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DISEASES OF CHILDHOOD

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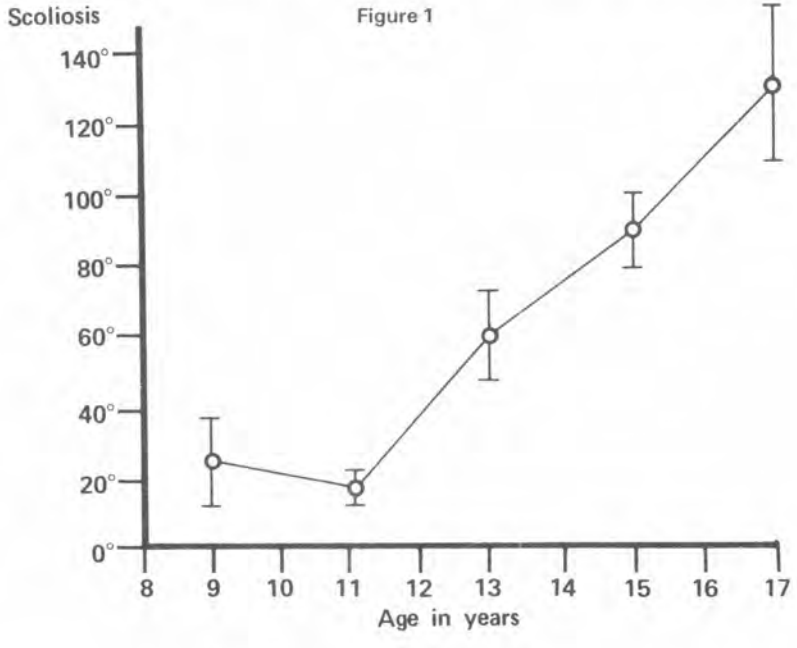
THE MANAGEMENT OF SCOLIOSIS IN DUCHENNE MUSCULAR DYSTROPHY

Mr L. Read, FRCS, Lecturer Dept. of Orthopaedic Surgery, University of Manchester

Duchenne muscular dystrophy is a crippling, progressive disease inherited as an X-linked recessive trait or occurring as a new mutation. Although present from birth it is often not diagnosed until the boy is four or five years old. It remains an incurable condition in which treatment can only be supportive. It therefore, is important that the treatment offered be done so carefully and with a proper knowledge of its implications. These children have many inter-related problems that make rigid regimes of treatment impossible and while some clinicians adopt a non-interventionist attitude, others advocate an intensive programme of activities, physiotherapy, bracing and operations to maintain mobility and prevent deformity.

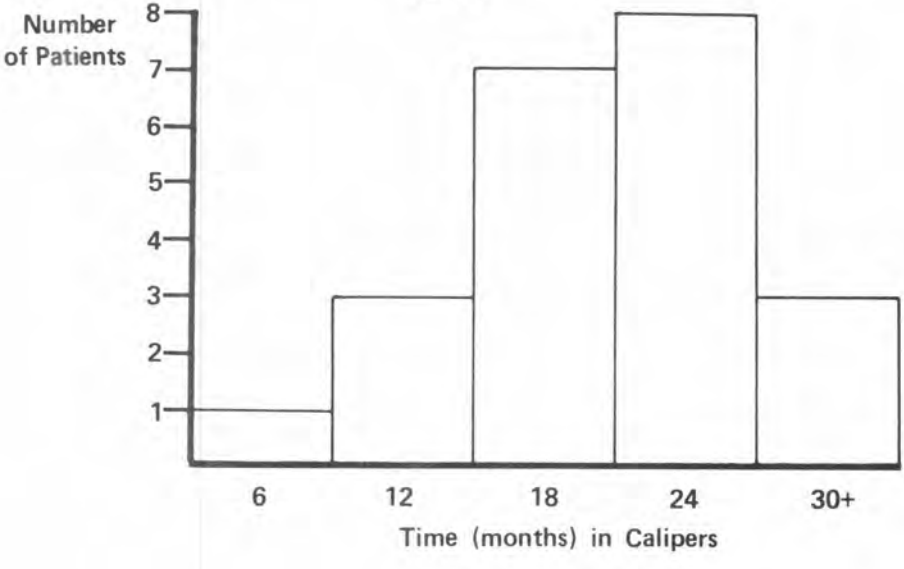
Scoliosis, a lateral curvature of the spine, becomes an increasing problem as the patient weakens and becomes wheel-chair bound. As in most neuro-muscular conditions the curve extends virtually the whole length of the spine and progresses with age. The curve increases until the rib cage abuts painfully on the iliac crest. Associated with the curve is an obliquity of the pelvis which throws the body weight more and more onto one buttock and even the greater trochanter, making sitting impossible. This article outlines a scheme of treatment designed to reduce the progression of the scoliosis and presents the evidence for its success.

Without treatment, scoliosis appears soon after the patient becomes wheel-chair bound: Figure 1 shows that scoliosis increases with the years spent using a normal wheel-chair.

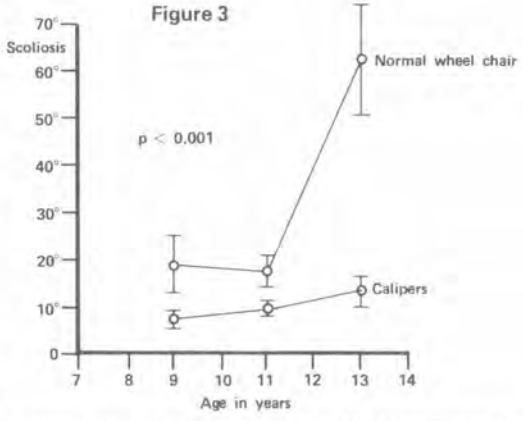


By using light weight, ischial weightbearing cosmetic calipers the period of walking can be prolonged by up to two and one half years. A survey of twenty-two boys between the ages of nine and thirteen years, who were fitted with these calipers showed that one gave up walking after six months, three after twelve months, seven after eighteen months, eight after twenty-four months and three patients were still ambulant after three years. Their walking was prolonged by an average of twenty months (Fig. 2).

Figure 2



What has also been shown is that these boys do not develop the same degree of scoliosis as those boys allowed to use wheel-chairs in preference to calipers (Fig. 3). A great deal of determination and hard work are required to keep these patients ambulant. Because the Achilles Tendon is already tight by the age of five years physiotherapy should be instituted as soon as the diagnosis has been established. At regular six monthly examination a search for other contractures must be made using Thomas' and Ober's test. Parents can be shown how to extend the joints of the lower limbs on a daily basis stressing that these routines must be enjoyable periods of play for the patient.



Even though a fixed equinus of the foot is detrimental to walking most patients eventually exhibit a dynamic equinus together with a wide-based stance, an exaggerated lumbar lordosis and thrown-back shoulders in an attempt to maintain balance and ambulation; about the same time climbing stairs becomes difficult. It is at this stage that calipers should be fitted; we have found it best to admit the patient to hospital for a few days to familiarise him and his parents with their use. The calipers must be carefully made and accurately fitted as the least discomfort will lead to rejection of the orthosis. Bilateral or unilateral fixed equinus should be corrected surgically prior to fitting. Possibly due to their regular physiotherapy over many years our patients have not required surgical release of knee or hip flexion contractures. Six of twenty patients, however, did require elongation of the Tendo-Achilles prior to fitting and four required lengthening to continue with their use.

In Duchenne muscular dystrophy any period of recumbency leads to rapid muscle wasting and may result in premature loss of mobility. Any illness, injury or operation, including elective orthopaedic procedures, therefore, must be managed by keeping the child out of bed, standing and walking as much as possible. With fractures of, or operations on the lower limb long leg light weight resin casts should be applied in which the patient can stand from the very first day.

Once accustomed to their use, calipers can be worn for long periods: during the school day the patient should not only walk from room to room but also be encouraged to stand throughout many of the lessons. While it is clear that caliper use reduces scoliosis there comes a time when walking is no longer possible: the patient is in danger of falling and he requires a powered wheelchair, for mobility. It is still, however, beneficial for him to stand for some hours every day. This is made possible by the use of a standing frame, easily fitted and applied both at school and at home. The beneficial effect of the upright posture on the digestive, circulatory and urinary systems and in preventing loss of calcium from the skeleton is well known. It seems likely, but not proven, that it will have a similar beneficial effect to caliper use in delaying scoliosis. Most of the standing frames available are satisfactory: to avoid backache it is necessary to support the pelvis with a strap passing between the iliac crest and greater trochanter.

