ConferMED™ Connecting Primary Care to the Future

Dermatologic Pharmacology

Thursday November 6th, 2025

Jerri Hoskyn, MD, FAAD

Disclosure

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I have no disclosures

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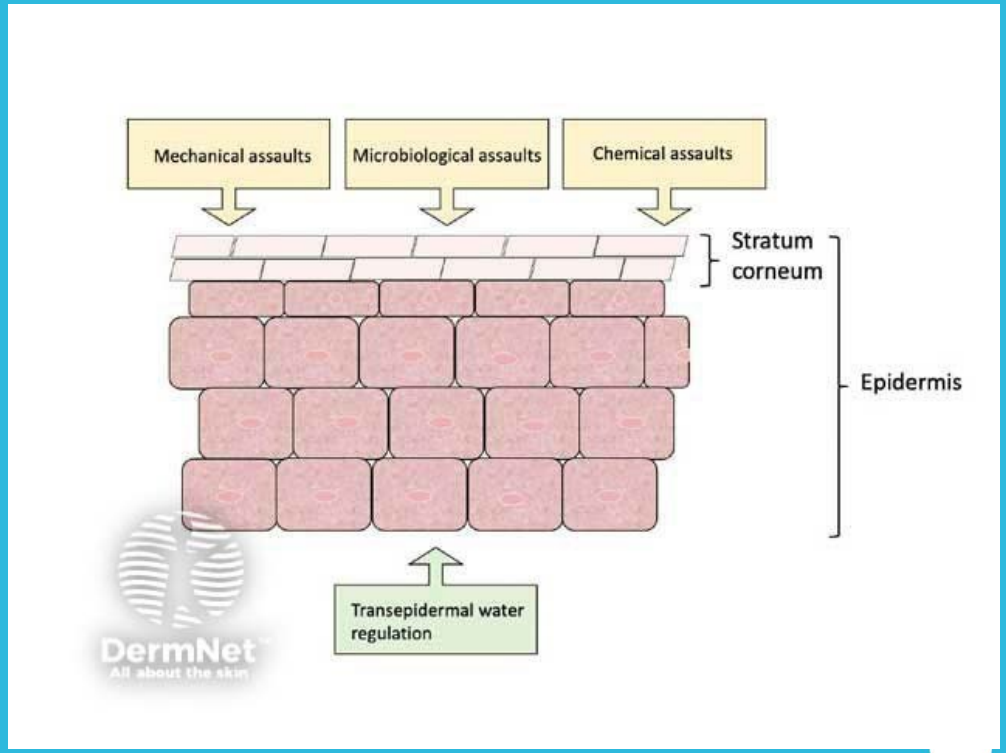
Learning Objectives

1. Review efficacy, potency, topical vehicles, and calculating amounts needed for topical medications
2. Review topical steroids, nonsteroidal topicals, and topical antifungals
3. Review sunscreens and sun protection

Topical Medications in General

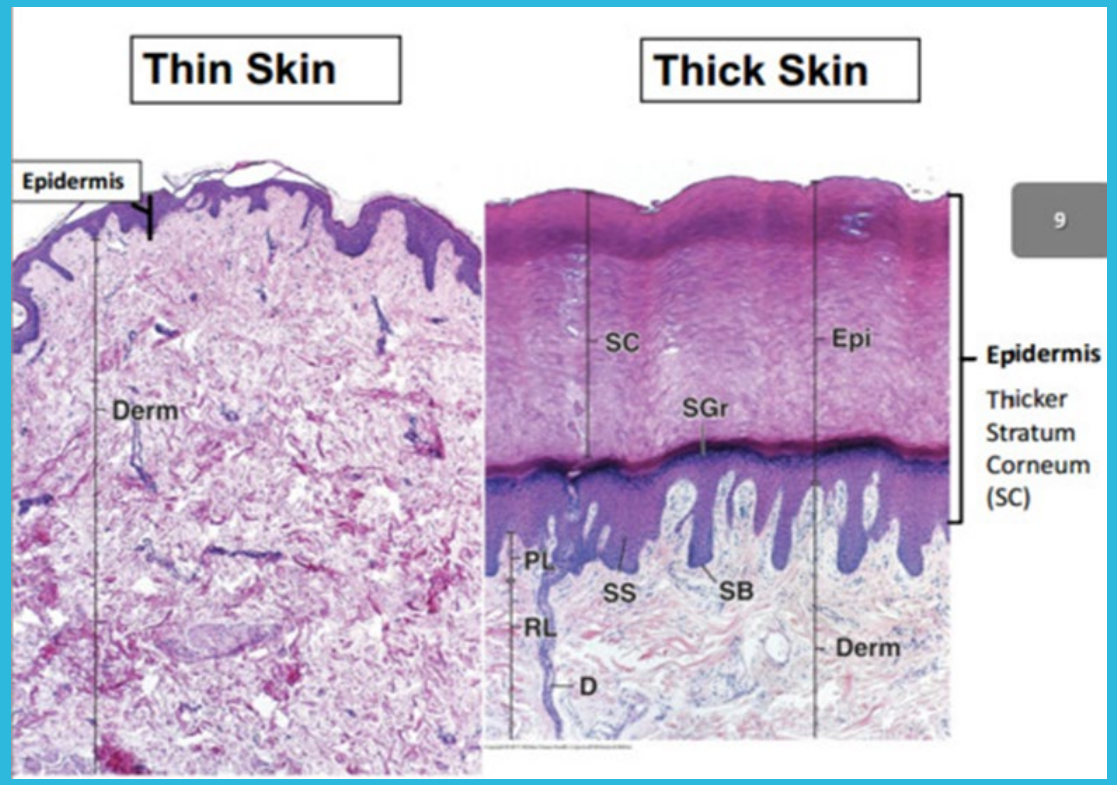
Challenge for a Topical Medication = Crossing the Skin Barrier

- Protects us from environment
- Reduces water loss
- **Stratum corneum = major barrier**
- SC = outermost epidermis, layers of dead skin cells
- “Bricks and mortar”



SC Barrier Thickness

- Varies by anatomic location
- Thinnest: eyelids, face, genitals
- Thickest: palms, soles



https://quizlet.com/29065660/structure-and-function-of-skin-flash-cards/

Drug Potency vs Efficacy

POTENCY

= Quantity of drug required to produce desired effect

Inherent to molecule

EFFICACY

= Drug's ability to produce desired therapeutic effect

What Affects Efficacy?

DRUG FACTORS

Active Ingredient
Potency
Concentration
Vehicle

PATIENT FACTORS

Age
Anatomic location
Severity
Skin Integrity
Occlusion

Vehicles


Triamcinolone Acetonide
Ointment USP, 0.1%
FOR EXTERNAL USE ONLY. NOT FOR OPHTHALMIC USE.
Rx only
TARO


Clobetasol Propionate
Gel 0.05%
FOR EXTERNAL USE ONLY. NOT FOR OPHTHALMIC USE.
Rx only
TARO


fougera
DESONIDE LOTION 0.05%
Rx only
59 mL (2 Fl Oz)


NDC 0168-0269-50
fougera
CLOBETASOL PROPIONATE TOPICAL SOLUTION USP, 0.05%
50 mL
FOR USE ON THE SCALP FOR DERMATOLOGIC USE ONLY NOT FOR OPHTHALMIC USE
Rx only
E. FOUGERA & CO.


Luxiq
(betamethasone valerate) Foam, 0.12%
LUXIQ® Foam, 0.12% is a medium-potency topical corticosteroid indicated for relief of the inflammatory and pruritic manifestations of corticosteroid-responsive dermatoses of the scalp.


Fluocinolone Acetonide
Topical Oil
0.01%
(SCALP OIL)
Rx only


Desonide
Cream 0.05%
Desonide
Cream 0.05%
FOR EXTERNAL USE ONLY. NOT FOR OPHTHALMIC USE.
Rx only
Keep this and all medications out of the reach of children.
TARO

What is a Topical Vehicle?

Delivery system for the active ingredient

Inactive ingredients

- Emollients
- Emulsifiers (keep oil/water from separating)
- Preservatives
- Penetration enhancers (example: propylene glycol)
- Solvents (keep active ingredient dissolved)

Vehicles: Ointments

- Petroleum jelly base (little to no water)

PROS

- Absorb best
- Occlusive
- Soothing
- Good for dry/thick skin (palm/sole, elbow/knee)

CONS

- Greasy
- Messy
- Can stain clothing

Vehicles: Creams

- Oil/water mixture

PROS

- Moisturizing
- Can rub in
- Good for thinner skin (face, neck, body folds)

CONS

- Require more preservatives
- Can sting/burn

Vehicles: Gels

- Water or alcohol base, jelly-like

PROS

- Absorb well
- Dry quickly
- Good for oily skin (acne), hairy areas, poison ivy

CONS

- Require more preservatives
- Can sting/burn
- Drying

Vehicles: Foams

- Water/alcohol or emollient base, mousse-like

PROS

- Absorb well
- Spread Easily
- Dry quickly
- Good for scalp & hairy areas

CONS

- Require more preservatives
- Can sting/burn
- Can be drying
- More expensive

Vehicles: Solutions

- Water/alcohol base, liquid

PROS

- Absorb well
- Spread Easily
- Dry quickly
- Good for scalp & hairy areas

CONS

- Require more preservatives
- Can sting/burn
- Can be drying

Vehicles: Oils

- Oil based, liquid

PROS

- Spread Easily
- Soothing
- Good for scalp
- Help soften/remove scale

CONS

- Messy
- Hard to wash out

Vehicles: Lotions

- Water based oil/water mixture

PROS

- Spread Easily
- Cover large areas
- Lightweight
- Good for scalp

CONS

- Fewer options

Estimating BSA: Use Palm of Hand

- Palm = 1% BSA
- Patient's palm (not yours)

www.unsplash.com (Ruthson Zimmerman)

Estimating Topical Use: Fingertip Unit

- From DIP to fingertip
- Approximately 0.5 g
- Covers about 2% BSA (2 palms)

- How much do you need to treat 2% BSA dosed bid for 30 days?

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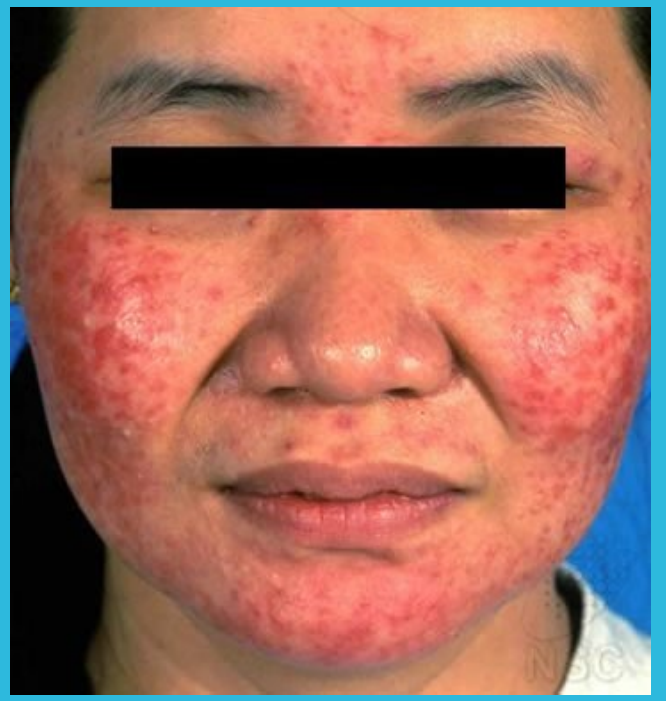
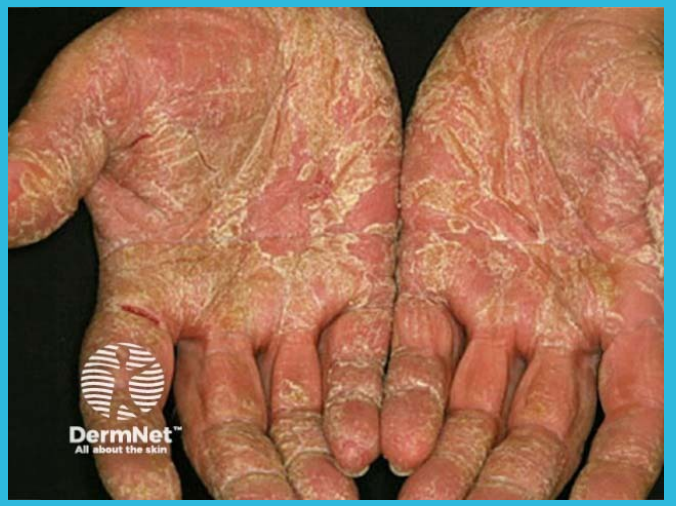
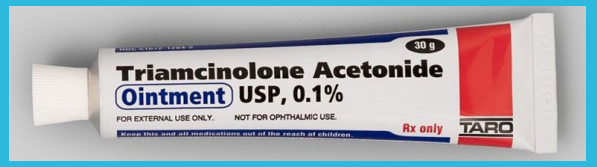
Estimating Topical Use: FTU Math

