

# An Introduction to Skin Care for those Managing Lymphoedema

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The guideline originated from a National Lymphoedema Partnership proposal, supported by a Macmillan Cancer Support development grant.

The aim of the document is to support staff working with patients who have lymphoedema/chronic oedema. Skin care is a key cornerstone of management; this guidance introduces the most common skin clinical observations, and potential management options.

Author: Anita Hobday

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Appendix 1: General skin product information and guidance (as of January 2021; reviewed and updated on a bi-annual basis)

## 1.0 Background

Lymphoedema is described by the Professor Peter Mortimer as follows:

Lymphoedema results from a failure of the lymphatic system. Consequences are swelling, skin and tissue changes and predisposition to infection (1).

The term 'Chronic oedema' is often used interchangeably but in essence does refer to a condition caused by different factors such as venous disease, trauma, infection and indeed surgery (2).

With the lower limbs, the increase in filtration as a result of venous disease being in excess of what the lymphatic drainage system can absorb and resulting in oedema; as such, this is clearly a mixed aetiology however, this is lymphoedema (3).

Therefore, for the purpose of this document the term lymphoedema will be used as an 'umbrella' term and will include all chronic oedema because essentially, they are the same (1).

Good skin care is a cornerstone of good lymphoedema/chronic oedema management. It must be a core component of care for each patient, and modified to suit the individual.

## 2.0 The skin and lymphoedema

The skin is the largest organ of the body supported by the subcutaneous tissues that consist mainly of fat. Both have an active microcirculation consisting of blood vessels that are the supply chain to the tissues while the lymph vessels serve as the drainage route. The blood and lymph vessels are affected when normal regulatory processes fail resulting in swelling (4). The skin changes discussed in this document are as a direct result of Lymphoedema (1).

Chronic inflammation associated with Lymphoedema results in an increase in the production of fibrosis and fat deposition, which then contributes to the hardening of the skin with the resulting change of oedema converting from pitting to non-pitting (5). This results in a further reduction in the flow of lymph. The resulting changes have an effect on the skin and subcutaneous tissues and therefore the need for skin care as part of any management of lymphoedema. As such, the importance of skin care should not be under-emphasised.

Skin complications, because of lymphoedema, will vary according to the severity of the impaired lymph drainage and the degree of increased lymph load for example venous hypertension. This document will discuss these skin changes and offer a consensus on the management of these conditions.

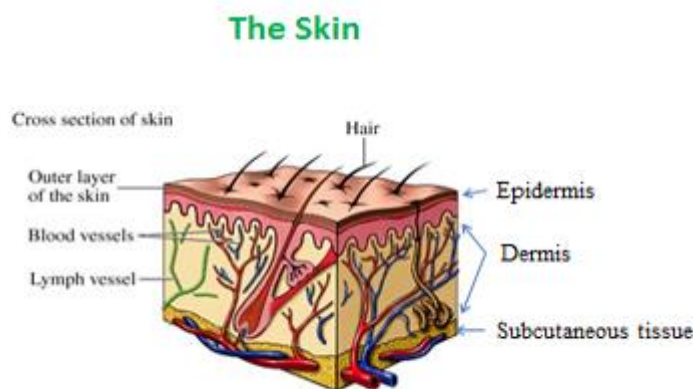
### 3.0 Structure of the skin

The skin consists of two main layers, the epidermis and dermis (see figure 1).

**Epidermis** – is the outer covering. It contains keratin on the surface that acts as a barrier to resist friction and prevent infection.

**Dermis** – sits beneath the epidermis. Its role is to support it and supply it with nutrients. The dermis contains connective tissue, (collagen and elastin), blood and lymph vessels and nerves. Hair follicles and sweat gland represent invaginations of epidermal structures into the dermis. Elastic fibres and supporting collagen, fibrous connective tissue provide the skin's elasticity. An increase in collagen leads to fibrosis.

The subcutaneous tissues consist mainly of adipose, which is an insulating layer and is vitally important in the conservation of body heat. It also allows the skin to move over the underlying tissues and adds to body shape.



**Fig 1. Diagram of the skins structure**

### 4.0 Function of the skin

#### 4.1 Protection

- From physical damage, trauma & infection
- Immune function. The lymphatic system houses the immune system. With a healthy immune system, the skin has the potential to recognize harmful substances that may enter the body, and then activate the immune responses to eliminate them.
- Inflammation & repair. The skin is frequently damaged, so its repair functions have to be good. Inflammation is one of the initial responses of living tissue to injury (that injury may be physical, such as accidental or surgical trauma, or radiation; chemical: such as acid; or necrosis from loss of blood supply).
- Sensation: the skin is the largest sensory organ. It senses danger and so provides a protective function.

This function of skin is supported by its presentation on different aspects of the body, e.g. very thick on soles of feet/palms of hands and delicate on the eyelids, scrotum & penis.

#### **4.2 Temperature regulation**

Temperature regulation: the skin is important for controlling heat loss.

#### **4.3 Sensation**

The skin is the largest sensory organ. It provides a protective function (pain or itch) and also touch and pressure sensation.

#### **4.4 Endocrine – vitamin D production**

On exposure to sunlight (especially UVB radiation) a substance found in the skin cells (7-dehydrocholesterol) is converted to cholecalciferol. This is the precursor to Vitamin D.

#### **4.5 Psychosocial/sexual**

The skin forms part of how the world sees us. Adornment of the skin is part of human behavior. It can help to identify our culture, personality and age. We also express some emotions through the skin exhibited by colour change.

***Please refer to Appendix 1 for suggestions on preparations which could be considered for each skin condition covered in this document (dated January 2021; plan to review and update on a bi-annual basis)***

### **5.0 Skin complications in Lymphoedema**

Skin complications associated with lymphoedema are described as common (5). The aim of appropriate skin care is fundamentally to keep the skin healthy and reduce the incidence of complications such as infection. Health care professionals (HCP) should be consider aesthetic factors, from the patient's point of view. Skin care practices are life long and as such, must be part of each individual's self- care regime. This is central to successful lymphoedema management.

