

BACK TO BASICS: CORRECT LEG ELEVATION FOR THE OEDEMATOUS LIMB

Oedema is fluid retention in the body that results in the swelling of tissue. Elevation represents a key component of the treatment regimen for individuals with an oedematous limb. This article examines good and bad practice, and seeks to ensure optimum patient compliance with treatment.

“Elevation of the hand/arm should be included in the treatment regimen of a person with upper-limb trauma as it reduces oedema and improves blood supply.”

Elevation of the oedematous limb is a fundamental aspect of care and can contribute enormously to the success of treatment. Conversely, failure to elevate a limb can delay limb injury or ulceration healing.

The human body is approximately 60% water and the balance of water within the body is of vital importance for the wellbeing of the individual. Failure to balance fluids within the body can be caused by conditions such as cardiac failure and renal disease. However, the formation of oedema – be it post-injury or due to a chronic disease – is not considered to be medically urgent and maybe of secondary importance, but nonetheless, requires attention.

Oedema is the swelling of tissue due to the accumulation of fluid. It may occur as a natural reaction to injury or as a result of an underlying condition. Complex interactions between capillary vessels and the surrounding tissue result in the flow of water to and from the circulation and tissues of the body (European Wound Management Association, 2003). Should these be interrupted due to injury or underlying medical condition, water accumulates in the tissues resulting in oedema.

Upper limbs

The main cause of oedema to the hands and arms is trauma, which may be severe (e.g. bone fracture) or more minor (e.g. a sprain, cut, or bite). All of these instances may cause swelling and oedema, which then causes pain. Elevation of the hand/arm (*Figure 1*) should always be included in the treatment regimen of a person with upper limb trauma as elevation reduces oedema and improves the blood supply to aid healing.

Lower limbs

Epidemiological studies have shown that more than 100 000 people are suffering from chronic oedema in the UK due to a wide variety of causes (Moffatt et al, 2003). Conditions in which leg elevation is an important intervention include:

- ▶ Venous leg ulceration (Royal College of Nursing, 2006).
- ▶ Chronic oedema (Bianchi et al, 2012).
- ▶ Lymphoedema (Lymphoedema Framework, 2006).
- ▶ Injury with associated swelling of the lower leg (e.g. pretibial laceration; Beldon, 2008).
- ▶ Burn injury (Edwards, 2011).

Drugs that have the potential to cause oedema include steroids, non-steroidal anti-inflammatories, and calcium

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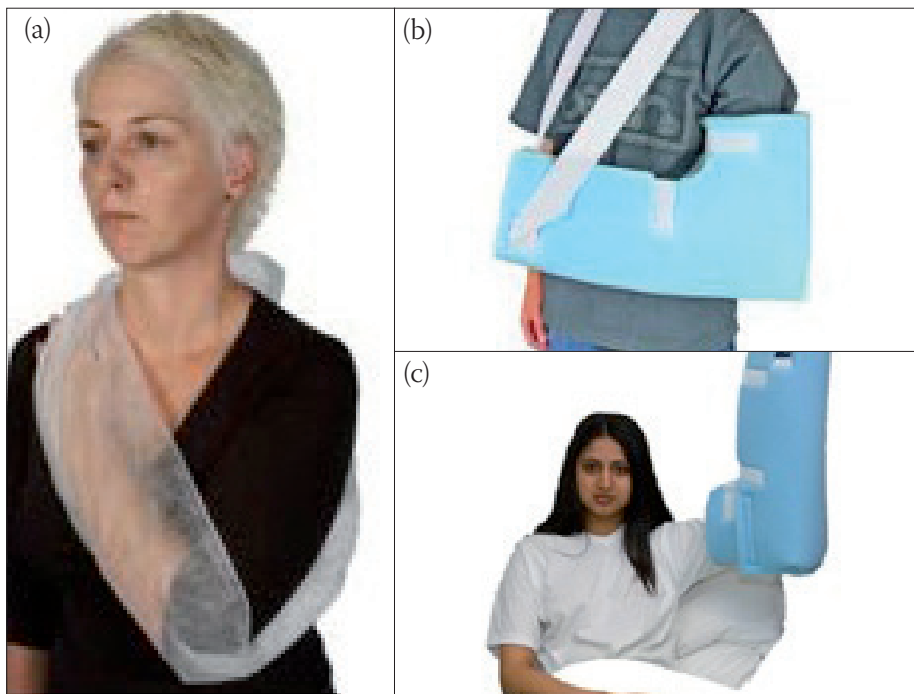


Figure 1. (a). A sling elevates the arm (note the sling is passed around the back, rather than on the neck, to ensure the hand rests on the shoulder and avoids strain on the neck). A foam sling can be used either around the neck (b) or hooked onto a stand to ensure elevation (c).

channel blockers; the latter block the amount of calcium entering muscles – especially cardiac muscle – and include verapamil, diltiazem, amlodipine, and nifedipine (Billingham, 2007).

