PHYSIOTHERAPY IN RELATION TO ORTHOPAEDIC SURGERY IN THE TREATMENT OF CEREBRAL PALSY

by

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SUMMARY

1. Introduction.
   (a) The Integration of the Orthopaedic Approach with other techniques used.
   (b) Preparation for hospitalisation.
2. Physiotherapy in Relation to Specific Surgical Procedures.
3. Note on the Forest Town Boot.
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SUMMARY
Physiotherapy in relation to Orthopaedic Surgery in the treatment of Cerebral Palsy.

Orthopaedic Surgery is an integral part of the treatment of cerebral palsy; the success of such surgery being largely dependent on the pre- and post-operative therapy which the patient receives. A format of physiotherapy which decreases post-operative disturbance and enhances the results of surgery has been developed at the Forest Town School for Cerebral Palsied Children and is described as it pertains to surgery of the lower extremities.

The Integration of the Orthopaedic Approach with other techniques used in the Treatment of Cerebral Palsy.

Physiotherapy has been used in the treatment of Cerebral Palsy since the time that treatment was directed towards it as a specific condition. The role of physiotherapy has varied with the passage of time. At first, it was considered to be the only treatment indicated, albeit used in conjunction with braces, by Winthrop Phelps, who also advocated the “Team Approach” (Keats, “Cerebral Palsy”—Thomas 1965).

Different techniques or approaches to the physiotherapeutic treatment of Cerebral Palsy became established and are fully described in the literature. (American Journal of Physical Medicine, Vol. 46, No. 1, February 1967).

Orthopaedic surgery, when it first entered the field, was used as a substitute treatment, disregarding physiotherapy, with disastrous results from the orthopaedic angle. It is now appreciated that the success of surgery is largely dependent on the quality of therapy which the patient receives, and orthopaedic surgery and bracing is now an integral part of the treatment of cerebral palsied. The physiotherapist shares the responsibility for the state of the patient.

However, there still exists a great deal of confusion and doubt as to the role of orthopaedic surgery, among therapists working in the field. This is mainly due to the fact that some exponents of accepted treatment techniques have, in the past, condemned the use of orthopaedic measures in this regard. In addition, there are certain difficulties in treating post-operative cases which may prove hazardous to the inexperienced therapist.

There is as yet, very little in the literature to guide the therapist in this aspect of treatment.

During the past fifteen years we have developed a format of physiotherapy which is used in the treatment of cerebral palsied children and adults undergoing surgery, which largely eliminates permanent post-operative complications and ensures maximal success.

At Forest Town School an eclectic approach to therapy is employed, rather than strict adherence to any one technique. The type of treatment used is dependent on the particular requirement of the child at any neurodevelopmental stage and on the type of disability (i.e. the patho-physiology). Some children respond best to a specific technique while others require a combination of techniques to achieve the best results.

Thus a baby without head control and uninhibited abnormal reflexes would respond best to the Bobath technique using reflex inhibiting patterns and facilitation of normal responses, while in the same child arm weight-bearing might be achieved by using techniques of sensory stimulation to the extensors of the arm as advocated by Rood.

In an older child, however, where co-operation may be enlisted, Proprioceptive Neuromuscular Facilitation could play an important part in the breaking down of
abnormal synergies provided that due regard is given to the neurological aspect of the child's condition—and thus careful positioning is important when using this technique.

In the same way as physiotherapy has been adapted to meet the needs of the cerebral palsied child, so has the orthopaedic approach been tempered to suit their particular problems. Thus orthopaedic assessment must necessarily take into account the general neurological condition of the child and the effect that surgery or splintage will have upon this.

The integration of the orthopaedic approach with other aspects of therapy presents minimal problems when all members of the team are aware of all aspects of the child's condition. This includes not only the orthopaedic and neurological facets, but also educational and emotional problems which present themselves in the cerebral palsied child.

One of the basic principles in the treatment of cerebral palsy is the understanding and accurate assessment of the abnormal synergic patterns and therapy is directed towards modifying or changing these patterns in order to achieve as normal or as functional a pattern as possible. However, due to incomplete brain or whole body abnormality, an abnormal synergic cannot be inhibited in a functional position (e.g. as in a persistent exaggerated positive supporting reflex producing equinus of the foot), normal development is even further impaired. Here the orthopaedic approach, whether it be conservative (i.e. bracing, “New Concepts in Bracing in Cerebral Palsy” by Alice L. Garrett, M.D. Physical Therapy, July 1966, Vol. 46 No. 7) or operative, is often the most dynamic method of facilitating normal development.

