Al-Haud Al-Marsoud

Psoriasis Protocol

Management & Treatment Guidelines

FIRST EDITION



PSORIASIS UNIT:

HEAD OF UNIT Hala Abdel Salam

EDITORS

Amir Atef Abeer Abdel Aziz Amera Abdel Rahman Nehal Mohsen Nevine Abdel Sattar

Index

General Psoriasis Protocol	1
Mild chronic plaque psoriasis	
Initial treatment	2
Maintenance	3
Fingertip unit method	4-6
Moderate & severe chronic plaque psoriasis	
Initial treatment and Follow up	7-12
Topical drugs in Psoriasis	
Basic treatment	13-16
Principal treatment	17-24
Specific types of psoriasis	25-34
Treatment of special cases in psoriasis	
Active alcohol abuse	35
Children < 7 yrs	33
Children > 7 yrs	36
12 to < 18 yrs	30
Demyelinating disease	37
Diabetes	38
Erectile dysfunction	39
Female of childbearing age	40-41
Heart diseases	42-43
Hyperlipidemia / Hypertension	44-45
Immunosuppression / Inflammatory bowel disease	46
Kidney disease	47
Lactation	48
Liver disease	48-49
Males trying to have children / Malignancy	50
Metabolic syndrome / Obesity	51-52
Pregnancy	53-54
Psoriatic arthritis	55
Psychiatric disorders	56
Uveitis	57
Topical treatment for special cases	58
Acitretin	59-60
Methotraxate	61-62
Combination therapy in psoriasis	63-66
Isotretinoin	67-73
Phototherapy in psoriasis	74-77
Possible triggers of psoriasis	78

General Psoriasis Protocol

<\= 10-15% BSA

Topical Tx

=/> 10-15 % BSA
Or failure of topical Tx

Systemic Tx + Adjuvant Topical Tx Adjunctive Tx (& as Maintenance)

Omega 3 cap

RDA of Vitamin D & Ca for 3 months (Except if deficient & need higher doses)

Diagnosis & Management of Psoriatic Arthritis

Diagnosis & Management of Metabolic Syndrome

Diagnosis & management of other comorbidities e.g. cardiovascular disease, uveitis, cancer

Rx screening intervals for PSO comorbidities:

- Every 6 mo in patients on systemic Tx
- Every 12 mo in patients receiving local Tx



https://onlinelibrary.wiley.com/doi/pdf/10.1111/jdv.12024

Notes on strategy of using topical Tx

<u>Topical Tx is the **mainstay of Tx** in PSO:</u>

- 1) **Dry skin is more susceptible to outbreaks** of PSO, so keep the skin well lubricated all the time via **emollients**
- 2) Use Topical therapy **in the most affected areas** as adjuvant with systemic therapy
- 3) Topical agents (i.e. Principal topical Tx e.g. Steroids) can be combined with either phototherapy or systemic agents to enhance efficacy in patients who are improving but still have areas of active disease/resistant lesions
- In other words, doses of systemic Tx should be reduced to the lowest possible amount of drug needed to achieve adequate control of psoriasis with concomitant topical therapy
- 4) More than one principal topical treatment to cover wider range of BSA without mounting max dose of each of them in cases of contraindications of systemic Tx & phototherapy (Suggested Under discussion)

Mild chronic plaque psoriasis </= 10-15% BSA (Initial treatment)

Basic treatment 4 weeks + Potent/Super potent topical steroid 1x1 + Vitamin D analogue 1x1 No clearance or no near clearance **Basic treatment** 4 weeks + Calcipotriol/betamethasone oint No clearance or no near clearance **Basic treatment** + Intralesional triamcinolone acetonide 4-6 weeks (+/- Anthralin short contact therapy) No clearance or no near clearance **NB-UVB** + Basic treatment + Calcipotriol/betamethasone or Tazarotene/Topical 4-6 weeks corticosteroid combination No clearance or no near clearance Coal tar & UVB 4-6 Or weeks **Topical PUVA** Or **Excimer laser** No clearance or no near clearance Consider systemic treatment

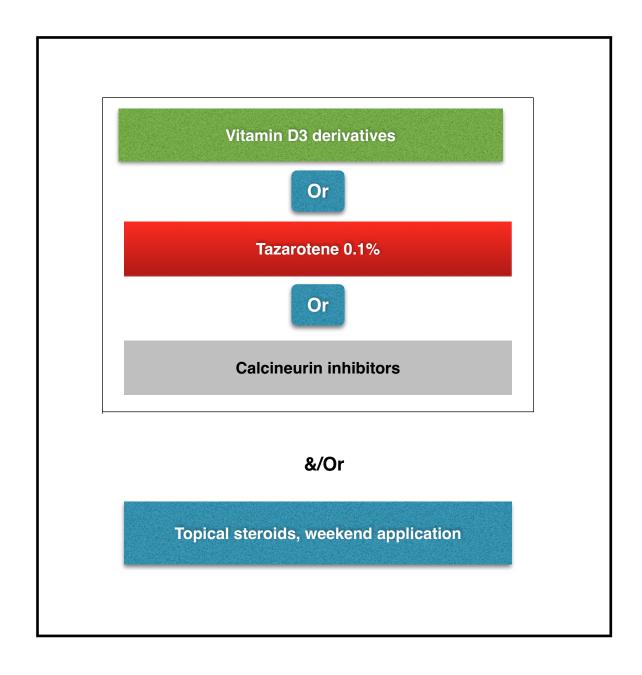
Mild chronic plaque psoriasis 10-15% BSA (Maintenance)

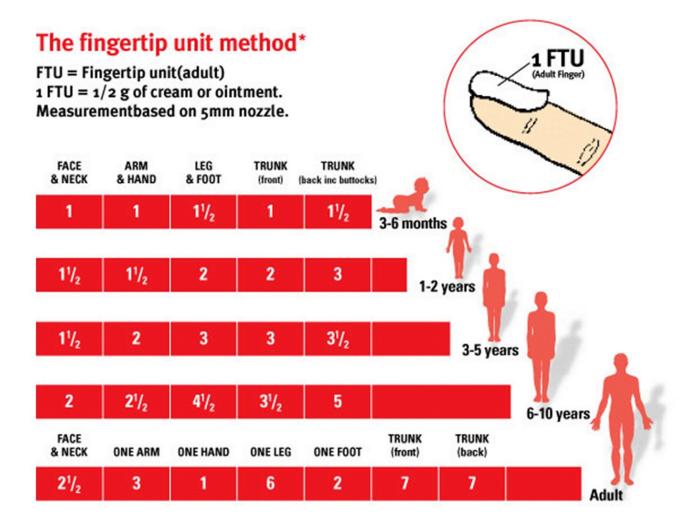
Start when goal of treatment is reached



Basic treatment including moisturizers

And





Used mainly for Topical Corticosteroids

Table I

Use of topical agents: The fingertip unit and how to assess quantity of topical agents needed to cover a given body surface $area^{79}$

Area to be treated	No. of fingertip units	Approximate body surface area (%)
Scalp	3	6
Face and neck	2.5	5
One hand (front and back) including fingers	1	2
One entire arm including entire hand	4	8
Elbows (large plaque)	1	2
Both soles	1.5	3
One foot (dorsum and sole), including toes	1.5	3
One entire leg including entire foot	8	16
Buttocks	4	8
Knees (large plaque)	1	2
Trunk (anterior)	8	16
Trunk (posterior)	8	16
Genitalia	0.5	1

https://www.jaad.org/article/S0190-9622(09)00012-7/fulltext

Important notes

https://dermnetnz.org/topics/fingertip-unit/

The quantity of cream in a fingertip unit varies with age:

- Adult male: 1 fingertip unit provides 0.5 g
- Adult female: 1 fingertip unit provides 0.4 g
- Child aged 4 years approximately 1/3 of adult amount
- Infant 6 months to 1 year approximately 1/4 of adult amount.

The amount of cream that should be used varies with the body part:

- One hand: apply 1 fingertip unit
- One arm: apply 3 fingertip units
- One foot: apply 2 fingertip units
- One leg: apply 6 fingertip units
- Face and neck: apply 2.5 fingertip units
- Trunk, front and back: 14 fingertip units
- Entire body: about 40 units.

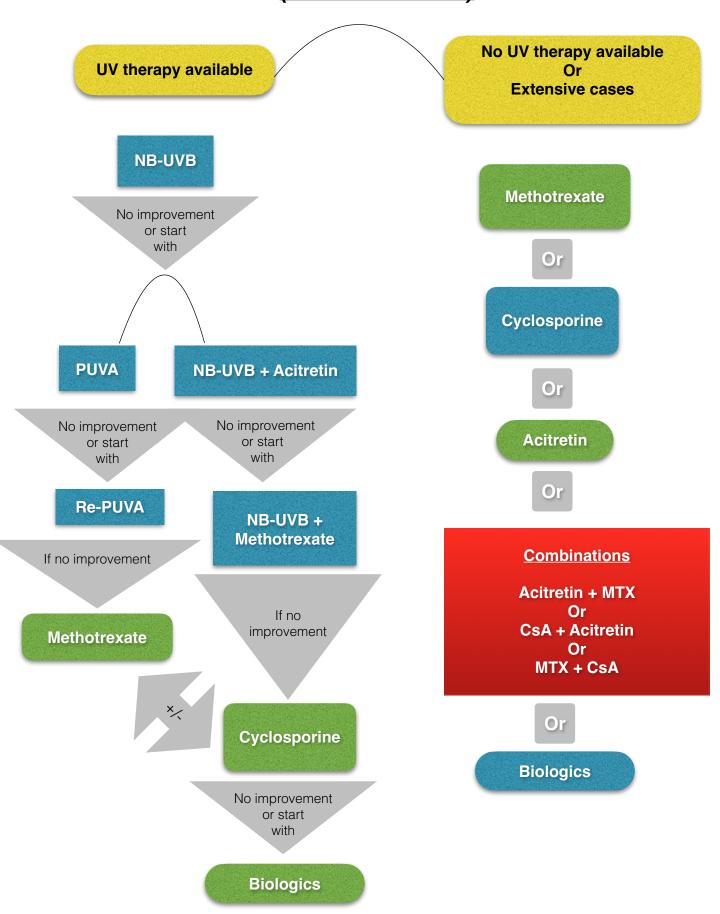
Example

An adult female applies a cream once daily to both arms. She uses 2.4 g in one day (2 arms x 3 fingertip units x 0.4 g = 2.4 g). This is 16.8 g per week (7 x 2.4 g).

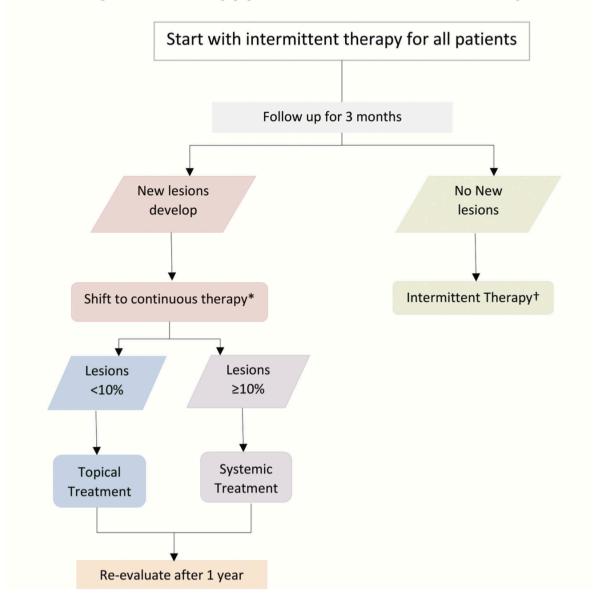
A 30 g tube should last her two weeks. But if she applies it twice daily (4.8 g/day), the tube will be finished in less than a week (33.6 g/week).

An adult male applies a cream once daily to the dorsal and volar surfaces of both feet and both hands. He uses about 3 g per day (2 feet x 2 units PLUS 2 hands x 1 unit, x 0.5 g = 3.0 g). This works out as 21 g/week (7 x 3 g) A 50 g tube should last him about 2 1/2 weeks.

Moderate & severe chronic plaque psoriasis =/> 10-15% (Initial treatment)



Choice of systemic therapy protocol for moderate-severe psoriasis



Flowchart for the choice of systemic therapy protocol for moderate to severe psoriasis. *Continuous therapy indicates the continuation of systemic medication despite good clinical response to avoid recurrence or relapse. †Intermittent therapy indicates the interruption of systemic therapy when complete or almost complete clearance is achieved for a significant period of time. CsA, cyclosporine; MM, mychophenolate

Table illustrating expected durations for initial improvement and complete or near complete clearance in chronic plaque psoriasis **Treatment Initial improvement Short-term results** Long-term results (Complete or near (Remission) complete clearance) **NB-UVB** Response observed at Average of 15-20 Remission rate of 38% 8-10 treatments treatments to achieve after 1 y https://www.jaad.org/article/ clearance S0190-9622(09)01058-5/ N.B.: Clearance within 2 N.B.: Maintenance fulltext (Table III) weeks may be seen therapy may prolong remission N.B.: If the patient fails to obtain an adequate response after app. 20-30 treatments w NB-UVB, so PUVA, traditional systemic agents, or biologic agents should be considered. https://www.jaad.org/article/S0190-9622(10)02173-0/fulltext (Case 2 discussion) Oral PUVA Initial improvement 20-25 treatments 3-12 months frequently seen within 1 https://www.jaad.org/article/ month of therapy N.B.: No adequate data S0190-9622(09)01058-5/ on efficacy of fulltext#sec5.3.1 (See Table maintenance therapy IX) https://www.jaad.org/article/ S0190-9622(09)01058-5/ fulltext#sec5.3.1 (Section of efficacy) Topical PUVA May take 30 treatments Single course usually is Remission: 3-12 months to have noticeable 30-40 treatments https://www.jaad.org/article/ response Once clearance has

S0190-9622(09)01058-5/ fulltext#sec5.3.1 (Table X)		Topical PUVA usually requires treatments 2-3 times/wk for several months for adequate clearing & maintenance of control of palmoplantar PSO https://www.jaad.org/article/S0190-9622(10)02173-0/fulltext (Case 4 discussion)	been achieved, maintenance treatment may be used
Methotrexate	4-8 weeks https://www.elsevier.es/ index.php? p=revista&pRevista=pdf- simple&pii=S15782190107 0682X&r=5 (Section of : Eficacy in Psoriasis, 1st sentence)	https://www.ncbi.nlm.nih.gov/ (Table 1 not figure 1) When no adequate respor 12 weeks with a dose of 2 was obtained by increasing https://www.elsevier.es/index p=revista&pRevista=pdf-simple&pii=S1578219010706 Efficacy in Psoriasis)	nse was achieved within 0 mg/wk, no improvement g the dose to 25 mg/wk

