

Essential intervention No. 3

Oedema control

KEY OBJECTIVES

- To know what causes oedema.
- To know which kind of oedema needs to be referred for emergency surgery and why.
- To know the effects of oedema on soft tissues and movement.
- To know how to decrease oedema in the upper and lower limbs.

In Buruli ulcer there is much soft-tissue injury and damage resulting from both the disease and the surgical excision. Oedema is the result of tissue damage, and is part of the early inflammatory response. It is reported that after soft-tissue damage, extracellular volume increases by 30–50%. This fluid has a high protein content that infiltrates the tendons and other sub-cutaneous structures, leading to fibrosis and adhesions.

Limb elevation is one of the most important methods of reducing oedema. Oedema makes movement painful and difficult, but active movement should be encouraged as muscle contraction serves as an effective pump to assist the return of the fluid to the circulation.

Passive motion is not recommended when there is excessive oedema, and aggressive passive motion can be harmful. Massage and compression can also be used to help return oedema fluid to the circulation. Compression needs to be done with great care so that pressure is not too great and movement is not restricted.

Danger

- Oedema can result in ischaemic necrosis because of an increase in extravascular pressure. The oedema will feel hard to the touch and not be very mobile. This may require emergency surgery to open the tissues to relieve the pressure.

REMEMBER

- Elevation of the affected limb is crucial in controlling oedema in the initial stage of healing, as it prevents fluid pooling in the tissues.
- It is important to control oedema early to prevent difficulties with joint mobility and to minimize fibrosis and adhesions.
- Common techniques used to control oedema are elevation, compression, massage, and early active movement.
- Splints are usually needed to maintain body parts in good antideformity positions. They should be removed every 2 hours for approximately 1 hour of exercises and self-care tasks.



Correct



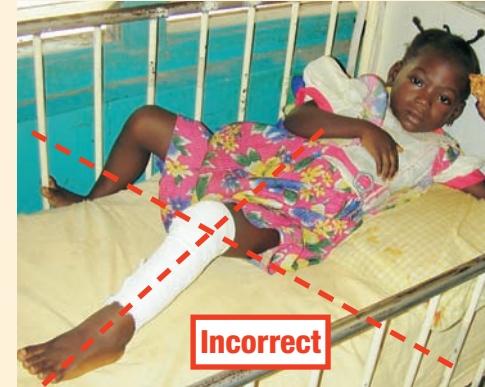
▲ ▲ Materials found at bedside are used to keep the hand up but also allow wrist extension, thumb abduction, MCP joint flexion, and finger extension. Alternatively, plaster can be used.



Incorrect



▲ The hand is down and the bandage has been wrapped too tightly, causing the hand to swell.



Incorrect

▲ Prolonged time with the foot down can cause oedema.

▲ The BU lesion is located on the upper arm with no elbow, wrist, or hand involvement. The flat extended splint restricts movement, and will cause disability and increase oedema.



Correct

▲ An IV pole can help keep the foot or hand up.

Figure 5.3.1 Positions to control oedema in the upper and lower limbs

Compression

Light compression can be applied with bandages during the initial phase of wound healing. Lightly-wrapped elastic bandages can be used when wounds are either open or closed. When wounds are closed, custom-fitted elastic pressure garments can be made, which are less bulky (see more details about pressure garments in the section on **Scar management**).

Compression not only helps to keep oedema down, but it causes the scars to become flatter and more flexible. Bandages and pressure garments should not restrict movement, and should permit exercises and activities to be done easily. Compression wraps **should not be applied** until approximately 5–10 days after grafting, when the graft appears to be well taken.

It may be necessary to rewrap compression bandages several times per day. Bandaging should be applied carefully, with consistent light pressure – starting from the fingers and wrapping up the arm, and from the toes wrapping up the leg (distal to proximal). The compression should extend far enough up the arm or the leg to avoid restricting venous return, which would cause more oedema. Wrapping should not squeeze fingers and toes tightly together, restricting movement and function. Fingers are best wrapped individually with a smaller-width bandage.

Bandages should be applied at a diagonal, covering one third of the previous layer wrapping from bottom to top (distal to proximal). Where there are concave spaces, such as thumb web spaces, foam can be inserted so that pressure is applied evenly. Bandages should not impede movement. The tips of the fingers and toes should be left free so that the blood-flow through the limb can be checked.



The rolled elastic bandage is slowly stretched and unrolled at an angle, covering two-thirds of the previous wrap. ▲



Movement should be encouraged, and limited time should be spent with the foot down.

Figure 5.3.2 Compression wraps to control oedema in the arm, hand, leg and foot

A summary of things that can be done to control oedema

- Elevate the affected limb – a sleeve or sling secured to a drip stand can help support the hand or foot in elevation.
- Encourage active movement, by using the affected limb in daily activities.
- Avoid dependent (non-elevated) positions and strenuous activities.
- Use compression and dressing wraps to help mobilize oedema back into the circulation.
- Avoid additional injuries when doing daily activities.

UPPER LIMB CONSIDERATIONS

- The hand should be positioned at a level above the heart. (**Remember:** the wrist should be extended, metacarpal phalanges (MCP) joints flexed, PIP and DIP joints extended and the thumb abducted with slight extension).
- In bed, the arm should be supported on a pillow to prevent compression of the ulnar nerve at the elbow. A sling attached to a drip stand can also be used.
- A sling can be used to keep the hand up when standing or walking.
- When sitting, the hand needs to be supported in an elevated position, not hanging down.
- Avoid long periods of time sitting, standing, or lying down without any active movement.
- Several times per day, the hand elevated, it should be closed tightly and then opened. This opening and closing action should be repeated 20 times, as the muscle contraction will help venous return.
- Splints should be removed every 2 hours for approximately 1 hour, for exercises and self-care tasks.