- Involved BSA = 2%
- 1 FTU covers 2% BSA
- 2% BSA = 1 FTU per dose
- BID dosing = 2 FTU/day = 2 x 0.5g = 1 g/day
- 1 g/day x 30 days = **30 g**

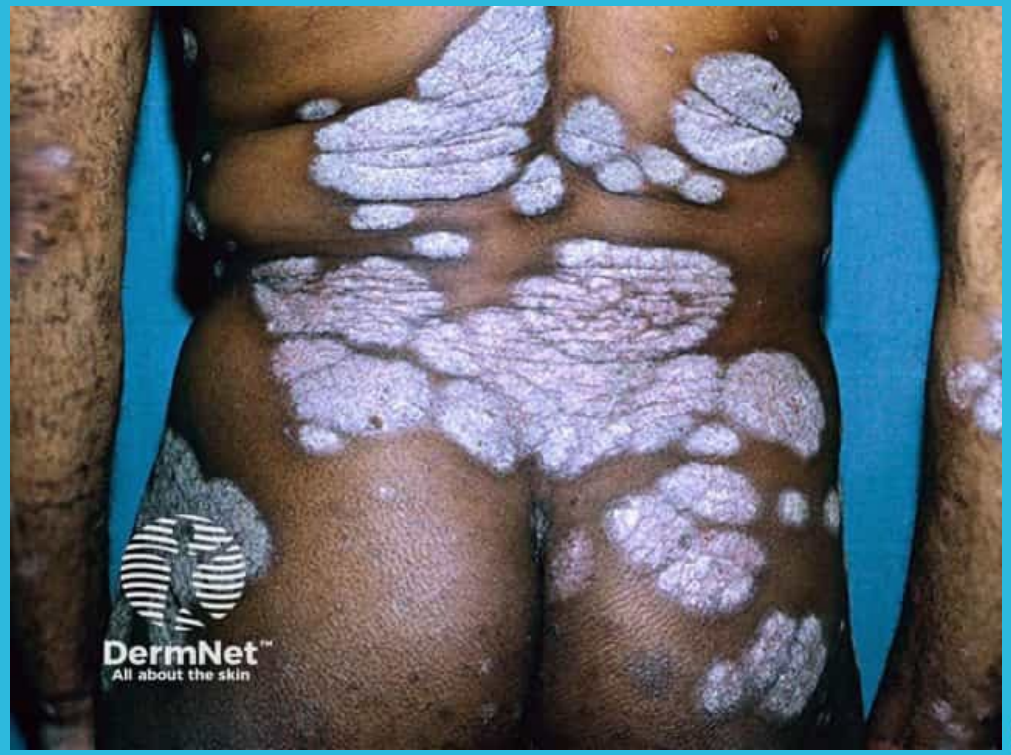






Quantity TCS needed for 1 month?

First, estimate BSA



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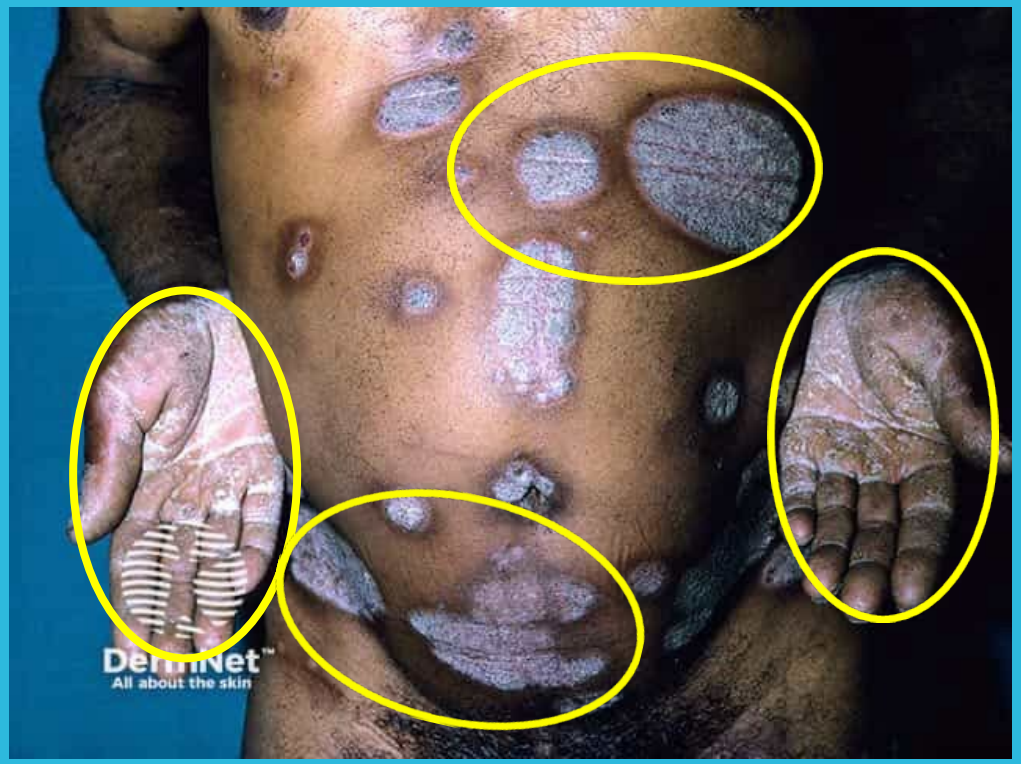

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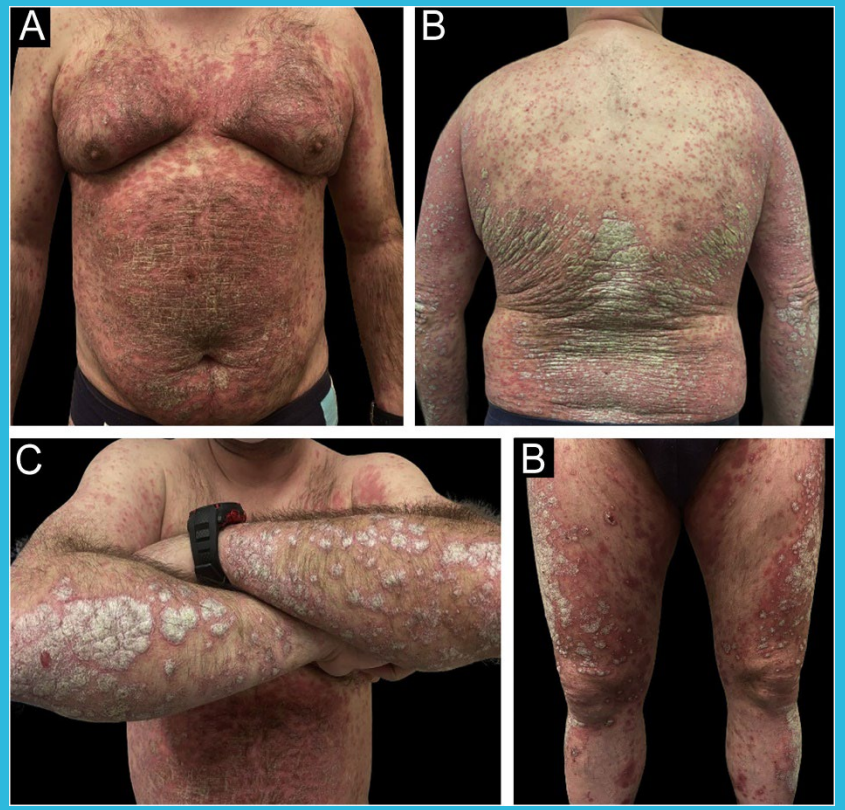
Quantity TCS needed for a month?

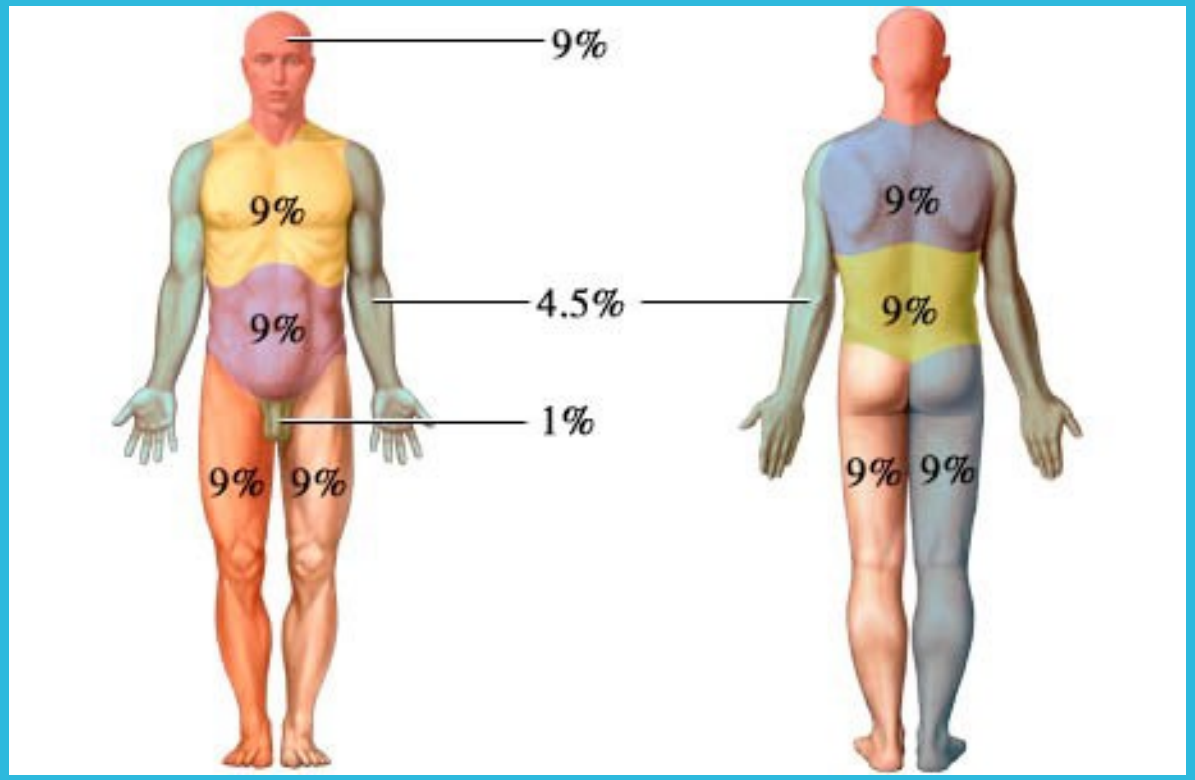
- Involved BSA = 8%
- 1 FTU covers 2% BSA
- 8% BSA = 4 FTU per dose
- BID dosing = 8 FTU/day = 8 x 0.5 g = 4 g/day
- 4 g/day x 30 days = **120 g**

Quantity TCS needed for large areas?

