

WELLCOME TRUST

Child with severe kwashiorkor

I asked about the child's diet. The mother had tried to continue breast feeding, but her milk had failed. The child ate only farina, as her mother could not afford meat or beans. Farina is mandioc flour, the old Brazilian Indian staple food, and is still widely used and liked by modern Brazilians. It is actually the staple food that I prefer, but it is rich only in carbohydrate and it was not surprising that the child, in her phase of maximum growth, had become protein deficient.

I told the mother the diagnosis and mapped out what must be done. I gave her 5 kg of beans from our kitchen and money to buy more, telling her to feed the child with the juice from the cooked beans in small regular doses and to feed her other children the rest. Children with kwashiorkor are very susceptible to secondary infections so I told her that the child must rest in a cool

shady place and that no one with fever or evidence of an infection should be allowed to visit her. I gave the mother a note with the diagnosis and the address of the nearest hospital in case the child got an infection. I explained how the child's intestine was weak and that diarrhoea was inevitable but that the child must continue to eat regular small meals. I also told the mother to give her a banana twice a day. The diarrhoea in kwashiorkor is usually the result of small bowel mucosal atrophy and pancreatic dysfunction, although patients are very susceptible to intestinal infections.

All this I explained in simple terms as do thousands of doctors in the tropics. I sent the mother and child to my house for a breakfast of bread, fruit, and coffee. The maid, who fed them, told me that my instructions had been understood, and I told the mother and the car driver that I would like to see the other children, whom they insisted were quite well. They did not return to the clinic while I was in the area. When I went to the farm to ask for her she lived in such an inaccessible place that I could not get there. I took the information that the child was much better with a pinch of salt as recovery is slow.

That evening I sat thinking. This was the first case of kwashiorkor I had seen in this area in 15 years of field clinics. The owner of the farm was not there and anyway would probably not be interested. Because the soil is rich much money is made from cacao in Bahia, and so the privileged have chocolate but the ordinary people are very poor. In parts of the north east where the land is hard kwashiorkor is common. It represents the peak of the pyramid of malnutrition—a dramatic clinical manifestation in the children most vulnerable to hunger and deprivation. The answer is simple: a better distribution of financial resources so that all mothers can feed their children at least beans. Brazil is the largest producer and consumer of beans in the world, and in part this is the country's salvation as they are an excellent source of vegetable protein. The most classic Brazilian dish, feijoada, is basically beans cooked with meat remnants. This was the food of the slaves on the old sugar plantations. Yes, the economy is the answer for malnutrition, with a better distribution of the great resources of a very rich country. The new president of Brazil is committed to redistribution of resources. Kwashiorkor is an excellent example of why prevention is better than cure.

---

## Everyday Aids and Appliances

---

### Crutches

Barbara E Potter, W Angus Wallace

Departments of  
Physiotherapy and  
Orthopaedic and Accident  
Surgery, University  
Hospital, Queen's Medical  
Centre, Nottingham  
NG7 2UH

Barbara E Potter, MCSP,  
physiotherapist  
W Angus Wallace, FRCSed,  
professor of orthopaedic and  
accident surgery

Correspondence to:  
Professor Wallace.  
Series edited by: Professor  
Graham Mulley.

Br Med J 1990;301:1037-9

The wooden crutches that are manufactured today bear a striking resemblance to the device used by Long John Silver. Modern day crutches, however, offer alternatives to axillary support or have a cushioned axilla pad to avoid the problems of injury to the nerves due to pressure in the axilla from the crutch. A pair of crutches allow an ambulant patient to walk and at the same time relieve weight from one or both legs by transferring weight through the arms. The crutch provides more relief of weight bearing than a standard walking stick. Ideally crutches should be light and, if possible, leave at least one hand free for activities such as opening doors. Crutches are less bulky than other devices such as walking frames but require more coordination and stability from the patient.

Crutches are needed after fractures of the legs, when partial or complete relief from weight bearing is required; to relieve pain in severe arthritis affecting one or more lower limb joints; during temporary weakness or paralysis of the leg for any reason, such as footdrop associated with a recent tibial fracture or traumatic neuropraxia, such as an anterior compartment syndrome; postoperatively for patients who have had an operation on the muscles or joints (particularly in uncemented hip replacement) when relief of weight bearing is often recommended for up to three months after the operation; for patients who have undergone amputation of a part of the leg and are waiting for their permanent prosthesis; and for patients with neurological disturbance, such as ataxia.