By way of example, a child who is unable to develop standing balance due to a persistent exaggerated Positive Supporting Reaction producing equinus could be considerably helped by wearing the Forest Town Boot, which will enable him to stand on a plantigrade foot. e.g. Case I.

‘Carel, spastic quadriplegic, is more affected on the Right than on the Left. He was pulling up to standing at 15 months, but he was unable to learn to stand alone because of bilateral equinus feet. After wearing Forest Town Boots, he walked at 20 months, for the following six months, he could stand and walk while wearing the Forest Town Boots, but not without them.’

In addition the effect of the Positive Supporting Reflex could be overcome by using the triceps surae muscles at a mechanical disadvantage as is achieved by a gastrocnemius recession and T.A.Z-lengthening operation.

The correction of deformities and contractures may enable a sedentary child to become upright and mobile and the psychological importance of this achievement cannot be over-estimated. Moreover, the educational aspect of the child's development is also enhanced as the experience of the upright position plays an important part in the awareness of spatial orientation and hence in perceptual development. The improvement in body image and the subsequent perceptual concepts brought about by the attainment of the upright position has been repeatedly observed.

A particular example is of a child who, in the “Draw-a-man” test would produce a picture of a man either lying down or with no particular relationship to the upright while the limbs showed no constant orientation. Post-operatively and following mobilization, she drew a man standing upright and on his feet.

In addition, increased mobility attained by surgery enables the child to explore his environment and thus learn new spatial concepts which he was unable to grasp beforehand.

Successful integration of the orthopaedic approach with other techniques used depends mainly on a close co-operation between surgeon and therapists. Surgery is never performed in isolation—all members of the team including the teachers are aware of the aims, purposes and possible problems of surgery. Post-operatively, a change of positioning in the classroom may be indicated as well as an adaption to classroom furniture.

The emphasis in therapy may be changed by surgery. Changes in pattern produced by surgery, if not anticipated, could cause alarm. However, with the therapist well aware of this, the opposite pattern which may be produced can be immediately counteracted before it has a chance to take over or cause any kind of stress.

In the use of the Rood technique therapists have realised the need for carefully thought out methods of splintage. It is important to be aware of certain neuro-physiological principles in order to know which muscles are being facilitated and which are being inhibited by the splint used; and thus methods of sensory stimulation advocated by Rood may be achieved by the splintage itself or superimposed on the particular method of splintage used.

The orthopaedic technician participates as a valuable member of the team and his awareness of the special problems of the Cerebral Palsied child along with his close co-operation with the surgeon and therapist enables him to adopt and modify orthopaedic appliances in such a way that the optimal support, correction and mobility can be achieved.

It has been shown that the orthopaedic approach to the treatment of the cerebral palsied child is, in our experience at Forest Town, an essential modality to supplement and complement the overall treatment and management of the child.

Preparation for Hospitalisation

Outline of the procedure which has evolved at Forest Town

At Forest Town all staff members co-operate and participate in the preparation of a child for surgery. It is appreciated that there can be a great deal of emotional trauma to both parents and child unless this aspect is carefully and frankly handled. Basic to the success of any methods which may be employed is the general attitude towards surgery (on the part of the staff) which is inevitably communicated to the parents and children. At Forest Town, in many cases, surgery is regarded as an indispensable modality which contributes to the child's general progress, rather than a method which is considered a last resort in the case of failure of therapy. Thus parents understand, right from the beginning, that surgery be recommended it would benefit the child, whether the aim was limited to cosmesis or to increased function.

Staff and Parents

Preparation of the child for hospitalisation starts with the members of staff handling the child and then with the parents, then staff and parents together, prepare the child.

It is imperative that all members of the team are fully acquainted with the type of procedure to be undertaken and the reasons for its being selected as part of the treatment programme.

2. The teaching staff who, will forfeit a certain amount of valuable time in the classroom, are aware that surgery aims to benefit the child as a whole and thus consider the time lost in the classroom is justified by the overall benefit gained. (Parents, too, understand that at this particular stage surgery takes precedence over schooling.)