Use the Rule of 9s



Mansilla-Polo M et al. 2024. An Brasil de Derm 99(6); 922-27.



https://www.health.state.mn.us/communities/ep/surge/burn/tbsa.html

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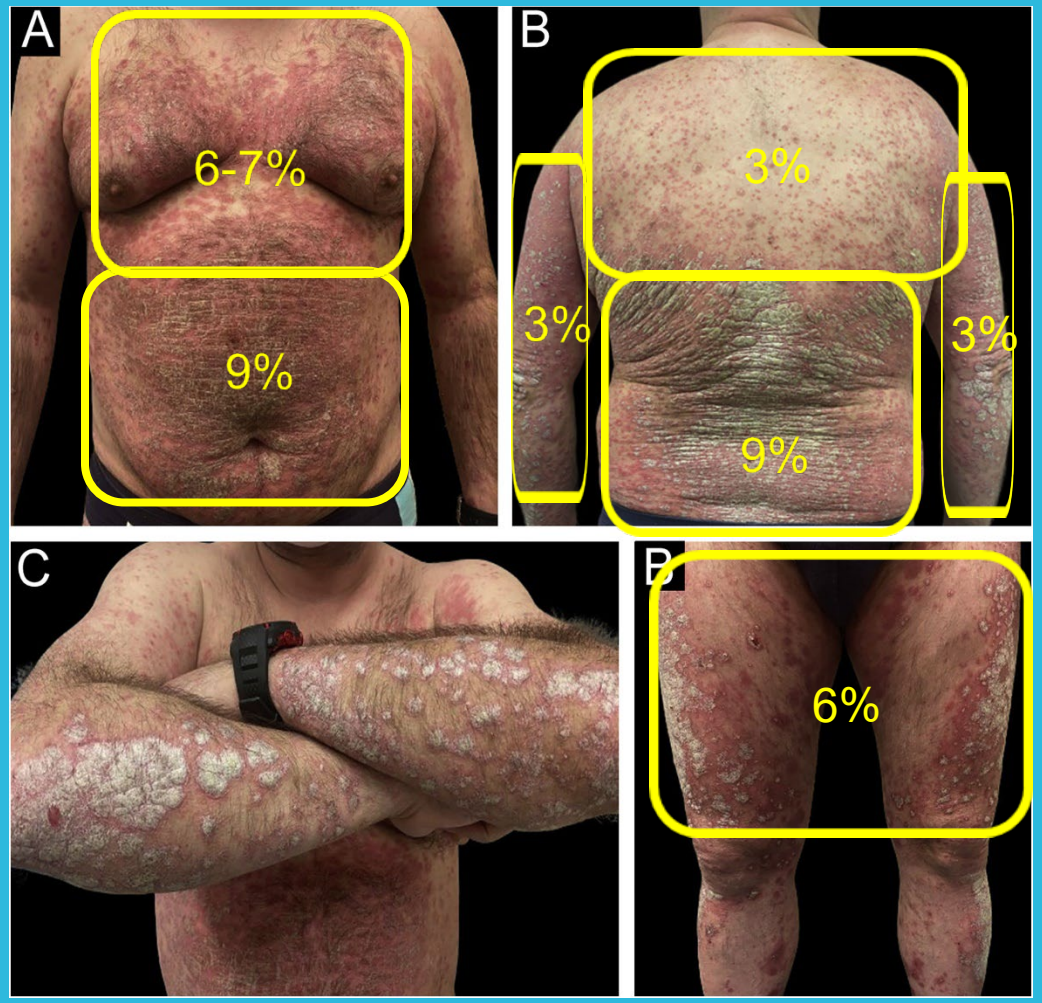
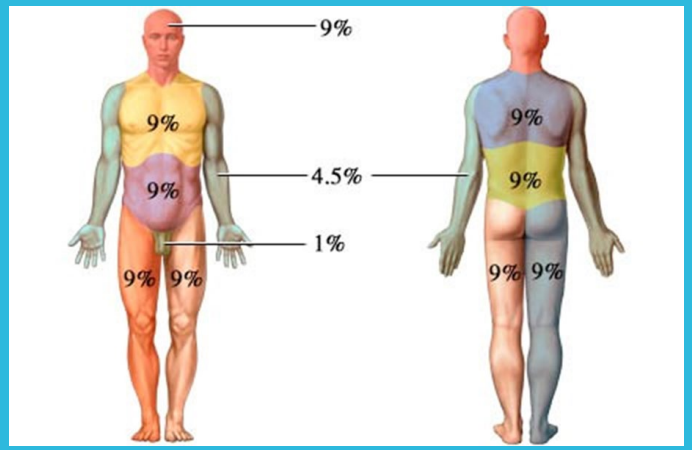
Quantity TCS needed for 1 month?

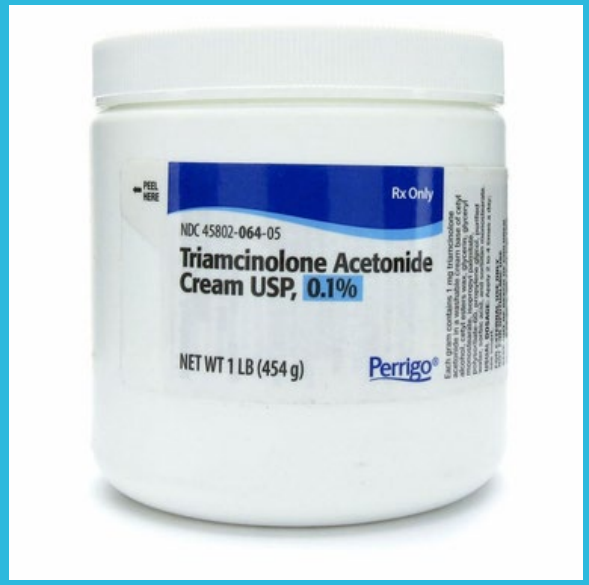




Total = 40%

Quantity TCS needed for a month?

- 1 FTU = 0.5 g
- 1 FTU covers 2% BSA
- 40% BSA = 20 FTU per dose
- BID dosing = 40 FTU/day = 20 g/day
- 20 g/day x 30 days = **600 g**



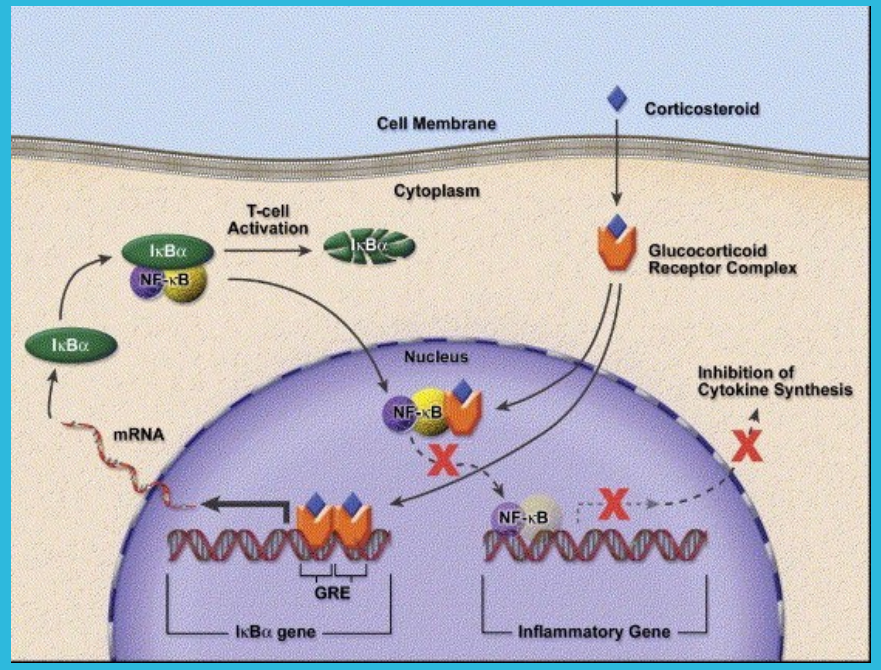
Topical Corticosteroids (TCS)

- Anti-inflammatory
- Relieves pruritus, burning
- Widely used for dermatitis, psoriasis, and multiple other dermatologic conditions

dermnetnz.org

TCS Mechanism of Action

- Work inside of the cell
- ⬇ inflammation/immune response
- ⬇ production of pro-inflammatory mediators
- ⬇ leukocyte traffic
- Vasoconstriction



Norris DA. Mechanisms of action of topical therapies and the rationale for combination therapy. J Am Acad Dermatol. 2005.

Topical Steroid Potency

Potency	Generic Name	%
Low (Class VI, VII)	Hydrocortisone Desonide	1 or 2.5 0.05
Medium (Class III, IV, V)	Triamcinolone acetonide	0.1
High (Class II)	Fluocinonide	0.05
Ultra High (Class I)	Clobetasol propionate Betamethasone dipropionate	0.05 0.05

