



# Cerebral Palsy Clinical Practice Guideline CP-CPG

Developed by Waikato District Health Board, Child Development Centre Therapy Team

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# Contents



## 1. Introduction

### 1.1 Background to the Cerebral Palsy Clinical Practice Guideline (CP-CPG)

The CP-CPG was developed by therapists at the Child Development Centre, Waikato District Health Board, in response to a review of the current services available to the paediatric cerebral palsy (CP) population. Although the prevalence of CP has remained stable over the past 20 years, the way in which these children are managed has changed significantly. The variety of clinical pathways for this heterogeneous population has been identified as a barrier for clinicians working in this area. The CP-CPG was developed as a reference for clinicians to improve consistency in the therapeutic management of cerebral palsy and optimise outcomes for children with CP

### 1.2 Purpose and scope

**The purpose of the CP-CPG is to:**

- 1 Provide a current best practice therapeutic management reference for all Allied Health professionals providing therapy to individuals with cerebral palsy. It aims to support consistent assessment, intervention and follow-up recommendations to help guide therapeutic management for clients with CP.
- 2 Ensure the therapeutic management provided to all paediatric clients with cerebral palsy is evidence based, where possible, and reflects current knowledge.
- 3 Standardise the therapeutic management for paediatric clients with cerebral palsy.
- 4 Provide support to service delivery decision making.
- 5 Be widely and readily available in order to support practitioners.

### Scope of the CP-CPG:

The target population of the CP-CPG is Waikato District Health Board (DHB) residents who have been diagnosed with cerebral palsy or who meet the definition of cerebral palsy. The document is intended to be applicable across the paediatric (0-18 years) cerebral palsy population. Differences in the therapeutic management for different age groups and functional levels are indicated within the document where relevant.

The CP-CPG is intended as a resource that covers the main aspects of therapeutic management of cerebral palsy and the role of the Allied Health professionals providing therapy to individuals with cerebral palsy. There are a range of other professionals that are involved in the management of the child with cerebral palsy such as Paediatricians, Orthopaedic Surgeons and wellchild providers to name a few and these are referenced to where applicable.

### 1.3 Method

Clinical practice guidelines, consensus statements and evidence based practice pertaining to CP were reviewed. In the absence of these, expert opinion and professional consensus have been included. The CP-CPG presents the current practices of clinicians in an effort to facilitate a common approach to client care. Numerous clinicians, primarily from the Child Development Centre, Waikato District Health Board have contributed to the CP-CPG based on their clinical expertise.



# Introduction

## 1.4 Rationale

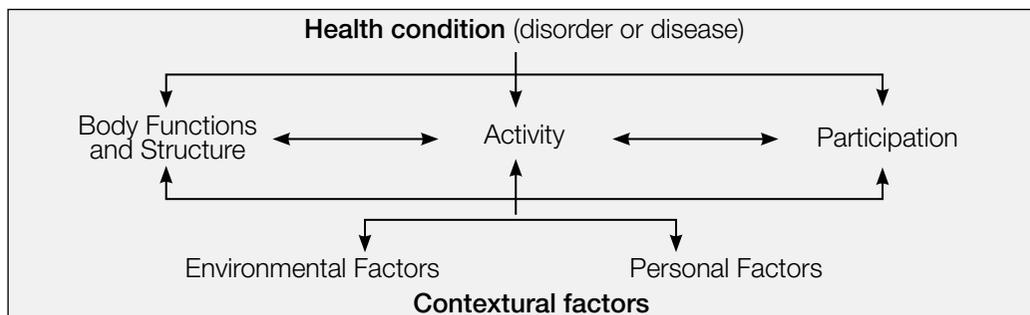
### 1.4.1 Clinical practice guidelines

Clinical practice guidelines (CPGs) are protocols or practice statements that are developed through a consensus process to synthesise evidence in order to formulate specific management recommendations for specific problems (MacDermid, 2008). Although CPGs should be based on research evidence, this is particularly challenging to obtain in rehabilitation practice where there are barriers to conducting high level research; for example clients often require multiple interventions at one point in time limiting the ability to attribute changes to a particular intervention (MacDermid, 2008).

Expert opinion that is based on literature and clinical experience constitutes a form of evidence (Centre for Evidence Based Medicine, 2009). In the absence of experimental data surrounding therapeutic management in a paediatric cerebral palsy population, the CP-CPG synthesises the clinical expertise of clinicians working with this specialised group. Contributions to the CP-CPG are expected to be ongoing as more information becomes available or is updated so that effective and current practices are maintained within this central document. This approach is consistent with literature recommendations that CPGs should be updated every three years to ensure that evidence is current (MacDermid, 2008). In addition, it is recommended that as research evidence becomes available, it should replace or supplement the expert opinions included in the CPG (MacDermid, 2008).

### 1.4.2 International Classification of Functioning, Health and Disability (ICF)

In determining the structure for a tool that organises assessment, intervention and referral for the various health professionals, a number of models were evaluated. After some consideration the International Classification of Functioning, Health and Disability (ICF) was determined to be a suitable framework as it is based on biopsychosocial model, which recognises that individual and/or environmental factors can impact on the therapeutic management of children with CP. As depicted in the ICF, the domains



of the CP-CPG can be categorised under body structures and functions, activity and participation, environmental factors and personal factors.

The ICF provides a suitable framework on which to base the CP-CPG as it addresses both personal and environmental factors in the therapeutic management and uses a language that is recognised by health care professionals internationally.

## 1.5 Cerebral palsy

CP is the most common childhood disability. The overall incidence in the past 20 years has remained relatively stable at 2.0-2.5 per 1000 live births. There is an absence of data in New Zealand however, in a recent report by the cerebral palsy Institute in Australia (2009) the incidence was shown to be 2.0 per 1000 live births. In that cohort 94.7% of the cerebral palsy population acquired it pre/perinatally. Also in that cohort the following findings were reported:

- Maternal age at delivery in this cohort is comparable to that of the Australian population
- Males are at a higher risk of developing cerebral palsy. 56.4% of the cohort were male
- 41.5% of cerebral palsy births were premature (<37 weeks gestation). This is in contrast to the Australian population where 7.9% of all births were premature
- 42.5% of infants with cerebral palsy were born at a low birth weight (<2500g). In comparison, low birth weight in the Australian population was present in 6.3% live births.
- 11.1% of those with cerebral palsy were from a multiple birth. In the Australian population multiple births account for 1.7% of all births
- Spasticity was the most predominant motor type of cerebral palsy (85.9%)
- Over 28% of Australian children with cerebral palsy cannot walk. Another 11% require a walking frame or sticks to walk.

In a recent Swedish study ('Speech problems affect more than one in two children with cerebral palsy: Swedish population-based study' 2012, Nordberg et al) speech disorders were found in 21% of the 129 children and were present in all types of CP, and a further 32% were nonverbal. The remaining 47% had no speech disorders.

- 41% of the children with speech disorders also had lower intellectual function
- 42% were able to walk independently.
- Brain maldevelopment and basal ganglia lesions were found to be most common in the non-verbal group.

- 90% of the children with unilateral spastic CP had normal or understandable speech
- 97% of the children with dyskinetic CP had severely impaired or no speech.
- The children's speech ability was associated with type of CP, gross motor function and cognitive level.

A NZ CP register is currently in the development stage; once established it will provide NZ-based data.

### 1.5.2 Definition of cerebral palsy

"Cerebral palsy (CP) describes a group of disorders of the development of movement and posture, causing activity limitation, that are attributed to non-progressive disturbances that occurred in the developing fetal or infant brain. The motor disorders of cerebral palsy are often accompanied by disturbances of sensation, cognition, communication, perception, and/or behaviour, and/or by a seizure disorder".