3. Staff members and parents must be aware of the possible post-operative disturbances, the reasons for them and how to counteract them. These may include changes in:

- Functional aspects
- Emotional aspects
- Behavioral aspects
- Cognitive aspects
- Sensory aspects

Methods of management may include the following:

- Medication
- Physiotherapy
- Occupational therapy
- Speech therapy
- Education
- Social work
- Family counselling
Physiotherapy in Relation to Orthopaedic Surgery of the Lower Extremities in Cerebral Palsy

General pre-operative measures, to be followed in all cases

These are generally the same as those used in conservative therapy when surgery is not indicated, and include the following:

1. Facilitation and training of postural reactions (balance and equilibrium) in all developmental sequences.

The following secondary responses are desirable for good results post-operatively:

i. Head control in all positions.
ii. Hand support.
iii. Protective reactions of arms.
iv. Equilibrium reactions in lying and sitting, possibly in supported standing.

The presence of primitive reflexes is a deterrent to surgery but does not necessarily preclude satisfactory results. In actual fact, surgery may be an aid to the inhibition of a primitive reflex by facilitating more normal
movement: e.g. a persistent Moro reflex may be triggered by antero-posterior movement of the head which results from tight hamstrings pulling a sitting child into extension. Lengthening or release of adductors results in a wider sitting base with resultant improved balance and the ability to inhibit the Moro reflex, e.g. Case 2.

In this severely involved spastic quadriplegic at six years old, was unable to sit in any position due to continual Moro reaction. He had threatened dislocation of the hips as a result of contractures of adductor and internal rotators and had surgical correction of these deformities. Post-operatively he could sit, learnt to inhibit the Moro reflex action and learnt to hold on with his hands, even pushing a walker.

2. Establishment of maximal joint mobility and stability permitted by deforming forces.

3. Adjustment by patient to regime which will follow post-operatively.

4. Establishment of rapport with patient and parents.

5. Preparation of patient and parents for hospitalisation and the effects thereof. *2

6. Assessment of patient as regards:
   (a) emotional reaction to surgery and hospitalisation;
   (b) anticipated change in patterns of movement and/or spasticity;

Following surgery, e.g. (i) Pre-operative adductor spasm may mask lesser degree of spasticity in abductors of hip, with consequent over-action of abductors following adductor transfer. (ii) Pre-operative pattern of hip and knee extension, adduction and equinus of feet caused by positive supporting reflex, may change to complete flexion after lengthening of triceps surae, due to weak spastic extensors of knee and ‘breaking up’ of total extensor pattern.

Therefore pre-operatively, strengthen voluntary extension, even though extensor spasticity is present.

7. Preparation of appliances which are to be used post-operatively.

8. The therapist should have a good understanding of the indications, aims and procedures of surgical treatment of the cerebral palsied. *3

9. An appreciation, on the part of the therapist, of any changes occurring in the patient’s condition which may necessitate early consultation with the surgeon, e.g. (i) a complaint of pain in the hips, which may indicate early post-operative period (a) During this time the patient is sedated; to relieve pain and spasm. After the first few days spasm only may need to be prevented; and valium is usually prescribed for this purpose.
(b) Nursing postures should be corrected to prevent by abnormal reflex spasticity, e.g. the head should be in the mid-line and slightly flexed forward to prevent extensor spasm in many cases, or flexor spasm of the legs in patients with a residual symmetrical tonic neck reflex.
(c) Prevention of pressure sores.
(d) Therapy given while patient is in plaster includes: (i) Maintenance of upper extremity mobility and strength.
(ii) Abdominal and hip extension exercises, also abduction when not in a spica.
(iii) Maintenance of foot movement when possible.
(e) Routine post-operative chest care.

2. Removal of Plaster of Paris
(a) Minimise apprehensions and fear by giving a suitable sedative, and by the presence of a familiar therapist during actual removal of plaster.
(b) Prevent any untoward movement of the limb by preventing and controlling spasm.
(c) Give adequate skin care.
(d) Check appliances. N.B. Retain plaster of paris backslabs for use when appliances are not used, or for use as night-splints.
(e) There may be increased spasm and pain, or fear of movement, and it is advisable to use valium (prescribed by doctor) at the beginning; decreasing and discontinuing its use as soon as possible during the day. Many children have spasm at night, and as rest is necessary for child and parent, it is often necessary to take measures to ensure this.

Re-assurance, support, if necessary total bodily support, are very often needed until a child becomes used to being without the support of the plaster.

Physiotherapy in Relation to the Hips, e.g. Adductor Transfer, Psoas Release, with or without Release of Rectus Femoris.

