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Pharmacotherapy for psoriasis: Topical and systemic non-corticosteroid therapies[1-24]

Mild-to-moderate psoriasis:
Induction:
- Acute treatment via TCS +/- topical VDA, CI, retinoid, PDE-4, or AhR based on body area (combination more effective than monotherapy).

Maintenance:
- Treatment 2-3x/week via VDA, retinoid or CI.
- Add corticosteroid BID on weekends if needed.
- Or, use novel topicals (roflumilast/tapinarof) until lesions resolve; restart if they recur.

Candidates for systemic therapy:
- For moderate-to-severe psoriasis (BSA ≥ 3%, PGA ≥ 3, DLQI > 10), **and/or**
- Lesions of high-impact sites: face, palms, soles, genitalia, scalp and nails, **and/or**
- Failure of topical treatment (defined as inability to achieve clear/nearly clear skin, BSA ≤ 1% or PGA 0-1 after two consecutive 4-week topical therapy courses).

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Topical Therapy

Vitamin D analogues

Mechanism:
Help psoriasis by slowing down the rapid growth of skin cells, normalizing their maturation and reducing inflammation in the plaques. This leads to thinner, less scaly and less inflamed lesions.

Characteristics:
- Slower onset of effect vs corticosteroids (4-8 weeks for improvement).
- Efficacy similar to high potency corticosteroids (Class 2-3).
- Oral Vitamin D supplementation and application to > 30% BSA are generally not recommended to avoid hypercalcemia.
- Apply after exposure to sunlight or ultraviolet light to prevent drug inactivation.
- Avoid use with salicylic acid as it decreases efficacy.

Medication	Considerations	Dosage	Cost/Coverage (1 month)
Calcipotriol/ betamethasone dipropionate (Dovobet®, Enstilar® foam) 50 mcg/0.5 mg per gram gel, ointment or foam *VDA/ corticosteroid combination*	**Body areas:** • Scalp: ✓ (foam or gel) • Face and intertriginous areas: X • Trunk and arms/legs: ✓ • Palms and soles: ✓ • Nails: ✓ • Foam/gel can be used on all body areas, especially hair-bearing areas. • Can be effective for redness, scaling, itching and thickness/infiltration. • **Combination simplifies regimen, improves adherence and more effective than monotherapy without TCS.** • Possibility of tachyphylaxis and possible rebound effect with abrupt discontinuation due to corticosteroid component. **Pregnancy:** ? (Risk is uncertain; minimize duration and dose) **Breastfeeding:** ? (Risk unknown; if used, do not apply to breasts or surrounding areas)	**Initial:** Applied topically to the affected areas once daily. **Maintenance:** • After satisfactory improvement, the frequency of application can be ↓ or drug can be d/c. • If recurrence takes place after d/c, can restart treatment. **Max:** 15 g/day or 100 g/week or BSA of ≤ 30% treated.	**Brand:** Gel/oint: $108 Foam: $84 (one cannister costs ~$127) **Generic:** Gel/oint: $67 Foam: N/A **ODB:** ✓ **NIHB:** ✓

Medication	Considerations	Dosage	Cost/Coverage (1 month)
Calcipotriol (Dovonex®) 50 mcg/g ointment	**Body areas:** • Scalp: X • Face and intertriginous areas: X • Trunk and arms/legs: ✓ • Palms and soles: ✓ • Nails: ✓ • Ointment formulation is less suitable for scalp, face and folds due to greasiness. • Occlusive effect may improve penetration, hydration and efficacy. • Somewhat effective for redness, scaling and thickness/infiltration. • Not effective for itching. **Pregnancy:** ? (Safe use not established; only use if benefits outweigh risks) **Breastfeeding:** ? (Risk unknown; if used, do not apply to breasts or surrounding areas)	**Initial:** Applied BID (AM/PM). **Maintenance:** • Application can be ↓ to once daily. • After satisfactory improvement, the drug can be d/c. • If recurrence takes place after d/c, can restart treatment. VDA BID (weekdays) + high potency TCS BID (weekends) can also be considered for maintenance treatment. **Max:** 100 g of ointment/week (=5 mg/week of calcipotriol).	**Brand:** $66-119 **Generic:** N/A **ODB:** ✓ LU 191 **NIHB:** ✓
Calcitriol (Silkis®) 3 mcg/g ointment		**Initial:** Applied BID (AM/PM). **Maintenance:** • Application can be ↓ to once daily. • After satisfactory improvement, the drug can be d/c. • If recurrence takes place after d/c, can restart treatment. VDA BID (weekdays) + high potency TCS BID (weekends) can also be considered for maintenance treatment. **Max:** 30 g of ointment/day or BSA of ≤ 35% treated.	**Brand:** $72-132 **Generic:** N/A **ODB:** ✓ LU 191 **NIHB:** X

