SKIN CARE: MANAGING DRY SKIN CONDITIONS

This article provides practical and evidence-based guidance for clinicians on the use of emollients and topical corticosteroids. These are both important therapies in the treatment of dry skin and inflammatory skin disorders, such as psoriasis and eczema.

Carrie Wingfield is a Dermatology Nurse Consultant, MSC Advance Practitioner, Independent Nurse Prescriber and Associate University Lecturer at the University of East Anglia, Norwich and the Dermatology Department, Norfolk and Norwich University Foundation Hospital Trust

Skin care is an important aspect of care in any patient group and must never be under-prioritised, with skin diseases affecting up to one-quarter of the population at any one time in both adults and children (Action on Dermatology, 2003).

This article provides practical and evidence-based guidance on the effective use of emollients and topical corticosteroids, both of which are important therapies in the treatment of dry skin and inflammatory skin disorders. The function of both emollients and topical corticosteroids will be highlighted as well as examples of the skin conditions where these treatments are commonly used.

The aim is to provide an understanding of potential side-effects, whilst encouraging clinicians to gain sufficient knowledge to be able to educate patients/carers to self-care where appropriate. Both treatments are more effective when the patient/carer has been shown how to use them effectively, instead of just being handed a prescription (Gradwell et al, 2002).

The term emollient and moisturiser are often used synonymously, although there are subtle differences. However, most patients understand the term 'to moisturise' better than the term 'emollient' and this should be remembered in practice.

Background

Where skin is compromised by illness, age, environmental factors or skin disease, patient access to skin maintenance and active treatment becomes an important aspect of individual well-being. Skin care should feature high on health-clinicians' educational curriculums but is often conspicuous by its limited time slot and low focus. The objective of this article is to promote awareness and help clinicians achieve a level of basic knowledge about topical therapies that will encourage best practice according to national guidelines and best practice evidence.

The skin

The skin itself is an impressive multi-functioning organ that is designed to support survival. Like any other organ, the skin is subject to abuse and damage by lifestyle choices, disease, the aging process and the environment. It protects against the bacteria and pathogens that exist in the external environment and prevents moisture and heat loss, adjusting to the environmental climate as required.

The skin also produces melanin to protect against ultraviolet (UV) radiation and maintains a level of balance (homeostasis) in the body's internal environment. Without the skin, the ability to sense heat, cold, pain, itch, and pressure would be lost. It also has a vital role as a sexual organ and is crucial to psychological well-being.

Figure 1. Patient with varicose eczema.

Figure 2. Patient with extensive psoriasis.

Emollients

Emollients have been around since ancient times and as early as 700BC the Greeks were using wool fat to treat dry skin (Marks, 2001). The emollients used today are reputed to be much more 'user-friendly', although patients who have to frequently apply copious amounts to combat their dry skin conditions may disagree.

According to its eczema guidelines, the National Institute for Health and Clinical Excellence (NICE, 2004) states that emollients should be recognised as the first line treatment for dry skin conditions. This applies to the management of any dry skin condition, regardless of the age group.

Figure 3. Patient with ichthyosis.

Emollients can be used directly on the skin or as an alternative soap substitute in place of detergent products (such as soap and shower gels), which can further dry the skin. This simple replacement is a useful tool in the treatment of conditions such as atopic eczema, varicose eczema, chronic oedema/lymphoedema, icthyosis, psoriasis and other skin conditions where dryness can enhance active symptoms such as itching, flaking/scaling of the skin and impairment of skin (*Figures 1 to 4*).

There is a confusing array of emollients available to the patient and clinician, both on prescription and over the counter, but little evidence exists that any one is superior.

Bath emollients are often petroleum-based, but evidence is poor about the effectiveness of these preparations. They are not meant to replace emollients that are applied directly onto the skin (Drugs and Therapeutic Bulletin [DTB], 2007) and will not be discussed in this article.

