

LECKEY[®]

KNOW

HOW



- Clinical Set-Up
- Specific Presentations
- Progressing Skills
- Motivation / Participation
- Research and Evidence

 **MyWay**

MyWay is an upright mobility device that supports children, who cannot stand or walk independently. When supported in the product, the wheeled frame allows children to propel themselves about their environment using their lower limbs.





Clinical Set-up / Checklist

Name:

Date of Assessment:

Physiotherapist:

Leckey Product Specialist:

“ Remember to match the product to the child, not the child to the product ”

CHECKLIST			Done	
Check child/parent/therapist aspirations for walker				
Check contra-indications and precautions (User Instructions)				
OBSERVE (Background information from therapist)	Functional mobility (GMFCS level)			
	Hoisting used for transfers?			
	Tone: Type, severity and distribution			
	Understanding and motivation to move			
	Problems with the existing walking system			
	Spinal deformity: Fixed/correctable?			
	All four limbs: the extent of any fixed deformities			
	All four limbs: use of normal/abnormal active movement			
	Appliances: ankle splints (AFOs), spinal brace, lycra suit.			
MEASURE			MEASUREMENT	
	Height from shoulder to foot (cm)			
	Inner leg length (cm)			
	Waist, at navel level (cm)			
SET-UP			SIZE / MEASUREMENT	
	Harness size (see table on next page)			
	Frame size (see table on next page)			
	Frame height (saddle attachment/saddle height to the user's inside leg measurement)			
			ACCESSORIES REQUIRED	
	ACCESSORIES	Saddle		
		Head support		
		User handles: may be better after child is attached to frame		
		Ankle guides		
		Adult handles		
Adult connection belt				
POSITION	Harness on: wrap, groin straps, tighten			
	Transfer to frame: standing/hoist			
	Attach harness to frame (white and red buckles)			
ADJUST	Shoulder height and straps (grey buckles)			
	Ankle guides			
	Prone angle			
	Fine height adjustment upwards			
	Castor setting for direction and resistance			



Clinical Set-up / Checklist

Harness Size	Age (approx)	Description	Waist at navel level (mm)	Colour
1	1-4	Infant	460-560	Purple
2	2-6	Toddler	500-600	Green
3	5-9	Small	550-650	Blue
4	8-12	Medium	600-700	Red
5	12-15	Large	700-800	Orange
6	16-18	Teen	800-900	Grey

Frame Size	Age (approx)	Shoulder to floor height (mm)	Inside leg/saddle height (mm)	Maximum user weight (kg)
1	1-5	635-920	220-440	25
2	4-11	870-1190	400-610	50
3	9-16	1070-1490	550-810	80

Contra-indications/Cautions

Contra-indications

- Children with significant leg length discrepancy which precludes from reciprocal contact with the floor when stepping.
- Children with a history of frequent fractures (e.g. Brittle Bone disease).
- Children using a portable ventilator.
- Open/healing wounds under areas of pressure including trunk, groin and shoulders.
- Spina Bifida with protruding lesion along spine.
- Children experiencing discomfort associated with positioning in or out of the device where this cannot be resolved with adjustment of support/positioning.

- Children with significant asymmetry of lower limbs which precludes stepping.
- Children with no muscle activity/ movement of their lower limbs.

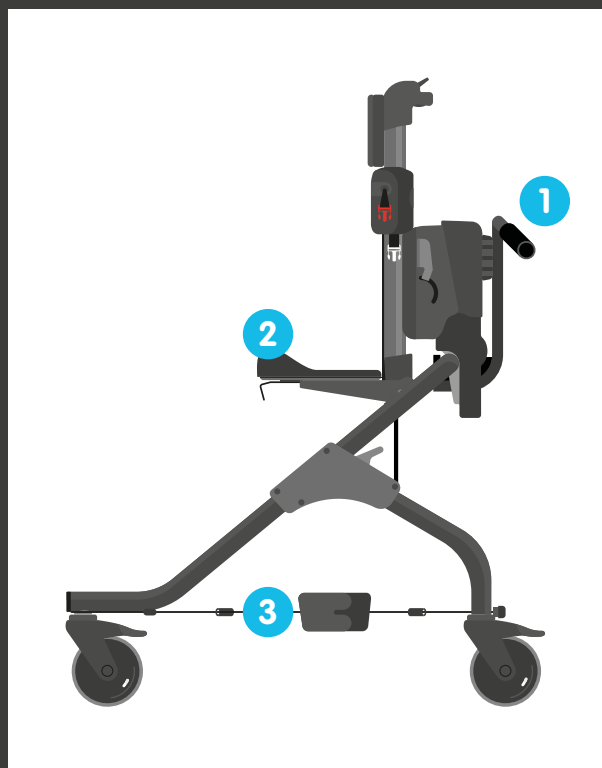
Cautions

- Children with severe dystonic movement which presents a manual handling risk for child and carer when getting the child in and out of the product.
- Children with device fed through the abdominal wall, such as PEG and gastrostomy.
- Children with abdominal device in situ such as Baclofen pump.
- Children with compromised respiratory function, who may experience increased effort of breathing due to fit of harness.

- Children with severe lower limb deformity with reduced range of movement to achieve stepping.
- Using the product for children with significant learning disability or behavioural issues which present risk of injury to the child and/or carer.



