

Essential intervention No. 5

Positioning and splinting

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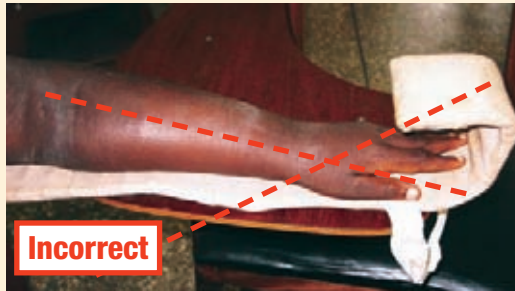
KEY OBJECTIVES

- To know how to position for oedema, for function, and to prevent deformity.
- To know the principles of splinting and when splinting is indicated.
- To know how to correctly make a splint for the axilla, elbow, wrist, hand, knee, and foot.
- To know how to teach other health workers, persons affected by BU and their families, and how to use splints correctly.

Positioning correctly to manage oedema has been described earlier in this manual. Correct positioning will also maintain full joint movement and encourage good function. Positioning of body parts during the wound-healing process is usually in the opposite direction to the forces created by contracting skin (anti-deformity position). For example, an ankle with a dorsal wound needs to be positioned for half of the time in plantar flexion position – to stretch out contracting dorsal skin – and half of the time in neutral position – to avoid Achilles tendon shortening.

This positioning may be accomplished by using the body and limbs correctly during daily activities and exercise, avoiding prolonged periods in postures and positions that would encourage deformities. For example, lying in bed with the knees flexed and the feet dropped down would encourage knee flexion deformities and tightening or shortening of the heel cords (Achilles tendon). Hands held flatly with wrists flexed create a deformity that will make grasping, holding, and manipulating objects difficult or impossible.

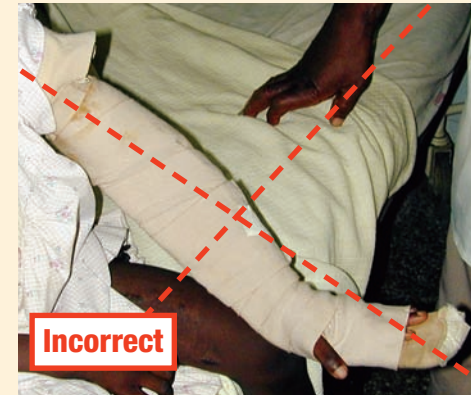
During exercise and activity, the person should adopt a position that will help prevent deformities. Correct positioning facilitates proper use of the limbs during activities of daily living.



The hand is positioned flat on the splint. ▲



The hand position has been corrected to enable wrist extension, thumb abduction, MCP joint flexion and finger extension. This facilitates a better grasp position.



The BU lesion is on the upper arm. ▲ **Do not** immobilize parts that are not involved.



The hand is up – good, ▲ but the hand is flat – incorrect. This flat hand position must be corrected.



The hand is correct when it is placed in an antideformity position. ▲ This position facilitates grasp.



The incorrect splint has ▲ been removed and exercise started to decrease the joint stiffness caused by the splint.

Figure 5.5.1 Positions that cause deformity versus positions that minimize deformity

(continued on next page)

Incorrect ▲
Prolonged hospitalization with poor positioning in bed contributes to foot, knee and hip contractures.

Correct ▲
The foot should be moved frequently and the foot supported and raised during the night to prevent Achilles tendon shortening.

Incorrect ▲
Prolonged sitting in a position of comfort should be discouraged as it contributes to contractures.

Correct ▲
Encourage the use of the limb through appropriate play activities that prevent knee and hip contractures.

Figure 5.5.1 (continued)

Splints

At times, outside support splints must be used to adequately position the body and limbs, in order to prevent deformities or to facilitate function. Splints are an invaluable tool in assisting the health worker to prevent the deforming forces of wound contraction.

Many local materials such as wood, wire, metal, cardboard, plaster, papier-mâché, coconut shells, yarn or thread, spindles, cones, plastic containers, rubber tubing, foam, and elastic can be used. It is important to identify materials that are locally available and learn to use them adequately.

The main objectives of using splints in Buruli ulcer management are to:

- maintain or improve the position of a body part before and after surgical excision of the ulcer;
- improve soft tissue length and joint mobility;
- immobilize a body part to protect it for the first 5–10 days following skin grafting or during an acute infection (usually only a few days), or to protect an area where there are exposed tendons; and
- facilitate function for activities of daily living.

Splinting principles

- Splints should be adapted to each individual situation and adjusted according to response and progress.
- The splint should be moulded or shaped to the correct size.
- Splints should only immobilize involved joints and leave the adjacent joints free for movement.

