

# Positioning for Hip Health: A Clinical Resource

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## Introduction

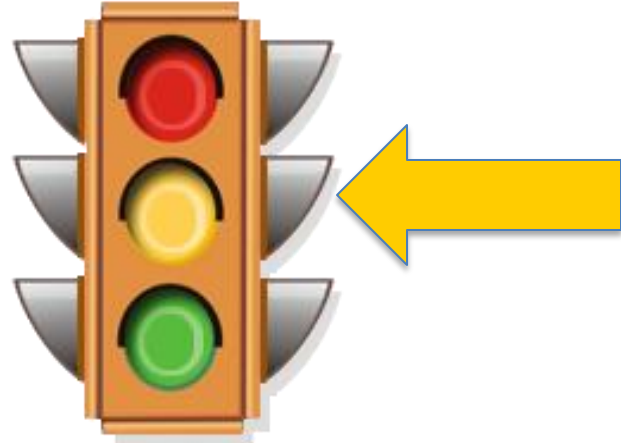
The development of hip displacement and dislocation in children with cerebral palsy (CP) is well documented in the literature [1, 2]. The progression is from a normal hip at birth to a displaced hip as early as 2-3 years [3]. Hip displacement/dislocation and its resulting pain can have a huge negative impact on care-giving, participation, activity, sitting ability and sleep [4, 5]. Management of hip displacement/dislocation primarily involves medication and surgery. Clinically, positioning in lying, sitting, standing and walking is used pre and post hip surgery to address many goals such as participation in activities, self care, sleeping and comfort. The role of positioning for prevention and management of hip displacement and/or dislocation is emerging. The objective of this poster is to illustrate a clinical resource tool that integrates GMFCS levels, ages from infancy to skeletal maturity and positioning interventions. The resource is based on research evidence and expert opinion.

## Research Evidence

As a clinical team we reviewed the evidence of positioning as a treatment approach for the prevention of hip displacement and/or dislocation. Our research question was:

Among children with CP does “positioning” affect the hip development?

The research evidence is insufficient to demonstrate a strong causation between positioning and hip development. This is due to the relatively low numbers of studies, the mostly moderate and weak quality of the studies and the low level of the study designs. The “traffic light” code and state of the evidence classification is yellow [6].



The traffic light designation of yellow is symbolic, indicating insufficient evidence and an ongoing need to measure outcomes.

### Poster References

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## What is the Clinical Implication of the Research?

The information to be gleaned from the research evidence includes the trends and the clinical and/or non statistical effects, both positive and negative. The following trends became apparent:

- Many of the studies had a positive clinical result from the positioning intervention, including a positive result with the migration percentage; however many are not statistically significant.
- Researchers are using hip migration as an outcome measure. It is a valid and reliable outcome measure, indicative of hip location.
- Researchers are frequently positioning the hips in abduction; between 15-30° or as tolerated by the child.
- The dosage or time spent in positioning device(s) has an effect. Positioning is more likely to have positive clinical results when more time is spent using positioning equipment with an abducted hip position.

These trends informed our clinical discussion and development of a clinical resource.

## What is our Expert Opinion?

We identified the following key components to consider when positioning a child with CP GMFCS levels III-V to have a positive impact on hip health:

- early intervention
- dosage
- hip abduction,
- hip external rotation, and;
- Each components should be considered in lying, sitting, standing and walking.

We integrated the research and our expert opinion to develop a clinical tool. The purpose of this tool is to guide clinicians regarding equipment provision for children GMFCS III-V to give them the best hope for prevention of the painful displaced or dislocated hip. Further research is also needed in this area to clarify the efficacy of positioning for hip health.

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

**ABOUT THIS TOOL**

Positioning may play a role in the prevention and management of hip displacement/dislocation in children with cerebral palsy. Gross Motor Function Classification System (GMFCS) [1] levels III-V. Clinical recommendations in this tool are informed by clinical expertise. Recommendations informed by the research evidence are **bolded** with reference(s) in brackets. This tool augments clinical practice and does not replace clinical assessment, judgment and reasoning.

**GUIDING PRINCIPLE:** Aim for symmetry of pelvis, trunk, neck and head in all positions. Change position to encourage motor development and movement.

#### INFANTS: AGES 0-2 YEARS

##### SUPINE

Use positioning pillows, rolls, wedges and positioning devices that hold their shape.

**INFANTS IN SUPINE:** Introduce early, in hospital if possible.

**SUPPORTS:** Laterally at the pelvis, trunk and head, and trough supports under the thighs and calves. Feet may be free or supported. **Avoid asymmetrical lying posture [2].**

**HIP POSITION:** Aim for **hip abduction 15-30° [3]**, hip flexion 10-40° and hip external rotation 5-10°.

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

##### SITTING

Adapt commercially available baby highchairs, strollers, and/or use positioning equipment such as floor siters 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:** Laterally at the pelvis, trunk and head. Shape parent 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:** Use daily as per the infant's tolerance.

