SEBORRHEIC DERMATITIS

CHI Formulary Development Project

مجلس الضمان الصحي
Council of Health Insurance

INDICATION UPDATE

ADDENDUM- November 2023

To the CHI Original Seborrheic Dermatitis Clinical Guidance- Issued May 2020

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Abbreviations

AAD	American Academy of Dermatology
AIAF	Anti-Inflammatory and Antifungal
AIDS	Acquired Immunodeficiency Syndrome
ASD	Adult Seborrheic Dermatitis
CHI	Council of Health Insurance
CPG	Clinical Practice Guideline
EBM	Evidence-Based Medicine
EMA	European Medicines Agency
FDA	Food and Drug Administration
GoR	Grade of Recommendation
HIV	Human Immunodeficiency Virus
IDF	Insurance Drug Formulary
ISD	Infantile Seborrheic Dermatitis
JAMA	Journal of the American Medical Association
KTZ	Ketoconazole
LoE	Level of Evidence
OD	Once Daily
OTC	Over the Counter
PCDS	Primary Care Dermatology Society
PCR	Polymerase Chain Reaction
PMN	Polymorphonuclear Neutrophil
PUVA	Psoralen and Ultraviolet A
ROS	Reactive Oxygen Species
SD	Seborrheic Dermatitis
SFDA	Saudi Food and Drug Authority
TCI	Topical Calcineurin Inhibitors
UK	United Kingdom
US	United States
UVA	Ultraviolet A
UVB	Ultraviolet B

Executive Summary

Seborrheic dermatitis (SD) is a prevalent inflammatory skin condition characterized by a papulosquamous appearance in regions abundant in sebaceous glands, notably the scalp, face, and body creases. The presence of both infantile (ISD) and adult (ASD) variants reflect the condition's bimodal occurrence[1].

Risk factors that increase the likelihood of developing seborrheic dermatitis include age, the male gender, increased sebaceous gland activity, immunodeficiency (e.g., lymphoma, renal transplantation and HIV-AIDS), neurological and psychiatric disorders (e.g., Parkinson's disease, stroke, Alzheimer's dementia, major depression, autonomic dysfunction), exposure to certain medications, such as dopamine antagonists, immunosuppressants, psoralen/PUVA, lithium, and low environmental humidity and/or low environmental temperature[1].

Seborrheic dermatitis can manifest with the following signs and symptoms: flaking skin, resembling dandruff, which can occur on the scalp, hair, eyebrows, beard, or mustache; areas of oily skin covered by flaky white or yellow scales or crusts, commonly found on the scalp, face, sides of the nose, eyebrows, ears, eyelids, chest, armpits, groin, or beneath the breasts; rashes that may appear darker or lighter in individuals with brown or black skin, and redder in those with white skin; finally, in some cases, a ring-shaped (annular) rash, referred to as petaloid seborrheic dermatitis and pruritus. Signs and symptoms of SD often worsen during periods of stress, fatigue, or seasonal changes[2].

Seborrheic dermatitis exhibits a two-phase pattern of occurrence, first appearing in infants aged 2 weeks to 12 months typically as cradle cap. Cradle cap presents as slightly reddened, scaly, or crusty yellow patches on the scalp, and it can also initiate on the face or diaper region before potentially spreading to other areas of the body in affected babies and then resurfacing during adolescence and adulthood. The prevalence of seborrheic dermatitis that presents clinically significant symptoms is estimated at around 3 percent, with the highest occurrence observed during the third and fourth decades of life[3]. Since the primary underlying pathogenic mechanisms include the yeast Malassezia proliferation as well as skin inflammation, treatment includes topical antifungal, in addition to keratolytic and anti-inflammatory agents[4].

The prevalence of seborrheic dermatitis in Saudi Arabia is approximately 2.3%[5].

CHI issued seborrheic dermatitis clinical guidance after thorough review of renowned international and national clinical guidelines in May 2020. **Updating clinical practice guidelines (CPGs) is a crucial process for maintaining the validity of recommendations.**

This report functions as an **addendum** to the prior CHI Seborrheic Dermatitis clinical guidance and seeks to offer guidance for the effective management of Seborrheic dermatitis. It provides an **update on the Seborrheic Dermatitis Guidelines** for CHI Formulary with the ultimate objective of updating the IDF (CHI Drug Formulary) while addressing **the most updated best available clinical and economic evidence related to drug therapies.**

Main triggers for the update are summarized, by being the addition of **new recommendations to the report** such as the **American Academy of Dermatology (AAD)** clinical recommendations for the diagnosis and treatment of seborrheic dermatitis (**2022**), the **Primary Care Dermatology Society (PCDC)** recommendations on seborrheic eczema (**2022**), the **Australian College of Dermatologists** recommendations on seborrheic dermatitis and cradle cap (**2020**), the **National Eczema Association (US)** recommendations on seborrheic dermatitis in children (**2023**) and the **National Eczema Society (UK)** recommendations on SD in adults (**2022**). **Review articles** were also detailed, including one published by Dall'Oglio et al. in *Clinical, Cosmetic and Investigational Dermatology* in August **2022**, and another by Borda et al. published in the *Journal of Dermatological Treatment* in May **2018**.

After carefully examining clinical guidelines and reviewing the SFDA drug list, alclomethasone, tea tree oil shampoo, flumetasone pivalate, olive oil and petrolatum white were withdrawn from the SFDA market and were delisted from the drug summary spreadsheet. One modification was also made to the prescribing edits: metronidazole does not need "prior authorization (PA)" to be prescribed.

A new agent, **roflumilast foam**, is a potential novel treatment option for SD. A phase 2a randomized clinical trial on the efficacy of roflumilast foam 0.3% in patients with SD was published in JAMA Dermatology in May 2023, and the results showed favorable efficacy, safety, and local tolerability in the treatment of erythema, scaling, and itch caused by seborrheic dermatitis, supporting further investigation as a nonsteroidal topical treatment[6]. Topical roflumilast is not yet approved for the management of SD.

All recommendations are well supported by reference guidelines, Grade of Recommendation (GoR), Level of Evidence (LoE) and Strength of Agreement (SoA) in all tables reflecting specific drug classes' role in Seborrheic Dermatitis management.

Below is a table summarizing the major changes based on the different seborrheic dermatitis guidelines used to issue this report:

Table 1. General Recommendations for the management of Seborrheic Dermatitis

Management of Seborrheic Dermatitis	
General Recommendations	**Level of Evidence/Grade of Recommendation and reference**
In adults, the use of topical agents with antifungal (ketoconazole, ciclopirox, miconazole), anti-inflammatory (betamethasone valerate, clobetasol propionate) or keratolytic/humectant (propylene glycol) properties is strongly recommended.	Dall'Oglio et al. (2022)[7]
In the pediatric age, scant scientific evidence supports the effectiveness and safety of topical antifungals, anti-inflammatory or keratolytic agents. Generally, the mainstay treatments of "cradle cap" include the use of baby shampoos enriched with emollient agents and vegetable oils, followed by gentle mechanical removal of loosen scales.	Dall'Oglio et al. (2022)[7]
Non-Scalp Seborrheic Dermatitis: The use of topical antifungal and anti-inflammatory agents is strongly recommended for mild-to-moderate SD on face and/or body areas.	Dall'Oglio et al. (2022)[7]
SD of the Non-Scalp Area in Infants: Topical Treatment In infants and young children with mild-to-moderate facial/body SD, limited evidence supports the use of a topical pharmacological approach, due to scarce data and to the possibility of systemic drug absorption in newborns. The use of natural anti-inflammatory/antioxidants and/or emollient agents as gel or cream, may be considered.	Dall'Oglio et al. (2022)[7]
SD in Adults: Systemic Treatment Systemic antifungals (terbinafine, itraconazole) are mainly indicated in acute and/or severe and/or resistant adult SD forms.	Dall'Oglio et al. (2022)[7]
Low to mild potency topical corticosteroids are effective in clearing of signs and symptoms associated with SD. Topical corticosteroids can be used alone or in combination with antifungal agents; however prolonged use is not suggested	Borda et al. (2018)[8]

due to their side effects, such as telangiectasias, hypertrichosis, atrophy, and perioral dermatitis.	
Topical antifungals are used in the treatment of SD due to their ability to decrease Malassezia burden and subsequent inflammatory response. Therefore, topical antifungals are generally one of the first line treatment for SD. Topical azoles, such as ketoconazole, clotrimazole, and miconazole have been shown to be effective.	Borda et al. (2018)[8]
Nutrition: numerous nutrient mediators such as essential fatty acids, vitamins A, E and D, vitamins B1, B2, B6, niacin and biotin, vitamin C selenium, zinc, and iron may play a role in treating psoriasis and seborrheic dermatitis.	Borda et al. (2018)[8]

At the end of the report, a **key recommendation synthesis section** is added highlighting the latest updates in **Seborrheic Dermatitis clinical and therapeutic management.**

Section 1.0 Summary of Reviewed Clinical Guidelines and Evidence

This section is divided into two parts: the first includes recommendations from **updated versions of guidelines** mentioned in the previous CHI Seborrheic Dermatitis report, and the second includes **newly added guidelines** that have helped generate this report.

