

## ARTICLE

# Rational use of topical corticosteroids

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Santiago de Chile**Key words**atrophy, cream, ointment,  
pregnancy, vehicle*Aust Prescr 2013;36:158–61***SUMMARY**

Many dermatological conditions will respond to a topical corticosteroid. The clinical outcome will depend on making a correct clinical diagnosis and applying the right molecule in the most appropriate vehicle for the correct duration.

Topical corticosteroids are classified by their strength, but the same molecule will have different effects depending on the vehicle. The patient's age and the affected area of skin are other important factors.

If used correctly the adverse effects of topical corticosteroids are usually minimal. Systemic effects can occur with high doses.

**Introduction**

Skin conditions represent 10% of the problems managed in general practice,<sup>1</sup> and many inflammatory skin diseases are treated with topical corticosteroids.<sup>2</sup>

Before prescribing a topical corticosteroid it is important to be certain of the diagnosis as the drugs exacerbate some conditions, such as tinea. Topical corticosteroids may be underused or overused, so it is important that the patient knows what the treatment is and how it should be applied.

**Molecules and vehicles**

There are many topical corticosteroids which are available in a variety of strengths and in different vehicles. The classification of topical corticosteroids was based on how much vasoconstriction they cause and on some comparative clinical trials. The USA classification ranges from Class 1 (most potent) to Class 7 (least potent), whereas the UK classification has four different categories (Table). The Australian Medicines Handbook and Therapeutic Guidelines class topical steroids as mild, moderate, potent and very potent, while the Schedule of Pharmaceutical Benefits lists them as weak, moderately potent and potent.

Topical preparations may have the same or similar active compound but differ in their concentration or vehicle, which ultimately affects their potency, absorption and efficacy. As an example, betamethasone dipropionate 0.05% is found in a number of categories. By changing its vehicle from

a cream to an ointment its potency increases from moderate to potent (UK category III to II), and when it is delivered in an optimised vehicle it becomes very potent (category I).

In general, ointments improve the drug's penetration as they occlude the skin and enhance hydration and absorption. However, ointments are greasy and difficult to spread. This is sometimes an important reason for a patient's poor adherence to treatment.

Creams are a combination of one or more non-mixable liquids and an emulsifying agent. They are less greasy than ointments, very easy to spread and are washable in water.

Lotions are insoluble preparations dispersed into a liquid. They may need shaking to get the mixture ready for use, but are easy to apply, can cover extensive areas and are preferred for children (due to their more permeable skin) and on hairy skin.<sup>5</sup>

**Mechanism of action**

Topical corticosteroids act by binding to a specific receptor in the cellular cytoplasm and modulating the transcription of multiple genes. This leads to the suppression of the production of inflammatory substances such as prostaglandins and leukotrienes, and also inhibits the recruitment of inflammatory cells into the skin.

**Adverse effects**

Although topical corticosteroids are relatively safe, they can produce local (more frequent) and systemic (infrequent) adverse effects when used incorrectly.<sup>6</sup> High potency topical corticosteroids should not be used on areas of thin skin (for example face, flexural sites, scrotum, eyelids) as absorption is increased. They should not be used on denuded skin or for longer periods. Caution is needed if these drugs are used under occlusion, in children or in elderly patients.

**Local effects**

Atrophy of the skin is one of the most common cutaneous adverse effects. There is an increase in skin transparency and brightness, telangiectasia, striae and easy bruising. Scars and ulceration may appear due to dermal atrophy. The use of topical corticosteroids on the face can induce eruptions such as steroidal rosacea, acne and perioral dermatitis.

Less frequent local adverse effects include hypopigmentation, delayed wound healing and

glaucoma when corticosteroids are applied around the eye. Contact sensitivity to preservatives in the product or the corticosteroid itself may occur and clinically it can be suspected by persistence or worsening of the skin disease.

Other adverse effects include:

- disease recurrence due to a rebound effect when treatment is stopped
- tachyphylaxis or loss of clinical improvement after a period of use (although frequently reported, it has not been observed in clinical trials)
- masking or stimulation of some cutaneous infections (for example tinea incognito).