LOWER LIMB CONSIDERATIONS

- The leg and foot should remain elevated when in bed, either by using pillows or a sling attached to a drip stand.
- A support or splint should be used to keep the foot dorsiflexed (up) preventing a foot drop position, which leads to tightness and contracture of the



The person squeezes his hand tightly and then opens it with as much force as possible. The muscle action helps to keep oedema (swelling) down.

Figure 5.3.3 Movement to reduce oedema in the arm and hand

Achilles tendon. Take care not to tuck bed sheets down too tightly, forcing the foot down.

- The foot can be supported when sitting by placing it on another chair. The foot should not be allowed to hang down.
- Avoid long periods of time sitting, standing, or lying down without any active movement.
- The feet should be moved up and down against resistance several times per day. Standing and pushing up on the toes and down again, helps to pump extra fluid out of the legs. The contraction of the muscles helps venous return.
- Splints should be removed every 2 hours for approximately 1 hour, for exercises and self-care tasks.
- Use crutches to encourage normal movement and facilitate ADLs.

ATTENTION

If there is an increase in swelling or pain, check:

- Is the limb being elevated properly all the time?
- Are the compression bandages too tight?
- Is the person actively moving or is someone passively moving the affected part?
- Are exercises done in a dependent position or for too long?
- Is there an infection that needs to be treated?
- Is there ischaemic necrosis which requires immediate surgery?

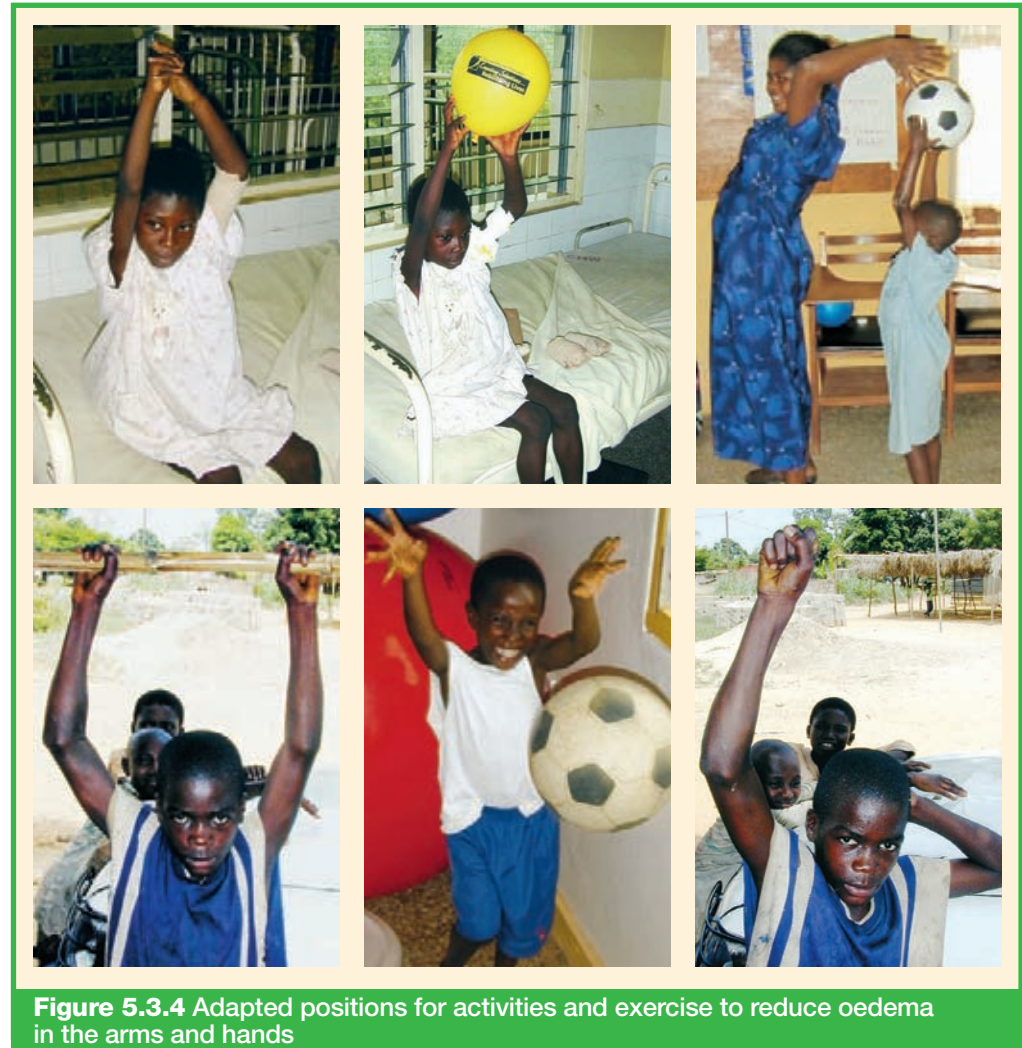


Figure 5.3.4 Adapted positions for activities and exercise to reduce oedema in the arms and hands



Figure 5.3.5 Movement to reduce oedema in the legs and feet



Figure 5.3.6 Adapted positions for activities and exercise to reduce oedema in the legs and feet