1.1 Revised Guidelines

This section contains the **updated versions** of the guidelines mentioned in the May 2020 CHI Seborrheic Dermatitis Report and the corresponding recommendations:

Table 2. Guidelines Requiring Revision

Guidelines requiring revision	
Old versions	**Updated versions**
Evidence-based Danish Guidelines for the Treatment of Malassezia related Skin Diseases (2015)	N/A*
Optimizing Treatment Approaches in Seborrheic Dermatitis (2013)	N/A*

Treatment of Seborrheic Dermatitis in Asia: A Consensus Guide (2015)	N/A*
Diagnosis and Treatment of Seborrheic Dermatitis. American Academy of Family Physicians (2015)	N/A*

*: No updated version available; the existing version is the most recent one and no further updates or revisions have been made or released.

1.2 Additional Guidelines

This part includes the added guidelines to the previous CHI Seborrheic Dermatitis report, along with their recommendations.

No recent guidelines were published by major societies for the management of seborrheic dermatitis. Two relevant review articles were included in this section, and cover the management options for the treatment of SD. In addition, clinical recommendations by major associations such as the AAA and the PCDC, aimed at the scientific community or at public, were included for a well-rounded overview of the management of SD.

Table 3. List of Additional Guidelines

Additional Guidelines
Dall'Oglio et al. An overview of the Diagnosis and Management of Seborrheic Dermatitis. *Clinical Cosmetic and Investigational Dermatology* (**2022**)[7]
Borda et al. Treatment of Seborrheic Dermatitis: A Comprehensive Review. *Journal of Dermatological Treatment* (**2018**)[8]
American Academy of Dermatology (AAD): Diagnosis and Treatment of Seborrheic Dermatitis (**2022**)[9]
Primary Care Dermatology Society (PCDC): Seborrheic Eczema (**2022**)[10]
Australian College of Dermatologists: Seborrheic Dermatitis and Cradle Cap (**2020**)[11]
National Eczema Association (US): Seborrheic Dermatitis in Children (**2023**)[12]
National Eczema Society (UK): Seborrheic Dermatitis in Adults (**2022**)[13]

1.2.1 Review Article: An Overview of the Diagnosis and Management of Seborrheic Dermatitis (2022)

The recommendations listed in this section are from a review article published by Dall'Oglio et al. in the journal *Clinical, Cosmetic and Investigational Dermatology* in 2022[7]:

The available topical, systemic agents and physical treatments for scalp and non-scalp SD (facial and/or body hairy areas) have been classified according to Evidence-Based Medicine (EBM) criteria from level A (strong evidence for efficacy) to E (least evidence of efficacy), based on the quality and relevance of available scientific studies supporting their use.

SD of the scalp in adults: topical treatment

In adults, the use of topical agents with antifungal (ketoconazole, ciclopirox, miconazole), anti-inflammatory (betamethasone valerate, clobetasol propionate) or keratolytic/humectant (propylene glycol) properties is strongly recommended.

Table 4. Recommended Pharmacological Topical Agents for Scalp Seborrheic Dermatitis in Adults

Agent	Dose/ formulation	Schedule	Comments
Ketoconazole	1-2% shampoo	Twice weekly for 4 weeks	Ketoconazole 2% shampoo once weekly for 6 months has been shown to be effective in preventing relapse
	2% foam	Twice daily for 4 weeks	Twice daily continuative use (for up to 12 months) has demonstrated high safety profile
	2% gel	Twice weekly for 4 weeks	Fast efficacy and low rate of recurrences after discontinuation
	2% foaming gel	Twice weekly for 1 month → once weekly for 3 months	Significant reduction of erythema and P. orbiculare count by microbiological evaluation vs 0.005% betamethasone dipropionate lotion
Ciclopirox	1-1.5% shampoo	3 times a week for 4 weeks	No statistically significant difference in clinical response for higher vs lower concentrations
	0.77% gel	Twice daily for 4 weeks	
Miconazole	2% solution	Once daily for 3 weeks	Miconazole 2% solution + 1% hydrocortisone solution

			more effective than 2% miconazole as monotherapy
Betamethasone valerate	0.12% foam	Twice daily for 4 weeks	Prolonged use not recommended, due to possible side effects
Clobetasol propionate	0.05% shampoo	Twice weekly for up to 2 weeks	It can be used alone or in combination with antifungal agents; prolonged use should be avoided to prevent side effects
Propylene glycol	15% solution	Once daily for 3 weeks	Significant reduction of P. orbiculare count by microbiological evaluation

SD of the scalp in children: topical treatment

In pediatric age (from birth up to 24 months), scant scientific evidence supports the effectiveness and safety of topical antifungals (1% ciclopirox shampoo, 1% KTZ cream/shampoo, 2.5% SS shampoo), anti-inflammatory (1% hydrocortisone cream/lotion) or keratolytic agents (3% salicylic acid in combination with 1.5% ciclopirox shampoo, lactamide monoethanolamine shampoo). Generally, the mainstay treatments of “cradle cap” include the use of baby shampoos enriched with emollient agents (i.e., shea butter, glycerin) and vegetable oils (i.e., olive oil, borage oil, almond oil), followed by gentle mechanical removal of loosen scales.

Non-Scalp Seborrheic Dermatitis

The use of topical antifungal (KTZ, ciclopirox, clotrimazole) and anti-inflammatory (desonide, hydrocortisone, lithium succinate/gluconate, topical pimecrolimus/tacrolimus) agents is strongly recommended for mild-to-moderate SD on face and/or body areas.

Table 5. Recommended Pharmacological Topical Agents for Facial Seborrheic Dermatitis in Adults

Agent	Dose/ formulation	Schedule	Comments
Ketoconazole	1–2% cream/foam/gel	Twice daily for 4 weeks (cream) once daily for 2 weeks or twice daily for 4 weeks (foam/gel)	Significant reduction of Malassezia count by PCR evaluation (KTZ 2% cream)
Ciclopirox	1% cream	Twice daily for 4 weeks	Limited data support the efficacy of ciclopirox vs other topical antifungal agents
Clotrimazole	1% cream	Once daily for 3 weeks	Limited data support the short-term efficacy of clotrimazole vs corticosteroids
Desonide	0.05% cream	Twice daily for 8 weeks	Similar efficacy vs non-steroidal AIAF product
Hydrocortisone	1% cream	Once daily for 4 weeks	Limited data support the efficacy
Lithium succinate/ gluconate	8% ointment	Twice daily for 8 weeks	Limited data support the efficacy vs KTZ 2% cream
Pimecrolimus/ tacrolimus	1% cream 0.03%-0.1% ointment	Once or twice daily for 4–8 weeks (acute phase), then once weekly for 12 weeks (maintenance therapy)	Better side effects profile vs topical corticosteroids

SD of the Non-Scalp Area in Infants: Topical Treatment

In infants and young children with mild-to-moderate facial/body SD, limited evidence supports the use of a topical pharmacological approach, due to scarce data and to the possibility of systemic drug absorption in newborns. The use of natural

anti-inflammatory/antioxidants (e.g., stearyl glycyrrhetinate, Aloe vera, vitamin E, Echinacea purpurea, lactoferrin) and/or emollient agents (e.g., hyaluronic acid) as gel or cream, may be considered.

SD in Adults: Systemic Treatment

Systemic antifungals (terbinafine, itraconazole) are mainly indicated in acute and/or severe and/or resistant adult SD forms, as well as in selected and difficult-to-treat conditions.21 In these cases, the goal of systemic approach is the prompt reduction of symptoms and the possibility to use topical agents as a maintenance therapy. Terbinafine (Level A), is a lipophilic molecule able to create a cutaneous reservoir of effective drug concentrations even after its withdrawal. When used orally, it is administered at a dosage of 250 mg/day for 4–6 weeks or 250 mg/day for the first 12 days of the month for 3 consecutive months (pulse regimen). Itraconazole (Level B) is a highly keratinophilic and lipophilic triazole agent secreted with sebum at the stratum corneum level where Malassezia colonies are generally present.

