

The Very Early Treatment of Cerebral Palsy

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THERE are many reasons why children with cerebral palsy benefit more from early treatment started by the age of 9 months than from treatment given at a later age. The following points may be sufficient to emphasise the importance of very early treatment.

1 *Plasticity of the Infantile Brain*

Early treatment is important because of the great adaptability and plasticity of the infantile brain. The first 18 months of a normal child's life are a period of great and fast development. At no other stage of his growth does the child learn and develop so quickly. It is not only a stage with the highest potential for learning, but also for adjustment to cerebral damage.

2 *The Importance of Sensori-Motor Learning.*

The learning of movements is entirely dependent upon sensory experience, upon sensory input which not only initiates but also guides motor output.

The normal child changes and modifies the sensori-motor patterns of early and primitive movements and adapts them gradually to more complex functions such as walking and prehension. The child can only use what he knows—that is, what he has felt, what he has experienced and what he can remember. If, as is the case with a child with cerebral palsy, sensori-motor

experience has been abnormal from the beginning, he will only be able to make use of his abnormal sensori-motor patterns. The intelligent child, if not too severely affected, will adapt these abnormal patterns for some functional use and in this way perpetuate and reinforce them. In time this will lead to contractures and structural deformities, an outcome which could, in most cases, be avoided by very early treatment.

3 *The Child's Mental Development*

Sensori-motor deprivation may cause mental retardation in children whose potential mental endowment may be normal. Disturbances of perception are present in many cases of cerebral palsy, and are known to interfere with educational progress. They are, however, often due to lack of experience which results from the motor handicap. By giving the child at an early age a great deal of sensory stimulation and by helping him to control and adapt in the most normal way the movement he makes in response to it, this secondary mental retardation may be prevented (Bobath, K. 1963).

4 *Abnormal Postural Reflex Activity*

The child with cerebral palsy not only shows persisting primitive motor patterns and insufficiently developed postural reflex mechanisms, but he also shows abnormal

postural activity with abnormal postural tone. It is this which interferes with, or prevents, the development of the potential normal postural reactions, such as head righting, equilibrium reactions, and many other adaptive and protective postural reactions.

Abnormal postural reflex activity and spasticity or athetosis, however, are not usually very strong in the infant, and therefore changes of the abnormal postural patterns with reduction of hypertonus can be obtained more easily and quickly at that time than later on.

5 *Prevention of Contracture and Deformities*

Contractures and deformities are not usually present in the baby, except perhaps for a possible congenital dislocation of one or both hips not due to cerebral palsy. There may, however, be very early signs of threatening deformities such as a persistent asymmetry with a tendency to a scoliosis, one leg turning inwards more than the other, obliquity of the pelvis with shortening of one side of the trunk, adduction of the extended lower limbs with plantiflexion and inversion of the ankles, and a kyphosis of the spine when the child is supported in sitting.

Very early treatment could in most cases, prevent the development of such contractures and deformities.

6 *The Time Factor*

Very early treatment in most cases will give quicker and better results because the child is not, as yet, very abnormal, the treatment is easier, and the mother, if instructed in the proper handling of the baby, can become an active member in the treatment programme with the result that the infant receives more treatment. Once spasticity or athetosis is well developed, and deformities and contractures have

become established it may take years to achieve—if it can be achieved at all—what might have been done in only months of very early treatment.

The Aim of Treatment

The aims of treatment are:

- (1) To develop normal postural reactions and postural tone against gravity for support and control of movements.
- (2) To counteract the development of abnormal postural reactions and of abnormal postural tone.
- (3) To give the child, by means of handling and play, the functional patterns he will use later on for feeding, dressing, washing, etc. for self help.
- (4) To prevent the development of contractures and deformities.

Treatment can at best help the child to develop his full potential abilities. If treatment is started before abnormal patterns have become established it can help him to organise his potential abilities in the most normal way.

Specific treatment techniques and ways of handling the baby are designed to obtain active movements in the form of normal postural reactions. Normal postural reactions may be defined as the active adaptations of a baby's posture when he is moved. They include righting and equilibrium reactions, support on upper limbs and hands and holding on to a support. These develop in a normal child in a definite sequence. The abnormal postural reactions are those of the tonic reflexes described by Magnus (1926), Walshe (1923) and others. They interfere with or prevent development of more normal postural reactions. If in treatment their development is counteracted and the baby given normal 'postural background patterns' one can then facilitate the development of inherent specific normal active movements (Bobath and Bobath 1964).