- Joints should be immobilized in the best anti-deformity position.
- Stretch from splints should be gentle and prolonged.
- Close observation and care is needed to areas having a decrease or loss of sensation.
- Splints should not cause pain, oedema, or pressure wounds. If this happens, the splint should be modified immediately. If the reddened area from the pressure does not go away within 15 minutes, adjustments in the splint are needed. If the person is at home or the health worker is not available to make adjustments, the splint should be removed and discontinued until the person sees the health worker.
- When possible, splints should be worn during rest periods during the day and at night, but taken off for daily exercises and activity.
- **The only occasions when a splint should remain in place for a longer period are:**
 - after skin-grafting, when the splint must stay in place for 5–10 days;
 - for 2–3 days when an acute infection occurs.
- **In all other circumstances the splint must be removed for an hour or two each day to mobilize the joints.**
- The person or caregiver should understand the function and care of the splint and should be able to demonstrate how to put the splint on and remove it.

Splints are indicated for the following situations.

- **Oedema.** Certain joints such as the wrist, the metacarpo-phalangeal joints of the hand, the thumb and the ankle should always be placed or held in a good antideformity position when there is oedema or swelling (*Figure 5.5.2*).

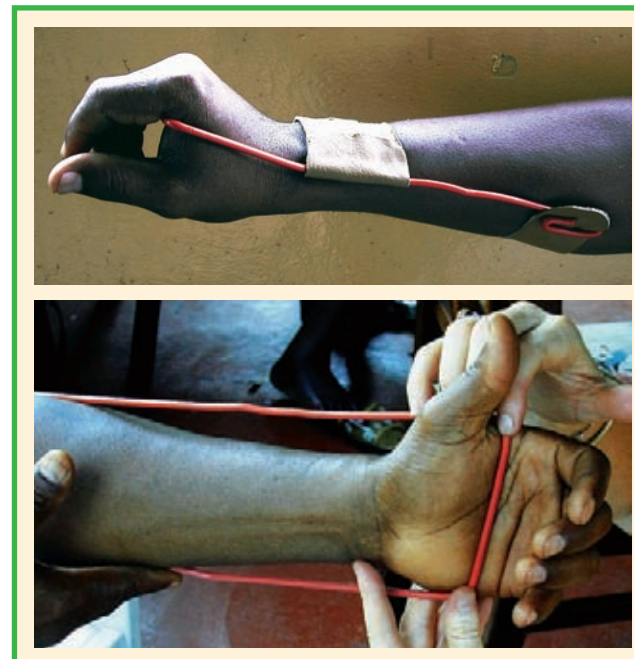


Figure 5.5.2 Wire splints are lightweight, adjustable, and free the hand to be used for activities of daily living

- **Skin grafts.** Skin grafts should be protected and movement prevented in the area of the graft for 5–10 days. The length of time for immobilization should be determined by the surgeon. The skin graft may fail because:
 - the graft is applied to a wound bed, without good granulation tissue;
 - infection occurs;
 - wound care (dressing changes) is started too early after the grafting; or
 - mobilization is started too early.
- **Difficulties with joint mobility.** Many mobility problems can be prevented by encouraging the person to move the joints early (i.e. while waiting for initial surgery and skin grafting) and participate in activities of daily living while in the hospital. However, if there is difficulty, splints can be used in conjunction with exercise and activity to improve joint mobility.
- **Soft-tissue contractures.** Soft tissue contractures (shortening) can reduce joint mobility and cause deformity by retracting body parts such as fingers and toes. These deformities can make everyday activities difficult and stigmatize the person affected by BU within the family and community. Joint mobility and soft-tissue lengthening can be achieved by using progressive serial casting or splinting. A slow, gentle traction is placed on the joint and its surrounding structures, stretching the skin, soft tissues and other extra-articular structures. This stretching influences new cell division, elongating the new cells being formed in the contracted structures. Care should be taken not to use excessive tension causing pain and inflammation that will result in further tissue damage and increase the contracture of the soft tissues.
- **Combined soft-tissue contractures and joint stiffness.** Serial splinting can be done to obtain the maximum movement possible. However if joint stiffness and soft tissue contractures are great, reconstructive surgery may be indicated. Such surgery should be followed by an aggressive splinting and exercise programme.
- **Acute infection.** Wounds that are infected should be treated with systemic antibiotics and rested. The part that is infected should be immobilized with a splint during the acute phase so that the infection does not spread. This is particularly important in the hand and foot.
- **Tendon exposure.** If tendons are exposed, splints are used to place joints in an antideformity position and to reduce stress on the fragile structures. Every attempt should be made to keep the tendons and surrounding structures moist. Humidity is maintained with saline and vaseline gauze dressings. Saline soaks are used throughout the exercise programme of active and gentle passive motion. Tendon necrosis is noted if the tendon has no shiny appearance and has a dark coloration. At this time, efforts must be focused on maintaining joint mobility in anticipation of future reconstructive surgery.



■ Neck



■ Shoulder and arm



■ Wrist



■ Hand



■ Knee



■ Thumb



■ Foot



Figure 5.5.3 Useful splints to prevent or correct soft-tissue contractures