discretion (usually 7–10 days). |

| **Miconazole 1% in Fitalite™** |
|---|
| Apply a thin layer to affected areas. |
| Doses per day: 2 (every 12 hours) |
| Duration of treatment: at the doctor's discretion (usually for 7–10 days). |

| Clotrimazole 1% + Hydrocortisone 1% in Fitalite™ |
|---|
| Apply a thin layer to affected areas. |
| Doses per day: 2 (every 12 hours) |
| Duration of treatment: at the doctor's discretion (usually for 7–10 days). |

## 4.5. Seborrheic Dermatitis

Seborrheic dermatitis is a chronic, relapsing, inflammatory skin condition that commonly affects infants and adolescents.[49] The prevalence in infants under three months is approximately 10%, affecting 3-5% of the general population (Figure 6).[50] The condition is driven by an overgrowth of *Malassezia spp.* and abnormal sebaceous gland activity, resulting in erythematous plaques with greasy scales, typically on the scalp, face, and chest.[51] Management includes antifungal agents to reduce yeast proliferation and mild corticosteroids to control inflammation.[52,53]

**Figure 6.** Seborrheic dermatitis in the scalp and face of an infant.

### Prescription examples

*Gentle emollients (for infants)*

| Aloe vera extract 1% in Seraqua™ |
|---|
| Apply a thin layer to affected areas. |
| Doses per day: 1 (every 24 hours) |
| Duration of treatment: at the doctor's discretion. |

*Antifungal Treatment (for adolescents)*

| Ketoconazole 2% in Versatile™ (or in Fitalite™) |
|---|
| Apply a thin layer to affected areas. |
| Doses per day: 1 (every 24 hours) |
| Duration of treatment: at the doctor's discretion (usually for 4 weeks). |

| Ketoconazole 2% in Espumil™ |
|---|
| Apply a thin layer to the scalp. |
| Doses per day: 2-3 times per week |
| Duration of treatment: at the doctor's discretion (usually for 4 weeks). |

## 4.6. Skin infections

### 4.6.1. Bacterial skin infections

Bacterial skin infections, particularly impetigo and infected dermatitis, are common pediatric conditions caused primarily by *Staphylococcus aureus* and *Streptococcus pyogenes*.[54] Impetigo, a highly contagious superficial infection, often affects children aged 2 to 5 years, presenting as honey-colored crusted lesions around the mouth and nose (Figure 7).[55] The incidence of impetigo is highest in warm, humid climates and among children in close-contact settings including daycare centers.[56]

**Figure 7.** Impetigo's lesions in the face of a toddler.

Infected dermatitis may develop from pre-existing skin conditions, such as eczema, and typically manifests as erythematous, exudative, or crusted lesions.[57] Treatment of both skin infections involves topical antibiotics to eradicate the infection and antiseptics to prevent its spread.[58]

### Prescription examples

| Mupirocin 2% in Versatile™ Anhydrous |
|---|
| Apply a thin layer to affected areas. |
| Doses per day: 3 (every 8 hours) |
| Duration of treatment: at the doctor's discretion (usually for 7 days). |

| **Clindamycin 1% in Fitalite™** |
|---|
| Apply a thin layer to affected areas. |
| Doses per day: 3 (every 8 hours) |
| Duration of treatment: at the doctor's discretion (usually for 7 days). |

### 4.6.2. Fungal Skin Infections

Fungal skin infections are common in children and are caused by dermatophytes (tinea), yeasts (*Candida spp.*), and other fungi (*Malassezia spp.*).[59] Tinea infections can affect various body sites, including the scalp (tinea capitis), body (tinea corporis), and feet (tinea pedis), presenting as annular, scaly, and erythematous plaques.[60,61] Candidiasis primarily occurs in warm, moist areas such as skin folds and the diaper region, causing erythematous patches with satellite pustules.[62] Pityriasis versicolor, caused by *Malassezia spp.*, leads to hypo- or hyperpigmented macules, typically on the trunk and upper arms.[63]

The prevalence of fungal infections is higher in humid climates and among children in close-contact settings.[59] Risk factors include excessive sweating, immunosuppression, and prolonged antibiotic or corticosteroid use.[54,62] The treatment will depend on the specific fungal pathogen and site of infection.[59] Topical antifungals are commonly used for localized infections.[64]