Executive Committee for the Definition of Cerebral Palsy: Martin Bax DM FRCP, Murray Goldstein DO, Peter Rosenbaum MD, Alan Leviton MD, Nigel Paneth MD (2005, 2009).

### 1.5.3 Types of cerebral palsy

There are three main types of movement disorders in cerebral palsy, which can co-exist. These are:

- Spasticity – where affected muscles have an increased resistance to passive movement which causes stiffness and jerky movement.
- Dyskinesia – variable involuntary movement e.g. dystonia or athetosis
- Ataxia – incoordination with unsteady movements and tremor

Cerebral palsy can also be described according to the part of the body it affects:

- Hemiplegia - the leg and arm on one side of the body are affected.
- Diplegia - both legs are affected significantly more than the arms. People with diplegia may have some clumsiness with their hand movements.
- Quadriplegia - both arms and legs are affected. The muscles of the trunk, face and mouth can also be affected.

### 1.5.4 Communication skills in different types of cerebral palsy:-

Spastic cerebral palsy - children with spastic diplegia and mild-moderate spastic

quadriplegia may develop speech skills quite early on.

- Articulation is normally quite good but they often have dysphonia secondary to a disorder of breathing.
- Children with more severe spastic quadriplegia may have problems with all speech subsystems.
- As they get older, children with spastic diplegia or quadriplegia spend increasing amounts of time in fixed positions and may develop contractures and deformities which may lead to a regression in speech skills, particularly effecting loudness, resonance (increasing hypernasality) and voice quality. This regression can be particularly noticeable during times of rapid growth for the child.
- Speech errors may include omissions, vowel errors, substitutions and nasalization errors.

Ataxic Cerebral palsy - children may attain speech motor skills along normal developmental lines.

- Speech tends to be intelligible but there may be problems with speech rate, and timing. Articulatory distortions may also occur.
- Speech production tends to improve as the child gets older but the above types of speech difficulties mentioned may persist to some extent.

Dyskinetic cerebral palsy - these children tend to demonstrate severe oral motor involvement from birth.

- Some are limited to using just vowel production for the first 18-24 months. There may be significant problems with co-ordinating movements of the vocal tract, and their sound system may be very limited.
- Typically late to speak.
- Receptive language may be significantly better than verbal skills therefore these children may particularly benefit from early introduction of Alternative and Augmentative Communication (AAC).
- As they gain body weight, stability and more oral motor control, some children may develop functional verbal communication. This can occur as late as puberty to early adult years.

# Introduction

# Introduction

## 1.6 Gross Motor Function Classification System (GMFCS)

The GMFCS is a five level classification system that describes the gross motor function of children and youth with cerebral palsy on the basis of their self-initiated movement with particular emphasis on sitting, walking, and wheeled mobility. Distinctions between levels are based on functional abilities, the need for assistive technology, including hand-held mobility devices (walkers, crutches, or canes) or wheeled mobility, and to a much lesser extent, quality of movement. (Palisano et al. 1997, Palisano et al. 2008). Since classification of motor function is dependent on age, separate descriptions are provided for several age bands within each level. The age ranges described are as follows: before 2nd birthday, from age 2nd to 4th birthday, from age 4th to 6th birthday and from 6th to 12th birthday, and from 12th to 18th birthday. Emphasis is on what they do (usual performance in home, school, and community settings), rather than what they are known to be able to do at their best (capability). Both the original GMFCS (Palisano et al. 1997) and the new GMFCS: Expanded and Revised (GMFCS-E & R) (Palisano et al. 2008) can be downloaded free of charge from the website [www.canchild.ca](http://www.canchild.ca)

## 1.7 Classification of communication impairment in children with cerebral palsy

The Communication Function Classification System (CFCS) has been developed to “classify the everyday communication performance of individuals with cerebral palsy into one of five levels”. Hidecker et al, The Communication Function Classification System (CFCS)[Online] Retrieved from <http://faculty.uca.edu/mjchidecker/CFCS/index.html> [Accessed 10.01.13]

Within the Communication Matrix the CFCS level has been used to guide practitioners to relevant assessment and treatment considerations. When appropriate indications of age ranges have also been noted.

## 1.8 Classification of manual ability in children with cerebral palsy

The Manual Ability Classification System (MACS) for children aged 4-18 years describes how children with cerebral palsy use their hands to handle objects in daily

activities. The MACS describes five levels based on the child’s self-initiated ability to handle objects and their need for assistance or adaptation to perform manual activities in everyday life. The MACS can be downloaded free of charge at: [www.macs.nu/](http://www.macs.nu/) The MACS level is used in the Upper Limb Intervention matrix.

## 1.9 Use of the CP-CPG

The clinical practice guideline for the therapeutic management of clients with CP was categorised into three domains which reflect those used in the ICF. The fourth domain – personal factors, overarches all levels of the CPG and is represented throughout. Within the three domains there are broad categories of clinical areas described, where therapeutic intervention is required. Matrices are provided for specific clinical areas. Each clinical area or matrix is further refined by the use of the GMFCS, MACS or CFCS. Age ranges are specified within matrices as applicable.

Each matrix contains a description of the clinical presentation and/or assessment findings, and provides intervention strategies, equipment provision (if relevant) and recommendations for referral or follow up.

Example of Domain, Clinical Area, GMFCS, age.

Domain = Body Structure and Function

↳ Clinical Area = Mobility

↳ GMFCS = Level V

Age = 6-12

- Assessment
- Intervention and equipment
- Referral / Key Resources & References (if any)

Throughout the CPG, use of an asterisk (\*) denotes a definition which is further explained in section 10.0 Definitions.

The three CP-CPG domains are described here:

Body structure and function are components of a person that are typically expected to be similar across individuals. Body structures are defined as “anatomical parts of the body such as organs, limbs, and their components” (WHO, 2002, p. 10) and

body functions are defined as “the physiological functions of the body systems, including psychological functions” (WHO, 2002, p. 10). Problems experienced by clients may arise when these structures and functions develop atypically. Clinical areas with matrices described in this domain are: Musculoskeletal lower limb, upper limb intervention, communication and feeding.

Activities and participation describe the degree to which an individual is able to engage in pursuits within their specific context (environment). Activities pertain to the individual level of functioning and are defined as “the execution of a task or action...” (WHO, 2007, p. 229). Participation refers to the societal level of functioning and encompasses “involvement in a life situation” (WHO, 2007, p. xvi). Clinical areas with matrices described in this domain are: Mobility, and community access.

Environmental factors are those which exist externally to the individual. They make up “the physical, social, and attitudinal environments in which people live and conduct their lives” (WHO, 2007, p. xvi). Clinical areas with matrices described in this domain are equipment and housing and Interpersonal Interactions.

The fourth domain over arches all levels of the CPG: “Personal factors are contextual factors that relate to the individual, such as age, gender, social status, [and] life experiences...” (WHO, 2007, p. 229).

## 1.10 Review of the CP-CPG

It is intended that the CP-CPG be formally reviewed every 2 years to include changes that may arise from new evidence, changes to practice and changes to external agencies or services.