Treatment	Initial improvement	Short-term results (Complete or near complete clearance)	Long-term results (Remission)
Cyclosporine	In general some improvement occurs in 2 weeks https:// www.accessdata.fda.gov/ drugsatfda_docs/label/ 2009/050715s027,050716s028l bl.pdf: Section of dosage & administration related to psoriasis: 3rd paragraph) Average time to reach PASI 50 is 4.3 weeks at conc. of 5mg/kg/d or 6.1 weeks at 2.5mg/kg/d https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3745987/ (reference point no 18) Erythrodermic PSO: oral CsA was initiated at 4 mg/kg/d w dramatic improvement during a period of 2-3 wks https://www.jaad.org/article/S0190-9622(10)02173-0/fulltext (Case 6)	Average of 7.8 weeks to re https://www.ncbi.nlm.nih.gov/pm/ (paragraph before the last one, in Satisfactory control may to achieve Treatment should be discoresponse cannot be achieve https://www.accessdata.fda.g2009/050715s027,050716s028 administration related to ps If an adequate response has months of treatment at an oracyclosporine should be withd https://www.jaad.org/article/Sfulltext	c/articles/PMC3745987/ in section 2.1 of general data) ake 12-16 weeks to continued if satisfactory aximum tolerated dose cov/drugsatfda_docs/label/ 28lbl.pdf: Section of dosage coriasis not been achieved after 3 al dose of 5 mg/kg/d, rawn
Acitretin N.B.: Psoriasis gets worse for some patients when they first start acitretin treatment	Within 8 weeks in chronic plaque psoriasis https://www.elsevier.es/ index.php? p=revista&pRevista=pdf- simple&pii=\$\$15782190130014 79&r=40 (section of chronic plaque reference point no 54) In generalized pustular psoriasis, acitretin is used at a dose of 0.5 to 1mg/kg/d and treatment generally produces a rapid clinical response with clearing of the lesions within 10 days https://www.elsevier.es/index.php? p=revista&pRevista=pdf- simple&pii=\$15782190130014 79&r=40 (pustular PSO 1st paragraph)	https://www.elsevier.es/index p=revista&pRevista=pdf- simple&pii=S1578219013001 efficacy) Palmoplantar pustulosis: Two RCTs compared acitretin wi pustulosis.48, 49 Acitretin was s placebo, acting within 4 weeks in pustules. After 12 weeks the acitretin and etretinate showed a which was similar for both retino https://onlinelibrary.wiley.com/do 1365-2133.2010.09755.x	th placebo in palmoplantar ignificantly more effective than to produce a fivefold reduction second study49 comparing a tenfold reduction in pustules ids

Table illustrating expected durations for initial improvement and complete or near complete clearance in chronic plaque psoriasis

complete clearance	complete clearance in chronic plaque psoriasis								
Treatment	Initial improvement	Short-term results (Complete or near complete clearance)	Long-term results (Remission)						
Guselkumab (Tremfya)		16 weeks (according to many https://www.accessdata.fda.g 2017/761061s000lbl.pdf#pag studies)	ov/drugsatfda docs/label/						
Secukinumab (Cosentyx)		At 12 weeks (at which mandone) many patients reach complete clearance or PA: https://www.accessdata.fda.g2016/125504s001s002lbl.pdf	n complete or near SI 75 improvement						
Ustekinumab (Stelara) https:// www.ncbi.nlm.nih.gov/pmc/ articles/PMC5697570/ (Table 1 not figure 1)	7.1 (5.8, 8.7) weeks (To reach 50% of the maximal treatment effect)	13.3 (11.1, 16.7) weeks (To reach 90% of the maximal treatment effect)							
Infliximab https:// www.ncbi.nlm.nih.gov/ pmc/articles/ PMC5697570/ (Table 1 not figure 1)	4.7 (3.5-6.2) weeks (To reach 50% of the maximal treatment effect) N.B.: Dramatic improvement occurs within 48-72 hours in Generalized pustular psoriasis https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4252692/(Figure 2 & last para of the article)	10.0 (6.8, 14.2) (To reach 90% of the maximal treatment effect)							

Drug	Dose	Pregnancy, lactation & children	C.I.	Drug interaction	Precaution	Side effects	Comments
I) Basic TTT							
1) Urea 10%	BID Suitable for use on large areas	Pregnancy: C Lactation: Unknown: Children: =/> 2 y	safety		Avoid on eroded or fissured skin	Irritation & burning	May work best if the skin to be treated is left slightly damp before urea is applied drugs.com

Drug	Dose	Pregnancy, lactation & children	C.I.	Drug interaction	Precaution	Side effects	Comments
2) Salicylic acid	Once daily (More in other sources) https:// www.jaad.org/ article/ S0190-9622(09)0 0012-7/ fulltext#sec10.2 (Table IX) Conc.: 2–6 % (Up to 10% if needed) https:// www.ncbi.nlm.nih.g ov/pmc/articles/ PMC5518573/#! po=29.0698 (Section of salicylic acid: Efficacy & adverse effects) Not used > 20% of BSA per day https:// www.sciencedirec t.com/science/ article/pii/ S2210836X10000 035: read for salicylic & others	https:// www.ncbi.nlm.nih.g ov/pmc/articles/ PMC5683115/#! po=30.2632 (Table 2) AAD: Appears to be a safe choice for the control of localized psoriasis in pregnancy https:// www.jaad.org/ article/ S0190-9622(09)00 012-7/ fulltext#sec10.2 (Table IX) Lactation: Unknown safety Children: =/> 2 y AAD: Because of greater risk of systemic absorption and toxicity, SA should be avoided in children		1) Inactivates clacipotriol 2) Blocks UV light, and therefore should be applied after phototherapy https:// www.ncbi.nlm.n ih.gov/pmc/ articles/ PMC5518573/#! po=29.0698 (Section of salicylic acid: adverse effects)	Its use should be avoided on genitals, MM & the eyes https:// www.ncbi.nlm.nih.gov/pmc/articles/ PMC5518573/#! po=29.0698 (Section of salicylic acid Efficacy) Be cautious w following conditions: 1) DM: may cause severe redness or ulceration, esp. on hands or feet 2) Flu or varicella: Should not be used due to risk of Reye's syndrome 3) Liver or renal disease: risk of systemic toxicity from per cutaneous absorption is increased 4) Wide range of systemic medications esp. oral salicylates https:// www.mayoclinic.org/drugs-supplements/salicylic-acid-topical-route/before-using/drg-20066030 (Section of: before use)	Temporary shedding of telogen hair The major problem in the topical treatment of psoriasis with salicylic acid is the potential chronic or acute systemic intoxication with the symptoms of oral mucosa burning, frontal headache, CNS symptoms, metabolic acidosis, tinnitus, nausea & vomiting.[52,53] https://www.ncbi.nlm.n ih.gov/pmc/articles/PMC5518573/#! po=29.0698 (Section of salicylic acid: adverse effects)	Augments action of TCS, CI, dithranol https:// www.ncbi.nlm.n ih.gov/pmc/ articles/ PMC5518573/#! po=29.0698 (Section of salicylic acid)

Drug	Dose	Pregnancy, lactation & children	C.I.	Drug interaction	Precaution	Side effects	Comments
3) Lactic acid 10% or ammonium lactate 12% https:// www.rxlist.com/ lac-hydrin- drug.htm المحوظة: ده المصدر القصر العيني في التركيز و بالرغم من الجرعة غير اللي في reference الجرعة غير اللي في reference البحرية فير اللي في https:// www.verywellhe alth.com/lactic- acid-skin- care-4178819 (Section of: What to Look For)	BID	Pregnancy: B Lactation: Unknown safety Children: Safety & efficacy in pediatrics has not been established			Avoid w calcipotriene (https:// www.jaad.org/ article/ S0190-9622(09)0 0012-7/fulltext: general principles, 3rd paragraph) Sun exposure should be minimized or avoided Stinging or burning if applied to skin with fissures or erosions https:// www.rxlist.com/ lac-hydrin- drug.htm#warning s	Irritant dermatitis	

Drug	Dose	Pregnancy, lactation & children	C.I.	Drug interaction	Precaution	Side effects	Comments
4) Petroleum jelly (Vaseline)	Depending on severity of xerosis, frequency of application can vary between 1-3 times daily https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4885180/(section of dosage: last sentence)	Pregnancy: N Generally considere sources	ed safe in most	such as petrolatur before NB-UVB tras this increa effectiveness in preduces UV-induct Thickly applied however, decrease and potentially displayed however, decrease and potentially displayed https://www.jss0190-9622(19)3063 https://www.ncbi.nlm_PMC5916397/https://link.springer_s40257-015-0 The application of petrolatum, which effect, and also of immediately befor should not be recommendated.	n has a blocking f basis cream re PUVA therapy ommended .nlm.nih.gov/pmc/	Vaseline may cause folliculitis (for being occlusive)	Better added after a bath Friction & irritation may play a significant role in inverse PSO and a thin coat of an emollient such as petrolatum applied to areas of inverse PSO after bathing may be beneficial https://www.jaad.org/article/S0190-9622(10)02173-0/fulltext
	are a few common	ly available moisturize	ers reported to provid	so keep your skin well de good results. Avoid -managing-psoriasis/	l lightweight lotions, v		

Drug	Dose	Pregnancy, lactation & children	C.I.	Drug interaction	Precaution	Side effects	Comments
II) Principal TTT							
1) Cortico- steroids https:// www.jaad.org/ article/ S0190-9622(09)0 0012-7/ fulltext#tbl2	Amount/d: According to chart of finger tip unit Max amount/wk: 50 g Max duration: 4 wks with free interval of at least 2 wks Maintenance: 3 successive application 12 h apart once/w or apply twice weekly	Pregnancy: C Lactation: Unknown Children: drugs.com Clobetasol & Betame dipropionate: =/> 12 Mometasone: =/> 2 Betamethasone value of the value	ethasone y 2 y llerate: =/> 1 y etate & butyrate:		1) Possible rebound phenomenon w abrupt withdrawal Recommendation: Decrease strength or frequency gradually to avoid it 2) Tachyphylaxis w prolonged use However, in a 12-wk study of continuous Tx w topical steroids, none of the pt.s exhibited tachyphylaxis.58 https://www.jaad.org/article/S0190-9622(10)02173-0/fulltext	Atrophy — Telangied distensae — Purpul Acne or Folliculitis Occasionlly cause Cushing's syndrom Increased intraocul glaucoma & catara around eyes Unilateral or bilater necrosis of femoral Hypo-pituitary-adre suppression Growth retardation	contact dermatitis e ar pressure, cts : reported w use al avascular head enal axis

Drug	Dose	Pregnancy, lactation & children	C.I.	Drug interaction	Precaution	Side effects	Comments				
2) Calcipotriene (Calcipotriol) 0.005% https:// www.jaad.org/article/ S0190-9622(09)0 0012-7/ fulltext#tbl3	Max amount/w: 100 g in adults - 50 g in children 2-14 yrs Not used > 30% of BSA or 15 g / d (Daivobet leaflet at http://www.leo- pharma.com.au/ Admin/Public/ Download.aspx? file=Files/Filer/ LEO local downl oads/leo- pharma.au/ Daivobet%20gel% 2050 500%20CM Lpdf) Maintenance: Frequency of application may be decreased to once daily, depending on the response https:// www.medicines.or g.uk/emc/product/ 6899/smpc	Pregnancy: C Lactation: Unknown safety Children: =/> 18 yrs AAD: 2-14 yrs: Effective & well tolerated w mild skin irritation & no metabolic effects noted at dosages up to 50 g/wk	1) Renal dysfunction 2) Abnormalities of bone or Ca	1) Degraded when mixed w 6% salicylic acid, 12% ammonium lactate or hydrocortisone -17 valerate oint https:// www.ncbi.nlm.nih.gov/pmc/articles/ PMC5518573/#! po=41.6667 (reference point no 108) 2) Apply after and not before UVA phototherapy (Vitamin D analogue degraded by UVA) 3) Avoid w lactic acid (https://www.jaad.org/article/S0190-9622(09)00012-7/fulltext: general principles, 3rd paragraph)	Irritates face & sensitive areas	Burning - Pruritus Dryness - Peeling Erythema -Edema Photosensitivity (presumably due to thinning of the epidermis), but no C.I. to combining with UVB Hypercalcemia & PTH suppression w excess amounts, renal disease or impaired Ca metabolism	Recommended combinations: w topical steroids, UVB, CsA or Acetretin (to decrease the dose & increase efficacy of them) Similar efficacy to betamethasone valerate oint (a class 3 topical corticosteroid) Or tazarotene https://www.jaad.org/article/S0190-9622(10)02173-0/fulltext (Reference 70)				
	N.B. : In compariso	N.B. : In comparison to superpotent TCS, calcipotriene has delayed onset of action but results in longer disease-free interval									

Drug	Dose	Pregnancy, lactation & children	C.I.	Drug interaction	Precaution	Side effects	Comments
3)Calcineurin inhibitors (Pimecrolimus & tacrolimus) https:// www.jaad.org/article/ S0190-9622(09)0 0012-7/fulltext#tbl3 Indications: No FDA-approved indications for PSO; primary indications for off-label use are for facial, genital & intertriginous psoriasis	BID Duration to reach good results: 8 wks	Pregnancy: C Lactation: Excreted in milk Children: =/> 2 yrs old if Pimecrolimus 1% Or Tacrolimus 0.03% =/> 16 y if Tacrolimus	s 0.1%		Avoid UV exposure after application (risk of malignancy increases)	1) Burning & itching: generally reduces w ongoing usage and can also be mitigated by not applying immediately after bathing 2) A controversial lymphoma "black box" warning has been issued by the FDA but no evidence in clinical practice	Salicylic acid enhances its penetration