Pre-operative therapy
Conservative therapy aims at establishment of postural control in all basic motor developmental sequences. Mobility and stability of the hips is very often impaired due to muscle instability caused by spasticity or contracture of the hip flexors, adductors and internal rotators. Long-standing muscle imbalance may lead to subluxation and anteverision of the femoral necks with eventual dislocation. Surgery aims to correct muscle imbalance, and prevent bony deformity, or to correct deformity, when such has developed. *4

Early physiotherapeutic measures to prevent deformity include:

1. Mobilisation of the hips

From infancy this is done with the baby in supine, in flexion, bringing the toes to the mouth. This activity ensures spinal mobilisation as well as full external rotation and flexion/abduction of the hips. It also helps to prevent the contracted, stiff hips sometimes seen in older children, where hip flexion contracture may be decreased by surgery, but the inability to fully flex the hips persists, with resultant flexion of the spine instead. The use of a Frejka pillow prevents adduction and effectively breaks up a total extensor pattern.

2. Weight-bearing with corrected alignment
In normal development, a baby starts taking weight from about five months of age onwards. Weight-bearing with the head of the femur located in the acetabulum is necessary for the development of a normal acetabulum and this process is completed by the age of four years. In the presence of spastic adductors and psoas muscles, there is a tendency for the development of anteverision of the femoral neck, coxa valga and subluxation of the hip, with failure of acetabular development. It is therefore important that weight-bearing is encouraged even though the child is not neurologically matured. Measures used to correct alignment and prevent abnormal patterns when standing include:

1. Use of Forest Town Boot (or below-knee iron, with backstop) to provide plantigrade feet. In spite of heels riding up in boots with irons, the boot provides a plantigrade surface.
2. Roller between legs to ensure abduction and a wide standing base.
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Hollowing hip surgery, pelvic stability may initially depend on the reaction to surgery and hospitalisation. The time taken depends on the patient’s disability. In some cases, the programme is followed as far as is possible; a certain amount of pelvic stability is needed while the child is in plaster of paris for sitting balance. When surgery is done to facilitate sitting, as in wheelchair cases, the programme is followed as far as is possible after surgery, and the lengthening is maintained.

Post-operative Stage, in plaster of paris

The patient may or may not be immobilised in a hip-spica. In any event sitting up will be started after three weeks or after removal of plaster. After hip surgery, the patient may or may not be able to bear weight-bearing and extension of the hip on that side, while the other leg one achieves hip extension in the inner range and knee extension in order to enable the gaited leg to clear the ground.

Standing. It is easier to start standing up from sitting on a high stool, with hand support. The stool is lowered, to increase muscle work and postural control. Give approximation through the knees to facilitate quadriceps, and prevent the head from leading into total extension. A great deal of sensory training (proprioceptive, kinesthetic) is given with a great variety of slight postural changes and adjustments to acclimatise the patient to the altered centre of gravity and skeletal alignment. This is essentially sensory-motor learning.

Support of the patient and parents during this time is an important part of therapy. It is very often necessary to use a mild muscle relaxant/sedative for a while as well as counselling.

Standing at first in parallel bars, using hands for support, in different positions. Weight transference, laterally as well as antero-posteriorly, and reciprocal arm movement precedes walking. Walking starts in the parallel bars with hand support. This is progressed to walking with a rollator, crutches and sticks, or independent walking.

Trunk rotation is an important component of the walking pattern and is facilitated by resisted walking, the therapist resisting at the hips either anteriorly to increase flexion, or posteriorly to increase extension and external rotation of the leg. Give downward approximation of the pelvis to increase extension.

If there is a tendency to walk with flexed knees, the use of a gaiter or similar splint on the one leg ensures weight-bearing and extension of the hip on that side, while on the other leg one achieves hip extension in the inner range and knee extension in order to enable the gaited leg to clear the ground.

The above measures apply to treatment in cases where locomotion is aimed for. In those cases where hip surgery is performed to facilitate nursing, treatment includes mobilisation, but not necessarily exercises in weight-bearing positions.

When surgery is done to facilitate sitting, as in wheelchair cases, the programme is followed as far as is possible; a certain amount of pelvic stability is needed for sitting balance.

Physiotherapy in Relation to Surgery of the Knee

For Pre-operative measures, see under general pre-operative requirements. Assess patients’ disability.

Post-operative Stage, in plaster of paris

1. Whether non weight-bearing, or in weight-bearing cases the ability to stand erect, even fully supported, without the spasm or contracture which was present pre-operatively, gives the child and his parents a great deal of pleasure and encouragement.

Postural training begins on the day after removal of plaster, and is given concomitantly with mobilisation and strengthening exercises.

(ii) Assisted walking (in calipers when necessary). This activity acts as an incentive to most children.