Class I about 1000x as potent as hydrocortisone 1%

TCS Potential Side Effects

*Risk increases with increasing potency

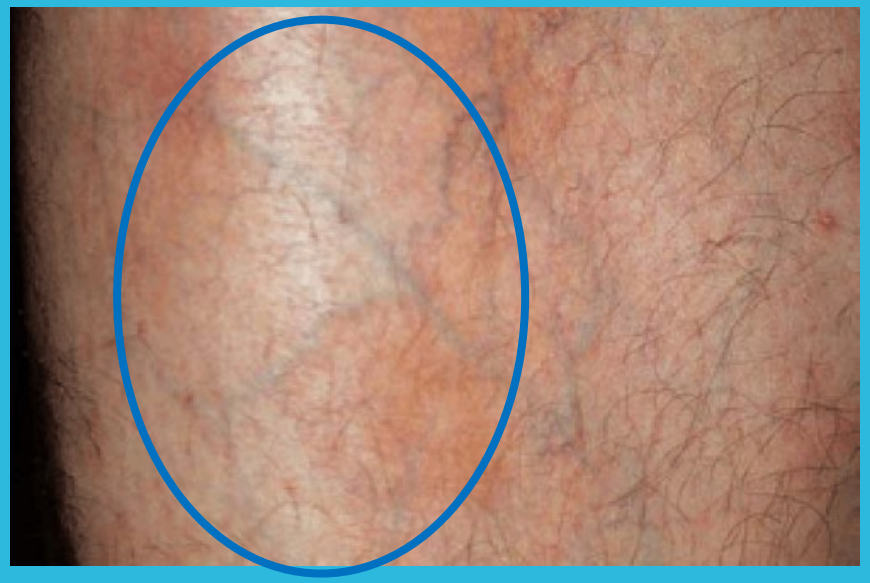
Local cutaneous side effects

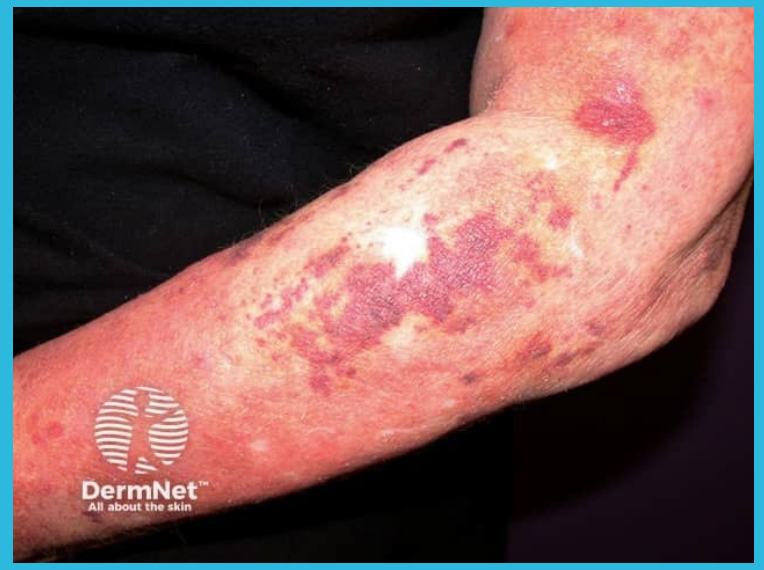
Systemic

Adverse Effects: Skin Atrophy

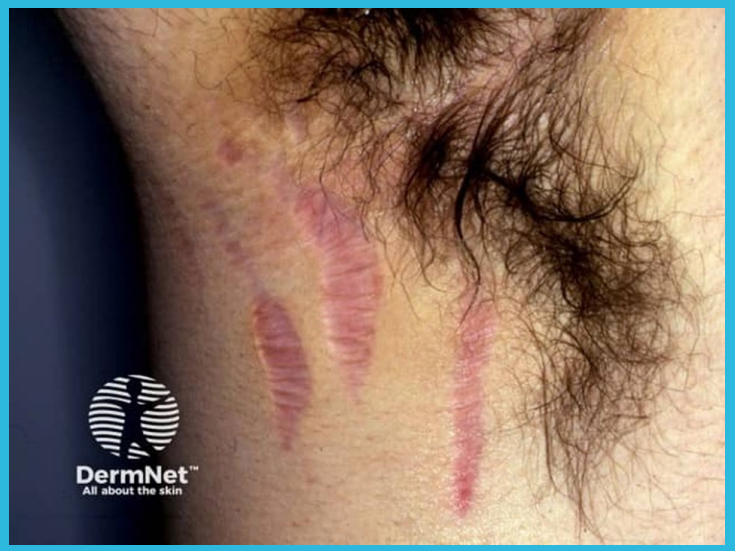
- Skin thinning
- More visible veins

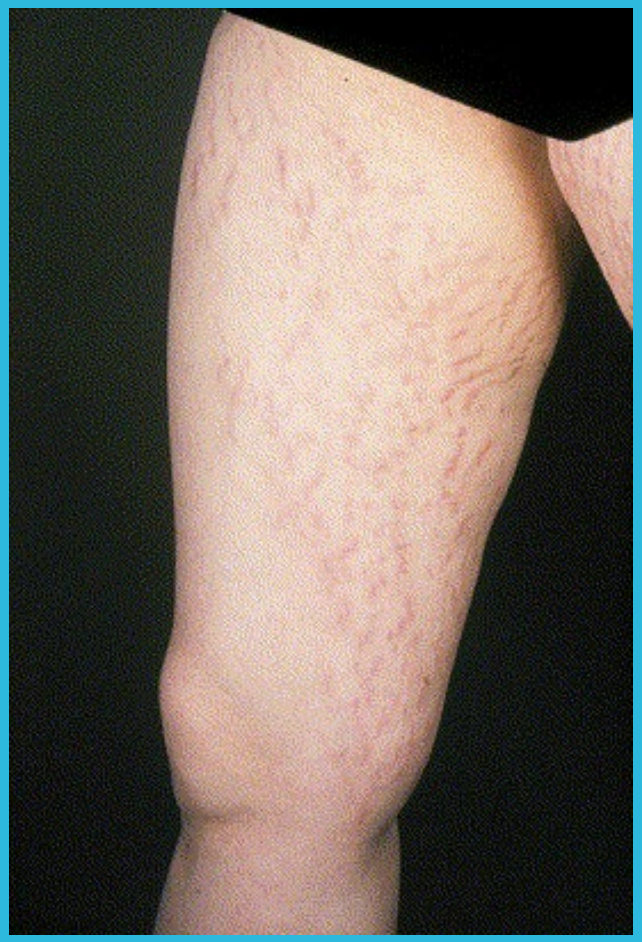
- Skin fragility
- Purpura

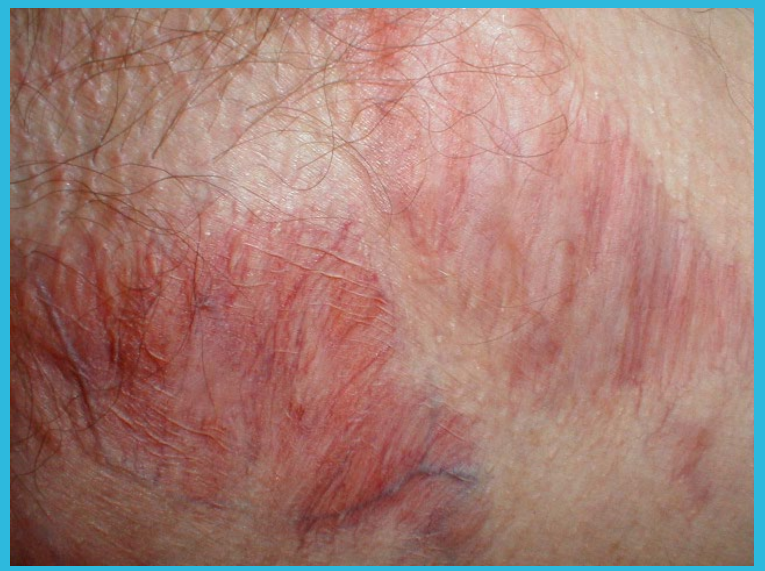




Adverse Effects: Striae



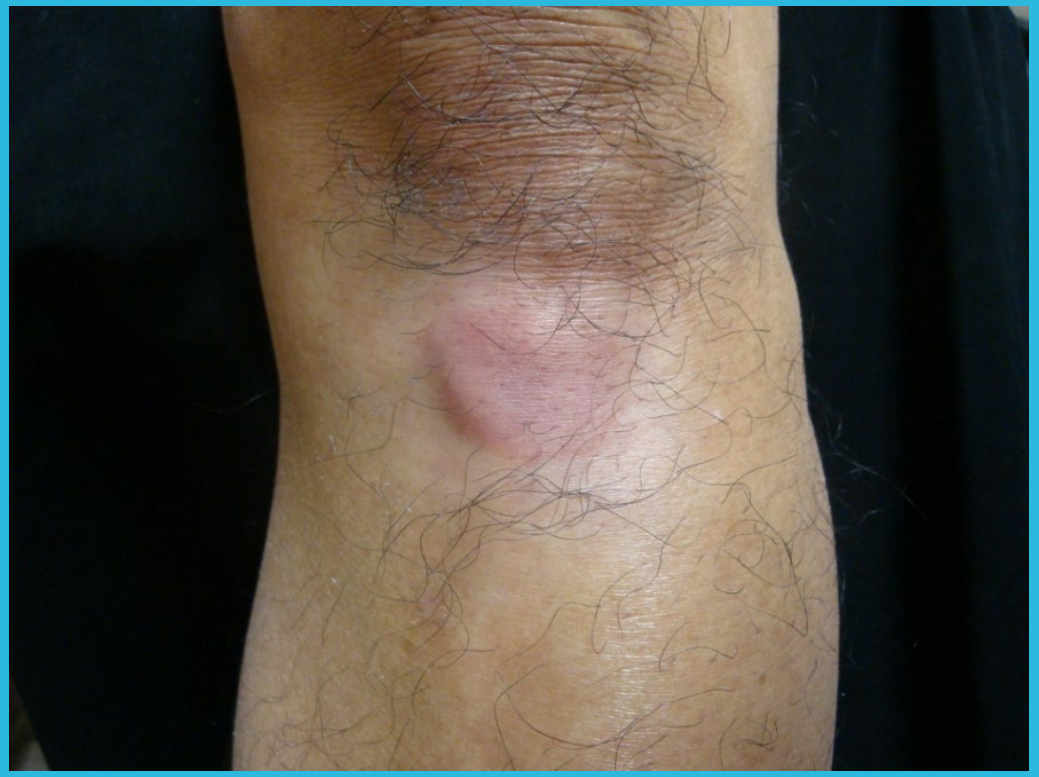


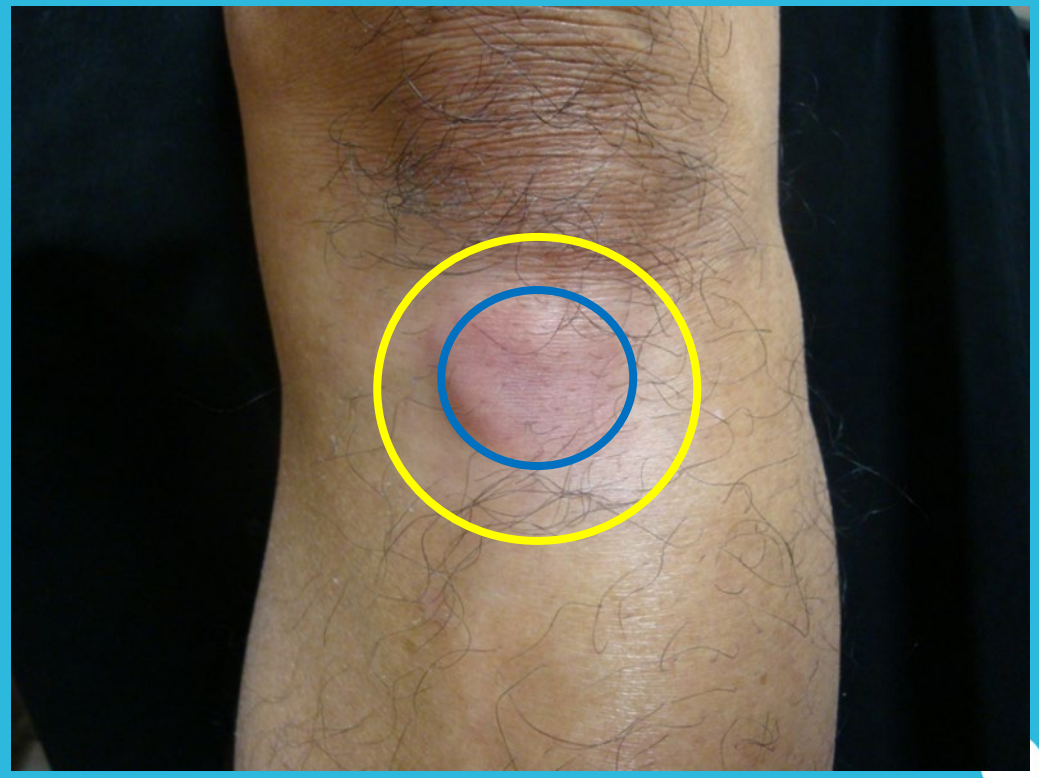


www.medpics.ucsd.edu

Hengge UR et al. 2010. Adverse effects of topical glucocorticosteroids. JAAD 54(1): 1-15.