Drug	Dose	Pregnancy, lactation & children	C.I.	Drug interaction	Precaution	Side effects	Comments
Tazarotene 0.05 -1 % https:// www.jaad.org/ article/ S0190-9622(09)0 0012-7/ fulltext#tbl3 https:// www.jaad.org/ article/ S0190-9622(10)0 2173-0/fulltext (Reference 52) N.B.: Using lower concentration then increasing it gives better tolerance	At night Irritation may be reduced by use of the cream base, use of lower concentrations, combination w moisturizers, application on lesions only, application on alternate days, short-contact (30 - 60 min) Tx & combination w topical steroids	Pregnancy: X Lactation: Excreted in milk Children: No available data w PSO < 18 yrs, although in acne, approved for children =/> 12 yrs			Potentially photosensitizing (due to thinning of epidermis), so Photoprotection is needed — Reduce dose of UVB if combination used to prevent skin burning Avoid on face, flexures & genitalia	Irritation tazarotene gel once daily (0.05% & 0.1%) has similar efficacy to twice daily fluocinonide 0.05% cream (a class 2 topical corticosteroid) https:// www.jaad.org/ article/ S0190-9622(10)0 2173-0/fulltext (Reference 73)	Although tazarotene is potentially photosensitizing (due to thinning of epidermis), combination of tazarotene & UVB not only results in significant enhancement of efficacy of phototherapy, but also greatly diminishes the amount of UV exposure needed to obtain a good clinical response As effective as calcipotriol combination w topical steroids produce a synergistic effect w longer duration of Tx benefit & remission (Guidelines, Section 3).52

Drug	Dose	Pregnancy, lactation & children	C.I.	Drug interaction	Precaution	Side effects	Comments
4) Anthralin (Dithranol) https:// www.jaad.org/ article/ S0190-9622(0 9)00012-7/ fulltext#tbl3	Short contact duration 20-30 min Start with 1% conc. then increase it according to tolerance If psoriatic plaques are well defined, surrounding normal skin can be protected by use of Zinc oxide paste	Pregnancy: C Lactation: Unknown safety Children: Use with caution	1) Pustular psoriasis 2) Erythrodermic psoriasis	Topical zinc oxide reduces efficacy of anthralin, unless salicylic acid is used in the same combined formula which also enhances anthralin effect https://www.karger.com/Article/Abstract/252139		- Irritation esp. on face & sensitive areas - Staining of skin, nails, clothing & other objects with which patients come into contact	As monotherapy, anthralin appears to have lower efficacy than more potent topical corticosteroids or vitamin D derivatives Triethanolamine applied after removal of anthralin, prevents staining & irritation by neutralizing any anthralin residue remaining on the skin https://www.karger.com/Article/Abstract/252139

Drug	Dose	Pregnancy, lactation & children	C.I.	Drug interaction	Precaution	Side effects	Comments
https:// www.jaad.org/ article/ S0190-9622(0 9)00012-7/ fulltext#tbl3	1% shampoo: applied 5 min twice weekly Topical 0.5-5%: 1-2 times/d (Up to QID) Left at least 2 h	 Pustular & erythro-dermic ps. PUVA 	Pregnancy: C https:// www.ncbi.nlm. nih.gov/pmc/ articles/ PMC5518573/ #!po=41.6667 AAD: Risk of topical coal tar used for brief periods of time during pregnancy is likely to be small Lactation: Excreted in milk Children: Use with caution	Photosensitivity to UVA It is important that coal tar not be applied immediately before NB-UVB treatment. 1,14,33,34,36-38 https://www.jaad.org/article/S0190-9622(19)30637-1/fulltext N.B. In Goekerman technique, it is applied before it (AAD) or after it in other regimens	1) Avoid concomitant sun exposure to avoid increasing redness of skin 2) Avoid bleeding plaques in psoriasis	1) Odor 2) Staining 3) ICD 4) Folliculitis 5)Keratoacanthoma 6) Coal tar is carcinogenic in animals; however, in humans there are no convincing data proving carcinogenicity, Although occupational exposure to coal tar may increase the risk of lung cancer, scrotal cancer, and skin cancer, patients w PSO or AD who are treated w coal tar products applied to skin do not have an increased risk	Combination with moisturizer & steroid for better results in psoriasis Gockerman & modified Gockerman techniques are effective Better improvement in PASI score in patients treated with 1% lotion than in 5% extract

Drug	Dose	Pregnancy, lactation & children	C.I.	Drug interaction	Precaution	Side effects	Comments
Abbreviations		ibitors branes on		drug			
References	1) Psoriasis Protoc 2) NCBI articles 3) Kasr El Einy Pso	ol of American acader oriasis Protocol	my of dermatology				
Comparison between	1) Calcipotriol oint	has similar efficacy to	betamethasone val	erate oint (a class 3 to	opical corticosteroid	after 6 weeks	
different topical treatments	N.B. : Vitamin D ar	nalogs have a slower o	onset of action than	topical corticosteroids	s, but tend to yield lo	nger disease-free p	eriods
https:// www.jaad.org/		is more effective for m ids have comparable (or short contact anth	nralin, and only potent
article/ S0190-9622(10)0 2173-0/fulltext (Comparison		gths of tazarotene gel 12-week, multicenter, erapies.73					
studies of topical	N.B. : Tazarotene o	did demonstrate signifi	cantly better mainte	enance of effect after of	discontinuation of the	erapy	
therapies)	4) Tacrolimus oint	(0.1%) is more effective	e than Calcitriol oin	t In intertriginous & fa	cial psoriasis after 6	weeks	
	receive one of 3 ac 0.005% oint resulte	domized, double-blind tive treatments or vehed in a 62% mean redu group had a 20% me	icle control. Betame uction in PASI score	ethasone oint 0.1% pr e, with pimecrolimus c	oduced an 86% mea	an reduction in PAS	I score, calcipotriol

Drug	Dose	Pregnancy, lactation & children	C.I.	Drug interaction	Precaution	Side effects	Comments
https:// www.jaad.org/ article/ S0190-9622(10)0 2173-0/fulltext (Case 4)	N.B. : twice daily C	.l. + Twice weekly cort	icosteroid is a usefu	l regimen			

Type of psoriasis	Topical Tx	1st line sys Phototherap MTX, CsA	stemic Tx: by, acitretin,	2nd line sys Biologics	stemic Tx:
Scalp PSO	1st line: Steroid +/- salid calcipotriol + Coal tar 1% share N.B.: Thick scale shour removed to prevent alogeither: a) Olive oil occluded wy moist towel for 30 min (Habif textbook 4th edition Or b) 10% Salicylic acid in under plastic cap overnit (Fitzpatrick textbook 6th edition p 15	npoo Id be gently becia by warm, on p 126) mineral oil ght lition p 68)	https://www.spsoriasis/exc	re to the scalp and no scratchir ypy dishampoos including tar, salic topical steroid, zinc, and keto reroids ene a betamethasone dipropio cid ylic acid Photothe UVS: exciri stero Systemic Acitre Acitre Acitre Adalai Etiane	ctory improvement ctory improv
Face; groin, axilla, and other body folds	- Mild topical corticos - Topical calcineurin in - Tacalcirol/calcitriol in commild topical corticos Bolognia 4th edition p 15 N.B.: Antiseptics and topic agents are often recommence psoriasis may be complicate & yeasts, including Candid Malassezia https://dermnetnz.org/toppsoriasis/	hibitors bination w a teroid 7 table 8.18 al antifungal led as flexural ed by bacteria a albicans &	(Fitzpatrick to edition p 69) N.B.: Phot sometimes in	extbook 6th cotherapy is mpractical in ne body folds	
Guttate PSO https://www.ncbi.nlm.nih.gov/books/ NBK482498/	Mild		Мо	oderate to sev	ere

Type of psoriasis	Topical Tx	1st line sys Phototherap MTX, CsA	stemic Tx: by, acitretin,	2nd line sys Biologics	temic Tx:
Tx of the cause e.g. antibiotics for streptococcal infection (10 days) N.B.: In patients w pharyngeal colonization by streptococci, an excellent response has been reported after tonsillectomy Andrew's 11th edition p 188	Children: Clobetasol & Betamethasone =/> 12 y Mometasone: =/> 2 y Betamethasone valerate: =/> Hydrocortisone acetate & buty &/or 2nd line: Anthralin, calcipotrio calcineurin inhibito N.B. Calcipotriol is deactivate acid so avoid their combinatio Calcipotriol is contraindicated	dipropionate: 1 y yrate: =/> 3 m I, tazarotene, ors d by salicylic n	1st line: BB -U UVB N.B.: Rapid re occurs at eryth doses. Subery doses often himpact on the MED testing is recommended appropriately a Andrew's 11	esponse nemogenic themogenic nave little e lesions. s I to allow for aggressive Tx th edition p	
Mucosal PSO	Treatment for oral pso	teroids. h rinses. nent: metho	otrexate, aci		losporin

Type of psoriasis	Topical Tx	1st line systemic Tx: Phototherapy, acitretin, MTX, CsA	2nd line systemic Tx: Biologics
Palmoplantar chronic plaque PSO https://www.ncbi.nlm.nih.gov/books/NBK448142/ https://www.jaad.org/article/S0190-9622(10)02173-0/fulltext (Case 3 & 4) (Fitzpatrick textbook 6th edition p 68) N.B.: Minority of patients respond to topical Tx	Potent to superpotent topical steroids BID +/- Salicylic acid Or Calcipotriol N.B.: 1) Under occlusion therapy can ++ efficacy of steroids either alone or in combination w calcipotriol 2) Calcipotriol is deactivated by salicylic acid so avoid their combination	Excimer laser > Excimer light > targeted NB-UVB Topical PUVA = Excimer light efficacy https://www.jaad.org/article/S0190-9622(19)30637-1/pdf (References 80, 96-100, 103-105) &/or Acitretin N.B.: a case that fails w oral PUVA, may succeed w topical PUVA https://www.jaad.org/article/S0190-9622(10)02173-0/fulltext Topical PUVA usually requires treatments 2-3 times/wk for several months for adequate clearing & maintenance of control of palmoplantar PSO https://www.jaad.org/article/S0190-9622(10)02173-0/fulltext (Case 4 discussion) 3rd line: MTX Or CsA	Biologics are reserved for patients who fail or cannot complete Tx w topical & other systemic medications
Pustular PSO	_	neralized, it's poorly respons s may show some respon	
A) Palmoplantar pustular psoriasis	classified as a type o	lated, palmoplantar pus f psoriasis. It nearly alw e drug-induced, often by etnz.org/topics/drug-indu	ays occurs in smokers. TNF-α inhibitors

Type of psoriasis	Topical Tx		stemic Tx: py, acitretin	2nd line syste , Biologics	emic	Tx:
https:// www.ncbi.nlm.nih.gov/pmc/ articles/PMC5683122/#! po=45.1220 (Table 4)	Strong glucocorticoids under plastic occlusion (e.g., for the night) may be effective but do not prevent recurrences	Consider locacitretin (35, 1mg/kg/d) N.B.: Excim	mg/d or up to	- Prefer ETA C more available both are prese - In case of fai Consider othe	e data ent lure,	a for
https://www.elsevier.es/ index.php?	Topical calcipotriene	light can als		anti-IL17	1 1141	101
p=revista&pRevista=pdf- simple&pii=S15782190130 01479&r=40 (Section of pustular psoriasis) Andrew's 11th edition p	Topical Tazarotene	pdf (Referer	2(19)30637-1 nces 96-100)	· ·	0.111	
188 (Fitzpatrick textbook 6th		MTX or CsA recalcitrant of CsA is prefe	cases but			
edition p 69)		https:// www.onlinel om/doi/epdf/ 15340 (table				
B) Acrodermatitis	Table 5		First line – systemic			
continua of Hallopeau	Treatment of acrodermatitis continua of hallopeau		Cyclosporine 3–5	mg/kg/day	Oral	
https:// www.ncbi.nlm.nih.gov/pmc/	Medication Dosage First line – topical	Route Notes	Acitretin 45 m	ng/day, 35-40 mg/day, 35 mg/day	Oral	Dosing based on case reports
articles/PMC5683122/#! po=50.0000 (Table 5)	Corticosteroids Standard dosing under	Topical	Adalimumab Stan	dard dosing	SC	
(143.5 5)	occlusion Second line – topical			dard dosing	SC	
https://	Calcipotriol 50 μg/g ointment BID	Topical		dard dosing	IV SC	
www.ncbi.nlm.nih.gov/ pubmed/22816881	Fluorouracil 5% cream	Topical Recurrence after stopping	Second line – systemic	dard dosing	sc	
	Tacrolimus 0.03%–0.1% cream/ointment applied	Topical Minor		nisolone 75 mg daily	Oral	
	BID with one application being under occlusion overnight for 1–2 weeks, then once daily under occlusion for 1–2	recurrence n		le dose of triamcinolone acetonide g, then repeat dose 1–2 weeks later	IM	
	weeks; maintenance therapy of once weekly			5 mg/weekly	Oral	
			mg/d	g/day gradually increased to 70 ay over 5 months; g BID for 1 month then decreased mg	Oral	Dosing based on case reports
			PUVA-bath 24 tr	eatment sessions	Topical	Dosing based on case reports
			Broadband BB-UVB and mont thalidomide	$\label{eq:JVB} \text{JVB} + \text{thalidomide 50 mg/day for 2} \\ \text{hs}$	Topical	Dosing based on case reports
				8-MOP applied following NB-phototherapy twice weekly	Topical	
			UVB at 80	eted NB-UVB twice weekly starting % minimum erythema dose and asing by 20% each session	Topical	Dosing and results based on case
Generalized pustular PSO	https://www.ncbi.nlm.nih.ge	ov/pmc/article	es/PMC5683	122/#!po=50.000	<u>)0</u> (Ta	able 1

Type of psoriasis	Topical Tx		1st line sys Phototherap MTX, CsA	stemic Tx: by, acitretin,	2nd line sys Biologics	temic Tx:
General measures	Irritat Over Pregg Syste Infec Emot Sudd topical s 2) Hospital N.B.: Syste N.B.: Decre	nal medications ing topical age exposure to UV nancy emic steroids tions tional stress len withdrawal esteroids https://www.lization, bed resmic symptoms ease crust, scales of pustules & v.dovepress.co	of systemic medosoriasis.org/abot, fluid & electrosedation & high including fever anti-inflammatory wraps; whirlpot blood samples pustu	dications (such pout-psoriasis/ty plyte correction diet will protein diet ory medications t via topical corpol treatments a gram stains tulosis d-screening-of-	as corticosteroi	entrol, mild Intipyretics & Ital body wet causes of
In General French guidelines 2019 gives this algorithm But Another algorithm below can help according to severity	<u>pustular-p</u>		- Prefer CsA Or acitretin - Consider MTX - Phototherapy not recommended https://www.onlinelibrary.wiley.com/doi/epdf/10.1111/jdv. 15340 (table 5)		- Prefer INFLI (rapidity of action) - Consider USTK - Consider anti-IL17 - No data available for APR https:// www.onlinelibrary.wiley.com/doi/epdf/10.1111/jdv. 15340 (table 5)	
a) Severe acute disease https:// www.ncbi.nlm.nih.gov/ pmc/articles/ PMC5683122/#! po=50.0000 (Table 1)	Cyclosp 3.5–5 m adequate taper down t every	g/kg/d; if response, by 0.5 mg/kg	Infliximab (Rapid Action) IV standard dosing https://www.researchgate.net/ publication/ 269190664_Two_Cases_of_Gener alized_Pustular_Psoriasis_Success		Recalcitrant GPP: Use contherapies from classes such ETA + CsA Or INFLI + MTX	mbination m different as :
b) Non acute disease		Acit	retin	Methotre	exate	
For more info see https:// www.ncbi.nlm.nih.gov/ pmc/articles/ PMC5683122/#! po=50.0000 (Table 1)		maintenan 0.25 mg/l several N.B. : Isotro be use alternativ	mg/kg/day; nce: 0.125– kg/day for months etinoin may d as an e (shorter -life)	week until start at 7.5 r patients >7	g/week, by 2.5 mg/ response; ng/week for 0 years old; 25 mg/week	