All the measures described under pre-operative therapy are used. Increased post-operative mobility will facilitate nursing, which is given first, in rolling, with or without resistance at hip or shoulder, then in the movement from four-foot kneeling to side-sitting and up to kneel-standing. If arm support is used, the hands should be in a flat supportive position, instead of grasping and pulling with the arms.

Half-kneeling may be a progression from step-standing, as the adductors, hamstrings and hip flexors are stretched. This position should be achieved as soon as possible after surgery, and the lengthening maintained. Resistance to the pelvis anteriorly on the weight-bearing side, and laterally to the non weight-bearing knee, facilitates full extension of the weight-bearing hip and external rotation of the non weight-bearing knee.

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Physiotherapy in Relation to Surgery of the Knee

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Post-operative Stage, in plaster of paris

1. Whether non weight-bearing, or in weight-bearing
casts, emphasis must be on improving pelvic stability by strengthening the abdominals, extensors and abductors and external rotators of the hips.

Patients are often able to long-sit for the first time while in plaster after a hamstring release or lengthening. This may lead to excessive sitting and possible hip flexion contracture with weakening of hip extensors.

2. Prone-lying should be enforced for at least half a day.

3. Postural reactions are stimulated in standing between bars, also in assisted walking.


5. Back extension to correct kyphosis produced by previously tight hamstrings.

**For Removal of Plaster — See General Post-operative page.**

**Post-operative Therapy** follows the post-operative programme used while plaster casts are worn, including the following after removal of plaster of paris:

(a) Mobilisation, using passive, assisted active, active and resisted movements progressing through the developmental sequences.

(b) Bilateral calipers are worn initially until strength and control of muscles around the knee is sufficient to enable only one caliper to be worn. This is done on alternate legs until it can be discarded, or a lesser splint, e.g. gaiter, can be worn.

(c) Night splints should be used to maintain correction of deformity.

(d) Strengthening of:

(i) hip musculature.

(ii) knee extensors, using sensory stimulation, resisted exercises, first in non-weight-bearing, then in weight-bearing positions.

(e) Spasm of the rectus femoris may be aggravated by the release of the hamstrings and the wearing of long calipers.

Post-operative period.

This consists of three stages:

1. First three weeks in long or above-knee plaster-of-paris casts which are non-weight-bearing.

2. The second three weeks, after removal of sutures, either long or short, below-knee casts which are weight-bearing.


1. During this stage, the therapist should take care that the muscle balance around the hip joints does not deteriorate, but improve it if possible. She should note any evidence of pain or pressure in the plaster.

2. During the second half of the wearing of a plaster cast, the cast may be above-knee in the presence of tight hamstrings or weak quadriceps, or it may be below-knee in the absence of the above-named. We find it useful to start with an above-knee cast, which we cut down below the knee as soon as control of weight-bearing is achieved, and before we remove the plaster completely.

This allows time to work on the knee while the foot is still immobilised.

1. Weight transfer function is taught; leg length being equalised by using temporary raises under other foot.

(b) Establish control of knee extension, in weight-bearing. Re-education of vastus medialis in sitting with knee flexed over edge of bed, and foot held in dorsiflexion in plaster. In addition all other measures of muscle stimulation and strengthening are used (sensory stimulation and resistance) as well as the use of temporary splintage. *10

**After Removal of Plaster Casts**

(a) Tendon lengthening very often has a widespread effect on the whole limb or body, in addition to the predictable expected localised effect.

In this way the extension-adduction pattern which is produced by an exaggerated positive supporting reaction may be so altered by a gastrocnemius recession and Tendo Achillies lengthening that abduction and knee flexion becomes possible, even in weight-bearing. In some cases a child may start to crawl post-operatively, whereas pre-operatively she could only creep, dragging extended legs, e.g. Case 3.

Joanne, at two years old, was able to assume sitting position with knees flexed, not extended due to tight hamstrings. Her arm protective reactions were very slow, she could creep, dragging extended legs, but could not crawl, as she had no dissociation of the legs. She tried to pull up standing, but could not take steps in the parallel bars, as she had co-contraction of the legs due to...
to a grossly exaggerated positive supporting reaction which made her stand with rigidly extended, adducted legs and equinus feet.

Surgery performed: Bilateral Gastrocnemius Recessions and Tendo Achillis Z-lengthening. Six months later Joanne was crawling, enjoying rolling, sitting much better, pulling up to standing and pushing a walker on her own. There has been a marked change in her emotional state; from being an introverted, frustrated, unhappy infant, she has changed to an outgoing, happy young child, eager to explore around her.

