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KNOW

HOW



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

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Squiggles+

Standing is very important.

An upright posture allows gravity to assist the function of our internal systems. By standing, children bear their weight through their bones and joints, which helps form and shape them while increasing their strength.

The new Squiggles Stander Plus offers new, additional features to the extremely versatile three-in-one Squiggles Stander for children aged 1-5 years.



New Features



Tray height and adjustability



Hip abduction (including gauge & hip laterals)

Knee blocks – improved wrap & larger, more comfortable medial support

Wider, longer chassis with dropped skis to accommodate abduction

New foot pedal

Ability to accommodate leg length discrepancy



Intended Use

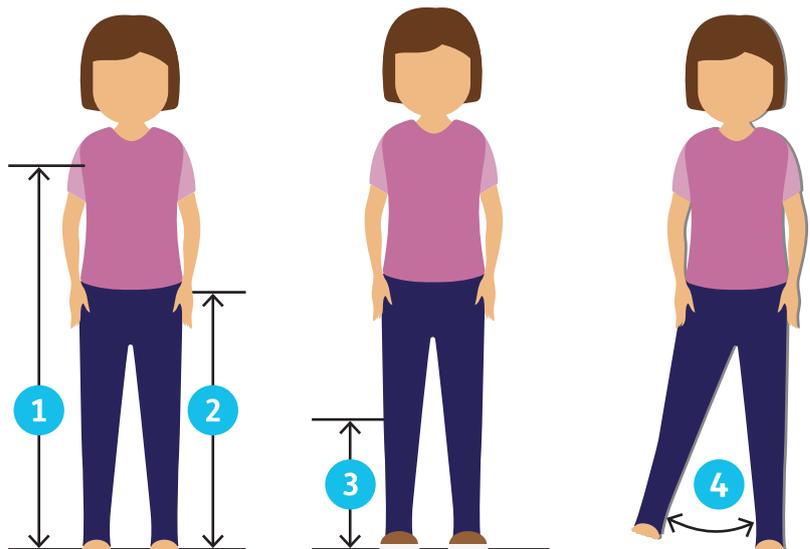
- Children with Cerebral Palsy in GMFCS III-V, especially spastic or dystonic types
- Children presenting with developmental delay who are currently non-ambulating
- Children where early intervention is indicated
- **PRECAUTION:** Therapists should exercise their own clinical reasoning and consider child specific goals in the presence of hip/ knee flexion contracture. Intended benefit versus potential discomfort or risk of injury should be considered, especially if intending to use the hip abduction component where hip/ knee flexion contracture will impact alignment achieved and may minimise potential benefits of positioning. Joints should never be forced through a range of movement.



Clinical Set-up

Following assembly, adjust the Squiggles Stander Plus to fit the user. Measurements are required:

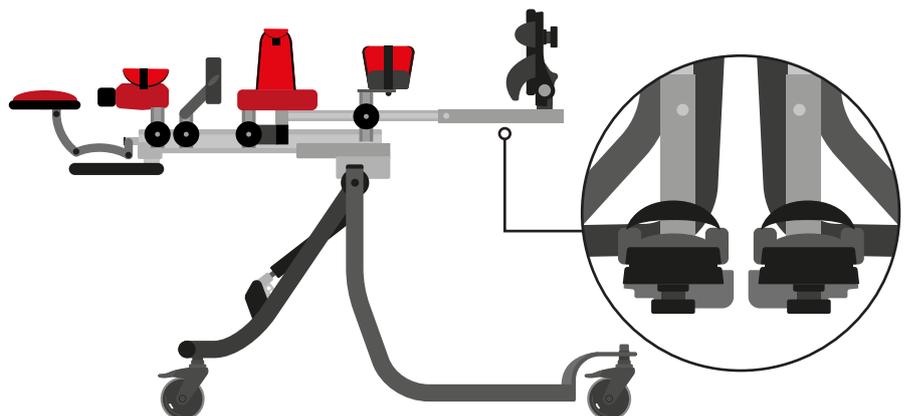
- 1 Axilla to floor
- 2 ASIS to floor
- 3 Knee to floor with shoes on
- 4 If planning on using the hip abduction feature also measure the child's range of hip abduction at this stage.