Part of the support provided by the clinician can be as simple as helping a patient to choose the most acceptable emollient to encourage repeated and regular usage (Loden, 2003).

Where young children are concerned it is the role of the clinician to guide the parent as to the choice of emollient, although it is not uncommon for parents to prefer treatments that will not 'grease up' clothes, thereby losing sight of the benefits to the child's skin.

Figure 4. Patient's legs showing atopic eczema.

Ultimately, choice of preparation should be based on severity of condition, patient preference and the site of application.

One of the most commonly known emollients is aqueous cream, a cost-effective treatment originally designed as a soap substitute but often prescribed as a direct skin application emollient. It has high water content, requiring preservatives to prolong its shelf life and to reduce bacterial contamination — these can lead to skin sensitivity.

In an audit involving children with atopic eczema, Cork et al (2003) demonstrated that aqueous cream caused stinging and discomfort when used as a leave-on emollient in some children, although others tolerated it when used as a soap substitute.

Tsang and Guy (2010) state that aqueous cream can reduce the thickness of healthy skin and increase irritation by over 10% in just four weeks. Water loss through the skin was also found to increase. However, this was a very small study of six volunteers and requires further examination to be conclusive.

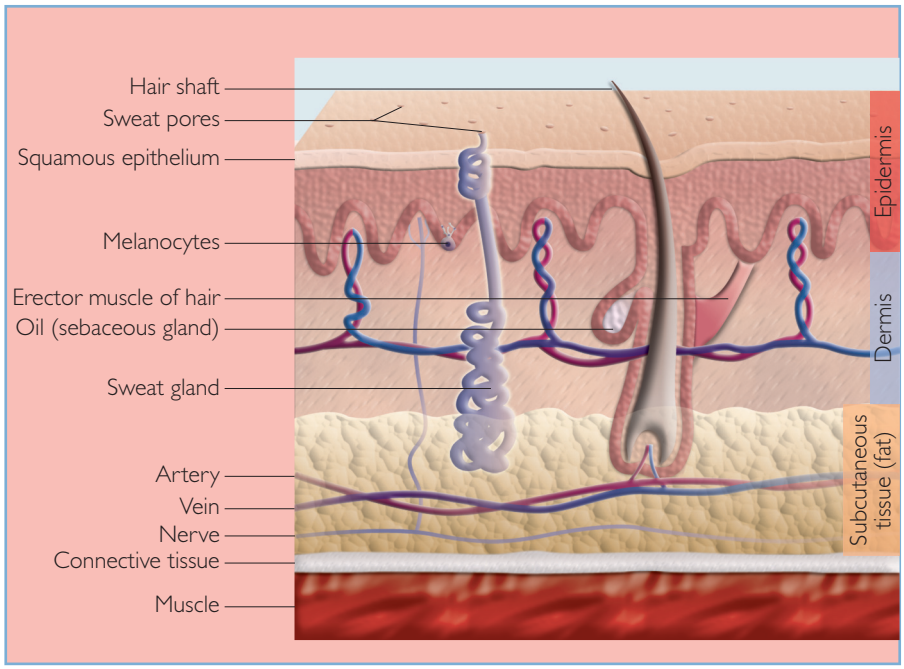

Figure 5. The anatomy of the skin.

In general, emollients are safe products with limited adverse effects (*Table 1*).

How do emollients work?

Emollients are used essentially to increase the retention of water held in the top layer of the skin (*stratum corneum*) (*Figure 5*). They work in two different ways, by either blocking the escape of water from the skin (occlusion) or in an 'active' way by drawing water into the skin from the *dermis* (humectants) (Rawlings et al, 1994; 2004).

The skin cells in the top layer of the skin form what is often referred to as the 'brick wall', which comprise the essential skin barrier.

The skin cells are structured in a way that allows fats (lipids) to form between them. This fat acts as a 'cement' to keep the skin barrier intact. Emollients penetrate between the skin cells to a limited extent, mimicking the function of lipids. Lipid reduction is seen in aging skin and those suffering with eczema. By using an emollient on a regular basis a moisture-retaining layer on the surface of the skin can be produced, which aids retention of lipids and water.