Once chair-bound, modifications of the normal wheel-chair may be used to slow the progress of the scoliosis. A reclining back, a narrow seat and carefully-adjusted arm supports can help to prevent the patient leaning to the side. Placing the control unit of an electrically-powered chair in the mid-line rather than to one side also encourages an erect, symmetrical posture. However, patients dislike the reclining position; cannot work at a desk or table; cannot reach the capstans of a self-propelled chair, and find that a central control is obtrusive.

Spinal supports such as steel-ribbed linen corsets, and molded leather or plastic jackets have been used for many years to prevent increasing scoliosis but there has been no published evidence that they are effective. Seventy-nine boys with proven Duchenne muscular dystrophy were divided into four groups: nineteen had had no treatment and had used a normal wheel-chair; fourteen boys used a normal wheel-chair but wore a spinal support; twenty-two boys used a modified wheel-chair but never wore a spinal support; and twenty-four boys used both a modified wheel-chair and a spinal support. By measuring the progression of the scoliosis on a radiograph of each patient taken at six monthly intervals the four groups were compared. Fig. 5 shows that both modification of the wheel-chair and the use of a spinal support have a beneficial effect and the use of a spinal support can, therefore, be recommended.

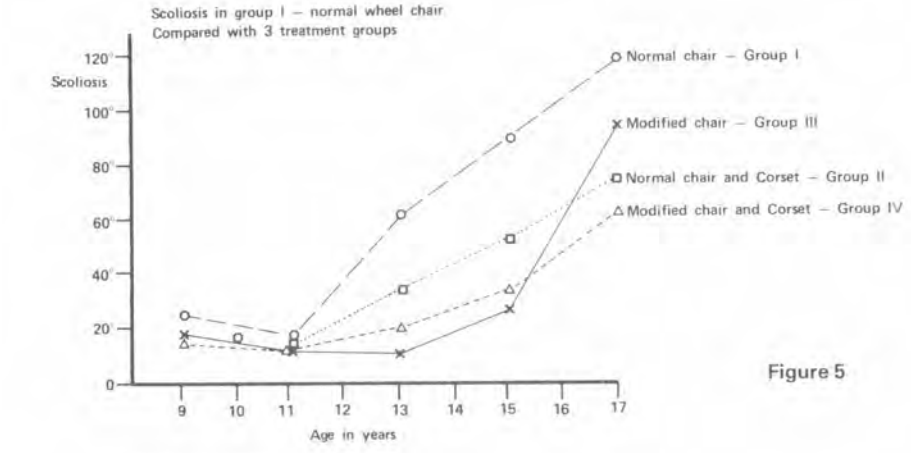


Figure 5

Group I vs. Group II $p < 0.002$
Group III $p < 0.001$
Group IV $p < 0.001$

Attention to detail is again the secret of success in encouraging a patient to wear such a support. Plastic or leather orthoses are best made from a mold taken with the patient supported and straightened on a Risser table. The orthosis grasps the pelvis firmly forming a stable base that reaches to within one inch of the seat cushion posteriorly and to the symphysis pubis anteriorly: it must just clear the thighs when sitting. By molding-in the waist and supporting the lower ribs in a closely-applied inverted cone the spine can be corrected and held. Another important feature is the built-in lumbar lordosis which tilts the pelvis anteriorly and throws the body weight on the ischii and the back of the thighs rather than onto the sacrum. Note also that the knees should be just a little lower than the hips to allow the thighs to take some of the body weight. The support is best applied with the patient supine and it should be worn for as many hours as possible each day. However, external support will not totally prevent the development of a severe scoliosis and with the introduction of techniques of spinal fusion that do not require long periods of post-operative immobilisation, there has been a move toward operative stabilisation of the spine. This, however, must be carried out while the lung function and general condition of the patient is adequate to withstand a major operation and the use of a spinal support should not allow consideration for operation to be postponed: the optimum time for spinal stabilisation is about one year from becoming chair-bound.

The system most commonly used is the Luque system in which each vertebrum in turn is wired securely to two strong rods placed on either side of the spinous processes. The scoliosis can be corrected to some degree and the rods inserted into the pelvis to reduce the pelvic obliquity that usually accompanies the scoliosis. The fixation is so secure that no external plaster jacket is required post-operatively and the patient can return to his chair within a few days.

At the Royal Manchester Children's Hospital, ten patients with Duchenne muscular dystrophy have undergone segmental spinal stabilisation. Because the lung function is reduced to 30 - 50% of normal predicted values and many patients have evidence of a myocardial conduction defect this operation can only be carried out in units experienced in dealing with these problems. The average degree of scoliosis was 49° and this was corrected to an average of 26°. The early complications were minimal and included three superficial wound infections which healed with conservative treatment and one re-operation to deal with a rod that had cut out of the pelvis. All patients were sitting out of bed within seven to fifteen days and all returned home within three weeks.

The long term results of this operation are not yet known but experience with these few patients has been encouraging. By preventing the progress of the scoliosis it is expected that the patient will be mobile in his chair for a considerably longer period and thus be able to live at home and have continuing contact with his peers.

Our experience, therefore, encourages us to believe that by following a programme of physiotherapy, bracing and appropriate operations, crippling, progressive scoliosis in Duchenne muscular dystrophy can be controlled. This can prolong the mobility and improve the quality of life of these patients.

ASPECTS OF MANAGEMENT OF NEUROMUSCULAR DISEASES OF CHILDHOOD

Mrs S. A. Hyde, District Physiotherapist, Hammersmith Hospital

Introduction

Neuromuscular diseases of childhood are a complex group of diseases, many of them genetically determined and often having a progressive clinical course. The detailed pathology and clinical signs are to be found in the standard texts (1 and 2). Classicfication and reclassification of the diseases according to structural changes, clinical course and mode of inheritance are abundant in the literature but a useful method for the physiotherapist is that of Moosa (3) who suggests an anatomical approach to the problem (Table 1.) Further subdivision of each group is then possible based on genetic inheritance.

Unfortunately, all too often, children are referred with a diagnosis of "Dsytrophy"; this of course is not a diagnosis and it is absolutely essential that a definitive diagnosis is sought if realistic and effective management is to be achieved. The use of the umbrella term "dystrophy" has a negative influence on the attitude and response of both patient/family and therapist because it is seen as synomymous with Duchenne Muscular Dystrophy.

Muscle weakness, often profound, is a common feature shared by this group of disorders and it primarily affects the proximal muscle groups, causing considerable disability particularly in the tasks associated with standing and walking.

Imbalance of muscle strength and the inability to move normally predispose towards the development of contractures of tendons and ligamentous structures as the patient is forced to adopt modified postures to compensate. The contractures which occur at both the peripheral joints and spine, once established, further impede movement and put more stress on an already impaired musculoskeletal system.

In the disorders occuring in childhood, normal skeletal growth may have an adverse effect on the child's ability to maintain an adequate level of performance given such marked muscle weakness. As the child experiences growth spurts, the already precariously balanced biomechanical system often falters and at such times, great vigilance is required in monitoring the child's performance and it may be necessary to institute a short intensive treatment programme until stability has been re-established.

Although advice and physiotherapy treatment should be structured around the patient's physical needs, it is vitally important that the emotional, educational and social components of the child and family's life are not disregarded or eroded. Clinical attendances therefore should be kept to a minimum and intensive bursts of treatment only given when necessary.

Assessment

Comprehensive, accurate, standardised and quantitative assessment of the child's physical abilities is the most important contribution to effective management. Careful, accurate recording and interpretation of the objective findings and frequent reassessment will enable the team of professionals caring for the child to anticipate problems and plan effective treatment

programmes. A further, but equally important benefit of this approach is that both the child and family may be counselled and prepared for the next stage of the disease rather than facing a series of crises.

Assessment comprises the following constituent parts:

History
Observation
Examination
Recording
Evaluation of findings
Decision making
Communication

Omission of any part of the assessment will result in an incomplete or poor management programme.

There are various methods of assessment (4,5) but the method outlined here is that developed and used at Hammersmith Hospital (6).

Unobstrusive observation will provide important information on:

General health — weight, colour, etc.
Posture — habitual sitting/standing posture.
Quality of movement — type, frequency, spontaneity.

Anthropometric Measurement

Height measured in centimetres using a stadiometer. Weight measured in kilogrammes using a weighing chair.

Voluntary Muscle Strength

Two methods are used — manual and myometry.

Manual

A global evaluation of the patients muscle strength is obtained using the MRC scale (7). Total muscle strength may then be expressed as a percentage where:

$$\frac{\text{Total score}}{\text{total muscles tested x 5}} \times 100 \text{ is used.}$$

Myometry

There are a number of commercially available dynometers available for obtaining quantitative measurement of muscle force (8) and it is usually only necessary to measure eight key muscles, Table 2.

Range of Motion and Fixed Deformity

These are measured using a goniometer and recorded using the standards accepted by the joint meeting of Orthopaedic Associations in Vancouver 1965 (9). Where a deformity has more than one element it is helpful to append a simple description as an annotation to the measurement.

