

# RECOGNISING CHRONIC OEDEMA AND THE NEED FOR INTERVENTION

In order to effectively treat chronic oedema, the practitioner must understand the varying causes of this condition and how underlying pathology can influence management choices. As chronic oedema is progressive and can lead to skin and tissue changes if left unmanaged, early identification and initiation of treatment is important to obtain the best therapeutic outcomes.

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Oedema is a widely recognised condition by the nursing and medical professions but sadly it is not always dealt with promptly or effectively due to lack of knowledge, experience, and poor assessment. Unfortunately, a lack of early treatment may precipitate the progression of chronic oedema or even lymphoedema which requires a more complex approach and treatment.

## Definition

Chronic oedema is defined as abnormal swelling in the tissues which lasts longer than three months and does not completely reduce overnight or with elevation (Williams and Craig, 2007).

Chronic oedema is a progressive condition. In the early stages, the patient may report tension in the leg, and feelings of heaviness and discomfort. The oedema is usually soft and pitting, reducing on elevation. If left untreated, however, the oedema becomes less soft and non-pitting over time, with the subcutaneous tissues becoming thickened. The oedema will no longer reduce on elevation, may produce a positive Stemmer's sign (the inability to pinch a fold of skin



*Figure 1. Chronic oedema is a progressive condition which can lead to distortion in the shape of the limb, skin folds and skin changes such as hyperkeratosis.*

at the base of the second digit), and may be accompanied with skin changes (*Table 1*) and/or ulceration. Shape distortion of the limb also occurs, resulting in deepened skin folds (Billingham, 2007).

Chronic oedema can occur at any age but is most prevalent in those aged over 65 years due to changes in the lymphatics caused by chronic venous disease, heart disease, orthopaedic surgery, dependency, immobility and infection (Moffatt et al, 2003).

## Aetiology

Oedema is the result of an accumulation of fluid in the tissues and is a symptom of

many different clinical conditions, and occurs as a result of a number of complex mechanisms involving the permeability of the capillary walls and the oncotic and hydrostatic pressure gradients that exist between the blood vessels and the tissues (European Wound Management Association [EWMA], 2003).

The capillary wall is a semipermeable membrane and blood moves continually between the blood capillary and the tissues so that the exchange of nutrients, waste, fluids, electrolytes, and proteins from the vascular and lymphatic systems and tissue can occur. In this area, pressure

**Table 1****Skin changes**

- » Dry flaky skin
- » Hyperkeratosis: brown scaly discolouration on lower limbs with thickened plaques on shins
- » Skin folds and creases: result of tissue stretching and volume of oedema distorting the limb
- » Blisters
- » Papillomatosis: warty papilloma develop usually on the foot, giving the skin a cobblestone appearance
- » Fibrosis: excessive hardened fibrous tissue
- » Cellulitis: acute inflammation of skin and subcutaneous tissues
- » Increased occurrence bacterial and fungal infections
- » Folliculitis: pustules around hair shaft
- » Lymphorrhoea: leaky wet legs
- » Maceration: wet soggy skin and tissues
- » Lymphangioma: blister-like bulging of dilated lymphatic vessels
- » Eczema

may be low and attract fluid into the tissue, or be unusually high and force fluid into the lymphatics and capillaries. It is here that the forces resulting in oedema come into effect (Moffatt, 2007).

### Types and causes of oedema

There are several different causes of oedema which will now be described in detail below.

#### Dependent/gravitational oedema

Dependent oedema (*Figure 2*), also known as gravitational oedema or armchair syndrome, occurs in immobile limbs that are left hanging downwards, such as in patients who spend most of the time sitting in an armchair. Some of the worst cases of oedema occur in those who do not go to bed at night but sit in a chair, which should be avoided at all costs (Franks et al, 1995). When the limb is dependent, pressure develops in the venous circulation (venous hypertension)



*Figure 2. Dependent oedema with venous leg ulcer.*

leading to increased capillary permeability which forces fluid into the tissues, resulting in oedema formation. This rise in pressure can be counteracted by periods of high elevation with the foot higher than the heart to promote drainage (Moffatt, 2007).