Type of psoriasis	Topical Tx	1st line systemic Tx: Phototherapy, acitretin, MTX, CsA	2nd line systemic Tx: Biologics
Erythrodermic PSO In General French guidelines 2019 gives this algorithm But Another algorithm below can help according to severity		- Prefer CsA - Consider acitretin Or MTX - Phototherapy not recommended https://www.onlinelibrary.wiley.com/doi/epdf/10.1111/jdv. 15340 (table 5)	- Consider TNFi (Prefer INFLI for speed of action) or USTK or anti-IL17 - No data available for APR https:// www.onlinelibrary.wiley.com/doi/epdf/10.1111/jdv. 15340 (table 5)

Type of psoriasis	Topical Tx		-	2nd line systemic Biologics	Tx:		
Acute unstable phase https://	Potential septic	Hospitalization Potential septic & thromboembolic complications justify close surveillance of patients					
www.ncbi.nlm.nih.gov/ pmc/articles/ PMC5572467/#! po=37.8049	(Sepsis wa	2) Rule out sepsis by blood culture (Likewise it is imperative to rule out sepsis with blood cultures, which frequently may be a trigger factor for erythrodermic psoriasis.130) (Sepsis was ruled out by negative blood cultures, then CsA is given) https://www.jaad.org/article/S0190-9622(10)02173-0/fulltext (Case 6 discussion)					
	3) Identif	ication & re	moval of triggering factors (se	ee table 1 below)			
		Table 1					
		Summary of eryt	hrodermic psoriasis triggers				
	-	Type of trigger	Examples	References			
		Environmental	Sunburn, skin injury/trauma, emotional stress, $\label{eq:substress} alcoholism, infection^b$	5, 15, 75			
		Chemical reaction	Bupropion use in smokers ^a , CT contrast ^a , topical tar	65 ^a , 66 ^a , 75			
		Systemic illness	HIV, leukemia, T-cell lymphoma, paraneoplastic presentation, gout ^a	5, 22, 45 ^a			
		Pharmaceutical drugs	Lithium, antimalarials, TMP/SMX, infliximab, acitretin	38, 46, 51			
		Rebound phenomenon	Topical and oral steroids, efalizumab, methotrexate	5, 30, 32			
	1	Notes:					
		Strictly case reports of With Group A Strept	discuss this trigger. ococcus or Staphylococcus aureus.				
		Abbreviations: CT, co	omputed tomography; HIV, human immunodeficiency vi thoxazole.	rus; TMP/SMX,			
	4) Supportive	measures	(Fluid & electrolyte imbalance Thermoregulation)	e - Nutritional status -			
			is a common presentation of /S0190-9622(10)02173-0/full		on)		
	5) Appropriate w	vet dressing	gs w mid potency topical stero	oids i.e. under occlusi	on		
	Em	ollients to r	estore normal barrier function	of the skin			
	https://www.jaac	d.org/article	/S0190-9622(10)02173-0/full	text (Case 6 discussion	on)		
	alternative Tx is intro	duced U	used as a temporizing or adj seful in rapid relief & control a pi.nlm.nih.gov/pmc/articles/PN	as short term solution			
			aced on antibiotics for concer e/S0190-9622(10)02173-0/full				

Type of psoriasis Topical Tx 1st line systemic Tx: Phototherapy, acitretin, MTX, CsA 2nd line systemic Tx: Biologics

7) Rapidly acting agents, such as

Cyclosporine 1.5–4.2 mg/kg/d starting dose for 3-4 months

https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5572467/#!po=37.8049 (table 3)

In one study oral CsA was initiated at 4 mg/kg/d w dramatic improvement during a period of 2-3 wks

https://www.jaad.org/article/S0190-9622(10)02173-0/fulltext (Case 6)

Or

infliximab

https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5572467/#!po=37.8049 (table 4)

https://www.jaad.org/article/S0190-9622(10)02173-0/fulltext (Case 6 discussion & figure 10)

Chronic stable phase	Acitretin 25–50 mg/d	Etanercept, adalimumab, and ustekinumab could
	https://www.ncbi.nlm.nih.gov/ pubmed/22816881	also be given due consideration
	OR	https://www.jaad.org/article/ S0190-9622(10)02173-0/
	Methotrexate I.M./S.C. (Not oral due to decreased GIT absorption)	fulltext (Case 6 discussion)
	MTX given subcutaneously, thus bypassing the liver, may be a reasonable choice, as well, but the possible need to upwardly titrate the initial dose of this medication may limit its usefulness in patients requiring rapid response https://www.jaad.org/article/	Furthermore, 75% of responders to ustekinumab had recalcitrant EP who previously failed therapy with other agents, including the TNF-α inhibitors that were also reviewed in this article
	<u>S0190-9622(10)02173-0/fulltext</u> (Case 6 discussion)	https:// www.ncbi.nlm.nih.gov/ pubmed/22816881

Type of psoriasis	Topical Tx	1st line sy Photothera MTX, CsA	stemic Tx: py, acitretin,	2nd line systemic Tx: Biologics
Nail PSO Differentiate proximal versus distal nail unit pathology due to nail matrix versus nail bed pathology, respectively; Also consider coexisting onychomycosis Bolognia 4th edition p 157 table 8.18 Topical treatment must be applied to the nail matrix & hyponychium (https://dermnetnz.org/topics/nail-psoriasis)	I) Topical ages For distal nail unit pathological calcipotriol onto nail bed & I N.B: Topical Tx effectiveness nail bed PSO (but not on nail because they do not penet plate & proximal nail They can be massaged inthe hyponychium or utilized under order to increase their effectiveness are their effectiveness. They can be massaged inthe hyponychium or utilized under order to increase their effectiveness are their effectiveness. They can be massaged inthe hyponychium or utilized under order to increase their effectiveness. They can be massaged inthe hyponychium or utilized under order to increase their effectiveness. They can be massaged inthe hyponychium or utilized under order to increase their effectiveness. They can be massaged inthe hyponychium or utilized under order to increase their effectiveness. They can be massaged inthe hyponychium or utilized under order to increase their effectiveness. They can be massaged inthe hyponychium or utilized under order to increase their effectiveness. They can be massaged inthe hyponychium or utilized under order to increase their effectiveness. They can be massaged inthe hyponychium or utilized under order to increase their effectiveness. They can be massaged inthe hyponychium or utilized under order to increase their effectiveness. They can be massaged inthe hyponychium or utilized under order to increase their effectiveness. They can be massaged inthe hyponychium or utilized under order to increase their effectiveness. They can be massaged inthe hyponychium or utilized under order to increase their effectiveness. They can be massaged inthe hyponychium or utilized under order to increase their effectiveness. They can be massaged inthe hyponychium or utilized under order to increase their effectiveness. They can be massaged inthe hyponychium or utilized under order to increase their effectiveness. They can be massaged inthe hyponychium or utilized under order to increase their effectiveness. They can be massaged inthe hyponychium or utilized under ord	Phototheral MTX, CsA Ints: Ints: Ints: Ints: Ints: Ints: Intralesional X, into nail bed Patternet: Intralesional X, into nail bed Into nail bed Intralesional X, into nail bed Into nail bed Intralesional X, into nail bed Ints: Intralesional X, into nail bed		_
	· ·	/pmc/articles/ : page 13) 77 table 8.18 Fect is pain at ay be reduced chloride spray used in nail cetonide w a g/mL every 4-6 //1107949-190385/ the-treatment-of- ed at a dose of a patient w evel of the eek for 6 wks. up, there was not in pitting & and the results or 2 yrs /// edition p 69) mmended onths //article/		

Type of psoriasis	Topical Tx	1st line systemic Tx: 2nd line systemic Tx: Phototherapy, acitretin, Biologics			
		MTX, CsA			
References					
1) French guidelines 2019 (table 5) @ https://www.onlinelibrary.wiley.com/doi/epdf/10.1111/jdv.15340					
2) JAAD guidelines 2011 @ https://www.jaad.org/article/S0190-9622(10)02173-0/fulltext					
3) NCBI articles					
4) Bolognia text book 4th edition 2018 (table 8.18)					
5) Andrew's text book 11th edition 2016					
6) Thomas P. Habif text book 4th edition 2018					
7) Fitzpatrick text book 6th edition 2009					

Co-morbidities	Phototherapy	ototherapy Systemic treatment				
& Special cases in alphabetical order		Retinoids	MTX	CsA	Biologics	
Active alcohol abuse	√			√	√	
https:// www.onlinelibrary. wiley.com/doi/ epdf/10.1111/jdv. 15340	NB-UVB > PUVA			drugs.com interaction checker	Prefer TNFi (particularly INFLI for improving compliance) or USTK Then Consider anti-IL 17 or apremilast	
Children < 7 yrs https:// www.ncbi.nlm.nih.gov/ pmc/articles/ PMC4906111/ (Table 2 & 3)	NB-UVB N.B.: There is theoretically UVB but the issue is that it the child can realize to sta machine. A possible solution that an adult can remain wance incomplete photoprotection unnecessary exposure of the cases the body of the adult the therapeutic radiation https://www.tandfonline.edm.11.41# i9: (Box of kontents) https://www.ncbi.nlm.nih PMC6536079 (NB-UVB for reference points 9,27)	is allowed as young as and in front of the NB-UVB on for younger children, is with the child; however, in may often lead to the adult, and also in some it can shield the child from com/doi/full/10.1586/ey issues - last paragraph)	Theoretically not FDA approved for children in psoriasis but preferred over CsA if phototherapy fails N.B.: Approved for children in cancer chemotherapy and in polyarticular-course juvenile rheumatoid arthritis	Theoretically not FDA approved for children in psoriasis but used in literature in severe resistant cases N.B.: Approved for children for organ transplant rejection prophylaxis		

Co-morbidities	Phototherapy		Systemic	treatment	
& Special cases in alphabetical order		Retinoids	MTX	CsA	Biologics
Children > 7 yrs https:// www.ncbi.nlm.nih.g ov/pmc/articles/ PMC4906111/ (Table 2 & 3)	NB-UVB		Theoretically not FDA approved for children in psoriasis but preferred over CsA if phototherapy fails	Theoretically not FDA approved for children in psoriasis but used in literature in severe resistant cases	
12 to < 18 yrs https:// www.ncbi.nlm.nih.g ov/pmc/articles/ PMC4906111/ (Table 2 & 3)	NB-UVB	Isotretinoin: can be used in psoriasis but is less effective than acitretin	Theoretically not FDA approved for children in psoriasis but preferred over CsA if phototherapy fails	Theoretically not FDA approved for children in psoriasis but used in literature in severe resistant cases	

Co-morbidities	Phototherapy		Systemic treatment			
& Special cases in alphabetical order		Retinoids	MTX	CsA	Biologics	
Demyelinating disease	✓		√		✓	
https:// www.onlinelibrary. wiley.com/doi/ epdf/10.1111/jdv.					Prefer USTK (Grade C – longer follow-up data compared to anti-IL17)	
<u>15340</u>					Consider anti-IL17 (Grade C – no negative effect of SEC on multiple sclerosis in phase II)	
					TNFi are C.I.	
					https:// www.jaad.org/ article/ S0190-9622(10)0217 3-0/fulltext (Case 2 discussion)	

N.B.: Cyclosporine is not a standard Tx for MS, but one that has been successfully & safely used in some patients

https://www.jaad.org/article/S0190-9622(10)02173-0/pdf (Case 2 discussion)

Co-morbidities	Phototherapy				
& Special cases in alphabetical order		Retinoids	MTX	CsA	Biologics
Diabetes	V	√	√		√
https:// www.ncbi.nlm.nih.g ov/pmc/articles/ PMC4300999/#! po=32.5000 If possible, delay treatment initiation in patients with a glycosylated haemoglobin >8% https:// www.onlinelibrary.wil ey.com/doi/epdf/ 10.1111/jdv.15340 https:// onlinelibrary.wiley.co m/doi/pdf/10.1111/	1st line	Preferred over MTX	Consider MTX in case of phototherapy & acitretin contraindications Apply caution because of the increased risk of infection & hepatic fibrosis		Prefer biological agents w a short- half life (See section of females of childbearing age) or those w fewer associations w an increased infectious risk (Avoid INFLI) Not enough data but no negative feedback for anti- IL17 & APR N.B.: ETA was associated w hypoglycemia while ADA w hyperglycemia in

N.B.: Pioglitazone used as antidiabetic have proved efficacy in improving psoriasis & psoriatic arthritis https://onlinelibrary.wiley.com/doi/pdf/10.1111/jdv.12024

https://www.dovepress.com/psoriasis-and-comorbidities-links-and-risks-peer-reviewed-fulltext-article-CCID

Co-morbidities	Phototherapy	Systemic treatment					
& Special cases in alphabetical order		Retinoids	MTX	CsA	Biologics		
Erectile dysfunction	√			V	√		
http:// www.psoriasisdern egi.org/DATA/ Uploads/files/ 2017-3-3.pdf							
https:// www.ncbi.nlm.nih.g ov/pmc/articles/ PMC6292237/							