#### Prescription examples

| **Clotrimazole 1% in Versatile™ (or Fitalite™)** |
|---|
| Apply a thin layer to affected areas. |
| Doses per day: 2 (every 12 hours) |
| Duration of treatment: at the doctor's discretion (usually for 2-4 weeks). |

*Antifungal and keratolytic treatment*

| **Ketoconazole 2% + Salicylic acid 3% in Fitalite™ (or Versatile™)** |
|---|
| Apply a thin layer to affected areas. |
| Doses per day: 1 or 2 (every 24 or 12 hours, respectively) |
| Duration of treatment: at the doctor's discretion (usually for 2–4 weeks). |

### 4.6.3. Virus Skin Infections

*Molluscum contagiosum* is a common viral infection in children caused by a poxvirus.[65] It presents as small, firm, dome-shaped, and umbilicated papules, typically 2-5 mm in diameter, often found on the face, trunk, and extremities.[66] Although generally self-limited, treatment may be considered to prevent autoinoculation and transmission.[67] Many cases resolve spontaneously within 6-12 months.[65] Typical treatments for molluscum contagiosum include curettage, topical solutions like salicylic and lactic acids, or potassium hydroxide, and, eventually, imiquimod cream.[68,69]

Warts in children are benign epidermal eruptions caused by human papillomavirus (HPV).[70] They present as hyperkeratotic papules and can be classified based on location and shape, such as common, plantar, flat, and filiform warts (Figure 8).[71] Typical treatments for warts include cryotherapy, curettage, electrosurgery, topical salicylic acid, and imiquimod cream for recalcitrant cases.[72]

**Figure 8.** Warts in the hand of a toddler.

#### Prescription examples

*Immune response modification*

| **Imiquimod 2-5% in Versatile™ (or Versatile rich™)** |
|---|
| Apply a thin layer to affected areas. |
| Doses per day: Once daily before bedtime, 3x per week |
| Duration of treatment: at the doctor's discretion (usually for 16 weeks). |

### 4.6.4 Parasitic Skin Infections

Scabies and lice infestation are highly contagious parasitic skin conditions commonly seen in pediatric patients.[73] Secondary bacterial infections are common and can cause severe health complications. In addition, both conditions are highly prevalent in school-aged children and those in impoverished and overcrowded living settings.[74] Direct skin-to-skin contact and shared personal items facilitate transmission.[73]

Scabies is caused by the *Sarcoptes scabiei* mite, which creates serpiginous tunnels into the epidermis, triggering an intense pruritic reaction.[75] The condition is characterized by linear lesions, papules, and widespread itching, particularly at night. It commonly affects the interdigital folds, axillae, and inguinal regions.[76]

Lice infestation (e.g., pediculosis capitis, corporis, or pubis) results from infestation with *Pediculus humanus* or *Pthirus pubis*, leading to pruritus, often with secondary excoriated lesions.[77] First-line pharmacologic treatment includes topical permethrin, and mechanical removal of nits is recommended for lice (Figure 9).[78]

**Figure 9.** Treatment of lice infestation: mechanical removal of nits.

### Prescription examples

*For scabies*

| **Permethrin 5% in Versatile™ Rich (or Fitalite™)** |
|---|
| Apply overnight to the entire body below the neck and rinse off after 8–12 hours. |
| Doses per day: 1 |
| Duration of treatment: Single application, repeat after 7 days. |

| **Permethrin 5% + Aloe vera extract powder (200:1) 0.5% in Versatile™ Rich (or Fitalite™)** |
|---|
| Apply overnight to the entire body below the neck and rinse off after 8–12 hours. |
| Doses per day: 1 |
| Duration of treatment: Single application, repeat after 7 days. |

*For scabies in infants (under 6 months)*

| **Benzyl benzoate 10% in Versatile™** |
|---|
| Apply a thin layer to the entire body from the neck down and rinse off after 8–12 hours. |
| Doses per day: 1 |
| Duration of treatment: Single application, repeat after 7 days |
| Warning: Avoid sensitive areas. Keep the product away from the face, eyes, and mucous membranes. If accidental contact occurs, rinse thoroughly with water. |

