



**Strato clinical guidelines  
& user trials**

a new postural correction seat

“strato ● promotes a secure and stable forward leaning functional posture with an extended rather than flexed spine.”

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# principles underlying the design of strato

A Straddle Seating System

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## AIMS OF STRATO SEAT

- 1) To provide a secure stable base
- 2) To promote postural control
- 3) To facilitate functional efficiency

The aims of the Strato are achieved mainly through the contouring of the seat.

## PRINCIPLES OF DESIGN

- 1) The pelvis is the 'keystone' of the body structure and determines the posture above and below it.
- 2) The pelvis in sitting is unstable and relies on muscular activity to control position. External control must be provided where internal control is inadequate.
- 3) Extension of the upper trunk, shoulder girdle and head is dependent upon pelvic stability, orientation and the existence of a lumbar curve, the latter itself being dependent upon the position of the pelvis (Pope 1985; Zacharkow 1988).
- 4) Stability of posture is essential for functional efficiency.

### ► The straddle seat

The seat is contoured to provide a wide base of support; to promote midline position of the pelvis and to support the thighs. The straddle abducts the thighs and controls pelvic rotation. Stability of base position is achieved without recourse to straps, knee blocks etc.

### ► The back prompt

The back prompt is not a support but acts as a 'prompt' to help maintain pelvic position.

### ► The armrests

These are provided mainly to assist in transfer into and out of the system.

### ► The footplate

The footplate is optional where support other than the floor is required.

### ► Adjustable seat height

Facilitates use with different working surfaces and occupant's needs.

# guidelines for the prescription of the strato seat

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These are general guidelines and must not be rigidly applied. Conditions and circumstances may alter cases. Prescription must be considered on an individual basis, not only in relation to postural needs but also taking account other factors such as social, environmental and psychological constraints.

## GENERAL SUITABILITY

The system is designed for the child with:

- 1) weakness or motor malfunction of the lower limbs or trunk for example in hemiplegia, diplegia or other forms of paraplegia;
- 2) some postural control of the head and upper trunk;
- 3) sufficient abduction at the hip joint;
- 4) in any situation where an erect posture and functional efficiency is being encouraged, for example, in the mainstream classroom.

## CONTRA-INDICATIONS

- 1) Established contractures around the hip joint that preclude attainment of a straddle position.
- 2) Established significant kypho/scoliosis (in most cases).
- 3) Insufficient postural control of upper trunk and head.
- 4) Subluxation/dislocation of the hip joint in some cases where the joint range is severely compromised. In cases where hip joint location is at risk the configuration of the pelvis and lower limbs imposed by use of the Strato will encourage normal alignment and development.

## FITTING AND ADJUSTING THE STRATO

- 1) There are 5 sizes of the Strato seat. It is essential that the correct size is chosen and that the adjustments are made according to the individual child's needs.
- 2) The hip width should fit within the contours of the seat.
- 3) Abduction at the hip joint must be sufficient to accommodate the pommel.
- 4) The thighs should be fully supported.
- 5) The seat to foot support/floor height should be adjusted to ensure adequate support for the feet.
- 6) Select seat incline to suit individual needs with respect to midline pelvic position and stability.
- 7) Adjust work surface height to correspond with seat if necessary.

# user trials - case study 1

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## BACKGROUND

Case 1 is a 5 year old female with Diplegic Cerebral Palsy. She is a pupil at a Special School in the South West of England.

Prior to the trial, a Box Stool with Dycem top was used for general and task sitting.

Due to sensory issues, the hard surface of the Box Stool was difficult to tolerate. Pelvic stability was needed for 1) engagement in classroom tasks, 2) to facilitate reaching out from base of support as well as 3) to work towards independent transfers. It was anticipated that a slight forward leaning position would improve the spine profile, pelvic position and hand function.

## TRIAL SET-UP AND DURATION

A size 2 Strato was used for the trial. The seat was set at 0° angle that is, no degree of seat angle was required.

The trial took place over 6 days (3 days each week) for an average of 3.5 hours per day.

## TRIAL RESULTS

### Comparative Lateral Views:

Fig 1.



Sitting on Box Stool with tilted posterior pelvis and flexed spine. Thighs adducted to stabilise.

Fig 2.



Sitting in Strato with thighs abducted, feet firmly supported, upper trunk balanced and extended, arms relaxed.

**Comparative Anterior Views:**

Fig 3.



Sitting on Box Stool with thighs adducted, thus reducing base area.

Fig 4.



Strato gives a wide and secure base of support resulting in a relaxed and balanced posture.

**Comparative Posterior Views:**

Fig 5.



Sitting on Box Stool with an asymmetrical spine.

Fig 6.



Sitting in Strato with a more symmetrical spine.