Oedema can also be reduced by activating the calf and foot pump which encourages the return of blood and fluid to the heart. Simple flexion, dorsiflexion and circular movements of the ankle may promote this if regularly performed throughout the day. Patients who sit with their limbs in a dependent position often have other concurrent medical and mobility problems that prevent movement. Such patients frequently have complex oedema problems due to underlying chronic conditions such as cardiac and renal disease and chronic arthritis (Moffatt, 2007).



*Figure 3. Lymphovenous oedema.*

#### Lymphovenous oedema

Lymphovenous oedema (*Figure 3*) refers to oedema in limbs that have been affected for years by chronic venous hypertension that has been poorly managed (Green and Mason, 2006). The constant unrelieved pressure on the venous circulation results in overload of the lymphatic system reducing its ability to remove fluid from the tissues, which then leads to oedema. The oedema starts as soft and pitting and reduces with elevation but if it is left untreated, skin and tissue changes occur (*Table 1*). The fluid in the leg is at risk of infection and complex inflammatory changes may lead to ulceration in a proportion of patients with lymphovenous oedema.

#### Lymphoedema

Lymphoedema (*Figure 4*) is chronic oedema caused by impaired lymphatic drainage that results in swelling that is not reduced by elevation or overnight. A positive Stemmer's sign may also be present where there is increased skin thickening and swelling of the toes. It can result



*Figure 4. Lymphoedema.*



Figure 5. Cardiac oedema. The leaking fluid from the leg can be noted on the mat behind the patient's left heel.

in limbs that are misshapen and have deep folds. Lymphoedema results in a build up of protein, fluid and waste products in the interstitial spaces and this triggers the inflammatory process. Consequently skin changes occur such as thickening with less pitting, hyperkeratosis, lymphangioma, papillomatosis and in some cases lymphorrhoea (Table 1).

### Cardiac oedema

Cardiac oedema is caused by the heart being unable to pump blood effectively around the body. Oedema is often soft and pitting but can become fibrous over time. In patients with acute cardiac failure, legs can become blistered and leak serous fluid (Figure 5) and in turn this can lead to ulceration. Oedema can extend to the thighs and sacral area when cardiac failure is undiagnosed or uncontrolled sufficiently by medication. Cardiac oedema is associated with increased shortness of breath on exertion, during exercise, or when lying down and the jugular

vein may be distended. Patients frequently complain of loss of appetite, and feeling generally unwell and tired (Moffatt, 2007). It is recommended that any patient presenting with lower leg oedema should be examined and if oedema is present in the thighs and sacrum the patient should be referred to their GP urgently for diagnosis and treatment.

### Assessment and diagnosis

A comprehensive assessment of chronic oedema is essential to identify the cause of the swelling correctly in order that prompt and effective treatment is given appropriately (Billingham, 2007).

It is paramount that nurse assessors do not accept oedema as part of the ageing process or believe that there is no treatment available.

A thorough assessment of the patient will help to identify risk factors for the development of chronic oedema and aid in its diagnosis. A careful history and examination should be carried out to include:

- ▶▶ General medical history, including identification of conditions that may affect the outcome of treatment such as a history of venous insufficiency, deep vein thrombosis and cardiac history. Underlying conditions such as congestive cardiac failure, liver and renal disease should be medically diagnosed and treated. If the patient has not seen a doctor regarding the onset of oedema they must be referred for tests and diagnosis before any treatment is initiated
- ▶▶ Limb volume measurement to assess the degree of swelling

- ▶▶ Assessment of the skin and tissues to identify changes associated with chronic oedema, noting factors that might affect the outcome of treatment, such as repeated episodes of cellulitis, fungal infections, papillomatosis, and skin allergies, such as dermatitis. Chronic oedema can present on its own or with ulceration. Ulceration can also occur as a result of untreated oedema. Clinical examination is essential to identify skin changes such as dry flaky skin or hyperkeratosis (brown scaly discolouration on lower limbs with thickened plaques on the shins) which can lead to ulceration as these are an indication of progressive deterioration

