Topical Corticosteroids

May, 1998 [iii]

Topical corticosteroids are widely used in the treatment of inflammatory skin conditions. There are over 20 agents to choose from, and an abundance of formulations. Optimal therapy involves careful consideration of the disease's steroid responsiveness, as well as the potency, formulation, application frequency, and cost of the topical steroid.

Highlights

- Topical corticosteroids have been classified into 7 potency groups: (**Group 1 = Ultra High Potency**, and **Group 7 = Lowest Potency**).
- **Higher potency** drugs are useful in more resistant conditions and thick skin areas. Caution should be taken to minimize the potential for side effects.
- **Lower potency** drugs are generally preferred on thin skin areas, in young children & infants, and where long term use is required. Many conditions can be managed with low or mid potency agents.
- A **step-down approach** from higher to lower potency agents, less frequent application, or to non-steroid emollients is often useful for maintenance therapy.
- **Ointments** cause more occlusion and are more effective in dry & hyperkeratinized skin conditions.
- Relatively **low-cost creams/ointments** per potency group

Ultra-High:	**Clobetasol propionate**	**(Dermovate®)**
High:	**Betamethasone dipropionate**	**(Diprosone®)**
Mid:	**Betamethasone valerate**	**(Betaderm®)**
Low:	**Hydrocortisone**	**(Cortate®)**

PRODUCT SELECTION & USE

Potency: Groups 1 – 7

Topical corticosteroids are classified according to their relative potencies. Seven potency categories (Group 1=Ultra high potency and Group 7=Lowest potency) have been used and described in **Tables 3 and 4**.[1,2] Higher potency agents exert a greater anti-inflammatory activity and carry a greater risk of side effects. Optimizing therapy involves choosing the agent with the lowest potency, which will control the skin condition.

Lower potency products are preferred on areas where penetration is high such as the *groin*, the *axillae*, and the *face*. They are also recommended in young *children*, *infants*, and the *elderly* who are more prone to local and systemic side effects. These agents are usually preferred in patients who require *long term therapy* or application to *large areas*.[3]

Higher potency agents are indicated in areas with *chronic lesions* (plaque psoriasis, lichen simplex, and discoid lupis erythematosus) and areas where skin penetration is poor (such as the *elbows, knees, palms, soles*).[3] After initial control is obtained, maintenance therapy with a lower potency agent is often advisable. Occlusive dressings should be avoided when using Ultra-potent agents.[4]

Vehicle

Ointments are more potent and effective than other formulations due to their natural occlusive nature. Ointments are generally preferable in *dry, brittle, fissured, scaly, or hyperkeratinized* skin areas. They are more effective in treating *chronic lesions* (psoriasis). They should not be used in areas such as the axilla, groin, or skin folds as their occlusive effect may cause maceration, folliculitis and potential systemic side effects.[5] Ointments are particularly useful in *young children with infantile atopic dermatitis* where dryness of the skin is a particular problem.

Creams are often preferred for *non-acute dermatoses* as they are *cosmetically more acceptable*. Proper application requires rubbing fully into the skin in such a way that a residue is not visible after application. Some patients with chronic conditions may benefit from application of creams during the day, followed by ointments at night to maximize efficacy.

Gels are non-greasy, non-occlusive, non-staining, and quick drying. They are most useful when applied to *hairy or facial* areas where residue from a vehicle is unacceptable. Caution is warranted if used on the face as most products are potent.

Lotions are the least occlusive type of base. They are useful when *large skin areas* or *skin flexures* are affected. They are most useful in conditions where there is *acute inflammation* or tenderness such as acute contact dermatitis.[8] Six ounces should cover the whole body of an average adult. Some lotions, such as scalp lotions, are suitable for hairy areas.

Concentration – Higher concentrations will increase the potency, however, this effect seems to plateau. For example, increasing the concentration of hydrocortisone by a factor of 10 results in an increase in potency by a factor of only 4.[6]

Hydration/Occlusion – Application to hydrated skin **after bathing** can increase absorption by 4-5 times.[7] **Occlusion (e.g. plastic wrap)** increases absorption by up to 10 times.[8] Short term use of occlusion may be useful for severe lesions. If plastic occlusion is used, a maximum of 12 hours in a 24 hour period is recommended to reduce the potential problems of sweat retention, infection, and systemic side effects.[9]

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Other factors – Various substances can enhance the penetration and potency of topical corticosteroids. For example, while Diprosone® and Diprolene® both contain betamethasone dipropionate, the penetration of the drug is enhanced in an **optimized base containing propylene glycol** resulting in an *Ultra-high* potency product. **Urea and salicylic acid** also enhance the potency of a product and can be especially useful in conditions such as psoriasis.

COMPARATIVE SAFETY

The risk of side effects from topical corticosteroids is related to drug potency, duration of therapy, frequency of application and anatomical area. Common side effects are described in **Table 1**. *Dermal atrophy* is one of the most notable local side effects. It may occur over several weeks, and is usually reversible. Systemic side effects such as *HPA axis suppression* are rare but have been seen when the Ultra potent (Group 1) corticosteroids are used. Infants, children, and elderly are at higher risk. **Limiting the use of Ultra potent agents** to a maximum of **50g/week** and a maximum duration of **2 weeks** is recommended. Rarely, topical corticosteroids may cause allergic reactions where the allergy is to the steroid itself. In addition, other ingredients (e.g. lanolin, wool alcohols, parabens, antibiotics) in the product may be responsible.[10] Allergy testing may be required to select an alternative product. (Common allergens included in Table 3 comparison.)