Safety:
- **Topical S/E:** itching or irritation, burning or stinging, redness or inflammation, dermatitis (including allergic/contact), dryness or flaking, rash of various types, pigmentation changes, photosensitivity, folliculitis, application-site pain or discomfort, skin infection, blisters or eczema flare, rare skin atrophy
- **Systemic S/E:** hypercalcemia, hypercalciuria, kidney stones, abnormal calcium laboratory tests, polyuria, polydipsia, constipation, anorexia, nausea, vomiting, muscle weakness, depression, confusion, coma (severe cases), heart rhythm disturbances (severe vitamin D toxicity)
- **Contraindications:** hypersensitivity to calcipotriol, calcitriol, VDA or formulation components, disorders of calcium metabolism including existing hypercalcemia, severe renal impairment or end-stage renal disease, liver dysfunction, ophthalmic use (not for use in or near eyes), pregnancy, internal use including oral or intravaginal application

Calcineurin inhibitors

Mechanism:
Reduces psoriatic inflammation by blocking calcineurin-dependent T-cell activation, lowering cytokine production and reducing mast cell mediator release. This leads to decreased redness, itching and local immune-driven inflammation.

Characteristics:
- Particularly effective on thin skin areas such as the **face and intertriginous/inverse psoriasis.**
- A good next step in sensitive areas if mild corticosteroids are not providing adequate control.
- Often used as steroid-sparing therapy for longer-term control (> 4 weeks).
- Can consider 2–3 days of TCS first to reduce burning before starting CIs.
- Not typically used for thick plaques on elbows/knees/trunk.

Medication	Considerations	Dosage	Cost/Coverage (1 month)
Pimecrolimus† (Elidel®) 1% cream	**Body areas:** • Scalp: X • Face and intertriginous areas: ✓ • Trunk and arms/legs: ✓ (not for thick plaques) • Palms and soles: X • Nails: X • **May be more effective on thinner skin (face and intertriginous areas).** • Cream can be used on all applicable body areas and has some hydrating effects. • Somewhat effective for redness, itching and thickness/infiltration. Not effective for scaling. **Pregnancy:** ? (Safe use not established; only use if benefits outweigh risks) **Breastfeeding:** X (Avoid)	**Initial:** Applied BID (AM/PM). **Maintenance:** • Application can be ↓ to once daily. • After satisfactory improvement, the drug can be d/c. • If recurrence takes place after d/c, can restart treatment. **Max:** N/A	**Brand:** $142-272 **Generic:** N/A **ODB:** X LU 383; atopic dermatitis only **NIHB:** ✓
Tacrolimus† (Protopic®) 0.03% ointment 0.1% ointment	**Body areas:** • Scalp: X • Face and intertriginous areas: ✓ • Trunk and arms/legs: ✓ (not for thick plaques) • Palms and soles: X • Nails: X • **May be more effective on thinner skin (face and intertriginous areas).** However, ointment formulation is less suitable for face and intertriginous areas due to greasiness. • Occlusive effect may improve penetration, hydration and efficacy. • Somewhat effective for redness, itching and thickness/infiltration. Not effective for scaling. • Minimize or reduce sun exposure to sites of application. Some patients may experience a flushing reaction if used on the face or on site of application after alcohol consumption. **Pregnancy:** ? (Safe use not established; only use if benefits outweigh risks) **Breastfeeding:** X (Avoid)		**Brand:** $162-332 **Generic:** N/A **ODB:** X LU 383; atopic dermatitis only **NIHB:** ✓