# trial feedback (supervising therapist response)

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Below are the supervising therapist's responses noted on completion of the trial:

**Q. On a scale of excellent to poor, how would you rate the Strato in the following categories:** (Please tick relevant box)

**A. Appearance**

Excellent  Good  Fair  Poor

**B. Choice of adjustments**

Excellent  Good  Fair  Poor

**C. Ease of adjustment**

Excellent  Good  Fair  Poor

**D. Manoeuvrability**

Excellent  Good  Fair  Poor

**E. Overall ease of use**

Excellent  Good  Fair  Poor

**F. Ease of transfer**

Excellent  Good  Fair  Poor

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**Q.** What are your overall thoughts on the colour of the chair?

**A.** Everyone likes the green.

**Q.** Please state what you most like about the Strato.

**A.** Class staff liked its modern appearance. Therapist staff liked the range of adjustability, angle of lap strap and the functional posture the Strato gave.

## user trials - case study 2

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### BACKGROUND

Case 2 is a 7 year old male with Cerebral Palsy. He is a pupil at a Mainstream School in the South West of England.

Prior to the trial, an activity chair was used for general and task sitting.

A seat was required that maintained pelvic stability whilst encouraging a slight forward lean to promote a more dynamic posture. This enabled us to work towards independent transfers both on and off the seat. A chair that was more acceptable in appearance to integrate in the classroom was also required. The chair ideally should also be easily manoeuvrable for classroom staff.

### TRIAL SET-UP AND DURATION

A size 3 Strato was used for the trial. The seat was set at a 10° angle inclined forwards.

The trial took place for 7 days (over the duration of a fortnight) for an average of 1.5 hours per day. It was noted that the trial took place during Literacy and Maths classes.

### TRIAL RESULTS

#### Comparative Lateral Views:

Fig 7.



Flexed spine with neck extended. The vertical backrest prevents extension and balance of upper trunk over the pelvis.

Fig 8.



Strato facilitates an extended and balanced posture over base of support.

**Comparative Anterior Views:**

Fig 9.



Sitting with trunk flexed leaning on the armrest for additional stability.

Fig 10.



Strato gives a wide and stable base of support which facilitates extension of the trunk.

**Comparative Posterior Views:**

Fig 11.



Both head and trunk are flexed forward.

Fig 12.



Overall posture more erect. Head and trunk extended and well balanced.

## trial feedback (carer response)

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Below are the carer's responses noted on completion of the trial:

**Q.** On a scale of excellent to poor, how would you rate the Strato in the following categories: (Please tick relevant box)

**A.** Appearance

Excellent  Good  Fair  Poor

**B.** Choice of adjustments

Excellent  Good  Fair  Poor

**C.** Ease of adjustment

Excellent  Good  Fair  Poor

**D.** Manoeuvrability

Excellent  Good  Fair  Poor

**E.** Overall ease of use

Excellent  Good  Fair  Poor

**F.** Ease of transfer

Excellent  Good  Fair  Poor

---

**Q.** What are your overall thoughts on the colour of the chair?

**A.** Happy with the black.

**Q.** Please state what you most like about the Strato.

**A.** Castors give easy manoeuvrability. The seat is comfortable.

## user trials - case study 3

### BACKGROUND

Case 3 is an 11 year old male with Quadriplegic Cerebral Palsy. He is a pupil at a Mainstream School in the South West of England.

Prior to the trial, a Smirthwaite Mayfield was used. This chair was found not to be appropriate because the flat back and seat did not provide support where required. This resulted in a posteriorly tilted pelvis, kyphosis and chin poke.

The child has underlying low tone in his trunk; the left side more affected than the right. He has increased tone in his limbs; his left side slightly more affected than his right. He fatigues very quickly at times particularly in the afternoons which impacted on his school work - attention and interaction. His posture when tired resulted in a left side collapse in his trunk and an increase in his distal tone and hand shake, causing problems with some functional tasks.

### TRIAL SET-UP AND DURATION

A size 3 Strato was used for the trial. The seat was set at a 10° angle inclined forwards.

The trial took place over 14 days for an average of 5 hours per day.

### TRIAL RESULTS

#### Comparative Lateral Views: (first time in Strato Chair)

Fig 13.



Vertical backrest pushes trunk forward resulting in flexed spine. Head not balanced over trunk. Note chin poke. Overall, this requires more effort for child to sit erect.

Fig 14.



Using Strato the upper trunk and head is extended and balanced over the pelvis and base of support. The result is a relaxed posture. Note no chin poke.

**Comparative Anterior Views:**

Fig 15.



Vertical backrest pushes trunk forward. Note chin poke. Flexed trunk, thighs adducted and arms used to prop.

Fig 16.



Using Strato thighs abducted giving a wide base of support resulting in an erect and balanced posture.