The Value of 'Handling' the Child

During the first 8 months of life the normal baby is picked up, put down, carried, washed, dressed, fed and so on. His mother supports him where necessary, she adjusts his posture, but she only does it when and where she feels it to be necessary. As the infant's brain matures the patterns of his own adjustment of posture to changes of position as he is handled by his mother develop gradually. There is a natural interplay between mother and baby, between her way of moving and supporting him and his growing independent ability of 'putting himself right', of getting himself out of uncomfortable positions, by righting and controlling the position of his head and trunk, and by holding on to his mother for support.

The child with cerebral palsy does not react normally to being handled. He may be stiff, his muscles resist when he is moved, especially if this is done quickly, or he may be 'floppy' needing support in all his parts. In either case he gets little chance of gaining practice in adaptive responses of posture when he is moved. The infant's first sensori-motor patterns are in response to the handling he receives. In the baby with cerebral palsy these responses all tend to be abnormal. Unless the baby with cerebral palsy is handled with great skill he will experience and learn only the sensations of abnormal postures and movements. Because he will know no other patterns he will use these abnormal patterns for movements he learns later on. Early treatment and management can help him to more normal sensori-motor experience. To teach the mother the special ways of handling her baby is a most important aspect of treatment. Only if she helps in this way can the baby acquire the necessary sensori-motor patterns of postural adjustment and, like the normal child, use them later on for his spontaneous and independent activities.

Assessment and Planning of Treatment

To plan a rational treatment programme one has first to make a systematic assessment of a baby's abilities and disabilities. One also has to find out *why* he can do certain things and cannot do others. To answer these questions one must have a thorough knowledge of normal child development in terms of the acquisition and gradual perfection of the postural reflex mechanism. This will enable one to discover to what extent the perfection of the postural reflex mechanism is interfered with by abnormal postural reflex activity in association with abnormal postural tone. A careful study of these two factors and the effect of their interplay in the individual case, will serve to explain why a cerebral palsied baby has not achieved certain milestones. Treatment is then directed towards *inhibiting* the abnormal postural reflexes which interfere with the baby's motor activities, and *facilitating* the innate normal abilities in keeping with his chronological age. Care must be taken *not* to attempt to facilitate motor patterns beyond the baby's chronological age.

The normal postural reflex mechanism develops in a child gradually over many years and in a definite sequence. In a child with cerebral palsy this development is usually retarded or arrested and, as a result, his motor age is below his chronological age. The arrest may be general, with the various aspects of motor development closely grouped around the same age level, or, more frequently, it will show a wide scatter over several developmental age levels. This latter is especially so in the baby who is not totally involved, or when, in total involvement, some parts of the body are less affected than others. He may then develop fairly normally in some aspects of his motor behaviour but not in others. If motor behaviour is generally retarded, treatment must seek to advance it on a 'broad front', and bring it as far as

possible up to the level corresponding with the child's chronological age. If motor development is patchy, treatment should be planned to fill in the gaps, giving the child the missing links in the ordinary sequence of normal development. For instance, a baby of six months may be able to sit as well as can be expected at this age, but still be unable to roll over from supine to either side, or he may be able to bear his weight in supported standing (frequently too well on stiffly extended legs), but, in prone lying, he may not be able to extend his back and hips sufficiently to bear his weight on his extended arms and hands. (For greater detail see Bobath, B. 1963).

When planning a rational treatment programme, the following questions should be considered:

(1) What stage of normal development has the baby reached? How does this compare with his chronological age, that is to say, which aspects of the child's motor behaviour are normal or fairly normal but are 'infantile', i.e. typical of a younger age level, development not having progressed to the abilities to be expected at the baby's chronological age?

These findings will indicate the stage of development from which to advance the child's activities.

(2) Are the various aspects of the baby's arrested motor behaviour closely grouped around the same level of development, or is there a wide scatter, with abilities belonging to different stages of development?

These findings will indicate the gaps that have to be filled in between the child's lowest and highest performances.

(3) What abnormal postures can be observed when the baby is tested in various positions, and in what way do these abnormal postural patterns interfere with his activities?

These findings will indicate which patterns

have to be inhibited in order to facilitate the normal patterns which they prevent or with which they interfere.

(4) Does the baby show any abnormal postural patterns which are likely to produce in time any of the well-known typical contractures and deformities? Are there any persistent asymmetries of the neck and trunk, is there flexion and pronation of the elbows and wrists with fistled hands, or adduction and inward rotation of the legs, one leg showing more inward rotation than the other, or obliquity and tilting of the pelvis with apparent shortening of one leg, or a kyphosis or kyphoscoliosis?