Table 2

The physical and psychological effects of chronic oedema on patients

#### Physical effects

- ▶▶ Large heavy legs
- ▶▶ Reduced mobility
- ▶▶ Skin changes such as dry flaky skin and hyperkeratosis
- ▶▶ Wet legs
- ▶▶ Offensive smelling legs
- ▶▶ Misshapen legs
- ▶▶ Skin folds
- ▶▶ Recurrent systemic and local infection
- ▶▶ Poor hygiene
- ▶▶ Maceration of skin
- ▶▶ Ulceration
- ▶▶ Problems with shoes and clothing
- ▶▶ Pain
- ▶▶ Discomfort
- ▶▶ Reduced joint function

#### Psychological effects

- ▶▶ Poor self esteem
- ▶▶ Reduced social activities
- ▶▶ Isolation
- ▶▶ Embarrassment
- ▶▶ Anxiety
- ▶▶ Depression
- ▶▶ Altered body image



- ▶ Psychosocial assessment to determine the impact of the swelling on the patient
- ▶ Circulatory assessment — ankle brachial pressure index (ABPI) or toe brachial pressure index (TBPI). An ABPI must be calculated to exclude significant arterial disease. An ABPI must be greater than 0.8 before high compression can be applied. If below 0.8 refer for further vascular investigations (Stevens, 2004) before undergoing compression therapy (Green, 2007).

Early diagnosis and intervention is vital to stop progression of oedema and irreversible damage both physical and psychological (Green, 2007)(Table 3).

### Managing chronic oedema

Practitioners need to be aware of how to treat oedema, the complications that can arise and when to refer for specialist advice (Williams and Craig, 2007). Cellulitis, infection of the skin and subcutaneous tissue, is a common complication of chronic oedema. It is due to the compromised immune response of the impaired lymphatic system. Infection can occur through abrasions, fungal infections and ulceration. Patients and healthcare professionals need to be aware of the risk of complications and be vigilant in recognising signs of infection. Clinical signs of infection — spreading erythema, heat, and increased pain with a raised temperature — should be treated promptly with antibiotics.

The main role of the healthcare professional is recognising



Figure 6. Compression bandaging not including the feet or toes, has resulted in the swelling of these areas.

patients at risk and identifying oedema in the early stages when treatment can be most effective.

A multidisciplinary approach is required for best care of the patient. If frontline clinicians do not have the necessary skills to manage chronic oedema then advice should be sought from specialist services or clinics and by following local guidelines and patient pathways. Ineffective management will only lead to increased costs to both the patient and the NHS.

### Skin care

Skin care is vitally important and a good daily skin care routine should be encouraged. Maintenance of skin integrity can reduce the risk of infection (Moffatt, 2006). Skin should be washed daily and dried thoroughly *especially* skin folds and between the toes to prevent

fungal infection. Fungal infections such as Athlete's foot should be considered on assessment and subsequent examinations. Athlete's foot starts as scaly dry skin but goes on to cause maceration between the toes allowing infection to penetrate the tissues and can cause cellulitis. Emollients should be applied frequently in the direction of hair growth to soothe, smooth and hydrate. Emollients are often under-valued in nursing and under-used by patients (Linnit 2007) and their application should be encouraged.

### Compression therapy

Compression therapy can help to improve skin integrity, restore the limb to a normal shape and enhance the patient's quality of life (Osbourne, 2007). Compression therapy can be applied to reduce the oedema when it is safe to do so. It is not



Figure 7. Damage resulting from inappropriate bandaging.

always safe to apply compression if arterial disease is present with an ankle brachial pressure index (ABPI) of under 0.8 or over 1.2, cellulitis, deep vein thrombosis, uncontrolled heart or renal disease. These must be excluded on assessment and treated before initiating compression therapy. Bandaging may just involve the lower leg or the whole leg but should include toes if oedema is present there or develops as a result of inappropriate bandaging forcing fluid into the toes (Figure 6). Compression bandaging needs to be applied by trained skilled practitioners who are able to assess the effectiveness of treatment and recognise and deal with any problems that arise (Figure 7).