Safety:
- **Topical S/E:** burning, stinging, itching, irritation (can be reduced by avoiding application to moist skin), flushing, redness or rash, folliculitis or acne, skin infections including impetigo and herpes, sensitivity to hot or cold, dry or peeling skin, vesicles or blisters, urticaria
- **Systemic S/E:** flu-like symptoms, headache, nausea or diarrhea, lymphadenopathy, alcohol intolerance (flushing), seizures (rare), renal impairment (rare), theoretical lymphoma or skin cancer risk (refer to monograph for theoretical risks)
- **Contraindications:** hypersensitivity to CIs or any ingredient in the formulation, use in immunocompromised patients, use on pre-malignant or malignant skin conditions, unresolved bacterial or viral skin infections prior to starting therapy

Retinoids

Mechanism:
Help psoriasis by normalizing keratinocyte proliferation and differentiation while reducing inflammatory markers in psoriatic plaques. This leads to thinning of plaques, reduced scaling and improvement in redness and thickness.

Characteristics:
- Used in mild to moderate plaque psoriasis, often as an add-on.
- Response can take 8–12 weeks (not rapid onset).
- Combination with TCS increases duration of treatment effect and total remission time.

Medication	Considerations	Dosage	Cost/Coverage (1 month)
Halobetasol propionate/tazarotene (Duobrii®) 0.01%/0.045% lotion *Corticosteroid/retinoid combination* *Tazorac® 0.05-0.1% (tazarotene) d/c.* *Arazlo® 0.045% (tazarotene) indicated for acne vulgaris only.*	**Body areas:** • Scalp: X • Face and intertriginous areas: X • Trunk and arms/legs: ✓ • Palms and soles: ✓ • Nails: ✓ • **Simplifies regimen and improves adherence.** • Lotion is non-greasy and preferred for hair-bearing areas. • Can be effective for redness, scaling, itching and thickness/infiltration. • **Combine with moisturizer to limit burning/pruritus.** • *Can be combined with additional occlusion to increase penetration (e.g., dressings, plastic wrap, plastic gloves/socks). May be particularly helpful in psoriasis of the palms, soles, nails. This should be done carefully and with close monitoring.* • Possibility of tachyphylaxis and possible rebound effect with abrupt discontinuation due to corticosteroid component. **Pregnancy:** X (Obtain negative pregnancy test prior to initiation; do not use during pregnancy) **Breastfeeding:** ? (Risk unknown; if used, do not apply to breasts or surrounding areas)	**Initial:** Applied once daily. **Maintenance:** • After satisfactory improvement, frequency can be ↓ or the drug can be d/c. • If recurrence takes place after d/c, can restart treatment. **Max:** 50g/week or BSA ≤ 12% treated (Efficacy for BSA > 12% not established). The use of TCS (mid- to high potency) along with tazarotene is recommended to decrease the duration of treatment as well as increase the length of remission. *D/c if no meaningful response by 8 weeks.*	**Brand:** $97 (one tube cost ~$237) **Generic:** N/A **ODB:** ✓ **NIHB:** ✓

Safety:
- **Topical S/E:** burning, stinging, skin pain, redness, erythema, itching, irritation, peeling, flaking, dry skin, contact irritant dermatitis, eczema, rash, inflammation, acne (rare)
- **Systemic S/E:** teratogenicity (pregnancy risk), symptoms similar to oral ingestion of excess vitamin A, hypertriglyceridemia, systemic retinoid-type effects at high exposure (bone and hepatic changes only in animals)
- **Contraindications:** hypersensitivity to tazarotene, hypersensitivity to retinoid compounds or any excipients, pregnancy or possibility of becoming pregnant, presence of seborrheic dermatitis

Phosphodiesterase-4 (PDE-4) inhibitors

Mechanism:
Increases intracellular cyclic AMP, reducing the release of pro-inflammatory cytokines that drive psoriatic plaque formation. This leads to resolution of redness, scaling, itch, and overall inflammation.

Characteristics:
- Topical treatment of plaque psoriasis, including intertriginous (skin fold) involvement.
- May address long-term topical needs with minimal S/E, particularly in sensitive or intertriginous areas where steroid tolerability is limited and unmet need persists.