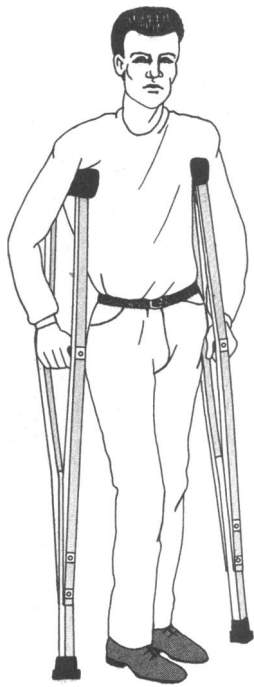


FIG 1—Axilla crutch

## Types of crutch

*Axilla crutches* (fig 1) are the most commonly prescribed type. Those supplied by hospitals are usually made from wood and are cheaper but slightly heavier than the commercially available metal crutches made from lightweight aluminium. The cost of wooden crutches is about £14 a pair compared with metal crutches, which cost £20 a pair. The cross piece of the crutch, which rests under the axilla, is usually padded and covered with a non-slip washable material. The hand grip can be either wooden or metal with a moulded plastic covering. The height of the hand grip and the overall height of the crutch are adjustable: in wooden crutches by means of nuts and bolts and in metal crutches by spring loaded buttons (fig 2). Wooden crutches are suitable for short term use for non-weight bearing or the early stages of partial weight bearing. When longer term use is expected metal axilla crutches are more appropriate.

*Elbow crutches* (fig 3) are made of aluminium tubing with an arm support of polypropylene. The hand grip is covered with moulded plastic. The overall height of the crutch below the hand grip (and on some models above the grip) is adjustable by means of spring loaded buttons. The cost of elbow crutches is between £13 and £15 a pair. Folding elbow crutches (fig 4) are commercially available and may prove more convenient than standard elbow crutches, which can be awkward to store when not in use—for example, when the patient is travelling or in fixed seating units. Elbow crutches are suitable for partial weight relief and are not recommended for patients who cannot bear at least part of their weight on both legs. They may be indicated when it is impracticable or uncomfortable for the patient to use conventional axilla crutches—for instance, when there are rib fractures, old mastectomy, and arm injury or weakness. Patients who suffer from rheumatoid arthritis or the carpal tunnel syndrome and may have a reduced hand grip power will probably find elbow crutches more convenient and easier to control.

*Gutter crutches* (fig 5) are similar to elbow crutches but instead of a straight crutch have a forearm gutter support with a handle set at right angles to the shaft. The gutter support is usually lined with sheepskin or a synthetic equivalent and is secured to the patient's forearm by means of Velcro straps with the hand grip covered by moulded plastic. The crutch is fully adjustable with spring loaded buttons to permit adjustment of the height between the ground and the forearm support. The telescopic forearm support has a handle that rotates through 360°. The crutch can be provided with either single or quadruped feet (inset to fig 5), quadruped feet being more applicable to patients with poor balance. The cost of gutter crutches is around £26 a pair. They have the advantage that patients are able to take weight through the forearm over a larger area of support and therefore they can be more useful for relieving weight bearing in the legs than the other types of crutches described. They are particularly appropriate when the range of movement in the wrist joints is either restricted or painful, such as in rheumatoid arthritis and osteoarthritis; when a forearm plaster cast is present; or when wrist splintage is required. They may also be helpful for patients with reduced hand grip strength.

A non-slip rubber ferrule is applied to the lower end of all models to prevent the crutch slipping.

## Assessment of patients

Careful assessment of the patient's capability is necessary before crutches are issued or prescribed. Expenditure of energy is high when using crutches and therefore patients with cardiac and chronic chest conditions might be unsuitable. Energy expenditure

when using crutches can rise by over 60% compared with the average for normal level walking.<sup>1</sup> As a general rule older patients should be considered for walking frames rather than crutches. Our observations are that many patients aged over 60 find the use of crutches difficult for non-weight bearing or partial weight bearing, particularly when this has to be sustained for a prolonged period or distance. Patients who may have problems in using crutches include those with multiple sclerosis, stroke, or poor vision. Although patients with impaired balance generally experience difficulties when using crutches, they can be used to provide stability, particularly for patients with ataxia. The use of crutches entails the transfer of weight through the arms, and some patients may be unable to tolerate this when muscle power is reduced or joint instability is present.

## Fitting the crutches

In the NHS it is usually the physiotherapist who distributes crutches on the advice or prescription of a doctor. Physiotherapists, however, are not always available, and crutches are sometimes distributed by nursing staff (or even doctors). In these cases assessment of the patients should still be made regarding their suitability for crutches and advice should be given to patients as outlined below. One crutch should not normally be issued as it may cause problems with weight distribution and possibly disturb the gait. A pair of crutches is recommended, though a combination of axillary and elbow or gutter crutch may be prescribed, depending on the needs of the individual patient. The appliance selected must be the correct size for the user and adjusted to ensure that the patient can maintain their normal erect posture comfortably. All adjustments should be made with the patient standing erect and wearing normal footwear. Patients should be advised to wear flat heeled shoes with non-slip soles and heels. They should be made aware of the alteration to their height that may occur if they change footwear or wear no shoes and the effect this can have on the use of their crutches. Failure to wear shoes may result in the crutches being too long and therefore pressing in the axilla, and stockinged feet may lead to slipping and therefore a fall.