The complications and conditions discussed below reflect those identified in the literature. Evidence from publications underpin this document but the list is by no means exhaustive. Each condition can present in isolation, but more often, more than one coexist and therefore the management should reflect this combination.

#### **Common skin conditions associated with Lymphoedema**

- Dry / flaky skin
- Dermatitis (Eczema)

- Hyperkeratosis
- Papillomatosis
- Skin folds
- Folliculitis
- Cellulitis
- Mixed type lymphatic malformation previously known as Lymphangioma
- Lymphangiectasia
- Plantar Dermatitis
- Venous Dermatitis (eczema)
- Fungal infections
- Onychomycosis
- Lymphorrhoea

#### **Aims of skin care**

- Maintain skin integrity
- Maintain a healthy tissue condition
- Reduce risk of infection
- Encourage self- care
- Reduce the effects of any long term associated skin condition

## Standard skin care protocol

Patient's should be encouraged to carry out skin care twice daily as follows:

- Conduct a thorough examination of the limb looking for signs of changes in the skin condition for example increased dryness, infection, injury, changes in shape because of the change in the distribution of oedema and signs of any of the conditions discussed in this document.
- Use warm water to comfortably and thoroughly cleanse area.
- Use a soap substitute such as Dermol or Hydromol. Soap substitutes are water and oil based and therefore do not have the same irritant or drying effect of perfumed soaps. (NB: Aqueous cream is not a moisturizer and may cause irritation if used as one\*)
- Great care must be taken when washing and drying between the digits to reduce the risk of fungal infections. Consider using a spray cleanser if soap and water not available.
- Moisturisation – patients should apply a moisturiser (note that the main aim of a moisturiser is to stop the evaporation of water from the skin) at least, once a day, preferably twice. This can depend on whether patients can still apply their garments following moisturisation. Therefore, wait up to half an hour after applying cream before attempting to put on a garment because this will allow time for the preparation to be absorbed and make application easier. Moisturisation can also be completed by the patient (or carers) at night, when their compression garments have already been removed.
- Skin damage – reducing the risk of damage to the integrity of the skin, will reduce the chance of infection. Historically patients were advised to not let a medical practitioner take blood or give an injection into the affected limb. There is little robust evidence to support this advice, but any break in the surface of the skin creates an opportunity to trigger infection. It is therefore recommended to take all reasonable precautions to avoid any puncture wounds.
- Great care should be taken when working in the garden to try to prevent cuts and insect bites. The use of protective gloves, for example, will reduce the risk of cuts. All cuts should be treated promptly with an antiseptic.
- The removal of unwanted hair: The aim is to remove hair above the hair follicle, i.e. not extract the hair from the follicle, and leave it exposed and therefore create a portal for infection. As such careful consideration needs to be taken regarding plucking, waxing and shaving over the swollen area (or area at risk of swelling). The use of an electric razor or depilatory cream is recommended, however individualized options should be discussed with the patient as other pragmatic options may be possible.

\*<https://www.gov.uk/drug-safety-update/aqueous-cream-may-cause-skin-irritation>



Guidance should be provided to patients regarding sensible protection of their skin and other risk reduction activities; the BLS have produced a leaflet to support this aspect of self-management (6).

## 6.0 Topical preparations (Emollients, Oils and creams)

All substances placed on the skin have the potential to penetrate, and be processed by the lymphatic system. Health Care Professionals (HCP) need to consider the impact a compromised lymphatic system might have on this process, if the aim is absorption. Any excess topical preparation should be avoided, and indeed removed, during the standard skin care regime. 'Emollient' and 'moisturiser' are terms often used synonymously. An emollient is a substance that smoothes and softens the skin, usually via occlusion, with the purpose of reducing water loss and introducing more moisture because of the product itself being applied (7). Moisturisers can actively add moisture to skin, usually as a humectants, but their main role is to prevent loss of water from the skin. Humectants are substances that absorb water or help another to retain moisture for example urea, glycerin or sorbitol.

### Emollients

Emollients are divided into three categories:

- Bath oil
- Soap substitutes
- Moisturisers. These are then subdivided into
  - Lotions
  - Creams
  - *Ointments*

### Bath oils

These contain oil and/or emulsifiers and are designed to disperse in water (7). Patients should avoid all products with perfume content as they are potential sensitizers to dermatitis.

### Creams

These are made of a mixture of oil and water and include stabilisers and emulsifiers to prevent substances from separating. Some creams contain lanolin which can cause sensitivity and dermatitis.

### Lotions

These are made as creams but with more water content so the consistency is thinner.

### Ointments

Ointments, besides the same active ingredients as creams, differ because they contain little or no water. They are therefore thicker and often greasy. This helps prevent evaporation of water by diminishing the trans-epidermal water loss. They form an impermeable layer over the skin. These are ideal for patients with a marked dryness but are often considered less cosmetically acceptable. They should be thoroughly removed prior to a new application.

*Many preparations are flammable, such as those containing paraffin. HCP must check the product label for precautions, and discuss this with the patient and/or carers.*

## 7.0 Treatment guidelines for common skin conditions

### 7.1 Dry/flaky skin

Dry skin is caused by loss of moisture and aging. Chapping and cracking area are signs of dry skin. Figure 2 and 3 diagrammatically show the effect of drying on the skin. The aim of care is to restore lipid layer, to ensure the integrity of the skin surface and reduce the risk of portals for infection.

