



Featuring  
Clinical research  
Modular  
Adaptive  
Dynamic  
Seating



## What is x:panda?

X:panda is a highly adaptable modular seating system that can be configured to meet a range of postural requirements and to accommodate growth.

It is available in 4 sizes and is best suited for babies from 5 months old through to young adults with CP at GMFCS level 3- 5, who present with strong extensor spasticity, asymmetry or developmental delays. It can help children who might typically have pelvic asymmetry, hip migration or tight hamstrings.

All sizes are available with individual growth in width, depth and back height. This extends the life of the seat and accommodates the greatest range of sizes in

comparison to other chairs on the market. The x:panda features patented recline adjustment, tilt in space to 30° and a dynamic back with gas springs that can be set to control range of movement or can be locked. The seat offers optimum support and comfort for the child and can be mounted on a number of bases.

This interactive workbook takes a detailed look at the x:panda including pelvic stability, understanding dynamic seating, maintaining pelvic positioning during transfers and accessories.



High-Low base



Stingray base



Strong base

See how easy it is to change bases



## Pelvic Stability

The pelvis is the foundation for a stable seating posture. A poorly controlled pelvis can lead to instability, asymmetry and impaired function.

### Contoured Seating

Correctly prescribed seat wedges are used in the x:panda seat to create a contoured seating surface. Without support the pelvis will naturally rock backwards as the child seeks stability. The most effective way to achieve optimal functional use of the arms and hands is with the pelvis supported as near to midline as possible and secured with the spine in neutral alignment.

Watch our video to find out how the wedges help to achieve this.



### 4 Point Hip Belt

The 4-Point Padded Hip Belt attaches to the seat in 4 of the multiple fixing points via snap locks. This maintains the pelvis in an aligned and stable position within the seat pocket that is created by the wedge or pre ischial bar as it's commonly described.

### Patented articulation of the back rest

X:panda was developed with particular attention to the articulation of the backrest relative to the seat. The goal being to create a seating system that moves in harmony with the body. When the back rest pivots correctly in alignment with the hip, the user will experience zero shear in the back rest.



Learn more about the patented articulation of the backrest.



See how the x:panda can be adjusted for seating in abduction.

### Abducted Seating

The x:panda is designed with individually adjustable leg channels that enable the seat to be triangulated and offer an improved base of support. The inner and outer knee guides provide additional support for maintaining the required degree of abduction/adduction.

## Breathing and Upright Posture

Mary Massery used a soda-pop can model of postural support to explain the interactions between posture, postural control and breathing and the importance of this when designing wheelchairs and seating systems.

Breathing and Upright Posture:  
Simultaneous Needs, Mary Massery



# Understanding Dynamic Clinical Support for Dynamic

## What is a “dynamic” back and why is it so important?

A back support typically provides stability. A dynamic back allows movement by absorbing the force and flex of the user (D D Freney & K Swartz).

It can address issues that are related to abnormal movement patterns. Benefits include a reduction in the intensity of non voluntary movement, improved tolerance to seating, pain reduction and reduction in potential skin breakdown. Overall it enables optimum positioning within the seat and enhances stability, symmetry and function. (Dr Tim Adlam)

## Why the x:panda dynamic back?

The dynamic back of the x:panda absorbs the energy driven by the child's extensor pattern of movement. It returns them back to their original upright posture without compromising the pelvis and while maintaining a midline symmetrical position.

Gail Russell, (OT) MSc, BSc, Clinical Consultant to R82 explaining the dynamic back.

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### Extensor Thrust

Children experiencing involuntary extensor thrust are able to exert very large forces on the seatback, headrest and footrest that can lead to significant skin breakdown even if the seat is well padded.

During these involuntary movements, children have difficulty in postural maintenance mainly due to destabilisation of the hip joint and most have the same difficulty in replacing the pelvis to its original position. A dynamic seat was suggested as a potential solution to provide greater freedom and safety.

A study by Seong-Wook Hong et al provided invaluable information for the design of dynamic seats for people with high extensor thrust.

A method for identifying human generated forces during an extensor thrust,  
Seong-Wook Hong et al

### Pressure and Shear

The articulation point for the x:panda is very close to the child's hip pivot point. This will ensure the head support and side supports remain in the correct position when the child gets a spasm and pushes the dynamic back backwards, preventing shear.



