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Emollient therapy can help to prevent skin breakdown in dry skin conditions

Use of emollients in dry skin conditions

In this article...

- The structure and function of the skin
- Why and what happens when skin becomes dry
- How emollients work and how to apply them effectively

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Abstract Elson D (2011) Use of emollients in dry skin conditions. *Nursing Times;* 107: 47, 18-21.

As nurses receive inadequate training in dermatology, they may lack knowledge in prescribing and using emollients. This article outlines the physiology of the skin, the role of emollient therapy and how to use it in clinical practice.

Skin conditions are one of the most common diseases among all age groups, ranging from atopic eczema in children to problems associated with ageing (British Association of Dermatologists, 2008).

Unfortunately, skin care is inadequately covered in nurse training, leaving nurses lacking in information. When they are faced with a skin condition and the choice of topical products available they, therefore, may feel it is safer to omit treatment rather than apply the incorrect emollient.

This article gives advice on which emollient to apply and guidance on how, where and when they should be used, including in combination with other products.

Skin is the body's largest organ and has a range of vital functions; preventing skin breakdown is therefore one of the cornerstones of nursing care (Voegell, 2010).

Promoting good skin health prevents skin breakdown and improves comfort and quality of life, and emollients have a crucial role in maintaining skin health and patient wellbeing (Van Onselen, 2009). It is important that nurses recognise that emollients are one of the most important therapeutic agent for dry skin conditions (*Drug and Therapeutics Bulletin*, 2007). They therefore need to ensure that this type of medication is prescribed and applied correctly and in the right amount.

Skin structure and function

To appreciate the principles that underpin emollient therapy, it is necessary to understand how the skin maintains its barrier functions.

The skin is not just a simple thin coat that keeps the body together and provides protection. It has a surface area of approximately 2m^2 (22 sq ft), weighing 4.5-5kg (10-11lb), and ranges in thickness from 0.5mm to 4.0mm depending on location (Lépore, 2003). Fig 1 shows the structure of the skin.

The skin is a complex, multifunctional organ with a unique capacity to heal. Its many functions are outlined in Box 1.

The top layer of skin, the stratum corneum, is the outer aspect that is visible to us. This means it plays a significant part in psychological wellbeing.

The functions of the skin described above and in Box 1 highlight the importance of maintaining an intact structure. At times, this needs to be helped by the correct use of topical treatments.

Problem of dry skin

Breakdown of the stratum corneum is the first event in the development of atopic eczema (Cork and Danby, 2009). In normal skin, this barrier is impenetrable to irritants and allergens and prevents water loss from the body. However, when the skin dries, the cells (corneocytes) shrink, causing cracks to appear between them. These cracks allow irritants and allergens to penetrate, which can trigger an inflammatory response (Figs 2 and 3).

As the corneocytes shrink, they release cytokines (pro-inflammatory mediators) that cause inflammation within the skin, which leads to itching (Cork and Danby, 2009).

External factors that cause dry skin are soaking in water for long periods, excessive washing and washing using soaps and shower gels. Nurses need to remember this when washing patients in hospital and should use emollients, also known as soap substitutes, to wash the skin (Penzer and Ersser, 2010).

The environment adds to drying the skin, especially when it is hot and dry or in centrally heated/air-conditioned, low humidity environments such as hospital wards and nursing homes.

How emollients work

Emollients form the mainstay of dermatological treatments; they are not optional extras.

The importance of using emollients liberally for acute, sub-acute or chronic skin conditions cannot be overemphasised, according to the Best Practice Statement (2009). In the view of the expert panel

5 key points

1. Nurses' training in dermatology is inadequate
2. Preventing skin breakdown is a cornerstone of nursing care
3. Emollients have a crucial role in maintaining skin health and patient wellbeing
4. Breakdown of the skin barrier is the first event in the development of atopic eczema
5. Emollients use can significantly improve chronic inflammatory skin conditions such as eczema