Accessories



1

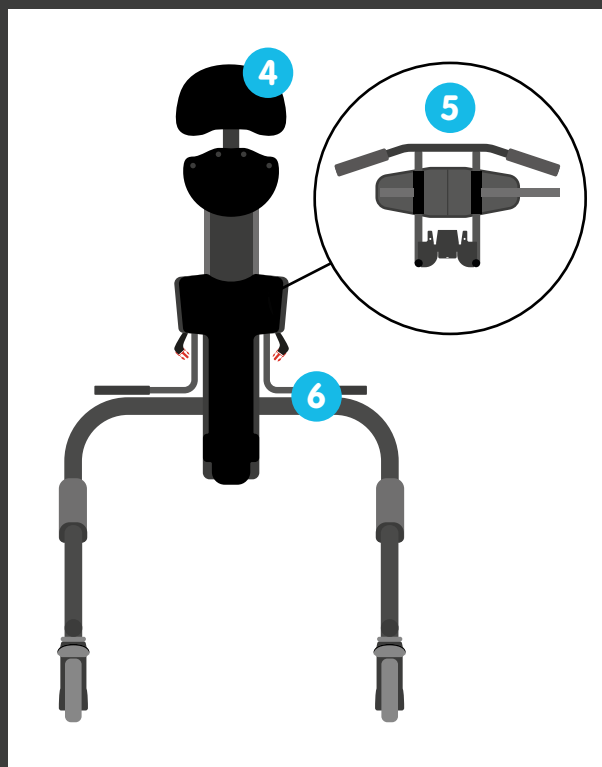
Adult handles: These are a useful adjunct to the walker to enable carers to safely push and steer the walker.

2

Saddle: This is required to perch the user prior to attaching the harness to the frame. However, once positioned, the user may not require the saddle. This can be removed and the user takes their own weight with additional support from the harness and groin straps.

3

Ankle guides: Apply to guide lower limb movement away from scissoring or asymmetric stepping pattern. The guides may be applied further up the lower limb for more proximal support.



4

Head support: If the user has limited head control and/or fluctuating muscle tone, ensure the head support is in position prior to transferring the user into the walker.

5

Adult belt: This provides useful support to enable the therapist to control movement of the walker with their hands free to facilitate the user's head control. The connection may also be used to facilitate optimum reduction of spasticity by standing the user and moving to either side to achieve mobile weight bearing/lateral shift.

6

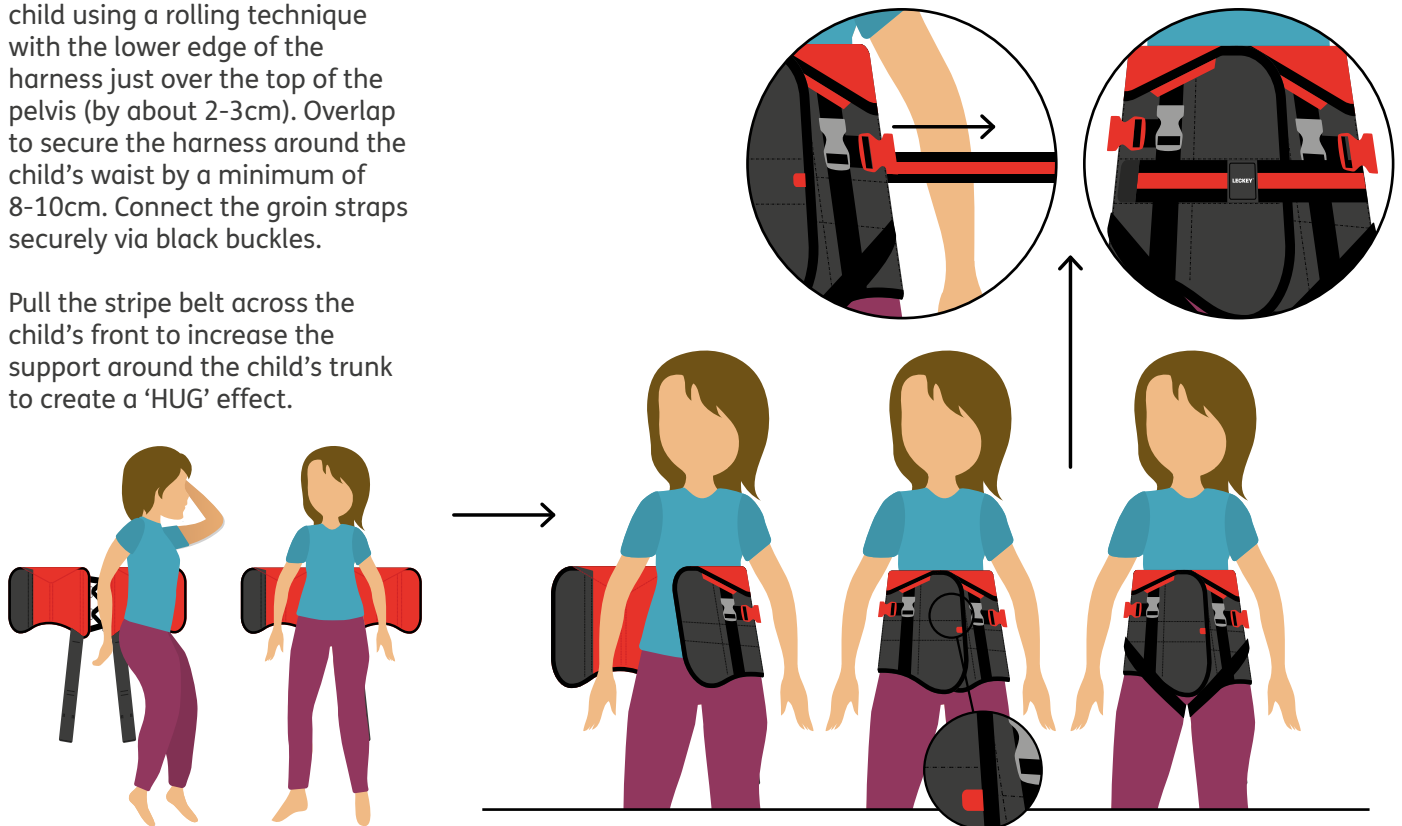
User handles: Attach the user handles after the user has been transferred into the frame if the user requires space within the frame.

