

## An example the horse-riding position restoring function in comparison with traditional seating.



Figure 16a.

*A woman with Cerebral Palsy unable to sit in a wheelchair without restraint by a waist belt and arms pushed through the sides of her wheelchair. This woman is totally dependent.*

*This woman could not exert this control except in the horse-riding position. She was safe and independent riding alone.*

*In contrast, sitting in a wheelchair or chair would make her quickly go into spasm and lose control of her balance. She is secure and independent in the horse riding position.*

## Quoted extracts from research on seating/balance and its application to cerebral palsy.

Stewart & McQuilton, in their paper 'Straddle Seating For The Cerebral Palsied Child' (Physiotherapy 1987) state in their conclusion:

*'It appears that the centre of gravity of the upper trunk, relative to the sitting base, plays a major part in the mechanics of sitting comfortably in the normal person. In those with Cerebral Palsy it has an even greater effect, particularly in relation to the predominantly reflex pattern of extension and asymmetry.'*

Prior to this, in the same paper, they quote M. Brunswick (*Physiotherapy U.K.*, 1984):

*'...when sitting the centre of gravity for the upper part of the body lies just in front of the 12th Thoracic Vertebrae'*

and say:

*'For comfort, working activities and balance, the centre of gravity needs to be over the supporting base, ie the Ischial Tuberosities'.*

The following quotes are from Dr A.C. Mandal, 'The Seated Man', *Applied Ergonomics* (March 1981):

*'Modern work chairs are constructed in such a way that nobody can use them without excessive loading of the back... The construction of chairs has, so far, mainly been based on tradition and fashion. In future it ought to be based on knowledge of the anatomy of the seated man.'*

*'No child can sit in the upright posture for more than a few minutes, as they can only bend the hip joints to 60°...'*

(The remaining 30° of the movement occurs at the lumbar spine, flattening it. This is a result of the pelvis tilting back to allow hip flexion.)

*'Evidently we have tried to alter the anatomy of the child. It appears more reasonable to alter the chair...'*

*'Without doubt the best sitting posture is obtained on horseback. The hip joints are in the resting position with a bend of 45°. Thus the hip joints and lumbar spine are not loaded in an extreme position and a perfect balanced position is obtained in which the body adjusts its centre of gravity.'*

David France, B.Ed B.Sc, M, Chiro, says:

*'Like no other ergonomic chairs, it places the person in a more favourable posture tilting the pelvis forward with the knees below the hips, maintaining the lumbar curve. Unlike the other chairs, it is exceedingly comfortable, with the feet on the ground, absorbing the weight of the thighs; it is highly manoeuvrable and thus very workplace friendly.'*

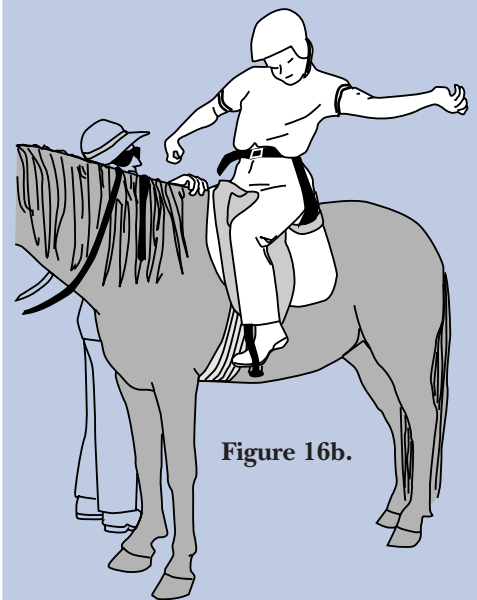


Figure 16b.

*First ride – able to sit on a horse unsupported and ride it, eventually at a trot.*



Figure 16c.

*One year later – able to use the reins by means of an attachment with velcro at the shoulder; the trunk used to guide the horse: trunk rotation for right and left, and trunk extension for stop.*

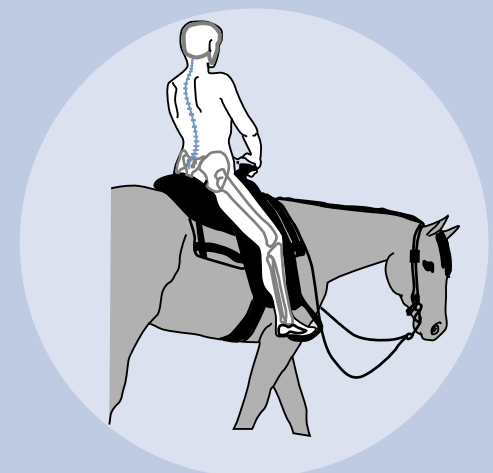


Figure 17.