Motor Ability

This is scored using a progression of twenty movements based on normal developmental sequence, Table 3. The child attempts each movement and is scored according to achievement, succeeds = 2, minimal reinforcement = 1.

Physical Performance

Two standardised timed walking tests are used to measure the time in seconds taken to walk 28 feet and 150 feet respectively.

Functional Classification

The nine point scale of Vignos is used and provides an indication of the child's functional level (10) Table 4.

Respiratory Function

Total vital capacity and FEV, are measured.

Supplementary Information

This includes information on gait analysis and the presence or absence of spinal deformity.

Objectives of Physiotherapy

These may be summarised as :-

1 Maintenance or improvement of muscle strength.
2 Prevention of contractures and deformities.
3 Maintenance or improvement in function.
4 Promotion or prolongation of ambulation.
5 Patient/family education.
6 Maintenance/improvement of respiratory function.
7 Maintenance/improvement of the social quality of life by encouraging full participation in leisure activities.
8 Maintenance of good postural alignment.

Methods

Exercise
Passive Movements
Splinting
Provision of orthoses
Re-education of walking/prolongation of walking

The readers of this article will be familiar with all the methods listed above and therefore they will not be detailed but will be discussed in relation to their use in the management of some of the more frequently occuring neuromuscular diseases.

Duchenne Muscular Dystrophy

In the early stages of the disease, emphasis is on the maintenance of muscle strength, function and the prevention of contractures which tend to occur at the tendon achilles, hip flexors, iliotibial band and knee flexors in response to the adaptive posture of wide based toe stance with associated hyper lordosis that boys assume as muscular weakness progresses. The effectiveness of passive stretching and night splints to control the contractures has been reported (11).

The use of restricted exercise to maintain muscle strength was a subject of controversy until the last decade because some workers felt that resisted exercise and fatigue might encourage degeneration of muscle tissues and accelerate dystrophic changes. This issue is now largely resolved and our own study (12) did not confirm those findings. The influence of activity levels whether induced by electrical stimulation or exercise will be discussed more fully by my colleague, Mrs Scott, in the next section.

Usually, somewhere between the age of 8-10 years, the child loses the ability to walk and at that time, a decision, based on assessment of the boys' physical, mental and psychological status, must be made on whether to attempt prolongation of ambulation by the use of orthoses. The decision must be made by the child and parents, the therapist's task is to ensure that it is an informed decision.

An outline of the proceedings for fitting othoses is given in Table 5. and the details of orthoses, criteria for application and intervention may be found in an earlier paper (13).

A recent review of 51 cases seen at Hammersmith (14) showed that the period of independent ambulation may be increased by an average of two years; this is similar to the findings of other studies(15, 16).

In discussing the use of orthoses it is important to stress that the boy may still need and prefer to use a wheelchair for speed over long distances, just as non-affected people choose to use a car.

The benefits of using orthoses are that they offer the boy independence through crucial years and that the development of contractures at the peripheral joints and spine is retarded.

Once wheelchair bound, that is during the late and and terminal stages of the disease, emphasis is on prevention of deformity particularly scoliosis, function and respiration. Some workers, especially those in Denmark, report great benefits from the use of inspiratory training exercises and the use of CPAP in addition to conventional breathing exercises and postural drainage.

Spinal Muscular Atrophy

Although clinically classified as occuring in three forms, mild, intermediate and severe (2) (Table 6) in practice there is considerable overlap especially between the mild and intermediate forms of the disease.

The child with the severe form (Werdnig, Hoffman) only places a demand on the physiotherapist in terms of managing respiratory involvement. The physiotherapist teaches the parents how to perform postural drainage and, if necessary, suction at home. Sometimes, it is also necessary to advise on positioning of joints, unprotected by muscle tone and therefore subject to trauma.

The intermediate and mild forms of the disease require far more aggressive treatment and nowhere is the need for thorough assessment more important.

Active, resisted exercise to develop muscle strength is essential, whilst splinting is used to prevent contractures, to stabilise unprotected joints and to encourage function. For example, a child may well wear light-weight splints to control the knees and ankles in standing whilst being encouraged to use the arms,hands and trunk in activities such as drawing on a blackboard. This not only stimulates the child mentally but encourages the development of postural control. The approach to the provision of splints and formal orthoses must remain flexible and the effects carefully monitored; this may mean considering the biomechanical implications on joints far removed from those splinted. For example, in giving a child below-knee orthoses and elbow crutches, one may be giving greater freedom at the knee, without doubt an important feature in negotiating stairs, but by encouraging

forward flexion of the spine predisposing to the development of scoliosis. The difficulties of managing the neurogenic spine and controlling scoliosis will be considered separately.

Congenital Muscular Dystrophy

Stiff joints or limited mobility and contractures are often the major feature of this disease and cause more impairment of functional than the muscle weakness, albeit temporarily, and requires long and intensive rehabilitation programmes.

The use of serial plasters to improve joint range of motion are definitely advocated and often provide the most rewarding results. The application of the plasters must be done with extreme care to avoid pain and the possibility of creating pressure areas. It is also essential that an intensive programme of physiotherapy is undertaken to strengthen the muscle in the range of motion that has been gained.

Neurogenic Scoliosis

Space does not permit detailed discussion of this important facet of management of neuromuscular disease, but there are several points that must be stressed. Neurogenic scoliosis (the collapsing spine) cannot be managed in the same way as idiopathic or congenital scoliosis and the rate of progression is not predicatable. The use of spinal jackets and seating systems have been investigated but results have not been particularly encouraging.

Spinal fusion using the Harrington procedure has been used but the long period of immobilisation required has meant that this procedure was reserved for very late stage disease. The new Luque method (17) of intersegmental wiring appears to offer hope for these children since they can be mobilised quickly.

TABLE 1

Simple classification of Neuromuscular disorders of childhood based on the side of pathology in the lower motor neurone **After Moosa (3)**

PRIMARY SIDE	DISEASE	
	HEREDITARY	ACQUIRED
Anterior Horn Cell	Spinal Muscular Atrophy	Poliomyelitis
Nerve Fibre		Neuropathies a) Demyelination, eg infectious polyneuritis, peroneal muscular atrophy, leucodystrophies. b) Azonal, eg lead, diabetes, porphyria
Neromuscular Junction		Myasthenia gravis
Muscle	1 Muscular Dystrophy 2 Dystrophic Myotonica 3 Congenital Myopathies 4 Metabolic myopathies, eg glycogenoses types II and V, malignant hyperpyrexia	1 Dermatomyositis/ Polymyositis 2 Endocrine myopathies, eg thyrotoxic. 3 Latrogenic, eg steroid myopathy.

TABLE 2 **METHOD OF MYOMETER EXAMINATION**

Muscle Group	Position of Patient	Position of Part to be Examined	Position of Myometer
Knee Extensors	High sitting	Hip and knee at 90°	Anterior aspect of ankle joint proximal to line between media lateral malleoli.
Knee Flexors	High sitting	As above	Posterior aspect of ankle joint over musculotendinous junction calf muscles.
Hip Extensors	Prone lying	Hip extended 20° Knee extended	Upper border popliteal fossa.
Hip Abductors	Supine	Leg abducted to 20° in line of body Knee extended.	Lateral condyle of femur.
Hip Flexors	Supine	Hip and knee flexed to 90°, operator supports lower limb.	Upper border of patella.
Shoulder Abductors	Sitting upright on standard chair	Shoulder abducted to 90° in anatomical position, elbow at 90°, lower arm pronated and supported by operator.	Distal third of arm immediately proximal to laterial epicondyle of humerous.
Wrist Extensors	Supine Head on low pillow	Arm abducted 10° in line of body elbow pronated and extended wrist extended fingers flexed	Centre dorsum of hand
Neck Flexors	Supine Head on low pillow	Head raised to 45° with chin tucked in.	On centre of forehead above bridge of nose.
Foot Dorsiflexors	Supine	Foot dorsiflexed to 90° if possible.	Distal portion of first metatarsal.

Table 3
MOTOR ABILITY

	Score	2	1	0
Lifts head				
Supine to prone over right				
Supine to prone over left.				
Prone to supine over right.				
Prone to supine over left.				
Gets to sitting.				
Sitting				
Gets to standing.				
Standing.				
Standing on heels.				
Standing on toes.				
Stands on right leg.				
Stands on left leg.				
Hops on right leg.				
Hops onleft leg.				
Gets off chair.				
Climbing step — right leg.				
Descending step — right leg.				
Climbing step — left leg.				
Descending step — left leg.				
Total out of 40.				