Position / Donning the Harness

Child in a lying position:

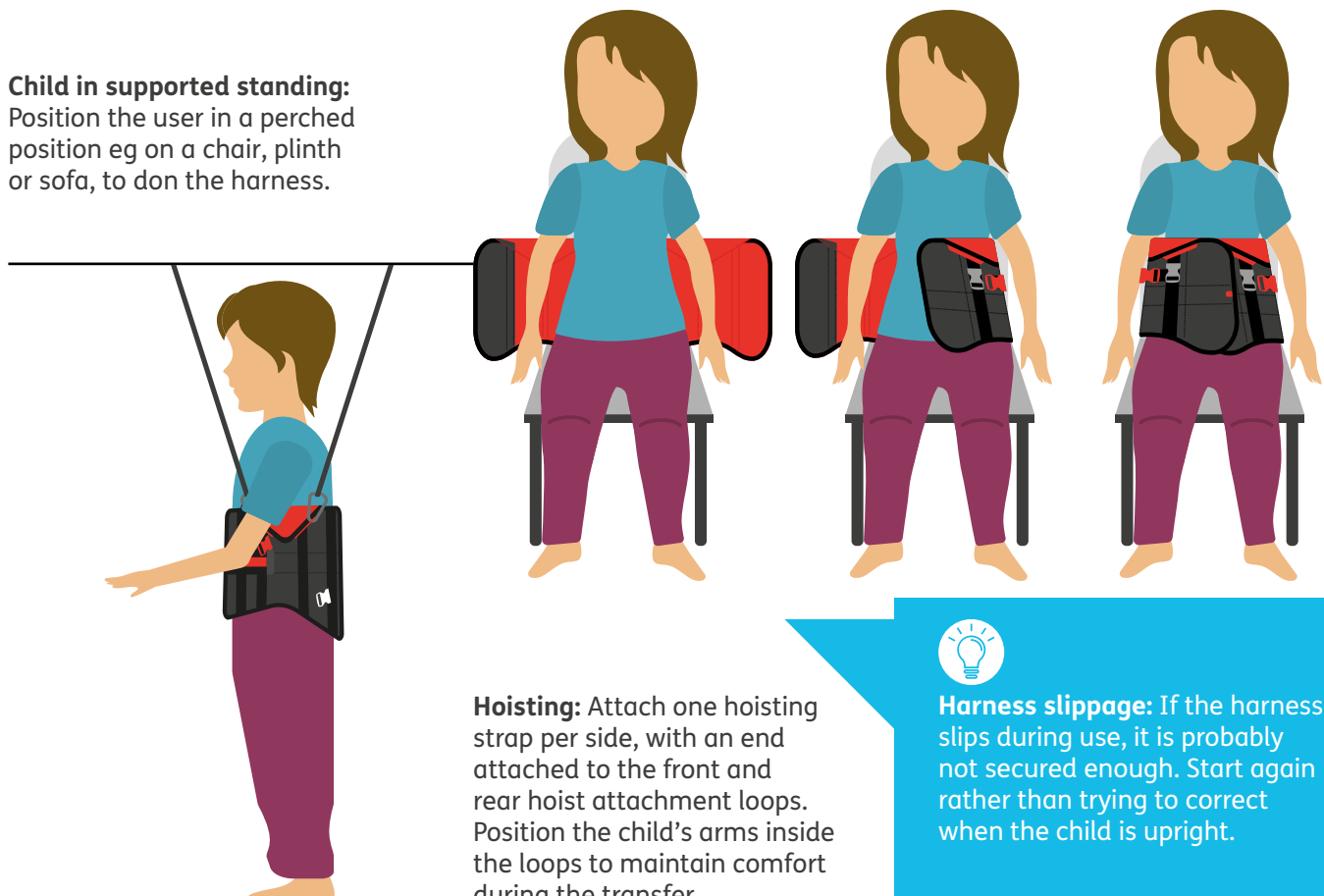
Place the harness under the child using a rolling technique with the lower edge of the harness just over the top of the pelvis (by about 2-3cm). Overlap to secure the harness around the child's waist by a minimum of 8-10cm. Connect the groin straps securely via black buckles.