SD in Children: Systemic Treatment

In children, limited and conflicting data support the benefit of oral biotin supplementation (4 mg/day for 4 weeks) vs placebo as shown in a dated double-blind, crossover trial.

SD in Adult: Physical Treatment

SD patients often experience improvement during the summer. An anti-inflammatory and/or inhibiting effect on Malassezia yeasts cultured from the skin as a result of UVA and UVB light exposure has been demonstrated by some in vitro studies. However, limited clinical evidence supports the advantages of UVB phototherapy (Level C) in diffuse and resistant SD forms.

Miscellaneous

Conditions associated with a higher incidence and/or a more refractory course of SD include HIV-infection, neurological diseases, and Down's syndrome. Additionally, in case of SD-like dermatitis, the causative role of some systemic drugs should be ruled out. In HIV-infected patients, SD is generally not only more prevalent but also more severe than usual, and frequently associated to a relapsing course. Several factors are likely to promote its development, including immune system failure causing an overgrowth of Malassezia yeast. Mild SD forms, in either children or adults, may be treated with topical 2% ketoconazole, two to three times per week for 4 weeks, with a once weekly maintenance treatment as needed. In case of moderate-to-severe SD, the therapy may be challenging, as these forms generally show poor response to topical and systemic antifungals and/or to mid- to high-potency corticosteroids.

1.2.2 Treatment of Seborrheic Dermatitis: A Comprehensive Review (2018)

The recommendations listed in this section are from a review article published by Borda et al. in the *Journal of Dermatological Treatment* in 2018[8]:

I. Topical Treatment

1. Antifungals

Since SD is a chronic inflammatory disease that occurs in response to the presence of fungus on the skin, antifungals play a key role in the treatment of SD. Topical antifungals are used in the treatment of SD due to their ability to decrease Malassezia burden and subsequent inflammatory response. Therefore, topical antifungals are generally one of the first line treatment for SD. Topical azoles, such as ketoconazole, clotrimazole, and miconazole have been shown to be effective. Topical ketoconazole 2% in Accepted Manuscript different presentations as shampoo, cream or gel has shown to be effective in the treatment of SD. Furthermore, topical ketoconazole 2% treatment showed a remission rate similar to that of steroids; however, the occurrence of adverse effects was 44% lower in the ketoconazole arm than in the steroid group.

Ciclopirox olamine 1% (cream, shampoo, and gel) is a broad-spectrum antifungal agent, whose mechanism of action involves inhibition of metal-dependent enzymes inside of the fungal cell with anti-inflammatory activity has been shown to be effective for SD of the face and scalp.

2. Corticosteroids

Low to mild potency topical corticosteroids are effective in clearing of signs and symptoms associated with SD. Topical corticosteroids can be used alone or in combination with antifungal agents; however prolonged use is not suggested due to their side effects, such as telangiectasias, hyperthrichosis, atrophy, and perioral dermatitis.

3. Non-steroidal anti-inflammatory agents

Non-steroidal anti-inflammatory agents are topical therapies that treat scalp and non-scalp seborrheic dermatitis primarily through the inhibition of the growth of the Accepted Manuscript Malassezia species anti-inflammatory, antimycotic, keratolytic, and antioxidant effects. Studies involving non-steroidal anti-inflammatory agents indicate these treatments to be efficacious and well-tolerated. Adverse effects are generally mild and are limited to a temporary pricking sensation, stinging, itching, burning, erythema, and viral gastroenteritis. Overall, non-steroidal anti-inflammatory agents appear to be effective, viable, and safe therapeutic modalities for SD.

a. Climbazole/piroctone olamine cream

The combination of piroctone olamine and climbazole offers an effective treatment option with little to no adverse effects. Additionally, it has the advantages of decreasing wet hair combing force and increasing hair conditioning. Piroctone olamine is found in numerous cosmetic products at a maximal concentration of 1% (rinse-off products) or 0.5% (other products), including anti-dandruff shampoo. It is an ethanolamine salt of the hydroxamic acid derivative piroctone and serves as a hydroxypyridone anti-mycotic agent. Piroctone olamine has antifungal effects and its mechanism of action involves penetrating the cell membrane and creating complexes with iron ions, ultimately barring energy metabolism in the mitochondria.

b. Bisabolol

Bisabolol is a monocyclic sesquiterpene alcohol that is usually applied to affected areas in the form of a topical. In vitro studies have demonstrated that bisabolol downregulates human polymorphonuclear neutrophil (PMN) release of reactive oxygen species (ROS), inducing antioxidant and anti-inflammatory effects. Further, it has anti-oxidant properties against neutrophil bursts that result in increased amounts of reactive oxygen species. Bisabolol protects the gastric Accepted Manuscript epithelium from damage from prostaglandins and nitric oxide, which may be carried over to the skin due to the similarities in behavior of the two in turnover and barrier function. In reference to sebhorreic dermatitis, bisabolol has an anti-inflammatory effect that is more specific than that of steroids and anti-fungal therapies, but is probably not as potent as monotherapy. Studies evaluating skin conditioning agents containing bisabolol have indicated that these creams result in early and significant improvement with limited complications.

c. Glycerrhetinic acid

Glycyrrhetinic acid, an ingredient in black licorice, is primarily indicated for hypertension management due to its mineralcorticoid properties, but also has broad-spectrum anti-microbial and anti-inflammatory activity, making it beneficial in the treatment of SD. It is a potent inhibitor of 11-B-hydroxysteroid hydroxygenase, the enzyme that facilitates the conversion of hydrocortisone in normal steroid metabolism, potentiating anti-inflammatory effects.

d. Lactoferritin

Although the mechanism by which lactoferrin modulates inflammatory and immune response is not well-elucidated, it may be accounted for through the modulation of the migration, maturation, and function of immune cells, as well as iron binding and interactions with other compounds.

e. Promiseb topical cream

Promiseb® Topical Cream is a nonsteroidal cream that combines many of the active ingredients previously mentioned (ex. lycyrrhetinic acid and piroctone olamine) to enhance anti-inflammatory and anti-fungal activity.

4. Immunomodulators

Immunomodulators primarily treat SD through the inhibition of calcineurin, a calcium-dependent phosphase necessary for T-cell activation and proinflammatory cytokine production. In addition to producing anti-inflammatory effects, immunomodulaters may have antifungal activity against Malessezia furfur/P. ovale. The two main immunomodulators indicated for the treatment of SD include tacrolimus and pimecrolimus, and are especially beneficial for facial SD due to their limited adverse events. They are generally implicated when treatment Accepted Manuscript with topical corticosteroids and antifungal do not effectively control SD.

a. Tacrolimus

Tacrolimus ointment is a topical, noncorticosteroid immunosuppressant, similar to cyclosporine, and approved for the treatment of atopic dermatitis. Its anti-inflammatory properties also make it a suitable treatment for SD. Tacrolimus is advantageous over topical corticosteroids in terms of safety. Unlike corticosteroids, tacrolimus is not linked with skin atrophy, striae, or skin thinning, and can be safely administered on the face, neck, and intertriginous regions.

b. Pimecrolimus

Since creams tend to produce greater cosmetic acceptability, more studies have been conducted on pimecrolimus than tacrolimus. Pimecrolimus 1% cream is a topical macrolactam immunomodulator, widely used in the treatment of atopic dermatis. Unlike tacrolimus, it was specifically created as a therapeutic modality for inflammatory dermatoses, but like its counterpart, it has numerous advantages over corticosteroids. Due to its higher lipophilicity and higher molecular weight, pimecrolimus may have a more favorable skin permeation profile because of its lower degree of percutaneous absorption when compared with corticosteroids. Since both tacrolimus and pimecrolimus typically do not cause skin atrophy or hypopigmentation, they may be excellent treatment modalities for treating SD in African Americans. Pimecrolimus is generally applied twice daily over the course of four weeks, although studies have also monitored its effectiveness over the course of 2, 6, 8, and 16 weeks. Overall, pimecrolimus is generally well tolerated, especially on the face, but does induce adverse effects comparable with those of tacrolimus including burning, tingling, pruritus, feeling of warmth, itching, and erythema.

5. **Miscellaneous**

a. Metronidazole

Metronidazole is an antiprotozoal and imidazole-derived antibacterial agent. When used systematically, it has strong antibacterial activity against anaerobic bacteria. This drug decreases oxidative damage via inhibition of neutrophil-generated inflammatory mediator.

b. Keratolytic agents

Coal tar: Coal tar may be efficacious against SD due to its keratoplastic effects.