Medication	Considerations	Dosage	Cost/Coverage (1 month)
Roflumilast (Zoryve®) 0.3% cream 0.3% foam *0.15% cream only indicated for atopic dermatitis.*	**Body areas:** • Scalp: ✓ • Face and intertriginous areas: ✓ • Trunk and arms/legs: ✓ • Palms and soles: ✓ • Nails: ? (Not studied) • **May simplify treatment regimen by reducing number of topical agent when multiple body areas are involved.** • Foam can be used on all body areas, especially hair-bearing areas. Foam has evidence for treatment of sebopsoriasis as well as psoriatic plaques. • Cream can be used on all body areas (including scalp with correct application technique) and has some hydrating effects. • Free from common contact dermatitis irritants (e.g., propylene glycol). • Can be effective for redness, scaling and thickness/infiltration. **Pregnancy:** ? (Risk is uncertain) **Breastfeeding:** ? (Risk is uncertain)	**Initial:** Applied once daily. **Maintenance:** • After satisfactory improvement, frequency can be ↓ or d/c. • If recurrence takes place after d/c, can restart treatment. **Max:** No maximum duration of use; BSA ≤ 20% (when applying to larger BSA, insomnia and diarrhea may be more common). *D/c if no meaningful response by 8 weeks.*	**Brand:** $223 (one tube cost ~$350) **Generic:** N/A **ODB:** X **NIHB:** X

Safety:
- **Topical S/E:** application-site pain
- **Systemic S/E:** headache, diarrhea, nausea, vomiting, nasopharyngitis, upper respiratory tract infection, insomnia
- **Contraindications:** moderate to severe hepatic impairment (Child-Pugh B or C), hypersensitivity to roflumilast or any ingredient in the formulation

Aryl hydrocarbon receptor (AhR) agonist

Mechanism:
Helps restore skin barrier function and reduces inflammatory signalling, leading to decreased resolution of redness, scaling and plaque thickness.

Characteristics:
- Approved for treatment of plaque psoriasis in adults as a non-steroidal topical option.
- Notable for long duration of maintaining response to therapy (some up to 52 weeks) even after discontinuation (may allow for long drug holiday, and less medication use).
- Generally well tolerated with good local safety profile. Folliculitis and contact dermatitis common, but transient.

Medication	Considerations	Dosage	Cost/Coverage (1 month)
Tapinarof (Nduvra®) 1% cream	**Body areas:** • Scalp: ✓ • Face and intertriginous areas: ✓ • Trunk and arms/legs: ✓ • Palms and soles: ✓ • Nails: ? (Not studied) • Studied in all Fitzpatrick Types. • Cream can be used on all body areas and psoriasis severities (including face and scalp with correct application technique) and has some hydrating effects. • Can be effective for redness, scaling and thickness/infiltration. **Pregnancy:** ? (Risk is uncertain) **Breastfeeding:** ? (Risk is uncertain)	**Initial:** Applied once daily. **Maintenance:** • After satisfactory improvement has occurred, the drug can be d/c. • Treatment-free interval typically 115-130 days or greater, leading to more drug-free days. • If recurrence takes place after d/c, can restart treatment. **Max:** No maximum duration of use, up to maximum 20% BSA currently studied. *Typically, 4-12 weeks of therapy required.*	**Brand:** $323 (one tube cost ~$510) **Generic:** N/A **ODB:** X **NIHB:** X

Safety:
- **Topical S/E:** folliculitis (common, self-resolving), contact dermatitis, pruritus, application-site irritation, peeling, burning, stinging, erythema, urticaria (rare)
- **Systemic S/E:** minimal systemic absorption reported; nasopharyngitis, headache, influenza-like symptoms
- **Contraindications:** hypersensitivity to tapinarof or any ingredient in the formulation

Keratolytics

Mechanism:
Reduces the binding between keratinocytes thereby minimizing scaling and softening psoriatic plaques.

Characteristics:
- Often used as supportive therapy to enhance effectiveness of other topicals rather than as stand-alone high-efficacy agents.
- Best for patients with thick, scaly plaques where reducing scale improves response to anti-inflammatory therapy.
- Combining salicylic acid with TCS or CIs increases penetration and clinical effectiveness.
- Avoid combination with VDA because low pH can inactivate calcipotriene/calcitriol.