Dry skin is often itchy and a vicious circle can develop with damage caused by scratching in turn increasing inflammation and perpetuating the itch.

Effective use of emollients can help to break this cycle. Because of this effect, emollients can be termed as an anti-inflammatory, antipruritic therapy — they can also slow down skin cell production (known as anti-mitotic action) (Cork, 1997).

Held at el (2001) advocates emollients as they can accelerate the regeneration of the skin barrier function.

Types of emollient

There are various types of emollient available.

Petroleum-based

Petroleum-based emollients increase the amount of water held in the skin (occlusion). The most effective of these are the greasiest varieties, often referred to as 'heavy duty' or 'heavy sealing' (*Table 2*). With petroleum as the primary ingredient, they can reduce water loss by 98% in comparison to other oils that manage to reduce water loss by only 20–30% (Rawlings et al, 2004).

The down side is that petroleum products are often the least user-

Table 1.

Some adverse effects of emollients

Stinging/discomfort — dry broken skin
Allergic/sensitivity — reactions/irritation from preservatives used in product
Folliculitis — blockage of hair follicles forming pustules and irritation. Lighter emollients/lotions recommended for hair-producing areas
Reduction of heat loss from skin — in hot weather occlusive emollient can affect thermo-regulation of the skin
Fire risk — parrafin products can be a risk when soaked into dressings and clothing
Tachyphylaxis — emmolient can become less effective/develop resistance. Change of emollient made be needed
Patient compliance/non-concordance — stop using or only apply in small quantities
Slipping — be mindful of smooth flooring and baths and showers
Cross-contamination — open product tubs; warm environment (e.g. bathrooms); multiple users; growth of bacteria in tubs and lids

friendly and patient compliance can be compromised.

It is considered good practice to offer two emollients, one for heavy duty use at night and a lighter cream/lotion for use during the day, giving the patient options and increasing effective use.

Creams, lotions, gels

Creams tend to be more cosmetically acceptable, are lighter in action and more usable during the day (*Table 3*). They are often available in pump dispensers, making for easy use and less risk of cross-bacterial contamination. Most can be doubled up to be used as soap substitutes. Often they are mixed with other components such as menthol, antimicrobials or glycerine to address specific symptoms like itching, very dry skin and bacterial infection.

Active products (humectants)

Humectants draw moisture from the skin (*Table 3*) and contain substances such as urea and glycerine, which have substances have water-attracting abilities.

When applied to the skin they penetrate the top layer and draw water in from the dermis layer. These emollients often have a dual function with both occlusive and humectants properties as they can also contain petroleum. They are particularly effective on dry thickened scaling skin seen in eczema and icthyosis. Some patients find the urea irritant and again it will come down to personal preference.

Table 2.

Common petroleum-based emollients (heavy duty)

Petroleum emollient	Emollient	Soap subsititute	Adverse effects	Top tips
Liquid paraffin/ soft paraffin BP (50/50)	Yes	Yes	Inflammable when soaked through dressings and clothing — avoid naked flames	Excellent hydration under occlusive bandages/suits/dressings/paste bandaging especially in management of surrounding skin in leg ulcer management
Emollin® Spray (Salveo Medical)	Yes	Yes	Can reduce heat loss through the skin — caution in hot climates or where there is extensive skin infection and redness Poor compliance issues due to greasy nature — marks clothing and bedding Folliculitis risk in hair bearing areas — irritation	Minimal preservatives, less chance of sensitivity issues Poor uptake of bacterial contamination in tub and spray Spray easy to use for those patients with difficult areas to reach when self-caring Spray useful in the treatment of eczema where occlusion is used in combination with topical steroids, avoids spreading around of steroid to good skin.
Hydromol® Ointment (Alliance Pharmaceuticals)	Yes	Yes	As above	As above
Epaderm® Ointment (Mölnlycke Health Care)	Yes	Yes	As above	Excellent for washing legs to help hydrate and loosen dead skin for removal
Emulsifying ointment BP	Yes	Yes	As above	As above