Adverse Effects: Hypopigmentation

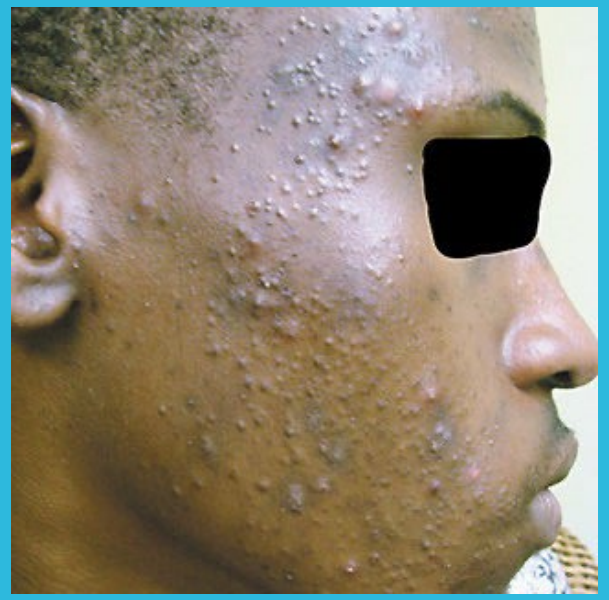




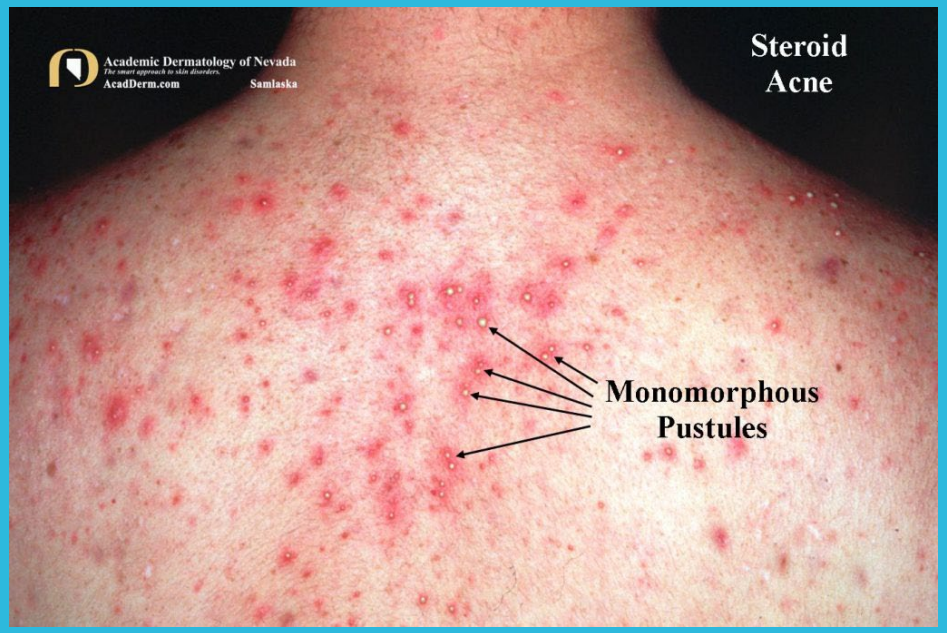
www.aad.learning.org

Adverse Effects: Steroid Acne

- Classic = monomorphous pustules
- More common with systemic steroids

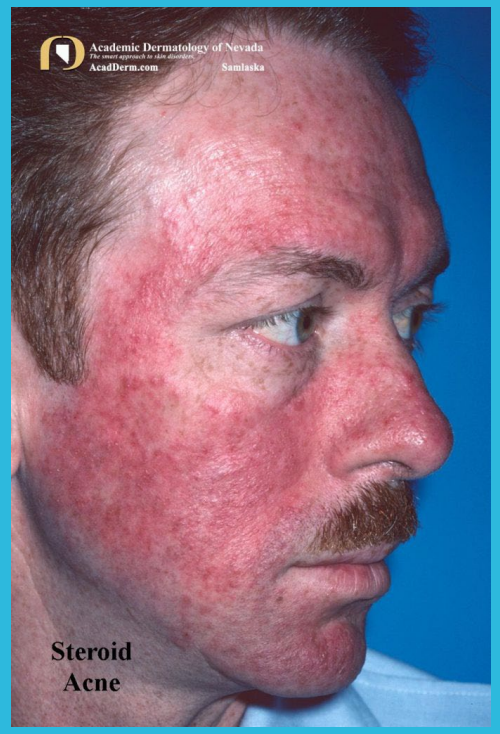


Researchgate.net

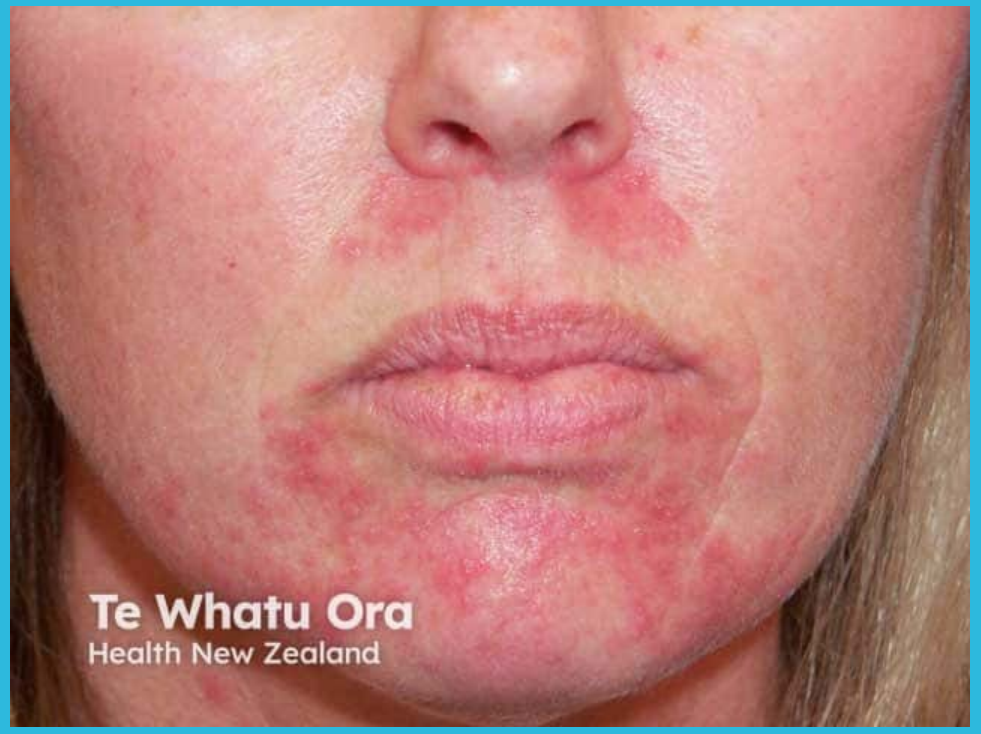


Adverse Effects: Facial

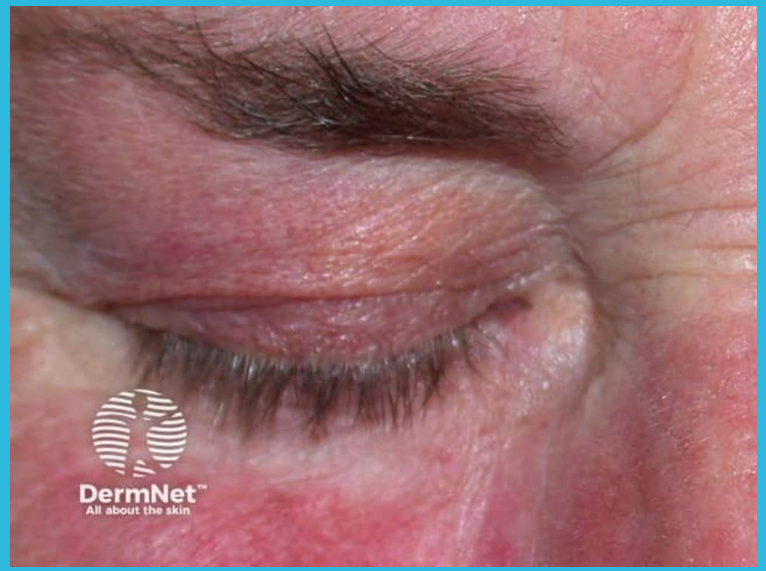
Steroid acne, erythema



Perioral Dermatitis

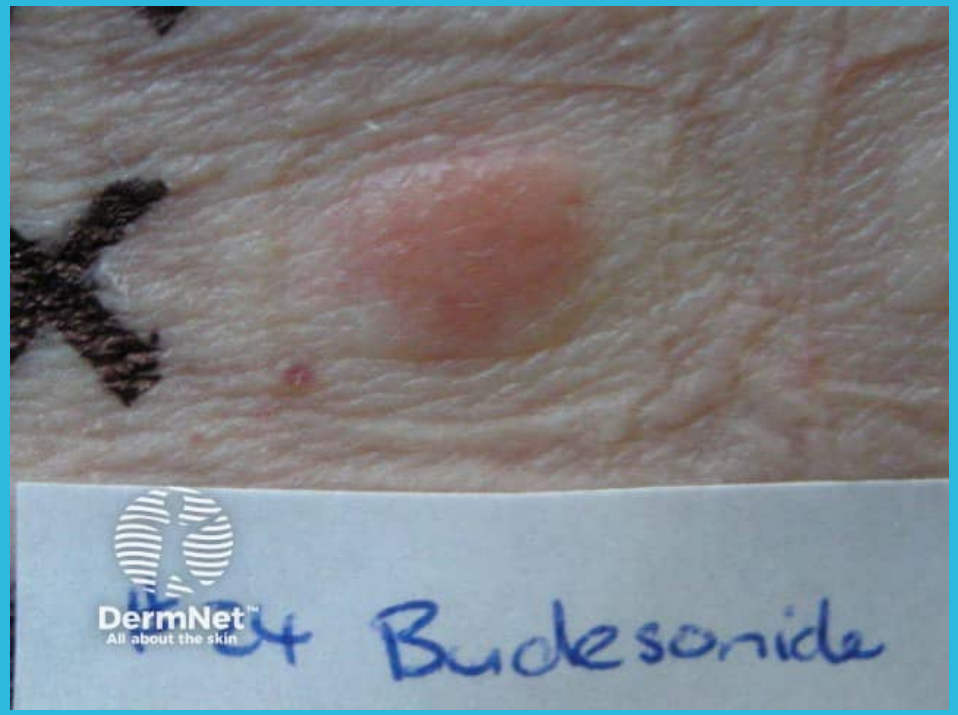


Erythema, Telangiectasia



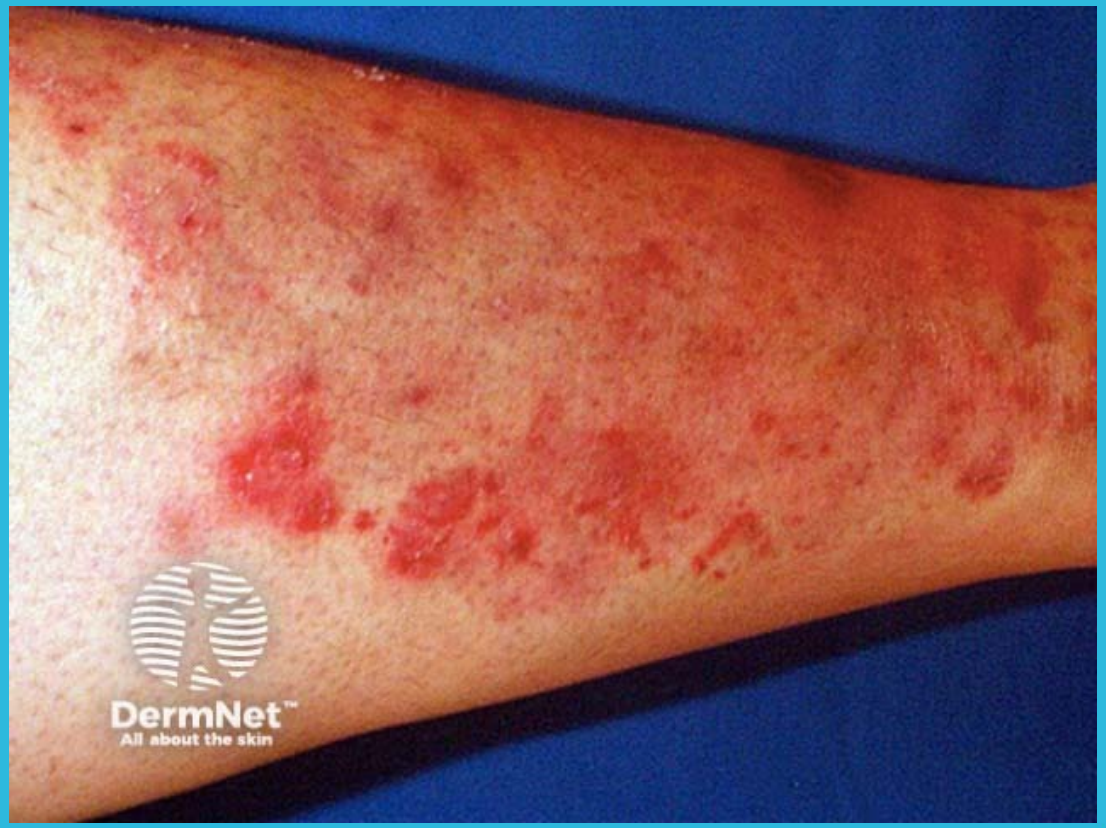
Adverse Effects: Contact Dermatitis

- Inactive ingredients (preservatives, lanolin, etc)
- Steroid itself
- Complaints: making rash worse, or stopped working as well