Medication	Considerations	Dosage	Cost/Coverage (1 month)
Betamethasone dipropionate/salicylic acid (Diprosalic®) 0.5 mg/30 mg per gram ointment (= 0.05%/3% w/w) *Corticosteroid/keratolytic combination* *Lotion d/c.*	**Body areas:** • Scalp: X • Face and intertriginous areas: X • Trunk and arms/legs: ✓ • Palms and soles: ✓ • Nails: ✓ • Can be effective for scaling (salicylic acid). Also effective for redness, itching and thickness/infiltration (corticosteroid). • **The improvements in efficacy seen with combination therapy compared with corticosteroid alone is likely due to the increased skin penetration caused by salicylic acid.** • Possibility of tachyphylaxis and possible rebound effect with abrupt discontinuation due to corticosteroid component. **Pregnancy:** X (Avoid) **Breastfeeding:** X (Avoid)	**Initial:** Applied BID (AM/PM). **Maintenance:** • Application can be ↓ to once daily or twice weekly (2-3 days apart). • After satisfactory improvement has occurred, the drug can be d/c. • If recurrence takes place after d/c, can restart treatment. **Max:** 50 g/week or BSA ≤ 20% treated.	**Brand:** $79-129 **Generic:** N/A **ODB:** X **NIHB:** ✓
Salicylic acid 3-10% preparations as ointment, cream, lotion, or shampoo *Some preparations may require special compounding.* *Some non-prescription shampoos may be useful in scalp psoriasis as adjunct.*	**Body areas:** • Scalp: ✓ • Face and intertriginous areas: X • Trunk and arms/legs: ✓ • Palms and soles: ✓ • Nails: ✓ • May be effective adjunct for palm and soles in conjunction with a Class 1-3 TCS. • Avoid using on face and intertriginous areas due to increased irritation. • Can be effective for scaling. Not effective for redness, itching and thickness/infiltration. **Pregnancy:** X (Avoid concentration > 2%, peels, or oral formulations; topical low concentration ≤ 2% may be okay) **Breastfeeding:** X (Avoid concentration > 2%, peels, or oral formulations; topical low concentration ≤ 2% may be okay)	**Initial:** • Applied BID (AM/PM). • Shampoo applied twice weekly. **Maintenance:** • Application can be ↓ to once daily or twice weekly (2-3 days apart). • After satisfactory improvement has occurred, the drug can be d/c. • If recurrence takes place after d/c, can restart treatment. **Max:** BSA ≤ 20% treated. *Treatment can be used for 8-16 weeks.*	**Brand:** N/A **Generic:** < $75 **ODB:** X **NIHB:** X

Safety:
- **Topical S/E:** skin irritation (burning, stinging, redness, itching), dryness or peeling, contact dermatitis, skin breakdown, delayed wound healing, photosensitivity
- **Systemic S/E (rare, specific to excessive absorption):** tinnitus, dizziness, headache, gastrointestinal upset, metabolic acidosis or electrolyte disturbances, hypoglycemia, confusion or CNS toxicity, renal impairment
- **Contraindications:** hypersensitivity to salicylates or aspirin, use on large body surface areas or under occlusion, application to broken or inflamed skin or mucous membranes, severe renal or hepatic impairment

Systemic Therapy

Folate antagonist

Mechanism: Reduces psoriatic plaque formation by inhibiting folate-dependent DNA synthesis, which slows the rapid proliferation of keratinocytes, and by exerting immunosuppressive and anti-inflammatory effects that decrease T-cell activity and cytokine release.

Characteristics:
- May be preferred in peripheral joint involvement.
- May be an option in heart failure, ischemic heart disease or Crohn's Disease.