The Squiggles Stander Plus can be set-up for use in either supine or prone.

Supine Set-Up

The new Squiggles Stander Plus now goes completely flat for ease of horizontal loading in supine. For supine transfer into the system we recommend that the hip abduction component of the equipment is in neutral. This provides a stable platform upon which to transfer the child onto.

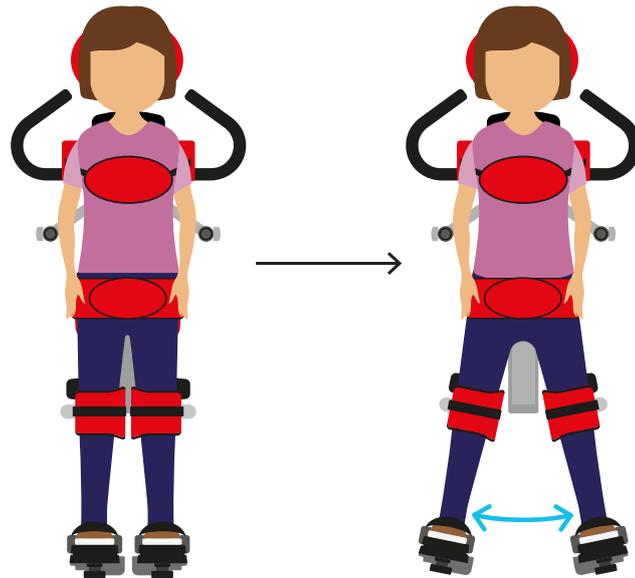


Supine Set-Up Continued

- To maintain a stable support beneath the child's leg throughout, secure the child's leg into the support and then ease the leg through available range of abduction.

However, it may be the therapist's preference, especially in presence of adductor spasticity, to fix the equipment in desired range of hip abduction and facilitate the child's leg into the support.

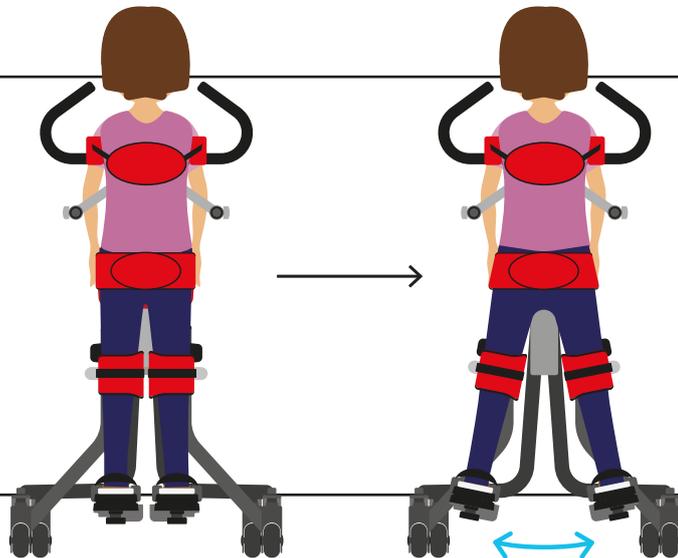
- Once the child is securely supported in optimal alignment within the equipment, bring them through to desired upright position.