Adverse Effects: Worsening Tinea Infections

- Tinea incognito
- Majocchi granuloma (fungal folliculitis)

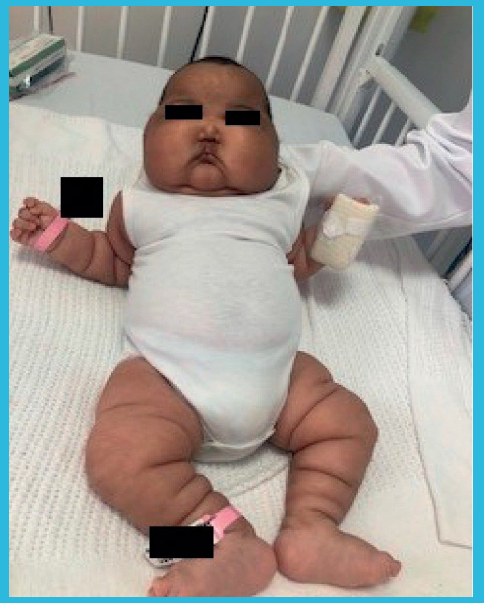


Systemic Adverse Effects (Rare)

EYE
- Topical steroid use on eyelids
- Glaucoma, cataracts

www.brightfocus.org

ENDOCRINE
- Cushing syndrome
- *Prolonged use, large BSA, children



Alkhuder L. 2019. Infantile iatrogenic Cushing's syndrome. Case Rep Pediatrics Dec 2.

TCS: Prescribing Considerations

- What are you treating?
- Anatomic location?
- Severity? Condition of skin? (lichenified, thick)
- Anticipated duration of treatment? Acute vs chronic?
- How much BSA involved?
- Best vehicle choices?
- Appropriate potency for this patient right now?

TCS: Potency Guidelines

ULTRA-HIGH POTENCY

- Palm, Sole, Scalp
- Thick plaques
- Extensor surfaces
- *NOT face, neck, body folds*

MID POTENCY

- Trunk, Arms, Legs
- Limited use in flexural (lichenified AD)
- *NOT face, neck, body folds*

LOW POTENCY

- Face, Eyelid, Genital, Neck
- Intertriginous
- Baby/Young Child

TCS: Duration Guidelines

*use should taper over time

SUPER-HIGH POTENCY

- < 3-4 weeks for thick, lichenified areas

MID POTENCY

- < 6-8 weeks for body areas
- (less for flexures)

LOW POTENCY

- < 2 weeks for sensitive areas

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TCS Prescribing Tips

- Know 1-2 TCS at each potency level
- Know what tube/jar sizes are available
- Quantity sufficient to treat affected areas
- Choose a vehicle your patient will use
- Add area-specific instructions to Rx

Triamcinolone ointment 0.1%
80 g
BID prn to affected areas on body. Not for face, neck, body folds.

Hydrocortisone 2.5% cream
30 g
BID prn to affected areas on face and neck.

Strategies for Ongoing TCS Treatment

Maximize TCS benefits & minimize risks

- Use lowest potency agent that will do the job
- Transition to PRN use as tolerated (no preventative use)
- Intermittent dosing: 2 days per week for maintenance
- Rotate TCS and nonsteroidal topicals (M-F/Sat-Sun, rotate weeks)
- Nonsteroidal Topicals: especially helpful for sensitive areas, kids

Nonsteroidal Topicals

Several Categories

- Calcineurin Inhibitors
- PDE4 Inhibitors
- Aryl hydrocarbon receptor agonist
- JAK Inhibitor

Most approved for children and/or adolescents

Topical Calcineurin Inhibitors

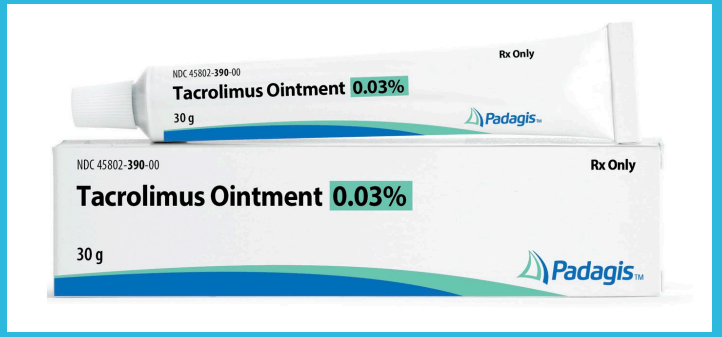
Pimecrolimus cream 1%

- Ages 2+ (AD)

Tacrolimus ointment 0.03%, 0.1%

- 0.03% ages 2+ (AD)
- 0.1% ages 16+ (AD)

- Can burn/sting



PDE4 Inhibitors

Eucrisa (crisaborole) 2% cream

- Age 3 mos+ (AD)

Zoryve (roflumilast) 0.15% & 0.3% cream, 0.3% foam

- 0.15% cream: Age 6+ (AD)
- 0.3% cream: Age 6+ (PsO)
- 0.3% foam: Age 9+ (Seb Derm), Age 12+ (PsO)

Aryl Hydrocarbon Receptor Agonist

VTAMA (tapinarof) cream

- Age 2+ (AD)
- Age 18+ (PsO)

JAK Inhibitors

Opzelura (ruxolitinib) 1.5% cream

- Age 2+ (AD), age 12+ (vitiligo)

Anzupgo (delgocitinib) 2% cream

- Age 18+ (chronic hand eczema)

Other Non-TCS Topical Psoriasis Medications

Calcipotriene 0.005% ointment/cream

- Vitamin D analog
- Good combo with TCS
- Intertriginous areas

Tazarotene cream/gel 0.05% & 0.1%

- Retinoid
- Good combo with TCS

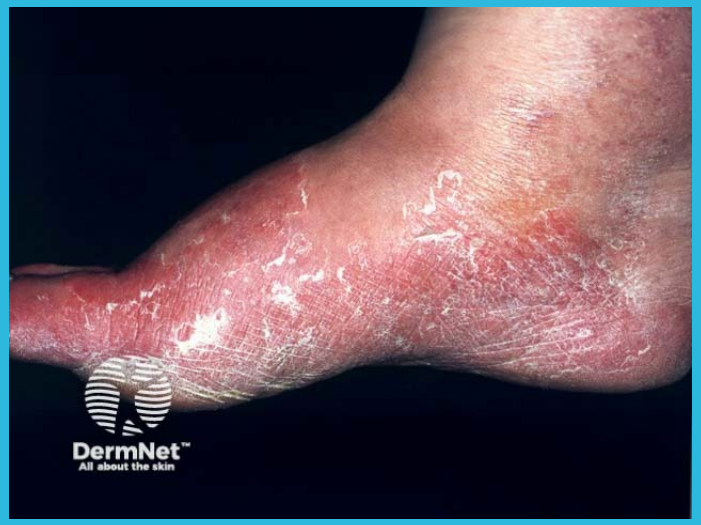
Topical calcineurin inhibitors (off label)

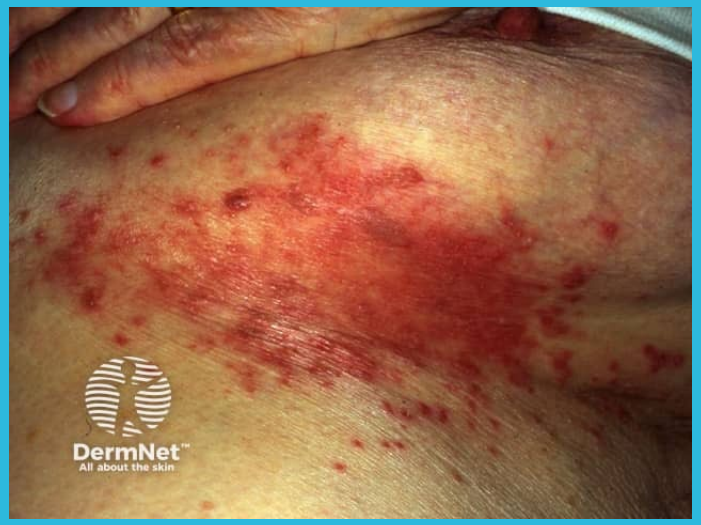
- Face/intertriginous/genital areas

Topical Antifungals

Main uses: Dermatophyte, Candida, Tinea versicolor

- What works best for each?





Classes of Topical Antifungals

CLASS	DRUGS	Dermatophyte	Candida	Tinea Versicolor
Imid**AZOLES**	Ketoconazole Miconazole Clotrimazole Econazole	X	X	X
Allyl/Benzylamines	Terbinafine Naftifine Butenafine	X	(+/-)	X
Hydroxypyridone	Ciclopirox	X	X	X
Polyene	Nystatin		X	

Common Fungal Infections

Fungus	Clinical	First Line Topical	Second Line Topical	Oral Options
Dermatophyte	Tinea pedis Tinea cruris Tinea corporis	Terbinafine	Azole Ciclopirox	Terbinafine Fluconazole Itraconazole
Candida (yeast)	Intertrigo	Azole	Nystatin	Fluconazole
Malassezia (yeast)	Tinea versicolor	Selenium sulfide Ketoconazole shampoo Other azole (cream etc) Terbinafine	Zinc pyrithione Ciclopirox	Fluconazole Itraconazole

Note: Tinea capitis and onychomycosis respond best to oral antifungal treatment

The Case Against Lotrisone
(clotrimazole/betamethasone dipropionate)

- Steroid is too potent (ultrapotent)
- Risk of adverse effects (atrophy)
- If it's fungal, steroid may decrease inflammation but worsen infection
- If it's dermatitis, the antifungal is unneccessary

Sunscreens


New!
BANANA BOAT
SPORT
Performance
30
Long Lasting
UVA/UVB Protection
Neutrogena
Ultra Sheer
DRY-TOUCH SUNBLOCK
45
FEELS CLEAN AND WEIGHTLESS
Aveeno
ACTIVE NATURALS
Continuous Protection
Sunblock Lotion
FACE
SPF 70
specially formulated for face • oil-free waterproof
active photobarrier complex

Sunscreens: Why Bother?