**THE BAMBACH SADDLE SEAT PTY LTD**

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# The Bambach Saddle Seat and Cerebral Palsy

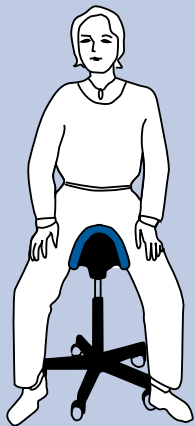
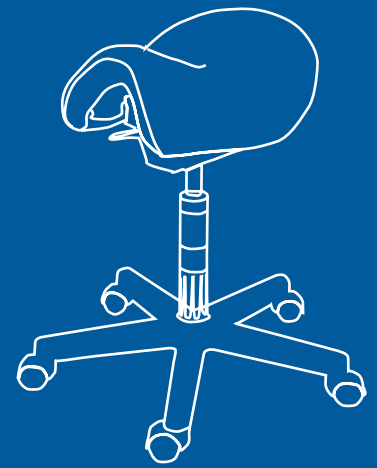


Figure 1.

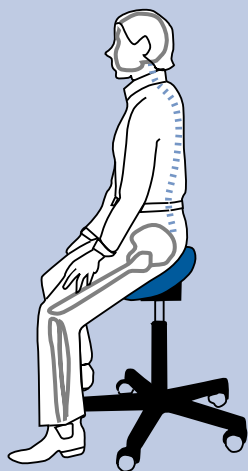


Figure 2.



Figure 3.

## Introduction

People with Cerebral Palsy often have severe motor problems, including poor control of voluntary and involuntary movements. Sufferers have great difficulties with posture, head and limb control; Cerebral Palsy interferes with normal ability to move easily and to maintain posture and balance. All normal activity and social intercourse can be very difficult.

The resulting problems can cause great frustration in the sufferer and may result in his or her social marginalisation.

The Saddle Seat represents a new initiative in transforming the principles of therapeutic practice into a practical seat designed to take best advantage of human body mechanics. The design of the saddle seat helps position the body for good normal posture and, therefore, for best functional ability.

## Balance Symmetry and Weight Bearing

The Saddle Seat offers a wide base of support for the pelvis and a clear midline for the whole body. This makes it easier for the sitter's righting reactions to gain and maintain symmetry.

Midline positioning is facilitated as a result of the design of the Saddle Seat. Once seated, symmetrical body position is more easily gained and maintained.

One-sided neglect is counteracted, as the contour of this seat centres the body, and the astride position maximises sensory input from the affected side. It is easy to work towards putting equal weight through both legs to the feet using plantar contact. Weight taken through the legs and feet encourages proprioceptive feedback.

On the Saddle Seat the pelvis is stabilised in its neutral upright position with the hips abducted in mid position. As a result there is improved ability to centre the head and trunk symmetrically on the spinal column.

## Natural Spinal Position

The upright pelvis is stable and supported in its neutral position on the Saddle Seat. This will encourage the spine towards its natural curves. It will now be much easier for a person to sit and hold an upright symmetrical position. On a Saddle Seat, the anti-gravity muscles are not working against a mechanical disadvantage to sustain the upright position. There is co-activation of posterior musculature with anterior musculature.

## Improved Hand Control for Functional Activities

(Figures 4,5,6,8,14.) Sitting in a flat seat causes the pelvis to tilt back and the spinal curves to reverse, resulting in the flattening of the lumbar and cervical curves. This is a poor posture. Good arm-hand control needs a stable, symmetrical shoulder girdle. Sitting on a flat seat causes the scapula and humerus to rotate forward as a result of the pelvis tilting back which, reverses spinal curves. On a flat seat, not only is the spine in a 'C' curve, but the trunk must lean over the thighs or 'lap' to reach the task. In many sling type seats, pushers and chairs, the position is even worse.

The Saddle Seat improves trunk and shoulder girdle stability as, with the trunk supported in natural balance and the pelvis in the neutral position, the shoulder blades are retracted in the neutral position for best mechanical advantage for forearms and hands.

On the Saddle Seat (Figure 7), the thighs, shoulders and arms are relaxed in a neutral position and fall each side of the body. The seat allows really close access to work surfaces and work tasks. This means that the arms and hands do not have to act at or near the end range of movement, giving more accuracy and power. In addition, eyesight is maximised and the head is closer to the work without bending. Children like to work close to their tasks.