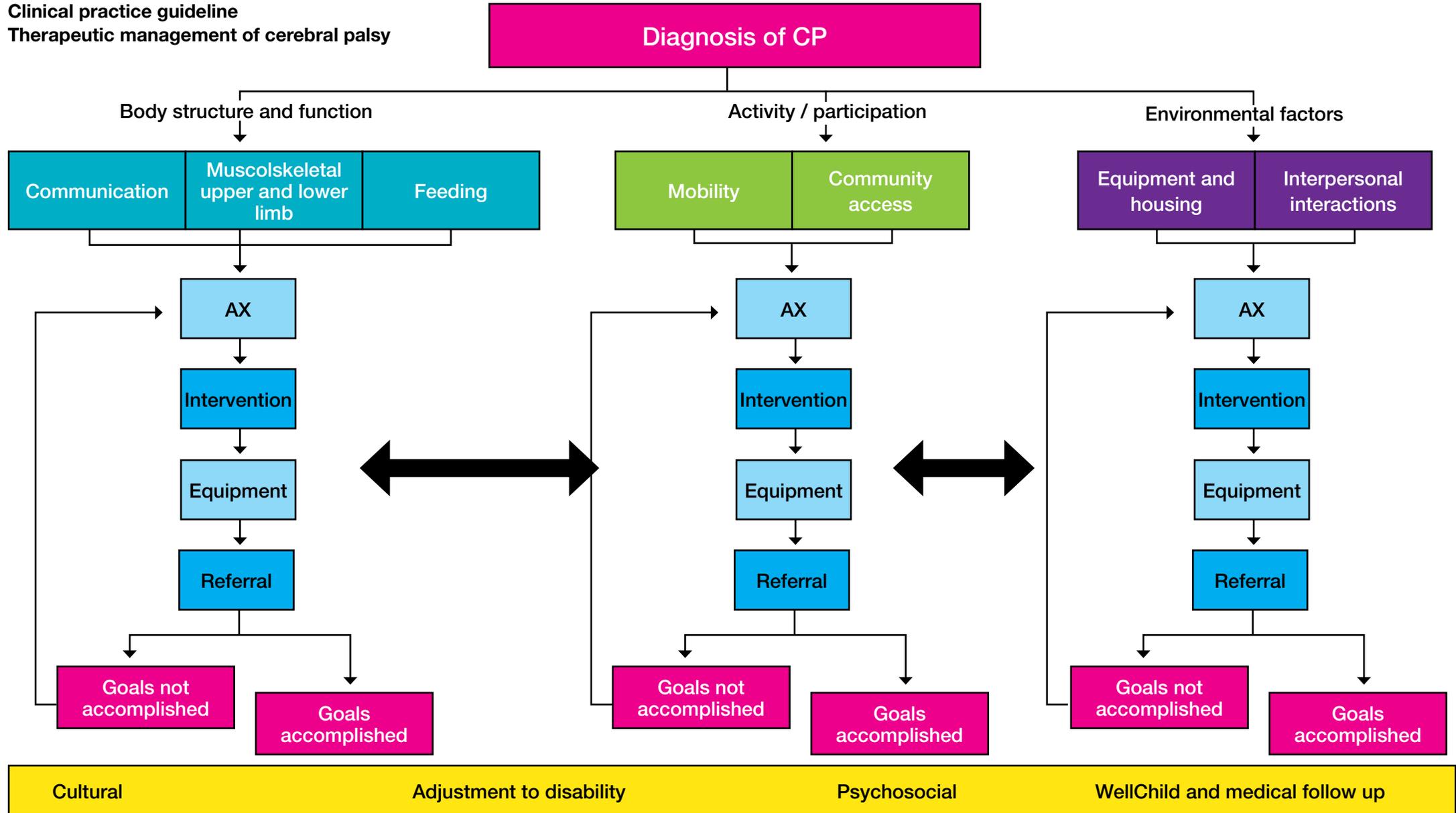
## CP CPG Contributors

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Stephanie Hessel	Visiting Neurodevelopmental Therapist
Victoria Blair	Physiotherapist

# Introduction

# Introduction

Clinical practice guideline  
Therapeutic management of cerebral palsy



## Assessment

## Intervention and equipment

## Referral / resources

Alberta Infant Motor Scale (AIMS)\*

Gross Motor Function Measure (GMFM)\*

Functional Mobility Scale (FMS)\*

Peabody Developmental Motor Scale 2nd edition (PDMS-2)\*

Bayley Scale of Infant and Toddler Development 3rd edition (BSID III)\*

Winters' Classification of hemiplegia\*

**Musculoskeletal management**

- See musculoskeletal matrix

**Positioning for play** i.e. tummy time, half kneel, standing at furniture.

Weight bearing through upper limbs, hips and knees through use of various positions (4 pt kneeling, high kneeling, propping) and use of equipment (wedges, tables, H stools).

**Neurodevelopmental therapy (NDT) theoretical framework**

As the child ages then therapy should be functional and goal-directed. Strategies such as treadmill training can be used to assist with achieving goals around walking.

**Trolley ten months – two years**

Encourage children into a standing position at developmentally appropriate level.

Considerations for trolleys:

- Height of hand support provided by the trolley
- Stability of trolley
- Distance between child and trolley to enable appropriate gait pattern and stability

Generally commercially available “baby walkers” and jolly jumpers are not recommended.

VNT loan equipment pool can be accessed for a range of equipment

Therapists new to this area are recommended to attend an introduction/intermediate paediatric NDT course (NZ Bobath Association [www.bobath.org.nz](http://www.bobath.org.nz))

<http://kidshealth.schn.health.nsw.gov.au/sites/kidshealth.schn.health.nsw.gov.au/files/safety-factsheets/jolly-jumpers.pdf>

<http://kidshealth.schn.health.nsw.gov.au/sites/kidshealth.schn.health.nsw.gov.au/files/safety-factsheets/baby-walkers.pdf>

# 2.1 Mobility – GMFCS I

## 0 - 2 years

Infants maintain floor sitting but may need to use their hands for support to maintain their balance. Infants creep on their stomach or crawl on hands and knees. Infants may pull to stand and take steps holding onto furniture (GMFCS E&R, 2007)

### Assessment

**Alberta Infant Motor Scale (AIMS)\***

**Gross Motor Function Measure (GMFM)\***

**Peabody Developmental Motor Scale 2nd edition (PDMS-2)\***

**Bayley Scale of Infant and Toddler Development 3rd edition (BSID III)\***

### Intervention and equipment

#### Musculoskeletal management

- See musculoskeletal matrix

#### Positioning for play

i.e. tummy time, half kneel, standing at furniture. Weight bearing through upper limbs, hips and knees through use of various positions (4 pt kneeling, high kneeling, propping) and use of equipment (wedges, tables, H stools).

Neurodevelopmental therapy (NDT) theoretical framework

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### Referral / resources

VNT loan equipment can be accessed for a range of equipment

Therapists new to this area are recommended to attend an introduction/intermediate paediatric NDT course (NZ Bobath Association [www.bobath.org.nz](http://www.bobath.org.nz))

<http://kidshealth.schn.health.nsw.gov.au/sites/kidshealth.schn.health.nsw.gov.au/files/safety-factsheets/jolly-jumpers.pdf>  
<http://kidshealth.schn.health.nsw.gov.au/sites/kidshealth.schn.health.nsw.gov.au/files/safety-factsheets/baby-walkers.pdf>

# 2.2 Mobility – GMFCS II

# 2.2 Mobility – GMFCS II

## 0 - 2 years

### Assessment

### Intervention and equipment

### Referral / resources

#### Walker

Assess the environments that the child will be using the walking aid in as this will determine the style of frame i.e. do they need to access tables etc at preschool. Safety issues should also be considered i.e. using walking aid on ramps.

Considerations for walkers

- Posture
- Braking system
- Posterior vs. anterior.
- Handle type
- Height
- Wheel type (castors, fixed, stoppers)

Common options include:

- Tiny Tot – Tubular Equipment
- Kaye Walker – Medix 21
- Crocodile – Euromedical

#### Shoes

Usually shoes are the first option for providing foot and ankle stability when beginning to pull to stand, cruise and walk. With increasing complexity, stock boots and orthoses may be required but would not be indicated prior to active standing. This requires assessment of range of motion (ROM) and foot position in standing to determine what level of footwear/orthoses is required.

All children are typically wearing shoes from 8-12 months of age and parents require education on the shoe features when their child has cerebral palsy (CP).