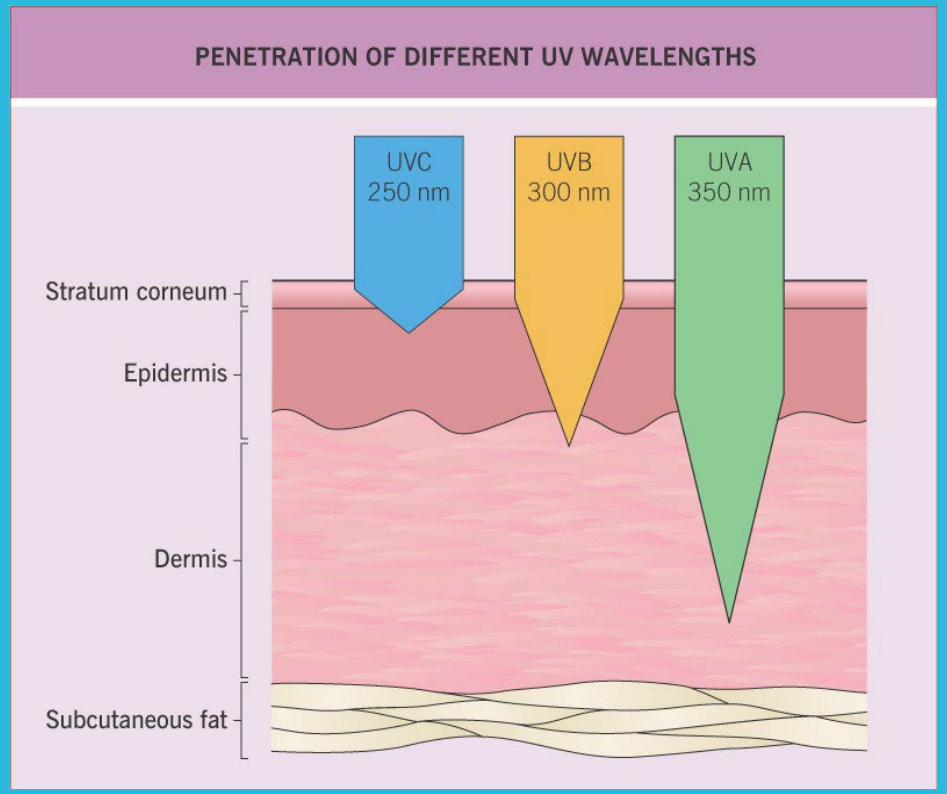
UV radiation causes skin cancer and photoaging

UVA = Aging

- Penetrates glass
- Skin thickening, wrinkles

UVB = Burning

- Penetrates water
- DNA damage, skin cancer



Sunscreen Terminology

Broad Spectrum = UVA + UVB protection

SPF (Sun Protection Factor) = ability to block UVB (amount of solar exposure NOT time)

- Very little difference above SPF 30
- SPF 15 blocks 93%, SPF 30 blocks 97%, SPF 50 blocks 98%

Water Resistance = maintains SPF after 40 or 80 minutes of water or sweat

- Cannot claim to be waterproof

ConferMED Connecting Primary Care to the Future

Sunscreen Active Ingredients

PHYSICAL/MINERAL

Zinc Oxide
Titanium Dioxide

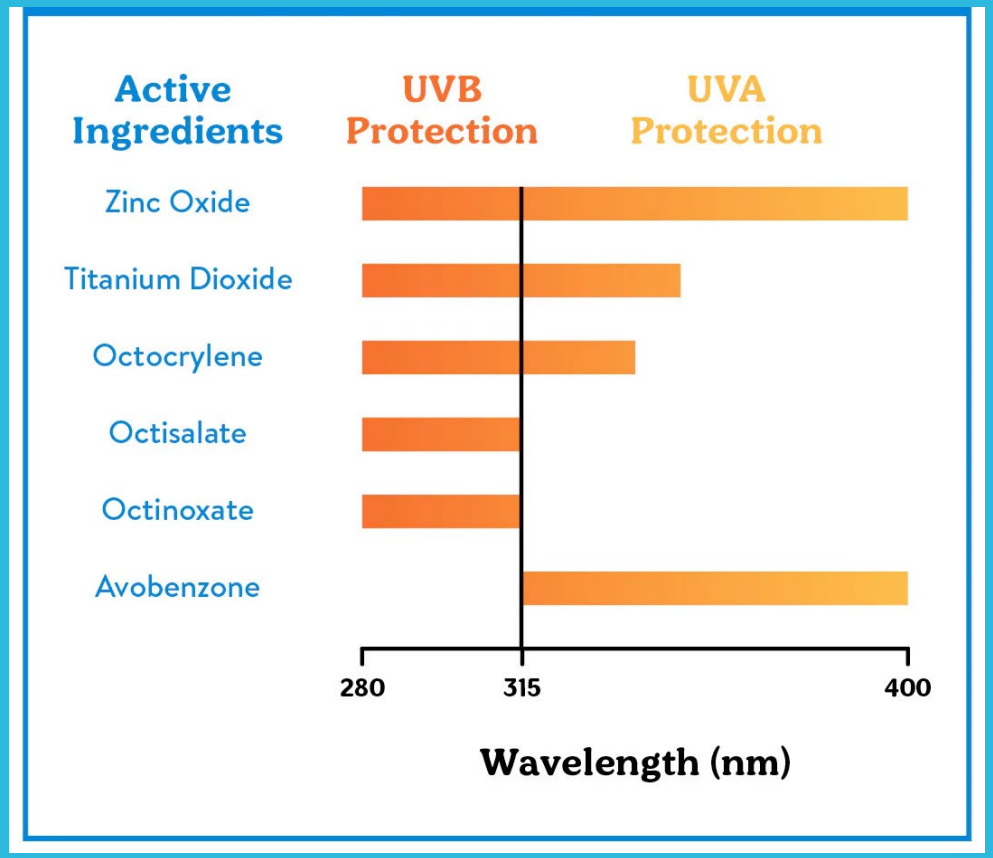
*white color, acne

CHEMICAL

Avobenzone
Oxybenzone
Octocrylene
Homosalate
Octinoxate
Octisalate
Meradimate

*irritation, photoallergic contact dermatitis, acne

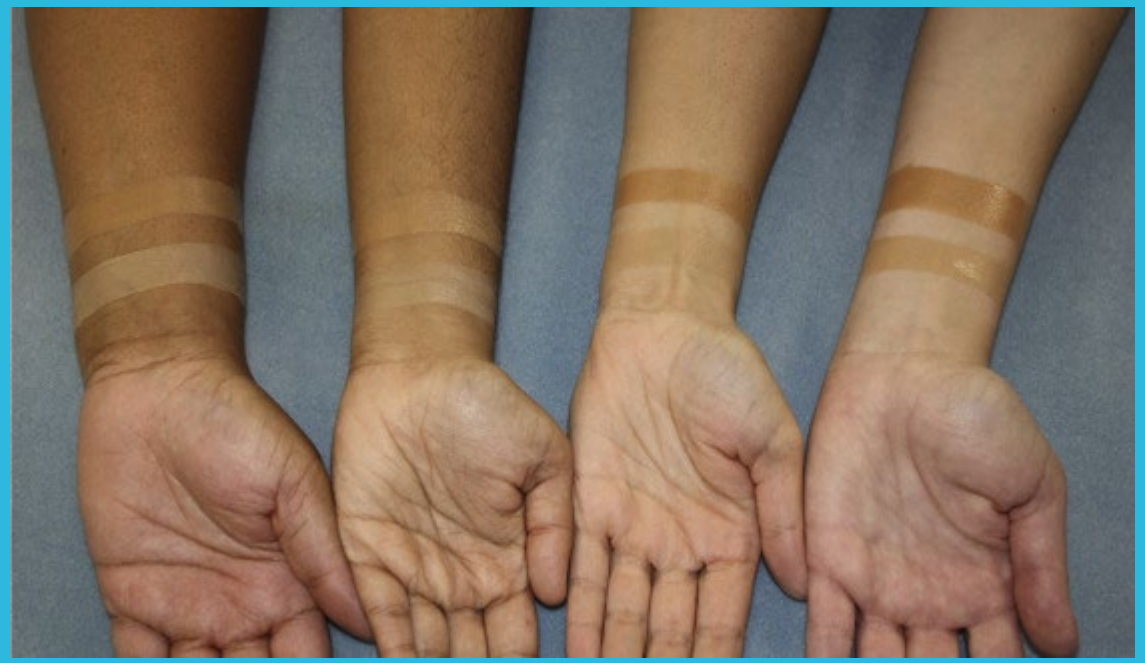
UVA/UVB Protection



Badgerbalm.com

Tinted Sunscreens

Contain IRON OXIDES & pigmentary TITANIUM DIOXIDE



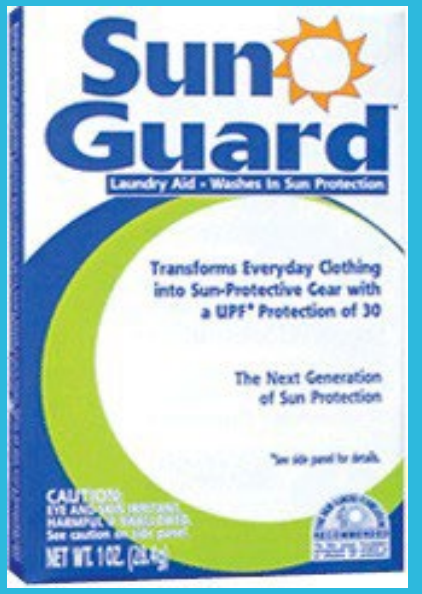
Tinted Sunscreens

Protect against VISIBLE LIGHT

- Melasma
- Post-inflammatory hyperpigmentation
- Certain photosensitive disorders

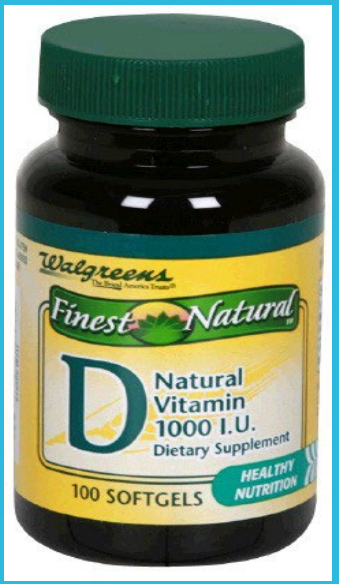
Sun-protective clothing

- Broad-brimmed hat
- Long sleeves
- Rash guard
- UV-protective clothing
- Sun Guard – adds UV protection to own clothing (wash in)



Sunscreens: What About Vitamin D?

- Needed to absorb calcium and for bone strength
- UVB required to synthesize Vitamin D
- Study: No Vitamin D deficiency with sunscreen use/hat
- BUT not tested with high SPF sunscreens or very strict photoprotection (photosensitive)

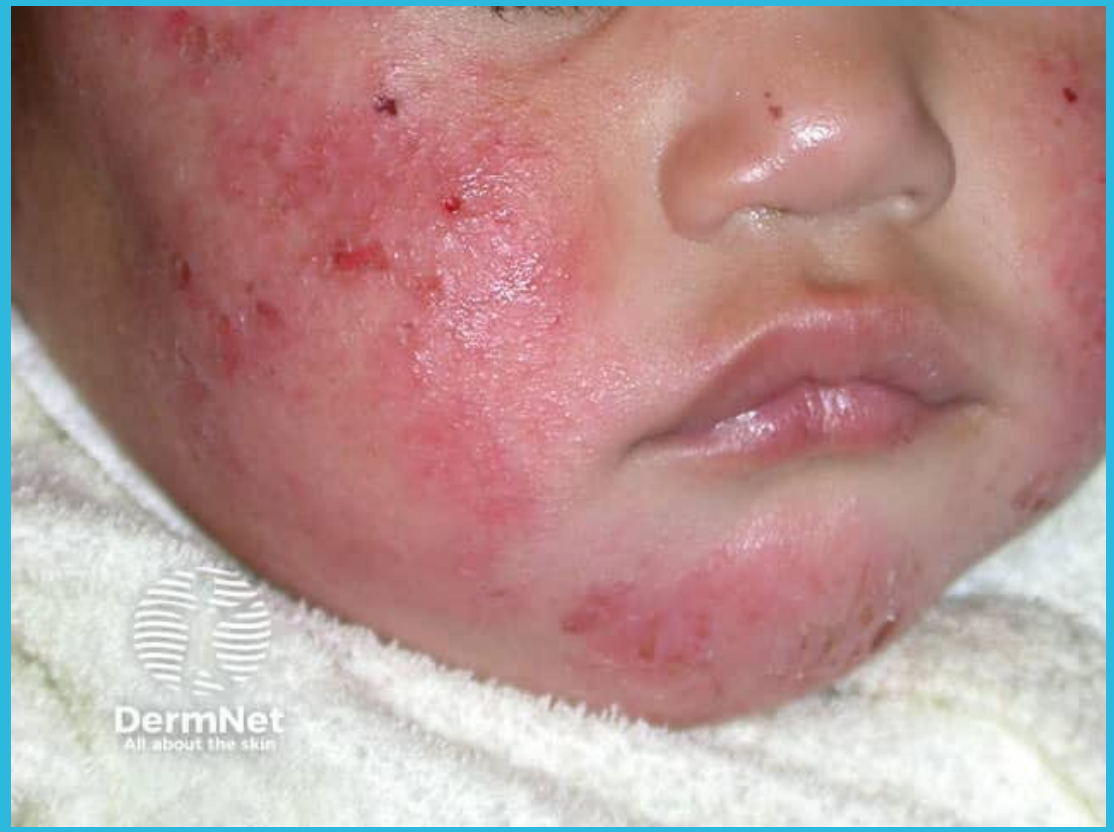


Sunscreen Tips/Recommendations

- Broad spectrum SPF 30+ (50+ may be better)
- Water resistant
- Apply evenly to all exposed areas, rub in
- Reapply every 2 hours, after swim/sweat
- Avoid sprays: uneven application, harder to achieve SPF
- BEST = THE ONE THAT GETS USED
- Combine with protective hats, clothing, shade structures