Re-establishment of balance and equilibrium is therefore done, progressing through the different stages of development. Even where the postural reactions are good in standing, the confidence gained by the child while performing the basic gross motor activities of rolling, sitting, kneeling and crawling will enhance his progress in walking.

Weight-bearing and Transference of Weight

Gastrocnemius recession and Tendo Achillis Z-lengthening, by mechanically reducing plantarflexion and decreasing the effect of the positive supporting reaction, lifts the balance of power to the dorsiflexors of the ankle, thereby predisposing towards the total flexor pattern of the lower extremity.

To prevent post-operative 'folding up' or collapse into flexion with failure to weight-bear, pre- and post-operative therapy should establish control of extension of the hip and knee.

Sensory stimulation (icing, brushing, vibration) of the quadriceps, followed by active and restricted extension, is given alternatively with weight-bearing and assisted standing and walking in calipers. Initially, long calipers or gaiters are used bilaterally to assist extension. As soon as possible one caliper only is used on alternate legs, to give stability on that side with increased mobility on the other. Gaiters or any other temporary splints may be used. When control of the knees is satisfactory, parallel bars to rollator walker, then elbow crutches or tripod sticks, which may later be discarded.

Weight-bearing in a corrected standing position is a good way of preventing this 'shift' of spasticity.

(ii) Prevent dorsiflexion of ankle by excessive contraction of extensor halluces longus; isolate action of Tibialis anterior by repeated contractions of anterior tibial in inner range holding the big toe in flexion while activating dorsiflexion.

(iii) Extension of the toes with the foot in dorsiflexion to overcome any tendency of clawing.

(iv) Maintenance of lumbrical action, especially when a Forest Town Boot is worn for a long time.

(v) When dorsiflexor strength is adequate, plantarflexion is strengthened to allow push-off in walking.

(vi) Balancing the action of the evertors and invertors of the foot.

The above exercises are done with resistance, in modified patterns using proprioceptive neuromuscular facilitation, and ideally also in the weight-bearing position.

(c) Early weight-bearing, whether supported or assisted, is very important, as the upright position, with the head vertical, and compression of the joints, added to the positive supporting reaction, increases extensor tone and postural reflex activity. If a child is allowed to be non weight-bearing for too long, especially if there is a tendency to flexor hyperactivity, then there is a danger that the flexors of the hip, knee and ankle may become overactive and preclude muscle-balance. Calcaneous deformity may result.

References

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2. The boot serves to control the position of the foot executed.

3. The boot is used both pre- and post-operatively as a night splint.

4. The boot is worn post-operatively whenever there is a sign of recurrence of muscle imbalance around the ankle. The patient walks with a Forest Town Boot for a few hours every day, and needs no other appliances. Recurrence rate of deformity after surgery is therefore reduced.

5. The boot provides a plantigrade foot as a base, instead of an equinus foot, and makes standing balance and learning to walk much easier.

Comment

The child is usually first accustomed to wearing the boot as a night splint. Some children do not sleep through the night at first and parents have to use their discretion in lengthening the periods of use.

Generally speaking, the boot is most effective when used for walking in. This is also started very gradually, inspecting for signs of pressure at lengthening intervals. When ordered bilaterally, it may be advisable to get the child used to walking with one at first, with an ordinary boot on the other foot. However, most children tolerate the boots very quickly.

There may be a tendency, initially, for a child to either flex or hyperextend the knee, as the boot stretches the spastic triceps surae. Judicious use usually overcomes this problem speedily.

Children with fixed contracture cannot tolerate the boot; and children with gross spasm of the triceps surae may not be able to tolerate them for weight-bearing until they have slept in them for a length of time.

More stamps for more Cripples

Fourteen million colourful Easter Stamps have been printed by the National Council for the Care of Cripples for its 30th annual Easter Stamp Fund campaign, which will be conducted during March, 1974 to raise funds in aid of cripples of all races in the Republic and South West Africa. This means four million more stamps than issued for any of the Council’s previous campaigns.

The stamps will be offered for sale in sets of 20 in the popular series depicting South Africa’s maritime history in full colour and introduced in the 1973 campaign.

This new set is available in sheets containing a single set of 20 stamps or five sets of 20 stamps and will be sold at only one cent per stamp. They are obtainable, together with sheets of interesting information about each of the 20 ships printed on the stamps, from all Cripple Care Association offices or from The Director, National Council for the Care of Cripples in South Africa, P.O. Box 10173, Johannesburg 2000 (telephone 31-5151).