Table 4
FUNCTIONAL CLASSIFICATION

1 Walks, climb stairs.
2 Walks, climbs stairs, needs a railing.
3 Walks and climbs stairs with great difficulty.
4 Walks, rises from chair, cannot climb stairs.
5 Walks, cannot rise from chair or climb stairs.
6 Walks with assistance, walks independently with long leg braces.
7 Walks, in long leg braces, requires assistance for balance.
8 Stands in long leg braces, unable to walk even with assistance.
9 Wheelchair bound.

Ref. Vignos 1966

Table 5

ORTHOSES FOR DMD

Procedure

Day 1 Percutaneous tenotomy of TA.
Long leg plasters — ischial lip, sheepskin padding.

Day 2 Standing/Walking in POP.

Day 3 Bivalve plasters.
Measure of orthoses.
Reapply plasters.

Day 10 Fit Orthoses.

Table 6

Clinical Classification of Spinal Muscular Atrophy.

Severe	Unable to sit unsupported.
Intermediate	Able to sit unsupported. Unable to stand or walk unaided.
Mild	Able to stand and walk.

After Bubowitz (2)

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THE EFFECT OF INCREASED ACTIVITY IN NORMAL AND DISEASED HUMAN MUSCLE

Oona M. Scott, Research Physiotherapist, Hammersmith Hospital.

Introduction

In this second section, I would like to discuss some aspects of the effect of changes of activity in human muscle. Mammalian skeletal muscle, although exhibiting a high degree of specialization, shows a remarkable ability to adapt its biochemical, physiological and ultrastructural properties in response to changes in demand. This was shown by experiments of nerve transposition as early as 1960. In these experiments, the nerve that normally supplied the slow contracting soleus muscle of the cat was sutured into the fast contracting flexor digitorum longus (FDL) and soleus was innervated by suturing the nerve from FDL. It was found that not only the contractile properties were exchanged, but that there were also extensive changes in both the metabolic and histological properties.

Similar changes have been demonstrated when animal muscles are subjected to chronic low frequency stimulation and fast muscle fibres undergo a series of systemic changes which ultimately result in complete transformation to slow contracting fibres (2). There is overwhelming evidence that these changes are directly related to the imposed activity and that both functional and metabolic characteristics of muscle fibres depend on the activity of the motorneurone.

In recent years considerable emphasis has been placed on the "plasticity of skeletal muscle" and many studies have been undertaken to explore the nature and time course of these changes and the circumstances in which they occur (3). The similarities between these induced changes and the effect of exercise indicate that the changes caused by endurance training may be very similar and that the same basic characteristics are involved (4).

It is important to remember, however, that much of this work has been done in animals and, as yet, data from human studies is very limited.

Human Muscle Function Studies

Assessment of human muscle function has always been basic to physiotherapy and, for many years, attempts have been made to quantify changes of muscle strength or tasks of physical performance.

As physiotherapists, we are familiar with the use of MRC grading and many physiotherapists are now using commercially available myometers to record the forces exerted by individual muscles or groups of muscles to monitor changes of muscle strength.

In the past ten years, these objective studies of muscle strength have been extended by the development of further tests of muscle function and it is now possible to measure the contractile responses of muscle in response to electrical stimulation in terms of:—

1. the time course of muscle contraction (CT) and relaxation (½RT):
2. the ability to maintain tension or the fatigue index (FI); and
3. the relative forces produced at different frequencies of stimulation.

These methods of assessment have been used by physiotherapists for the past five years to evaluate their treatment procedures (5).

Electrical stimulation has the advantage of by-passing voluntary control, of being non-invasive and clinically acceptable in both adults and children. Experience has shown that the technical difficulties are minimal.

The Effect of Increased Activity

While the metabolic, contractile and structural characteristics of muscle fibres appear to depend on the activity of firing of the motoneurone, questions persist as to what extent its order of recruitment, the frequency at which it fires and the duration of its activity can alter (6). Imposed electrical stimulation can be used to induce physiological changes in innervated skeletal muscle and carefully defined patterns of activity to selected skeletal muscles can thereby be administered. Electrical stimulation manipulates the output activity pattern of the motoneurone by adding to its inherent activity, whereas with exercise, the relative activity of each motor unit remains unaltered with respect to the rest of the units (4).

Studies of Human Subjects

Studies have been undertaken in this department to investigate the effects of prolonged low frequency electrical stimulation in normal and diseased muscle (6). There are indications that normal muscle maturation during postnatal development depends upon interaction between muscle and its motor nerve and that disturbance of the normal sequence of activation of nerve and muscle may lead to neuromuscular disease (7). Recently, it was found that there was a slowing of the rate of maturation of this diseased muscle and that imposing low frequency electrical stimulation enhanced the rate of maturation of the fibres and reduced the amount of degeneration (8).

Subjects were supplied with small battery-operated stimulators, a battery charger, two leads with small carbon electrodes and a tube of conductive gel. They were instructed how to apply the electrodes and to use the stimulator and they were asked to stimulate their muscles for an hour, three times each day for periods of at least six weeks. During this time, they returned to the department of regular assessments and it was possible to monitor changes in their muscle function.

The results of the study so far show that the changes produced in human muscles by chronic low frequency stimulation are similar to those induced in animals. In rats and rabbits, stimulation are similar to those induced in animals. In rats and rabbits, stimulation of fast skeletal muscles caused them to become more fatigue resistant; this change was seen to occur in the tibialis anterior (TA) muscles of normal adult muscles (9).

The possibility that low frequency stimulation could be beneficial to diseased muscle is presently being investigated in a group of children with Duchenne Muscular Dystrophy (DMD).

Muscle Function Studies in Children with DMD

We have been able to investigate:

1. skeletal muscle function in young normal children in order to investigate the latter stages of maturation in human muscle contractile characteristics, and
2. to identify differences in contractile properties between young normal children's muscles and those of children with DMD.

Results of these studies have shown that, during fatigue testing, neither the muscles of normal children nor those with DMD showed the characteristic loss of force observed in the muscles of adult subjects during the same testing procedure. Up to six years of age, the maximum force exerted by the anterior tibial muscles of children with DMD with similar to age matched normal children but, amongst those with DMD, there was no further increase with age. Relaxation times of muscles in DMD children were significantly longer than those of normal children.

Maintenance of Function Previous studies of boys with DMD had shown a progressive decline of muscle strength with age. As stated in the earlier section by Mrs Hyde, systematic evaluation had also shown that there is a close association between the loss of independent ambulation and the loss of dorsiflexion due to increased shortening of the tendo achilles. It has been shown that it is possible to prolong ambulation by daily stretching and the wearing of night splints. Recent work has shown that the development of contractures is secondary to changes of the muscle tissue and that factors controlling protein turnover and muscle growth such as mechanical signals, e.g. passive stretching may have an important role (10).

It is further possible that chronic low frequency stimulation could be a means of manipulating the activity pattern to these muscles and, using the tests described in the previous section together with those mentioned above, of accurately evaluating the effect of stimulation on dystrophic muscle.

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Extracts from the Minutes of The Muscular Dystrophy Association Spinal Support System Review Team Meeting

Winnipeg Manitoba December 1982

There are two clinics for Muscular Dystrophy in Winnipeg, one for children, one for adults. In the children's program they have a caseload of approximately 100 children, about half are actively followed. The clinic was established in 1975 at the Rehabilitation Centre for children with outreach into the school system and the home and community. The team consists of a pediatrician, orthopedist, therapist, social worker, rehabilitation engineer, orthotist, with consultants available in neurology, genetics and muscle pathology.

Some children are referred for total management by referring physicians, others for consultation only, there is attempt to avoid any traumatic exposure of children with mild involvement to those more severely involved. The clinic has been structured under the Muscular Dystrophy Association Council, well received by parents, who are encouraged to enroll with the Association. Funding is provided in total by the Manitoba government which also covers the PT/OT and physician services. Therapists from the schools and other agencies attend the clinic regularly. Five or six patients are seen at each monthly clinic. Technical aids are provided by the government, including seating and powered mobility, the latter only through approval of a review panel. Families needing

Devices not provided by the government have back up support through the MDA Exception Services Program. The Clinic philosophy is to maintain ambulation as long as possible through surgery and bracing.

Surgical Management. Dr. Munson, the orthopedic member involved with establishing the Clinic, indicated that approximately two years of additional ambulation are provided as the result of lower limb surgery combined with bracing. He indicated the rationale for maintaining upright mobility is weight bearing to reduce the occurence of osterporosis and fractures. It is not uncommon to observe undetected fractures over the years, especially once weight bearing ceases.

Regarding spinal management Dr. Munson reported that approximately 90% of children with Duchenne Dystrophy develop a progressive scoliosis, and these spinal curvatures tend towards hip dislocation, and that corrective or supportive spinal orthosis have not been very effective. The seating support of choice in Winnipeg has been the standardised or modular spinal insert with the accentuated lumbar lordotic area, with centralised control box for the power chair, and an innovate armrest arrangement which provides the central mounting of the box, and improved location for a clear laptray.