Co-morbidities	Phototherapy		Systemic	treatment	
& Special cases in alphabetical order		Retinoids	MTX	CsA	Biologics
Female of childbearing age https:// www.onlinelibrary. wiley.com/doi/ epdf/10.1111/jdv. 15340	NB-UVB 1st line N.B.: Owing to the potential for maternal folate photodegradation w this Tx, and the association of folate deficiency w neural tube defects, ensuring that women of childbearing age receive adequate folic acid supplementation (0.8 mg daily) is an important consideration Furthermore, due to an increased risk of melasma, the use of facial shielding is recommended to prevent exacerbation https://www.sciencedirect.com/science/article/pii/S2352647519300346 (Section of phototherapy) https://www.jaad.org/article/S0190-9622(19)30637-1/pdf (Reference 70 & 71)			https:// www.ncbi.nlm.nih.gov/ pmc/articles/ PMC5683115/#! po=53.9474 (Section of : Treatment of psoriasis in females in consideration of childbearing age, 2nd paragraph) https:// www.sciencedirect.com/ science/article/pii/ S2352647519300346 (Section of systemic agents)	3rd line Consider maintenance of ETA if there is no alternative If there is no alternative, ADA or INFLI can be initiated or continued if necessary but must be discontinued at the end of the 2nd trimester of preg Ideally interrupt biologics before conception (acc. to SmPC): ETA: 3 wks before ADA: 20 wk before INFLI: 24 wks before USTK:15 wks before IXE: 10 weeks before SECU:20 wks before APR: 1 day before

Co-morbidities & Special cases in alphabetical order	Phototherapy	Systemic treatment						
		Retinoids	CsA	Biologics				
	https:/	e so limited, isotretinoin //www.jaad.org/article/Solutions s are so limited, MTX car	0190-9622(10)02173-0	<u>0/fulltext</u> (Case 5 discu	ussion)			

Co-morbidities	Phototherapy		Systemic	treatment	
& Special cases in alphabetical order		Retinoids	MTX	CsA	Biologics
Heart (Major cardiovascular risk) https:// www.onlinelibrary. wiley.com/doi/ epdf/10.1111/jdv. 15340 https:// onlinelibrary.wiley.c	Phototherapy	√	Preferred as it is associated w lower incidence of vascular disease However, long-term MTX use was also found to cause hyperhomocysteinemia, which is an		Prefer TNFi as it is associated w lower incidence of CV events (More than MTX) N.B.: The best cardio-protective activity is reached by combination of MTX + TNF inhibitors45.
om/doi/pdf/ 10.1111/jdv.12024 https:// www.dovepress.com/ psoriasis-and- comorbidities-links-and- risks-peer-reviewed- fulltext-article-CCID http:// www.psoriasisderne gi.org/DATA/ Uploads/files/ 2017-3-3.pdf			independent risk factor for vascular disease.38		N.B.: USTK may be associated w more risk of cardiovascular events than placebo

Co-morbidities	Phototherapy	Systemic treatment				
& Special cases in alphabetical order		Retinoids	MTX	CsA	Biologics	
Heart failure	√	√	√		V	
https:// www.onlinelibrary. wiley.com/doi/ epdf/10.1111/jdv. 15340	NB-UVB				USTK Avoid TNFi	
https:// onlinelibrary.wiley.c om/doi/pdf/ 10.1111/jdv.12024						

Co-morbidities	Phototherapy		Systemic	treatment	
& Special cases in alphabetical order		Retinoids	MTX	CsA	Biologics
Hyperlipidemia	√		√		√
https:// www.ncbi.nlm.nih.g ov/pmc/articles/ PMC4300999/#! po=32.5000					TNFi & UST are tried w no negative impact N.B.: Avoid ADA
https:// onlinelibrary.wiley.c om/doi/pdf/ 10.1111/jdv.12024 https://www.jaad.org/ article/ S0190-9622(18)33002-0/ fulltext					

	Phototherapy		Systemic treatment				
& Special cases in alphabetical order		Retinoids	MTX	CsA	Biologics		

N.B: Use of statins for dyslipidemia may benefit the course of psoriasis but rarely it can exacerbate psoriasis

https://onlinelibrary.wiley.com/doi/pdf/10.1111/jdv.12024

https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3163346/

Fibrates, another class of lipid-lowering drugs, may exacerbate psoriasis. 121,122

https://www.dovepress.com/psoriasis-and-comorbidities-links-and-risks-peer-reviewed-fulltext-article-CCID

Although there are data from RA studies suggesting that TNFi may increase total cholesterol & HDL,116 similar elevations have not been demonstrated in patients w PSO treated w TNFi and the significance of these findings is not known

https://www.jaad.org/article/S0190-9622(10)02173-0/fulltext (Case 5 discussion)

Hypertension	√	√	V	√
https://				Anti-TNF-α & UST are tried w no
www.ncbi.nlm.nih.g				negative impact
ov/pmc/articles/				
PMC4300999/#!				
po=32.5000				

N.B.: B-blockers & Ca channel blockers may aggravate or trigger flares of psoriasis

https://onlinelibrary.wiley.com/doi/pdf/10.1111/jdv.12024

https://www.dovepress.com/psoriasis-and-comorbidities-links-and-risks-peer-reviewed-fulltext-article-CCID

https://www.jaad.org/article/S0190-9622(18)33002-0/fulltext

Co-morbidities	Phototherapy	Systemic treatment			
& Special cases in alphabetical order		Retinoids	MTX	CsA	Biologics
Immunosuppression (e.g. HIV/AIDS) (Bolognia 4th edition p 158 - Table 8.19)	V UVB	√			
Inflammatory bowel disease	√		V	V	V
https:// www.onlinelibrary. wiley.com/doi/ epdf/10.1111/jdv. 15340					Prefer USTK Avoid Anti-IL17
https://www.jaad.org/ article/ S0190-9622(18)33002-0/ fulltext					

N.B.: While TNFi are used as therapy for moderate-to-severe psoriasis, their use for IBD can paradoxically cause psoriasiform eruptions to emerge

https://www.jaad.org/article/S0190-9622(18)33002-0/fulltext

Co-morbidities	Phototherapy				
& Special cases in alphabetical order		Retinoids	MTX	CsA	Biologics
Kidney (Decreased renal function) https:// www.ncbi.nlm.nih.g ov/pmc/articles/ PMC4300999/#! po=32.5000 https:// www.onlinelibrary. wiley.com/doi/ epdf/10.1111/jdv. 15340	NB-UVB > PUVA	Isotretinoin is safe for kidney but patients with high creatinine levels at the baseline of treatment should be closely followed up http://cms.galenos.com.tr/ Uploads/Article 16917/ TDD-12-18.pdf https://www.tandfonline.com/doi/abs/ 10.3109/15569527.2016.11692 84? src=recsys&journalCode=icot20 N.B.: Acitretin may not be safe due to accumulation with renal dysfunction https://m.pdr.net/Mobile/Pages/drug-summary/Soriatane-acitretin-547.3728 (section of contraindications) Consider acitretin only in case of early & moderate renal impairment (GFR > 60 mL/min)	Consider MTX in case of early & moderate renal impairment (GFR > 60 mL/min) In case of renal insufficiency stage 1 or 2: use MTX w standard dose. In case of stage 3: use a reduced dose of MTX. In case of stage 4 or 5: do not use MTX		Prefer TNFi or USTK then Consider anti-IL17

Five stages of renal insufficiency defined by the GFR (in mL/min/1.73 m2): GFR <90 (stage 1), GFR = 60–89 (stage 2), GFR = 30–59 (stage 3), GFR = 15–29 (stage 4), GFR <15 (stage 5)

Co-morbidities	Phototherapy				
& Special cases in alphabetical order		Retinoids	MTX	CsA	Biologics
Lactation	√				
https:// www.onlinelibrary. wiley.com/doi/ epdf/10.1111/jdv. 15340	NB-UVB				
Liver disease (cirrhosis, fibrosis)	V				√
(Bolognia 4th edition p 158 - Table 8.19)	UVB				Consider TNFi or USTK in patients w steatosis or compensated liver cirrhosis
https:// www.onlinelibrary. wiley.com/doi/ epdf/10.1111/jdv. 15340					CITTIOSIS

Co-morbidities	Phototherapy	Systemic treatment			
& Special cases in alphabetical order		Retinoids	MTX	CsA	Biologics
Liver disease (Hepatitis B or C viral infection)	V UVB				
(Bolognia 4th edition p 158 - Table 8.19)	N.B.: Tx of viral hepatitis will improve psoriasis as well				
Liver disease (Non-alcoholic fatty	V	V		V	V
https:// www.ncbi.nlm.nih.g ov/pmc/articles/ PMC4300999/#! po=32.5000		Be cautious as systemic Tx may have deleterious effects on the liver esp. in the presence of metabolic syn or PSO arthritis		Be cautious as systemic Tx may have deleterious effects on the liver esp. in the presence of metabolic syn or PSO arthritis	Anti-TNF-α & UST
https://www.jaad.org/ article/ S0190-9622(18)33002-0/ fulltext					

Although significant elevations of liver enzymes occurred in 4.9% of patients during the phase III clinical trials of INFLI117 and in a smaller percentage of patients treated w ADA,118,199 the relevance of these findings in clinical practice is unclear, and the elevations are, in the majority of cases, self-correcting.

https://www.jaad.org/article/S0190-9622(10)02173-0/fulltext (Case 5 discussion)

Co-morbidities	Phototherapy		Systemic treatment				
& Special cases in alphabetical order		Retinoids	MTX	CsA	Biologics		
Males trying to have children	https:// www.ncbi.nlm.nih.go v/pubmed/464634	Controversial		https:// www.ncbi.nlm.nih.go v/pubmed/1988720			
Malignancy (History of internal malignancy (e.g. lymphoma, lung cancer)) (Bolognia 4th edition p 158 - Table 8.19)	UVB	✓					
Malignancy (History of frequent skin cancers) (Bolognia 4th edition p 158 - Table 8.19)		✓					

Co-morbidities	Phototherapy	Systemic treatment						
& Special cases in alphabetical order		Retinoids	MTX	CsA	Biologics			
Metabolic syndrome	Same	Same Tx implications as for obesity, dyslipidemia, HTN & Diabetes are applied						
https:// onlinelibrary.wiley.c om/doi/pdf/ 10.1111/jdv.12024								

Co-morbidities	Phototherapy		Systemic	treatment	
& Special cases in alphabetical order		Retinoids	MTX	CsA	Biologics
Obesity	√	√	√		√
https:// www.ncbi.nlm.nih.g ov/pmc/articles/ PMC4300999/#! po=32.5000 https:// www.onlinelibrary. wiley.com/doi/ epdf/10.1111/jdv. 15340 https://			Preferred over acitretin		Prefer USTK In case of USTK failure, consider IXE then SEC or APR N.B.: TNFi such as ADA, ETA & INFLI are associated w weight gain
onlinelibrary.wiley.c om/doi/pdf/ 10.1111/jdv.12024 https:// www.dovepress.com/ psoriasis-and- comorbidities-links-and- risks-peer-reviewed- fulltext-article-CCID					

Co-morbidities	Phototherapy		Systemic treatment			
& Special cases in alphabetical order	in alphabetical		Retinoids MTX		Biologics	
		Pregi	nancy			
a) Impetigo herpetiformis https:// www.ncbi.nlm.nih.gov/ pmc/articles/ PMC5683122/#! po=50.0000 (Table 2)	Early delivery is recommended in pregnant patients with impetigo herpetiformis https://www.ncbi.nlm.nih.gov/books/NBK537002/ (Section of treatment 2nd paragraph) https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5683122 (Section of epidemiology/presentation last paragraph)					
	1st	line		2nd	line	
PMC5904797/ (A The administration of a effective in IH, although ar disease Antibiotic therapy can be and additive or alternate corticosteroids can then be appear to be ineffective. A by cephalosporins is adverthe pustules are sterile. O safe during pregnancy, but	antibiotics .nih.gov/pmc/articles/ Antibiotic section) antibiotics seems to be atibiotics cannot control the entirely considered in mild cases, tive treatments such as be considered if antibiotics ntibiotic therapy especially ised, despite the fact that	Systemic co (2nd or 3rd Prednisolone at 15–30 of 60–80 N.B. : Although the pus authors recommend adj in cases that respond steroids, or when a 2ry https://www.ncbi.nlm	ed poorly to systemic infection is suspected nih.gov/pmc/articles/on of pustular PSO of	Cyclosporine (+/ 2-3 mg N.B.: CsA represents case of refractor corticosteroids, or as a order to taper off hig The literature contains cases of severe IH corticosteroids treate addition to corticoste safety problems. In t control of the dise	/- corticosteroids) g/kg/day an alternative option in iness to systemic steroid-sparing agent in h dosages of steroids s reports of at least 14 resistant to systemic d with CsA, mostly in eroids, without relevant en out of such cases, ease was achieved	
•	clofazimine are among own efficacy in ttt of IH			PMC5683115/ (Secti	.nih.gov/pmc/articles/ on of pustular PSO of erence point 15)	

Co-morbidities	Phototherapy				
& Special cases in alphabetical order		Retinoids	MTX	CsA	Biologics
b) Chronic plaque psoriasis	1st	line	2nd line	3rd line	
	Owing to the potenti photodegradation with the association of formeural tube defects, explementation considers applementation considers. Furthermore, due to melasma, the use of recommended to provide the phototherapers. https://emedicine.meg	al for maternal folate th this treatment, and plate deficiency with insuring that women of ive adequate folic acid in is an important eration an increased risk of of facial shielding is revent exacerbation edscape.com/article/w#a14 (section of by: NB-UVB) edirect.com/science/2647519300346 phototherapy) S0190-9622(19)30637-1/pdf to 70 & 71)	Cyclosporine Preg category C (Bolognia 4th edition p 158 - Table 8.19)	throughout if the ADA, or INFLI can I end of the 2nd tr alte Avoid USTK, anti-IL availa	maintenance of ETA ere is no alternative be maintained until the imester if there is no ernative 17 or APR (no enough able data) elibrary.wiley.com/doi/111/jdv.15340

	Phototherapy		Systemic	treatment	
& Special cases in alphabetical order		Retinoids	MTX	CsA	Biologics

Although all of the TNF-alfa antagonists approved for treating psoriasis are FDA pregnancy category B, infliximab and etanercept have been rarely associated with the VACTERL syndrome (vertebral, anal, cardiovascular, tracheoesophageal, renal, and limb abnormalities) when used during pregnancy.128 Although congenital anomalies were not reported in babies born to women taking adalimumab during pregnancy, the database where these data are de- rived ended in 2005, which was relatively soon after adalimumab received FDA approval.128 Careful con- sideration of the risks and benefits of TNF-alfa antagonists is warranted before they are used to treat psoriasis in pregnant women.

https://www.jaad.org/article/S0190-9622(10)02173-0/fulltext (Case 5 discussion)

Psoriatic arthritis		√	√
https:// onlinelibrary.wiley.c om/doi/pdf/			ADA, ETA, INFLI are used
10.1111/jdv.12024			USTK have proven efficacy but still under phase III studies

Co-morbidities & Special cases in alphabetical order	Phototherapy				
		Retinoids	MTX	CsA	Biologics
Psychiatric disorders (Anxiety/ Depression)	✓		V	Preferred more than MTX	
https:// www.onlinelibrary. wiley.com/doi/ epdf/10.1111/jdv. 15340					Avoid APR, Anti-IL17 & ADA

N.B.: Lithium-containing drugs for psychiatric diseases may be associated w psoriasis flare-ups

Of interest in this case is the patient's Tx w lithium, which can exacerbate psoriasis. There is evidence that inositol supplementation may benefit lithium-induced PSO.110 Switching from lithium to an alternative psychiatric medication or lowering the dose of lithium was recommended for this Pt. Unfortunately, when the lithium dose was lowered, his depression flared and his psychiatrist was unwilling to consider an alternative medication to control his otherwise recalcitrant depression.

https://www.jaad.org/article/S0190-9622(10)02173-0/fulltext (Case 4 discussion)

Inositol containing cap: Supraton H cap or B complex cap

Inositol rich foods are ...