Shoe features to consider:

- Shoes need to be correctly fitting
- Laces/Velcro with wide opening
- Heel counter needs to be stable
- Some flexibility through the long arch of shoe

Funding for families is sometimes available through the Physiotherapy Service at CDC (via the Elios Trust) where there is difficulty sourcing appropriate footwear.

If walking aids are indicated then an Enable assessor in Walking & Standing accreditation is required

[www.disabilityfunding.co.nz](http://www.disabilityfunding.co.nz)

Request to physiotherapy for shoe voucher.

## 0 - 2 years

### Assessment

### Intervention and equipment

### Referral / resources

#### Stock boots

Used to provide stability through the ankle region. Can be too heavy for some children. Ensure that the foot can be positioned appropriately within the boot. Try Stock boots prior to AFO use as these may be sufficient.

Features:

- High ankle support
- Rigid materials
- Maximum stability in heel counter



#### Orthoses

Used to prevent contractures, optimise joint alignment, provide a stable base, assist with biomechanics of gait and reduce energy expenditure. Ensure the child has adequate range of motion (ROM) in the ankle plantarflexors prior to prescription to comfortably position in the ankle foot orthoses\* (AFO). The child must have full knee extension before considering a hinged AFO.

Common options include:

- Rigid AFO
- Hinged AFO

#### Orthotic Centre

A new referral is made by a specialist (Orthopaedic, Medical) to this service. Additional referrals can be made by the primary therapist.

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A new referral is made by a specialist (Orthopaedic, Medical) to this service. Additional referrals can be made by the primary therapist.

Refer to "Orthotic management of children with cerebral palsy" to determine rationale behind prescription.

# 2.2 Mobility – GMFCS II

# 2.2 Mobility – GMFCS II

## 2 - 4 years

Children floor sit but may have difficulty with balance when both hands are free to manipulate objects. Movements in and out of sitting are performed without adult assistance. Children pull to stand on a stable surface. Children crawl on hands and knees with a reciprocal pattern, cruise holding onto furniture and walk using an assistive mobility device as preferred methods of mobility (GMFCS E&R, 2007)

Assessment	Intervention and equipment	Referral / resources
<p><b>Gross Motor Function Measure (GMFM)*</b></p> <p><b>Functional Mobility Scale (FMS)*</b></p> <p><b>Peabody Developmental Motor Scale 2nd edition (PDMS-2*)</b></p> <p><b>Bayley Scale of Infant and Toddler Development 3rd edition (BSID III)*</b></p> <p><b>Winters' Classification of Hemiplegia*</b></p> <p><b>Gait Patterns in Spastic Diplegia*</b></p> <p><b>Timed 10 meter walk test</b></p> <p><b>Modified Timed Up and Go</b></p>	<p><b>Musculoskeletal management</b></p> <ul style="list-style-type: none"> <li>• See musculoskeletal matrix</li> </ul> <p><b>Functional, goal-directed approach to mobility through Activities of Daily Living (ADL's) and community activities</b></p> <ul style="list-style-type: none"> <li>• Stair practice</li> <li>• Mobility on various surfaces including treadmill training as appropriate</li> <li>• Sit to stand with a stable surface</li> </ul> <p>Treadmill training may be appropriate using the handrails and/or therapist facilitation</p> <p><b>Walking aid</b></p> <p>Assess the environments that the child will be using the walking aid in as this will determine the style of frame i.e. do they need to access tables etc at preschool. Safety issues should also be considered i.e. using walking aid on ramps.</p> <p>Common options include:</p> <ul style="list-style-type: none"> <li>• Tiny Tot – Tubular Equipment</li> <li>• Kaye Walker – Medix 21</li> <li>• Crocodile – Euromedical</li> <li>• Nurmi Neo – Allied Medical</li> </ul> <p>Considerations:</p> <ul style="list-style-type: none"> <li>• Posture</li> <li>• Handle type</li> <li>• Braking system</li> <li>• Height</li> <li>• Wheel type (castors, fixed, stoppers)</li> <li>• Posterior vs. anterior. Posture and energy efficiency usually enhanced with posterior walker.</li> </ul>	<p>Treadmill training generally accessed in the CDC gym with the paediatric treadmill. If considering other community-based treadmills, check the slowest speed and height of handrails.</p> <p>If walking aids are indicated then an Enable assessor in Walking &amp; Standing accreditation is required <a href="http://www.disabilityfunding.co.nz">www.disabilityfunding.co.nz</a></p>

## 2 - 4 years

### Assessment

### Intervention and equipment

### Referral / resources

#### Shoes

Usually shoes are the first option for providing foot stability. With increasing complexity, stock boots and orthoses may be required. This requires assessment of range of motion (ROM) and foot position in standing to determine what level of footwear/orthoses is required.

All children are typically wearing shoes from 8-12 months of age and parents require education on the shoe features when their child has cerebral palsy (CP).

Shoe features to consider:

- Shoes need to be correctly fitting
- Laces/Velcro with wide opening
- Heel counter needs to be stable
- Some flexibility through the long arch of shoe

Funding for families is sometimes available through the physiotherapy service at CDC (via the Elios Trust) where there is difficulty sourcing appropriate footwear.

#### Stock boots

Used to provide stability through the ankle region. Can be too heavy for some children. Ensure that the foot can be positioned appropriately within the boot. Try Stock boots prior to AFO use as these may be sufficient.

Features:

- High ankle support
- Rigid materials
- Maximum stability in heel counter



Request to physiotherapy for shoe voucher.

#### Orthotic centre

A new referral is made by a specialist (orthopaedic, medical) to this service. Additional referrals can be made by the primary therapist.

# 2.2 Mobility – GMFCS II

# 2.2 Mobility – GMFCS II

## 2 - 4 years

### Assessment

### Intervention and equipment

### Referral / resources

#### Orthoses

Used to prevent contractures, optimise joint alignment, provide a stable base, assists with biomechanics of gait and reduces energy expenditure. Ensure the child has adequate range of movement in the ankle plantorflexors prior to prescription to comfortably position in the AFO\*. The child must have full knee extension before considering a hinged AFO.

Common options include:

- Rigid AFO
- Hinged AFO

#### Winters Type I Hemiplegia

Posterior Leaf Spring

Hinged AFO with plantar flexion stop

#### Winters Type II Hemiplegia

Rigid AFO

#### Winters III and IV

Orthotic management is usually done in conjunction with Orthopaedic Surgery therefore a team approach for individualised management is required.

#### Orthotic centre

A new referral is made by a specialist (Orthopaedic, Medical) to this service. Additional referrals can be made by the primary therapist.

Refer to “Orthotic management of children with cerebral palsy” to determine rationale behind prescription.