Assessment should take note of these and other abnormal postural patterns and their role in producing future contractures and deformities, and treatment should be aimed at preventing them.

(5) What is the baby's postural tone like? Does one obtain normal adaptation of muscles when moving the baby, or is there excessive resistance, or abnormal lack of resistance, to certain movements? How does tonus change with stimulation or effort, that is to say, are abnormal reactions only apparent in response to quick movement or when the baby is excited? Do they occur only in some positions and not in others? Are abnormal reactions only apparent, or do they become worse, when balance becomes a problem?

These findings will indicate the infant's or young child's needs and hence what particular techniques of treatment to use in the individual case.

The spastic child needs, apart from inhibition of abnormal postural reflexes, a great deal of active movement. Static postures must be avoided, passive movements and stretch of individual muscles are useless. Much sensory stimulation is necessary, but this should be carefully graded to avoid abnormal reactions. At

this stage the child may have general hypotonia, he may have general hypertonia with increased tendon reflexes, or he may already be more or less fixed in certain positions, his movements requiring excessive effort and being limited in range and speed. In treatment, the spastic child needs to experience a great many varied normal movement patterns which are new to him, and also a gradual increase of speed and range of movement.

The athetoid child is too mobile. He lacks sustained postural control and cannot give fixation and guidance to the moving parts. His movements are disorganised and are too fast, jerky, and extreme in range. To stop the intermittent abnormal postural reflex activity from interfering with his movements he needs techniques of inhibition; to increase the postural tone against gravity he also needs techniques of stimulation. His treatment will need to be more static and much slower than that of the spastic child. He will have to learn to maintain normal postures for a gradually increasing period of time, in order to give fixation to the moving parts. Weight bearing, with or without resistance, plays a major part in the treatment programme. The child has to obtain better control of the mid-range of movement, and to reduce excessive range and speed. The problem here is one of organising the disorganised existing patterns of movement.

The hypotonic baby (floppy infant). This is usually a transient phase in the baby with cerebral palsy, soon followed by hypertonus of either intermittent or permanent character. The first fluctuations of postural tone appear as a result of stimulation occurring in the baby's being handled or as a result of the baby's own efforts. To increase postural tone against gravity, he will need tactile and proprioceptive stimulation, carefully graded in order to avoid the development of intermittent spasms or athetoid move-

ments. Proper alignment of head and neck with the body, and of body with limbs, are important aims of treatment. Postural control and alignment have first to be obtained. After this the child is slowly moved in order to facilitate righting of posture against gravity and balance reactions.

The planning of a treatment programme has been discussed in a previous publication (Bobath, B. 1963).

Normal Postural Reactions and their Importance for Motor Development and Treatment

Normal motor development has been described in great detail by Gesell and Amatruda (1949), Illingworth (1960), Schaltenbrand (1925, 1927), McGraw (1943) and other workers. Every new activity is built up on previous patterns which are gradually elaborated and modified. Although in time the spontaneous activities of a child become very varied and complex, there are a few basic motor patterns of postural control and adjustment which develop simultaneously at certain stages and which seem to underlie and make possible the great number of new and complex functional abilities which the child develops at any particular stage. It is therefore unnecessary in treatment to teach the child all the varied abilities of a certain stage *separately*. It is more useful to facilitate the basic motor patterns which the child can then use and translate into a whole *group* of new activities. Consequently it is important to have a thorough knowledge of these basic patterns and their development in the growing baby.

Basic Postural Patterns of a Baby of Four Months

1. The *labyrinthine* righting reaction on the head.
2. The *Landau* reaction (not very strong as yet, extension having reached spine and

hips, but not the knees). In *prone*-lying these two reactions coincide with an ability to raise the head to such an extent that the plane of the face forms an angle of 90 degrees to the couch. Extension of head and body against gravity enables him to take his weight partly on extended upper limbs, with his hips on the couch, lower limbs abducted and flexed at the knees, and at times, to arch the spine and 'swim' on the support or floor.

Placed on his *feet*, he can take a good deal of his weight, extend his legs recurrently and rise on his toes.

Head righting against gravity enables him not only to lift his head in *prone*-lying but also to flex it against gravity when *pulled to sitting*, so that there will be only a slight initial head-lag.

3. *Symmetrical* postural behaviour. This coincides with the disappearance of the last vestiges of an asymmetrical tonic neck response. This can be observed in *supine*-lying, the head being in midline, the hands engaging in midline. The lower limbs at rest are symmetrically flexed and abducted.
4. *The neck righting* reaction is present and still unmodified. Rotation of the body as a whole follows movements of the head. The baby is able to roll from *supine* to either side and back to *supine* again.

