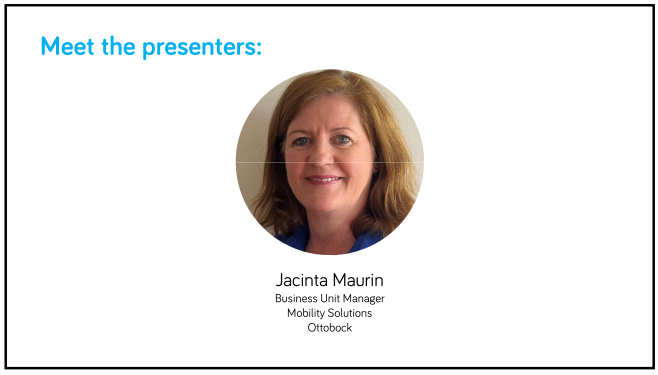
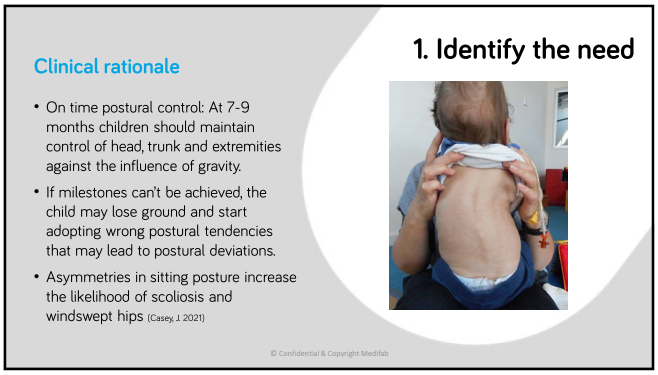
Power Mobility Buggies and Strollers





Power Mobility Buggies and Strollers

Identification

Seminal Paper: Fulford and Brown 1970's

- Changes to body shape and posture are linked more with the limited function of mobility than with the condition itself.
- The concern of these changes are non condition specific
- "...deformities are **caused by the effect of gravity on an immobile child**, rather than spasticity or muscle imbalance"

Postural asymmetries, pain, and ability to change position of children with cerebral palsy in sitting and in supine: a cross-sectional study.

(Casey, J., Rosenblad, S., & Rodby-Bousquet, E., 2020)

Sample: 2735 children (1628 ♂ and 1107 ♀) with CP; 0-18 yo; I-V GMFCS

Findings:
- 60.2% had postural asymmetries in **sitting**; 53% in **supine** and 39.2% reported **pain**
- Postural asymmetries increased as **age** increased, and **gross motor function** decreased
- Children **unable to change position** were twice as likely to have **postural asymmetries**
- Children with **severe postural asymmetries** were twice as likely to have **pain**

Relationship between scoliosis, windswept hips and contractures with pain and asymmetries in sitting and supine in 2450 children with CP

(Casey, J., Agustsson, A., Rosenblad, A., & Rodby-Bousquet, E., 2021)

Sample: 2450 children with CP; 0-18 yo; I-V GMFCS. PPAS used to assess supine lying and sitting posture in the frontal and sagittal plane

Findings:
- Postural asymmetries are **strongly associated** with occurrence of fixed changes and contracture of the spine, hips and knees
- **Asymmetries in sitting** posture increased the likelihood of **scoliosis and windswept hips**
- **Asymmetries in supine** posture increased the likelihood of **windswept hips, hip flexion contracture and knee flexion contracture**

Relationship between scoliosis, windswept hips and contractures with pain and asymmetries in sitting and supine in 2450 children with CP

(Casey, J., Agustsson, A., Rosenblad, A., & Rodby-Bousquet, E., 2021)

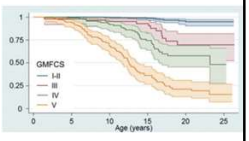
Recommendations:
- Interventions should **target prevention and reduction** of postural asymmetry to reduce risk of future fixed changes and contractures with associated pain
- Necessary to **focus on careful postural alignment** and symmetrical positioning, especially if the child is unable to change position
- Possibility that fixed changes become established early in life reinforces the **importance of regular surveillance** to monitor posture and ROM to provide early intervention
- Interventions should be directed at postural asymmetries **whilst they are still reducible** to inhibit the development of fixed changes
- Reduce the time spent in asymmetric postures through the **provision of appropriate supports** such as individually tailored seating systems and finding non-harmful and comfortable sleeping positions to reduce stress and strain on tissues.