General Advice

- Do not use the same tub or spray for multiple patients: decant from tub and avoid putting hands in.
- Apply in downwards fashion following the growth of hair, avoid vigorous rubbing.
- Be aware of patient preference and choice where appropriate to encourage frequent application.
- Ensure adequate supplies- Adult up to 500g week -Child 250g a week- varies according to severity.
- Be aware that emollient can make surface areas slippery, warn patient to be careful.

Antimicrobials

Other types of emollients include those with antimicrobial content (*Table 3*). These are used in skin conditions such as eczema where there is evidence of skin infection. They work by reducing common bacterial colonisation such as *Staphylococcus aureus*.

Symptoms of infection may include increased itching, redness, weeping and failure to respond to treatment. They should not replace oral antibiotics if infection is extensive, but can be used in combination with each other. Some antimicrobial lotions are also used in the management

Table 3.

Common petroleum-based emollients (heavy duty)

Creams, lotions and gels	Emollient	Soap substitute	Adverse effects and safety considerations	Top Tips
Creams				
Aqueous cream BP	No	Yes	Irritation/sensitivity Limited use as a dual purpose emollient. Cross contamination bacteria in tub	Cheap
Cetraben® Cream (Stada)	Yes	Yes	Irritation/sensitivity	Reduced risk of contamination
Zerobase® cream (Thornton and Ross	Yes			Easy to use
Humectants				
Calmurid® cream (Galderma)	Yes	No	Irritation/sensitivity	Reduced risk of contamination
Eucerin® intensive cream/lotion (BDF)	Yes	No	Can sting on broken skin	Easy to use Apply thinly
Balneum® Plus cream (Almirall)	Yes	No		Contains lacromycrol to relieve itching
Dermol® cream (Dermal Laboratories)	Yes	Yes	Irritation/sensitivity	Antimicrobial- use in infected eczema – reduces *Staphyloccocus aureus* bacteria
Eczmol® 1% w/w cream (Genus)	Yes	Yes		
Aqueous cream menthol 1%	Yes	No	Irritation/sensitivity Sting on broken skin Cross contamination	Menthol has cooling effect on skin-short term Night time use if woken up with itching
Gels/lotions				
Doublebase® gel (Dermal Laboratories)	Yes	Yes	Irritation/sensitivity	See through pump-see when running out-light
Dermol® lotion (Dermal Laboratories)	Yes	Yes	Irritation/sensitivity	

of acne and can be used as soap substitute for this condition.

Application

Importance of patient education

Under-use of emollients or poor concordance can be caused by many factors and it is important that patients make sure that carers have enough supplies.

Clinicians should also provide appropriate advice about maintaining repeat prescriptions. For those patients who have to pay, pre-paid prescriptions are advisable for chronic skin disease management.

Regular application is needed to keep the skin well-hydrated. Children will average 250g and adults 500–600g per week, depending on the severity of the skin condition and level of dryness (Britton, 2003).

Management of patients who suffer from chronic dry skin conditions requires a minimum twice-daily application of emollients — 3–4 times a day is advocated where possible.

Using emollients as both soap substitutes and as a direct skin application maximises the hydrating effect. After washing the skin recommend gentle drying, leaving the skin slightly moist before application of the direct skin emollient.

Further emollient application should be encouraged to improve hydration throughout the day depending on how this suits the patient/carer —variability will be vast depending on lifestyle, severity of skin disease, resources and personal motivation.

Emollients are often used under occlusion using paste bandages, wet-wraps or suits that enhance the penetration and effect. Varicose eczema is often treated in this way, especially when coexisting with leg ulceration.