Basic Postural Patterns of a Baby of Six Months

1. The *labyrinthine* reaction on the head is stronger now and the *optical* righting reaction reinforces it. This coincides with perfect head control when *prone*-lying, when *pulled to sitting* and when *sitting*. The child is also able to lift his head from *supine* and he can assist when *pulled to sitting*.
2. The *Landau* reaction is strong now. This coincides with the ability in *prone*-lying

to support himself on his extended upper limbs with fully extended hips and knees, lower limbs abducted. He also bears almost all his weight in standing.

3. *Elaboration and modification of the primitive total flexion and extension patterns*. This achievement accompanies his ability to sit erect with straight spine, flexed hips and extended knees, whereas before he either slumped forward in full flexion or fell backward extending his whole body when trying to look up. When pulled to sitting he now lifts his lower limbs off the couch, flexed at hips and extended at knees, whereas before he lifted his lower limbs flexed at hips and knees, using a total pattern of flexion in making an effort to bend his head forward against gravity. The ability to lift his lower limbs by flexing them at the hips while they are extended at the knees can be observed also when he is lying on his back and playing with his toes. With his feet on the support, knees flexed, he now also raises his hips and extends his spine, showing a combination of parts of the former total patterns of flexion and extension.
4. *The modification of the neck righting reaction*. Rotation between thorax and pelvis begins (body-righting reaction on the body) coinciding with the baby's ability to roll over from *prone* to *supine* and, a little later on, from *supine* to *prone*-lying. This rotation also enables him to reach out with one hand in *prone*-lying, while supporting himself on the other arm.
5. *The protective extension reaction* of the upper limbs (parachute reaction, Milani 1964). This coincides with the baby's ability to bring his extended upper limbs forward for reaching out and weight-bearing. He reaches his upper limbs out forward in anticipation of

being picked up. He plays with his feet when lying on his back. He sits, leaning well forward and supporting himself on his extended upper limbs. In prone-lying he supports himself on his extended arms. The Moro reaction has disappeared, probably being inhibited by the protective extension reaction of the arms forward and downward.

6. *Equilibrium* reactions in prone. These coincide with the baby's ability to shift his weight from one arm to the other in prone-lying without falling over and to reach out then for a toy with one arm.

Basic Postural Patterns of a Baby of Eight Months

1. The *Landau* reaction has become very strong.
2. The *body righting* reaction on the body is also stronger.
3. The *protective extension* reaction of the upper limbs is present now forward and sideways.
4. *Equilibrium* reactions are now present in prone, supine and sitting.
5. *Labyrinthine* and optical righting reactions are well established.

The development of these postural reactions is related to the newly acquired activities in the following ways:

1. The strength of the *Landau* reaction seems to underlie the baby's ability to take his full weight on his legs when made to stand, the lower limbs being abducted and outwardly rotated, heels down. (Kicking has stopped, simultaneous extension of both legs being predominant.)
2. The strength of the *body righting* reaction on the body with its pattern of rotation around the body axis (Schaltenbrand 1926) underlies the child's ability to sit up from prone and return to the prone again from sitting.
3. The *protective extension* reaction of his upper limbs forward and sideways

allows him to sit with little over-balancing and without falling sideways, which he still did at six months of age. He can now support himself with his arms, which helps him to sit up from prone lying.

4. *Equilibrium* reactions are now present in sitting, enabling him to recover his balance and to twist around without falling.

Basic Postural Patterns of a Baby of Ten Months

By the age of 10 months the baby has developed secure balance in sitting without the use of his arms for support.

Equilibrium reactions in standing start to develop. He stands by holding on to a rail; he can lift up one leg and he can walk by holding on to the furniture, though he does so with a wide base and with abducted outwardly rotated lower limbs. He still has to rely on his hands for support as his *equilibrium reactions* in standing are, as yet, poorly developed.

Equilibrium reactions of trunk and legs are almost perfect in sitting, and he can pivot and progress on the floor on his seat, turn around, and also pick up objects from the floor without losing balance.

The protective extension reaction of the arms in sitting now functions well backwards in addition to sideways and forwards. (Thomas *et al.* 1960) This enables him to push himself up with one arm from supine to sitting. He no longer has to turn over completely to prone-lying in order to sit up, but can do so with less rotation around his body axis. He makes use of the patterns of long-sitting and of *protective extension* of the arms forward, which he had developed at the age of six months when creeping plantigrade. The *Landau* reaction is still very strong.