Salicylic acid/Lipohydroxy acid (LHA): LHA's mechanism of action includes exfoliation, stimulation of epidermal renewal, and antimicrobial activities against Malassezia ovalis.

K301: K301 (Kaprolac) is a relatively new topical solution consisting of a homogeneous mixture of urea, propylene glycol and lactic acid with small amounts of glycerol and water, all of which are biodegradable. These ingredients treat SD through keratolytic, exfoliating, anti-fungal, and hydrating activities.

c. Selenium sulfide

Topical selenium sulfide has antifungal activity mainly via the promotion of shedding of the infected stratum corneum.

d. Sodium sulfacetamide

The combination of 10% sodium sulfacetamide and 5% sulfur has been demonstrated to be effective as the treatment of several inflammatory facial dermatoses including seborrheic dermatitis. Sodium sulfacetamide has antibacterial and anti-inflammatory properties while sulfur is a nonspecific antifungal and antibacterial. The foam formulation of 10% sodium sulfacetamide and 5% sulfur permits a slight application film, leaving behind no remnant on hair bearing or non-hair bearing skin. This preparation may be found as foam or lotion and can be applied once or twice daily on scalp, face, and body.

e. Lithium gluconate/succinate

Lithium succinate ointment has been studied in various formulations (lithium succinate 8%, zinc sulphate 0.05%, preservative in wool alcohol ointment 0.1%), ((lithium succinate 8%, zinc sulphate 0.05%, dl-a tocopherol in a lanolin base), and (8% lithium succinate, 0.05% zinc sulfate, 0.1 % preservative in wool alcohols ointment). The ointment treats SD through inhibiting the growth of fungi and yeast that cause SD as well as through inhibiting arachidonic acid, which is the first step generating the production of leukotriene and prostaglandin. It is typically applied twice daily over the course of 4 to 8 weeks.

f. Phototherapy

It has been shown that patients improve with exposure to natural sunlight during summer months, and two studies have reported the benefit of treatment with selective ultraviolet (UV) phototherapy or oral photo-chemotherapy. However, SD may be precipitated by psoralen and ultraviolet A therapy. Narrow-band UVB phototherapy is a kind of phototherapy that uses specially filtered fluorescent lamps emitting selective UVB spectra in the range of 311 to 313nm (narrow-band UVB). UVB radiation (280 to 320nm) is absorbed in the epidermis and superficial dermis by molecules called chromophores, including DNA, urocanic acid (product of histidine breakdown in stratum corneum), melanin, and keratin.

g. Glycerin

Pure glycerin may help heal SD through its emollient, dehydrating, and slightly irritating effects.

h. Others

Aloe vera, crude honey, Benzoyl peroxide, mud treatment and borage and tea tree oil and quassia amara ad solanum chrystrichum and copper hairbrush are being studied and might be of benefit.

II. Systemic treatment

1. Itraconazole

Systemic antifungals such as Itraconazole, ketoconazole, terbinafine, and fluconazole have been tried as treatment options of patients with both moderate to severe and/or refractory-to-treat SD. Itraconazole is highly keratinophilic and lipophilic triazole which makes it suitable for the systemic treatment of SD and secretion in sebum is the main mechanism via which the drug gets to the stratum corneum. Itraconazole is the most common oral treatment for severe SD associated with a good therapeutic and safety profile.

2. Terbinafine

Terbinafine is an anti-mycotic agent that possesses antioxidant and anti-inflammatory properties, as well as anti-mycotic activities against dermatophytes, molds, dimorphic fungi, and other pathogenic yeasts as it inhibits Malassezia furfur subgroups. It may be used topically or orally. When used orally, it is administered daily at a dosage of 250 mg, generally over the course of 4 to 6 weeks.

3. Fluconazole

Fluconazole is a broad-spectrum bistriazole derivative that inhibits dermatophytes, yeasts, and dimorphic fungi and has generated satisfactory therapeutic results in the treatment of seborrheic blepharitis and Malassezia folliculitis.

4. **Ketoconazole**

Ketoconazole was one of the first drugs used as systemic treatment for SD. However, there is usually a rapid SD recurrence when ketoconazole is stopped, it may produce hepatotoxicity, and it can alter the metabolism of testosterone.

5. **Pramiconazole**

Pramiconazole is also a triazole antifungal whose main mechanism of action consists of inhibition of ergosterol synthesis. It has a broad activity against Candida sp., dermatophytes, and Malassezia sp. Pramiconazole has the highest activity via minial inhibitory concentration testing against Malassezia spp., showing 10 times more potent than ketoconazole.

III. Nutrition

Numerous nutrient mediators such as essential fatty acids, vitamins A, E and D, vitamins B1, B2, B6, niacin and biotin, vitamin C selenium, zinc, and iron may play a role in treating psoriasis and seborrheic dermatitis.

1.2.3 American Academy of Dermatology Recommendations for Diagnosis and Treatment of Seborrheic Dermatitis (2022)

The American academy of dermatology association 2022: seborrheic dermatitis: diagnosis and treatment lists the below recommendations[9]:

- If the baby could have seborrheic dermatitis (called cradle cap in babies), it is best to see a dermatologist for a diagnosis.
- A dermatologist can often tell if a baby has cradle cap, a type of seborrheic dermatitis that babies develop, or an adult has this disease by:
    - Asking about symptoms
    - Looking closely at the affected skin on the scalp, face, and other areas with signs of cradle cap or seborrheic dermatitis
- **Treating cradle cap**: While this will go away by the time your baby is six to 12 months old, treatment can help your baby feel more comfortable. You can often treat this at home without prescription medication.
    - When treating cradle cap, you want to avoid irritating your baby's skin.
    - Use a gentle baby shampoo. Avoid shampoos meant to control dandruff and those with a strong fragrance.
- Tips for treating cradle cap in the diaper area: Dermatologists recommend:
    - Using superabsorbent diapers and changing them often.

    - Wash the diaper area with a gentle baby shampoo. Avoid using soap and products that contain alcohol.
- Treating seborrheic dermatitis in teens and adults:
    - Scalp: This is the most common place to develop seborrheic dermatitis. Treatment may include:
        - Dandruff shampoo: Often used to treat the scalp, without a prescription. If you have moderate to severe seborrheic dermatitis, you may need a prescription dandruff shampoo.
        - Rotating dandruff shampoos can be an effective way to get the disease under control.
        - If you have severe seborrheic dermatitis, your dermatologist may prescribe a shampoo or topical solution that contains a corticosteroid. You will use this for a short time to get the disease under control. Once under control, your dermatologist would recommend another dandruff shampoo to help prevent flare-ups.
- To determine how often you need to shampoo to get seborrheic dermatitis under control, the texture of the hair will be looked at.
    - People with straight or wavy hair usually shampoo every day.
    - Curly or tightly coiled hair will likely shampoo once a week.
- To get seborrheic dermatitis under control, it's important to leave the shampoo on the scalp for the amount of time recommended. This gives the medication time to work.
- Rinse off the shampoo thoroughly. Skin with seborrheic dermatitis is easily irritated. If you have shampoo residue on your skin or scalp, it could cause a flare-up.
- **Medication to soften thick crusts:** If you have raised patches that are covered with thick crusts on your scalp, your treatment plan may include one of the following to soften the crust: Coal tar, bath oil, or medication you apply to your scalp. Some people apply the treatment, letting it sit on the scalp for about one hour. If the patches are widespread or very thick, you may need to apply this treatment before bed and leave it on while you sleep.
- **Medication to decrease inflammation:** Used to stop swelling and discoloration, this medication is used short term.

Eyelids: The medical term for seborrheic dermatitis in this area is “seborrheic blepharitis.” Not everyone who has seborrheic dermatitis develops this. If you do, you should:

- **Gently clean your eyelids and eyelashes with baby shampoo applied to a cotton swab.** Most people do this once or twice a day until the crusts on the eyelids go away.
- **Apply medication as needed.** Some people need an antibiotic ointment, which they apply to the eyelids, usually for 2 to 8 weeks.

Other areas of the body: If you have seborrheic dermatitis on your face, in or around your ears, on your chest, or elsewhere, you may be prescribed:

- **Medication to apply on your skin:** To get the disease under control, you may be prescribed a corticosteroid for a short time. This medication can quickly reduce swelling, discoloration, and itch.
  To get the disease under control, some people also need an antifungal medication that they apply to their skin.
- **Skin softener**: The medical name for a treatment that softens the skin is “keratolytic.” This can help get rid of the scale and crusts on your skin. Coal tar is commonly used to soften skin with seborrheic dermatitis.