## 4 - 6 years

Children sit in a chair with both hands free to manipulate objects. Children move from the floor to standing and from chair sitting to standing but often require a stable surface to push or pull up with their arms. Children walk without the need for a hand held mobility device indoors and for short distances on level surfaces outdoors. Children climb stairs holding onto a railing but are unable to run or jump (GMFCS E&R, 2007)

Assessment	Intervention and equipment	Referral / resources
<p><b>Gross Motor Function Measure (GMFM)*</b></p> <p><b>Functional Mobility Scale (FMS)*</b></p> <p><b>Peabody Developmental Motor Scale 2nd edition (PDMS-2)*</b></p> <p><b>Winters' Classification of Hemiplegia*</b></p> <p><b>Gait Patterns in Spastic Diplegia*</b></p> <p><b>Timed 10 meter walk test</b></p> <p><b>Modified Timed Up and Go</b></p> <p><b>Timed stairs test</b></p>	<p><b>Musculoskeletal management</b></p> <ul style="list-style-type: none"> <li>• See musculoskeletal matrix</li> </ul> <p><b>Functional, goal-directed approach to mobility through ADLs and community activities</b></p> <ul style="list-style-type: none"> <li>• Stair practice</li> <li>• Mobility on various surfaces</li> </ul> <p>Treadmill training</p> <p>Outdoor mobility practice</p> <p><b>Walking aid for distance mobility</b></p> <p>Assess the environments that the child will be using the walking aid in as this will determine the style of frame. Safety issues should also be considered i.e. using walking aid on ramps.</p> <p>Common options:</p> <ul style="list-style-type: none"> <li>• Elbow crutches</li> <li>• Kaye Posterior Walker</li> <li>• Nurmi Neo – Allied Medical</li> <li>• Crocodile - Euromedical</li> <li>• Junior Rollator – Tubular Mobility</li> </ul> <p>Considerations:</p> <ul style="list-style-type: none"> <li>• Posture</li> <li>• Handle type</li> <li>• Braking system</li> <li>• Height</li> <li>• Wheel type (castors, fixed, stoppers)</li> <li>• Posterior vs. anterior</li> </ul>	<p>Treadmill training generally accessed in the CDC gym with the paediatric treadmill. If considering other community-based treadmills, check the slowest speed and height of handrails.</p> <p>If walking aids are indicated then an Enable assessor in walking and standing accreditation is required.</p> <p><a href="http://www.disabilityfunding.co.nz">www.disabilityfunding.co.nz</a></p>

# 2.2 Mobility – GMFCS II

# 2.2 Mobility – GMFCS II

## 4 - 6 years

### Assessment

### Intervention and equipment

### Referral / resources

#### Shoes

Considerations:

- Laces/Velcro with wide opening
- Heel counter needs to be stable
- Some flexibility through the long arch of shoe
- Ability to accommodate AFO

Funding for families is sometimes available through the physiotherapy service at CDC (via the Elios Trust) where there is difficulty sourcing appropriate footwear.

#### Orthoses

Used to prevent contractures, optimise joint alignment, provide a stable base, assists with biomechanics of gait and reduces energy expenditure

Ensure the child has adequate range of movement in the ankle plantar flexors prior to prescription to comfortably position in the AFO\*. The child must have full knee extension before considering a hinged AFO.

Common options include:

- Rigid AFO
- Hinged AFO
- Posterior Leaf Spring
- Dynamic AFO

Request to physiotherapy for shoe voucher.

#### Orthotic centre

A new referral is made by a specialist (Orthopaedic, Medical) to this service. Additional referrals can be made by the primary therapist.

Refer to “Orthotic management of children with cerebral palsy” to determine rationale behind prescription.

## 6 - 12 years

Children walk in most settings. Children may experience difficulty walking long distances and balancing on uneven terrain, inclines, in crowded areas, confined spaces or when carrying objects. Children walk up and down stairs holding onto a railing or with physical assistance if there is no railing. Outdoors and in the community, children may walk with physical assistance, a hand held mobility device, or use wheeled mobility when travelling long distances. Children have at best only minimal ability to perform gross motor skills such as running and jumping. Limitations in walking may necessitate adaptations to enable participation in physical activities and sport (GMFCS E&R, 2007)

Assessment	Intervention and equipment	Referral / resources
<p><b>Gross Motor Function Measure (GMFM)*</b></p> <p><b>Functional Mobility Scale (FMS)*</b></p> <p><b>Winters' Classification of Hemiplegia*</b></p> <p><b>Gait Patterns in Spastic Diplegia*</b></p> <p><b>Timed 10 meter walk test</b></p> <p><b>Six-minute Walk test</b></p> <p><b>Modified Timed Up and Go</b></p> <p><b>Timed stairs test</b></p>	<p><b>Musculoskeletal management</b></p> <ul style="list-style-type: none"> <li>• See musculoskeletal matrix</li> </ul> <p>Functional training or task oriented training i.e. sit to stand, climbing stairs, walking, transfers</p> <p>Treadmill training to train walking endurance including inclines</p> <p>Outdoor mobility practice</p> <p><b>Walking aid for distance mobility</b></p> <p>Assess the environments that the child will be using the walking aid in as this will determine the style of walking aid. Safety issues should also be considered i.e. using walking aid on ramps.</p> <p>Common options:</p> <ul style="list-style-type: none"> <li>• Elbow crutches</li> <li>• Quad sticks</li> <li>• Kaye Posterior Walker</li> <li>• Nurmi Neo – Allied Medical</li> <li>• Junior Rollator</li> </ul> <p>Considerations:</p> <ul style="list-style-type: none"> <li>• Posture</li> <li>• Handle type</li> <li>• Braking system</li> <li>• Height</li> <li>• Wheel type (castors, fixed, stoppers)</li> <li>• Posterior vs. anterior</li> </ul>	<p>If walking aids are indicated then an Enable assessor in walking and standing accreditation is required.</p> <p><a href="http://www.disabilityfunding.co.nz">www.disabilityfunding.co.nz</a></p>

# 2.2 Mobility – GMFCS II

# 2.2 Mobility – GMFCS II

## 6 - 12 years

### Assessment

### Intervention and equipment

### Referral / resources

#### Seated mobility for long distances

Considerations:

- Seat depth and width
- Footplate height
- Cushion
- Attendant handles
- Ability to transport
- Brake system
- Wheel type
- Availability of equipment in Enable store

Common options include:

- Action 3 – Invacare
- Karma – Allied Medical

#### Orthoses

Used to prevent contractures, optimise joint alignment, provide a stable base, assists with biomechanics of gait and reduces energy expenditure. Ensure the child has adequate range of movement in the ankle plantar flexors prior to prescription to comfortably position in the AFO\*. The child must have full knee extension before considering a hinged AFO.

Common options include:

- Rigid AFO
- Posterior Leaf Spring
- Hinged AFO
- Dynamic AFO

#### Shoes

Considerations:

- Laces/Velcro with wide opening
- Heel counter needs to be stable
- Some flexibility through the long arch of shoe
- Ability to accommodate AFO

Funding for families is sometimes available through the physiotherapy service at CDC (via the Elios Trust) where there is difficulty sourcing appropriate footwear.

Refer to the Wheeled Mobility and Postural Management Competency Framework to decide the appropriate service for the child.

Level 1 – CDC (Hamilton/Thames area) or community OT (other areas)

#### Orthotic centre

A new referral is made by a specialist (Orthopaedic, Medical) to this service. Additional referrals can be made by the primary therapist.

Refer to “Orthotic management of children with cerebral palsy” to determine rationale behind prescription.

Request to physiotherapy for shoe voucher.