Figure 4.

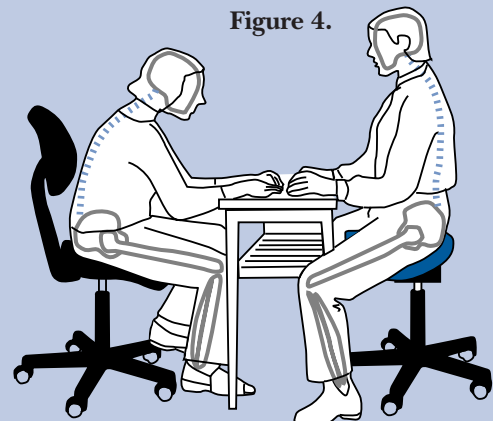


Figure 5.

*Comparing the seated position in a flat seat vs a Saddle Seat in performing activities.*



Figure 6.

*Traditional office seat position.*



Figure 7.

*Saddle Seat Position.*

## Activities of Daily Living

(Figures 9, 10.) Carers, who when showering people, must lift the person to their feet for transfers, find that the Saddle Seat facilitates this activity. The client can come to standing more easily and is in a position from which it is much easier to transfer, putting less stress on the back and body of the carers.



Figure 9.

*Lifting from a flat seat. The carer's back is under great stress.*

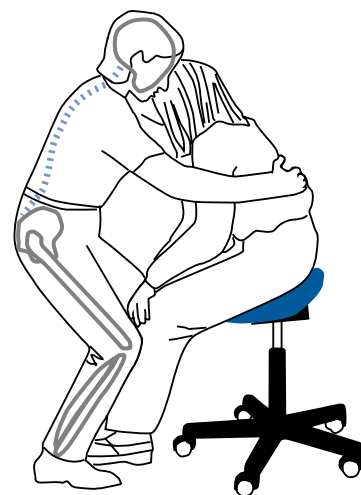


Figure 10.

*Lifting from a Saddle Seat. The carer's back now in a less stressed position*

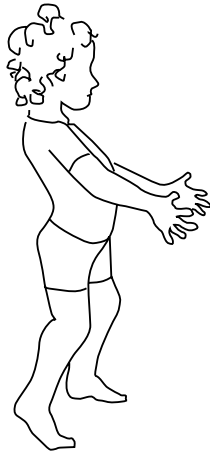
As already described, the position of a person on a Saddle Seat facilitates function of upper and lower limbs so that self-care activities are easier to perform. This is true for many tasks – self care, domestic (eg showering, cooking, dressing, washing up, eating) and other activities such as hobbies (eg playing a musical instrument, craft work) where active use of the limbs and good functional position is desirable.

## Some Examples of Effects of Cerebral Palsy on Human Function



**Figure 11.**

*Example of a spastic, position standing.*



**Figure 12.**

*Example of an athetoid, position standing.*



**Figure 13a.**

*A typical reaction to conventional seating.*



**Figure 13b.**

*A solution, but not ideal for activities.*



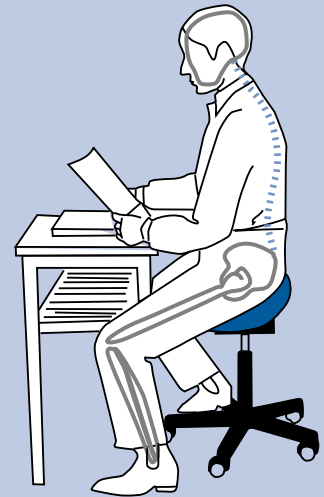
**Figure 14a.**

*If the pelvis is unsupported this is the resulting spinal position.*

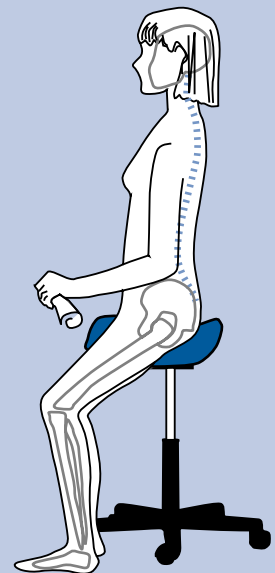


**Figure 14b.**

*An example of roller, or straddle, seat. A better position for activity.*



**Figure 8.**



**Figure 15.**

*The Saddle Seat contour tilts the pelvis forward and stabilises it, thus assisting in maintaining normal spinal curves. A plain roller does not have the contour to stabilise the pelvis.*