THE PRONE BOARD AND IT'S USE IN THE TREATMENT OF CEREBRAL PALSY

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In the treatment of the cerebral palsied child it is desirable for the child to be treated therapeutically throughout the day. This is achieved by periods of specific therapy and by correct positioning and handling at all other times, for example during dressing, eating, in the classroom and at play.

Fig. 1 Prone Board, Front View.

The Prone Board can be used with the following advantages.

(i) Weight is taken through the legs in a modified standing position, while the legs are well positioned for standing.
(ii) The position of the child on the board is a Reflex Inhibiting posture, i.e. inhibiting adduction, flexion and internal rotation and stimulating extension with abduction and some external rotation of the legs.
(iii) The child who normally relies on his hands for support in the standing position is then able to free them for other activities.
(iv) The inclined plane stimulates more active extension particularly in hips, upper trunk and neck and hence improves head and trunk control and hip extension for independent standing.
(v) It also stimulates mobility and improves function of the shoulder girdle particularly by increasing the incline of the working surfaces.
(vi) It encourages co-contraction particularly round the hip and therefore improves his stability.
(vii) It stimulates symmetry with equal weight bearing and some weight transference can be brought in with activities of the upper extremity.
(viii) It enables the severely handicapped child to experience the upright position when he would otherwise not be able to do so.
(ix) Weight bearing stimulates the development of a well formed hip joint, particularly the shape of the acetabulum and hence reduces the danger of subluxation.
(x) The severely handicapped child who sits in a very flexed position or is in a lying position for the greater part of the day, experiences an enlargement of his visual field. The child is stimulated to be more aware of it's surroundings and is encouraged to interact more readily with it as well. This also plays a part in a more normal perceptual development.
(xi) If the working surface is placed lower than the supportative surface one can encourage weight bearing on the arms.
(xii) Being strapped in gives the child a sense of security in the near upright position in which he might otherwise feel very insecure.

Fig. 2 Spastic Child on Prone Board: can only stand in a flexed, supported standing position; sits in wheelchair all day.

Fig. 3 Spastic Athetoid Child on Prone Board: cannot stand alone due to varying muscle tone; sits in wheelchair all day.

SPECIFIC EFFECTS OF THE PRONE BOARD

(1) Flexion is inhibited and extension is stimulated in the predominantly flexor child.

(2) Increased tone is stimulated in the hypotonic child.

(3) Stability is improved in the dyskynetic child.

(4) Pre-operatively the child can experience the upright posture.

(5) Common problems post operatively are a strong withdrawal reflex which initially the child does not know how to control and fear of involuntary flexor spasm. On the prone board, stimulation of extension and weight bearing help him to overcome these problems. The support of the prone board prevents him from collapsing into flexion and he feels secure and confident.

POSITIONING THE CHILD

(a) The child is laid on the prone board which is placed on the floor. The parts are then adjusted so that the trunk is supported from just below the axilla on the trunk support. The trunk support should be at the highest level.

(b) The knees must lie in the middle of the knee support. The child *must not* sit on the pommel.

(c) The heels must be well against the heel guard with the leather strap holding the foot in position.

(d) The straps are fastened round the child, one across the thorax, one across the buttocks and one across the back of the knees. The most important one being the one across the buttocks. As a progression the thorax and knee strap can be left off and as stability improves still further the buttock strap can be left off.

(e) Once the child is correctly positioned, the board is lifted up to the required supporting surface. The ideal height being that height which allows the child to react in the desired way, for example, the child who needs more head control is placed on a flatter board, whereas in the child where more extension and weight bearing is required and a feeling of the upright position, the board must be placed at a greater angle to the floor, i.e. more vertical. The working surface should be flat and wide enough to allow the child sufficient space to support itself and perform an activity. One can place a tilting working surface over the table rest.

(f) In the classroom the teacher often prefers the child to be more part of the group while standing on the prone board. Hence the use of a special table, enabling the child to face into the classroom.

MATERIALS USED IN MAKING THE PRONE BOARD

(a) The trunk, knee and foot supports are made from a compressed board or Resocore, the trunk and knee supports being covered by 4 cm foam and durohide or durokit.

(b) The base is constructed from solidcore coated with a veneer.

(c) The pommel and heelguards are made from pieces of solidcore glued together to give the required thickness and then shaped accordingly.

(d) The two central pipes are cut from electric conduits 2 cm in outer diameter.

(e) The covering pipes, which are fixed to the back of the trunk and knee supports are cut from water pipes 3 cm in outer diameter. The covering pipe below the footrest is cut half way down into 4 equal parts which are then splayed outwards for attachment to lower surface of the footrest.

(f) The outer pipes are fixed to the back of the trunk and knee support by means of a saddle attachment which can be either bought or made.

(g) The supporting bar is made from a 3/4 cm iron rod. The angle between this bar and the central pipes being determined by the height of the supporting surface.