This summary of normal motor development will perhaps serve to show some of

the most important basic postural motor patterns which have to be obtained in treatment in order to prepare the child with cerebral palsy for the new and voluntary complex activities which are based upon them. A few examples will be described below, illustrated by photographs taken during the treatment of two children, both spastic quadriplegics, one a baby of 7 months (10 weeks premature) unable to control his head, roll, sit, or support himself with his arms; the other a boy of 2 years 6 months, with strong spasticity, unable to sit unsupported, or to use his arms for support in sitting but having fairly good head control. In many respects his motor age is below that of a 6-month-old baby. (Figs. 1 and 2)

Pictures of the older child are included to give a broader illustration of the possibilities of treatment, as the treatment of the baby was limited to the few patterns he was then ready for.

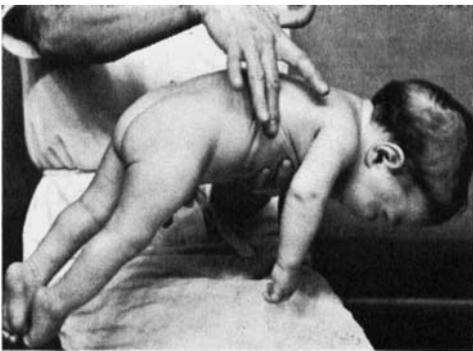


Fig. 1. Testing the Landau reaction with a spastic baby of 7 months. Note: flexion of trunk and hips with extended adducted legs and plantiflexed feet.

Treatment

Some examples of the basic postural patterns used in treatment

1. The *pattern of extension* of the whole body in prone-lying, supported on upper limbs and hands, and with abducted and outwardly rotated lower limbs. This pattern is valuable in preparation for standing. (The pattern of



Fig. 2. Quadriplegic child 30 months old. Note: total pattern of flexor spasticity combined with extensor spasticity, heels off ground, toes clawing and backward pressure of his body weight.

the Landau reaction and of the protective extension reaction of the arms forward.) (Fig. 3a, b, c, d, e.) It can also be practised in supine lying (Fig. 4a and b).

2. The *pattern of head righting against gravity*. This is an essential reaction. It gives the child head control when his body is moved or when he moves actively. It also enables him to initiate sitting up from prone and supine. It paves the way for equilibrium reactions, which develop in the normal child only when head control has become perfect (Figs. 5a, b, c, d, e, f).
3. *Symmetry of postural patterns*, that is head in mid-line, shoulder girdle and pelvis level. When obtained, this will enable the child to engage his hands in midline, to play with them, to get them to his mouth, to suck his fingers, and to



Fig. 3a



Fig. 3b



Fig. 3c

Fig. 3a. Extension in prone with abducted outwardly rotated legs in preparation for the Landau reaction.

Fig. 3b. Extension and support on arms in prone. Note: Pressure exerted on sacrum to stimulate extension of spine and head raising.

Fig. 3c. Extension of the whole body with abducted legs in outward rotation in preparation for standing. Note: child's feet placed against therapist and intermittent pressure given to extended legs to stimulate support tonus.

Fig. 3d. (right) Followed by lowering child over the ball to stand. Note: arms are held up extended to counteract flexor spasticity with downward pressure of trunk.

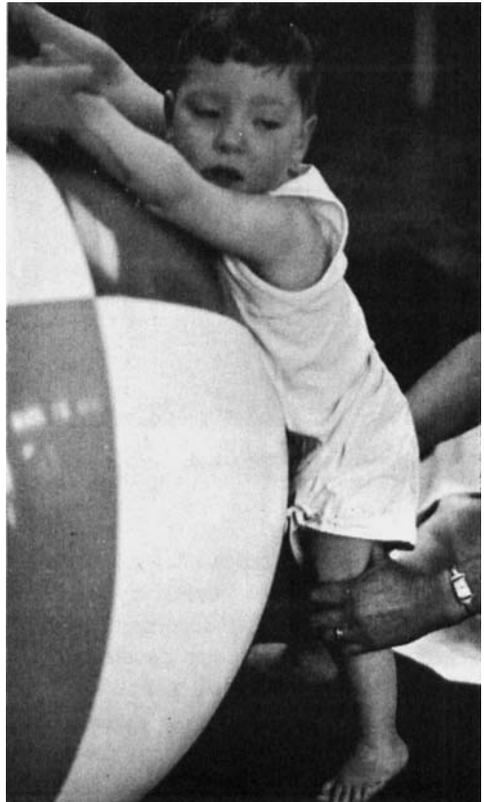




Fig. 3e. Extension of head, trunk and abducted legs supported on forearm in preparation for standing.