Co-morbidities	Phototherapy	apy Systemic treatment			
& Special cases in alphabetical order		Retinoids	MTX	CsA	Biologics
Uveitis		No clear	studies		√
https://www.jaad.org/ article/ S0190-9622(18)33002-0/ fulltext					INFLI or ADA improved uveitis in addition to PSO
Abbreviations	ļ .	APR, apremilast; GFR, ab; TNFi, tumor necros	<u> </u>		
References					
	1) Bolognia 4th Edition 2018 Text book (Table 8.18 p 158)				
	2) JAAD guidelines 2018 @ https://www.jaad.org/article/S0190-9622(18)33002-0/fulltext				
	3) European guideline	es 2012 @ <u>https://onlinelibra</u>	ry.wiley.com/doi/pdf/10.1	111/jdv.12024 (Table 3)	
	4) French guidelines 2019 @ https://www.onlinelibrary.wiley.com/doi/epdf/10.1111/jdv.15340 (Table 4)				
5	5) https://www.dovepress.com/psoriasis-and-comorbidities-links-and-risks-peer-reviewed-fulltext-article-CCID				CID
	6) http://www.psoriasisdernegi.org/DATA/Uploads/files/2017-3-3.pdf				
	7) [https://www.ncbi.nlm.nih.go	v/pmc/articles/PMC4300	999/	
8) NCBI articles (mentioned above)					

	Corticosteroids	Other topical agents
Pregnancy	Mild to moderate strength	
Metabolic syndrome	✓	√
Liver disease	✓	V
Hepatitis B* or C viral infection	✓	√
nmunosuppression (e.g. HIV/AIDS)	✓	√
listory of internal malignancy (e.g. lymphoma, lung cancer)	✓	√
History of frequent skin cancers	√	Vitamin D3 analogues
		Retinoids
	References	

Acitretin	Available as: 10 & 25 mg cap Once daily after meals (esp. fatty ones) or with whole milk		hole milk	
Dosage	Lab screening	Lab monitoring	Contraindications	Precautions
A) Chronic plaque PSO:	CBC	Triglycerides, cholesterol, HDL &	A) Absolute:	# Contraception: Females: 1) Double
Starting dose:	LFTs (AST, ALT, γGT, alkaline	LFTs: Every-other- wk for 8 wks then	1) Pregnancy (X) 2) Lactation	contraception for 4 wks before, during
10mg/d (To avoid or lessen	phosphatase, bilirubin)	every 6-12 wks	Severe liver or kidney dysfunction	& 3 yrs after acitretin last dose
initial PSO flare)	Serum	CBC & RFTs every 3 mo	4) Uncontrolled hyperlipidemia	2) Avoid alcohol till 2 mo after acitretin
Gradual dose ++:	triglycerides,	31110	5) Alcoholism	Males: Controversial
10 mg every 2 wks	cholesterol, HDL	Check Blood sugar		
(dose is increased	DET (L	more frequently in	D) D I II	# Advices:
till mild cheilitis (slight lip scaliness)	RFTs (Urea, creatinine &	diabetics esp. in the early stage of	B) Relative:	Avoid blood donation during &
just perceived by	electrolytes)	Tx	1) < 18 yrs	for 3 yrs after Tx
the pt. is reached)	0.001.019.009		2) Mild hepatic or	2) Avoid contact
,	Glucose	N.D. 1.ET. 16	renal impairment	lenses
Optimal dose:		N.B.: LFTs: If abnormal results	(adjust dose)	
25-50mg/d	Pregnancy test	are obtained,	3) Moderate to	3) Photoprotection
Once desired	N.B.:	weekly checks	severe hyperlipidemia	(including use of sunglasses)
clinical response	1) Contraception	should be instituted	4) Metabolic	4) Avoid waxing for
has been achieved,	should be 4 wks	and acitretin dose	syndrome	hair removal
consider gradually	before starting	adjusted	5) Poorly controlled	
reducing the dose	acitretin	accordingly	DM	5) Avoid alcohol
to the lowest	2) Pregnancy test		6) Atherosclerosis	6) Mucocutaneous
effective dosage	is done 2 wks	N.B.: Lipid Panel &	7) Suicidal ideation 8) Pseudotumor	Moisturizers
Maintenance dose:	before starting acitretin	LFTs: People w	cerebri	# Monitor Serious
10-25 mg/d or 25	Then	DM, obesity &	9) Leucopenia	adverse reactions:
mg/48 h	3) Tx is started on	alcoholism need	10) Hypothyroidism	1) Signs of ICH:
	the 2nd or 3rd day	more frequent	11) History of	severe headache,
B) <u>Generalized</u>	of the next	monitoring	pancreatitis	nausea, vomiting &
<i>pustular PSO</i> : Dose should be	menstrual cycle		12) Vit A supplements	blurred vision or
maximized, i.e. up	Baseline skeletal	Pregnancy test:	13) Concomitant	diplopia
to 1 mg/kg/d	screening by X-Ray	Monthly during Tx	organ toxic drugs	2) Be cautious if
(a dose that causes	due to risk of	then every other month after	e.g. hepatotoxicity	driving at night
a clinically apparent	hyperostosis w	discontinuation of	w MTX § or ICH w	3) Vision problems
but tolerable	acitretin is	acitretin	tetracyclines 14) Drugs affecting	or eye pain
cheilitis is the endpoint) —	controversial except if		acitretin	4) Depression,
The dose should	symptoms are	Skeletal monitoring	bioavailability or	aggressive feelings
then be tapered	present (bone pain	by X-Ray due to	whose metabolism	or suicidal thoughts
slowly until a	or limited	risk of hyperostosis w acitretin is	is altered by	_, _,
maintenance dose	mobility) for	controversial	acitretin ¥ (See	5) Signs of liver
of 10 mg/d is reached	details see lab investigations in	except if	drug interactions)	damage: jaundice, nausea & vomiting,
TOGOTION	detailed copy	symptoms are		loss of appetite, or
C) Erythrodermic		present (bone pain		dark urine
PSO: Chronic		or limited mobility) for		
stable phase: 0.25		details see lab		6) Musculoskeletal
mg/kg/d		investigations in		pain, trouble moving and hand
Duration: Up to 6 mo		detailed copy		or feet
				paresthesias

	<u> </u>	r treatment-resistant adjustment & careful	•
Abbreviations	PSO : Psoriasis	Tx: Treatment	ICH: Intracranial hypertension

Methotrexate	Available as 2.5 mg tab or 25, 50 or 500mg vials N.B.: Differentiate between single- & Multi-dose injections in the market			
Dosage	Lab screening	Lab monitoring	Contraindication s	Precautions
Oral: on 3 divided doses Q12 h once/ wk	CBC, LFTs and U&E	A) After test dose: CBC & LFTs on 5- 6th d after test dose	A) Absolute: 1) Pregnancy (X) 2) Lactation	# <u>Conception</u> : Avoid pregnancy during & after
I.M. < S.C.: Once/wk Add folic acid 1mg/	eGFR in elderly & give the prescribed dose accordingly	B) 1st stage of monitoring (still not on a stable dose): CBC - LFTs - U&E:	3) Leukopenia, thrombocytopenia or significant anemia 4) Significantly	stopping MTX for 3 mo in males & 3 ovulatory cycles
d (except MTX day) Test Dose (1st wk):	(See table 4 in detailed copy)	every 1–2 wks for the 1st mo & until a steady dose is	reduced lung function 5) Alcoholism 6) Severe hepatic or	in females of childbearing age
2.5–5 mg/wk (Bolognia 4th edition-2018)	QuantiFERON-TB Gold test (or initially PPD & chest x-ray)	achieved N.B.: LFTs should be performed the day	renal dysfunction or dialysis 7) Active peptic ulcer	# Monitor adverse reactions & manage
Initial dose (2nd wk): 7.5-15 mg/wk	N.B. : Repeat PPD after 1 week if	before MTX is taken C) 2nd stage of monitoring (stable	8) Immunodeficiency syndromes 9) Active significant	accordingly: Specifically, warn
Gradual ++: 2.5-5 mg every 2-4	negative)	dose established): CBC: Monthly	infections 10) Concurrent TMP	patient about: (i) fever/flu-like
wk until satisfactory results are obtained w minimal toxicity	Chest X-ray HBV & HCV	LFTs: Monthly till 1st 6 mo of starting MTX then every 1-3 mo	B) Relative: 1) Mild-to-moderate hepatic or renal	illness; (ii) mouth ulceration; (iii) tiredness;
Maintain effective dose for 1-2 mo before tapering	Serology Lipid profile	U&E: every 2-3 mo	dysfunction (Dose reduction) 2) History of HBV/	(iv) unexplained bruising or bleeding of gums;
N.B. : If 15 mg/wk initial dose is chosen	Pregnancy test	N.B. All tests above need more or less frequent monitoring	HCV 3) Obesity (BMI>30) 4) Untreated	(v) nausea, vomiting, abdominal pain or
wait 4 wks before dose modulation	+/- HIV	acc. to dosage changes, symptoms & previous lab results	hyperlipidemia 5) DM 6) Gastritis	dark urine; (vi) breathlessness or cough
Max dose: 25 mg/wk <u>Tapering dose</u> :	VZV serology (If no	Screening for TB & HCV/HBV: annually	7) Recent live vaccine N.B. Inactivated vaccine may be	# Photoprotection
2.5 mg every 1–2 wk to the lowest dose that still maintains	history of previous chicken pox & give vaccination	Fibroscan (unreliable in obese pt.s) or the	less effective 8) Concurrent immunosuppressives	is recommended # Arrange for
Maintenance dose (If	accordingly) Liver U/S	more precise MRE at 1.5 g cumulative dose then every 1 g	9) Concurrent use of alcohol, nitrous oxide anesthesia or drugs	patient to have pretreatment flu (annual) and
relapse occurs within 3 mo of stopping MTX): Restart as above	(If abnormal Check PIIINP or Fibroscan)	thereafter (Up to 3.5-4 g at 1st time allowed in most scientific sources if	that ++ MTX toxicity (See drug interactions) 10) 3rd space	pneumococcal (5- yearly) vaccinations
then keep lowest effective dose every 2 wk for 1 mo then	Baseline PIIINP (If possible)	no risk factors of hepatotoxicity are present- See Table	compartment morbidities e.g. ascites or pleural	# VZV vaccination (If no history of previous chicken
every 3 wk thereafter up to reaching 1.5 g cumulative dose then	, ,	II)) &/or Serial PIIINP every 3 mo (Unreliable in	effusion 11) Hypoalbuminemia 12) Concomitant	pox & negative VZV serology)
1 yr free period is recommended		children & others see detailed copy)	radiation therapy 13) Advanced age 14) Congestive heart	
		N.B. Liver biopsy is not preferred due to risk of hemorrhage	failure	

Abbreviations	PIIINP: amino-terminal peptide of pro-collagen III wk:Week mo:Month eGFR: estimated glomerular filtration rate
	MRE: Magnetic resonance elastography TMP: Trimethoprim

LFTs = Liver function tests : includes SGOT, SGPT, ALP, GGT, bilirubin, total protein, albumin & PT https://labtestsonline.org.uk/tests/liver-function-tests

U&E: Urea & electrolytes blood test : includes Na, K, Cl, Bicarbonate, Urea, Creatinine & Glucose https://healthengine.com.au/info/urea-and-electrolytes-test

Table illustrating combination Tx (Indicated & contraindicated ones) in PSO & how to perform				
Goal of combination Tx	Enhanced clinical response & reduction of side effects			
Topical Treatment				
General principles for	Topical Tx is the mainstay of Tx in PSO:			
topical Tx	Dry skin is more susceptible to outbreaks of PSO, so keep the skin well lubricated all the time via emollients			
	2) Topical agents can be combined with either phototherapy or systemic agents to enhance efficacy in patients who are improving but still have areas of active disease/resistant lesions			
	In other words, Doses of systemic Tx should be reduced to the lowest possible amount of drug needed to achieve adequate control of psoriasis with concomitant topical therapy			
	Use Topical therapy in the most affected areas as adjuvant with systemic therapy			
	4) More than one principal topical treatment to cover wider range of BSA without mounting max dose of each of them in cases of contraindications of systemic Tx & phototherapy (Suggested —Under discussion)			
Recommended combinations				
TCS & Calcipotriol	Superpotent TCS + Calcipotriol: Synergistic efficacy			
	Medium-strength TCS + Calcipotriol: No Additive efficacy but lessen irritation			
TCS & Salicylic acid	Should be limited to no more than medium-potency (class 3-4) TCS to avoid steroid toxicity			
Tazarotene & Mid- or high potency TCS	Increased efficacy (Measured in comparison to tazarotene or mometasone monotherapy) Decreased irritancy More prolonged remission Potential decrease in steroid induced atrophy			
Tacrolimus 0.1% & Salic	ylic acid 6% Improved efficacy			
Calcipotriol & Systemic Tx or phototherapy	1) CsA: low-dose CsA (2 mg/kg/day) plus topical calcipotriene led to marked improvement or clearing in 90% of patients in one study 2) Acitretin: more effective and permitted a lower dose of both acitretin & calcipotriene 3) PUVA: marked reduction in the cumulative dose of UVA required and enhanced efficacy			
TCS & Acitretin	Better response			
	Contraindicated combinations			
Calcipotriol & other topical agents	Calcipotriol is degraded when mixed with 6% salicylic acid, 12% ammonium lactate, 10% lactic acid or hydrocortisone -17 valerate oint			
	Appropriate Latency period after salicylic acid & prior to Vit D3 analogue: 3 days			