*For lice*

| **Permethrin 1% + DMSO* 10% in Seraqua™** |
|---|
| Apply to the scalp and rinse off after 10 minutes.<br>*DMSO is used as Permethrin solvent. |
| Doses per day: 1 |
| Duration of treatment: Single application. |

## 4.7. Psoriasis

Psoriasis is a chronic, immune-mediated skin disorder that affects approximately 1% of children and up to 3% of the global population.[79] It results from an accelerated skin cell turnover, leading to the buildup of thick, scaly plaques, typically on the scalp, elbows, and knees (Figure 10).[80] Pediatric psoriasis often has a genetic component and may be triggered by infections, stress, or skin trauma.[81] Topical therapies are the first line of treatment for skin-limited disease.[82] The management can include topical corticosteroids for reducing inflammation and vitamin D analogs to slow keratinocyte proliferation.[80] In addition, keratolytics, such as salicylic acid, help remove scales.[82]

**Figure 10.** Psoriasis lesion in the elbow of a school-aged child.

### Prescription examples

*Vitamin-Based Therapy (Supportive Treatment)*

| **Cyanocobalamin (Vitamin B12) 0.07% in Emolivan™** |
|---|
| Apply a thin layer to affected areas. |
| Doses per day: 2 (every 12 hours) |
| Duration of treatment: at the doctor's discretion. |

| **Cyanocobalamin (Vitamin B12) 0.07% + Avocado oil 3-5% in Emolivan™** |
|---|
| Apply a thin layer to affected areas. |
| Doses per day: 2 (every 12 hours) |
| Duration of treatment: at the doctor's discretion. |

*First-Line Treatment for Plaque Psoriasis*

| **Clobetasol Propionate 0.05% in Occluvan™** |
|---|
| Apply a thin layer to affected areas. |
| Doses per day: 1 (every 24 hours) |
| Duration of treatment: usually up to 2 weeks. |

*Keratolytic Therapy (For Thick Plaques and Scaling)*

| **Salicylic Acid 5% in Emolivan™** |
|---|
| Apply a thin layer to affected areas. |
| Doses per day: 1 (every 24 hours) |
| Duration of treatment: at the doctor's discretion. |

## 4.8. Acne Vulgaris

Acne vulgaris is a prevalent skin disorder, affecting up to 85% of adolescents aged 12 to 18 (Figure 11).[83] It results from increased sebum production, bacterial proliferation, follicular hyperkeratinization, and inflammation.[84] This condition can significantly impact an adolescent's self-esteem and quality of life.[85] Effective management includes daily use of moisturizers, cleansers, and sunscreens combined with keratolytic agents like benzoyl peroxide or salicylic acid.[86] Topical antibiotics may also be used to reduce bacterial load, while retinoids like tretinoin, promote cellular turnover and reduce comedones.[87]

**Figure 11.** Acne vulgaris in the face of a teenager.

### Prescription examples

*Mild Acne (Comedonal Acne)*

| **Benzoyl Peroxide 2.5% in Cleoderm™ (or Fitalite™)** |
|---|
| Apply a thin layer to affected areas at bedtime. |
| Doses per day: 1 (every 24 hours) |
| Duration of treatment: at the doctor's discretion. |

| **Benzoyl Peroxide 2.5% + Sulfur 2% in Cleoderm™ (or Fitalite™)** |
|---|
| Apply a thin layer to affected areas at bedtime. |
| Doses per day: 1 (every 24 hours) |
| Duration of treatment: at the doctor's discretion. |

| **Azelaic acid 10-20% + Alpha bisabolol 0.5% in Cleoderm™** |
|---|
| Apply a thin layer to affected areas at bedtime. |
| Doses per day: 1 (every 24 hours) |
| Duration of treatment: at the doctor's discretion. |

*Papulopustular Acne (Inflammatory Acne)*

| **Clindamycin 1% in Cleoderm™ (or Fitalite™)** |
|---|
| Apply a thin layer to affected areas. |
| Doses per day: 2 (every 12 hours) |
| Duration of treatment: at the doctor's discretion. |

| **Erythromycin 2% + Tretinoin 0.025% in Cleoderm™ (or Fitalite™)** |
|---|
| Apply a thin layer to affected areas. |
| Doses per day: 1 at bedtime (every 24 hours), avoiding sun exposure during the treatment. |
| Duration of treatment: at the doctor's discretion. |