**Comparative Lateral Views (after 15 minutes):**

Fig 17.



After 15 mins, trunk is rolling forward. Pelvis now tilted into posterior position. Feet moved forward to gain stability. Note chin poke accentuated.

Fig 18.



After 15 mins, spine remains aligned, extended and relaxed. Head is balanced over trunk and hands are also relaxed. Feet firmly planted. Note no chin poke.

**Comparative Lateral Views (in situ):**

Fig 19.



Head and upper trunk flexed. Armrest required as a 'prop' therefore reducing discrete function of the arms.

Fig 20.



Using Strato trunk is extended and balanced over the base of support, facilitating functional use of the arms.

**Lateral View (in situ after 15 minutes):**

Fig 21.



Base stability provided by Strato facilitates discrete movement of trunk, head and upper limbs.

# trial feedback (supervising therapist response)

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Below are the supervising therapist's responses noted on completion of the trial:

**Q. On a scale of excellent to poor, how would you rate the Strato in the following categories:**

**A. Appearance** (please tick box)

Excellent       Good       Fair       Poor

**B. Choice of adjustments** (please tick box)

Excellent       Good       Fair       Poor

**C. Ease of adjustment** (please tick box)

Excellent       Good       Fair       Poor

**D. Manoeuvrability** (please tick box)

Excellent       Good       Fair       Poor

**E. Overall ease of use** (please tick box)

Excellent       Good       Fair       Poor

**F. Ease of transfer** (please tick box)

Excellent       Good       Fair       Poor

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**Q.** What are your overall thoughts on the colour of the chair?

**A.** Black is great as it blends in well with other chairs - much less conspicuous.

**Q.** Please state what you most like about the Strato.

**A.** Lightweight, manoeuvrable, subtle in style, effective for posture, easily adjustable.

## OVERALL SUPERVISING THERAPIST SUMMARY

Strato gives good pelvic and trunk stability and alignment. This was maintained throughout the trial. Mobility of trunk is also good and maintained. The chair looks good, is easy to set-up and is smaller and easier to manoeuvre than his previous chair.

## trial feedback (user response)

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Below are the user's responses noted on completion of the trial:

**Q. On a scale of excellent to poor, how would you rate the Strato in the following categories:**

**A. Looks/appearance (please tick box)**

Excellent       Good       Fair       Poor

**B. How easy it is to use (please tick box)**

Excellent       Good       Fair       Poor

**C. Comfort (please tick box)**

Excellent       Good       Fair       Poor

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**Q. What do you think your classmates thought about the Strato?**

**A. They think it's cool and stylish.**

**Q. What do you most like about the Strato?**

**A. I think it is excellent across the board.**



## user trials - case study 4

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### BACKGROUND

Case 4 is a 14 year old female with Quadriplegic Cerebral Palsy with high tone. She is a pupil at a Special School in the South West of England.

Prior to trial a Bolster chair was used following an adduction tenotomy operation, this was part of her therapy programme. The Bolster chair was used to maintain her legs in abduction whilst seated. She also used a wheelchair for mobility but it was over supportive.

The Strato was initially used with a view to improving her sitting balance and postural strength, whilst placing her in a position to maximise functional ability and access the curriculum.

### TRIAL SET-UP AND DURATION

A size 4 Strato was used for the trial. The seat was set at a 10° angle inclined forwards.

### TRIAL RESULTS

#### Lateral View:

Fig 22.



In Strato, sitting with an extended head and trunk, balanced over the pelvis and base of support.

#### Anterior View:

Fig 23.



In Strato, thighs abducted and seat well supported giving a stable base of support. This facilitates discrete movement of head, upper trunk and arms.

### Posterior View:

Fig 24.



In Strato, showing an erect posture and symmetrical alignment.

### OVERALL SUPERVISING THERAPIST SUMMARY

The chair places the child in a well aligned position with her feet firmly on the footplate, legs kept apart, pelvis in anterior tilt and spine maintaining its natural curves. This is a very functional position for her and enables improved upper limb function and a good head position for education, communication and interaction.

Due to the minimal support provided by the chair, the child is required to recruit postural muscles in order to maintain her position. This ensures that she is an active participant in the task being carried out, rather than relying on the support that a wheelchair provides.

## summary

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For these four children it would appear that the Strato was beneficial and helped to achieve a better posture throughout the duration of the trial.

## acknowledgements

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Thank you to Vranth House School and Centre, Exeter and Dame Hannah Rogers School, Ivybridge for taking part in these trials. Thank you to Pauline Pope, Consultant Physiotherapist, for input and development of trial guidelines. Thank you also to therapists, staff and parents of the children for their assistance and kind permissions.



“For our children, we look for products that will have great clinical benefits for the management of their posture. We also need products that provide comfort for their bodies and focus for their mind.”

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