Optimal use of topical and intralesional corticosteroids

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Conflict of interest

• No conflicts to disclose
Educational Objectives

• Know the different classes and strengths of topical corticosteroids
• The attendee will be able to select 4 topical corticosteroids to treat the majority of steroid responsive dermatoses
• Understand common adverse effects of topical and intralesional corticosteroids and principles to help avoid these side effects
Principles of dermatologic therapies

- The **efficacy** of any topical medication is related to:
  - The active ingredient (inherent **strength**)
  - Anatomic **location**
  - The **vehicle** (the mode in which it is transported)
  - The **concentration** of the medication
Topical corticosteroids

- Topical corticosteroids steroids (TCS) produce an anti-inflammatory response in the skin
- They are used to treat many dermatological conditions, including atopic dermatitis and psoriasis
- They also provide symptomatic relief for burning and pruritic lesions
Topical corticosteroids

- Topical corticosteroids are organized into classes based on their strength (potency), ranging from super high potency (class I) to low potency (class VII)
  - Steroids within any class are equivalent in strength
  - Class one is about 1000 times more potent than hydrocortisone 1%
- Strength is inherent to the molecule, not the concentration
Where to use steroids

Class 4 or milder

High risk for atrophy

Need class 2 or stronger

Ointments better than creams
Vehicles

- **Ointments** (e.g. Vaseline): lubricating, semioocclusive, greasy
  - Useful for smooth, non-hairy skin; dry, thick, or hyperkeratotic lesions

- **Creams** (vanish when rubbed in): less greasy, not occlusive, may sting, could cause irritation (preservatives/fragrances)
  - Useful for acute exudative inflammation, intertriginous areas (when skin is in contact with skin, e.g. armpits, groin, pannus)

- **Lotion** (pourable liquid): less greasy, less occlusive, may sting
  - Helpful for acute exudative inflammation (e.g. acute contact dermatitis) and on hairy areas
Vehicles

- **Oils**: less stinging, keratolytic (removes scale)
  - Useful for the scalp, especially for people with coarse or very curly hair

- **Gel** (jelly-like): may sting, greaseless, least occlusive; dry quickly
  - Useful for acne; on scalp/hairy areas without matting

- **Foams** (cosmetically elegant): spread readily, easier to apply; more expensive
  - Useful for hairy areas, inflamed skin

- **Sprays**: aerosols (rarely used), pump sprays
# Vehicles:

<table>
<thead>
<tr>
<th>Vehicle</th>
<th>Solvent</th>
<th>Ideal Locations</th>
<th>Ease of use</th>
<th>Effect on potency</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lotion</td>
<td>Water based</td>
<td>General</td>
<td>+++</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Cream</td>
<td>Water based</td>
<td>General</td>
<td>++</td>
<td>+</td>
<td></td>
</tr>
<tr>
<td>Solution</td>
<td>Alcohol based</td>
<td>Scalp</td>
<td>+++</td>
<td>+</td>
<td>Stings in open wounds / eczema</td>
</tr>
<tr>
<td>Gel</td>
<td>Alcohol based</td>
<td>Face, Intertriginous</td>
<td>+++</td>
<td>+</td>
<td>Preferred by men</td>
</tr>
<tr>
<td>Foam</td>
<td>Variable – usually alcohol</td>
<td>Scalp, hair bearing areas</td>
<td>+++</td>
<td>++</td>
<td>Few generic forms available</td>
</tr>
<tr>
<td>Ointment</td>
<td>Oil based</td>
<td>Palms and soles</td>
<td>+</td>
<td>+++</td>
<td>Stains clothing, “greasy” feeling</td>
</tr>
<tr>
<td>Occlusive bandages</td>
<td>Impregnated in medical tape</td>
<td>Palms and soles</td>
<td>+</td>
<td>+++</td>
<td>Limited use, atrophy big concern</td>
</tr>
<tr>
<td>Proprietary Formulations</td>
<td>Micro - emulsions</td>
<td>Variable</td>
<td>+++</td>
<td>+++</td>
<td>Expensive - branded</td>
</tr>
</tbody>
</table>
Solution | lotion | cream | lipocream | ointment | Foam