*Moderate to Severe Acne*

| **Tretinoin 0.025% in Cleoderm™ (or Fitalite™ or Seraqua™)** |
|---|
| Apply a thin layer to affected areas at bedtime. Avoid sun exposure during the treatment. |
| Doses per day: 1 (every 24 hours) |
| Duration of treatment: at the doctor's discretion. |

| **Tretinoin 0.025% + Alpha bisabolol 1% (or Enoxolone 0.5-1%) in Cleoderm™ (or Fitalite™ or Seraqua™)** |
|---|
| Apply a thin layer to affected areas at bedtime. Avoid sun exposure during the treatment. |
| Doses per day: 1 (every 24 hours) |
| Duration of treatment: at the doctor's discretion. |

| **Clindamycin phosphate 1.2% + Tretinoin 0.025% in Cleoderm™ (or Fitalite™ or Seraqua™)** |
|---|
| Apply a thin layer to affected areas at bedtime. |
| Doses per day: 1 (every 24 hours) |
| Duration of treatment: at the doctor's discretion. |

| **Clindamycin phosphate 1.2% + Benzoyl peroxide 2.5% in Cleoderm™ (or Fitalite™)** |
|---|
| Apply a thin layer to affected areas at bedtime. Avoid sun exposure during the treatment. |
| Doses per day: 1 (every 24 hours) |
| Duration of treatment: at the doctor's discretion. |

| **Adapalene 0.1% in Cleoderm™** |
|---|
| Apply a thin layer to affected areas, at least one hour before bedtime. Avoid sun exposure during the treatment. |
| Doses per day: 1 (every 24 hours) |
| Duration of treatment: at the doctor's discretion. |

| **Adapalene 0.1% + Benzoyl peroxide 2.5% in Cleoderm™** |
|---|
| Apply a thin layer to affected areas, at least one hour before bedtime. Avoid sun exposure during the treatment. |
| Doses per day: 1 (every 24 hours) |
| Duration of treatment: at the doctor's discretion. |

## 4.9. Skin Pigmentation Disorders

Vitiligo is a chronic, autoimmune-mediated skin disorder characterized by the progressive loss of melanocytes, leading to depigmented macules and patches (Figure 12). It affects approximately 0.5–2% of the global population, with a peak onset in childhood and adolescence.[88] The condition is associated with genetic predisposition and environmental triggers, including oxidative stress and autoimmune dysfunction. Lesions commonly appear on the face, hands, axillary and inguinal regions, and areas subjected to repeated friction.[89] While vitiligo itself is asymptomatic, its psychosocial impact on pediatric patients can be significant.[90]

**Figure 12.** Vitiligo lesion in the eyebrow of a school-aged child.

Hyperpigmentation disorders, such as post-inflammatory hyperpigmentation (PIH) and melasma, result from excessive melanin production or abnormal melanocyte activity.[91] PIH is frequently seen in darker skin types following inflammation or injury (Figure 13), while melasma, although more common in adults, can occasionally occur in children due to hormonal influences or sun exposure.[92]

**Figure 13.** Post-inflammatory hyperpigmentation in the face of a teenager.

The management of pigmentation disorders should consider several factors, including extension, psychological impact, and possible associations with other autoimmune diseases.[90] Treatment for vitiligo aims to interrupt the progression and promote repigmentation.[93] Topical immunomodulators such as tacrolimus and corticosteroids are first-line therapies.[88] Hyperpigmentation disorders are managed with depigmenting agents such as hydroquinone, and antioxidants, combined with strict sun protection to prevent worsening.[94]

### Prescription examples

*First-Line for repigmentation in Vitiligo*

| **Tacrolimus 0.03-0.1% in Occluvan™ (or Versatile™ Anhydrous)** |
|---|
| Apply a thin layer to depigmented patches. |
| Doses per day: 2 (every 12 hours) |
| Duration of treatment: at the doctor's discretion. |

*For hyperpigmentation disorders (for adolescents)*

| **Hydroquinone 4% in Cleoderm™ (or Nourivan™ Antiox)** |
|---|
| Apply a thin layer to hyperpigmented patches at night. |
| Doses per day: 1 (every 24 hours) |
| Duration of treatment: at the doctor's discretion. |

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