Treatment of the surrounding skin in leg ulcer treatment is good

Figure 6. Decanting emollients from the tub using a wooden spatula.

practice in reducing dryness of the skin and irritation, maintaining the skin barrier and reducing the risk of skin tissue infections such as cellulitis (Wingfield, 2009).

Decanting emollients into clean smaller receptacles for daytime use is good advice to encourage use outside of the normal home environment. Pump dispensers are advised where large amounts of emollient are required. If tubs are used, to avoid bacterial contamination spoon out the amount needed rather than dipping in fingers and avoid multiple people using the same tub (*Figure 6*).

Clinicians should teach good hygiene techniques, such as encouraging hand washing before

Figure 7. Applying emollients in downward direction.

Figure 8. Folliculitis.

emollient application and keeping nails short.

Try to encourage gentle application of the emollient avoiding vigorous rubbing in. The action of rubbing the skin can stimulate circulation making the skin feel itchier. Advise application in a downward manner to avoid aggravation and blocking of hair follicles, especially in hair-bearing areas and when using petrolatum based products — this can reduce the risk of a condition know as follicultis (*Figures 7, 8 and 9*).

Topical Corticosteroids:

Topical corticosteroids have been around since the 1960s and are considered a common treatment for many inflammatory skin conditions, in particular in eczematous conditions, such as:

- Atopic eczema
- Varicose eczema
- Contact dermatitis
- Eczema from scabies
- Lichen simplex.

Topical corticosteroids are not a curative treatment but rather act against inflammation where emollients alone have failed. They received a bad press in the 1960s and 1970s due to overuse, which resulted in side-effects such as skin-thinning (atrophy) and stretch marks (striae).

Today, they are available in many different strengths and formulations. *The British National Formulary* (British Medical Association [BMA] and Royal Pharmaceutical Society of Great Britain [RPS], 2011) classifies topical corticosteroids as:

- Mild
- Moderate
- Potent
- Very potent.

Very potent steroids should only be used with specialist dermatological advice.

Adverse effects

Parents and carers of children with atopic eczema can be concerned about the side-effects of topical corticosteroids. The most common local side-effect is the thinning of the skin (NICE, 2004) and at least 25% of parents and carers report non-usage because of anxiety of potential side-effects.

Figure 9. Skin thinning (atrophy).

Despite the fact that topical corticosteroids have been around for some time there is still limited research on their long-term effects, although clinical opinion suggests that long-term usage appears to be safe providing clinicians and patients adhere to clinically recommended dosages (NICE, 2007).

The most common side-effects of long term use, the use of large amounts or use on inappropriate areas of the body, are:

- Thinning of the skin (atrophy) (*Figure 9*)
- Stretch marks (*striae*) (*Figure 10*)
- Easy bruising and tearing of the skin
- Perioral dermatitis (rash around the mouth)
- Enlarged blood vessels/ capillaries (telangiectasia) (*Figure 11*).
- Susceptibility to skin infections
- Disguising infection, e.g. fungal infections
- Reaction to the steroid cream (sensitivity to an ingredient)

Less common are the internal side-effects from topical corticosteroid such as adrenal gland suppression. Topical steroids in large quantities can suppress the production of natural steroids and if the topical steroid is stopped this may result in illness known as Addison's disease.

Figure 10. Stretch marks (striae)

Figure 11. Prominent vessels (telangiestasia).

Cushing's syndrome is another condition that can develop if large amounts of steroid is absorbed through the skin, possibly causing fluid retention, raised blood pressure and diabetes.

How do topical corticosteroids work?

Topical corticosteroids are absorbed through the top layer of the skin (epidermis) and act as an anti-inflammatory, suppressing the immune inflammatory response in the skin. The thickness of the skin on the part of the body that steroids are applied to will determine how much steroid is absorbed. This is why it is necessary to have different strengths. For example, a steroid used on the face can be milder due to the faster absorption rate of the thinner facial skin.