Dr. Munson reported a three year follow-up of seventeen cases, using the X-ray throne as developed by Toronto. It indicated the existence of two groups, the first maintaining essentially a straight spine over a 4 to 5 year period after which they progress to spinal curvature, and the second which progress to form a spinal deformity immediately on entering the wheel chair, approximately an equal number of curves are to the left and right. Eight subjects were stable with spinal support seating and no surgery, four progressed to the point in which the spinal fusions with Harrington instrumentation was done at approximately 35° of curvature, and four with progressive scoliosis chose not to have surgery. After Harrington spinal surgery, polypropolene plastic half shells are used for support rather than plaster casts.

Mr Marinic presented the Orthotic approaches used for lower extremity and spinal management. He reinforced the concept that plastic spinal orthosis do not seem to work well and rejection is usually inevitable.

Mr Forbes rehabilitation engineer presented the seating insert developed in Winnipeg and the modifications to the wheel chair base normally made. One type was a standardised insert for the child that first goes into the wheel chair and has minimal deformity, and the second used for patients with severe deformity, needing a significant accommodation for purposes of comfort. Details of the seating developments were given.

Social aspects were discussed by Mrs Murray-Davis, a social worker for the Society of Crippled Children and Adults (SCCA). Staff from SCCA regularly attend Clinics and provide the input and follow-up to the home and community, a close association with therapists in the school system and residential facilities is also maintained. The comprehensiveness of the outreach component of the Clinic in terms of being able to respond to home and community based needs was most impressive. For example, if a parent requires custodial or attendant services these can also be provided on a regular basis.

Regarding the psycho-social aspects, she indicated that such things as gradual loss of physical ability and independence at a time when a child normally strives for greater abilities and independence presents a great deal of stress. Peer pressure from being associated with others that are physically able tends to accentuate feelings of inadequancy, so they withdraw to solo type activities, they fantasize through the activities of others. Academic achievement can offset frustrations. Families become totally exhausted trying to meet the ever increasing needs of a demanding child.

It was indicated that increased independence through use of environmental control systems within the home was of high priority for the future. One pressing problem repeatedly presented, was that of an appropriate bed to cope with night time discomfort.

The Chicago Experience with the Spinal Support System was presented by Mr Silverman resulting from 75 fittings. The Clinic Team he is associated with, has an orthotist, physician, clinic co-ordinator, O.T., P.T., physiotrist and respiratory therapist. The overall philosophy is to minimise the amount of surgery done, and prolong standing to the extent of encouraging at least two hours standing a day within the school program. Regarding upper extremities they used balanced forearm orthosis.

The advantages of the Spinal Support System he felt, was excellence in providing comfort, and his Clinic agreed with the theory in principle. He felt the disadvantages were that the system was designed to be used with a modified E. & J. base, which has poor durability in terms of attachment framework and problems of availability in the United States. A second shortcoming was lack of ability to keep up with growth, finally the bulk of the overall system prevented its use as a car seat. In general the Clinic felt the SSS was effective in reducing the progression of a spinal curve. But he has moved on to the design of a new system that he will provide routinely.

The Saskatoon Approach. Mr Dwight Nelson presented the results of follow-up on thirty patients over a three and a half year period. Essentially they used the two step approach similar to Winnipeg. When a more customized approach is needed for more severely involved patients, the foam in place system, as developed in Memphis Tennessee is routinely used. Mr Nelson demonstrated the orthotic solution to an equino varus problem, a plastic cosmetic orthosis that can be worn with normal track shoes.

Mr Forbes presented a case history of a thirteen year old boy with problems of head control. He indicated that most systems were able to take care of the posterior Hopping head but were unable to deal with anterior Hopping heads. Of course concern is that if the head hops forward the child may suffocate. An approach suggested was the use of a soft foam neck collar which would prevent the head falling forward far enough to restrict the air passage.

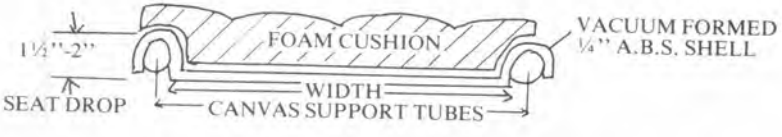
Dr. Cameron commented on some overall problems, one being the lack of dietician which he felt was an important contribution to the clinic. He thought the establishment of a respite care facility should have high priority, so that parents and families in need could look to this resource to deal with crisis situations. Dr. Cameron also pointed out that children are being kept healthier longer, and the complicating factor will be lack of respiratory

function. So children in wheel chairs are going to require assisted ventilation support. This will induce some medical, moral and ethical/philosophical issues that will have to be resolved. Even though assisted respiration could be provided, eventually the heart will malfunction and the patients die.

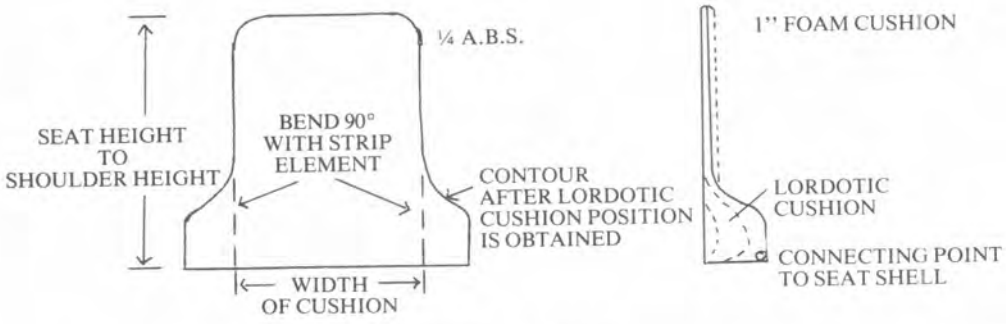
A SEATING APPROACH FOR MUSCULAR DYSTROPHY

Wheelchair — We are accustomed to using the Everest and Jennings (E. & J.) folding wheelchairs. The system outlined was fitted to 12", 14" and 16" chairs. Electric chairs of similar sizes were also fitted.

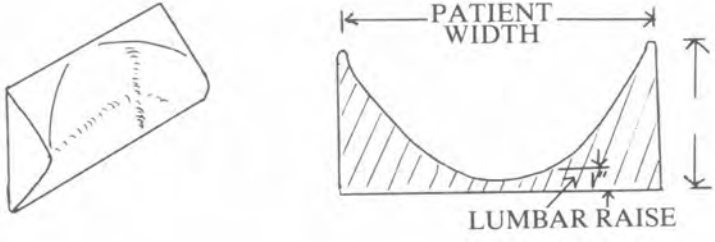
Seat — Remove the canvas (vinyl) seat and replace with a drop in tray. We used a vacuum formed A.B.S. plastic tray of ¼" material. Its design permitted the patient to set at the same height as the vinyl seat but allowed for the use of different foam densities and depths to suit the user.



Back Support — Remove back support canvas or in some cases it can remain and let new support shell rest against it. If canvas back is removed special metal hardware is required to attach the back shell to the uprights of the wheelchair. Our experience in seating many of the muscular dystrophy patients was their resentment to being reclined to such an angle they could not move from a relaxed position to a working position independently. We reclined the back somewhere between 5° - 10°.



LORDOTIC CUSHION



Headrest — Headrests were supplied to all patients and attached to the A.B.S. back support shell by adjustable hardware.

Armrest/ Work table — Special swivel type channel armrests were designed so the patient could comfortably support himself when in an upright position. The arm would swivel across the front of the patient at an angle suitable to the user.

Legrest — The commercial wheelchair adjustable legrest were supplied to all patients.

With this seat they use very light splints to hold the ankle when necessary.

TOYS

Save on Toys

As many of you already know, TLA publishes a list of toys considered to provide a good basic stock for a toy library. The list is included in the Pack for Potential Toy Libraries.

A package deal with ABCeta Playthings of Stockport, Cheshire has been negotiated which offers the **complete** Starter Kit List of Toys for £595 which includes VAT, post and packaging and a guaranteed delivery time of 2 - 3 weeks, within receipt of order.

This offer is ideal for toy libraries who are having problems in obtaining the recommended toys, or just want the easy way out, and have the lot delivered to the doorstep!

Starter Kit List and further details - contact Play Matters/The National Toy Libraries Association.

MacLaren PlayBar

PlayBar is an attractive, entertaining play system for young babies, designed to be fixed across a cot.

Any combination of the five PlayBar toys fix securely to the bar so baby can play happily and safely. The toys are designed to provide endless fun and stimulation with their combination of colour, noise and movement.