Medication	Considerations	Dosage	Cost/Coverage (1 month)
Methotrexate (Metoject®, Nordimet®) 2.5 and 10 mg tablets 7.5, 10, 12.5, 15, 17.5, 20, 22.5 and 25 mg injection *Immunosuppressant*	• **Consult on vaccination** (non-live vaccines: delay therapy 2 weeks after vaccination; live vaccines: d/c therapy 2-4 weeks before and resume 2-4 weeks after vaccination). • Patient education on susceptibility to infections. • Advise alcohol abstinence. • Conduct baseline and periodic investigations prior to initiation, including CBC, LFTs, SCr, urine status, pregnancy test, chest x-ray, TB-test, HBV/HCV, HIV, serum albumin and PIIINP (where available). **Pregnancy:** X (Contraindicated) **Breastfeeding:** X (Contraindicated)	**Standard:** 7.5-25 mg weekly (1 dose/week) PO, SubQ or IM. **Maintenance:** • Dose can be divided into 3 doses given 12 hours apart to improve tolerability. • Switch from PO to SubQ/IM to improve GI tolerability at higher doses. **Max:** 25 mg/week Folate supplementation recommended daily (except day of MTX administration) or once weekly (≥24 hours since MTX administration) to decrease risk of S/E (GI, liver, and possibly hematologic). GI tolerability with the oral dose can be further improved by taking with food. *Adequate trial may take up to 12 weeks: dosage changes may take ≥ 1 month for clinical response.*	**Brand:** Tabs: N/A Inj: $89-104 **Generic:** Tabs: $17-41 Inj: $39-99 **ODB:** ✓ (except 10 mg tablets) **NIHB:** ✓

Safety:
- **Local S/E:** injection-site pain, redness, swelling, pruritus, blistering, skin ulceration, local necrosis, sterile abscess, lipodystrophy, increased sun sensitivity
- **Systemic S/E:** GI upset, fatigue or fever, headache or dizziness, hair loss, bone marrow suppression with infection or bleeding risk, hepatotoxicity, pulmonary toxicity, renal impairment, neurotoxicity, mood changes, reproductive toxicity and teratogenicity
- **Contraindications:** hypersensitivity to MTX or ingredients, pregnancy, breastfeeding, severe renal impairment including dialysis, acute or chronic liver disease, immunodeficiency syndromes, pre-existing blood disorders, use with nitrous oxide anesthesia

Calcineurin inhibitor

Mechanism:
Selectively inhibiting calcineurin, which blocks activation of T-cells. This reduces the production of pro-inflammatory cytokines, dampening the immune response that causes keratinocyte overgrowth, redness and plaque formation.

Characteristics:
- **Not used as a long-term treatment (< 1 year) due to adverse events (nephrotoxicity).**
- Role as a **rapid-acting medication for severe, resistant disease, acute flares** and erythrodermic/pustular psoriasis or bridging to safer long-term therapy.
- Of the traditional systemic options, preferred option in pregnancy.
- May be an option in ulcerative colitis.

Medication	Considerations	Dosage	Cost/Coverage (1 month)
Cyclosporine (Neoral®) 10, 25, 50 and 100 mg capsule 100 mg/mL solution *Immunosuppressant*	• **Consult dermatology before initiation.** • **Consult on vaccination** (non-live vaccines: continue therapy without interruption; live vaccines: defer next dose 2-4 weeks after vaccination). • Patient education on susceptibility to infections. • CYP3A4 inhibitors and inducers may change clinical efficacy. Cyclosporine is a CYP3A4 inhibitor itself, which may impact plasma levels of co-medications. • If drugs known to increase cyclosporine levels are given concomitantly, frequent assessment of renal function and careful monitoring for cyclosporine-related side effects is warranted. • Reduced efficacy of progesterone-containing contraceptives. • Regular cancer screening advised due to lymphoproliferative malignancies. • Use sunscreen and avoid excessive sun exposure. • Conduct baseline and periodic investigations prior to initiation including CBC, LFTs, SCr, urine status, uric acid, Na^+, K^+, cholesterol, triglycerides, blood pressure (daily), Mg, pregnancy test, chest x-ray, HBV, HIV. **Pregnancy:** ? (Only use if benefits outweigh risks) **Breastfeeding:** X (Avoid)	**Initial:** 2.5 mg/kg/day PO in two divided doses (12 hrs apart). **Maintenance:** • If no improvement after one month, ↑ dose in increments of 0.5-1 mg/kg/day per month. • As skin lesions improve, ↓ dose by 0.5-1 mg/kg/day per month. • Psoriasis generally recurs when treatment is stopped. The goal is to achieve sustained improvement at the lowest dose. • If no relapse occurs within 6 months, attempt should be made to taper off treatment. **Max:** 5 mg/kg/day SCr should be measured q2weeks for the first 3 months. If stable, reduce to measure q2months if dose is ≤ 2.5 mg/kg/day or q1month if dose is > 2.5 mg/kg/day. Reduce dose 25-50% if SCr inc. > 30% above baseline; if levels do not ↓ within 1 month, *d/c* treatment. *D/c if no response in psoriatic lesions ≤ 6 weeks at 5 mg/kg/day.*	**Brand:** $261-2876* **Generic:** $236-459* *Assume 80 kg adult **ODB:** ✓ **NIHB:** ✓ (except solution)