Birds eye view, stander in horizontal configuration

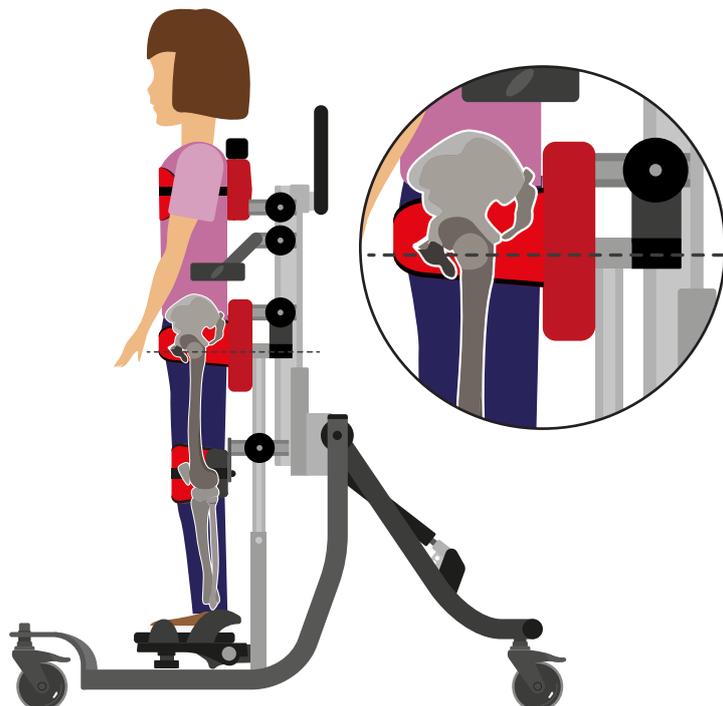
Prone Set-Up

- In the instance of prone transfer into the Squiggles Stander Plus, also begin with hip abduction component of the equipment in neutral. Secure the child into position before working into the desired range of abduction.



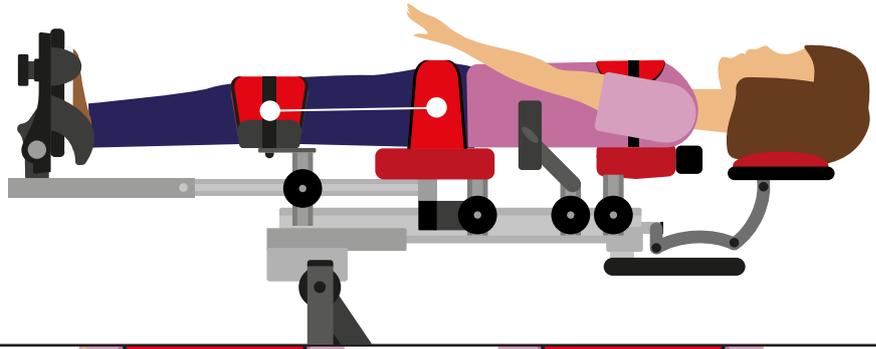
Applicable to supine and prone set-ups

- When positioning the child's hips on the pelvic support align the level of child's hip joint with the hip pivot point of the equipment. This is particularly important if intending to use the hip abduction component, as it ensures synchrony in the arc of movement between the child's leg and lever arm of the equipment.