Soaps and shower gels can dry skin

FIG 1. **CROSS SECTION OF SKIN**

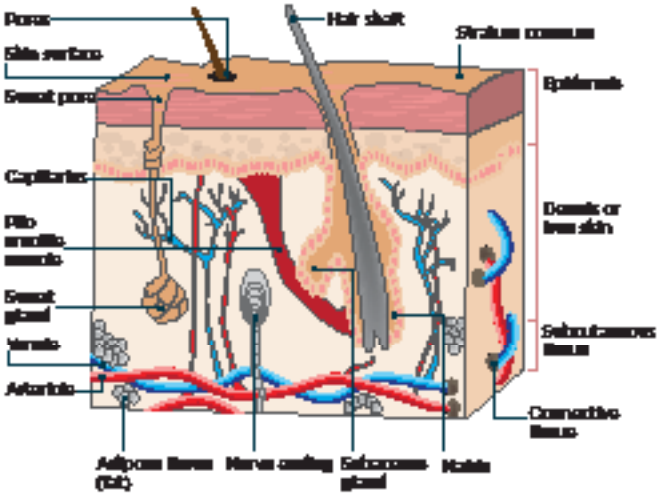


FIG 2. **HEALTHY STRATUM CORNEUM**

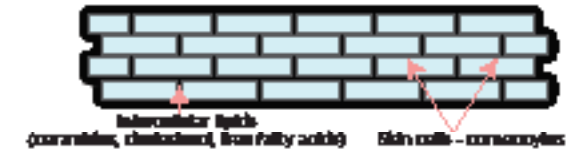
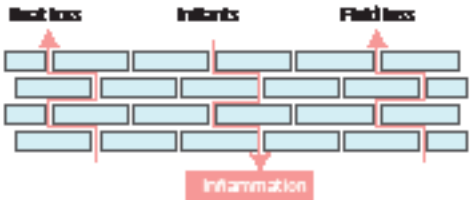


FIG 3. **STRATUM CORNEUM BREAKDOWN**



compiling this statement, effective use of emollients can significantly improve chronic inflammatory skin conditions such as eczema, as well as improving quality of life.

Emollients are used to help repair the skin barrier breakdown by rehydrating the stratum corneum, causing the corneocytes to swell up, which leads to an improvement in the integrity of the skin barrier (Cork and Danby, 2009). Emollients also help maintain the barrier function by reducing signs of dryness, alleviating sensations such as tightness and itching, and reducing water loss through the skin by providing a lipid film on the skin surface. They also assist in controlling thermoregulation.

The most important determinant in choosing an emollient is whether it is cosmetically acceptable (Best Practice Statement, 2009; Cork and Danby, 2009). They should suit patients' lifestyles; for example, asking them to apply a thick greasy product such as white soft paraffin during the day when they wear smart suits or silk fabrics, causing staining, would be inappropriate. Water-based products such as creams or lotions to use during the day, are likely to be more cosmetically acceptable. In addition, if an emollient smells and feels acceptable to patients, they are more likely to use it.

The Best Practice Statement (2009) described emollients as substances whose main actions are to occlude the skin surface and encourage build-up of water within the skin. The terms "emollient" and "moisturiser" are often interchangeable; Box 2 explains the difference.

Applying emollients effectively

Emollients are commonly thought to have few side-effects and generally patients or health professionals can use them without fear of unwanted outcomes.

However, when selecting and applying emollients the following factors should be considered:.

» Contact dermatitis, which is an inflammatory reaction within the skin,

BOX 1. FUNCTIONS OF THE SKIN

Protection The skin provides a physical barrier that protects underlying tissues from physical abrasion, bacterial invasion, dehydration and ultraviolet radiation (UV in sun rays).

Thermoregulation Changes in the flow of blood to the skin help to regulate body temperature. The skin maintains body heat by vasoconstriction and reduces it by vasodilation and sweat evaporation. It also serves as an insulator between the environment and the internal body.

Sensation The skin contains abundant nerve endings and receptors that detect stimuli related to temperature, touch, pressure and pain.

Excretion Besides removing heat and some water from the body, sweat is also the vehicle for excreting small amount of salts and several organic compounds.

Immunity Certain epidermal cells are important components of the immune system, and fend off foreign invaders.

Blood reservoir The dermis houses extensive networks of blood vessels that carry 8-10% of the total blood flow in a resting adult. In moderate exercise, skin blood flow may increase, which helps to dissipate heat from the body. However, during heavy exercise, skin blood vessels constrict, so more blood can circulate to contracting muscles.

Vitamin D synthesis The skin synthesises vitamin D when exposed to sunlight. Vitamin D undergoes a series of metabolic changes in the skin, liver and kidneys to convert to a final form known as 1.25-dihydroxycholecalciferol. The active form of vitamin D participates strongly in bone formation and metabolism of calcium, an essential mineral in the maintenance of healthy bones (Lépore, 2003). Because of the way vitamin D is converted and synthesised in one part of the body (becoming a hormone) and transported by the blood, then exerts its effect in another location, the skin can be considered an endocrine organ (Tortora and Grabowski, 1993).