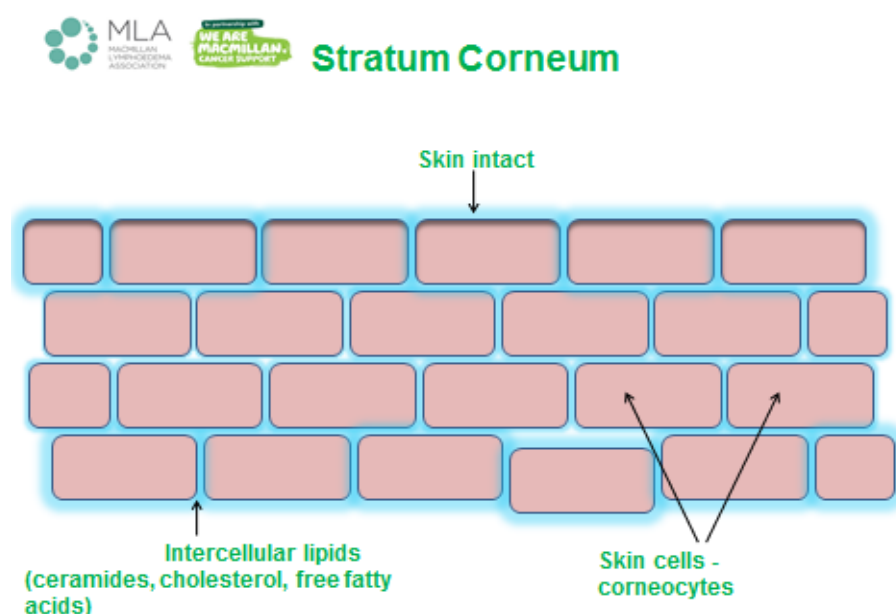
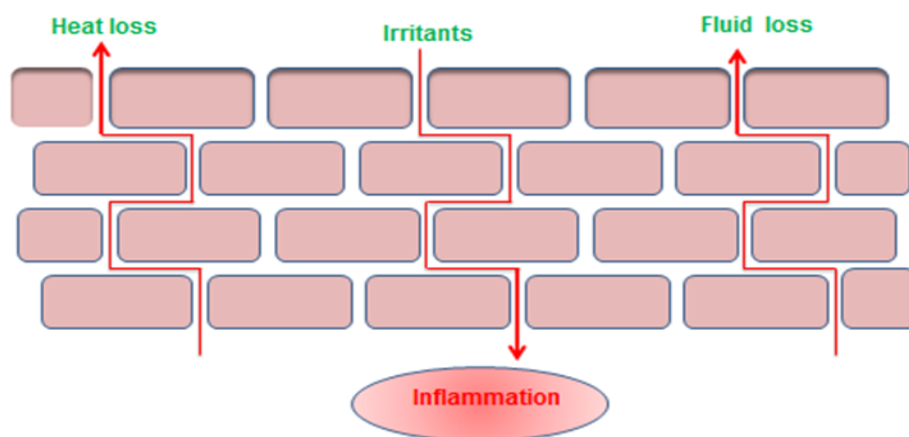


Figure 2. Normal skin



### Skin Dries and Cells Shrink



**Figure 3.** Drying effect by the skin losing moisture. Oil glands are not producing enough lubrication.

#### Management of dry skin

It is essential that patients or their carers consider this aspect of care as part of their self-management regime. The standard skin care protocol applies. Dry skin is caused by the loss of moisture and this can be affected by the climate for example during the winter months when ambient humidity is low and water loss from skin is high or conversely in hot climates. Dry skin contains fewer natural oils, and a dry skin is more prone to the effects of physical and chemical damage produces less sebum and as such can increase sensitivity. Co-morbidities such as an underactive thyroid (Hypothyroidism), diabetes and certain drugs such as diuretics can make this situation worse.

The use of an appropriate moisturiser, dependent on the level of dryness and any underlying skin conditions such as eczema, is essential. Applying a layer of emollient over the skin surface will trap water, prevent evaporation and restore the skin's natural barrier surface. Emollients are used to moisturise, lubricate and soothe dry irritated skin. They provide a surface lipid film that enhances the rehydration of the epidermis and reduces water loss. When choosing a moisturiser consider skin condition, hydration and contact sensitivity, preference and cosmetic acceptability.

Compression garments should be removed on a daily basis, as it is not recommended that garments stay in place for more than 24 hours. Anecdotally if garments are left in situ for prolonged periods, the normal shedding of dead skin cells does not happen and the build-up

of dead skin cells under compression is likely to add to the problem of hyperkeratosis. If removing garments daily is not possible, then the treatment used for dry skin needs to reflect this to ensure that dead skin cells do not build up causing hyperkeratosis or dryer skin conditions.

Patients can describe itching as a symptom and as such, a HCP should consider alleviating this symptom as part of any treatment regime. Again, leaving garments on can make itching worse, so an important treatment strategy is to ensure the daily removal of compression garments or bandaging.

## 7.2 Contact Dermatitis (eczema)

Dermatitis in some publications is synonymous with eczema and is classified as a group of conditions associated with inflammation of the skin. There are two main groups

- Contact irritant dermatitis
- Contact allergic dermatitis

Contact irritant is more common than allergic. Irritant is often due to exposure to a chemical or physical factor over a long period. It can occasionally be the result of an acute toxic irritant to the skin and tends to be in relation to occupation, for examples the solutions used by cleaners or nurses. Lymph is irritant to the skin and weeping lymph (Lymphorrhoea) readily causes a contact irritant dermatitis.

Contact allergic dermatitis is a hypersensitivity; a change in a product composition can be a less obvious cause, but should be considered. More often, this is an immune (allergic) response set off due to repeated contact. Patients with lymphoedema are believed to have a predisposition to becoming allergic to preparations they have always used if the composition is changed for example washing powder that they have always used if the label suddenly says 'new improved' may indicate that the content may not be the same and so has the potential to cause a problem. This is also the case in all skin preparations, which changed from time to time, so it is important to check these if an allergic reaction is suspected.