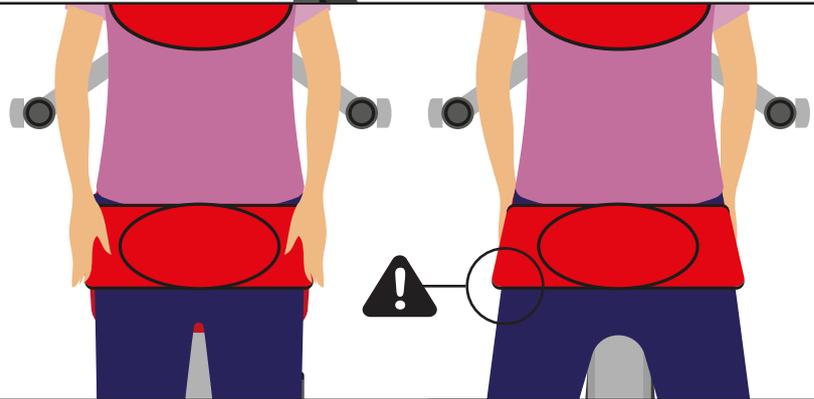


Applicable to supine and prone set-ups

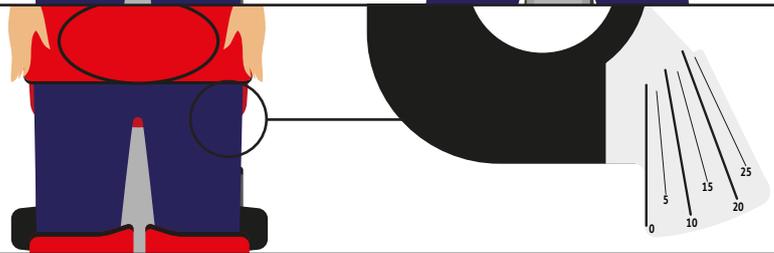
- Once the child's hips and knees are secured within their appropriate supports, check that neutral hip extension has been achieved, this assists maintenance of a more optimal alignment as the hips are moved and secured into an abducted position.



- The pelvic support laterals will move with the child's leg as it is eased into the desirable range of hip abduction, ensuring the lateral doesn't dig into the top of the child's thigh.

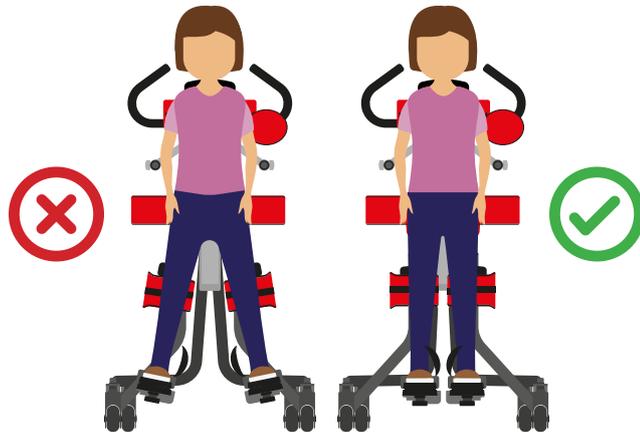


- Use the gauge on the side of the frame to measure and monitor degrees of hip abduction. This can be used to record hip abduction bilaterally for future set-up.

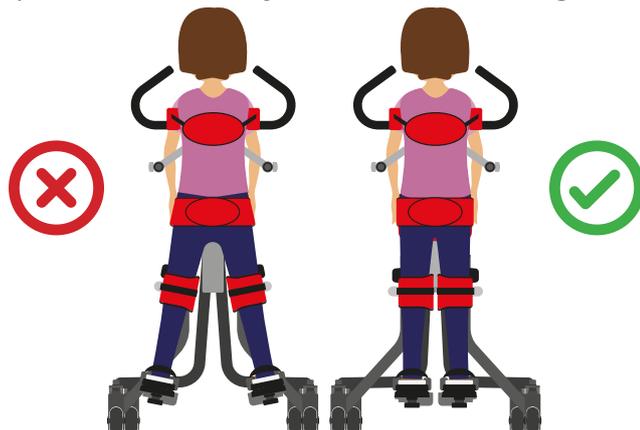


- When transferring the child back out of the Squiggles Stander Plus, return hips to neutral abduction before releasing straps and removing the child from the stander.

Leaving equipment legs in abducted position whilst performing the transfer may be less optimal from a manual handling perspective and less comfortable for the child, particularly in the presence of high tone.



Supine Position (birds eye view, horizontal configuration)



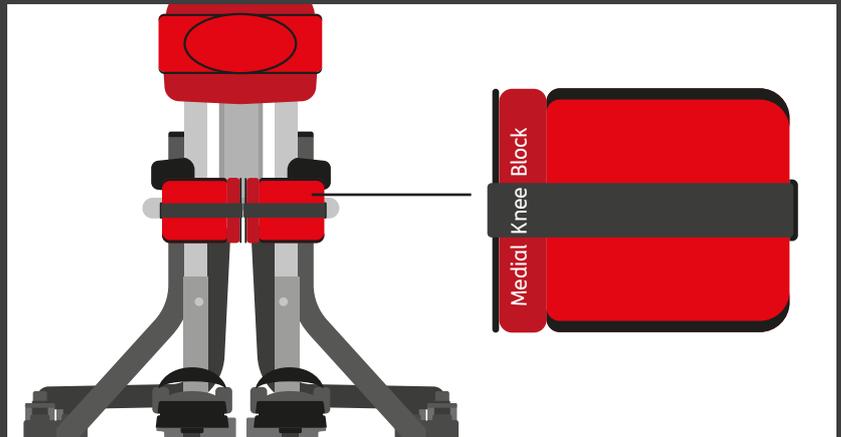
Prone Position (posterior view)