See the dynamic back in action

# Dynamic Seating

## Back v Rigid Back System



### Dynamic v Rigid back system

Research by Fumagalli compared a dynamic with a rigid seat system in dystonic patients with Cerebral Palsy using quantitative analysis of movement (3D kinetics and pressure distribution).

It found that adding dynamic components addressed some of the issues related to abnormal movement patterns.

The dynamic seat was able to reduce the

forces experienced by the users on the seatback and increased the range of motion in the anterior-posterior direction, enabling the upper body to rotate back and then go backward to the starting position and limiting the rolling down of the trunk.

Dynamic vs Rigid Seat System  
in Cerebral Palsy: Quantitative  
Comparison. Fumagalli

### Case Study

Taylor Miller, has Cerebral Palsy and Chronic Lung Disease. His muscle tone fluctuates and he has no independent sitting balance. His OT recommended a bespoke R82 x:panda to achieve a correctly aligned seating position.

Taylor has a tendency to push backward as part of a high tone extensor pattern, therefore the dynamic nature of the x:panda backrest is critical. Its ability to maintain pelvic position and support the spine in neutral alignment, means he can extend against relatively light resistance and return to his desired seating position without disrupting his pelvis and overall seating posture.

Taylor's mother had found it difficult to position Taylor with his high tone but the x:panda tilt and recline function, specially designed to articulate round the hip, allows him to be positioned more easily with the help of gravity. The lateral and head



in exactly the same position without any shear effect.

Following regular use of his x:panda, Taylor has shown increased core stability and control, improved breathing and has been discharged from his chest consultant.

[Read the full case study](#)



## Maintaining Pelvic Position during Transfer



### Managing Extension during transfer

When hoisting, our Molift 4-point spreader bars are used with Molift RgoSlings. They have unique sliding loops in the shoulder straps balancing weight at every stage of the lift so no external angle adjustment is necessary. These sliding loops also allow a child to extend and then return to their original position. The clever design of the leg parts distributes weight and pressure evenly for increased comfort.

The 4-point spreader bar opens out the sling for increased comfort making it easier to lift from the floor or a lying position and vice versa. The 4-point spreader bar is positioned well away from the child's head to ensure there is no risk of injury during involuntary movements.

See the 4-point spreader bar and sliding loops in action.

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### How to control the degree of recline?

The degree of recline can be controlled by adjusting the leg supports on the sling to give an upright or angled position.



See Warwick being transferred from his Stingray wheelchair to his x:panda using the Molift Smart hoist.

## Head, Shoulders, Knees and Toes....

A range of accessories are available to ensure the child achieves the best sitting position

### Head Support



Head supports maintain optimum head position and provide support in resting or active positions. Dynamic headrests absorb energy from extension. Alternatives from other manufacturers can be used with x:panda.

### Thoracic Support



A range of fixed or swing-away side supports are available to suit the size and postural needs of the child. Additional padding is available in most sizes. All supports are compatible with vests & harnesses from the R82 range.

### Neoprene Harness



Our neoprene harness ensures a comfortable, safe and correct sitting position. The flexibility of this light grade neoprene, used in conjunction with a tray allows rotation and re-rotation of the shoulders to allow hands to come to midline for improved function.

### Foot Supports



As well as a single foot plate, individual foot plates can be used to accommodate differing leg lengths or to manage foot position when the child is sitting in abduction. These foot supports are angle and height adjustable.

## Have a look at our “Find out how” videos!

Adjusting back height and backrest

Adjusting seat depth

## Getting the most from your assessments

For the physical assessment, the following needs to be undertaken:-

### Assessment in current seating

- symmetry, loading, function, movement and comfort
- is the current seating driving asymmetry?

### Assessment in supine

- flexibility of pelvis/trunk, ROM, symmetry, loading
- consider habitual lying posture (body shape distortion)

### Assessment in sitting on box/plinth

- what needs correcting/accommodating?
- amount of external support
- will the proposed seating complement other interventions?



### Main seating measurements to consider

- Range of hip flexion
- Range of knee extension with hip flexed
- Ab/adduction with hips flexed at 90 degrees
- Spinal profile - kyphotic, scoliotic etc

Gail Russell, (OT), MSc, BSc, Clinical Consultant to R82 UK



## How do I book a visit with my local Business Development Representative?

Contact us with the following details or click right to complete our online contact form.

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