Before elevating an individual's lower limbs, the clinician should ensure that a full medical history has been studied to evaluate any potential underlying health problems.

Chronic oedema

Medical conditions that can cause chronic oedema include cardiac failure, renal failure, liver failure, and arthritis. Failure to adequately control these conditions before initiating treatment of chronic oedema may cause cardiac overload (Moffatt, 2007).

Hormonal cyclic oedema

Hormonal cyclic oedema can present as generalised fluid and weight gain in women and is associated with the menstrual cycle (Williams and Mortimer, 2007).

Dependency oedema

Dependency oedema (or “armchair

syndrome”) occurs when the individual spends long periods sitting or sleeping in a chair, with their legs hanging down and immobile (Franks et al, 1995). Dependency oedema is associated with extreme old age and also with conditions that may limit mobility. When the feet are dependant, pressure develops in the veins leading to increased capillary permeability and fluid moves from the capillaries to the tissues, leading to oedema.

Lymphoedema

Lymphoedema is defined as the accumulation of fluid in the interstitial space due to insufficiency in the lymphatic system (International Society of Lymphology, 2003). Lymphoedema presents as swelling to either a single limb or bilateral limbs, depending upon the cause. The level of oedema depends on the cause, site, and length of time the disease has been untreated.

Venous disease

A common cause of chronic oedema is venous disease. Causes include obstruction due to deep vein thrombosis (DVT), damage to the valves within

the vein by trauma or DVT, or elevated intra-abdominal pressure due to pregnancy or obesity. The effect on the veins is to prevent their normal function, which is to aid the lymphatic system by draining excess fluid from the tissue.

Reducing oedema in the lower limb

It is the clinician's responsibility to explain to the individual how to correctly elevate their legs to achieve a reduction in oedema and prevent complications. It is insufficient to simply say: “You must elevate your legs”; as this is often meaningless and raises more questions, such as: “How high?”, “What shall I use?”, and “For how long?”. For the successful treatment of oedema, it is important to engage with the individual and explain fully what is meant by leg elevation, how it can be achieved safely, and how it will contribute to the healing of their wound or ulcer (if present).

Appropriate lower-limb elevation involves:

- ▶▶ The whole leg being supported, not just below the knee.
- ▶▶ The knee being slightly bent to avoid hyperextension.
- ▶▶ The foot being above hip level.

In addition, dorsiflexion exercises and circular rotation of the ankle will reduce oedema through promotion of the ankle and calf muscle pumps, which increase venous efficiency.

Assistance in elevating the legs

If the patient has grossly oedematous legs this is likely to add significantly to the weight of their legs, which may lead to difficulties in lifting their legs onto a surface for elevation. “Leg lifter” devices are widely available. These range from a simple strap device (Figure 3a), to more expensive and complicated devices and are widely available (Figures 3b–3c). A hospital or community occupational therapist should be able to offer advice on which device would be most suitable for an individual, as well as possible sources of funding. While the outlay for an electrical leg lifter may seem costly, if the device prevents repeated admissions



Figure 2. (a) Example of bad practice. The patient's legs are elevated, but the knees are acutely bent and unsupported; pressure is being applied to the heels, which may contribute to pressure damage. (b) Example of good practice. The whole leg is supported and the knees are slightly flexed, with the feet higher than the hips.

to hospital with leg infection/cellulitis then it represents a sound investment.

Obesity

Pre-existing venous insufficiency in an obese patient can be exacerbated by the weight carried around the abdomen. The venous system is prevented from efficiently removing of excess fluid from the body due to the volume and mass of fat, especially at the abdomen (Fife and Carter, 2009). While the most obvious

solution may be a reduction in weight, this can be difficult to achieve for some individuals. The obese patient requires increased clinician support when lowering their upper body into bed and when elevating their legs to avoid obstructions in lymph drainage.

Conclusion

The causes of oedema vary; if the individual has suffered trauma, this may be obvious, however, they may also have an underlying medical condition that could exacerbate the oedema and may also require treatment. It is important that the clinician looks beyond the obvious and ensures the individual receives a comprehensive examination. Once it is established that elevation of the limb is required, the clinician must ensure the individual understands why they should elevate their limb and how to do so safely, thus ensuring optimum compliance with treatment. **WE**

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Figure 3. (a) A simple strap leg lifter; one loop is placed around the foot and the other around the wrist to elevate the leg. (b)–(c) A person using an electric leg lifter to get into bed. The device can provide independence to some individuals, such as those with paraplegia or motor neurone disease. These individuals are unable to use their leg muscles effectively to ensure good venous return and so may develop significant leg oedema.