# 12 - 18 years

Youth walk in most settings. Environmental factors (such as uneven terrain, inclines, long distances, time demands, weather, and peer acceptability) and personal preference influence mobility choices. At school or work, youth may walk using a hand held mobility device for safety. Outdoors and in the community, youth may use wheeled mobility when travelling long distances. Youth walk up and down stairs holding a railing or with physical assistance if there is no railing. Limitations in performance of gross motor skills necessitate adaptations to enable participation in physical activities and sports (GMFCS E&R, 2007)

Assessment	Intervention and equipment	Referral / resources
<p><b>Gross Motor Function Measure (GMFM)*</b></p> <p><b>Functional Mobility Scale (FMS)*</b></p> <p><b>Winters' Classification of Hemiplegia*</b></p> <p><b>Gait Patterns in Spastic Diplegia*</b></p> <p><b>Timed 10 meter walk test</b></p> <p><b>Six-minute Walk test</b></p> <p><b>Modified Timed Up and Go</b></p> <p><b>Timed stairs test</b></p>	<p><b>Musculoskeletal management</b></p> <ul style="list-style-type: none"> <li>• see musculoskeletal matrix</li> </ul> <p>Functional training or task oriented training i.e. sit to stand, climbing stairs, walking, treadmill training</p> <p>Outdoor mobility practice</p> <p><b>Walking aid for distance mobility</b></p> <p>Assess the environments that the young person will be using the walking aid in as this will determine the style of frame. Safety issues should also be considered i.e. using walking aid on ramps.</p> <p>Common options:</p> <ul style="list-style-type: none"> <li>• Elbow crutches</li> <li>• Kaye Posterior Walker</li> <li>• Nurmi Neo – Allied Medical</li> </ul> <p>Considerations:</p> <ul style="list-style-type: none"> <li>• Posture</li> <li>• Braking system</li> <li>• Posterior vs. anterior</li> <li>• Handle type</li> <li>• Height</li> <li>• Wheel type (castors, fixed, stoppers)</li> </ul> <hr/> <p><b>Seated mobility for long distances</b></p> <p>Considerations:</p> <ul style="list-style-type: none"> <li>• Seat depth and width</li> <li>• Ability to transport</li> <li>• Footplate height</li> <li>• Brake system</li> <li>• Cushion</li> <li>• Wheel type</li> <li>• Attendant handles</li> </ul>	<p>If walking aids are indicated then an Enable assessor in walking and standing accreditation is required.</p> <p><a href="http://www.disabilityfunding.co.nz">www.disabilityfunding.co.nz</a></p> <hr/> <p>Refer to the Wheeled Mobility and Postural Management Competency Framework to decide the appropriate service for the child.</p> <p>Level 1 – CDC or community OT</p>

## 2.2 Mobility – GMFCS II

# 2.2 Mobility – GMFCS II

## 12 - 18 years

### Assessment

### Intervention and equipment

### Referral / resources

#### Orthoses

Used to prevent contractures, joint alignment, provide a stable base, assists with biomechanics of gait and reduces energy expenditure. Ensure the child has adequate range of movement in the ankle plantar flexors prior to prescription to comfortably position in the AFO\*. The child must have full knee extension before considering a hinged AFO.

Common options include:

- Rigid AFO
- Hinged AFO
- Posterior Leaf Spring
- Dynamic AFO

#### Shoes

Considerations:

- Laces / velcro with wide opening
- Heel counter needs to be stable
- Some flexibility through the long arch of shoe
- Ability to accommodate AFO

Funding for families is sometimes available through the Physiotherapy Service at CDC (via the Elios Trust) where there is difficulty sourcing appropriate footwear.

#### Orthotic centre

A new referral is made by a specialist (Orthopaedic, Medical) to this service. Additional referrals can be made by the primary therapist.

Refer to “Orthotic management of children with cerebral palsy” to determine rationale behind prescription.

Request to physiotherapy for shoe voucher.

## 0 - 2 years

Infants maintain floor sitting when the low back is supported. Infants roll and creep on their stomachs. (GMFCS E&R, 2007)

Assessments	Intervention and equipment	Referral / resources
<p><b>Alberta Infant Motor Scale (AIMS)*</b></p> <p><b>Gross Motor Function Measure (GMFM)*</b></p> <p><b>Peabody Developmental Motor Scale 2nd edition (PDMS-2)*</b></p> <p><b>Bayley Scale of Infant and Toddler Development 3rd edition (BSID III)*</b></p>	<p><b>Musculoskeletal management</b></p> <ul style="list-style-type: none"><li>• See musculoskeletal matrix</li></ul> <p>Maximise functional change specific to lower limb and trunk control</p> <p>Weight bearing through upper limbs, hips and knees through use of various positions (4 pt kneeling, high kneeling, propping) and use of equipment (wedges, tables, H stools).</p> <p>Neurodevelopmental therapy (NDT) theoretical framework (Please see additional literature specific to NDT.)</p> <hr/> <p><b>Seated mobility</b></p> <p>Considerations:</p> <ul style="list-style-type: none"><li>• Pelvic and trunk support</li><li>• +/- pommel</li><li>• Tilt/recline</li><li>• Parental ease of use</li><li>• Seat profile</li><li>• Availability of equipment in the Enable Store</li></ul> <p>Common options include:</p> <p>Shuttle – Medifab</p> <p>Kimba – Allied Medical</p>	<p>VNT loan equipment can be accessed.</p> <p>Therapists new to this area are recommended to attend an introduction or intermediate paediatric NDT course (NZ Bobath Association <a href="http://www.bobath.org.nz">www.bobath.org.nz</a>)</p> <hr/> <p>Refer to the Wheeled Mobility and Postural Management Competency Framework to decide the appropriate service for the child.</p> <p>Level 1 – CDC VNT/OT</p> <p>Level 2 – Seating to Go <a href="http://www.seatingtogo.co.nz">www.seatingtogo.co.nz</a></p>

# 2.3 Mobility – GMFCS III

# 2.3 Mobility – GMFCS III

## 0 - 2 years

### Assessments

### Intervention and equipment

### Referral / resources

#### Shoes

Usually shoes are the first option for providing foot stability when beginning to pull to stand, cruise and walk. With increasing complexity, stock boots and orthoses may be required but would not be indicated prior to active standing. This requires assessment of range of motion (ROM) and foot position in standing to determine what level of footwear/orthoses is required.

All children are typically wearing shoes from 8-12 months of age and parents require education on the shoe features when their child has Cerebral Palsy (CP).

Shoe features to consider:

- Laces/velcro with wide opening
- Heel counter needs to be stable
- Some flexibility through the long arch of shoe
- Ability to accommodate AFO if required

Funding for families is sometimes available through the physiotherapy service at CDC (via the Elios Trust) where there is difficulty sourcing appropriate footwear.

#### Stock boots

Used to provide stability through the ankle region. Can be too heavy for some children. Ensure that the foot can be positioned appropriately within the boot. Try Stock boots prior to AFO\* use as these may be sufficient.

Features:

- High ankle support
- Rigid materials
- Maximum stability in heel counter



Request to physiotherapy for shoe voucher.

#### Orthotic centre

A new referral is made by a specialist (orthopaedic, medical) to this service. Additional referrals can be made by the primary therapist.

## 0 - 2 years

### Assessments

### Intervention and equipment

### Referral / resources

#### Orthoses

Used to prevent contractures, optimise joint alignment, provide a stable base, assists with biomechanics of gait and reduces energy expenditure. Ensure the child has adequate range of motion (ROM) in the ankle plantorflexors prior to prescription to comfortably position in the ankle foot orthoses (AFO\*). The child must have full knee extension before considering a hinged AFO.

Common options include:

- Rigid AFO
- Hinged AFO

#### Orthotic centre

A new referral is made by a specialist (orthopaedic, medical) to this service.

Additional referrals can be made by the primary therapist.

Refer to “Orthotic management of children with cerebral palsy” to determine rationale behind prescription.