Fig. 4a. Extension of the whole body in preparation for standing.



Fig. 4b. Followed by standing with abducted outwardly rotated legs and dorsiflexed feet.

touch and explore his own body and limbs. This is a necessary step in preparation for self-feeding, dressing, washing, as well as for developing his body percept (Figs. 6a, b.)

4. The *pattern of protective extension of upper limbs and hands*, first forwards, then sideways and finally backwards,

in preparation for support and balance in sitting. This pattern prepares him for being able to push himself up to sitting from prone or supine-lying, for getting on to hands and knees and for crawling. It is also used in plantigrade walking, for pushing himself up to standing, for climbing on to a chair, and, later for

getting in and out of the bath.

The pattern of the protective extension of the arms remains throughout life, not only for the purpose of support and weight bearing, but as one of our most important protective reactions, an automatic response against falling, when the balance reactions of trunk, head and

limbs fail. Furthermore, the first stage of the protective extension of the arm, i.e. stretching out the limb and opening the hand and fingers before touching the support, is identical with that of reaching out in order to grasp an object. In preparation for reach and grasp it is therefore essential to obtain



Fig. 5a. Facilitation of head righting when pulled to sit. Note: reinforcement of head flexion forwards by grasp, approximation of hands to mouth and flexion and adduction of arms.



Fig. 5c. Facilitation of head righting, i.e. of extension against gravity in prone by extension of spine and abduction of the child's extended arms.



Fig. 5b. Facilitation of head righting in sitting. Note: extension of arms in outward rotation to make extension of trunk and neck possible.

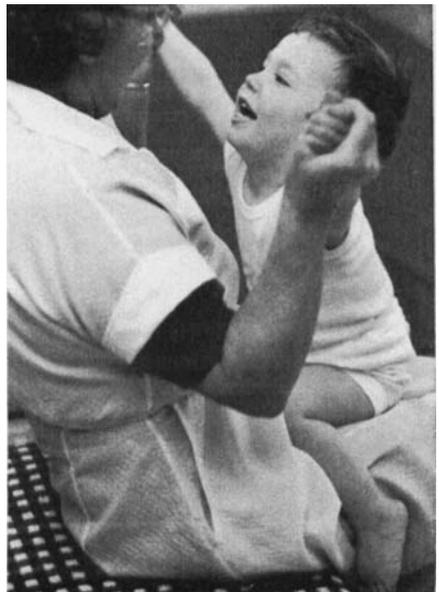


Fig. 5d. Facilitation of head righting in sitting, i.e. of extension of head and spine against gravity by abducting the child's extended arms.



Fig. 5e. Extending and adducting the child's arms, bringing his shoulder girdle forwards . . .



Fig. 6a. Symmetrical postural pattern in side lying, shoulders moved forwards against retraction, hands together and to mouth. This is followed by rolling the baby to supine maintaining the same pattern.



Fig. 5f. . . . facilitates head righting, i.e. flexion against gravity when pulled to sitting.



Fig. 6b. Symmetrical postural pattern, head mid-line, hands engage in midline, hands and objects to mouth.

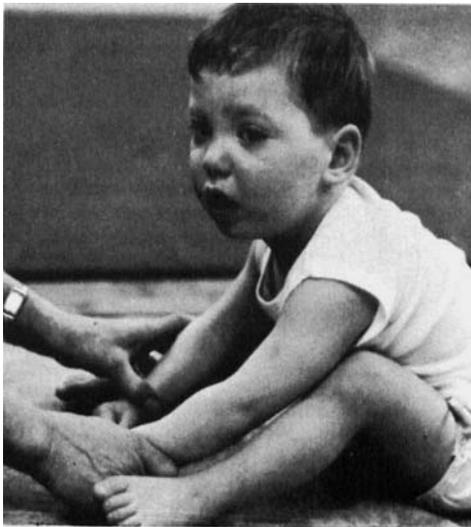


Fig. 7a. Preparation for protective extension of arms forwards.

this function in treatment (Figs. 7a, b, c, d, e, f).

5. The *pattern of long-sitting*, with the trunk leaning forward, thighs well flexed, abducted and externally rotated at hips, and extended at knees, with hands to feet. This pattern prepares the child for sitting up. It is also the pattern for plantigrade walking and prepares the child for standing up from the floor. This pattern can be prepared for in



Fig. 7b. Protective extension of arms forwards.



Fig. 7e. Preparation for protective extension of arms backwards by inhibition of flexor spasticity.