Anthralin & topical zinc oxide	Topical zinc oxide reduces efficacy of anthralin, unless salicylic acid is used in the same combined formula which also enhances anthralin effect		
Salicylic acid & Systemic treatments	The combination of salicylic acid with systemic therapies such as CsA, MTX, and fumaric acid esters can lead to nephrotoxic side effects. These therapies should only be used if absolutely necessary and should be administered under careful surveillance		
Photo	otherapy & its possible combinations		
	A) UVB Combinations		
Topical Tx	Effective combinations during UV sessions: 1) Mineral oil 2) Goeckerman therapy & Ingram regimen 3) Petrolatum oil or oint (thin layer) Effective combinations (but not during UV sessions): 1) Tazarotene 2) Calcipotriol/Betamethasone combination Bad combinations during UV sessions: 1) Salicylic acid: Blocks UV light so should be applied after UV sessions 2) UV blocking agents e.g. Zinc oxide N.B.: UV blocking properties may be used to cover uninvolved skin with preparations such as zinc oxide to prevent unnecessary exposure & adverse effects Unuseful combinations in general: 1) TCS: Additive effect is controversial. It may ++ rate of relapse. 2) Calcipotriol: Additive effect is controversial 3) Short contact anthralin		
Possible Systemic Tx	Topical calcineurin inhibitors : increased photocarcinogenecity Acitretin (Anticarcinogenic) MTX (Be cautious)		
Contraindicated Systemic Tx	1) CsA: Simultaneously or Sequentially		
	B) PUVA Combinations		
Useful Topical Tx (But Avoid during UV sessions)	1) Calcipotriol 2) Tazarotene		
	N.B. : Corticosteroids : may decrease period of remission so not recommended		
Contraindicated Topical Tx	 Combination of coal tar with PUVA induce significant phototoxic responses Calcipotriol: Deactivated by UVA Salicylic acid: diminishes efficacy of phototherapy (12 h interval needed) UV blocking agents e.g. Zinc oxide Topical calcineurin inhibitors: increased photocarcinogenecity 		
Useful Systemic Tx	Acitretin (anti-carcinogenic)		
Contraindicated Systemic Tx	CsA: Simultaneously or Sequentially MTX		

Acitretin & its possible combinations

Combination with Phototherapy

Advantages:

Reduces number of phototherapy sessions & dose of acitretin, so improving tolerance

Moreover the anticarcinogenic potential of retinoids makes combination Tx safer than phototherapy alone

Combination with Methotrexate

Advantages:

Very effective particularly in case of pustular psoriasis

The combination of MTX & acitretin has been used in those patients in whom all treatments have failed

Disadvantages:

Although this combination can be very effective, severe hepatotoxicity has been reported; therefore, careful monitoring is mandatory

Combination with Cyclosporine

Not recommended as combination therapy except as a temporary overlap in the context of a sequential strategy, or in selected cases of psoriatic erythroderma

Combination with Biologics

For cases in which the biologic treatment has not achieved complete control of the disease (or when response to biologic therapy diminishes), acitretin may add the small degree of efficacy required to completely control the disease

Methotrexate & its possible combinations

Combination with CsA

Advantages:

Successful in recalcitrant psoriasis (including recalcitrant generalized pustular forms)

More rapid action & better clearance rate

Allows using lower doses of MTX (7.5-15 mg/wk) & CsA (3-3.5 mg/kg/day) with fewer side effects (less toxicity) than monotherapy with either of them

Disadvantages:

Increased immunosuppression

Combination with NB-UVB

Generally safe & effective

After reaching adequate response, it's better to withdraw phototherapy & not the opposite to avoid the severe psoriasis flare that may occur with some cases

Advantages:

Clearance rate is increased (Controversial)

Lower weekly doses (such as 15mg/week) & lower cumulative doses of MTX to reach clearance

Lower number of sessions & lower cumulative dose of UVB (less than 1/2 in some studies)

Shorter duration for reaching clearance (Median of 4-7 weeks)

Disadvantages:

May increase phototoxicity

N.B. : Pruritus, erythema, and nausea were more common in the combination group than in the group receiving NB-UVB monotherapy in one study

Combination with Biologics

Generally safe & effective

MTX can be a rescue therapy (using low doses 7.5-10 mg/wk) during psoriasis flares in patients taking biologic agents

N.B. Rotation of methotrexate with other treatment options is not recommended for patients with psoriatic arthritis

Abbreviations

TCS = Topical corticosteroids

For details of exact steps to perform combination Tx, See detailed copy

Isotretinoin	Available as 10, 20 & 40 mg cap				
	After meals (esp. fatty ones)				
Dosage	Lab screening	Lab monitoring	Contraindications	Precautions	
	2 Pregnancy tests	Pregnancy test: Monthly	A) Absolute: 1) Pregnancy (X) 2) Lactation 3) Severe liver or kidney dysfunction 4) Uncontrolled hyperlipidemia B) Relative:) Leucopenia) Vit A supplements) Moderate to severe hyperlipidemia) Hypothyroidism) Suicidal ideation) Pseudotumor cerebri		
Abbreviations					

Indications:

Bolognia 4th edition

Retinoids are structural & functional analogues of Vit A that exert multiple effects on cellular differentiation & proliferation, the immune system, and embryonic development

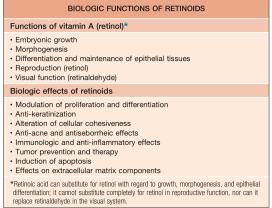


Table 126.1 Biologic functions of retinoids.

Among natural and synthetic retinoids, only oral isotretinoin and its 4-oxo-isotretinoin metabolite significantly suppress sebum production, which explains their dramatic effects on acne

Pharmacologic features: Table 126.2 Bolognia 4th edition P 2203

Notes on Dosage:

psoriasis wn	o need a systemic retinoid to avoid the long post-acitretin contraception period.
Schedule	
Overdosage	
	Notes on Lab screeing:
	Notes on Lab monitoring:
Dyslipidemia	Retinoids probably cause hyperlipidemia by interfering w lipid clearance
	The risk for developing hyperlipidemia is increased in the setting of DM, obesity, a increased alcohol intake.127
	Patients who are maintained on acitretin over long periods of time and whose triglycerides are chronically elevated may be at increased risk for atherosclerosi and may warrant therapy with triglyceride-lowering therapy.
	Less severe increases may be treated by dose reduction, withdrawing therapy ur normalization of serum lipids occurs, and changes in diet or lifestyle. In some instances, lipid-lowering agents may be indicated76
	Statins for hypercholesterolemia & fenofibrate for hypertriglyceridemia
	In cases of severe retinoid-induced hypertriglyceridemia, eruptive xanthomas 8 acute hemorrhagic (fatal fulminant) pancreatitis may occur
	Discontinuation of therapy is suggested if fasting triglycerides reach 800mg/dl (8
	For other oral retinoids (other than bexarotene), monitoring levels monthly for the first 2 months and then at 2–3-month intervals is adequate if baseline lipid levels a normal, there are no increases in dosage, and risk factors (obesity, high alcohol intake, diabetes) are absent.
	More recently, less frequent monitoring (e.g. only at baseline and after 2 months treatment if normal) has been recommended for young healthy adults receiving isotretinoin for acne75
	(Bolognia 4th edition p 2212)

Liver toxicity	Transient elevations in serum transaminases may occur
	Also alkaline phosphatase, lactic dehydrogenase, and bilirubin may also occasionally become elevated
	LFT abnormalities are typically mild, usually developing between 2 and 8 weeks after starting therapy and then returning to normal within another 2–4 weeks despite continued therapy.
	Severe or persistent hepatotoxic reactions occur in <1% of patients.
	Transaminase elevations to greater than three times the upper limit of normal should prompt discontinuation of retinoid therapy.
	With two- to three-fold transaminase elevations, therapy should be withdrawn until normalization occurs13.
	Other causes of hepatic dysfunction should be excluded.
Hematologic toxicities	Hematologic abnormalities are much less common with other retinoids, but careful hematologic monitoring in HIV-infected patients is warranted.
	Drug interactions:

Concurrent use of retinoids with alcohol or other medications having similar side effects may increase the incidence of adverse events.

The following should be avoided or used with caution:

tetracycline, doxycycline, minocycline (may increase intracranial pressure)

alcohol (increased conversion of acitretin to etretinate and hepatotoxicity)

Methotrexate (synergistic liver toxicity with retinoids; however, combination may be used with caution in patients with PRP or severe psoriasis)

vitamin A supplements (risk of hypervitaminosis A)

Retinoid drug levels and resultant potential for toxicity may increase with CYP3A4 inhibitors such as azoles and macrolides.

In contrast, antituberculosis drugs (rifampin) and anticonvulsants (phenytoin and carbamazepine) may decrease the drug levels of retinoids via CYP3A4 induction.

Retinoids may also increase the drug levels of cyclosporine via competition for CYP3A4 metabolism13.

In rare instances, patients with diabetes mellitus may have more difficult glucose control while taking a retinoid; however, the causal relationship remains uncertain.

Acitretin has been reported to potentiate the glucose-lowering effect of glibenclamide (Drug interactions)

Acitretin has been shown to possibly reduce the efficacy of progestin-only contraceptives.

Also, unprotected UVR exposure or photosensitizing medications should be avoided because of the potential for increased photosensitivity related to retinoid therapy.

Since retinoids act through nuclear receptor dimers, cross- talk with other nuclear receptors may provide synergistic effects: for example, interactions between RXR and vitamin D receptor (VDR) positively influence the action of vitamin D3, and cross-talk with PPAR and its ligands is under investigation.

Notes on Contraindications:		
	Special cases:	
Females of childbearing age	take monthly comprehension and pregnancy tests (as well as two pregnancy tests prior to instituting therapy), and pledge to use two forms of effec- tive contraception (or abstinence) continuously for 1 month before, during, and for 1 month after isotretinoin treatment51,52. Patients taking systemic retinoids should not donate blood while on therapy and for 1 month or 3 years after the last dose of isotretinoin or acitretin, respectively. (Bolognia 4th edition p 2210)	
Males	No typical retinoid embryopathy malformations have been reported in pregnancies where only the male partner was taking acitretin or isotretinoin at the time of conception. However, it is usually recommended that men who are actively trying to father children avoid systemic retinoid therapy. (Bolognia 4th edition p 2210)	
Pediatrics		
Geriatrics		
Management of Adverse reactions:		

	ADVERSE EFFECTS OF SYSTEMIC RETINOIDS		
Acute effects	Mucocutaneous	Xerosis with pruritus* Chellitis* Dry mucosa*: mouth, nose (epistaxis), eyes (see below) Skin fragility* Retinoid dermatitis (see Table 126.6)* Palmoplantar peeling* Photosensitivity Sticky sensation (palms, soles) Granulation tissue with pyogenic granuloma-like lesions (e.g. at sites of acne cysts, periungual) Intertriginous erosions with exuberant granulation tissue Nail fragility with softening, onycholysis, paronychia Facial swelling Staphylococcus aureus infection Telogen effluvium, hair thinning	
	Ocular	Xerophthalmia* Blepharoconjunctivitis Reduced night vision Blurred vision, photophobia, keratitis, comeal ulceration (rare)	
	Systemic	Myalgias Arthralgias Arnorexia, nausea, diarrhea, abdominal pain Headache, pseudotumor cerebri (rare) Fatigue, lethargy, irritability Depression, suicidal ideation (rare and controversial) Toxic hepatitis (rare) Clinical signs of hypothyrioidism (with bexarotene*) Pancreatitis secondary to hypertriglyceridemia (rare) Hyperuricemia with gout (rare)	
	Laboratory	Elevated liver function tests (usually transient, minor): AST, ALT, alkaline phosphatase, LDH, bilirubin Hyperfipidemia: hypertriglyceridemia"; increased cholesterol, VLDL and LDL; decreased HDL Decreased free thyroxine (T4) (with bexarotene*) Elevated creatine kinase Leukopenia (with bexarotene) Agranulocytosis (with bexarotene) Thrombocytosis, thrombocytopenia Hypercalcemia (rare)	
Chronic effects	Mucocutaneous	Alopecia (rare) Dry eyes, corneal opacities (rare)	
	Systemic	DISH syndrome-like bone changes: Osteophyte and bony bridge formation, especially of vertebrae (rarely clinically significant at dosages for acne) Anterior > posterior spinal ligament calcification Extraspinal tendon and ligament calcification Osteoporotic changes in long bones (rare, with possible exception of long-term etretinate) Premature epiphyseal closure (rare) Periosteal thickening Myopathy (rare)	
*Common adverse effe	cts.		
		tinoids. See Table 126.7 for teratogenicity. ALT, alanine aminotransferase; AST, aspartate aminotransferase; DISH, diffuse density lipoprotein; LDH, lactate dehydrogenase; LDL, low-density lipoprotein; VLDL, very-low-density lipoprotein. Bolognia 4th edition	
	Dry mouth accompanied by thirst		
		Decreased color vision	
ail	Fissuring esp. of fingertips		
	Burning or sticky skin		
Diffuse h	Diffuse hair loss (Telogen effluvium) is a relatively common complaint, although objective alopecia tends to occur only at high dosage levels		
	Nail: thinning, fragility, and shedding of the nail plate as well as paronychia-like changes with periungual granulation tissue that can resemble pyogenic granulomas		

Bone toxicity	Bone pain can occur in retinoid-treated patients without objective evidence of any abnormalities and without sequelae.
	Calcification of tendons and ligaments, particularly in the ankles53 may occur
	No narrowing of the disc space
	More rarely, ossification of the spinal posterior longitudinal ligament has been reported; this change, which can be progressive, may lead to spinal cord compression with signs of partial spastic paraplegia54.
	Based on data from retrospective studies, it was concluded that although many of the bone changes observed were common in the general population (especially adults) and could not be attributed with certainty to etretinate or acitretin therapy, spurs and interosseous membrane and tendon calcifications were probably treatment-related55. Of note, prospective studies have shown that the effect of retinoids on bone, if present at all, is likely to involve worsening of pre-existing skeletal overgrowth rather than induction of de novo changes. Even long-term use of isotretinoin in acne patients rarely causes clinically significant radiologic abnormalities, as most hyperostoses are asymptomatic and clinically insignificant56.
	Osteoporosis has been observed with hypervitaminosis A and after long-term therapy with etretinate but not with acitretin or isotretinoin57,58
	In children, only a few cases of skeletal abnormalities, including osteoporosis, periosteal thickening, slender long bones, and premature epiphyseal closure61,62 have been reported
	No baseline X-rays are required prior to administering an oral retinoid, although monitoring high-risk patients who require prolonged high-dose therapy may be useful.
Muscle effects	Although muscular pain and cramps can occur in patients taking etretinate or acitretin, these symptoms are more common with higher doses of isotretinoin therapy, especially in individuals involved in vigorous physical activity. Occasionally, elevated creatine kinase levels may be observed. Increased muscle tone as well as axial muscle rigidity and myopathy have been reported in patients receiving etretinate and acitretin therapy, respectively63.
GI side effects	Uncommon nonspecific GI complaints have been reported in association with retinoid therapy. Although there have been case reports of isotretinoin administration preceding the onset of IBD and one study showed an association between previous isotretinoin use and the development of ulcerative colitis, a cause-and-effect relationship has not been established to date. Several large population-based studies found that patients with IBD were no more likely to have used isotretinoin prior to diagnosis than matched controls72,73, and a recent meta-analysis concluded that isotretinoin use does not increase the risk of IBD overall or ulcerative colitis specifi- cally73. Potential confounding effects of severe inflammatory acne itself and treatment with oral antibiotics may also contribute to an apparent association between isotretinoin and IBD. Renal effects
Renal toxicity	Renal toxicity is not characteristic of retinoid therapy. Isotretinoin has been safely administered to patients with end-stage kidney disease who were undergoing hemodialysis. Renal function should be monitored in patients with a history of kidney disease.