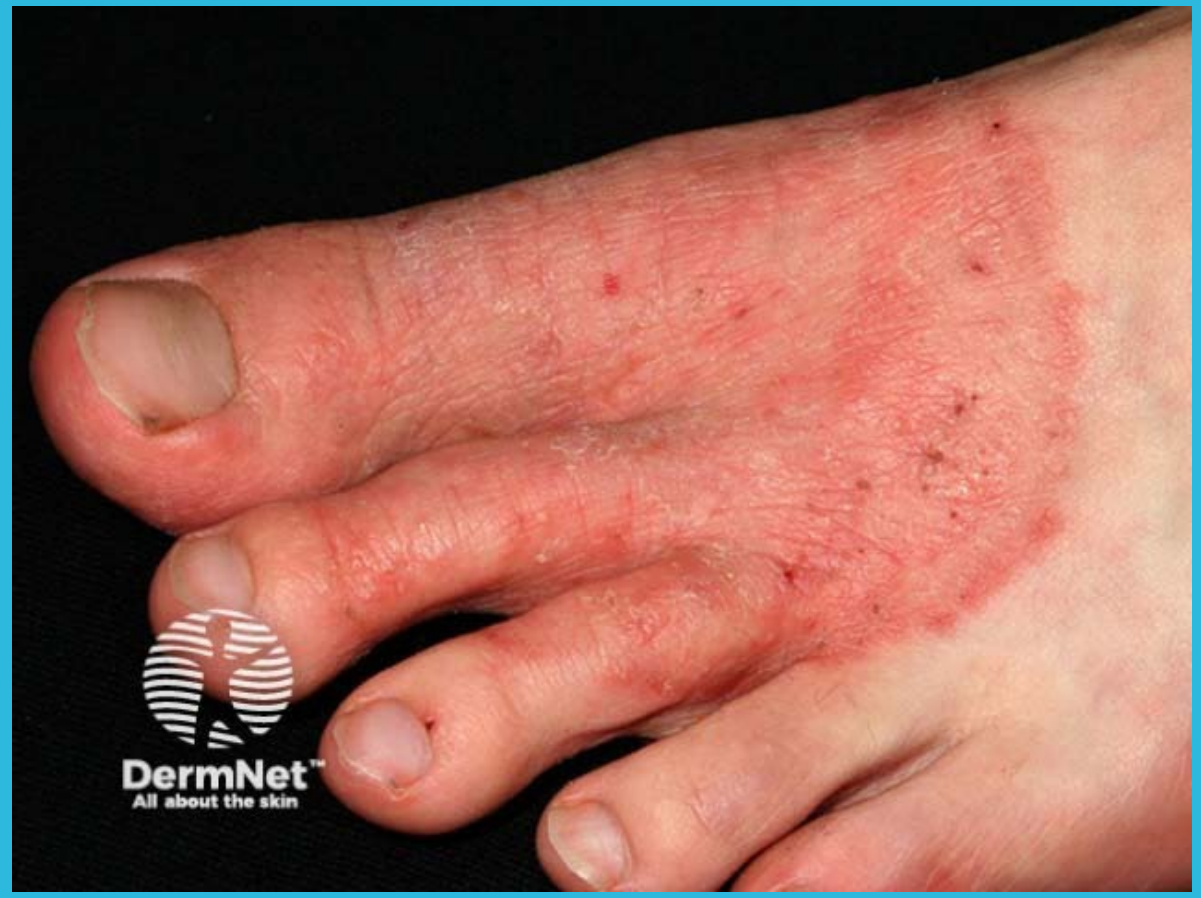
Case Studies

- Clinical Findings?
- Best topical steroid options?



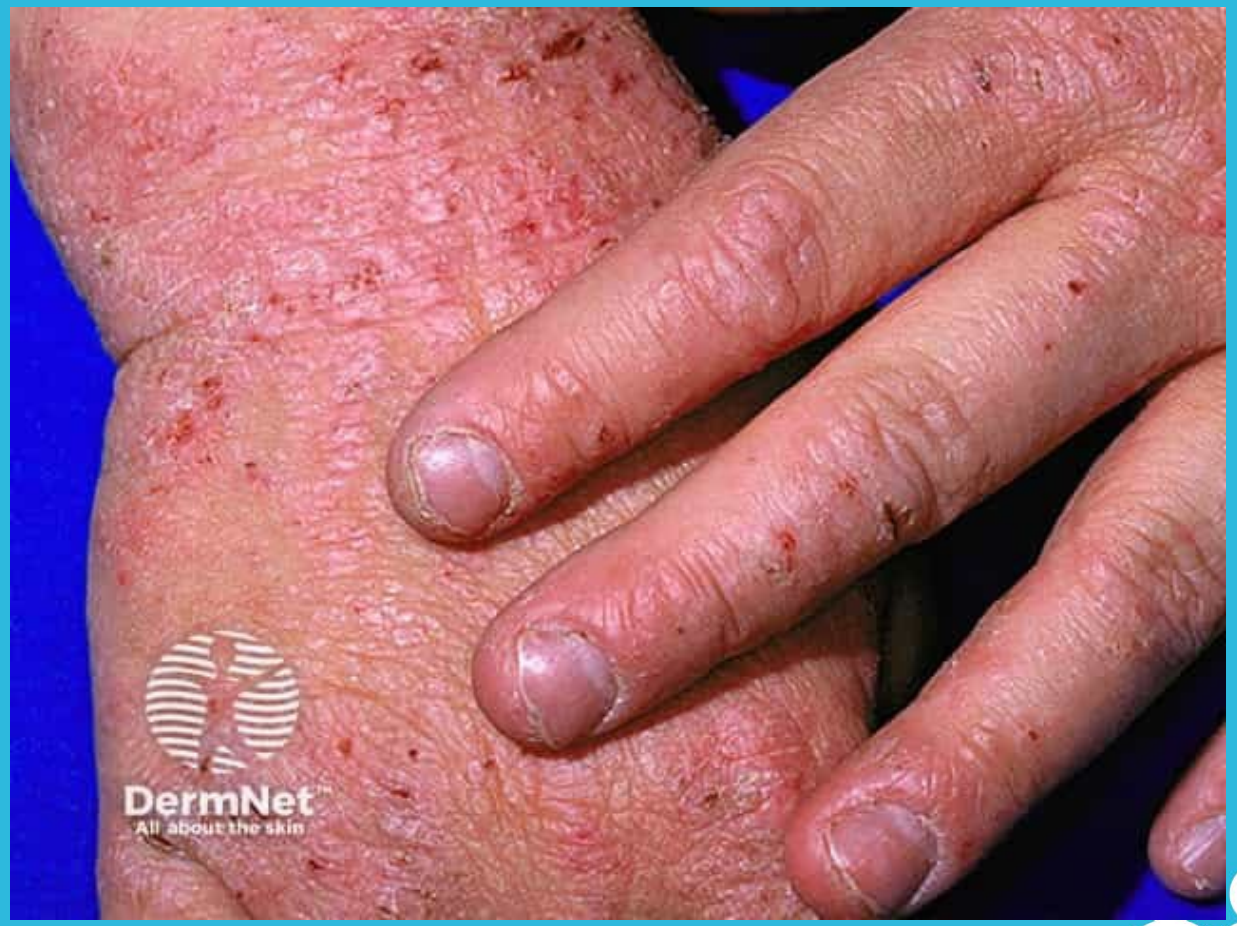
- Clinical Findings?
- Best topical steroid options?

- Clinical Findings?
- Likely diagnosis?
- Best topical treatment options?



- Clinical Findings?
- Best topical steroid options?
- What else could you use?

- Clinical Findings?
- Best topical steroid options?



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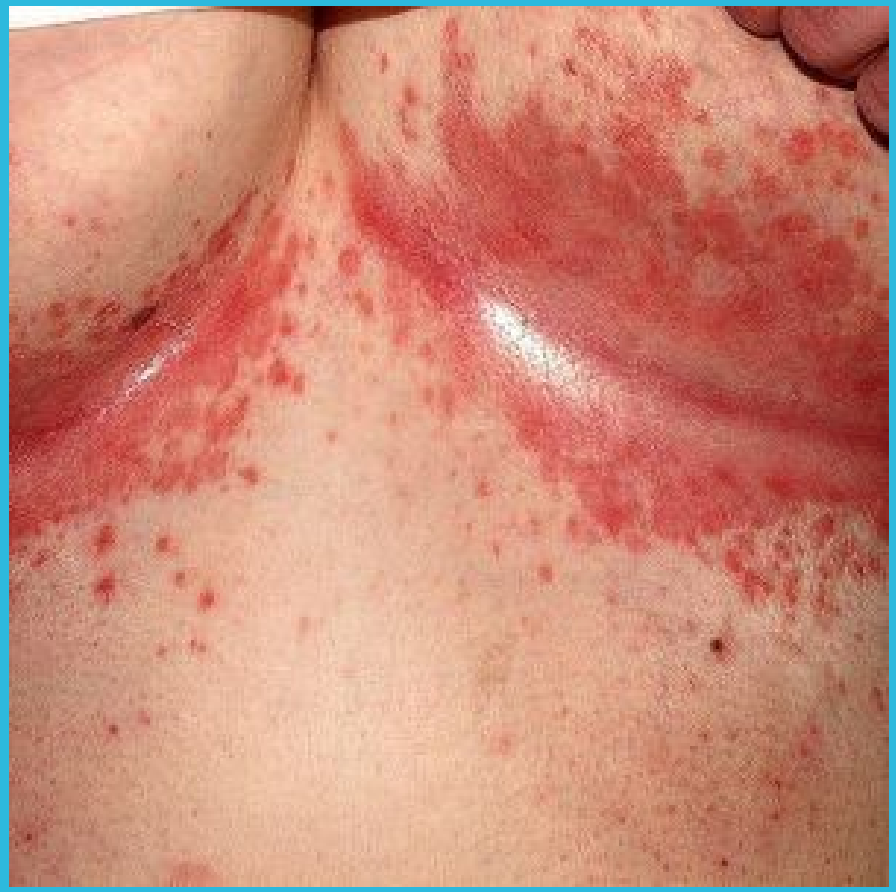

https://www.pcds.org.uk/clinical-guidance/intertrigo

Thank You!
Questions?