## 2.3 Mobility – GMFCS III

# 2.3 Mobility – GMFCS III

## 2 - 4 years

Children maintain floor sitting often by “W-sitting” (sitting between flexed and internally rotated hips and knees) and may require adult assistance to assume sitting. Children creep on their stomach or crawl on hands and knees (often without reciprocal leg movements) as their primary methods of self-mobility. Children may pull to stand on a stable surface and cruise short distances. Children may walk short distances indoors using a hand-held mobility device (walker) and adult assistance for steering and turning. (GMFCS E&R, 2007)

Assessments	Intervention and equipment	Referral / resources
<p><b>Gross Motor Function Measure (GMFM)*</b></p> <p><b>Functional Mobility Scale (FMS)*</b></p> <p><b>Peabody Developmental Motor Scale 2nd edition (PDMS-2)*</b></p> <p><b>Bayley Scale of Infant and Toddler Development 3rd edition (BSID III)*</b></p> <p><b>Gait Patterns in Spastic Diplegia*</b></p> <p><b>Timed 10 meter walk test</b></p>	<p><b>Musculoskeletal management:</b></p> <ul style="list-style-type: none"> <li>• See musculoskeletal matrix</li> </ul> <p>Functional, goal-directed approach to mobility through ADLS and community activities</p> <ul style="list-style-type: none"> <li>• Stair practice</li> <li>• Mobility on various surfaces including treadmill training as appropriate</li> <li>• Sit to stand with a stable surface</li> </ul> <p>Treadmill training may be appropriate using the handrails and/or therapist facilitation</p> <hr/> <p><b>Walking aid</b></p> <p>Assess the environments that the child will be using the walking aid in as this will determine the style of frame i.e. do they need to access tables etc at preschool. Safety issues should also be considered i.e. using walking aid on ramps.</p> <p>Common options include:</p> <ul style="list-style-type: none"> <li>• Kaye Walker – Medix 21</li> <li>• Crocodile – Euromedical</li> <li>• Nurmi Neo – Allied Medical</li> </ul> <p>Considerations:</p> <ul style="list-style-type: none"> <li>• Posture</li> <li>• Handle type</li> <li>• Braking system</li> <li>• Height</li> <li>• Wheel type (castors, fixed, stoppers)</li> <li>• Posterior vs. anterior. Posture and energy efficiency usually enhanced with posterior walkers.</li> </ul>	<p>Treadmill training generally accessed in the CDC gym with the paediatric treadmill. If considering other community-based treadmills, check the slowest speed and height of handrails.</p> <hr/> <p>If walking aids are indicated then an Enable assessor in walking and standing accreditation is required <a href="http://www.disabilityfunding.co.nz">www.disabilityfunding.co.nz</a></p>

## 2 - 4 years

### Assessments

### Intervention and equipment

### Referral / resources

#### Seated mobility for distance

Common options include:

- Shuttle – Medifab
- Kimba – Allied Medical
- Leckey Seating System – Allied Medical
- Xpanda - Euromedical

Considerations:

- Pelvic and trunk support
- +/- pommel
- Tilt/recline
- Parental ease of use
- Seat profile
- Availability of equipment in Enable store

#### Shoes

Usually shoes are the first option for providing foot stability. With increasing complexity, stock boots and orthoses may be required. This requires assessment of range of motion (ROM) and foot position in standing to determine what level of footwear/orthoses is required.

All children are typically wearing shoes from 8-12 months of age and parents require education on the shoe features when their child has cerebral palsy (CP).

Shoe features to consider:

- Shoes need to be correctly fitting
- Laces/Velcro with wide opening
- Heel counter needs to be stable

Some flexibility through the long arch of shoe

Funding for families is sometimes available through the physiotherapy service at CDC (via the Elios Trust) where there is difficulty sourcing appropriate footwear.

Refer to the Wheeled Mobility and Postural Management Competency Framework to decide the appropriate service for the child.

Level 1 – CDC VNT/OT

Level 2 – Seating To Go  
[www.seatingtogo.co.nz](http://www.seatingtogo.co.nz)

Request to physiotherapy for shoe voucher.

# 2.3 Mobility – GMFCS III

# 2.3 Mobility – GMFCS III

## 2 - 4 years

### Assessments

### Intervention and equipment

### Referral / resources

#### Stock boots

Used to provide stability through the ankle region. Can be too heavy for some children. Ensure that the foot can be positioned appropriately within the boot. Try Stock boots prior to AFO\* use as these may be sufficient.

Features:

- High ankle support
- Rigid materials
- Maximum stability in heel counter

#### Orthoses

Used to prevent contractures, optimise joint alignment, provide a stable base, assists with biomechanics of gait and reduces energy expenditure. Ensure the child has adequate range of movement in the ankle plantorflexors prior to prescription to comfortably position in the AFO\*. The child must have full knee extension before considering a hinged AFO.

Common options include:

- Rigid AFO
- Hinged AFO

#### Orthotic centre

A new referral is made by a specialist (Orthopaedic, Medical) to this service. Additional referrals can be made by the primary therapist.

#### Orthotic centre

A new referral is made by a specialist (orthopaedic, medical) to this service. Additional referrals can be made by the primary therapist.

Refer to “Orthotic management of children with cerebral palsy” to determine rationale behind prescription.

## 4 - 6 years

Children sit in a regular chair but may require pelvic or trunk support to maximize hand function. Children move in and out of chair sitting to standing but often require a stable surface to push or pull up on with their arms. Children walk with a hand held mobility device on level surfaces and climb stairs with assistance from an adult. Children frequently are transported when travelling long distances or outdoors on uneven terrain. (GMFCS E&R, 2007)

Assessments	Intervention and equipment	Referral / resources
<p><b>Gross Motor Function Measure (GMFM)*</b></p> <p><b>Functional Mobility Scale (FMS)*</b></p> <p><b>Peabody Developmental Motor Scale 2nd edition (PDMS-2)*</b></p> <p><b>Gait Patterns in Spastic Diplegia*</b></p> <p><b>Timed 10 meter walk test</b></p> <p><b>Modified Timed Up and Go</b></p>	<p><b>Musculoskeletal management</b></p> <ul style="list-style-type: none"> <li>• See musculoskeletal matrix</li> </ul> <p>Functional, goal-directed training or task oriented training i.e. sit to stand, climbing stairs, walking, transfers</p> <p>Treadmill training</p> <p>Outdoor mobility practice</p> <hr/> <p><b>Walking aid</b></p> <p>Assess the environments that the child will be using the walking aid in as this will determine the style of walking aid i.e. do they need to access tables etc at preschool. Safety issues should also be considered i.e. using walking aid on ramps.</p> <p>Consideration should be given to introducing elbow crutches as a trial although children are often not ready for crutches until over age 6. If a child can manage them, elbow crutches are the walking aid of choice in GMFCS III as this is likely to lead to a better long term community ambulation outcome.</p> <p>Common options include:</p> <ul style="list-style-type: none"> <li>• Kaye Walker – Medix 21</li> <li>• Crocodile – Euromedical</li> <li>• Nurmi Neo – Allied Medical</li> <li>• Elbow crutches</li> </ul> <p>Considerations:</p> <ul style="list-style-type: none"> <li>• Posture</li> <li>• Handle type</li> <li>• Wheel type (castors, fixed, stoppers)</li> <li>• Posterior vs. anterior.</li> <li>• Braking system</li> <li>• Height</li> </ul> <p>Posture and energy efficiency usually enhanced with posterior walkers.</p>	<p>Ensure that relevant school and community therapists are aware of child</p> <p>Treadmill training generally accessed in the CDC gym with the paediatric treadmill. If considering other community-based treadmills, check the slowest speed and height of handrails.</p> <hr/> <p>If walking aids are indicated then an Enable assessor in walking and standing accreditation is required.</p> <p><a href="http://www.disabilityfunding.co.nz">www.disabilityfunding.co.nz</a></p>

# 2.3 Mobility – GMFCS III

# 2.3 Mobility – GMFCS III

## 4 - 6 years

### Assessments

### Intervention and equipment

### Referral / resources

#### Seated mobility for long distances

Common options include:

- Action 3 – Invacare
- Karma – Allied Medical

Considerations:

- Seat depth and width
- Ability to transport
- Footplate height
- Brake system
- Cushion
- Wheel type
- Attendant handles
- Availability of equipment in Enable store

#### Orthoses

Used to prevent contractures, optimise joint alignment, provide a stable base, assists with biomechanics of gait and reduces energy expenditure. Ensure the child has adequate range of movement in the ankle plantar flexors prior to prescription to comfortably position in the AFO\*. The child must have full knee extension before considering a hinged AFO.