**Figure 4 Dermatitis**

## Management of Contact Dermatitis

The standard skin care protocol as previously described applies.

Patients experience red, itchy skin, which can be broken, and therefore, some degree of exudate can be present. Consideration should be given to potential substances that may be causing the dermatitis and avoidance of exposure to suspected agents. If not improving with these measures, or if the condition is severe, referral to a GP or indeed Dermatologist is appropriate. Patients can also be encouraged to access Pharmacists for advice.

Liners may be required to wear under garments/gloves. It is worth noting that liners can be bleached and therefore cause an associated reaction. These may also cause increased perspiration and hold the moisture to the skin, causing a moist warm environment for bacteria to grow. In this case a liner impregnated with silver may help.

Silver is considered to have an antibacterial property (8) Sensitivity can be increased by remnants of washing powder in clothing etc. It should be noted that specific sensitivity can be localised and reverse once the irritant is removed.

Often sensitivity is mistaken as an allergy. If this is suspected, then appropriate referral for consideration of patch (allergy) testing needs to be considered. Otherwise, sensitivity can be increased by remnants of washing powder in clothing etc. It should be noted that specific sensitivity can be localised and reverse once the irritant is removed. An allergy can result in an increase in oedema, because of the increase in the inflammatory response. A severe allergic reaction however can lead to whole body dermatitis, which can lead to an emergency or life-threatening situation (but this is rare).

Treatment can often include the use of topical steroids, and in severe cases, oral steroids. Topical steroid therapy should not be abruptly stopped, so a staged withdrawal process should be adhered to following the process as outlined in figure 5 below.

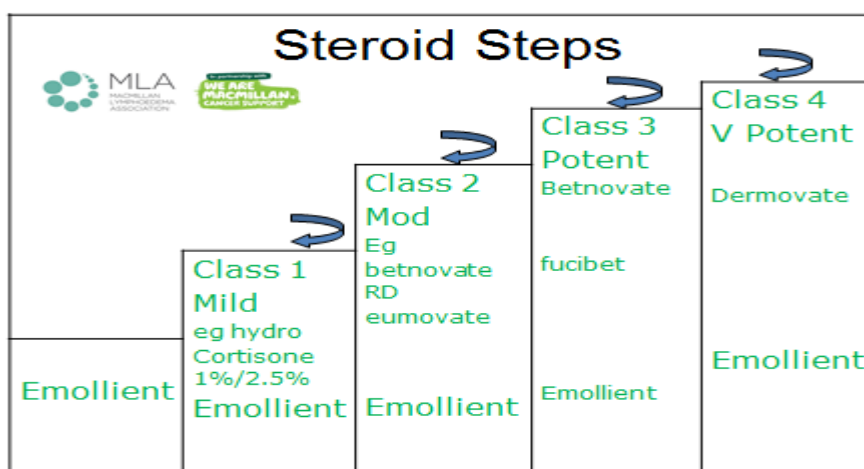


Figure 5 Steroid ladder

### 7.3 General management for Dermatitis

It is not the purpose of this document to discuss dermatitis in terms of the many different types and presentations. If the dermatitis does not respond to treatment then a referral to dermatology is suggested. For the purposes of this consensus and the association with lymphoedema the following broad statements are offered for information.

Tinea is the name of a group of diseases caused by a fungus. Types of tinea include ringworm, athlete's foot and jock itch. These infections are usually not serious, but they can be uncomfortable. You can get them by touching an infected person, from damp surfaces such as shower floors, or even from a pet. The difference between eczema and tinea can be considered as follows:

- Generally, eczema is bilateral and tinea unilateral
- Steroids improve eczema but make tinea worse
- Send clippings and scrapings for the diagnosis of tinea

#### 7.31 Management of Plantar Dermatitis (Fig 6)

The suggested skin care protocol is essential as is considering if there is any causal irritant. Frequent changing of any compression therapy is paramount with appropriate laundering of the garments or bandaging because of the increased shedding of skin and possible exudate. Occlusive bandaging may be used as treatment with the emphasis on 'paste' or medication impregnated material and as such this can be combined with the continued compression therapy needed to control the lymphoedema. Compression garments can sometimes irritate so a liner should be considered. If the Plantar eczema affects the digits, then it would be worth considering a toecap or occlusive bandaging using a cohesive bandage.



**Fig 6 Planter Eczema**

#### 7.32 Atopic eczema

Categorised as endogenous, Atopic eczema (Fig 7) is extremely itchy and as such the cycle of 'itching and scratching' (10) is difficult to break. With the patient group mostly being children, the likelihood of lymphoedema and atopic eczema in combination is usually

associated with a genetic lymphatic disorder. These patients often have a history of dry skin. They are prone to bacterial infection (9) and therefore if associated with lymphoedema have a significant risk of infection.

Referral to dermatology should be considered. It is however likely that the patient may have been referred from children's services including paediatric dermatology to lymphoedema services therefore establishing a multi-disciplinary approach to care.



**Fig 7 Atopic Eczema**

#### **Management of eczema/dermatitis**

The standard skin care protocol should be followed unless there are any contraindications. As the skin integrity is often broken, many of the preparations for reducing bacterial load, cleansing, and moisturisation cannot always be used because of the tendency to 'sting'. It is therefore an elimination process to find a topical preparation to suit the individual. Occlusive bandaging using medication impregnated material may help particularly with a 'soothing' effect.

Topical corticosteroids are used as a basis for treatment. The steroid ladder (fig 5) is useful with the aim being to secure control of symptoms with the lowest strength of steroid. The use of systemic antihistamines is considered in terms of reducing itching, and the sedative effect helping the patient cope with symptoms, such as itching (9). Infections must be treated promptly using the BLS guidelines (9). Topical corticosteroid preparations have an anti-inflammatory effect and are widely used.