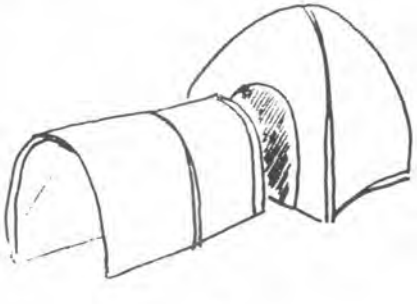
Available at leading nursery shops and department stores.

Andrews Maclaren Limited, Long Buckby, Northants, NN6 7PF. Tel. 0327 842662.

Playcamp-Tunnels of Fun

Bumper Indoor/Outdoor Camps for children 3 - 6 years. Use the den alone as a space-station, igloo, cave, etc. - or add a tunnel for extra fun. Covers made from white or green strong, woven polypropylene over sprung frames. Den 3ft. high × 5ft. across with rear window. Separate tunnels 4ft. or 6ft. long.

Den £19.70, Tunnel £16.70 for 4ft., £20.90 for 6ft. Each item £1.70 p. & p. Cheques or postal orders to:— Clapman Muntrell Ltd., 26, Market Place, Bedale, North Yorks. BL8 1EQ.



EMERGENCY OXYGEN WEIGHS ONLY 6 LBS

AAv's new '230' series portable emergency oxygen inhalers are available in three models.

Each has a 230-litre rechargeable cylinder and regulator.

Each comes complete in a Shoulder-sling carrying case and includes a tube and mask. Total weight, including cylinder and regulator: about 6 lbs.

Each operates under a working pressure of 1,800 p.s.i. and is manufactured to BS5045 specification.

Standard model: is set at 6 L.P.M. but is available with any other single flow rate required.

Two-flow model: permits selection of either 2 or 4 L.P.M.

Multi-flow model: offers a choice of 2, 4, 6, 8 or 10 L. P. M. All models may be prescribed by hospitals through the N. H. S. on form F. P. 10 (HP).

Also available: domiciliary oxygen sets to drug Tariff Spec. O1B: humidifier bottles and adaptors; nebulisers, masks and tubes.

For full details: Air Apparatus and Valve Limited, Oakfield Works, Branksome Hill Road, College Town, Camberley, Surrey. (Tel. 0276 35885).

'NEWEL' RAIL B78

A new hand rail to turn the corner at the top of the stairs. Right or left fitting.

From: Homecraft of London, SW17 7SF.

Thermoplastic Splinting for the Great and Small

Smith and Nephew announce two directly mouldable, low-temperature splinting materials, designed to meet most of your thermoplastic splinting needs.

San-Splint, a newly formulated rigid, low stretch, flesh coloured material is specifically designed for larger casts.

San-Splint XR is a rigid, high stretch, white material is especially suitable for smaller intricate casts.

These two materials combine with Plastazote an established Smith and Nephew product, to provide a range of light-weight sheet, thermoplastic materials for comfortable resting or supportive splints.

The Aerosol Respineb Inhaler

For the Inhalation of Aerosols in the Treatment of Cystic Fibrosis and other infections of the respiratory tract.

The New Aerosol Respineb Inhaler is designed for patients to use in their own home, school, office, etc. Housed in an attractive vanity type case with carrying handles, is convenient, lightweight, reliable and easy to use. The non-

disposable nebulizer, mouthpiece and nosepiece can be sterlised in boiling water, or autoclaved to 125°C. The very fine mist produced is effective in the treatment of all respiratory tract conditions. The appropriate medicament is prescribed by the patients physician or consultant. Price £63 plus postage and packing. No VAT payable with doctors certificate.

Also available, multi-voltage aerolyser model 216 suitable for use from 12 volt D. C. and from 100 - 240 volts A. C. allowing patient to travel and receive treatment in motor cars, caravans and all continental resorts.

Aerosol Products Limited, 680 Garratt Lane, London, SW17 0NP. Tel. 01 - 947 - 0285.

Bulky, awkward environmental controls will soon be a thing of the past

Elfin systems have two new products -

Home Help is an advanced environmental system controlling up to 16 mains devices, full remote control of TV (with teletext) loudspeaking telephone, intercom and front door. The method of device control, using the mains house wiring wherever possible, means installation causes the minimum of disturbance.

A similar approach is used in the Elf Centre, which is a cheaper version of Home Help but with less features.

It was heartening to see more equipment that gave severely disabled users access to standard microcomputers and allowed them to exploit commercial, keyboard driven software. Both Elfin and Possum showing keyboard emulators for the BBC microcomputer which were controlled by simple switches and yet allowed access to the full BBC keyboard without interferring with the normal operation of the microcomputer.

An individual's success or failure with so many of these devices still comes down to the weakest link; the user's 'switch'.

The Eye Controlled Switch developed at St. George's Hospital, Lincoln, is now undergoing extensive trials with promising results. The system detects horizontal eye movements using simple electrodes which are placed on either side of the head. The system does not detect small muscle signals but tracks the larger potential which changes as the eyes move to the left or right, it is thus far simpler to use than might be imagined.

No microelectronic aids exhibition is complete without some Synthetic Speech. The most interesting new application in this field was shown by British Telecom South East Region with Claudivs Converse. This device, connected to the telephone, holds a 64 phrase vocabulary from which the user may select using a simple keypad. The generated speech, which is of high quality, may be spoken locally or sent over the normal telephone lines, thus assisting the speech impaired.

The Possum Interface control for the B. E. C. 'B' computer has four modes of operation which can be selected to best suit the user. From: Possum Controls Ltd., Middlegreen Trading Estate, Middlegreen Road, Slough, SL3 6BX.

The Elfin Home Help controls up to 16 mains devices. Installation causes little disturbance, Elfin Systems, Byard Road, Gloucester.

Peter Watts, University of Manchester, Institute of Science and Technology.

Motoring — It's All Done in 90 Seconds!

The move to designing smaller, more fuel-efficient cars has left many disabled drivers and families who have a wheelchair user with the problem of what to do with the wheelchair once the occupant is safely installed in the car seat.

Last year we reviewed the first system for winching the chair on to the roofrack of a car. This has many advantages for the disabled driver, the most important being that he or she can choose the right car for the job without considering the wheelchair.

The Autochair from Mobility Techniques has the advantage of being completely sealed from the weather. Designed by a disabled person, it can fit on to the roof of any production car which has roof gutters (including a standard Mini).

The Autochair will take any make of wheelchair with removable footrests and can be fitted to either side of the car. It is fitted at the company works in Derbyshire. The only modification needed is a small hole to accommodate the power supply (It is driven by the normal 12V battery). The Autochair costs about £1,000. There is no VAT.

Further information from: Mobility Techniques Ltd., The Croft, Great Longstone, Bakewell, Derbyshire, DE4 1TF. Tel: 062987 278.

Everest & Jennings Introduce BRIO

Flex — Exciting new colourful aids for the disabled child, — that's the Brio range now being marketed in the UK by Everest & Jennings.

The Flex range of Wheelchairs provide independence and mobility for children up to the age of 15. Even the very young children will find it easy to use these completely adjustable chairs. The bright red seats and backs are covered with a washable cushion. There are pushbars available if control is required by the parents or therapists and an anti-tipping bar makes the Flex range completely safe.

With fully adjustable wheels, castors, footboards, footrests and seats these chairs are both fun and practical and all tough enough to stand up to the knocks of children's play.

Everest & Jennings, Ltd., 21 Princewood Road, Corby, Northants, NN17 2DX. Tel. Corby (05363) 67661.

Mobility Allowance

The Spastics Society Lobbying Dept is to produce an Occasional Paper on Mobility Allowance. It is hoped the document will provide a basis for a new campaign to extend the criteria for Mobility Allowance. If you know of people who have been turned down for the allowance or have gone to appeal, the Lobbying Dept. would like to hear from you. Please send information on why the claim was refused, or notes on successful/unsuccessful appeals to:— Linda Avery, The Lobbying Dept, The Spastics Society, 12 Park Crescent, London WIN 4EQ.

Perinatal Mortality Rates

According to the Junior Health Minister, Mr John Patten, the perinatal mortality rates are still falling, but it was difficult to indentify the exact cause of this fall, however, where the deaths of very low birthweight babies have been prevented, one factor must surely be the joint planning of the care of mothers whose pregnancy is at high risk, by obstetricians and paediatricians. Neonatal mortality rates have also come down, due largely to the advances made in neonatal paediatrics.

Britain's First Sound Playground

Specifically designed for children with mental and physical handicaps, the first Sound Playground was opened recently in Islington, North London. It was created by four professional musicians and instrument makers, employed by Interlink — a charity working internationally for the integration of disabled and disadvantaged people through the arts. Set up within one of several Adventure Playgrounds run by the Handicapped Adventure Playgrounds Assoc. Ltd. the project cost £6,000. Instrument range from simple to elaborate percussion, and are made from domestic and industrial materials.