Department of Dermatology
# TCS Strength

<table>
<thead>
<tr>
<th>Potency</th>
<th>Class</th>
<th>Example Agent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Super high</td>
<td>I</td>
<td>Clobetasol propionate 0.05%</td>
</tr>
<tr>
<td>High</td>
<td>II</td>
<td>Fluocinonide 0.05%</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Mometasone furoate ointment 0.1%</td>
</tr>
<tr>
<td>Medium</td>
<td>III – V</td>
<td>Mometasone furoate cream 0.1%</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Triamcinolone acetonide ointment 0.1%</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Triamcinolone acetonide cream 0.1%</td>
</tr>
<tr>
<td>Low</td>
<td>VI – VII</td>
<td>Fluocinolone acetonide 0.01%</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Desonide 0.05%</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Hydrocortisone 1%</td>
</tr>
</tbody>
</table>
Know one steroid from each class that would be available to the majority of your patients

<table>
<thead>
<tr>
<th>Class</th>
<th>Drug</th>
<th>Dosage form(s)</th>
<th>Strength (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>I. Very high potency</td>
<td>Augmented betamethasone dipropionate</td>
<td>Ointment</td>
<td>0.05</td>
</tr>
<tr>
<td></td>
<td>Clobetasol propionate</td>
<td>Cream, foam, ointment</td>
<td>0.05</td>
</tr>
<tr>
<td></td>
<td>Diflorasone diacetate</td>
<td>Ointment</td>
<td>0.05</td>
</tr>
<tr>
<td></td>
<td>Halobetasol propionate</td>
<td>Cream, ointment</td>
<td>0.05</td>
</tr>
<tr>
<td>II. High potency</td>
<td>Amcinonide</td>
<td>Cream, lotion, ointment</td>
<td>0.1</td>
</tr>
<tr>
<td></td>
<td>Augmented betamethasone dipropionate</td>
<td>Cream</td>
<td>0.05</td>
</tr>
<tr>
<td></td>
<td>Betamethasone dipropionate</td>
<td>Cream, foam, ointment, solution</td>
<td>0.05</td>
</tr>
<tr>
<td></td>
<td>Desoximetasone</td>
<td>Cream, ointment</td>
<td>0.25</td>
</tr>
<tr>
<td></td>
<td>Desoximetasone</td>
<td>Gel</td>
<td>0.05</td>
</tr>
<tr>
<td></td>
<td>Diflorasone diacetate</td>
<td>Cream</td>
<td>0.05</td>
</tr>
<tr>
<td></td>
<td>Fluocinonide</td>
<td>Cream, gel, ointment, solution</td>
<td>0.05</td>
</tr>
<tr>
<td></td>
<td>Halcinonide</td>
<td>Cream, ointment</td>
<td>0.1</td>
</tr>
<tr>
<td></td>
<td>Mometasone furoate</td>
<td>Ointment</td>
<td>0.1</td>
</tr>
<tr>
<td></td>
<td>Triamcinolone acetonide</td>
<td>Cream, ointment</td>
<td>0.5</td>
</tr>
<tr>
<td>III-IV. Medium potency</td>
<td>Betamethasone valerate</td>
<td>Cream, foam, lotion, ointment</td>
<td>0.1</td>
</tr>
<tr>
<td></td>
<td>Clocortolone pivalate</td>
<td>Cream</td>
<td>0.1</td>
</tr>
<tr>
<td></td>
<td>Desoximetasone</td>
<td>Cream</td>
<td>0.05</td>
</tr>
<tr>
<td></td>
<td>Fluocinolone acetonide</td>
<td>Cream, ointment</td>
<td>0.025</td>
</tr>
<tr>
<td></td>
<td>Flurandrenolide</td>
<td>Cream, ointment</td>
<td>0.05</td>
</tr>
<tr>
<td></td>
<td>Fluticasone propionate</td>
<td>Cream</td>
<td>0.05</td>
</tr>
<tr>
<td></td>
<td>Fluticasone propionate</td>
<td>Ointment</td>
<td>0.005</td>
</tr>
<tr>
<td></td>
<td>Mometasone furoate</td>
<td>Cream</td>
<td>0.1</td>
</tr>
<tr>
<td></td>
<td>Triamcinolone acetonide</td>
<td>Cream, ointment</td>
<td>0.1</td>
</tr>
<tr>
<td>V. Lower-medium potency</td>
<td>Hydrocortisone butyrate</td>
<td>Cream, ointment, solution</td>
<td>0.1</td>
</tr>
<tr>
<td></td>
<td>Hydrocortisone probutate</td>
<td>Cream</td>
<td>0.1</td>
</tr>
<tr>
<td></td>
<td>Hydrocortisone valerate</td>
<td>Cream, ointment</td>
<td>0.2</td>
</tr>
<tr>
<td></td>
<td>Prednicarbate</td>
<td>Cream</td>
<td>0.1</td>
</tr>
<tr>
<td>VI. Low potency</td>
<td>Alclometasone dipropionate</td>
<td>Cream, ointment</td>
<td>0.05</td>
</tr>
<tr>
<td></td>
<td>Desonide</td>
<td>Cream, gel, foam, ointment</td>
<td>0.05</td>
</tr>
<tr>
<td></td>
<td>Fluocinolone acetonide</td>
<td>Cream, solution</td>
<td>0.01</td>
</tr>
<tr>
<td>VII. Lowest potency</td>
<td>Dexamethasone</td>
<td>Cream</td>
<td>0.1</td>
</tr>
<tr>
<td></td>
<td>Hydrocortisone</td>
<td>Cream, lotion, ointment, solution</td>
<td>0.25, 0.5, 1</td>
</tr>
<tr>
<td></td>
<td>Hydrocortisone acetate</td>
<td>Cream, ointment</td>
<td>0.5-1</td>
</tr>
</tbody>
</table>
TCS Strength