### Systemic effects

Systemic adverse effects are uncommon and are mostly associated with the use of high potency topical steroids in large or denuded areas, under occlusion or in severe skin disease. Reversible suppression of the hypothalamic–pituitary–adrenal axis has been described in children with doses as little as 14 g per week. Moreover, stopping therapy may induce an Addisonian crisis. Other systemic effects include Cushing's syndrome, diabetes mellitus and hyperglycaemia.

### Recommendations for topical corticosteroid use

Establishing a diagnosis is essential to choosing the appropriate topical corticosteroid. Once a diagnosis

has been made, several considerations influence the choice.<sup>5,7</sup> It is also important to ask if the patient has already been using an over-the-counter topical corticosteroid.

### Disease responsiveness

On thin skin, inflammatory skin conditions like intertriginous psoriasis, children's atopic dermatitis, seborrhoeic dermatitis and other intertrigos are highly responsive and will respond to a weak topical corticosteroid. Psoriasis, adult atopic dermatitis and nummular eczema are moderately responsive diseases so require a medium potency corticosteroid. Chronic, hyperkeratotic, lichenified or indurated lesions, such as palmo-plantar psoriasis, lichen planus and lichen simplex chronicus, are the least responsive diseases and require high potency topical corticosteroids.<sup>5</sup>

As a general rule, topical corticosteroids should not be used in patients with rosacea, perioral dermatitis or acne. Skin infections are also a contraindication.

### Location

The anatomical site, specific characteristics of the stratum corneum and skin lipid structure affect the penetration and absorption of topical corticosteroids. For example, absorption on the palms, soles (0.1–0.8%) and forearms (1%) is poor, compared to the face (10%), scalp and intertriginous areas (about 4%). Other areas such as the scrotum and eyelids will absorb up to 40%

Table Classification system for commonly used topical corticosteroids<sup>3,4</sup>

	Presentations available		
	Ointment	Cream	Lotion
<b>Superpotent – Class 1 USA, Class I UK</b>			
Betamethasone dipropionate 0.05% in optimised vehicle	X		
Clobetasol propionate 0.05%	X		
<b>High potency – Class 2/3 USA, Class II UK</b>			
Betamethasone dipropionate 0.05%	X		
Betamethasone valerate 0.1%	X		
Mometasone furoate 0.1%	X	X	
<b>Moderate potency – Class 4/5 USA, Class III UK</b>			
Betamethasone dipropionate 0.05%		X	X
Betamethasone valerate 0.05%	X	X	
Triamcinolone acetonide 0.1%		X	
Methylprednisolone aceponate 0.1%	X	X	X
Clobetasone 0.05%		X	
<b>Low potency – Class 6/7 USA, Class IV UK</b>			
Hydrocortisone or hydrocortisone acetate 0.5%, 1%	X	X	X
Desonide 0.05%	X	X	X

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of applied drugs. Potent topical corticosteroids and prolonged use of lower strength topical corticosteroids should be avoided in these areas.

Dermatoses of the face and intertriginous areas are best treated with low-strength preparations. Lesions on the palms and soles frequently require treatment with high potency topical corticosteroids.

If the affected area is large, use low to medium potency corticosteroids to reduce the likelihood of systemic effects.

### Vehicle

Although ointments are generally the most effective vehicle for treating thick, fissured, lichenified skin lesions, patients may consider them cosmetically unappealing. Ointments should not be used in flexural or intertriginous areas due to high absorption. Creams are generally well accepted on most areas of the skin except the scalp.

Lotions are useful for extensive areas, while solutions, gels, sprays and foams are useful for the scalp and hairy skin. These products can produce irritation when applied to acute dermatoses.

### Amount

A single application to the whole body of an adult will require 30 to 40 g of product. An area of one hand (palm and digits) will require 0.3 g per application. No more than 45 g/week of potent or 100 g/week of a moderately potent topical steroid should be applied if systemic absorption is to be avoided. In children, the amounts should be smaller.

### Frequency of application

This depends on the selected topical corticosteroid and the site to be treated. Application once or twice daily is usually sufficient, but frequency may increase when treating areas where the preparation can easily be wiped off (for example palms and soles). Treatment under occlusion should be avoided and only prescribed by specialists familiar with the use of corticosteroids and the condition to be treated.