Incidence of Scoliosis in CP

(Hägglund, G., Pettersson, K., Czuba, T., Persson-Bunke, M., & Rodby-Bousquet, E., 2018)

Sample: 962 children with CP; 0-25 yo; I-V GMFCS

Findings:
- Incidence of scoliosis **increased with age and GMFCS level**
- Scoliosis occurs at **younger ages** in individuals classified at **higher GMFCS levels**
- **10/131 children** GMFCS V had scoliosis **before the age of 5**



Early Identification

- Asymmetry seen in small children 0-3 – Early intervention
  - Increases with age and with GMFCS level
- Optimise protection and prevention, lets be proactive!
- Maintenance should be seen as a positive outcome
- CP Consensus Statement:
  - Postural care intervention can be guided by GMFCS level
  - 24-hour postural care recommended for level IV and V with a focus on prevention

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Early Intervention for Children Aged 0 to 2 Years With or at High Risk of Cerebral Palsy: International Clinical Practice Guideline Based on Systematic Reviews

(Morgan, C., et al 2021)

Recommendation 1

- Intervention at the time of suspected diagnosis to harness neuroplasticity through specific training and recommend against waiting and seeing because the critical window for neuromuscular plasticity is missed

Recommendation 5

- Targeted cognitive interventions, because motor impairment hampers social interactions and exploration of the environment and toys, restricting discovery-based learning,
- Can include; social interaction with people and objects, multimodal learning (cognitive, language, and motor), challenging tasks with incremented complexity, parent participation and best-practice early-years enrichment (eg, adequate nutrition, interactive, child-led learning)

When to start?

- Peak of Neuroplasticity is around 2 years of age (Dr Andrea Guzzetta)
- Children in GMFCS groups IV-V should start 24-hour postural management programmes in lying as soon as appropriate after birth, in sitting from 6 months, and in standing from 12 months. (Tina Gericke 2008)
- GMFCS level III children still require support for sitting at 2 years old
  - Demands for these children to sit independently at this age will likely reduce ability to concentrate or attend to cognitive, language and social related tasks in sitting
- Individualised seating 3-6 months (Ginny Paleg & Roslyn Livingstone 2022)
  - Start at 3 months
  - 45 tilt recline with tray and toys
  - Work towards upright by 6 months

Recommended Age of Intervention

Age in months	1-3	3-6	9	12	18	24	36	48	60	72
Postural management in lying										
Individualised Seating										
Supported Standing										
Stepping devices										
Power Mobility										
Bathing/ Toileting										
Lift Systems										

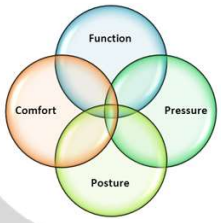
Evidence-informed clinical perspectives on postural management for hip health in children and adults with non-ambulant cerebral palsy. Paleg, G & Livingstone, R. 2022

2. Set up realistic goals

Individual and client-centered goals

The four interrelated ***goals*** in seating are:

- Functional capability,
- Pressure management,
- Postural support,
- Client comfort.

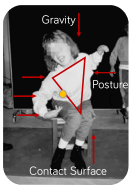


Source: www.aci.health.nsw.gov.au

Pelvis is KEY!

A stable pelvis is key to hold the body against the gravity.

An unstable pelvic position will require spinal compensations to maximise balance, stability and function - secondary complications will inevitably arise.



Pope, P. (2007)

Positioning for Children GMFCS Levels IV-V: focus on hip health

Sunny Hill Health Centre for Children 2014

0-2 Years

Adapt commercially available baby highchairs, strollers, and/or use positioning equipment such as floor sitters or small seats.

INFANTS IN SITTING: Introduce around 5 months as per the infant's tolerance. Gradually bring to more upright position to encourage head control.

SUPPORTS: Lateral at the pelvis, trunk and head. Shape pommels and/or seating system to encourage hip abduction and external rotation and aligned foot position.

HIP POSITION: Aim for **hip abduction 15-30° [3]** as tolerated and hip external rotation 5-15°.

DOSAGE: Use daily as per the infant's tolerance.