- Remember to look at the **class** not the percentage
  - Note that clobetasol 0.05% is much stronger than hydrocortisone 1%.
- Note that mometasone ointment is a high potency while mometasone cream is low potency because of the nature of the vehicle

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TCS Selection

- **Super high** potency (class I) are used for severe dermatoses over nonfacial and nonintertriginous areas
  - Scalp, palms, soles, and thick plaques on extensor surfaces
- **Medium to high** potency steroids (classes II-V) are appropriate for mild to moderate nonfacial and nonintertriginous areas
  - Okay to use on flexural surfaces for limited periods
- **Low** potency steroids (classes VI, VII) can be used for large areas and on thinner skin
  - Face, eyelid, genital and intertriginous areas
Absorption

- TCS are better absorbed through areas of inflammation and desquamation compared to normal skin.
- Absorbed more readily through thin stratum corneum of infants compared to adults.
- Anatomic regions with a thin epidermis are significantly (e.g., eyelid) more permeable than thick-skinned areas (e.g., palms).
- Ointments allow better percutaneous drug absorption and are therefore more potent than creams or lotions.
Local side effects of TCS

- Local side effects of topical steroids include:
  - Skin atrophy
  - Telangiectasias
  - Striae
  - Acne or rosacea-like eruption
  - Allergic contact dermatitis
  - Hypopigmentation

- The higher the potency the more likely side effects are to occur

- To reduce risk, the least potent steroid should be used for the shortest time, while still maintaining effectiveness
Perioral Dermatitis
Striae from topical steroids
Local Cutaneous Side Effects

Skin Atrophy

Striae
Local Cutaneous Side Effects

Hypopigmentation
Systemic Side Effects of TCS

- Systemic side effects are **rare** due to low percutaneous absorption
- They can include:
  - Glaucoma
  - Hypothalamic pituitary axis suppression
  - Cushing’s syndrome
  - Hypertension
  - Hyperglycemia
- Exercise caution with widespread use and occlusive methods (e.g., plastic wrap, bandages)
Principles of use

- In general:
  - Super high potency: treat for <4 weeks
  - High and Medium potency: <6-8 weeks
  - Low potency: side effects are rare. Treat facial, intertriginous, and genital dermatoses for 1-2 week intervals to avoid skin atrophy, telangiectasia, and steroid-induced acne

- Longer-term management: use least-potent corticosteroid that is effective
Principles of use

- Stop treatment when skin condition resolves
  - Taper with gradual reduction of both potency and dosing frequency to avoid rebound/flares

- Intermittent therapy may be effective for maintaining long-term disease control
  - Twice weekly application of TCS have been shown to reduce the risk of relapse in patients with atopic dermatitis

- If the patient does not respond to treatment within these guidelines, consider referral to a dermatologist
Treatment Tips

- Greater caution regarding potency is needed when treating thin sites (face, neck and skin folds)
- Avoid placing an absolute limit on duration of steroid use, which can lead to unsatisfactory outcomes
- Address patient fears of side effects
  - Improve adherence and avoid under treatment
What do I use?