1.2.4 Primary Care Dermatology Society (PCDS): Seborrheic Eczema (2022)

The primary care dermatology society (PCDS) based in the UK published in May 2022 a short chapter on the seborrheic eczema (synonymous to seborrheic dermatitis). The main recommendations are listed below[10]:

Drug treatment options for seborrheic dermatitis for the scalp:

- Nizoral® (ketoconazole 2%) shampoo. Initially use two to four times a week then once every two weeks for maintenance. An alternative is Selsun® (selenium sulphide) shampoo.
- For itch and erythema - a topical steroid scalp application or mousse
- For scale and crusts - olive oil for mild crusting. Sebco® ointment massaged in and left on for two to four hours can be very useful for thicker scale/crust.

Topical treatments for the skin:

- Topical Nizoral® cream - some patients find this causes too much skin irritation, in which case use either Canesten® (clotrimazole and hydrocortisone) or Daktarin® (miconazole nitrate) cream.

- Topical steroids such as Eumovate® (clobetasone butyrate) cream can be added in for flare-ups but should only be used for one to two days at a time on facial skin.
- Try to avoid giving patients combination products such as Daktacort® (miconazole nitrate (2% w/w) and hydrocortisone (1% w/w)) or Trimovate® (clobetasone butyrate, calcium oxytetracycline and nystatin) to treat facial skin as they may lead to the overuse of topical steroids
- If there are concerns about how much topical steroid is being used on the face consider the off-label use of topical calcineurin inhibitors e.g., Elidel® cream (pimecrolimus) or Proptopic® ointment (tacrolimus)

More extensive or recalcitrant symptoms:

- Systemic itraconazole (Sporanox®) 200 mg OD for 7 days
- If symptoms relapse frequently consider six-to-eight-week courses of a systemic tetracycline (off-label), which have an anti-inflammatory effect on the skin.
- Consider HIV in patients with more severe symptoms.

1.2.5 The Australian College of Dermatologists: Seborrheic Dermatitis and Cradle Cap (2020)

The Australian College of Dermatologists issued the below recommendations for the management of seborrheic dermatitis and cradle cap[11]:

When the condition affects the scalp, shampoos containing tar or antifungal agents (such as selenium sulfide, ketoconazole, miconazole or ciclopirox) are usually effective.

Creams containing antifungal and/or corticosteroid can be used for the face and trunk. Agents that help exfoliate the scaly skin such as salicylic acid are also useful. Treatment often needs to be used on a regular basis in order to clear the condition completely, with intermittent use thereafter to maintain long term control.

In babies, cradle cap can be treated by softening the scales on the skin with a little olive oil applied before bathing, and then removing the scales gently with a cotton bud. Sometimes a cream containing a mild corticosteroid (such as hydrocortisone 1%) or an antifungal agent or a tar-based product may also be useful to clear the scaling.

1.2.6 National Eczema Association: Seborrheic Dermatitis in Children (2023)

The US-based national eczema association issued the below recommendations for the management of seborrheic dermatitis in children[12]:

If the seborrheic dermatitis is mild, an OTC topical antifungal cream or medicated shampoo with ketoconazole, selenium sulfide, coal tar or zinc pyrithione, may be enough to control symptoms. It is okay to leave mild seborrheic dermatitis untreated if your child is not uncomfortable.

In more severe cases, a provider may prescribe topical steroids or TCIs to calm the inflammation. Oral antifungal agents may also be used.

Try the following home remedy for cradle cap:

- Apply plain mineral oil or petroleum jelly to your baby's scalp about an hour before bathing to loosen scales.
- Gently massage shampoo into the scalp for a few minutes to remove the scales. A dandruff shampoo works best but can sting if it gets into the eyes.
- Rinse well and gently pat dry.

1.2.7 National Eczema Society: Seborrheic Dermatitis in Adults (2022)

The UK-based national eczema association issued the below recommendations for the treatment of seborrheic dermatitis in adults[13]:

Seborrheic dermatitis cannot be cured, because once an individual has become allergic to Malassezia on the skin, exposure to it will always cause a problem. The only way to keep it under control is to use anti-yeast treatments, which will suppress seborrheic dermatitis but not eradicate it. However, it is usually not difficult to keep seborrheic dermatitis under control, and topical treatments are safe to use long-term, on the advice of a healthcare professional.

The major reservoir for the yeast is the scalp, so a medicated anti-yeast shampoo should be used. Even if all signs of the condition have disappeared, it is advisable to use an anti-yeast shampoo once a week as an ongoing preventative measure. After treating the scalp, it may still be dry, so an emollient should be used.

Moisturizing the scalp medical emollients can be applied to the scalp by parting the hair and massaging them into the skin. Ointment based emollients are not suitable as they are grease based and difficult to wash out. Emollients in lotion, gel, and spray-on oil forms; for example, E45 lotion, Double base gel or the spray-on oil, Emollin, may be suitable. Coconut oil is another option. It comes as a solid form that melts at skin temperature. Olive oil is no longer recommended as it has been found to damage the skin barrier. People often prefer to moisturize the scalp in the

evening, wearing a cotton turban or shower cap to keep the emollient overnight, and then rinse the product out in the morning.

For treating the scalp, there are many over-the-counter anti-yeast shampoos available. These include:

- Dandrazol (ketoconazole)
- Nizoral (ketoconazole) – also available on prescription
- Selsun – warning: selenium can stain cheap metals and jewelry black.

Use these shampoos as a treatment rather than as a hair wash. Leave them on for 5-10 minutes and then rinse off. Avoid using these more than twice a week as there is a risk of irritation. For more severe seborrheic dermatitis affecting the scalp, a scalp application or lotion containing a steroid and salicylic acid (e.g., Diprosalic scalp application) may be prescribed. This will help control inflammation and scale.

Tar-based shampoos or Dermax (not tar-based) are good for keeping symptoms of flaking and scaling at bay, and they can be alternated with a ketoconazole shampoo.

Tar-based shampoos include:

- Neutrogena T/Gel Therapeutic Shampoo
- Capasal Therapeutic Shampoo.

As with the treatment shampoos above, avoid using these more than twice a week as there is a risk of irritation. If the scalp becomes very scaly, you may need a de-scaling agent such as salicylic acid along with the shampoo. Alternatively, Capasal shampoo is a tar-based shampoo that contains a de-scaling agent.

Seborrheic dermatitis is typically quite mild elsewhere. Anti-yeast creams or ointments are usually effective and can be used safely in the long-term. Examples include clotrimazole, miconazole and nystatin. They are sometimes combined with a mild steroid for a few weeks to settle inflammation.

Sometimes, healthcare professionals advise people to wash their body with an anti-yeast shampoo containing ketoconazole, as well as using it on the scalp. This can be a good way of treating large areas, such as the chest. Leave the shampoo on the body area for 5 minutes or so before rinsing it off. Since applying shampoo to the body can irritate dry skin, do this no more than twice a week. In between, emollients can be applied if the skin is dry.

It is better to use a cream or ointment rather than a shampoo on smaller areas, such as the face. Sometimes, anti-yeast eardrops are prescribed for the ear canals. Mild topical steroids should be used for short-term bursts of treatment. The steroid treats skin inflammation, and once any irritation has settled and the dermatitis is controlled, it is wise to use just the anti-yeast agent.

Mild topical steroids can also be prescribed or purchased from the pharmacist as a combination treatment, recommended as a 7-day treatment course (e.g., Daktacort).

An oral anti-yeast treatment may be needed (e.g., itraconazole or fluconazole) if the seborrheic dermatitis becomes severe or extensive. Oral medication is taken over several months. The important message is that long-term treatment is needed to keep this condition at bay. If it recurs, it is not because the treatment has failed – it is because of the persistent nature of the condition, due to sensitivity to Malassezia yeasts. Therefore, ongoing treatment with anti-yeast measures is vital.

Section 2.0 Drug Therapy

This section comprises three subsections: the first one contains the newly recommended drugs SFDA registered, the second one covers drug modifications, the third one outlines the drugs that have been withdrawn from the market.

2.1 Additions

After May 2020, there have been no new drugs that have received FDA and EMA approval and are SFDA registered for Seborrheic Dermatitis treatment.

Clotrimazole cream was not mentioned in the previous CHI report and was added to the drug summary spreadsheet.

2.2 Modifications

Please refer to section 2.5.7 in the previous report:

Metronidazole does not need “prior authorization (PA)” as a prescribing edit.