Multilayer compression bandaging systems are suitable for patients with chronic oedema using inelastic (short-stretch) or elastic systems. Effective compression can also help ulcers to heal. Hosiery can be used for long-term management, once the oedema has reduced. It is available on the drug tariff but requires a skilled practitioner to measure, choose and fit a garment (Williams and Craig, 2007). The practitioner

also needs to check the ability of the patient to apply and remove hosiery as this is also important to facilitate adherence with treatment.

#### Wound care

If ulceration is present, appropriate dressings should be applied taking care to protect the peri-wound skin from maceration and further breakdown of tissue.

#### Patient advice and education

If treatment is going to be successful then patients need to be encouraged to make some lifestyle changes and practitioners must demonstrate the necessary knowledge and educational skills. Advice offered to patients should include:

- ▶▶ Elevating legs when sitting
- ▶▶ Going to bed at night rather than sleeping in a chair
- ▶▶ The importance of good hygiene and skin care routine
- ▶▶ Awareness of the risk of infections and what to do when symptoms occur
- ▶▶ Exercise and mobilisation
- ▶▶ Nutrition
- ▶▶ Concordance with compression therapy and the correct use of hosiery garments.

Some patients may require nursing or social care in order to comply with advice and treatment.

The physical and psychological effects that chronic oedema has on patients should not be forgotten (Table 2). How the individual reacts and the intervention that is received will determine the progress of treatment. Understanding from the practitioner and gaining trust from the patient is vital if treatment is to be accepted. If previous treatment has been painful or unsuccessful, further interventions may not be welcomed.

The effect of the oedema on the patient's body image should be established, since the swelling can have an effect on their choice of clothing, footwear or jewellery, or may contribute to relationship difficulties, anxiety and depression (Billingham, 2007).

#### Complex decongestive therapy

This specialist treatment for lymphoedema is now becoming more common for patients with chronic oedema. It is a programme of care that combines skin care, multilayer compression including hosiery garments, manual lymphatic drainage and exercises. Manual lymphatic drainage is a gentle and effective massage treatment that stimulates and moves the excess fluid away from the swollen parts allowing natural drainage into healthy lymphatics. This massage should be given by a specially trained practitioner. Specialist clinics for patients with lymphoedema are now

being developed in some areas of primary care. Patients will receive a period of intensive treatment followed by a long-term management plan.

### Conclusion

Chronic oedema is a widespread condition that has physical and psychological effects on each individual patient. It is a challenge for the practitioner to diagnose, treat, manage and know when to refer to a specialist. Chronic oedema should not be accepted as a result of ageing or part of a normal process and it is crucial that people are referred to an appropriate practitioner so that an early diagnosis and treatment can be sought to prevent further tissue damage.

Nurses in the community have consistently stated their lack

of knowledge and skills to deal with chronic oedema (Morgan et al, 2005). Part of the answer then must lie in staff recognising stages of oedema and when they can no longer cope or when they stop getting the desired effect from their initiated treatment.

NHS trusts need to provide comprehensive training as the costs of not managing and/or mismanaging will continue to rise and the detrimental effect on patients means they will require high cost treatments for much longer.

Services for chronic oedema and lymphoedema can vary from trust to trust and county to county. Often tissue viability specialist nurses are at the front end but they also have limited resources with high demands.

Ideally a local lymphoedema service would be most beneficial, along with comprehensive training regarding the causes of oedema and its management for all healthcare practitioners involved in the care of patients with chronic oedema. **WE**

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### Key Points

- ▶▶ **Chronic oedema is defined as abnormal swelling in the tissues which lasts for longer than 3 months and does not completely reduce with elevation or overnight.**
- ▶▶ **Chronic oedema is a progressive condition so early intervention is required to obtain the best outcomes for patients.**
- ▶▶ **It is important to understand the main causes of oedema, and how the underlying disease can influence management choices.**
- ▶▶ **Comprehensive training in the management of patients with chronic oedema is needed for all healthcare professionals involved in their care.**