Pull the stripe belt across the child's front to increase the support around the child's trunk to create a 'HUG' effect.



Child in supported standing:

Position the user in a perched position eg on a chair, plinth or sofa, to don the harness.



Hoisting: Attach one hoisting strap per side, with an end attached to the front and rear hoist attachment loops. Position the child's arms inside the loops to maintain comfort during the transfer.



Harness slippage: If the harness slips during use, it is probably not secured enough. Start again rather than trying to correct when the child is upright.

Position / Transfer the user to/from the frame

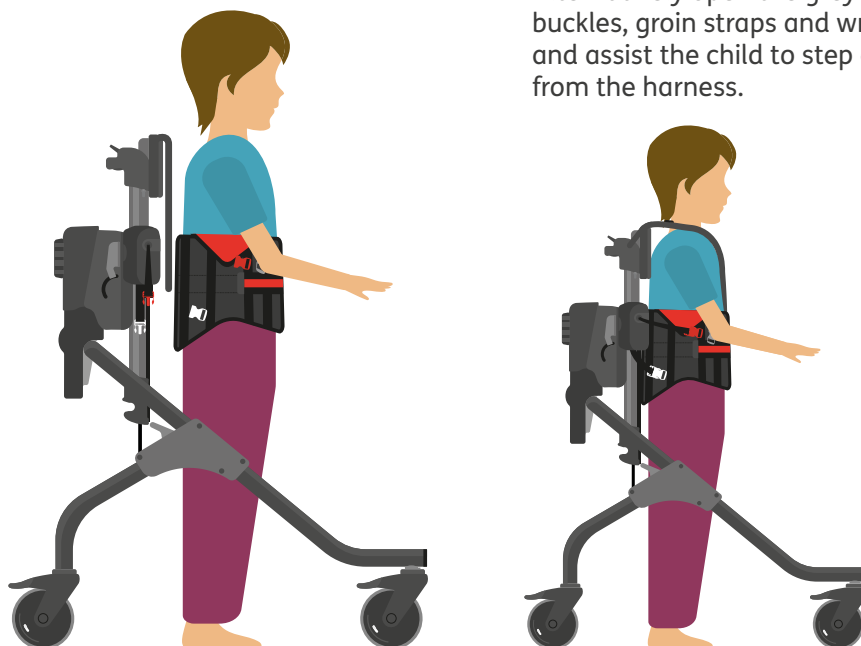
- **Transfer the child in the harness to connect the harness to the frame: Standing/Hoisting.**

- **Attach the harness to the frame: Standing/Hoisting**

- Connect colour coded white and red buckles with the child standing or perching on the saddle as required.
- Shorten harness attachment cords to secure the harness to the frame. These are also colour matched to the buckles for clarity of use.
- The buckles are colour matched to make the process more intuitive.
- White for height: Don't over-tighten if the user needs to rest on the saddle.

- Red for posterior support: Ensure user is sufficiently supported without over-tightening which may cause discomfort.

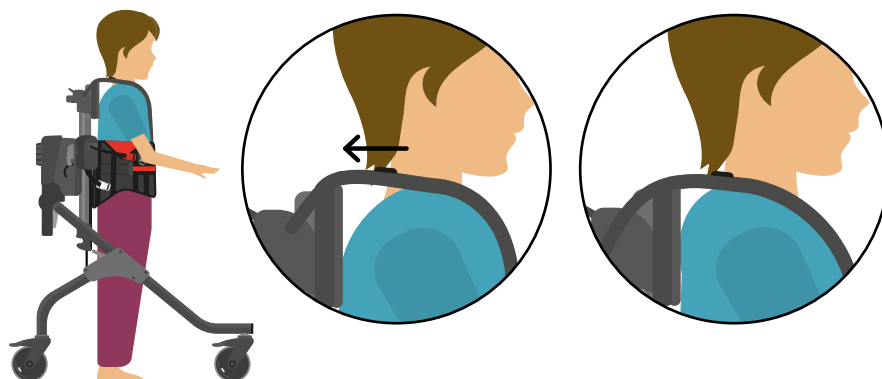
- Transfer the child from the frame from standing or hoisted position by opening the white, red and grey buckles to release the harness from the frame. Alternatively open the grey buckles, groin straps and wrap, and assist the child to step out from the harness.



Adjust

- **Shoulder height and straps:**

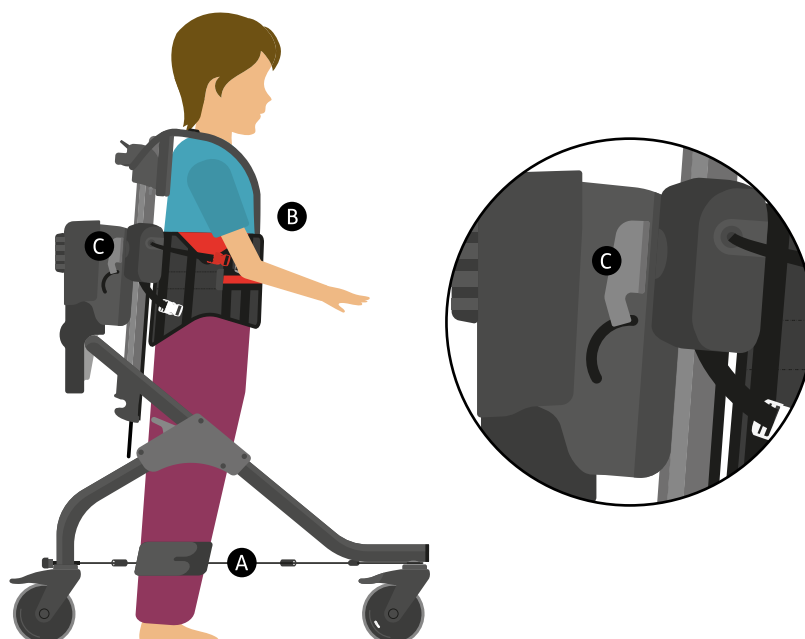
- Set shoulder height and secure straps to harness using grey buckles.
- Shorten the shoulder straps from the back to encourage an upright posture.