2.3 Delisting

Table 6. Delisted Drugs

Delisted medications	Reason	Medication status	Alternative
Alclomethasone	Withdrawn from SFDA	Not mentioned in the guidelines	Other topical corticosteroid such as betamethasone, dexamethasone, clobetasol, fluticasone and hydrocortisone

Tea tree oil shampoo	Withdrawn from SFDA	Nizoral shampoo is mentioned in the guideline and SFDA registered and more effective than natural components.	Other shampoo such as Nizoral (ketoconazole)
Flumetasone pivalate	Withdrawn from SFDA	Not mentioned in the guidelines	Other topical corticosteroid such as betamethasone, dexamethasone, clobetasol, fluticasone and hydrocortisone
Olive oil	Withdrawn from SFDA	Supportive treatment, not part of the main core treatment of seborrheic dermatitis. More important in cradle cap than in adults SD. Olive oil is no longer recommended as it has been found to damage the skin barrier.	Coconut oil is an alternative.
Petrolatum white	Withdrawn from SFDA	Supportive treatment, not part of the main core treatment of seborrheic dermatitis.	N/A

Section 3.0 Key Recommendations Synthesis

- Topical antifungals are used in the treatment of SD due to their ability to decrease Malassezia burden and subsequent inflammatory response. Therefore, topical antifungals are generally one of the first line treatment for SD. Topical azoles, such as ketoconazole, clotrimazole, and miconazole have been shown to be effective[8].
- Low to mild potency topical corticosteroids are effective in clearing of signs and symptoms associated with SD. Topical corticosteroids can be used alone or in combination with antifungal agents; however prolonged use is not

suggested due to their side effects, such as telangiectasias, hypertrichosis, atrophy, and perioral dermatitis[8].

- Tacrolimus ointment is a topical, non- corticosteroid immunosuppressant, similar to cyclosporine, and approved for the treatment of atopic dermatitis. Its anti-inflammatory properties also make it a suitable treatment for SD. Tacrolimus is advantageous over topical corticosteroids in terms of safety. Unlike corticosteroids, tacrolimus is not linked with skin atrophy, striae, or skin thinning, and can be safely administered on the face, neck, and intertriginous regions[8].
- SD in Adults: Systemic Treatment- Systemic antifungals (terbinafine, itraconazole) are mainly indicated in acute and/or severe and/or resistant adult SD forms[7].

Section 4.0 Conclusion

This report serves as **an annex to the previous CHI Seborrheic Dermatitis report** and aims to provide recommendations to aid in the management of Seborrheic Dermatitis. It is important to note that these recommendations should be utilized to support clinical decision-making and not replace it in the management of individual patients with seborrheic dermatitis. Health professionals are expected to consider this guidance alongside the specific needs, preferences, and values of their patients when exercising their judgment.

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Section 6.0 Appendices

Appendix A. Prescribing Edits Definition

I. Prescribing Edits (ensure consistent use of abbreviations, e.g., CU, ST)

Some covered drugs may have additional requirements, rules, or limits on coverage. These requirements and limits may include:

Prescribing edits Tools	Description
AGE (Age):	Coverage may depend on patient age
CU (Concurrent Use):	Coverage may depend upon concurrent use of another drug
G (Gender):	Coverage may depend on patient gender
MD (Physician Specialty):	Coverage may depend on prescribing physician's specialty or board certification
PA (Prior Authorization):	Requires specific physician request process
QL (Quantity Limits):	Coverage may be limited to specific quantities per prescription and/or time
ST (Step Therapy):	Coverage may depend on previous use of another drug
EU (Emergency Use only):	This drug status on Formulary is only for emergency use
PE (Protocol Edit):	Use of drug is dependent on protocol combination, doses, and sequence of therapy

Appendix B. Seborrheic Dermatitis Scope

Section	Rationale/Updates

American academy of dermatology association 2022: seborrheic dermatitis: diagnosis and treatment [9]	• **Treating cradle cap**: While this will go away by the time your baby is six to 12 months old, treatment can help your baby feel more comfortable. You can often treat this at home without prescription medication.
	  ○ When treating cradle cap, you want to avoid irritating your baby's skin
	  ○ Use a gentle baby shampoo. Avoid shampoos meant to control dandruff and those with a strong fragrance.
	• Tips for treating cradle cap in the **diaper** area: Dermatologists recommend that you:
	  ○ Use superabsorbent diapers and change them often.
	  ○ Wash the diaper area with a gentle baby shampoo. Avoid using soap and products that contain alcohol.
	• Treating seborrheic dermatitis in teens and adults:
	  ○ Scalp: Treatment may include:
	  ▪ Dandruff shampoo:
	  ▪ If you have severe seborrheic dermatitis, your dermatologist may prescribe a shampoo or topical solution that contains a corticosteroid. You'd use this for a short time to get the disease under control.
	• **Medication to soften thick crusts:** If you have raised patches that are covered with thick crusts on your scalp, your treatment plan may include one of the following to soften the crust: Coal tar, bath oil, or medication you apply to your scalp. Some people apply the treatment, letting it sit on the scalp for about one hour. If the patches are widespread or very thick, you may need to apply this treatment before bed and leave it on while you sleep.
	• **Medication to decrease inflammation:** Used to stop the swelling and discoloration, this medication is used short term.
	Eyelids: The medical term for seborrheic dermatitis in this area is "seborrheic blepharitis." Not everyone who has seborrheic dermatitis develops this. If you do, you should:
	• **Gently clean your eyelids and eyelashes with baby shampoo applied to a cotton swab.** Most people do this once or twice a day until the crusts on the eyelids go away.
	• **Apply medication as needed.** Some people need an antibiotic ointment, which they apply to their eyelids, usually for 2 to 8 weeks.
	Other areas of the body: If you have seborrheic dermatitis on your face, in or around your ears, on your chest, or elsewhere, you may be prescribed:

	• **Medication to apply on your skin:** To get the disease under control, you may be prescribed a corticosteroid for a short time. This medication can quickly reduce the swelling, discoloration, and itch. To get the disease under control, some people also need an antifungal medication that they apply to their skin. • **Skin softener**: The medical name for a treatment that softens the skin is "keratolytic." This can help get rid of the scale and crusts on your skin. Coal tar is commonly used to soften skin with seborrheic dermatitis.
Primary care dermatology society: seborrheic eczema may 2022: [10]	Drug treatment options for seborrheic dermatitis for the scalp: • Nizoral ® (ketoconazole 2%) shampoo. Initially use two to four times a week then once every two weeks for maintenance. An alternative is Selsun ® (selenium sulphide) shampoo • For itch and erythema - a topical steroid scalp application or mousse • For scale and crusts - olive oil for mild crusting. Sebco ® ointment massaged in and left on for two to four hours can be very useful for thicker scale / crust Topical treatments for the skin: • Topical Nizoral ® cream - some patients find this causes too much skin irritation, in which case use either Canesten ® (clotrimazole and hydrocortisone) or Daktarin ® (miconazole nitrate) cream • Topical steroids such as Eumovate ® (clobetasone butyrate) cream can be added in for flare-ups but should only be used for one to two days at a time on facial skin • Try to avoid giving patients combination products such as Daktacort ® (miconazole nitrate (2% w/w) and hydrocortisone (1% w/w)) or Trimovate ® (clobetasone butyrate, calcium oxytetracycline and nystatin) to treat facial skin as they may lead to the overuse of topical steroids • If there are concerns about how much topical steroid is being used on the face consider the off-label use of topical calcineurin inhibitors e.g., Elidel ® cream (pimecrolimus) or Proptopic ® ointment (tacrolimus) More extensive or recalcitrant symptoms: • Systemic itraconazole (Sporanox ®) 200 mg OD for 7 days • If symptoms relapse frequently consider six-to-eight-week courses of a systemic tetracycline (off-label), which have an anti-inflammatory effect on the skin • Consider HIV in patients with more severe symptoms.
The Australian college of dermatologis	When the condition affects the scalp, shampoos containing tar or antifungal agents (such as selenium sulfide, ketoconazole, miconazole or ciclopirox) are usually effective. Creams containing antifungal and/or corticosteroid can be used for the face and trunk. Agents that help exfoliate the scaly skin such as salicylic