Safety:
- **Systemic S/E:** GI upset, fatigue or fever, headache or dizziness, hair loss, bone marrow suppression with infection or bleeding risk, hepatotoxicity, pulmonary toxicity, renal impairment, neurotoxicity, mood changes, reproductive toxicity and teratogenicity, gingival hyperplasia, hypertrichosis, burning or irritation of mucous membranes (rare), hypertension, tremor, paresthesia, hyperlipidemia, hyperuricemia or gout, electrolyte abnormalities, increased risk of lymphoproliferative disorders and skin cancers, tinnitus, visual disturbances, peripheral edema, increased susceptibility to serious infections, anaphylactoid reactions, hirsutism, gynecomastia, thrombotic microangiopathy
- **Contraindications:** abnormal renal function, uncontrolled hypertension, malignancy (except non-melanoma skin cancer), uncontrolled infections, hypersensitivity to cyclosporine or any ingredient in the formulation. Previous treatment with PUVA or UVB phototherapy, other immunosuppressants, coal tar or radiation therapy may increase risk of skin malignancy.

Retinoid

Mechanism:
Normalizes keratinocyte differentiation and reduces epidermal hyperproliferation, which are key drivers of psoriatic plaque formation. It also has anti-inflammatory effects that help reduce scaling and plaque thickness, but does not have immunosuppressive effects.

Characteristics:
- Slow-acting class that can take 3-6 months for full treatment response.
- May be a better systemic option in psoriasis of the palms and soles.
- May be preferred in inflammatory bowel disease, especially with mild paradoxical psoriasis.
- May be an option in heart failure or concomitant latent/treated TB.

Medication	Considerations	Dosage	Cost/Coverage (1 month)
Acitretin (Soriatane®) *10 and 25 mg capsule*	• Contraception must begin 1 month before starting treatment and must continue for 3 years after stopping. • Alcohol ↑ the risk of conversion from acitretin to etretinate (a known teratogen with a long half-life), thus patients should not consume alcohol during treatment or for 2 months after cessation. • Dryness of skin and mucosa can be improved with moisturizers and lubricating eye drops. • Hair loss is possible but can be reversed with cessation of treatment. • Conduct baseline and periodic investigations prior to initiation including CBC, LFTs, SCr, urine status, uric acid, Na^+, K^+, cholesterol, triglycerides, blood pressure, Mg, pregnancy test, chest x-ray, HBV, HIV. • Night vision can be an issue worth considering in older adults and nighttime driving. **Pregnancy:** X (Contraindicated for 3 years after cessation) **Breastfeeding:** X (Contraindicated for 3 years after cessation)	**Initial:** 25 mg daily PO taken with the largest meal. **Maintenance:** • If after 1 month there is no response, dose can be ↑ gradually to a max of 75 mg daily. • Maintenance dose typically between 25-50 mg daily. **Max:** 75 mg daily *Consider a trial of 12-24 weeks to assess efficacy.* *Tolerability can be an issue, and dosing can be started at a lower dose of 10 mg x 1 month and then ↑ 25-35 mg daily.*	**Brand:** $127-614 **Generic:** $56-238 **ODB:** ✓ **NIHB:** ✓