If the same strength of steroid were used on the palm of the hand it would have a limited effect due to poor absorption through thicker skin. Absorption rates vary widely across the

Table 4.

Amount of topical preparation (in FTUs) for different areas of a child's body.

Age of child	Entire face and neck	Entire arm and hand	Entire leg and foot	Entire front of chest and abdomen	Entire back including buttocks
3–6 months	1	1	1.5	1	1.5
1–2 years	1.5	1.5	2	2	3
3–5 years	1.5	2	3	3	3.5
6–10 years	2	2.5	4.5	3.5	5

Source: Data from: (Long et al, 1998; MeReC, 1999)

body, for example:

- Forearm absorb 1%
- Armpits absorb 4%
- The face absorbs 7%
- Eyelids and genitals absorb 30%
- Palms of the hand absorb 0.1%
- The soles of the feet absorb 0.05%.

As mentioned above, due to the different strengths steroids come in many types and an exhaustive list can be found in the *The British National Formulary* (BMA and RPS, 2011).

Topical steroids are also available in combination with salicylic acid to enhance penetration, and with antibacterial and antifungal agents. Varied preparations are also available to help application to various areas of the body, such as the scalp, and for a variety of skin types (greasy, dry etc).

Where the skin is very dry, ointments can improve absorption to the top layer.

However, patients should be advised not to suddenly replace their emollient with an steroid ointment, but to use them both in combination following the clinician's instructions.

Creams are more effective on wet or weeping lesions and steroid-impregnated dressings and tapes (i.e. Haelan Tape [Typharm]) are also useful for specific conditions such as lichen simplex, discoid eczema and nodular prurigo. These impregnated dressings work on the principle that occlusion enhances the absorption rate.

The same effect can be mimicked with the use of topical corticosteroids under bandages, for example in the treatment of varicose eczema. As patients may only receive once-weekly dressing changes, they might not receive the necessary frequency of steroid and emollient therapy.

Therefore, the application of a moderately potent steroid under a paste bandage, together with an emollient, is an acceptable way to manage this condition.