The overall height of axilla crutches should be two to three finger breadths below the axilla when the crutch tip is resting on the floor 8 to 10 cm to the side of the feet and the patient is standing upright. The hand grip should be level with the distal wrist crease when the elbow is flexed to 15 or 20° with the arm resting by the side of the body. When the patient uses the axilla crutch no pressure should be transmitted from the cross piece to the axilla as this may cause pressure injuries to the posterior cord of the brachial plexus.

When elbow crutches are used the forearm support should be positioned distal to the elbow joint. The hand rest should be level with the distal wrist crease when the elbow is 15 to 20° flexed with the arm resting by the side of the body. For gutter crutches with the arm resting by the side but the elbow flexed at 90° the patient should be able to support his or her weight on the forearm and grip well enough to lift and place the crutch safely.

## Problems caused by crutches

Several problems may occur for patients using crutches. Firstly, compression of the brachial plexus from incorrect use or fitting of axilla crutches. Secondly, bruising of the ribs caused by the patient gripping an axilla crutch inwards towards the chest. Thirdly, blistering or soreness of the hands due to continual pressure between hand and handle;

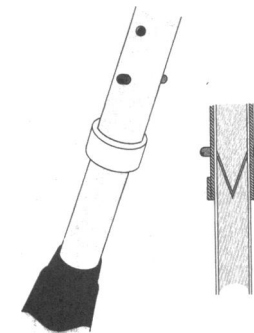


FIG 2—Spring loaded buttons

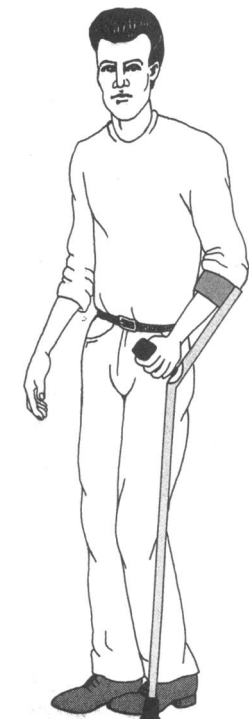


FIG 3—Elbow crutch

the patient should be advised to release pressure intermittently and wear gloves or pad the handle to reduce friction. Fourthly, the carpal tunnel syndrome can occur from a poor gripping action when the palms of the hand are used incorrectly for weight bearing, and, finally, fatigue—crutches are hard work.

### Care of crutches

All models require careful examination before issue, and advice should be given to the user on points that should be checked every week.

Firstly, the structure of the crutch should be inspected for signs of damage or fatigue, such as ill fitting, broken, or loose joints, cracks, or distortion. Metal and wooden crutches have been known to snap under the stress of long term use. Secondly, the wing nuts on adjustable wooden crutches should be tightened and checked for signs of wear. Thirdly, spring loaded buttons on metal crutches should be examined to ensure that all springs are working. Finally, ferrules should have a good tread. Worn ferrules may result in the crutch losing grip on wet or slippery surfaces. All patients must be advised carefully on the need for a safe ferrule and where to obtain new ferrules when they are required. The patient should be able to obtain replacement ferrules from the department where the appliance was issued. Alternatively, they may be bought from a retail outlet that supplies surgical requisites.

All hospital workers should be aware of their responsibilities under the Consumer Protection Act 1987. Because of these responsibilities crutches cannot be supplied directly to patients without advice being given to the patient on the use and maintenance of the crutch. Useful pointers to the implications of the act have been summarised by the Chartered Society of Physiotherapy.<sup>2,3</sup>

Crutch supplies are usually available in physiotherapy departments, accident and emergency departments, fracture clinics, orthopaedic wards and clinics, health centres, social services departments, and surgical appliance departments. Although it would be logical to supply all crutches from a central store through physiotherapists, this is not practical, particularly out of hours. Normally there is no charge to the patient for the loan of crutches. Some hospitals, however, demand a returnable deposit as many crutches are never returned. In Nottingham we lose up to 300 pairs of crutches a year because patients do not return them.