- **Ankle guides:** Apply ankle guides around the lower calf and adjust to correct tension to maintain optimum foot placement.

- **Prone Angle:** On initial assessment set the user in an upright position for optimum line of vision. If the user has difficulty initiating stepping, tilt the user forwards. Note the loss of height as the prone angle is adjusted. Use fine height adjustment to raise the child as required.

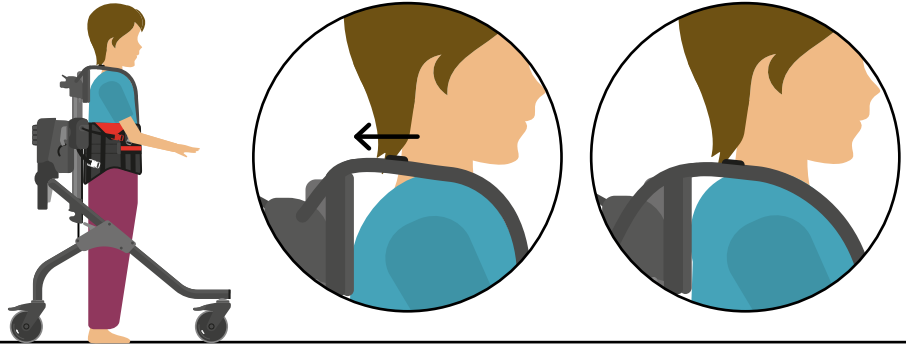
- **Fine height adjustment upwards:** To achieve optimum height to initiate and sustain stepping.



Adjust

• Shoulder height and straps:

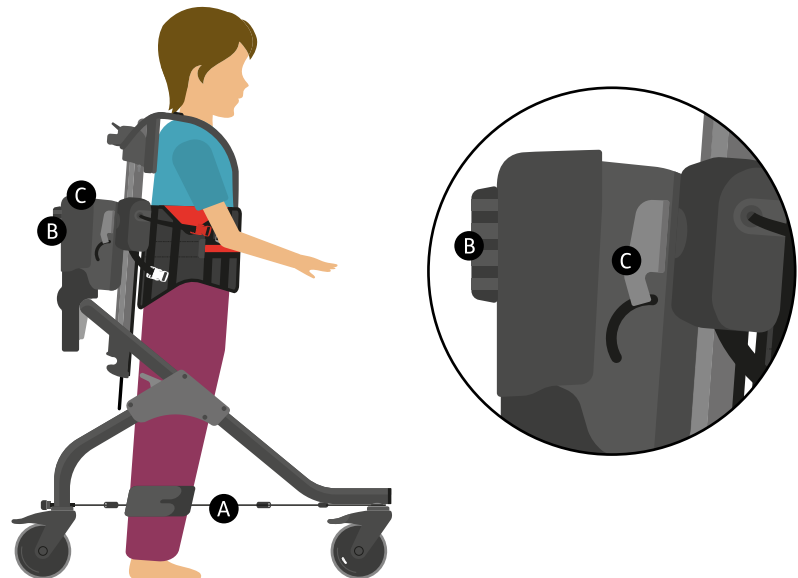
- Set shoulder height and secure straps to harness using grey buckles.
- Shorten the shoulder straps from the back to encourage an upright posture.



- **Ankle guides:** Apply ankle guides around the lower calf and adjust to correct tension to maintain optimum foot placement. **A**

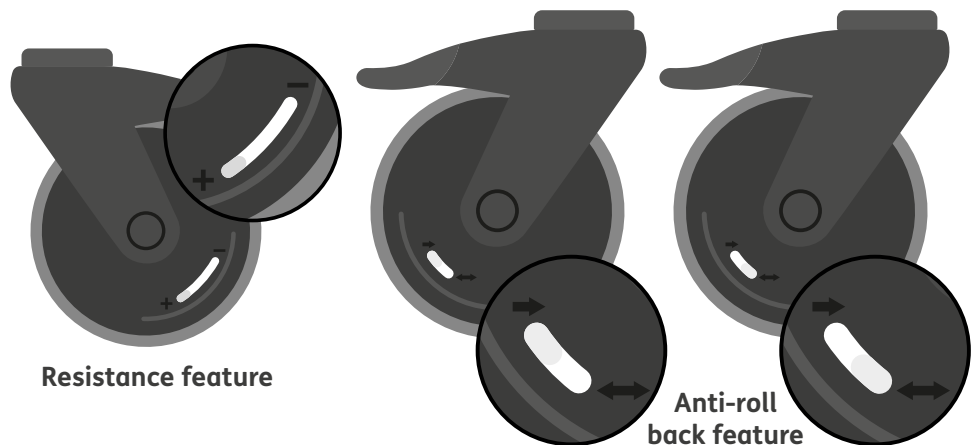
- **Prone Angle:** On initial assessment set the user in an upright position for optimum line of vision. If the user has difficulty initiating stepping, tilt the user forwards. Note the loss of height as the prone angle is adjusted. **B** Use fine height adjustment to raise the child as required.