(h) 10 mm thick guage wire, attached by nylon string to the moveable parts are used as stoppers to maintain position of each moveable part. Holes are drilled through the central pipes.

(i) A nonslip rubber mat is attached to the undersurface of the base.

(j) The central pipes are attached to the base by means of a hinge which consists of 2 pieces of angle iron 10 cm long, with a 6 cm spacer, fixed with a 3/4 cm bolt.

(k) The straps used to hold the child on the prone board can be made from leather or webbing, the latter being more flexible. The leather straps are fixed with a buckle, the webbing with velcro. The buttock strap is 10 cm wide while the thoracic and knee straps are 5 cm wide. Leather straps are used to hold the feet in place.

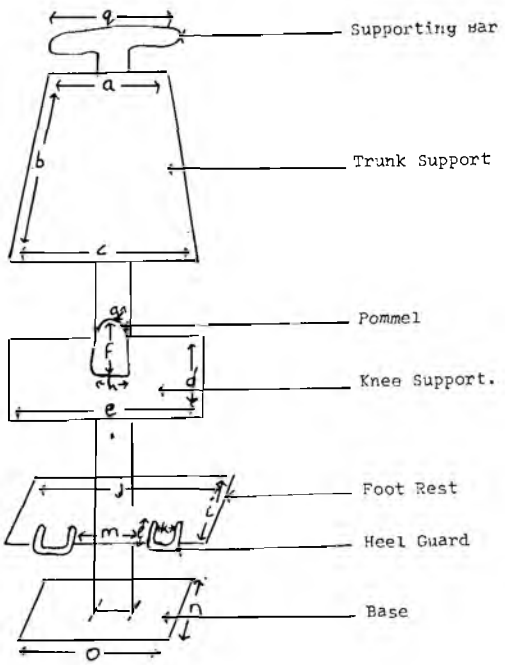

Fig. 4 **Prone Board, Front View.**

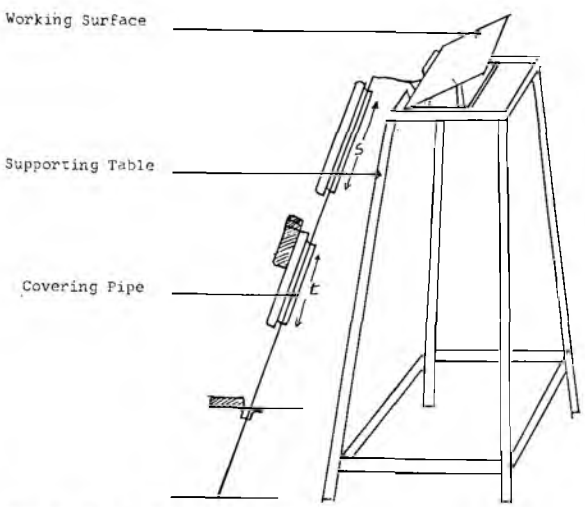

Fig. 5 Prone Board, Side View.

(*See Table for measurements*)

TABLE OF MEASUREMENTS

Part		*B by*	*Medium*
Trunk Support	a	21	22
	b	30	40
	c	29	34
Knee Support	d	20	20
	e	35	35
Pommel	f	13	13
	g	10	10
	h	10	10
Foot Rest	i	23	23
	j	36	36
Ankle Guard	k	8	8
	l	10	10
	m	12	12
Base	n	23	23
	o	31	35
Total Length	p	100	130
Supporting Bar	q	31	31
Covering Pipes (i) Trunk	r	14	38
(ii) Knee	s	19	19
Width Between Bars	t	6	6
Distance Between Holes	u	3	4
Width of Saddle Attachment	v	2	

My thanks and appreciation go to my colleagues in assisting me in writing this article and to Mr. de Meyer who made and adapted the prone boards to our specifications and specific requirements.

SUMMARY

The Prone Board is a piece of apparatus on which a child can be secured in a corrected standing position when this would otherwise not be possible or only with great difficulty for that particular child.

It can be used in conjunction with therapy in Cerebral Palsy, for example in the classroom. It can play a part in the therapy of other Neurological conditions where standing is desirable.

The Prone Board is easily constructed, the parts being readily obtainable and costing approximately R25.00 and requiring 10-12 hours to construct.

OPSOMMING

Die "Prone Board" is 'n stuk apparaat waarop 'n kind vasgemaak kan word in 'n gekorregeurde staan posissie waar toe hy normal weg nie in staat sou wees nie.

Dit kan gebruik word as 'n bykomstige terapeutiese behandeling, by voorbeeld in die klaskamer. Dit kan ook gebruik word in die behandeling van andere Neurologiese toestande waar die pasiënt nie daar toe in staat is om sonder hulp te staan nie.

Die dele vir so 'n "Prone Board" is maklik bekombaar teen 'n koste van omtrent R25 en neem 10-12 ure om aan mekaar te sit.