Table 1 - Side effects of topical corticosteroids

- **Skin atrophy**: Usually occurs after several weeks of treatment. Reversible within 2 months (sometimes longer).
- **Striae**: Most common around the groin, axillae, and inner thigh. Usually not reversible, although may fade over time.
- **Telangiectasia**: Visible distended capillaries. Often seen on the face, neck, chest. Usually reversible, but can be permanent.
- **Purpura**: Bruising occurs with minimal trauma
- **Fine hair growth**: Reversible.
- **Acneform/Rosacea like eruptions**: Common on the face with **high potency** agents. Reversible.
- **Hypopigmentation**: Especially in dark skinned people. Reversible.
- **Infections**: Symptoms of bacterial, fungal, and viral infections may be masked. Conditions may worsen without being recognized.
- **Rebound dermatitis**: Can occur with sudden discontinuation.
- **Systemic**: (e.g. Hypothalamic-pituitary axis suppression, Cushing's syndrome, hyperglycemia, growth retardation in children).[11] Rare. Children and elderly are at higher risk. Increased risk with *Ultra potent* agents, or *High potency* agents on thin skin areas. Avoid using more than 50g/week or longer than 2-4 weeks treatment with Ultra potent agents.

NOTES FOR OPTIMAL PRESCRIBING

Application frequency - Topical corticosteroids may be applied from OD to QID. For the initial management of acute conditions, BID to QID application may be necessary. Less frequent dosing (OD-BID) is usually adequate for the more potent agents. Since corticosteroids penetrate slowly, the skin serves as a reservoir for the drug. Therefore, **frequency of application can often be reduced with repeated application**. Once an acute condition is brought under control, **OD to BID dosing is often adequate for maintenance therapy** and reduces the risk of side effects and tachyphylaxis.

Clarifying "Apply sparingly"- Patient instructions often include "Apply sparingly". It is important to apply just enough to cover the affected area. Excess quantities are messy and a waste of money. As these products are well tolerated when used appropriately, it is important that the instruction to "Apply sparingly" does not convey the message that these products are extremely dangerous. An excessive fear of topical corticosteroids may result in poor compliance, and sub-optimal therapy. Before trying a second agent, potential non-compliance (e.g. patient only using OD or PRN) should be assessed if initial therapy appears to fail.

Tolerance (Tachyphylaxis) - Tolerance to the anti-inflammatory effects of topical corticosteroids can occur. This usually takes several weeks, but can occur earlier. Tolerance should be suspected if an inflammatory skin condition worsens after an initial good response.

Tolerance may be prevented by limiting long term application frequency to once or twice daily. It is reversible and can be managed by stopping therapy for a few (~4) days, and then resuming with the same or alternate agent.[2] Use of non-steroid bland emollients (See **Table 6**), following acute management of flare-ups, may also be a useful strategy.[12]

Mixing of Bases – Mixing of bases, or adding ingredients can reduce the potency and shelf-life of some formulations.[7]

Topical Antibiotic-Corticosteroid Combinations

There are few indications for antibiotic corticosteroid combinations. Many of the products contain neomycin, which is highly sensitizing and should be avoided. When infections necessitate the addition of an antibiotic, systemic treatment is usually preferred. Antifungal corticosteroid combinations are also best avoided except in exceptional circumstances. **Use of these combination products is generally discouraged as they are overused, sensitizing, and allow for treatment without diagnosis**.

Table 2 – Topical Antibiotic-Corticosteroid Combinations

Cortisporin® (Ointment)	($36/30g)
•Polymyxin B/Bacitracin(Zinc)/Neomycin/Hydrocortisone 1%	
•Anti-inflammatory (**Low**-potency)/antibacterial	
Kenacomb Mild® (Cream, Ointment)	($25/30g)
•Neomycin/Gramicidin/Nystatin/Triamcinolone Acet 0.025%	
•Anti-inflammatory (**Mid**-potency)/antibacterial/antifungal	
***Kenacomb/Viaderm-KC* ® (Cream)**	($23/30g)
•Neomycin/Gramicidin/Nystatin/Triamcinolone Acet 0.1%	
•Anti-inflammatory (**Mid**-potency)/antibacterial/antifungal	
***Kenacomb/Viaderm-KC*® (Ointment)**	($23/30g)
•Neomycin/Gramicidin/Nystatin/Triamcinolone Acet 0.1%	
•Anti-inflammatory (**High**-potency)/antibacterial/anti-fungal	
Lotriderm® Cream	($29/30g)
•Betamethasone dipropionate 0.05% / Clotrimazole	
•Anti-inflammatory (**High**-potency)/antifungal	
•NOT suitable for diaper dermatitis due to high potency! [2,6]	

References available on request

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