### 7.33 Varicose Eczema



**Fig 8 Varicose eczema**

Venous eczema/dermatitis is related to problems of venous return. The skin becomes itchy, red, dry and scaly. This leads to the skin 'flaking' and in some cases the skin breaks down to form an ulcer.

Varicose eczema can be present without significant oedema but still requires compression therapy because of the underlying venous condition. Therefore, the guidelines and evidence for treatment of venous disease should be followed. If lymphoedema is present then compression bandaging must follow the guidelines for treating the oedema as well as any eczema or even ulcer (1). In particular, this should include bandaging or a compression garment to the toes and above the knee. The treatment of this patient group requires a multi-disciplinary approach so that the evidence base for the treatment of venous leg ulceration is combined with the strategies used for patients with lymphoedema.

#### **Skin care for Varicose eczema (without ulceration)**

The skin care protocol is once again paramount. In addition, great care should be employed when considering moisturisation in terms of preparations for very dry skin. If there is an acute exacerbation of eczema, then topical steroid therapy may be appropriate. Medication impregnated materials and bandages may help to reduce the symptoms of itching and act to 'soothe' the irritation often felt by this patient group.

To reiterate, if lymphoedema is present then management strategies should include compression therapy to include toes and above the knee, if indicated. The Velcro compression wrap systems may be the best option to enable patients or their carers to undertake skin care as frequently as needed, and not have to rely on HCPs having to reapplying compression bandaging.

### 7.4 Hyperkeratosis

Hyperkeratosis comes with thickening of the skin and increased production of surface scale (keratin) (3). As in figure 6 this is scaly and is grey or light brown in colour. Common areas are the toes and around the ankle. However, in the case of figure 6 it is localised to the scar,



which was the result of a healed leg ulcer. The scales can be so thick that they are compressed by bandages/garments and therefore cause a localised increase in pressure resulting in softer oedematous tissue bulging through the gaps in between scales.

### Management of Hyperkeratosis

Adhere to the standard skin care protocol with the addition of the following strategies as appropriate:

- Washing can be enhanced by using a preparation that adds moisture such as an emollient in the form of a wash or bath additive.
- Moisturisation is vital and as such preparations such as 50/50 white soft paraffin and liquid paraffin (caution over being near a naked flame as inflammable). Commercially products are advertised as having a more intensive therapeutic property using such terms as 'intensive' in the trade name. Check the ingredient list to assess their worth, and potentially liaise with local primary care support for further guidance.
- Historically Salicylic acid was used to help soften and therefore 'lift' the scaling, but it can also be an irritant. Comes in paste preparation that can be used under a hydrocolloid dressing (5).
- Preparations described as having a keratolytic effect (having an ability to soften Keratin) property can be used to soften and lift the hyperkeratosis. These preparations are milder than salicylic acid alone yet may still have antifungal properties (7).
- Exfoliator pads are newer preparations that help to lift the scales without trauma when used as manufacturers suggest. Manufacturers suggest these should be used in a 'polishing' motion – not abrasively – the polishing motion will allow the solution to penetrate the skin and provide a deep clean and the debridement action of the cloth will pick up any loose debris. It will have a cumulative effect on hyperkeratosis as the more often it is used the hyperkeratosis begins to soften. As with any product designed to remove scales care should be taken to avoid using the product 'roughly' as it may make the skin sore.
- Creams containing urea are useful in skin hydration and removing dead scale.
- Extra vigilance should be taken when the patient has any co-morbidity, such as diabetes, because of the extra risk of infection and potential skin damage.
- Use of compression is essential in terms of better control of the oedema and softening of the tissues (10). This in turn reduces the opportunity for this type of skin complication to occur. However, where this is a risk of hyperkeratosis occurring it is essential that hosiery or compression bandages are removed and reapplied daily

allowing for treatment of the hyperkeratosis and the daily skin care protocol to be continued.



**Figure 9 Hyperkeratosis**

### **7.5 Papillomatosis**

Papillomatosis appears as a 'cobblestone' change in the skin surface due to dilated surface lymphatic vessels that have become organised, and encased in collagen. Fibrosis is believed to make this condition worse. Of great concern in the presence of excess moisture, as in the case of Figure 10, anecdotally known as 'Mossy foot', is the likelihood of fungal infection.



## Figure 10 Extreme Papillomatosis

### Management of Papillomatosis

Standard skin care protocol needs to be implemented with an emphasis on getting in between affected toes and skin folds. Surface bacterial load (often normal flora) increases from hundreds per square centimeter to millions when moisture and warmth are increased (9). Therefore, the risk of infection increases accordingly.

- Washing can be enhanced by using an antimicrobial preparation although in this case this might be better used in a container, such as a lined bucket or bowl, to immerse just the affected limb(s) rather than used as part of general bathing.
- Moisturisation needs to be planned; the balance of treating any fungal infection and the incidence of excess moisture (because of the site) needs to be considered. As such, the removal of any residual moisturiser must be scrupulous in between skin care activity.
- A urea-based cream is also useful in removing dead skin. Urea helps to plump up the cells and allows them to become softer which is particularly useful if the Papilloma are hard to the touch.
- Any fungal infection should be treated as cited in the section on fungal conditions, but care should be effective in terms of treatment options not compromising each other. The use of products with antibacterial and fungal properties should be considered.
- The application of compression is vital in order to reduce oedema and compress the dilated lymphatic vessels but caution needs to be exercised because of the risk of trauma in the application or removal of compression garments or bandages (9). In such cases, and dependent on the site, the use of a Velcro strapping system can be helpful. In the case of Figure 7 the use of a toe cap would be appropriate with toe bandaging being considered with extreme caution because of the risk of further damage caused by friction.

### 7.6 Skin folds

Areas of skin contain several hundred bacteria per cm<sup>2</sup>, whilst moist skin folds are usually colonised by several million per cm<sup>2</sup> (9). This is highly significant to lymphoedema patients as it increases their risk of infection. Skin problems include maceration and intertrigo (inflammation in a skin fold such as between toes).