##### STANDING

Use a supine, prone or upright standing frame.

**INFANTS IN STANDING:** Introduce standing after 9-10 months of age.

**SUPPORTS:** Head, trunk, upper limbs via a tray, pelvic, knee (via straps above and below), pommel and foot. If needed use tilt to provide support and encourage head control.

**HIP POSITION:** Aim for **15°-40° of hip abduction [4]**, more if tolerated by the infant.

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

##### WALKING

Use a supportive walker.

**INFANTS IN WALKERS:** Introduce walking to children GMFCS II and GMFCS III after 10 months of age.

**SUPPORTS:** Provide support where needed from the head downwards.

**HIP POSITION:** Aim for active range of motion.

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

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**GUIDING PRINCIPLE:** Aim for symmetry of pelvis, trunk, neck and head in all positions. Change position to encourage motor development and movement.

#### CHILDREN: AGES 2-6 YEARS

##### SUPINE

Use positioning pillows, rolls, wedges, padded brackets and positioning devices that hold their shape.

**SUPPORTS:** Laterally at the pelvis, trunk and head, and trough supports under the thighs and calves. Feet may be free or supported.

**HIP POSITION:** Aim for **hip abduction 20° [3,5]** and hip flexion 0-15° and hip external rotation 5-10°.

**DOSAGE:** As per the child's tolerance.

##### SITTING

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 a head control device.

**SUPPORTS:** In the head, trunk, pelvis, thighs and feet. Shape parent 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, free motor activities, interaction and mobility. **30-60 hours per day [2].**

##### STANDING

Continue with standing. Use a supine, prone or upright standing frame.

**SUPPORTS:** Head, trunk, upper limbs via a tray, pelvic, knee (via straps above and below), pommel and foot. If needed use tilt to provide support and encourage head control.

**HIP POSITION:** Aim for **hip abduction 15-30° [4, 6]**. **Avoid 0° hip abduction [7].**

**DOSAGE:** Aim for **60-90 minutes per day [3, 5].**

##### WALKING

Use a walker that has support where the child needs it, i.e. head, trunk, pelvis, upper limbs (via a tray or forearm supports).

**SUPPORTS:** Head, trunk, upper limbs via a tray, pelvic, knee (via straps above and below), pommel and foot. If possible introduce walking with children GMFCS V.

**SUPPORTS:** Provide support where needed from the head downwards, i.e. head, trunk, pelvis, upper limbs (via tray or forearm supports).

**HIP POSITION:** Aim for active range of motion.

**DOSAGE:** As per the child's tolerance.

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

**ABOUT THIS TOOL**

Positioning may play a role in the prevention and management of hip displacement/dislocation in children with cerebral palsy. Gross Motor Function Classification System (GMFCS) [1] levels III-V. Clinical recommendations in this tool are informed by clinical expertise. Recommendations informed by the research evidence are **bolded** with reference(s) in brackets. This tool augments clinical practice and does not replace clinical assessment, judgment and reasoning.

**GUIDING PRINCIPLE:** Aim for symmetry of pelvis, trunk, neck and head in all positions.

#### CHILDREN: AGES 6 TO SKELETAL MATURITY

##### SUPINE

Use positioning pillows, rolls, wedges, padded brackets and/or positioning devices that hold their shape.

**SUPPORTS:** Laterally at the pelvis, trunk and head, and trough supports under the thighs and calves. Feet may be free or supported.

**HIP POSITION:** Aim for **hip abduction 20° [5]**, hip flexion 0-10° and hip external rotation 5-10°.

**DOSAGE:** As per the child's tolerance.

##### SITTING

Continue with sitting equipment secured on wheeled bases.

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

**HIP POSITION:** Aim for **hip abduction 15-30°** as tolerated or within available comfortable passive range of movement; and hip external rotation 5-10°.

**DOSAGE:** As required for feeding, free motor activities, interaction and mobility.

##### STANDING

Continue with standing. Use a supine, prone or upright standing frame.

**SUPPORTS:** Head, trunk, upper limbs via a tray, pelvic, knee (via straps above and below), pommel and foot. If needed use tilt to provide support and encourage head control.

**HIP POSITION:** Aim for **hip abduction 15-30° [6]**. **Avoid 0° hip abduction [7].**

**DOSAGE:** Recommended daily for 60-90 minutes.

##### WALKING

Continue with supported walking with children GMFCS II and III. If possible continue walking with children GMFCS V.

**SUPPORTS:** Head, trunk, upper limbs via a tray, pelvic, knee (via straps above and below), pommel and foot. If needed use tilt to provide support and encourage head control.

**HIP POSITION:** Aim for active range of motion.

**DOSAGE:** As per the child's tolerance.

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

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