A section through healthy skin

Catherine Hollick, Alamy

occurs when it comes into contact with certain products;
- Incorrectly applied greasy emollients can result in pustules caused by the blockage and subsequent infection of the hair follicle (Penzer and Ersser, 2010).

A three-stage treatment regimen is generally followed when using emollients.

The first stage is bath additives; these are added to bath water and not rinsed off the skin. However, there is some controversy around their use in terms of their clinical contribution to the treatment of dry skin conditions such as atopic eczema (*Drug and Therapeutics Bulletin*, 2007).

The second stage is skin cleansers or soap substitutes, which are used instead of soap; they have cleansing properties, are non-drying and are rinsed off the skin. These may be branded products but many topical emollients can also be used as soap substitutes. They are used like soap, applied over the body, using a wash cloth or hands, then rinsed off to help remove organic matter and enhance the lipid coating on the skin (Best Practice Statement, 2009). They have the advantage of being non-drying.

If neither bath additives nor skin cleansers are effective, the final stage is the "leave-on" emollient. These come in five formulations – ointments, gels, creams, lotions and sprays.

Ointments are the greasiest preparations and are made up of paraffins, vegetable oils, animal fats or synthetic oils. Paraffin-based products such as 50% white soft paraffin pose a fire risk when in contact with dressings or clothing as they are easily ignited by a naked flame. Patients need to be advised not to smoke or come into contact with fire while using these preparations (British Medical Association and Royal Pharmaceutical Society, 2011).

Gel emollients are oil and water products. The carbomer gelling agent holds the oil and water together while it is in the bottle, giving the product a "jelly-like wobble" (Best Practice Statement, 2009). When applied to the skin, the gelling agent dissolves and allows the oil and water to separate (Electronic Medicines Compendium, 2007). This has the effect of allowing the oil to stay on the skin longer and makes it less vulnerable to being washed away (Best Practice Statement, 2009).

Creams are emulsion combinations of oil and water and their less greasy consistency often makes them more cosmetically acceptable than ointments and gels. However, they contain preservatives, which increase the likelihood of contact dermatitis, which can be either irritant or allergic in nature (Penzer and Ersser, 2010). Patch testing, undertaken by a dermatologist, is needed to confirm an allergic reaction.

Lotions have a higher water content than creams, which makes them easier to apply but less effective as emollients.

Sprays contain lipids such as white soft paraffin, liquid paraffin and fractionated coconut oil. They are easy to apply, allow patients to access hard-to-reach body areas, such as the back, and do not stain clothing.

The amount of emollient that should be applied depends very much on severity of the skin condition, from approximately 500g per week for dry skin conditions to 500g an hour for those in skin failure. Table 1, taken from the *British National Formulary*, provides guidelines depending on the body area and type of emollient (British Medical Association and Royal Pharmaceutical Society, 2011).

Emollients can be applied as frequently as patients or health professionals consider necessary to maintain skin integrity. Moisturisers of all types need to be applied to the skin in a stroking action in the direction of hair growth, avoiding circular or rubbing motions. They should be dotted over the skin and spread to leave a thin film on the skin. Regular remoisturising will reduce dryness, itch and discomfort.

BOX 2. EMOLLIENTS AND MOISTURISERS

- **Emollients** are lipids that occlude the skin surface, preventing water loss from the stratum corneum.
- **Moisturisers** are lipid emulsions that actively hydrate the skin by applying a humectant (often glycol or urea) to the skin surface. Humectants are water-loving and draw water from the dermis into the epidermis, hydrating it.

Source: Penzer and Ersser (2010)

TABLE 1. EMOLLIENT QUANTITIES

	Creams and ointments	Lotions
Face	15-30g	100ml
Both hands	25-50g	200ml
Scalp	50-100g	200ml
Both arms/legs	100-200g	200ml
Trunk	400g	500ml
Groins and genitalia	15-25g	100ml

Source: British Medical Association and Royal Pharmaceutical Society (2011)

Evaluating emollient use

Patients or health professionals will be able to tell whether they are applying the correct treatment regimen as the skin will start to improve and become less dry, itchy and irritated.

If this is not happening, practitioners need to ask various questions:
- Are the right emollients being used or should a greasier product be considered?
- Are more frequent applications needed and/or in larger quantities?
- Is the patient using soap substitutes when washing?
- Is a further treatment such as a topical steroid needed?
- Is it possible there is a contact allergy or another undiagnosed dermatological condition that needs referral to a dermatologist?

Conclusion

As preventing skin breakdown is a vital part of nurses' roles, all nurses need a basic understanding of the physiology of the skin and how emollients help to prevent skin breakdown. **NT**

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