### Management of skin folds

- Assessment needs to include observation of the patient from all angles as folds can be hidden by clothing or indeed the position of the patient, for example when sitting. It is useful to use a diagram to 'map' the folds and measure any protrusion or 'overhang' as part of the mapping.
- Careful examination in between skin folds for coexisting problems such as fungal infections is essential. These should then be treated accordingly
- Multi-layer lymphoedema bandaging (MLLB) improves skin folds and limb shape with use of appropriate padding to lift skin folds and break down fibrosis. Other systems such as cohesive two layer bandaging may be appropriate depending on the size and indeed 'overhang' of the skin folds. In this case extra padding to compensate for the weight of any 'overhang' may be necessary in order to support the pendulous nature of such skin folds to reshape and correct any shape distortion. Padding is also useful in reducing skin-to-skin contact therefore reducing moisture and the warmth, which encourages bacterial proliferation; this is provided the padding is changed often enough to avoid it becoming damp, wet or soiled.



**Figure 11 Front and rear view showing skin folds. The nature of the folds is far more extensive from the rear view.**

### 7.7 Folliculitis

Folliculitis is a pustular inflammation of superficial hair follicles caused by bacteria. It can be exacerbated by use of topical therapies especially if these are allowed to build up and not completely washed off in between applications. If left untreated cellulitis may develop. To help with the prevention of the condition applying topical preparations by downward strokes reduces the buildup of emollient in the hair follicles and returns the hairs to the correct anatomical position



**Figure 12 Folliculitis**

### **Management of Folliculitis.**

As with all skin care the standard protocol should be undertaken. Additional intervention includes:

- Swab the pustules, trying to get the actual pus, for identification of the bacterial organism. This is most commonly *Staphylococcus aureus* (5).
- Stop the application of moisturiser to the local area.
- Try to identify any irritant.
- If systemic symptoms are present indicating infection then treat as per the information on Cellulitis.
- Consider using an antimicrobial wash. Be mindful that cream or ointment preparations with antimicrobial activity may offer too much of a moisturising effect and therefore 'clog' the hair follicles further, and therefore should be thoroughly washed off in between each application.
- Consider topical antibiotic preparations if there is no evidence that infection has or is becoming systemic; for example, the patient is febrile.
- The use of compression therapy should be stopped or reduced during the acute phase of cellulitis when the patient finds it difficult to tolerate. However, as soon as it is comfortable to do so, it can be re-applied.

## 7.8 Cellulitis

Fig 13/14 Cellulitis



Cellulitis is one of the main causes of concern for patients with lymphoedema. It causes damage to the subcutaneous tissues by accelerating fibrosis, which then leads to increased oedema and subsequent increased risk of infection. The aim is therefore to try to suspend the cyclical nature of the condition with worse swelling encouraging more infection. Cellulitis can be severe enough to result in hospitalisation and life-threatening sepsis. Patients describe it as 'their worst fear' and it can make them extremely ill systemically and result in socioeconomic and long-term effects. The BLS cellulitis consensus guideline is reviewed annually, and updated as required, offering expert advice.

### Management of cellulitis

The BLS consensus document (9) should be used in conjunction with these recommendations.

- Standard skin care protocol
- Consider using antimicrobial wash or bath additive. Preparations such as washing with a chlorhexidine-based solution may be appropriate; however, be mindful that patients can become intolerant to this.
- The use of compression therapy should be stopped or reduced during the acute phase of cellulitis when the patient finds it difficult to tolerate. However, as soon as it is comfortable to do so, it can be re-applied.
- Cellulitis can be mistaken for hemosiderin staining or dermatitis and acute lipodermatosclerosis due to raised venous pressure. These other conditions are often bilateral whereas cellulitis is usually unilateral. It is therefore important to consider other signs and symptoms such as systemic upset. The BLS Red Leg pathway



is another tool which will provide guidance for clinical reasoning and diagnosis of cause of a pink/red limb (10).

- Specialist (Dermatology/Infectious diseases/Lymphoedema specialist) advice and monitoring may be needed particularly if the patient does not respond to treatment or infections become more frequent.



**Figure 15 Cellulitis that has caused the breakdown of the integrity of the skin.**

### **7.9 Lymphangioma (Lymphatic malformations)/Lymphangiectasia**

The distinction between lymphangioma and lymphangiectasia can be confusing. Indeed many references in the literature have added to this confusion. Clinically both appear on the skin as translucent vesicles.

Lymphangiectasia are dilated lymphatics that are associated with lymphedema and appear as small “lymph blisters” in the skin. Over time these can change in clinical appearance with the development of fibrosis and become firm and opaque – i.e. papillomata. In the past these have been known as ‘acquired lymphangiomas’ but this term is no longer recommended.

Lymphangioma was previously used to describe lymphatic malformations that may occur deep in the tissues and sometimes protrude through the skin. They can be divided into microcystic, macrocystic or mixed, depending upon the size of the cystic malformations of which they are formed. They are now more commonly known simply as lymphatic malformations.



**Figure 16 Lymphangioma Cavernosa**



**Figure 17 Lymphangioma Circumscriptum**

#### **Management of Lymphangiectasia.**

The management of lymphangiectasia requires adherence to the skin care protocol with emphasis on the prevention of infection as the vesicles can leak making a portal for bacterial infection. Compression should be considered to reduce the size of the vesicles, to prevent further dilatation and is an effective way of stopping leakage Therefore extra padding may need to be considered in between the compression and the skin.

#### **7.10 Fungal Infections**

Fungal infections are a common problem (4) particularly in skin folds because of the moist warm environment. Fungal infection increases the risk of bacterial infection (5). There are two main types of fungal infection- dermatophytes and yeasts.