Warnings of possible problems or complications from using crutches should always be made to the patients together with instructions on the care of the appliance. A short teaching session on walking with crutches is necessary before the patient leaves hospital. For inpatients this will usually entail the physiotherapist teaching the patient to use the crutches around the ward as well as a trial of negotiating stairs. In the accident and emergency department, however, there are major difficulties because of the large number of patients treated and few physiotherapists are

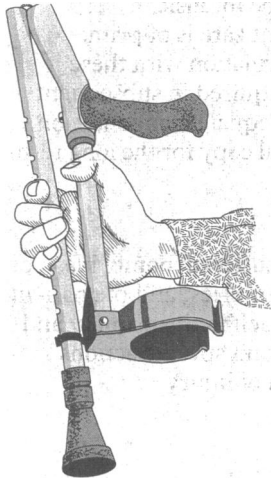


FIG 4—Folding elbow crutch (available from Cooper and Sons Ltd, Wormley, Godalming, Surrey)

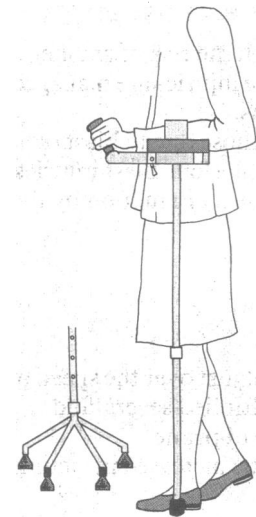
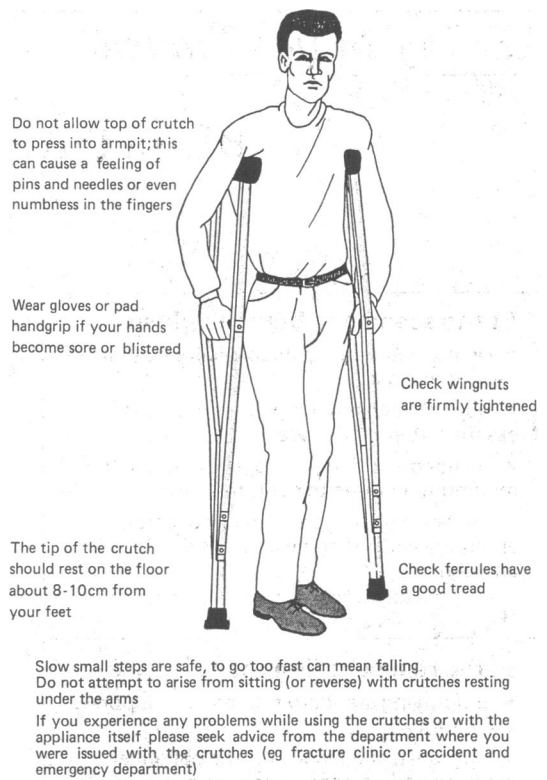


FIG 5—Gutter crutch



PHYSIOTHERAPY SERVICES, NOTTINGHAM

FIG 6—Instruction sheet for patients

specifically employed to work in this department. A nurse normally checks that the patient can walk a few steps with the crutches but does little else. Crutches should generally be used only on even ground, and the support should be sufficient to permit swing through of the legs during walking. Special advice is required for negotiating stairs, when usually both crutches are held in one hand and the other hand is used for grasping the handrail. When crutches are used to relieve weight it is normal practice to teach the patient to ascend the stairs stepping up with the unaffected leg first. The affected leg and crutches are then transferred to the same step. Variations to this practice may occur according to the patient's diagnosis and capability. Tuition should also include the use of crutches on steps with no rail support (such as kerbs and front doors).

Some hospitals supply instructions with crutches—describing what a crutch does, how it is to be used, and the problems related to it (fig 6).

- 1 Waters RL, Campbell J, Thomas L, Hugos L, Davis P. Energy costs of walking in lower-extremity plaster casts. *J Bone Joint Surg (Am)* 1982;64:896-9.
- 2 Chartered Society of Physiotherapy. Consumer Protection Act 1987. Implications for physiotherapists. *Physiotherapy* 1988;74:175-6.
- 3 Chartered Society of Physiotherapy. Consumer Protection Act 1987—update. *Physiotherapy* 1988;74:530.

### Recommended reading

- Reisman M, Burdett RG, Simon SR, Norkin C. Elbow movement and forces at the hand during swing-through axillary crutch gait. *Phys Ther* 1985;65:601-5.
- Gillespy FC, Fisher J, Williams CS, McKay EE, Curr MCH. A physiological assessment of the rolling crutch. *Ergonomics* 1983;26:341-7.
- Walking aids*. Oxford: Mary Marlborough Lodge.

## ANY QUESTIONS

When triamcinolone hexacetonide is used by injection (40 mg) for treating hay fever, pollen induced allergic rhinitis, or conjunctivitis it may be necessary to give treatment over several years. Are there any risks to using this drug over a long term?

Triamcinolone has the same side effects as other corticosteroids. These are

rarely a problem after a single injection of 40 mg and they are reversible on stopping the drug. Adrenal suppression occurs within 24-48 hours but adrenal function has usually returned to normal after about three weeks. As most of the patients in question require only one or sometimes two injections a year I would not expect any long term adverse effects. —LINDA BEELEY, director, drug and therapeutics unit, Birmingham