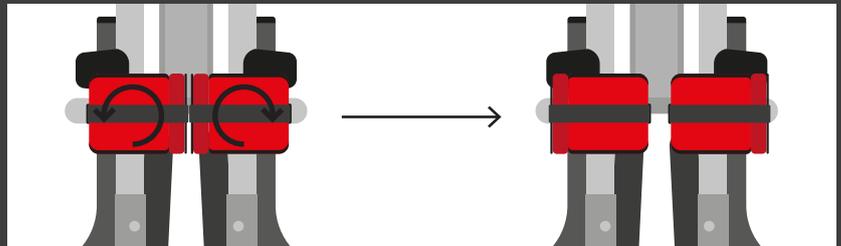
Specific Presentations

Increased or fluctuating tone -

Standing in hip abduction can offer a prolonged stretch to hip adductor muscles. The new Squiggles Stander Plus knee block is deeper on its medial aspect and padded so as to distribute pressure over a wider surface area and protect both the knee joint and medial collateral ligament. This feature improves alignment and comfort in abducted standing, particularly in the presence of high tone, where there may be greater forces and pressure imposed on the inside of the child's knee.

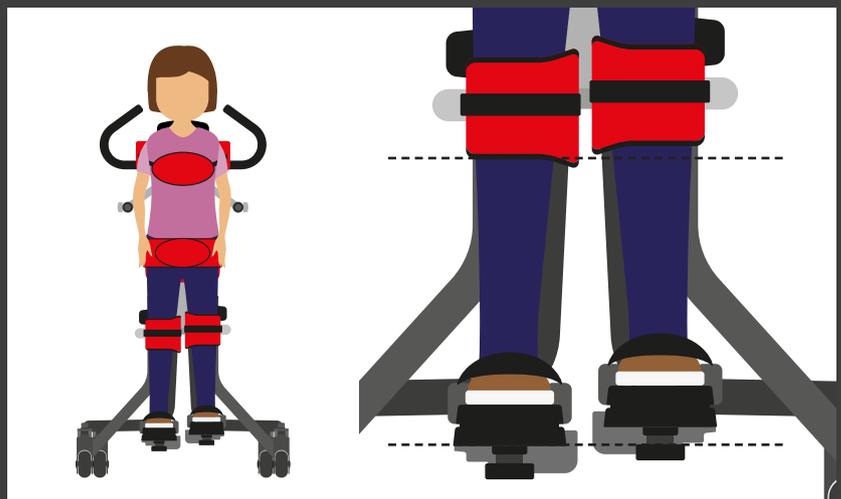


Low tone - In the case of a very low toned child who perhaps tends towards a circle sitting posture of the legs, the knee blocks may be turned through 180° so that the deeper aspect is placed laterally on the child's knee to optimise alignment within this clinical presentation.



Refer to Squiggles Stander Plus user manual for further information on set-up

Leg length discrepancy - the Squiggles Stander Plus now accommodates for leg length discrepancy as the lower limb lever arms and foot plates are separate, they can therefore be set to different heights each side.