Fig. 7c. Facilitating protective extension of arm sideways. Note the pattern of reaching out with opening of hands and fingers before touching the support.



Fig. 7d. Protective extension of arms sideways. Note therapist facilitating extension of child's right arm by extending and abducting left arm.



Fig. 7f. Protective extension of arm backwards. Note: Therapist's left hand extending child's dorsal spine to facilitate movement.

supine by making the baby touch and play with his feet and toes. This will also help him to feel and appreciate his legs and feet, which is important in the development of the body percept and for using his legs later in standing and walking (Figs. 8a, b, c).

6. The *patterns of rotation within the body axis*, the hips following the shoulders, and vice versa (the body righting reaction on the body). This pattern is important as a preparation for turning over from supine to prone, for sitting up from prone-lying, for side-sitting and for getting on to hands and knees in order to stand up (Figs. 9a, b, c, d).
7. The many and varied *patterns of the equilibrium reactions* in all positions have to be developed. They are an essential preparation for sitting, in which position they make possible maintaining and restoring balance, allowing the child to look around freely, using his hands independently to reach out and play, and moving his legs without falling over. They are also a preparation for standing up and for unsupported standing and walking (Figs. 10a, b, c, d).

Examples of some postural patterns of normal children to be avoided in treatment

When treating babies with cerebral palsy it is important to keep in mind that some of the normal motor patterns of early infancy have to be avoided as they are too similar to the abnormal motor patterns. For instance, it is quite normal for a baby of eight months in supine to arch his back, with his feet on the support, and to push his hips up, resting on head and shoulders. Though this is an important pattern to be developed in children with spastic diplegia it should be avoided or discouraged in children with athetoid quadriplegia. It is often the only activity for such children, in whom the legs are less involved than the head and trunk, and is



Fig. 8a. Preparation for long sitting, hands to feet and feet to mouth.



Fig. 8b. Long sitting, held up in the air, legs extended and abducted. The child is leaning well forward.



Fig. 8c. Long sitting, legs abducted, hips well flexed and hands to feet in preparation for sitting balance.

a common way in which athetoid children progress (backwards) on the floor. Its constant practice, however, will increase extensor spasms to such an extent that the head control and balance in sitting and standing may become impossible later on.

Another pattern to be avoided is that of kicking. The normal baby, after four months of age, kicks with lower limbs abducted and outwardly rotated, the ankles dorsiflexed. In the spastic or athetoid child, kicking, however, soon assumes an abnormal character with adduction, inward rotation of the legs, and plantiflexion of ankles and toes. In the child

with cerebral palsy, therefore, kicking will increase extensor hypertonus of his lower limbs and, in time, will produce scissoring of the legs, and toe-standing and walking. For the same reason, it will also prevent sufficient hip flexion and abduction when sitting and thereby rob the child of a proper sitting base and balance. A normal baby stops kicking altogether at 8 months (Illingworth 1960), probably because at this stage he has developed a symmetrical standing pattern with abducted legs in preparation for standing and walking, abduction being essential until balance in standing has improved and walking on a narrower base



Fig. 9a. Rotation between thorax and pelvis in preparation for rolling to prone.



Fig. 9b. Rotation between thorax and pelvis in preparation for rolling from prone to supine.



Fig. 9c. Combined extension with rotation in child with excessive flexor spasticity of trunk and arms. Rolling from one end of the bolster to the other.

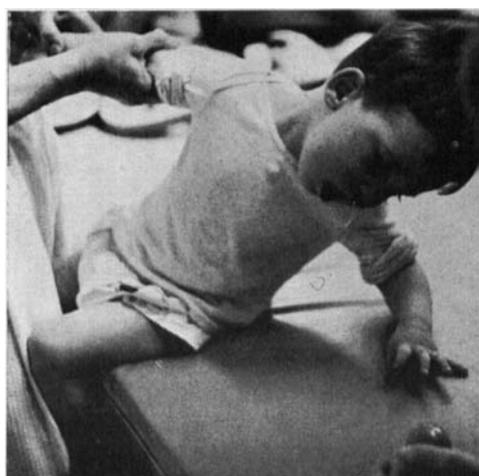


Fig. 9d. Rotation of trunk with facilitation of protective extension of arm backwards in preparation for sitting up from prone and supine.



Fig. 10a and b. Facilitation of balance reactions in sitting on roll. The roll is being moved gently when the child has got his balance.