CNS & Psychiatric effects	Although individual signs of increased ICP, such as headache, nausea & vomiting, are occasionally observed, the complete pseudotumor cerebri syndrome with papilledema & blurred vision is very rare64,65. Concomitant use of other drugs associated with intracranial hypertension (e.g. tetracyclines) is considered a risk factor for developing pseudotumor cerebri and should therefore be avoided66. Examination for papilledema should be performed immediately when a patient receiving retinoid therapy complains of a persistent headache, especially if it is accompanied by visual changes, nausea or vomiting, or when pseudotumor cerebri is otherwise suspected. Depression, psychosis & suicide attempts (Controversial)		
Others	See acitretin		
Uncommon or rare ARs			
Different types in the market			
Storage			
	References		
	1) Bolognia 4th Edition 2018 Text book		
	2) package insert @		
3) JAAD	3) JAAD guidelines @ https://www.jaad.org/article/S0190-9622(09)00390-9/fulltext		
	4) British Association of Dermatologists guidelines @		
5) European guidelines 2009			
6) French guidelines 2019 @ https://www.onlinelibrary.wiley.com/doi/epdf/10.1111/jdv.15340			
7) AAD @ https://assets.ctfassets.net/1ny4yoiyrqia/2b2PJIpcLFoOHpFCgVPFGc/6bdf2493e78c63c6235bc8607a791ba5/DIR-Fall-2017Boards-Fodder.pdf			
8) El sevier			

Dosage	Screening & Monitoring	Contraindications		Precautions	& Comments
UVB	BB-UVB 280-320 nm NB-UVB 311-313 nm				
2-3 times/wk		Absolute C.I.s: History of photosensitive disorders		Monitor si	de effects:
			E, XP	Xerosis — Itching	
	mbinations: opical:	History of PSO exacerbation w sunlight exposure/summer		Erythema, burning & stinging	
I) During	sessions:			Mild fo	lliculitis
	neral oil	Present skin malignancies			(1 ND 1 N/D
2) Petrolatum oli	or oint. (thin layer)	Concurrent Tx w CsA		Lesional blistering after NB-UVB	
II) After	sessions:	Containen		Reactivation of HSV	
	etamethasone dip.		e C.I.s:		
2) Taz	arotene		who tend to burn sily)	Premature skin ageing; actinic	
B) Sv	stemic:	eas	ыу)	damage; dermatoheliosis (wrinkling, lentigines & telangiectasias) Long	
	rti-carcinogenic)		intake (eg, Fowler	term	
2) Methotrexa	te (Be cautious)		ous Tx w ionizing		
		radiation therapy	grenz ray or x-ray)	Theoretical risk of	
		History of skir	n malignancies	photocarcinogenesis but no evidence in clinical studies of PSO	
Scre	ening:	r notory or oran	i mangnanoloo	iii diiiilda da	34.00 011 00
	nation to full body	Dysplastic me	elanocytic nevi		
	iation of therapy ior phototherapy	Any modical con	dition cignificant		
	ocytic nevi (esp. if	Any medical condition significant enough that the patient cannot			
	neous malignancies	tolerate heat or prolonged standing in			
		the light box			
	toring:	Dhata a saitirin a du sa			
	n examination to of photoaging,	Photosensitizing drugs			
	n & cutaneous	Immunosuppressive drugs			
maligi	nancies	Objidance No. and a superior at a standard and a			
N.B. · BAD · Hay	ving > 500 UVB Tx	Children: No adequate study so may be used w caution in people < 18			
	rill need annual skin	yrs In general used as long as child			
	or skin cancer for	can stand alone in UVB cabinet			
entire	e of life				
		History of re	current HSV		
Schedule of efficacy	Initial response		Complete or near complete clearance		Remission
NB-UVB	Response observed within 8-10 treatments		Average of 15-20 treatments to achieve clearance		Remission rate of 38% after 1 y
	N.B. : Clearance w be seen	thin 2 weeks may N.B. : Complete cle as long as 40 treatr		•	N.B. : Maintenance therapy may
	N.B.: A lack of improvement after sessions is considered as a failure				prolong remission
	t fails to obtain an ad or biologic agents sho		er app. 20-30 treatm	ents w NB-UVB, so	PUVA, traditional
BB-UVB	Initial	Average of 20-25 t	reatments to	Remission rate of 5	5% after 1 y
N.B. : Superior to NB-UVB in Tx of	improvement often occurs within 12-20	induce clearance		N.B. : Maintenance therapy may prolong remission	
Guttate PSO	treatments				

Dosage	Screening & Monitoring	Contrain	dications	Precautions	& Comments
Targete	ed UVB Includes excim		ner laser (308 nm), excimer light (308 nm) & targeted NB-UVB light (311-313 nm)		
Indications & efficacy	Mild, moderate, or severe PSO < 1 PSO & scalp PSO		10% BSA, including palmoplantar plaque or pustular		
	N.B.: 1) Efficacy	: Excimer laser >	Excimer light > Targeted NB-UVB		
	2) PUVA is equal	y effective to exci	mer light but more	effective than targ	geted UVB
2-3 times/wk, with a minimum of 48 hrs between treatments	Screening: None Monitoring:	Be cautious with Patients w photo disorders Drug interaction May need to low	sensitivity	Monitor side effects: Painful erythema & blistering are common but no scarring have been observed	
	For efficacy & for burning	on presence of p medications N.B.: Action spe photosensitizing the UVA range Pregnancy, lacta but expert opinion Children: No large	hotosensitizing ctrum of most medications is in ation: No studies in is that it is safe	include pruri hyperpigmenta perilesion N.B.: The long excimer laser the	adverse effects tus, burning, tion & transient nal edema y-term safety of erapy has not yet established
Schedule of efficacy	Initial response		Complete or near	near complete Remission	
Excimer laser	Response observed within 8-10 treatments N.B.: Frequently initial response observed after 1-2 treatments		Usually average of treatments	of 8-12	3.5-6 months
Excimer light	Some response may be noted as early as 6–8 treatments		Complete response may take 20–30 sessions		Some patients have long remission periods, while others may relapse within 3–6 months
Pulsed o	dye laser Eff		fective & recommended in nail psoriasis		
		nolysis & subungual hyperkeratosis were the most il PSO characteristics, and nail pitting was the least responsive			
Monthly for 6 month		Possible side effects:			
N.B.: Combination w topical tazarotene 0.1% cream improves its efficacy		Generally mild including, hyperpigmentation of the cuticles, transient petechiae & slight pain during Tx sessions			

Dosage	Screening &	Contrain	dications	Precautions & Comments	
PUVA	Monitoring				
TOTA		320-400 nm A) Oral PUVA			
		A) Ora	IPOVA		
	2-3 times/wk with at least 48 h between treatments		olute: notosensitive e.g. LE, XP	Advices: UV protective eye wear should be worn when outdoors for 12-24 h postingestion	
A) Topical (Af 1) Calc 2) Taza B) Sys 1) Acitretin (ant Scree History & examin skin before initia focusing on pric exposure, melan if dysplastic) malign - Eye examina recent evidence no increased ris adhering to safe - CBC, LF - If indicated b panels (anti-Ro Monit Regular full skin	ation to full body ation of therapy or phototherapy ocytic nevi (esp. & cutaneous ancies ation; however, e demonstrates sk of cataract if ety precautions Ts & RFTs by history: ANA o/La antibodies)	Pregnancy(C) Children Present skin Severe liver or Concurren > 200 treatment per Rela Skin types I & II (easily) A History of ars previous Tx w ic ther History of skir Dysplastic me Men & women years without Pediatrics: Use 10-1 Any medical core	tion w sunlight b/Summer b) & Lactation < 10 yrs malignancies kidney disease t Tx w CsA s or 2000 J/cm2 life tive: who tend to burn djust dose tenic intake or onizing radiation rapy malignancies elanocytic nevi in reproductive contraception ed w caution in 8 yrs addition significant	Monitor side effects: i) Acute: Nausea & vomiting (common) Dizziness & headache (rare) Erythema: peaks at 48-96 h — Blisters Pruritus — Xerosis Irregular pigmentation Tanning: starts 1 wk after PUVA Photo-onycholysis, melanonychia ii) Chronic: Photocarcinogenesis risk (SCC, BCC & possible melanoma) Photoaging (elastosis & poikiloderma) & lentigines (dark brown to black macules) are common, esp. in pt.s of skin types I-III and are cumulative UVA dose dependent (long term) Hypertrichosis Hepatic toxicity from psoralens	
photocarcinogenesis in Caucasians Patients who are noncompliant w eye protection, yearly eye exam.		enough that the patient cannot tolerate heat or prolonged standing in the light box Photosensitizing drugs		(uncommon) Cataract (If eye precautions not followed)	
CBC, LFTs & RFTs every 6-12 mo		Concomitant MTX Immunosuppressive drugs			
ANA every 6-12 months		> 100-150 sessions or 1000 J/ cm2 per life			
Schedule of efficacy	·		Complete or near complete clearance	Remission	
Oral PUVA	Oral PUVA Initial improvement frequently seen within 1 month of therapy N.B.: A lack of improvement after 20 sessions is considered as a failure		20-30 treatments	3-12 months N.B.: Efficacy of maintenance therapy is controversial	

Dosage	Screening & Monitoring	Contraindications	Precautions	& Comments
Topical PUVA	1) Topical PUVA	A for PSO of palms & soles or generalized PSO		
Topical PUVA dose (Using e.g. topical 8-MOP oint or lotion):		Contraindications: Patients w known LP, porphyria, or XP		Monitor side effects:
2-3 times / wk		Caution should be exercised w: Skin types I & II who tend to burn easily		Erythema, burning, itching
Bath PUVA do	se:	History of arsenic intake or p ionizing radiation		Blistering
2-3 times / wk		Atypical nevi		Hyper- pigmentation
		History (or multiple risk factors) of melanoma or multiple nonmelanoma skin cancers		
		Pregnancy (Category C)		
		Lactation: No data ava		
		Pediatric use: Safe provided pa instructions; however, no system studies have been perf	mic absorption	
Schedule of efficacy	Initial response	Complete or near complete Remission clearance		ssion
Topical PUVA	May take 30 treatments to	Single course usually is 30-40 treatments	Remission: 3-12	2 months
	have noticeable response	Topical PUVA usually requires Tx 2-3 times/wk for several mo for adequate clearing & maintenance of control of palmoplantar PSO	Once clearance achieved, main treatment may	tenance
Notes	 In darker-skinned individuals & in patients with very thick lesions, PUVA photochemotherapy is likely to be more efficacious (i.e. more than UVB) because of the better penetration of UVA compared with UVB (Guidelines, Section 5).54 Remission duration with NB-UVB is shorter than with PUVA 			
Abbreviations	PSO: Psoriasis BAD: British association of dermatologists MOP: methoxypsoralen Tx: Treatment SEs: Side effects LE: Lupus erythematosus XP: Xeroderma pigmentosum exam.: examination LFTs: Liver function tests RFTs: Renal function tests			

# Possible triggers of psoriasis		
Physical	Local injury e.g. scratching or sunburn	
Psychological	Stress	
Infections	Theoretically any type of infection but most commonly streptococcal	

Drugs

Drugs can lead to either induction or exacerbation of psoriasis or to psoriasiform drug eruption

N.B.: Psoriasiform drug eruption is a group of papular drug eruptions characterised histologically by epidermal hyperplasia & hypergranulosis

Onset of psoriatic symptoms can be up to months or years after drug has been started

While some cases of drug-induced psoriasis can resolve within weeks of stopping the causative medicine, in other cases, it can take much longer to resolve or not resolve completely

Theoretically, any drug can trigger a psoriatic flare but most common ones are:

1) HTN: <u>β-blockers</u> (e.g. propranolol, metoprolol, bisoprolol in Concor tab) & <u>ACE</u> inhibitors

N.B. : Alpha blocker is recommended for HTN in psoriatic patients

- 2) Infections: <u>Antibiotics</u> (e.g. amoxicillin) & <u>Antimalarial drugs</u> (e.g. hydroxychloroquine)
 3) <u>NSAIDs</u> including indomethacin & aspirin
- 4) Psychiatry: <u>Lithium</u> & less often, <u>other</u> <u>medications</u> that are given to improve mood
 - 5) TNF-α inhibitors6) Alcohol
- 7) Withdrawal of corticosteroids either systemic or topical superpotent ones used excessively

Possible triggers of special types of psoriasis

Erythrodermic psoriasis	Onset may be :
	Acute (Infections, drug-induced, systemic steroid withdrawal, excessive use of topical superpotent corticosteroids & phototherapy burns)
	Or
	Chronic from poorly controlled psoriasis
Generalized pustular psoriasis	Most commonly with: Systemic steroid withdrawal But also seen in: Pregnancy, after infection or with certain drugs such as lithium, antimalarials, diltiazem, propranolol & irritating topical therapy e.g. tar
Palmoplantar pustulosis	PPP can also be drug-induced, often by TNF-α inhibitors. Although closely related, PPP is no longer classified as a type of psoriasis. It nearly always occurs in smokers