ts 2020: seborrheic dermatitis and cradle cap:[11]	acid are also useful. Treatment often needs to be used on a regular basis in order to clear the condition completely, with intermittent use thereafter to maintain long term control. In babies, cradle cap can be treated by softening the scales on the skin with a little olive oil applied before bathing, and then removing the scales gently with a cotton bud. Sometimes a cream containing a mild corticosteroid (such as hydrocortisone 1%) or an antifungal agent or a tar-based product may also be useful to clear the scaling.
National eczema association: Seborrheic dermatitis in children 2023[12]	If the seborrheic dermatitis is mild, an OTC topical antifungal cream or medicated shampoo with ketoconazole, selenium sulfide, coal tar or zinc pyrithione, may be enough to control symptoms. It is OK to leave mild seborrheic dermatitis untreated if your child is not uncomfortable. In more severe cases, a provider may prescribe topical steroids or TCIs to calm the inflammation. Oral antifungal agents may also be used.
National eczema society: seborrheic dermatitis in adults 2022: [13]	Treating the scalp There are many over-the-counter anti-yeast shampoos available. These include: • Dandrazol (ketoconazole) • Nizoral (ketoconazole) – also available on prescription • Selsun – warning: selenium can stain cheap metals and jewellery black. Use these shampoos as a treatment rather than as a hair wash. Leave them on for 5-10 minutes and then rinse off. Avoid using these more than twice a week as there is a risk of irritation. For more severe seborrhoeic dermatitis affecting the scalp, a scalp application or lotion containing a steroid and salicylic acid (e.g., Diprosalic scalp application) may be prescribed. This will help control inflammation and scale. Tar-based shampoos or Dermax (not tar-based) are good for keeping symptoms of flaking and scaling at bay, and they can be alternated with a ketoconazole shampoo. Tar-based shampoos include: • Neutrogena T/Gel Therapeutic Shampoo • Capasal Therapeutic Shampoo.
An overview of the diagnosis and managemen t of seborrheic dermatitis-clinical	**SD of the scalp in adults: topical treatment:** In adults, the use of topical agents with antifungal (ketoconazole, ciclopirox, miconazole), anti-inflammatory (betamethasone valerate, clobetasol propionate) or keratolytic/humectant (propylene glycol) properties is strongly recommended. **SD of the scalp in children: topical treatment:** In pediatric age (from birth up to 24 months), scant scientific evidence supports the effectiveness and safety of topical antifungals (1% ciclopirox shampoo, 1% KTZ cream/shampoo, 2.5% SS shampoo), anti-inflammatory (1% hydrocortisone cream/lotion) or keratolytic agents (3% salicylic acid in combination with 1.5%

cosmetic and investigational dermatology 2022: [7]	ciclopirox shampoo, lactamide monoethanolamine shampoo).47,48 Generally, the mainstay treatments of "cradle cap" include the use of baby shampoos enriched with emollient agents (i.e., shea butter, glycerin) and vegetable oils (i.e., olive oil, borage oil, almond oil), followed by gentle mechanical removal of loosen scales. **Non-Scalp Seborrheic Dermatitis:** The use of topical antifungal (KTZ, ciclopirox, clotrimazole) and anti-inflammatory (desonide, hydrocortisone, lithium succinate/gluconate, topical pimecrolimus/tacrolimus) agents is strongly recommended for mild-to-moderate SD on face and/or body areas. **SD of the Non-Scalp Area in Infants: Topical Treatment** In infants and young children with mild-to-moderate facial/body SD, limited evidence supports the use of a topical pharmacological approach, due to scarce data and to the possibility of systemic drug absorption in newborns. The use of natural anti-inflammatory/antioxidants (e.g., stearyl glycyrrhetinate, Aloe vera, vitamin E, Echinacea purpurea, lactoferrin) and/or emollient agents (e.g., hyaluronic acid) as gel or cream, as well as AIAFp products, may be considered. **SD in Adults: Systemic Treatment** Systemic antifungals (terbinafine, itraconazole) are mainly indicated in acute and/or severe and/or resistant adult SD forms, as well as in selected and difficult-to-treat conditions.21 In these cases, the goal of systemic approach is the prompt reduction of symptoms and the possibility to use topical agents as a maintenance therapy. Terbinafine (Level A), is a lipophilic molecule able to create a cutaneous reservoir of effective drug concentrations even after its withdrawal. When used orally, it is administered at a dosage of 250 mg/day for 4–6 weeks or 250 mg/day for the first 12 days of the month for 3 consecutive months (pulse regimen). Itraconazole (Level B) is a highly keratinophilic and lipophilic triazole agent secreted with sebum at the stratum corneum level where Malassezia colonies are generally present. **SD in children: systemic treatment** In children, limited and conflicting data support the benefit of oral biotin supplementation (4 mg/day for 4 weeks) vs placebo as shown in a dated double-blind, crossover trial.

Treatment of seborrheic dermatitis: a comprehensive review 2018- Taylor and Francis group[8]	**Types of treatment:**
	• Topical treatment:
	  ○ Antifungals
	  ○ Corticosteroids
	  ○ Non-steroidal anti-inflammatory agents
	  ○ Immunomodulators: tacrolimus and pimecrolimus
	  ○ Miscellaneous: (metronidazole, keratolytic agents, selenium sulfide, sodium sulfacetamide, lithium gluconate)

	• Systemic treatment:
	  ○ Itraconazole
	  ○ Terbinafine
	  ○ Fluconazole
	  ○ Ketoconazole
	  ○ Pramiconazole
	For the nutrition: Numerous nutrient mediators such as essential fatty acids, vitamins A, E and D, vitamins B1, B2, B6, niacin and biotin, vitamin C selenium, zinc, and iron may play a role in treating psoriasis and seborrheic dermatitis.

Appendix C. MeSH Terms PubMed

Query	Filters	Search Details	Results
(((((Dermatitis, Seborrheic [MeSH Terms]) OR (Dermatitides, Seborrheic[Title/Abstract])) OR (Seborrheic Dermatitides[Title/Abstract])) OR (Seborrheic Dermatitis[Title/Abstract])) OR (Dermatitis Seborrheica[Title/Abstract])) OR (Seborrhea[Title/Abstract])	Guideline, in the last 5 years	("dermatitis, seborrheic"[MeSH Terms] OR (("dermatiti"[All Fields] OR "Dermatitis"[MeSH Terms] OR "Dermatitis"[All Fields] OR "Dermatitides"[All Fields]) AND "Seborrheic"[Title/Abstract]) OR "seborrheic dermatitides"[Title/Abstract] OR "seborrheic dermatitis"[Title/Abstract] OR "dermatitis seborrheica"[Title/Abstract] OR "Seborrhea"[Title/Abstract]) AND ((y_5[Filter]) AND (guideline[Filter]))	0