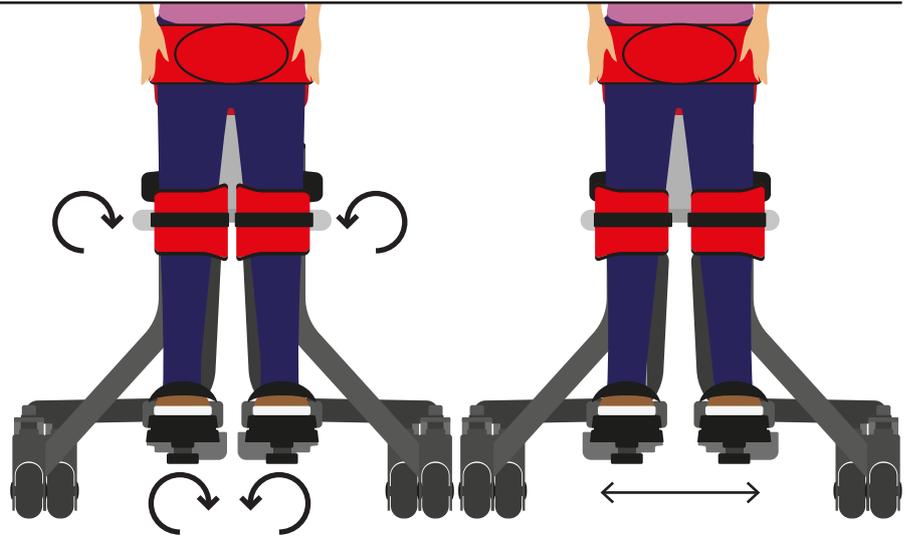
Hints & Tips

Hip rotation – There is currently minimal evidence around optimal hip rotation in positioning to prevent hip displacement. It may therefore be indicated to aim for neutral hip rotation unless advised otherwise by the child's orthopaedic consultant.

Ankle/ foot position – should be monitored throughout and optimised for the child. A neutral ankle/ foot position should be maintained where clinically viable, especially where the child does not have the additional support of ankle foot orthoses (AFO's).

Hip abduction gauge –

To ensure absolute accuracy of the gauge measuring degrees of hip abduction, knee and foot plates need to be positioned centrally on the leg lever arm. If, for example, both are shifted laterally then the child is starting in some degree of abduction already. If a lateral or medial shift of knee and foot plates is indicated in order to achieve a more optimal alignment for the child, then this should take priority but it is worth bearing in mind the potential impact on hip abduction gauge measurements.



Dosage

Degrees of hip abduction – there is limited evidence around the optimal degrees of hip abduction in standing. It has been suggested that the forces acting on the hip whilst standing in zero degrees hip abduction may do more to encourage than discourage hip displacement and therefore some degree of hip abduction to offset these forces in standing is recommended¹. Studies available vary between 15-30 degrees of hip abduction each side^{2,3}.

The Squiggles Stander Plus accommodates up to a maximum of 30 degrees of hip abduction each side i.e. 60 degrees bilaterally. Clinicians should exercise their own clinical reasoning across individual presentations. It seems reasonable to introduce small increments of hip abduction as tolerated³ and gradually work up towards just shy of a child's maximum range of abduction. Thus, maximising clinical benefits whilst maintaining comfort and tolerance.

Time spent in standing – Paeg et al (2013) states that standing programs 5 days per week positively affect bone mineral density (60 to 90 min/d); hip stability (60 min/d in 30° to 60° of total bilateral hip abduction); range of motion of hip, knee, and ankle (45 to 60 min/d); and spasticity (30 to 45 min/d)³

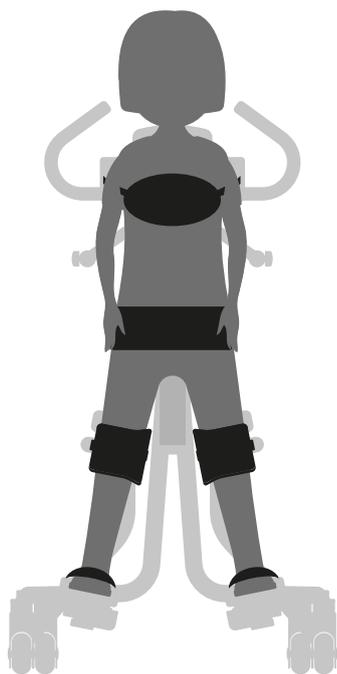


Recent years have seen a growing research interest around the effectiveness of abducted standing in maintenance of hip integrity. This has in turn driven popularity amongst clinicians in utilisation of this specific therapeutic modality.