**Figure 18 Fungal infection- Tinea Pedis**

Dermatophyte infections (figure 18) are usually superficial, spore producing and infectious. There are many different types but most cause maceration and can therefore lead to a secondary systemic infection. Some of the treatments for lymphoedema can exacerbate the infection for example occlusive bandaging.



The term 'Intertrigo' refers to inflammation in a skin fold where two skin surfaces are in apposition (11). When between toes it is often called 'athlete's foot'. For those with lymphoedema and associated skin folds the patient has a much higher risk of both fungal and bacterial infections.



**Figure 19 Yeast fungal intertrigo.**

### **Management of fungal infections**

The standard skin care protocol is important but HCP should take samples of the skin (scrapings) and nails for analysis to identify the organism causing the infection. This should then be treated with the most appropriate antifungal preparation. Anecdotally there is debate over whether an antifungal cream or ointment should be used versus a powder; suffice to say that once a powder is applied to a warm moist area it soon has the same problems as if a cream. It is most important to wash off 'old' preparations before reapplying. The area should be kept as dry as possible, and 'natural' materials such as silk or muslin can help to achieve this if placed in between skin folds. In practice, patients often report using a handkerchief for this purpose. In severe cases of maceration, a hair dryer can be useful to reduce further skin damage caused by using a towel.

- Terbinafine (Lamisil is the trade name) 1% is recommended (5) for up to six weeks.
- Half strength Whitfield's ointment can be used but is difficult to get hold of in the UK (anecdotally).
- Aerated footwear should be made from natural materials, and rotated so that the previously worn has time to 'dry out' and reduce the risk of reinfection
- Antifungal powder preparations can be applied to footwear to further treat the infection (18).
- Reinfection through recontamination is a hazard so clothing, towels and other materials need to be changed frequently and washed at higher temperatures than is currently the fashion i.e. above 40° (12).

### 7.11 Onychomycosis

Onychomycosis, also known as tinea unguium, is a fungal infection of the nail. This infection results in the nail becoming thickened with underlying hyperkeratosis. It can be caused by dermatophytes or yeasts. It can be painful especially when the patient has to wear compression for the treatment of lymphoedema. The wearing of occlusive compression garments or bandages hinder ventilation and therefore can exacerbate the problem.



**Figure 20 Onychomycosis**

#### Management of Onychomycosis

Nail clippings may be sent for analysis and the appropriate antifungal preparation used to treat the area. It should be noted that filing the surface of the nail from nail bed to nail tip regularly in hardened nails will thin them out and allow any topical preparation a route through. Removal of the nail can be considered an option, but the risk to patients with lymphoedema, and as such poor healing and wound infection should be considered. Oral terbinafine (Lamisil is the trade name) can be helpful. Referral to a Podiatrist should be considered if there is no improvement.

### 7.12 Lymphorrhoea

The weeping of lymph fluid through a break in the skin surface, which can be difficult to manage and causes:

- cold, wet feeling
- maceration of the skin and dermatitis
- infection/risk of infection
- distress/disability to patient

Lymphorrhoea is leaking of lymph through the skin surface, from a lymph blister (lymphangiectasia), or from a wound. It can be a sign that an underlying condition causing the lymphoedema is worsening, for example in heart failure, or that a patient has another condition either adding to or causing swelling. The aim is to reduce leakage and make the patient more comfortable.



**Figure 21 Single portal with Lymphorrhoea**



**Figure 22 Lymphorrhoea with associated blisters**

#### **Management of Lymphorrhoea**

The management of Lymphorrhoea depends on the cause and for those patients with life limiting conditions the care should include what the patient, relatives and carers think is

appropriate. The exudate that can be experienced with Lymphorrhoea can be substantial. External pressure is the mainstay of local treatment.

Protect around the broken area with a barrier cream. Spend some time observing the limb to ascertain the location of the portals that are leaking and then apply a non-adherent open weave dressing. This is to facilitate the skin being allowed to breathe through an open weave dressing, which should not be left for a prolonged period (manufacturers guidelines are useful to determine this). If this type of dressing is left in place for any length of time swelling can protrude through the weave and as such can result in further dilation of the lymph vessels and therefore more opportunity for leaking portals. Open weave silicone dressings are useful however the guidelines suggest this dressing can be left on for up to five days but this is unwise as dressing changes should be made as soon as 'strike through' (exudate soaking through the bandages) occurs. Therefore, an open weave, small pore, non-adherent dressing should be used.

MLLB is advised in conjunction with the above suggested skin care. In those with advanced disease such as cancer, the bandaging technique should be modified with the compression reduced according to patient tolerance. In this situation, bandaging may be used to relieve symptoms such as the discomfort of the 'tautness' of the skin or the cold sensation often felt because of the lymph leaking over the skin. MLLB should be reapplied at least daily (more frequently if there is strike-through, so that the compression/support is maintained and therefore offers the best prospect of reducing leakage. This may be reduced to alternates days as the leaking improves.

Exercise with compression is to be encouraged to stimulate lymph drainage but elevation of the part should be implemented when resting.

### 7.13 Other considerations

Consider when using cotton liners directly on to the patient's skin:

- Keep the weave of the material straight in accordance with manufacturers' guidelines. For instance with lymphoedema, ensure the coloured line denoting size is straight once applied. This will ensure the material does not exert any 'pull' on the hairs or skin because it is out of shape. This is especially important when you are applying compression bandages over the top.

Consider allergies:

- Patch test materials including fabric as well as topical preparations because patients may become allergic to the components including dye used. If a patient presents

with an allergic reaction consider checking the content of their usual washing materials including those used to launder garments and bandages in case the components have been altered especially when companies use adverts such as 'new improved'.

Consider nutrition:

- Patients who are malnourished may experience delayed healing and so nutritional support should be considered or referral on to an appropriate HCP for assessment.