Appendix D. Treatment Algorithm

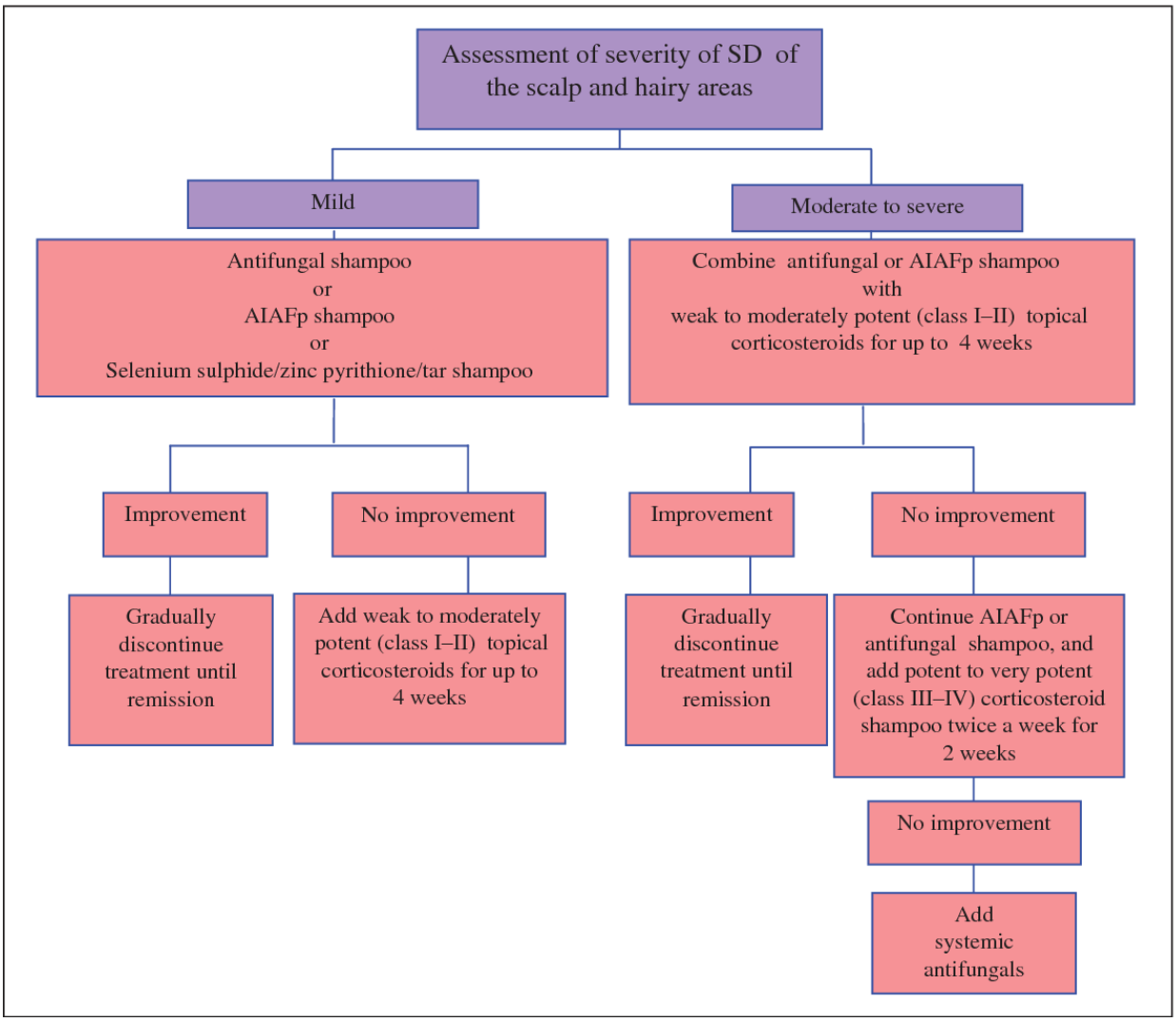

Figure 1. *Treatment Algorithm for the Management of Seborrheic Dermatitis of the Scalp and Hairy Areas in Adults*

Retrieved from Cheong WK, Yeung CK, Torsekar RG, Suh DH, Ungpakorn R, Widaty S, Azizan NZ, Gabriel MT, Tran HK, Chong WS, Shih IH, Dall'Oglio F, Micali G. Treatment of Seborrhoeic Dermatitis in Asia: A Consensus Guide. Skin Appendage Disord. 2016 May;1(4):187-96. doi: 10.1159/000444682. Epub 2016 Mar 23. PMID: 27386464; PMCID: PMC4908450[14]

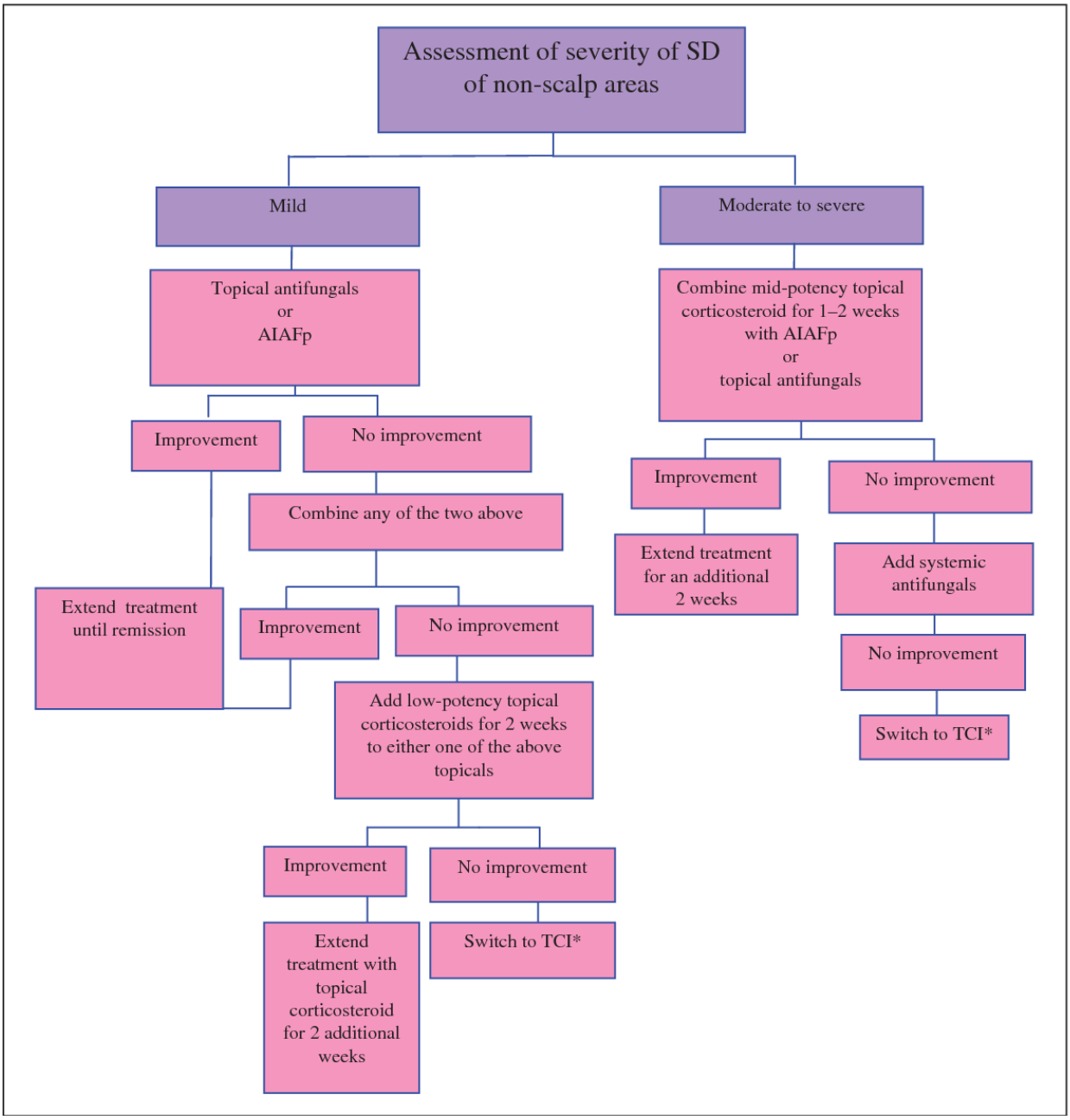

Figure 2. *Treatment Algorithm for the Management of Seborrheic Dermatitis of the Non-Scalp Areas in Adults*

Retrieved from Cheong WK, Yeung CK, Torsekar RG, Suh DH, Ungpakorn R, Widaty S, Azizan NZ, Gabriel MT, Tran HK, Chong WS, Shih IH, Dall'Oglio F, Micali G. Treatment of Seborrhoeic Dermatitis in Asia: A Consensus Guide. Skin Appendage Disord. 2016 May;1(4):187-96. doi: 10.1159/000444682. Epub 2016 Mar 23. PMID: 27386464; PMCID: PMC4908450[14]

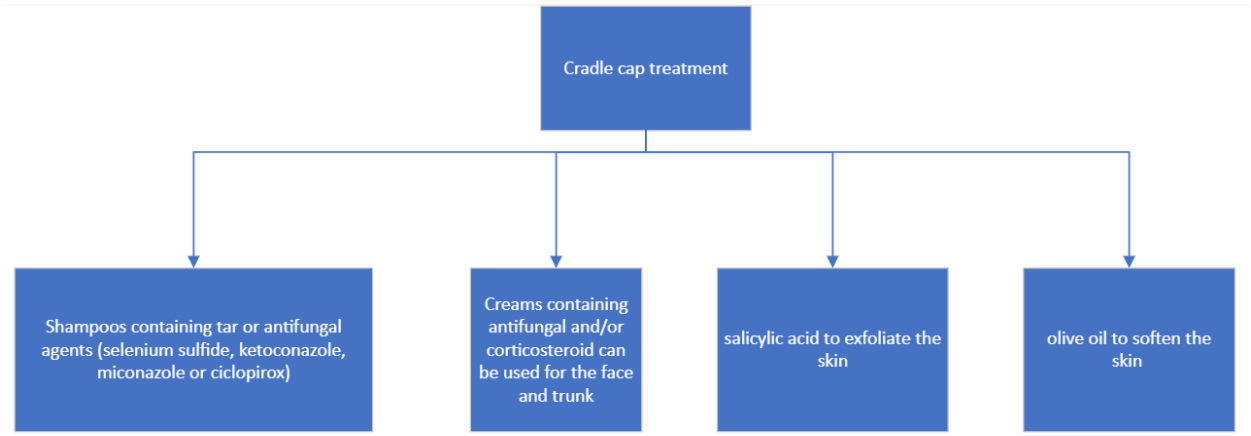

Figure 3. *Treatment Algorithm for the Management of Cradle Cap (Seborrheic Dermatitis in Pediatrics)*