- **Fine height adjustment upwards:** To achieve optimum height to initiate and sustain stepping. **C**



• Castor setting for direction:

- Set direction as free or uni-direction as appropriate for the user's steering ability.
- Set resistance as free or as required for optimum steering and control of speed.
- Set rear lock if the user tends to roll backwards.



Dosage and Limitations

The MyWay provides an opportunity to walk and a change in position. Daily interventions to promote breaks in sedentary time, and replacement with light physical activities are advocated for children within all GMFCS levels.¹

A therapist should prescribe and train parents and carers in the use of the MyWay. This should include recommendations for time spent in the MyWay depending on the child's presentation.

The therapist, family and carers should also monitor the child for signs of discomfort, fatigue, skin breakdown, seizures, breathing difficulty and any deterioration in activity or wellbeing which indicate that the child should be removed from the MyWay.

¹ Verchuren O, Peterson MD, Balemans ACJ, Hurvitz EA. Exercise and Physical Activity Recommendations for People with Cerebral Palsy. Dev Med Child Neurol. 2016 August ; 58(8): 798–808.



Specific Presentations

Children with different presentations may benefit from the various features of the MyWay. In order to get the most out of the MyWay, we have listed how some of the features may optimise the child's ability to achieve upright mobility.

• Generalised low tone

- Use the snug fitting harness to increase core stability, provide proprioceptive feedback and optimise limb movement and head control
- The harness is also used to provide alignment and when connected to the frame will guide the dynamic sinusoidal movements required for gait.
- The lightweight frame and multi-directional castors enable ease of manoeuvrability in the presence of weakness associated with low tone
- The fine height and prone angle adjustments enable fine tuning to optimise possibility of initiating independent stepping.

• General increased tone

- The improved trunk and hip alignment provided by the harness and saddle may prevent scissoring of lower limbs with or without using the ankle guides. This combination also permits the dynamic sinusoidal movements required for gait.
- Active trunk extension and head lift may be achieved by increasing the prone angle in the presence of a passively correctable kyphosis.
- Facilitation of reciprocal stepping is possible as the open frame enables the therapist to have access to the child's lower limbs.
- The tone reducing effect of lateral weight shift in standing may be achieved more easily with the adult wrap providing an extra pair of hands.¹

• Dyskinetic (fluctuating) movement - dystonia, athetosis

- Fluctuating movements can be dampened due to the snug fitting harness which provides core stability.
- The dynamic excursion of the pelvis required for gait is permitted by the fabric harness connection to the solid frame.
- Extensor thrust involving the neck is controlled by the head pad.
- Erratic lower limb movement may be controlled by the ankle guides.
- Dystonic posturing of upper limbs may be inhibited by reach and grasp of the user handles.
- The hoist provides comfortable support for the child while being attached and detached from the frame.
- Users may find specialised gloves useful to maintain grip on the user handles.
- Shoulder straps provide additional security.
- Supervise the child closely to start with to ensure that the frame permits full lower limb extension with all four castors on the floor.

¹ Effect on Spasticity after performance of dynamic-repeated-passive ankle joint motion exercise in chronic stroke patients, Kaohsiung Journal of medical sciences, Wu, 2006



Specific Presentations

• Asymmetry of posture and movement

- Passive correction of scoliosis and lordosis is achieved within the harness.
- Trunk and hip alignment are maintained with support from the harness and saddle.
- Steering control is improved with independent variable resistance of the castors.

• Severe lower limb deformity

- Lower limb deformity can be accommodated. However, stepping ability will be limited with increasing deformity. When measuring to set height of frame, measure the direct distance from groin to foot with knees extended as possible. It is likely that the child will not be able to use the inner range, therefore set the frame at a slightly lower height from the measurement taken (approx 2cm) and adjust height upwards using the fine height adjustment once the child is in the frame.
- If leg length inequality, enable the child to use both lower limbs to step by setting the height of the walker to fit the shorter leg.
- Targeted activity within a specific range of movement eg inner range knee and hip extensors can be achieved by adjusting the height.

• Risk of hip displacement

- The incidence of hip displacement is higher with increasing GMFCS levels.² This suggests that upright mobility may contribute to hip development and a reduced risk of hip displacement.

• Decreased head control

- Head control is improved with the trunk support provided by the harness.
- Facilitation of active head control in standing by lifting and moving the child's arms, is achieved using the therapist wrap to free up the therapist's hands.

• Lack of stepping initiation

- Optimum positioning to initiate stepping is achieved using the fine height and prone angle adjustments.
- Ensure the child has the best chance of initiating stepping using independent castor settings for resistance and direction lock.