Fig. 10c and d. Facilitation of balance reactions in standing. The child is being moved sideways and forwards-backwards, held by his knees to counteract flexor spasticity.

has become possible. The athetoid child, however, continues to kick in a primitive as well as abnormal crossed extension pattern. In some treatment this is often encouraged as it is wrongly regarded as a 'walking pattern', but unless it is replaced with symmetrical standing before the child is made to walk, it will result in very abnormal walking, if walking is achieved at all.

Another pattern to be discouraged in some children with cerebral palsy is that of support on extended arms forward when kneeling. This pattern reinforces the spastic child's tendency to flexor spasticity of shoulders and trunk with kyphosis of

the dorsal spine, and the athetoid child's tendency to extension, inward rotation and adduction of the arms (decerebrate rigidity posture). Though support on the arms forward is the earliest pattern of protective extension in the normal child, in children with cerebral palsy support on extended arms sideways, or even backwards, may have to be introduced first. By doing this first, flexor spasticity of the upper limbs and the pattern of adduction with inward rotation can be inhibited, before slowly and gradually encouraging the child to take his weight forward on his arms in a more normal way.

SUMMARY

The view that very early treatment will give the best results is stressed and the reasons for this view given. The need for an early recognition of cerebral palsy is emphasised, as treatment started later, i.e. after the age of 1 or 2 years, when athetosis or spasticity are stronger and abnormal patterns of posture and movement established, can achieve only limited results. The principles and aims of treatment are given. Normal motor development, in terms of the evolution and elaboration of the basic motor patterns responsible for the child's expanding and complex spontaneous activities, is outlined. The importance of a thorough knowledge of these basic motor patterns for assessment and for the planning of treatment is stressed. Some examples of treatment methods are given.

RÉSUMÉ

Le traitement très précoce de la paralysie cérébrale

L'auteur insiste sur l'idée qu'un traitement très précoce donnera les meilleurs résultats et expose ses raisons. Il souligne l'importance de reconnaître la paralysie cérébrale tôt, parce que le traitement commencé plus tard, c'est-à-dire après l'âge de 1 ou 2 ans, lorsque athétosis et spasticité sont plus forts et les types anormaux de maintien et de mouvement sont établis, ne peut atteindre que des résultats limités. On donne les principes et les buts du traitement. On expose les grandes lignes du développement moteur normal, en considérant l'évolution et l'élaboration des types moteurs basiques responsables des activités spontanées complexes et en expansion de l'enfant. On insiste sur l'importance d'une connaissance approfondie de ces types moteur de base pour l'évaluation et pour l'établissement d'un plan de traitement. Quelques exemples de méthodes de traitement sont donnés.

ZUSAMMENFASSUNG

Die sehr frühe Behandlung von Gehirnlähmung

Die Ansicht dass sehr frühe Behandlung die besten Resultate erzielt, wird unterstrichen und ebenso werden die Gründe für diese Ansicht dargelegt. Die Notwendigkeit einer frühen Erkennung der Gehirnlähmung wird betont, da eine später begonnene Behandlung d. h. nach dem Alter von 1 oder 2 Jahren, wenn Athetose oder Spastizität stärker sind und

abnorme Haltungs- und Bewegungsarten sich festgesetzt haben, nur begrenzte Resultate erzielen kann. Die Grundlagen und Ziele der Behandlung werden dargelegt. Normale motorische Entwicklung in Form der Evolution und Erweiterung der grundlegenden Bewegungsmuster, die für die komplexen und sich ausdehnenden, spontanen Tätigkeiten des Kindes verantwortlich sind, werden dargelegt. Die Wichtigkeit einer eingehenden Kenntnis dieser grundlegenden Bewegungs-Muster zur Einschätzung und zur Behandlungs-Planung wird betont. Es werden einige Beispiele von Behandlungsmethoden beschrieben.

RESUMEN

El tratamiento muy precoz de la parálisis cerebral

Se insiste en el punto de vista que un tratamiento precoz dará los mejores resultados, y se dan las razones para este parecer. Se consta la necesidad de un diagnóstico precoz en casos de parálisis cerebral, puesto que un tratamiento que empieza más tarde, es decir, después de la edad de 1 o 2 años, cuando la atetosis o la espasticidad son más graves y 'patterns' anormales de postura y de movimiento han sido establecidos, no puede ganar más que resultados limitados. Se explican los motivos y los objetivos del tratamiento. Se da un resumen de la evolución motriz normal, es decir del desarrollo y elaboración de los 'patterns' motrices básicos que determinan las actividades espontáneas complejas y cada vez más extensas del niño. Se da importancia a un conocimiento completo de estos 'patterns' motrices básicos para hacer un diagnóstico y para escoger un tratamiento. Se dan ejemplos de algunos métodos de tratamiento.

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