Paleg et al (2013) reviewed 6 papers relating supported standing programmes specifically to hip integrity and concluded on the evidence around abducted standing as 'fair evidence, possibly effective'. The author summarised the evidence as 'yellow light', interpreted as 'minimal evidence; proceed with caution'³.

McClelland et al (2014) of Sunny Hill Health Centre for Children Vancouver, reviewed the evidence around 'positioning as a treatment approach in the prevention of hip displacement' and in turn concluded 'yellow light' or 'insufficient evidence and an ongoing need to measure outcomes'¹.

The authors went on to integrate the research with expert opinion to develop a useful clinical resource tool that illustrates key components to consider when positioning a child with cerebral palsy (GMFCS III-V) to have a positive impact on hip health. Recommendations in terms of supported standing are illustrated below.



Standing

Continue with standing using a supine, prone or upright configuration.

Hip position –
Aim for hip abduction 15-30 degrees.
Avoid 0 degrees hip abduction

Dosage –
Aim for 60 – 90 minutes per day

McClelland, L; Magnuson, S; Gasior, S (2014). Positioning for hip health: A clinical resource, Sunny Hill Health Centre for children Vancouver, BC, Canada.

Further detail on the evidence base around abducted standing is available within Leckey's literature review and infographic which can also be found within the 'Know-How' section on our website.

As highlighted within this literature review, methodological flaws within studies can reduce the strength of the evidence. Clinicians are required to apply their own clinical reasoning and expertise to deliver best evidence informed practice. Monitoring via hip surveillance programmes and timely surgery remain the standard of care in the management of hip displacement⁴. Introduction of standing in hip abduction to a child's 24hr postural management programme should be agreed in liaison with the child's orthopaedic consultant and wider multi-disciplinary team.

¹ McClelland, L; Magnuson, S; Gasior, S (2014). Positioning for hip health: A clinical resource, Sunny Hill Health Centre for children Vancouver, BC, Canada.

² Gmelig Meyling, C; Ketelaar, M; Kuijper, M-A; Voorman, J; Buizer, A (2018). Effects of postural management on hip migration in children with cerebral palsy: A systematic review. *Pediatric Physical Therapy*, Volume 30, Issue 2, pp. 82-91 DOI: 10.1097/PEP.0000000000000488

³ Paleg, GS; Smith, BA; Glickman, LB (2013) Systematic review and evidence-based clinical recommendations for dosing of pediatric supported standing programs. *Pediatric Physical Therapy*, Volume 25, Issue 3, pp. 232-247 DOI: 10.1097/PEP.0b013e318299d5e7

⁴ Novak, I; Morgan, C; Adde, L; Blackman, J; Boyd, RN; Brunstrom-Hernandez, J; Cioni, G; Damiano, D; Darrach, J; Eliasson, AC; de Vries, LS; Einspieler, C; Fahey, M; Fehlings, D; Ferriero, DM; Fetters, L; Fiori, S; Forssberg, H; Gordon, AM; Greaves, S; Guzzetta, A; Hadders-Algra, M; Harbourne, R; Kakooza-Mwesige, A; Karlsson, P; Krumlind-Sundholm, L; Latal, B; Loughran-Fowlds, A; Maitre, N; McIntyre, S; Noritz, G; Pennington, L; Romeo, DM; Shepherd, R; Spittle, AJ; Thornton, M; Valentine, J; Walker, K; White, R; Badawi, N (2017). Early, Accurate Diagnosis and Early Intervention in Cerebral Palsy: Advances in Diagnosis and Treatment. *JAMA Pediatrics* Volume 171, Issue 9, pp. 897-907 DOI:10.1001/jamapediatrics.2017.1689

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