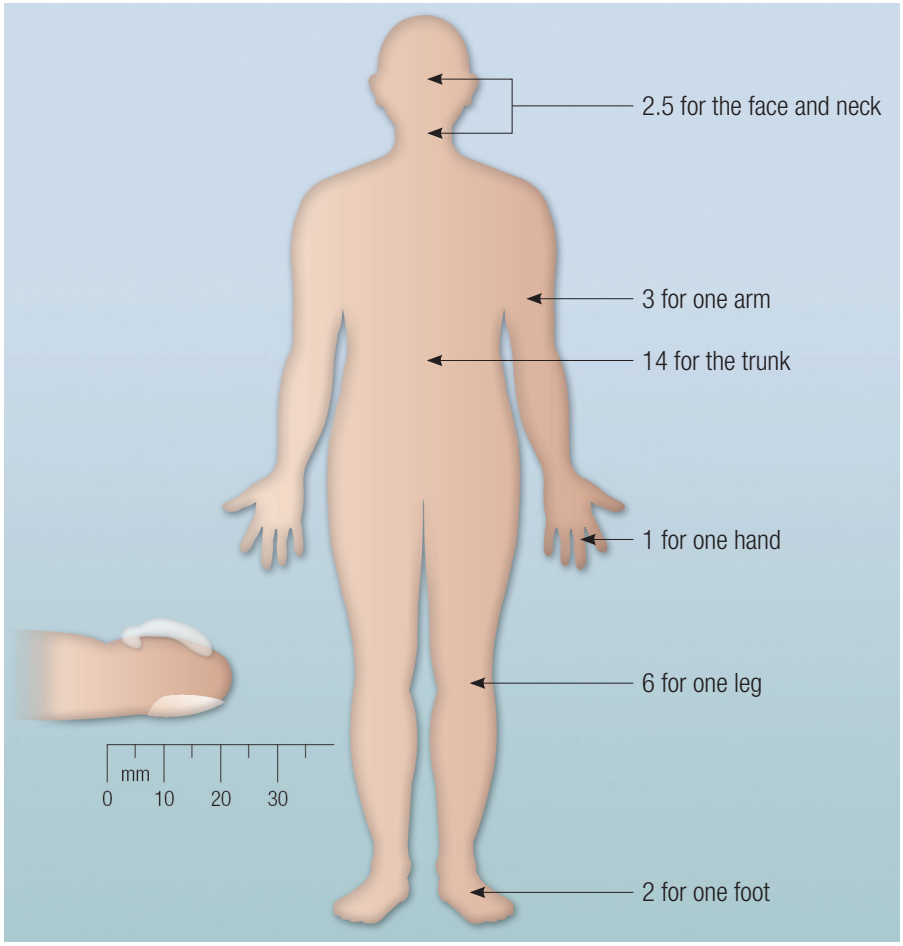

Figure 12. The application of topical treatments, using the finger tip unit (FTU) theory.

Application of topical corticosteroids

A useful guide to application of topical corticosteroids is the fingertip unit (FTU) (Long and Findlay, 1991). *Figure 12* provides a pictorial explanation of the correct amounts for an adult. These amounts will differ in children (*Table 4*).

Frequency of application

NICE guidelines on the frequency of application of topical corticosteroids for atopic eczema are sufficient as a general guide for other common eczematous inflammatory conditions (NICE, 2004; 2007). The guidelines recommend that steroids should be applied only once or twice daily and for 3–5 days for the face and 7–14 days for the body.

Where there is more than one choice in a potency class, the cheapest topical corticosteroid should be prescribed. It is common practice to treat acute episodes with either a potent or moderate strength before weaning down to a weaker strength over an allocated period of time. This is to try and reduce the risk of the condition rebounding after steroid treatment is discontinued.

Patient education

Both emollients and topical corticosteroids require regularly reinforced advice if patients are to achieve the best from these treatments in terms of reduced symptoms and limited side-effects.

Clinicians should remember that they may be dealing with patients who are using many different combinations of products at the same time, including emollients, different strengths of steroids, dressings, antibiotics and antihistamines and they will need careful management.

Spending time explaining all these treatments fully will potentially avoid the risk of acute episodes, further visits to the surgery, referrals to secondary care, failure of treatments and loss of confidence in the treatments.

Patients can get very confused when suffering with a chronic skin disorder and it can be useful when starting a new treatment regimen to ask patients to 'clear the decks' and discard previous treatments where appropriate, particularly if they have been using them for a while.

When reviewing patients' progress it also helps if clinicians are fully aware of the current treatments being used.

Key areas to explain are:

- That emollients and topical corticosteroids are not a cure.
- That patients should have realistic treatment expectations from day one
- That topical corticosteroids should only be applied to areas of active disease
- That topical steroids can either be applied before or after emollients, providing several minutes are left between applications
- That emollients must continue to be used even when the skin is clear or symptom-free
- That patients should decant from tubs to avoid bacterial contamination and for single person use only.
- How to arrange repeat prescriptions and the importance of not running low on supplies
- That their condition may flare-up and they may have to return to stronger strength steroids for short bursts before weaning down to a less potent preparation
- That infection can make conditions worse and cause treatments to fail and that they should seek appropriate help from their GP in this case.

Any explanations should be reinforced with written information, such as leaflets and treatment plans, as patient and carers appreciate this and may find this a useful reference.

Conclusion

Nurses in particular are best placed to make a difference to patients' experience of skin conditions. With an ever-increasing elderly population, clinicians will find themselves dealing more and more with problems associated with dry skin, in particular.

Timely intervention with simple therapies such as emollients is recommended, with patient and carer education taking priority (Ersser, 2000).

Patients should be made aware of the side-effects, especially for topical corticosteroids, however, these must be placed in the context of the benefits of treatment.

Clinicians must ensure that patients who are prescribed potent applications are