Implement movement:

- Exercise is accepted as a fundamental part of treating lymphoedema and as such should be integral to any skin care regime or treatment strategy. Passive exercises are important in ensuring range of movement and helping prevent muscle stiffness. BLS has resources available to suggest appropriate exercise regimes.

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## Appendix 1: General product information (dated January 2021)

### 1.0 General information

All skin care starts with the routine skin care protocol and is then adapted in line with suggestions in this document.

### 2.0 Choosing an emollient

Broadly speaking, emollients prevent moisture loss, but moisturisers prevent moisture loss **and** hydrate by the action of a humectant (hygroscopic substance) that draws moisture into the epidermis (6). The choice is therefore linked to the amount of moisture you wish to preserve and introduce into the epidermis.

One more thing to consider is the more water the product has in it, the lighter, less greasy the product will be; this may be important if a patient needs to wear a compression garment. The thicker, greasy products are more likely to block hair follicles, and as such, it is vital that they are washed off and replenished at least once a day.

General Product Types	Product characteristics	Examples of products (as of January 2021)
<b>Bath Oils</b>	Will disperse in water and as such designed are to leave a thin layer of the product on the skin  Vary in consistency but tend to be lightweight  Can be greasy and as such pose a slip hazard	Hydromol  Dermol 200  Dermol wash  Aveeno  Balneum  Double base bath additive
<b>Cold Creams</b>	Thick in consistency and difficult to 'rub in'  So called because they are cold when applied  Contain little water and lipids	Cetraben cream
<b>Vanishing Creams</b>	Can be 'rubbed in' so the product disappears but still smooths out the feel and appearance of the skin  Contain more water than creams and are often preferred for those needing	Diprobase  E45  Hydromol



	increased moisturisation but do not wish to use creams or indeed need to apply a garment	
<b>Lotions</b>	Thinner in consistency, contain a lot more water  Tend to be less greasy  May be cooling	
<b>Ointments</b>	Usually very greasy  Can contain other medication to treat specific conditions  May need to be warmed to help application	
<b>Pastes</b>	Stiff preparations often impregnated into non stretch cotton plain weave bandages	PB7 viscopaste  Ichthopaste  Zipzoc zinc oxide

### 3.0 Treatments specific recommendations (as of January 2021)

<b>Dry flaky skin</b>	Hydromol intense  Paraffin based products such as QV 5%, 50/50 cream  Epaderm  Cetraben
<b>Dermatitis</b>	<b>Lining:</b> <ul style="list-style-type: none"> <li>• Dermasilk</li> <li>• Tubifast</li> <li>• Clinotherm</li> </ul> <b>Topical:</b>

	<ul style="list-style-type: none"> <li>• Coal tar preparations</li> <li>• Coconut oil BP</li> <li>• Dermol</li> <li>• Eucerin intensive lotion</li> </ul>
<b>Hyperkeratosis</b>	<p><b>Wash:</b></p> <ul style="list-style-type: none"> <li>• E45 wash</li> <li>• Dermol 500 lotion</li> <li>• Oilatum</li> <li>• Balneum</li> </ul> <p><b>Moisturise/exfoliate:</b></p> <ul style="list-style-type: none"> <li>• Hydromol intensive</li> <li>• Soft paraffin preparations, Flexitol can be useful</li> <li>• Salicylic acid +/- Duoderm</li> <li>• Salactol</li> <li>• Occlusal</li> <li>• Debrisoft</li> <li>• UCS cloth</li> </ul>
<b>Papillomatosis</b>	<p><b>Washing:</b></p> <ul style="list-style-type: none"> <li>• As for Hyperkeratosis</li> </ul> <p><b>Moisturise/exfoliate:</b></p> <ul style="list-style-type: none"> <li>• Some of the preparations for hyperkeratosis are appropriate depending on the site. However, some areas like in between toes need extra attention and can become a concern if the area is too moist.</li> <li>• Eucerin cream particularly if the Papilloma are hard.</li> </ul>

	<ul style="list-style-type: none"> <li>• Treat fungal infection as directed in the section specific to this problem.</li> </ul>
<b>Skin folds</b>	<p>Parting the folds to allow skin to 'breathe' and release moisture.</p> <p>Use of non-bleached linings can be useful under compression and folded into the fold. These need to be changed regularly or they become a medium to trap moisture rather than offer some absorption.</p> <p>If skin becomes very macerated, then a barrier cream such as Cavilon can be used to help protect skin to skin contact.</p>
<b>Folliculitis</b>	<p>Swab pustules</p> <p>Antimicrobial wash such as Dermal (use until pustules dry up and are no longer open).</p> <p>Antimicrobial wipes (use until pustules dry up and are no longer open)</p> <p>Fucidin cream if the pustules are open and leaking pus etc.</p> <p>Bactroban cream</p> <p>Return to normal moisturiser once skin no longer red/pink and pustules are dry.</p>
<b>Cellulitis</b>	<p>Refer to British Lymphology Society guidelines which are reviewed by the BLS Scientific Committee on an annual basis (<a href="#">hyperlink here</a> plus link to our standard).</p>
<b>Fungal infections</b>	<p>Lamisil (Terbinafine) 1%</p> <p>Mycota</p> <p>Dakarlin</p> <p>Canestan</p> <p>Half strength Whitfield's ointment</p> <p>(Footwear needs treatment too)</p>
<b>Onychomycosis</b>	<p>Nail clippings sent for analysis</p> <p>Lamisil</p> <p>Ticonazole</p>

<b>Lymphorrhoea</b>	<p>Barrier cream such as Cavilon around leaking portals.</p> <p>Cover large blisters with appropriate dressing such as Atrauman.</p> <p>Open weave dressing can help in terms of letting moisture and exudate through but protecting skin. They have the advantage of being able to stay in place for up to 5 days. Additional absorbent dressings can then be placed over the top. Caution is needed to avoid oedematous skin protruding through the pores of the dressing and as such, the pore size needs to be reconsidered.</p>
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