2-6 Years

Continue with sitting equipment. Use positioning equipment such as small seats on tilt or wheeled bases. Gradually bring to more upright position to encourage head control or as head control develops.

SUPPORTS: At the head, trunk, pelvis, thighs and feet. Shape pommels and/or seating system to encourage hip abduction and external rotation and aligned foot position.

HIP POSITION: Aim for **hip abduction 15-30° [3]** as tolerated and hip external rotation 5-10°.

DOSAGE: As required for feeding, fine motor activities, interaction and mobility. **Up to 6 hours per day [2].**

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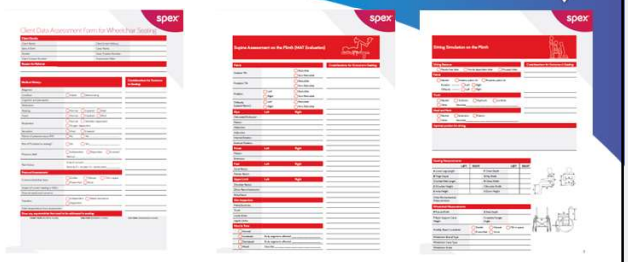
Comprehensive assessment

3. Identify individual needs

1. Identify the problem
2. Identify the cause
3. Identify flexibility
4. Determine optimal posture related to client's goals
5. Translate findings into product solutions

Seating Assessment Form



4. Intervention Plan

Goal

- What is the functional goal?
  - Community/environmental access
  - Comfort/relaxation
  - Toileting
  - Activity/play/learning
  - Vehicle transportation

Support

- Match device type to functional goal
- Identify configuration and components required based on individual needs
- Educate caregivers and parents on use

Buggies offer a primary mobility solution for children where a wheelchair might not yet be acceptable or appropriate in a families life

Benefits

Provide a gentle introduction to postural care

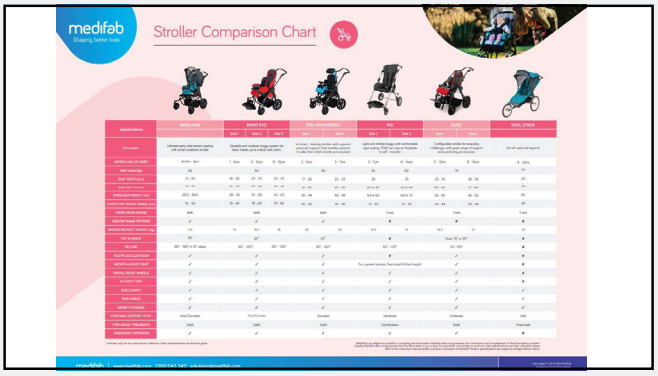
Provide a similar experience to that of friends and community

Transport can often be easier when using a car seat

Easy to prescribe and order

Appearance is highlighted as one of the top barriers to families accessing 24-hour postural care

Power Mobility Buggies and Strollers



Power Mobility Buggies and Strollers

Bingo Spex

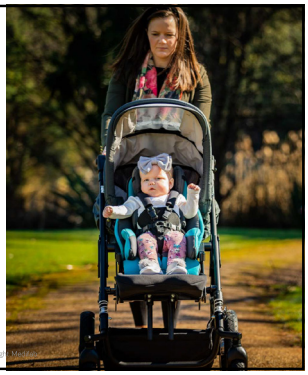
- Spex seating technology on a stroller base
- Supports moderate to complex postural care needs
- Superior hip positioning
- Tilt in space, back support recline, leg support elevation
- Foldable stroller base and adjustable suspension
- 2 sizes
  1. 1-5 years
  2. 3-7 years

Bingo Spex

Bingo Spex

Bingo Mini

- Posturally supportive stroller for the smallest of clients
- Tilt in space, seat recline, leg extension
- Foldable stroller base with adjustable suspension
  - Mobility and indoor base can be upgraded to accommodate Bingo evo or Bingo spex size 1
- 4 months – 4 years
- Mild-moderate level postural support



Duro

- Robust stroller for children with transport needs and challenging behaviour
- Mild to Moderate Postural Support
- 2 Fixed tilt angles
- Unique frame design
  - Robust folding mechanism
- 2 sizes (75kg)
  1. 3-12 years
  2. 8-15 years

Power Mobility Buggies and Strollers