### Treatment duration

The shortest course of treatment is recommended for acute diseases, although small recalcitrant lesions may need to be treated for longer. Treatment should not be longer than two weeks on the face and 3–4 weeks on the rest of the body. For longer treatment periods, intermittent therapy such as every other day, weekend-only application or a resting period of 1–2 weeks between cycles may be an option. Very short treatments (1–3 days) will not provide enough improvement of some conditions and this may be wrongly interpreted as unresponsiveness.

### Children

Children, especially infants, are more susceptible to adverse effects. They have difficulty in metabolising potent corticosteroids and their skin surface area:body weight ratio increases systemic absorption. Topical treatment in children should be used with extreme caution. Prescribe a low potency corticosteroid and preferably for short periods. An application under occlusion in the nappy area or under plastic should be avoided.

### Pregnancy and lactation

All topical corticosteroids are classified category C by the US Food and Drug Administration, but some are classified category A by the Therapeutic Goods Administration ([www.tga.gov.au/hp/medicines-pregnancy.htm](http://www.tga.gov.au/hp/medicines-pregnancy.htm)). Studies in animals have shown that topical steroids are systemically absorbed and may cause fetal abnormalities. Limited and inconclusive data are available for humans, however there seems to be an association between very potent topical corticosteroids and fetal growth restriction.<sup>8,9</sup> Caution is needed, but topical corticosteroids have been frequently used in pregnancy.

Although the mechanism of topical corticosteroid excretion in breast milk is unknown, there are no reported adverse effects during lactation. These drugs should not be applied directly to the nipples before breastfeeding.

### Adjunctive treatments

Patients should be given advice about skin care. This includes the use of soap-free cleansers and moisturiser which will affect the skin's overall integrity and improve the clinical outcome.

### Conclusion

Topical corticosteroids are safe and effective drugs. Always establish a clinical diagnosis before prescribing. Choose an appropriate topical corticosteroid according to the affected area, patient's age, clinical presentation and predicted responsiveness to treatment.

Monitor the clinical response, even if symptoms have resolved. Consider changing or even stopping treatment according to the response. Also monitor for adverse effects and cease the drug straight away if there is skin damage.

Refer to a dermatologist if the disease does not respond to treatment or when the diagnosis is unclear. <

*Conflict of interest: none declared*

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## SELF-TEST QUESTIONS

### True or false?

5. The potency of a topical corticosteroid is likely to be increased if it is formulated as an ointment, rather than as a cream.
6. Topical corticosteroids are contraindicated during lactation.

Answers on page 179

## Book review

### Therapeutic Guidelines. Management guidelines: developmental disability. Version 3.

Melbourne: Therapeutic Guidelines Limited; 2012. 303 pages

This book provides a practical approach to the management of developmental disability. Several chapters have been revised and this version offers new chapters on common presentations of developmental disability, oral health, dysphagia, nutrition, preventive health care and health promotion, men's health, fetal alcohol syndrome and neurofibromatosis type 1.

The book incorporates the International Classification of Functioning, Disability and Health used by the World Health Organization, refreshing the previous medical model and emphasising function, activity and participation. There are chapters focusing on the lifespan, including stages from birth, methods of delivery of information to new parents, adolescence, transition to adulthood, ageing and related medical health issues, and screening and preventive health. Issues of consent, legal framework and capacity and guardianship laws will assist with medical management.

Useful tables with checklists and highlighted boxes include differential diagnoses and appropriate

referrals for developmental delay, health concerns for adolescents and adults with developmental disability, and useful questions and data sheets for monitoring challenging behaviour. These tables are clear and provide excellent summaries for a busy clinician. At the end of several chapters are clinical scenarios illustrating management points.

There are chapters devoted to the assessment, management and drug treatment of behaviour and psychiatric illnesses. Specific developmental disabilities are also covered and include Angelman syndrome, autism spectrum disorder, cerebral palsy, Down syndrome, fetal alcohol syndrome, fragile X syndrome, neurofibromatosis type 1, Noonan syndrome, Prader-Willi syndrome, Rett syndrome, tuberose sclerosis and Williams syndrome. References and lists of further reading allow for wider information to be sought.

The layout of the book and its size make it an easy read and excellent summary for the GP, paediatrician, adult physician and multidisciplinary team. A list of resources for each state and up-to-date telephone numbers and online resources are helpful for finding the myriad of organisations in disability.

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