Haywards Playground, Market Road Gardens, Market Road, Islington, London. Tel: 01-607-0033.

Playboard

Having taken over many of the servicing functions of NPFA and Fair Play for Children, some explanation of who does what is needed. With the closure of the Childrens Play Dept. NPFA is in the process of redefining its policies and priorities. For the time being it will continue to make grants and loans within the existing policy, and its Midlands Resource Centre (with Play Train) will remain. A most important continuing function will be on the technical side. The Association and Playboard are co-operating on all technical matters, and enquiries in this area will be referred to NPFA until further notice.
Address — 25, Ovington Square, London SW3. Tel: 01-585-6445.

The Fair Play for Children Charitable Trust has closed down, and its publication and information acquired by Playboard. A Fair Play for Children Assoc. continues, and can be contacted at 137, Homerton High Street, London E9.

Specialist working groups are being established by Playboard, each chaired by a Trustee Director, and currently indentifying their aims and objectives and membership. The working groups are:—

Communication: David Bryant
Facilities/Equipment: Wendy Titman
Playwork: John Newing
Education/Training: Chris. Field
Fundraising: Bob Satterthwaite
Research/Development: Colin Stroud

Further information from:— Association for Childrens Play and Recreation Ltd., Brittania House, 50 Great Charles Street, Queensway, Birmingham. B3 2LP. Tel: 021-233-3399.

BOOKS AND LEAFLETS

Unshared Care — Parents and their disabled children. Caroline Glendenning. A series of in-depth interviews describing the emotional, practical and physical demands made on parents caring for their disabled child at home.
Routledge and Kegan Paul £6.95

Paediatric Development Therapy. Edited by Sophie Levitt B.Sc. (Rand). Provides information on all aspects of development therapy in Childhood. £12.80 Blackwell Scientific Publications Ltd.

Management of the Motor Disorders of Children with Cerebral Palsy. Edited by David Scrutton. A discussion of the various therapies and techniques, and the difficulty of deciding which to use.
£8.00 Blackwell Scientific Publications Ltd.

How to survive — as a childminder.
A Guide book for childminders covering many aspects of the work.
£1.25 post free from :— NMCA, 204/206 High Street, Bromley, Kent BR1 1PP

The Child with a Handicap. D. M. B. Hall, MB.Ch.B.MRCP.MRCS.
A logical approach to development paediatrics.
£35.00 Blackwell Scientific Publications Ltd.

Useful addresses for parents with a handicapped child.
Sale : Ann Worthington (10 Norman Road, Sale, Cheshire M33 3DF). £2.40

A combined leaflet and poster on eye care for children is being distributed by the Iris Fund for the Prevention of Blindness, based Jiminy Cricket, it gives information on how eyes work, and how to care for them.
Copies free on request of s.a.e. 10" × 6". Iris Fund, York House (Ground Floor), 199 Westminster Bridge, London SE1 7UT.

New Catalogue
R. Taylor & Son announce their brand new range of wooden furniture and toys which are now manufactured for use by children and adults in schools, hospitals, institutions, special care units and similar areas.

R. Taylor & Son (Orthopaedic) Ltd., Compton Work, Woodwards Road, Pleck, Walsall, WS2 9RN. Tel: Walsall 27601.

VIDEO - HOLIDAY IDEAS

Getting There By Bus

Video — This is a production available on free loan — which always brings a gleam to the eye! It's been made by the National Bus Company and it shows a number of ideas being developed to help disabled people to get around more easily by bus and coach.

Some features are experimental, some permanent, while some relate to bus stations and others to vehicles.

I was interested to note that the NBC and associated companies now have 15 vehicles equipped to transport parties of wheelchair passengers; and that the company also has an advisory committee on disability.

While obviously there's a promotional aspect to this movie there's a good deal of helpful information in it too.

Contact the Public Affairs Department, National Bus Company, 172 Buckingham Palace Road, London SW1W 9TN

Give Me A Boat

Video/Film — Chugging along on a boat ranks with hiking and cycling as one of the best ways of really getting a 'feel' of the countryside.

For severely disabled people it may be the only way and the Peter Le Marchant Trust is devoted to providing boating holidays on inland waterways for disabled people.

The Trust's new film, with commentary by Anthony Andrews of Brideshead Revisited fame, captures all the happiness of life on boats and shows the immense amount of work put in by staff and volunteers to ensure that the trips run smoothly and safely.

A useful and enjoyable film if you are looking at the ways of providing holidays for disabled people. There is also a discreet appeal for funds.

Details from the Peter Le Marchant Trust, Colston Bassett, Nottingham, NG12 3FF.

Bell F. Hill I.

Aid for the physically handicapped. (21 min. tape, 26 slides). University of Edinburgh : Rehabilitation Studies (Available from: Graves Medical Audio-visual Library, Holly House, 220 New London Road, Chelmsford CM2 9BJ Tel. 83351). 1983.

HELP

Hip Problems of Cerebral Palsy.

We are wanting to gather ideas and information from physiotherapists working with cerebral palsy children who present with hips at risk of dislocation.

Could you inform us if —

a) a conservative approach is taken, what techniques are used?
b) a radical approach is taken, what surgery is used and have the long term results proved satisfactory?

Replies please to : Miss Penny Hales, Senior Therapist, Branch House School, and Centre, Pinhoe Road, Exeter EX4 8AD.

Physiotherapists working in Child Development Centres/Assessment Centres,
What problems are you encountering, and how are you solving them?
Will you write and tell me about your centre so we may compare notes?
How many staff do you have in your centre, what hours do they work? How many patients do you assess/treat? How are you funded?

Our centre is funded jointly by Social Services and Health for three years. We are in a hut at the back of a school away from the hospital and child clinic, and unable to provide our patients with transport. In a clinic in London the Local Disabled Group provide patient transport, and the Pre-School Playgroup Association pay for a Nursery Nurse.

Replies please to : Mrs C. Burnett, MCSP Slough Child Development Centre, 51 Ladbrooke Road, Chalvey High Street, Slough, Berks.

Provision of static seating for severely handicapped children.
There is frequently a problem about funding for this — a chair that is required for a specific child for home use cannot be funded from the general physiotherapy equipment budget. ALAC will only supply wheelchairs, buggies, etc. Social services do not seem able to supply seating such as tumbleform floor sitter, Rifta Chair etc, these they often term 'therapeutic' and not an aid to activities of daily living!

It is difficult to trace official DHSS policy on this matter, and there is a feeling that charities should not always be expected to provide.

Has anyone any solutions to this problem sent in by a reader?
Replies to the Editor please.

HAZARDS

Product: Renray Products Variable Height Walking Frame.

Problem: There is a possibility of the front legs of these variable height walking frames fracturing at the front leg/bracing rail junction.

Solution: Authorities are advised to check that the dimensions of walking frames meet the Departmental specifications. One subject of the recommended specification for the equipment is to control dimensions in order to assure an acceptable performance level. This criteria should be of prime importance in consideration prior to procurement, S.I.B. (84) 5 January 1984.

Product: Carters Commode Chair.

Problem: Further incidents have been reported where chairs have failed in service, due to frame distortion. Previous S.I.B. (2) 4 January 1982 refers.

Solution: The need for planned maintenance is re-emphasised. Commode chairs with the single front cross member, should continue to be inspected at monthly intervals, in accordance with S.I.B. (2) 4 to ensure that programmed inspection and maintenance is carried out on all commodes and wheelchairs in use, and that caster brakes are applied during patient transfer.
S.I.B. (84) 1 January 1984.

WANTED

Part time Senior 1 Physiotherapist for Community Mental Handicap, in Burnley, Lancs. Informal enquiries to Mrs Margaret Jones MCSP — Burnley 25071 or 602754 (work) Pediham 72327 (home).

CEUD MILE FAILTE!

100,000 welcomes to our Capital City!

We are looking forward to seeing you all in Edinburgh on March 22nd and 23rd, 1985. Recognised as the capital of Scotland in the 15th Century it's natural situation, dramatic setting and classical architecture gained it the title "The Athens of the North". There is much of interest historically, architecturally, and culturally and has the reputaton of being the most popular holiday centre in the United Kingdom after London.

There are excellent communications with the rest of the country by rail, road and air.

The ACPC Conference is to be held at the Heriot Watt University which is attractively situated on the outskirts of the city. The Campus is surrounded by well kept grounds including many rare species such as California Redwood and Sycamores and Spanish Chestnuts over 300 years old. Well appointed accommodation is in comfortable study bedrooms overlooking a loch.

Dinner with a "Scottish flavour" will be served on Friday evening for the inclusive price of £15.25.

BOOK NOW!! CLOSING DATE : February 15th, 1985.