• Treatment including Botulinum Toxin-A injection therapy, Selective Dorsal Rhizotomy and Lower Limb Surgery

- The child may rehabilitate using the walker to enable lower limb activity and physical exercise following medical interventions to improve the child's ability. Height settings should be reviewed following any intervention which may affect active range of movement.

• Abdominal devices such as Percutaneous Endoscopic Gastrostomy (PEG) or Baclofen pump.

- Check skin around PEG sites prior to use to compare afterwards. Report any skin irritation or dislodging of tubing to carer.
- Ensure the harness is fitting well to avoid slippage of the harness and pulling on any tubing.
- If hoisting, provide additional support under the child's thighs to prevent harness slipping.
- Perch the child on the saddle when attaching harness to frame and keep the saddle in place during use.

• Compromised respiratory function.

- Once harness donned, observe the child and remove the harness if there are any signs of respiratory difficulty, including increased difficulty breathing, and change in respiratory rate, colour and alertness.
- The harness may be donned slightly loosely for ease of respiration. However, use the saddle to take the child's weight, and make sure the child is secured so that the frame and harness move as one and the child does not slide off the saddle.

² Terjesen T. The natural history of hip development in cerebral palsy. *Developmental Medicine and Child neurology* 2012 Oct; 54(10): 951-7



How can you prove if the MyWay is beneficial to the child? How can you assess progress using the MyWay?

It is possible to ascertain how effective the MyWay is, by setting goals with the child and their family and using appropriate outcome measures or records. Below are some suggestions. Outcome measures and records can be reviewed monthly, termly or annually to monitor progress and provide information for reports at school or clinics.

Goals	Outcome measures
Maintenance of walking ability (speed) using the walker	Measure speed (time taken to walk fixed distance or distance covered over set period of time) at set intervals e.g. six months
Achieve aerobic activity	Record HR/RR at rest and after use of walker
Experience regular movement in an upright posture or daily breaks in sedentary behaviour ¹	Set desired frequency of use and record on an activity chart
Socialisation with peers ²	Classroom/home diary to record achievement
Cognitive development by explorative play	Classroom/home diary to record achievement
Experience visual field from an upright position	Classroom/home diary to record achievement
Active participation (attendance and involvement ³)	Participation and environment measure for young children (YC-PEM) ⁴ or children and youth (PEM-CY) ⁵ (purchase from www.canchild.ca)
Develop walker skills	Leckey MyWay Walker Skills Assessment
Fun, enjoyment ⁶	Children's Assessment of Participation and Enjoyment (CAPE) ⁷ (purchase from www.pearsonassess.ca)

¹ Verschuren O, Peterson MD, Balemans AC, Hurvitz EA. Exercise and physical activity recommendations for people with cerebral palsy. *Developmental Medicine and Child Neurology* (2016) Aug;58(8):798-808.

² McKeever P, Rossen BE, Scott H et al. The significance of uprightness: Parents' reflections on children's responses to hands free walker for children. *Disability and Society* (2013);28(3):380-392

³ Imms C, Adair B, Keen D et al. 'Participation': A systematic review of language, definitions, and constructs used in intervention research in children with disabilities. *Developmental medicine and child neurology*. (2016) Jan;58(1):29-38

⁴ Khetani MA, Graham JE, Davies PL, Law MC, Simeonson RJ. Psychometric properties of the young children's participation and environment measure. *Arch Phys Med Rehabil* 2015; 96:307-16

⁵ Coster W, Bedell G, Law M et al. Psychometric evaluation of the Participation and environment measure for children and youth. *Dev Med and Child Neurol* 2011; 53:1030-7

⁶ Rosenbaum P, Gorter JW. The 'F-words' in childhood disability: I swear this is how we should think! *Child Care Health Dev.* (2012) Jul;38(4):457-63

⁷ King, G., Law, M., King, S. et al. Children's Assessment of Participation and Enjoyment (CAPE) and Preferences for Activities of Children (PAC) (2004) Harcourt Assessment, San Antonio, TX, USA.



Motivation/Participation

Participation is about being involved as well as being there.^{1,2}

Below are some suggestions of games and activities which may promote active involvement.