Safety:
- **Local S/E:** mucocutaneous dryness (dry skin, lips, eyes, nose, mouth), skin peeling or exfoliation (including palms and soles), pruritus or erythema, photosensitivity, hair and nail changes (alopecia, brittle nails, paronychia), dermatitis or skin fragility
- **Systemic S/E:** hyperlipidemia, hepatotoxicity or elevated liver enzymes, GI upset, musculoskeletal pain or skeletal changes with long-term use, headache or pseudotumor cerebri, mood changes, visual disturbances including night vision impairment, glucose intolerance, pancreatitis (rare)
- **Contraindications:** pregnancy or intent to become pregnant, breastfeeding, hypersensitivity to retinoids or vitamin A, severe hepatic or renal impairment, chronically elevated lipids or hypervitaminosis A, concomitant MTX or tetracycline use, alcohol use during treatment and shortly after discontinuation, use in patients < 18 years of age

Phosphodiesterase-4 (PDE-4) inhibitor

Mechanism: Increases intracellular cyclic AMP, reducing the release of pro-inflammatory cytokines that drive psoriatic plaque formation. This leads to decreased redness, scaling, itch and overall inflammation.

Characteristics:
- **Effective for the management of plaque psoriasis, psoriatic arthritis and palmoplantar psoriasis**.
- Has some immunosuppressive activity (i.e. selective immunosuppressant).
- For patients who would prefer to avoid injections, failed MTX or want less laboratory monitoring and are willing to accept a slower onset of skin clearance and lower likelihood of clearing.

Medication	Considerations	Dosage	Cost/Coverage (1 month)
Apremilast (Otezla®) 10, 20, 30 mg tablets	• Conduct baseline and periodic investigations prior to initiation, including CBC, LFTs, SCr, urine status, pregnancy test, chest x-ray, HBV/HBC, HIV. • CYP3A4 inducers may result in ↓ clinical efficacy. • Do not take in combination with potent immunosuppressive drugs (e.g., cyclosporine, tacrolimus). • Consultation on vaccination and education on susceptibility to infections. • Reduced efficacy of progesterone-containing contraceptives. Regular cancer screening advised due to risk of lymphoproliferative malignancies. • Use sunscreen and avoid excessive sun exposure. **Pregnancy:** X (Contraindicated) **Breastfeeding:** X (Contraindicated)	**Initial:** 10 mg daily ↑ by 10 mg/day over the first 5 days to minimize GI S/E. **Maintenance:** 30mg BID. **Max:** 30mg BID. If severe renal impairment (CrCl ≤ 30mL/min), max dose is 30 mg daily. *Consider a trial of 16 weeks to assess efficacy.*	**Brand:** $1547 **Generic:** $1249 **ODB:** X **NIHB:** X

Safety:
- **Systemic S/E:** diarrhea, nausea, headache, weight loss, vomiting, insomnia, common cold, fast or irregular heartbeat, dizziness, tremor, anxiety, or depression
- **Contraindications:** hypersensitivity to apremilast or any ingredient in the formulation

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Legend:

† = off-label; **BID** = twice daily; **BSA** = body surface area; **CI** = calcineurin inhibitor; **CrCl** = creatine clearance; **d/c** = discontinued; **GI** = gastrointestinal; **inj** = injectable; **MTX** = methotrexate; **N/A** = not applicable; **NIHB** = Non-Insured Health Benefits; **ODB** = Ontario Drug Benefit; **oint** = ointment; **PO** = by mouth; **S/E** = side effects; **TCS** = topical corticosteroid; **VDA** = vitamin D analogue

Cost: Several assumptions were made to derive a cost estimate. An approximation to cover a BSA of 5% (~1.25 grams per application) for a 1-month supply of daily use, factoring in the initial and maximum doses (including a 10% markup and a $12.99 dispensing fee).
Contraindications/side effects: The contraindications and S/E listed are not intended to be exhaustive. Consult monographs for additional considerations.
Duration of therapy: Generally continued until adequate disease control is achieved, then tapered or transitioned to maintenance therapy. Topical therapies are typically used in short courses intermittently or for proactive maintenance, while systemic therapies may be used longer with ongoing reassessment of efficacy, safety, and patient goals.
Follow-up: Regular follow-up is essential to monitor treatment response, safety and comorbidities, and to ensure patients achieve and sustain minimal disease activity. Follow-up should be structured, measurable and patient-centred, integrating both clinical outcomes and quality-of-life indicators.

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