PROGRAMME

Friday 22nd March

8.30 - 9.00	-	Registration	
9.30 - 9.45	-	Introduction	Miss E. Bell, MCSP
9.45 - 10.30	-	Assessment v Diagnosis	Dr J. K. Brown MB, FRCP, DCH
10.30 - 11.00	-	Coffee	
11.00 - 12.00	-	The Management of the Handicapped Child in the Community with the emphasis on the Prevention of Positional Deformity	Miss E. Bell, MCSP
		The Spina Bifida Child	Mrs V. Mairs, MCSP
12.00 - 1.00	-	Computer Aided Learning in the Lothians	Mr Philip Odor and Miss Sally Millar
1.00 - 2.00	-	Lunch	
2.00 - 3.30	-	Parents Problems	
4.00 - 5.00	-	Seating Problems	Mr R. L. Nelham B.Eng. C.Eng., M.I. Mech. E.,M.B.E.S. Technical Director Chailey Heritage Hospital

Saturday 23rd March

9.00 - 10.00	-	Annual General Meeting	
10.00 - 10.30	-	Coffee	
10.30 - 11.30	-	Chest Care in the Community	Dr M. McCrae FRFPS, FRCP Mrs E. Muir MCSP, Miss M. Campbell SRN
11.30 - 1.00	-	Problems of Working in the Community	Panel Discussion
1.00 - 2.00	-	Lunch	
2.00 - 3.00	-	Emotional Problems	Dr. J. Furnell
3.00 - 3.30	-	Tea	
3.30 - 4.30	-	Death	Dr. O'Gorman
4.30 - 5.00	-	Summing Up	Mrs O. Thomson
		The final address — Invitation to the next Conference	The Chairman of the National APCP Committee

REGIONAL REPORTS

North West **Reg. Rep. Mrs Kathleen Jones, 66, Mellor Brow, Mellor, Blackburn, Lancs.**

Our study day on 'Seating' which was held in Preston, drew a large response and was oversubscribed, so a repeat day at a later date will be announced. The Regions A.G.M. will include an Asian Study session and will be held in the Physiotherapy Dept. Royal Manchester Childrens Hospital, Pendlebury on February 16th 1985.

The North West Branch have agreed to sponsor three members of the North West A.P.C.P. for £50 each to attend the 1985 APCP Conference should they have difficulty in obtaining funding.

Further information from Mrs M. Casey, Physiotherapy Dept., Rochdale Infirmary, Rochdale, Lancs.

South West **Reg. Rep. Miss G. Riley, Children's Unit, Odstock Hospital, Salisbury.**

The Regional Committee met in February to discuss next years programme. Two Study Days are being arranged - they are in November on Haemophilia - to be held at the Lord Mayor College Treloar College, and the other in March on Dystrophy to be held in Dorchester.

Local day courses are also being held in venues throughout the region to combat the problems of travelling and lack of financial support. Details have already been circulated to A.P.C.P. members in the region.

Officers were elected at this meeting as follows - Tess James, Course Liason Officer, Mrs Jane Perkins, Newsletter Organiser, Gillian Riley, Regional Rep.

London **Reg. Rep. Miss Fiona Graham, Leon Gillis Centre, Queen Mary's Hospital, Roehampton.**

We have sadly had to say good-bye to two of our Committee members, Yvonne Mitchell, our Secretary, has left for an exciting trip overseas, Christine Young has been appointed as Superintendent at Brighton Childrens Hospital. We thank them for their hard work. With our skeleton committee we have managed to organize two events in October. On Friday October 12th we are having a workshop on the 1981 Educational Education Act at Great Ormond St. from 6 - 8 p.m. in the Lecture Theatre. We have four speakers, two members of the Executive Committee - Mrs Maggie Diffey, Vice-Chairman, Mrs Pam Eckersley, Post Registration Educational Representative, also a Divisional Educational Psychologist for I.L.E.A. Mr John Dowling, and Dr. Vivian Simmons, Senior Community Physician in Child Health, Kingston Health Authority. Each speaker will give a ten minute talk on their thoughts on the Act, and then

it will be up to the audience to participate by giving their view.

On Saturday 27th October, we are running a course on the 'Dying Child' at the Wolfson School of Nursing, 30 Vincent Square, Westminster. Our programme includes Leukaemia, the clinical and emotional management, a psychiatrists view of the child with long term or potentially fatal disease, and the counselling of children and their parents. The final lecture is to be given by a Senior Community Physiotherapist in Oxford, Mrs Bronwyn Bennett, who will talk on her role at Helen House, the recently very publicized hospice for children, which has opened in Oxford.

Midlands and Trent

About 50 members visited O.R.L.A.V. and the Robert Jones and Agnes Hunt Hospital at Oswestry in August, to discuss the newest hip guidance orthosis and compare notes and problems with research associate Penny Butler. A new Total Soft Play area has been installed at Ridge Hill in Dudley. In September there was a lecture on Portage at Birmingham Childrens Hospital, and on November 10th there will be a Bobath Workshop at Goodhope Hospital, Sutton Coldfield.

The new Trent sub-branch will also be having a Bobath Workshop early in March 1985, and the first A.G.M. is to be held in late March 1985 in Nottingham.

Regional reports not printed have not been received in time for publication.

ARTICLES OF INTEREST

Copies of the following articles can be ordered from : Mr Martin Saunders, Assistant Librarian, National Demonstration Centre, Pinderfields General Hospital, Wakefield, West Yorkshire, WF1 4DG.

Please quote the Bulletin date, the number of the article and full details of the citation. You will be invoiced at 9p per sheet. Do not send money with order.

September 1984

10

Parette HP Jr Hourcade JJ
A review of the therapeutic intervention research on gross and fine motor progress in young children with cerebral palsy.
Am J Occup Ther 1984 Jul; 38(7) : 462-8.

11

Peganoff SA
The use of aquatics with cerebral palsied adolescents
Am J Occup Ther 1984 July: 38(7) : 469 - 73.

23
Li FP et al
Follow-up of children with brain tumors.
Cancer 1984 Jul 1; 54(1) : 135 - 8.

28
Banta JV
Rehabilitation of pediatric spinal cord injury: the Newington Children's Hospital experience.
Conn Med 1984 Jan; 48(1) : 14 - 8.

29
Fontenrose A et al
Physicians' and physical therapists' evaluations of cerebral-palsied children for Achilles tendon lengthening.
Dev Med Child Neurol 1984 Apr; 26(2) : 208 - 13.

45
Hartley E Rushton C
The therapeutic use of a trampoline in inhibiting normal reflex reactions and facilitating normal patterns of movements in some cerebral palsied children.
J Soc Remed Gymnast Recreat Ther 1984 Aug; 113 : 6 - 11.

66
Lamb JM
Family use of functional clothing for children with physical disabilities.
Rehabil Lit 1984 May - Jun; 45 (5 - 6) : 146 - 50.

FORTHCOMING COURSES

4 - 9 November
Technology with Disabled Children and Adolescents.
(Apply: Mrs J. W. Knowles, Castle Priory College, Thames Street, Wallingford, Oxon OX19 0HE. Tel. 0491 37551).
Price : £90 (+ £90 residence)

9 - 11 November
Play and Leisure Aids for Disabled Children.
(Apply: Mrs J. W. Knowles, Castle Priory College, Thames Street, Wallingford, Oxon OX10 0HE. Tel. 0491 37551).
(Can be taken with the 4 Nov. course, fees: £100 (+ £108 residence).
Price : £30 (+ £36 residence).

10 November
Nobody told me . . . . (The delivery and co-ordination of services for families with handicapped children).
Lecture Theatre, Clarendon Wing, Leeds General Infirmary.
(Details : Julia Dunning, Genetics Health Visitor, Room 136, A Floor, Clarendon Wing, The General Infirmary, Leeds).
Price : £6.

29 November
Day Centre for the Younger Physically Disabled. Dalmeny Hotel, S. Promenade, St. Anne's, Lancs.
(Details: Mike Plumb, Development Officer, St. George's Ho., Otley Rd., Harrogate. OR Amanda Osborne, Conference Officer, RADAR, 25 Mortimer Street, London W1N 8AB).
Price : on application.

1 December
Technology and Disability
(Details: Mr Colin Richardson, Three Crowns Day Special School, Skip Lane, Walsall, West Midlands WS5 3NB. Tel: 0922 23119)
Price : £6.

2 - 5 December
Rehabilitation Engineering.
Stannington Children's Hospital, Morpeth, Northumberland.
(Details: Miss E. M. McGuire, Prin. Assistant Training Officer, Northern R. H. A., Regional Personnel Division, 52 Clifton Rd. Newcastle upon Tyne NE4 8DQ). (Closing date: 31 October)
Price: on application.