• Low potency: Desonide or hydrocortisone butyrate
• Medium potency: triamcinolone 0.1%
• High potency: clobetasol

• These will allow you to treat most steroid responsive skin diseases. All come in generic options
Prescribing TCS

The following slides will review how to estimate the amount of medication to prescribe according to the affected body surface area (BSA)
Estimating BSA: Palm of Hand

1 Palm = 1% BSA
Use the size of the patient’s palm, not your own
Estimating Topicals: Fingertip Unit

- Quantity of topical medication (dispensed from a 5mm nozzle) placed on pad of the index finger from distal tip to DIP joint
- Fingertip unit (FTU) = 500 mg = treats 2% BSA
1 FTU (0.5 grams) = 2% BSA

How much TCS should you prescribe for 2% BSA BID x 30 days?
1 FTU (0.5 grams) = 2% BSA

1 FTU = 0.5 grams = 2% BSA

0.5 grams x 2 times per day = 1 gram

1 gram x 30 days = 30 grams
Estimating Amounts: Reassess

- It takes \(~30\) grams to cover an average adult body (for one application)

- The best way to assure you are giving the right amount is to re-assess on follow-up
  - If your patient was given a 30-gram tube, confirm they are using it according to instructions, and ask how long that tube lasts
  - If a 30-gram tube only lasts them 2 weeks, they need 2 of them to last a month
Estimating BSA: Rule of Nines

- The “rule of nines” is a quick way of estimating the affected BSA
- The body is divided into areas of 9%
- Pediatric versions exist and should be used when evaluating children

Which corticosteroid would you choose?

- a. Clobetasol 0.05% ointment BID
- b. Desonide 0.05% ointment BID
- c. OTC topical hydrocortisone multiple times per day
- d. Triamcinolone 0.1% ointment BID
Which corticosteroid would you choose?

a. Clobetasol 0.05% ointment BID
b. Desonide 0.05% ointment BID
c. OTC topical hydrocortisone multiple times per day
d. Triamcinolone 0.1% ointment BID

I would pick triamcinolone or clobetasol BID and see them back in clinic in 2-4 weeks for re-evaluation.
Intralesional corticosteroids

• Direct delivery of corticosteroids into skin lesions

• Indications: acute and chronic inflammatory skin diseases, hypertrophic scarring/keloids
  – Psoriasis, lichen simplex chronicus, cystic acne, inflamed epidermoid cysts, keloid scarring, discoid lupus and others
Equipment

• 1 mL syringe
• 30 gauge needle
  – Locking needles
• ½ or 1 inch needles
• Bacteriostatic saline or lidocaine to mix/dilute the corticosteroid
• Triamcinolone 10mg/mL or 40mg/ML
Mixing solution

• Shake bottle
• Determine concentration of desired injection
  – 2.5mg/mL up to 40mg/mL
  – Example: for acne 2.5mg/mL, for keloid may need 20-40mg/mL
  – Dilute with desired amount of saline
  – Mix/shake syringe to be sure medication is adequately diluted
Injection technique

• Inject into dermis
  – Injecting into subcutis more likely to cause atrophy
• Inject at 45 to 90 degree angle
• Inject enough to cause blanching
Side effects and complications

• Most common side effects are local: atrophy and hypopigmentation, sterile abscess

• Avoid complications by using lowest concentration and smallest quantity of drug to achieve desired results
  – Error on side of undertreating and repeating treatment
  – Avoid injecting into fat. Greater risk of atrophy and minimal anti inflammatory effect
Side effects

• Avoid injecting lesions in the glabella
• Possible systemic steroid effects with high concentrations
  – Hyperglycemia, adrenal suppression, menstrual irregularity
Steroid Summary

• Topical and intralesional steroids are safer than systemic
• Know the strength of what you are prescribing
• Side effects happen – educate your patient
• Get good at 4 topical steroids
• Remember to choose the vehicle wisely
• Application is time consuming <10% BSA for most patients
Are there any questions?

• Enjoy the meeting