Game	Description
Football	Goal scoring, dribbling or playing in small teams
What's the time Mr Wolf?	A group of children stand along a line facing the 'leader' who stands approx 4m across the room and has his/her back to the children. The children shout 'What's the time Mr Wolf?' and the leader shouts a time eg '3 o'clock'. The children then take 3 paces and ask the time again. This goes on with different times until the children are well across the room. After a few goes when the children ask the time, the leader shouts 'Dinner time!' and turns to catch the children. If a child is caught, they stay with the wolf to help with catching. The last child to miss being caught is the winner.
Follow the leader (Simon says)	Simon is the leader and gives a series of instructions beginning with 'Simon says...'. These could include 'lift your foot', 'take a step', 'put your finger on your nose' etc. If the leader does not use the term 'Simon says' and a child performs the action they are out. This is repeated until the last child left is the winner.
Slalom	Race in and out of cones at distance apart that the children can manage. Put more cones in a row or place cones closer together for more able group members to give all participants a fair chance of winning.
Orienteering	Find numbers/jigsaw pieces/pictures around the room placed in reachable places.
Relay race	Children in teams walk/run to each other to receive an object which could be placed in a basket tied to the walker if the child is not able to carry it.
Obstacle course	Include walking through cones, kicking a ball, throwing, walk in different directions, through an arch etc
Circle game	Children positioned in a circle. Whoever is nominated has to walk around the outside of the circle and back to their place then nominate someone else. (Duck Duck Goose includes getting chased around the circle)
Stormy seas	Children try to get across the room while pirates try to catch them en route. If caught, then they become a pirate and try to catch others.
Basketball	Throw and catch to team members and into the basket as able.
Beachball/ Football	Various sizes of ball depending on child's ability to kick or push ball with walker.
Clumps	Children gather in groups of various sizes according to the number called. If not in a group then they are out. Remainder re-group into different sized group and so on until two winners left.
Port and Starboard	<ul style="list-style-type: none"> • Various instructions on pirate theme with actions called out by the 'Captain'. "Attention on deck" – all players say "Aye, aye Capitan" "Three men in a boat" – all players make groups of three "Starboard" – all players run to the left side of the boat "Port" – all players run to the right side of the boat "Stern" – all players run to the back "Bow" – all players run to the front "Poorly seagull" – each player flaps their hands and feet around in the air "Row the boat" – each player makes rowing movements "Man overboard" – each player kicks the air with one foot.
Hide and Seek	The child is given time to hide behind large objects. How long will it take to be found?
True/False	The leader makes statements. If they think it is true the children go to one side of the room. If they think it is false, they go to the other side of the room.

¹ Maxwell G, Alves I, Granlund M. Participation and environmental aspects in education and the ICF and the ICF-CY: findings from a systematic literature review. *Dev Neurorehabil* 2012; 15: 63–78.

² World Health Organization. *International Classification of Functioning, Disability and Health: Children and Youth Version (ICF-CY)*. Geneva: World Health Organization, 2007.



Responsible prescription of a walker involves identification of potential benefits for the user. These should be identified prior to supply with or without an application for funding. Evidence of potential benefits comes from liaising with the child/parents/carers, drawing on clinical experience, and sourcing relevant research evidence to support the prescription.¹

1. Parent and Child Preferences:

The decision to provide a supportive walking device should be made in conjunction with the user and parents/carers. Goals for the use of a walker may be set with the child and parents (see suggestions for goals in the 'progressing skills' section).

2. Clinical Expertise: Physiotherapists with experience in the management of children with physical disability may recommend the provision of a supportive walking device. It is the responsibility of the physiotherapist to measure their effectiveness because walking devices form a large part of standard care.² (see suggested outcome measures in the 'progressing skills' section).

3. Research Evidence:

3.1 McKeever (2013)³ 'With respect to using the hands-free walker, parents' accounts demonstrated the importance of children's ability to be upright and how the hands free walker enhanced their activities, daily lives and dignity. The opportunity to be upright, establish eye-contact, and gesture, fostered children's inclusion and participation in childhood activities that seemed to improve their quality of life.'

3.2 Paleg and Livingstone (2015)⁴ 'The population that appears to benefit most from gait trainer interventions is children with cerebral palsy or related complex developmental delays. Two or three years-of-age appears to be the youngest age of introduction and is concerning as evidence around impact of upright positioning and mobility on motor and sensory, visual, and social development suggests that mobility assistive technologies should be introduced around nine to 12 months-of-age when children who are typically developing begin to explore their environment.'

3.3 Verchuren (2016)⁵ produced CP specific physical activity and exercise recommendations based on robust research evidence, expert opinion and extensive clinical evidence. Health risks are considered greatest for those not physically active and spending large amounts of time being sedentary. Interventions to promote breaks in sedentary time, and replacement with light physical activities are advocated for children within all GMFCS levels. This approach encompasses participation throughout the entire day.

3.4 Novak (2014)⁶ 'Compensatory and environmental adaptation approaches involve society inclusively changing around the child instead of changing the child. These interventions include provision of environmental and task modifications or specialized equipment to accommodate the child's disability, promote inclusion, and independence.'

¹ Sackett DL, Rosenberg WM, Gray JA, Haynes RB, Richardson WS. Evidence based medicine: what it is and what it isn't. *BMJ*. 1996 Jan 13; 312(7023): 71-72.

² Novak I, McIntyre S, Morgan C et al. A systematic review of interventions for children with cerebral palsy: state of the evidence. *Developmental Medicine and Child Neurology* 2013 Oct;55(10):885-910.

³ McKeeverP, Rossen BE, Scott H et al. The significance of uprightness: parents' reflections on children's response to hands free walker for children. *Disability and Society* 2013; 28 (3): 380-392

⁴ Paleg G, Livingstone R. Outcomes of gait trainer use in home and school settings for children with motor impairments: A systematic review. *Clinical Rehabilitation* 2015 Nov;29(11):1077-91

⁵ Verchuren O, Peterson MD, Balemans ACJ, Hurvitz EA. Exercise and Physical Activity Recommendations for People with Cerebral Palsy. *Dev Med Child Neurol*. 2016 August ; 58(8): 798-808.

⁶ Novak I. Evidence-based diagnosis, health care, and rehabilitation for children with cerebral palsy. *Journal of child neurology*. 2014, Vol 29(8) 1141-1156





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