Common options include:

- Rigid AFO
- Hinged AFO
- Dynamic AFO

#### Shoes

Considerations:

- Laces/velcro with wide opening
- Heel counter needs to be stable
- Some flexibility through the long arch of shoe
- Ability to accommodate AFO

Funding for families is sometimes available through the physiotherapy service at CDC (via the Elios Trust) where there is difficulty sourcing appropriate footwear

Refer to wheeled mobility and postural management competency framework and decide the appropriate service for the child.

Level 1 - COC VNT/OT

Level 2 - Seating to go  
[www.seatingtogo.co.nz](http://www.seatingtogo.co.nz)

#### Orthotic centre

A new referral is made by a specialist (Orthopaedic, Medical) to this service. Additional referrals can be made by the primary therapist.

Refer to “Orthotic management of children with cerebral palsy” to determine rationale behind prescription.

Request to physiotherapy for shoe voucher.

## 6 - 12 years

Children walk using a hand-held mobility device in most indoor settings. When seated, children may require a seat belt for pelvic alignment and balance. Sit-to-stand and floor-to-stand transfers require physical assistance of a person or support surface. When travelling long distances, children use some form of wheeled mobility. Children may walk up and down stairs holding onto a railing with supervision or physical assistance. Limitations in walking may necessitate adaptations to enable participation in physical activities and sports including self-propelling a manual wheelchair or powered mobility. (GMFCS E&R, 2007)

Assessments	Intervention and equipment	Referral / resources
<p><b>Gross Motor Function Measure (GMFM)*</b></p> <p><b>Functional Mobility Scale (FMS)*</b></p> <p><b>Gait Patterns in Spastic Diplegia*</b></p> <p><b>Timed 10 meter walk test</b></p> <p><b>Modified Timed Up and Go</b></p> <p><b>Timed stairs test</b></p>	<p><b>Musculoskeletal management</b></p> <ul style="list-style-type: none"> <li>• See musculoskeletal matrix</li> </ul> <p>Functional training or task oriented training i.e. sit to stand, climbing stairs, walking, transfers</p> <p>Treadmill training</p> <p>Outdoor mobility practice</p> <hr/> <p><b>Walking aid</b></p> <p>Assess the environments that the child will be using the walking aid in as this will determine the style of walking aid. Safety issues should also be considered. If a child can manage them, elbow crutches are the walking aid of choice in GMFCS III as this is likely to lead to a better long term community ambulation outcome.</p> <p>Common options include:</p> <ul style="list-style-type: none"> <li>• Elbow crutches</li> <li>• Kaye Walker – Medix 21</li> <li>• Crocodile – Euromedica</li> </ul> <p>Considerations:</p> <ul style="list-style-type: none"> <li>• Posture</li> <li>• Handle type</li> <li>• Height</li> </ul> <hr/> <p><b>Seated mobility for long distances</b></p> <p>Considerations:</p> <ul style="list-style-type: none"> <li>• Seat depth and width</li> <li>• Ability to transport</li> <li>• Footplate height</li> <li>• Self propelled/power/attendant propelled</li> <li>• Availability of equipment in Enable store</li> <li>• Cushion</li> <li>• Wheel type</li> <li>• Attendant handles</li> <li>• Brake system</li> </ul> <p>Common options include:</p> <ul style="list-style-type: none"> <li>• Action 3 – Invacare</li> <li>• Karma – Allied Medical</li> </ul>	<hr/> <p>If walking aids are indicated then an Enable assessor in walking and standing accreditation is required. <a href="http://www.disabilityfunding.co.nz">www.disabilityfunding.co.nz</a></p> <hr/> <p>Refer to wheeled mobility and postural management competency framework and decide the appropriate service for the child.</p> <p>Level 1 - COC VNT/OT</p> <p>Level 2 - Seating to go <a href="http://www.seatingtogo.co.nz">www.seatingtogo.co.nz</a></p>

# 2.3 Mobility – GMFCS III

# 2.3 Mobility – GMFCS III

## 6 - 12 years

### Assessments

### Intervention and equipment

### Referral / resources

#### Orthoses

Used to prevent contractures, optimise joint alignment, provide a stable base, assists with biomechanics of gait and reduces energy expenditure. Ensure the child has adequate range of movement in the ankle plantar flexors prior to prescription to comfortably position in the AFO\*. The child must have full knee extension before considering a hinged AFO.

Common options include:

- Rigid AFO
- Hinged AFO
- Dynamic AFO

#### Shoes

Considerations:

- Laces/velcro with wide opening
- Heel counter needs to be stable
- Some flexibility through the long arch of shoe
- Ability to accommodate AFO

Funding for families is sometimes available through the Physiotherapy Service at CDC (via the Elios Trust) where there is difficulty sourcing appropriate footwear.

#### Orthotic centre

A new referral is made by a specialist (orthopaedic, medical) to this service. Additional referrals can be made by the primary therapist.

Refer to “Orthotic management of children with cerebral palsy” to determine rationale behind prescription.

Request to physiotherapy for shoe voucher.

## 12 - 18 years

Youth are capable of walking using a hand-held mobility device. Compared to individuals in other levels, youth in Level III demonstrate more variability in methods of mobility depending on physical ability and environmental and personal factors. When seated, youth may require a seat belt for pelvic alignment and balance. Sit-to-stand and floor-to-stand transfers require physical assistance from a person or support surface. At school, youth may self-propel a manual wheelchair or use powered mobility. Outdoors and in the community, youth are transported in a wheelchair or use powered mobility. Youth may walk up and down stairs holding onto a railing with supervision or physical assistance. Limitations in walking may necessitate adaptations to enable participation in physical activities and sports including self-propelling a manual wheelchair or powered mobility. (GMFCS E&R, 2007)

Assessments	Intervention and equipment	Referral / resources
<p><b>Gross Motor Function Measure (GMFM)*</b></p> <p><b>Functional Mobility Scale (FMS)*</b></p> <p><b>Gait Patterns in Spastic Diplegia*</b></p> <p><b>Timed 10 meter walk test</b></p> <p><b>Modified Timed Up and Go</b></p> <p><b>Timed stairs test</b></p>	<p><b>Musculoskeletal management</b></p> <ul style="list-style-type: none"> <li>• See musculoskeletal matrix</li> </ul> <p>Functional training or task oriented training i.e. sit to stand, climbing stairs, walking, transfers</p> <p>Treadmill training</p> <p>Outdoor mobility practice</p> <hr/> <p><b>Mobility device</b></p> <p>Choice of mobility device will be dependent on physical ability, environmental and personal factors.</p> <p>Options include:</p> <ul style="list-style-type: none"> <li>• Hand held mobility device – crutches, walker</li> <li>• Wheelchair – power, attendant controlled, self propelled</li> </ul> <p>Considerations:</p> <ul style="list-style-type: none"> <li>• Lower limb strength and range</li> <li>• Size of youth</li> <li>• Environment (access, distance, surface)</li> <li>• CP type</li> <li>• Cognitive ability</li> <li>• Personal factors</li> </ul>	<p>If walking aids are indicated then an Enable assessor in walking and standing accreditation is required. <a href="http://www.disabilityfunding.co.nz">www.disabilityfunding.co.nz</a></p> <p>If wheeled mobility is indicated then refer to the Wheeled Mobility and Postural Management Competency Framework to decide the appropriate service for the child.</p> <p>Level 1 – CDC VNT/OT/PT</p> <p>Level 2 – Seating to go <a href="http://www.seatingtogo.co.nz">www.seatingtogo.co.nz</a></p>

# 2.3 Mobility – GMFCS III

# 2.3 Mobility – GMFCS III

## 12 - 18 years

### Assessments

### Intervention and equipment

### Referral / resources

#### Orthoses

Used to prevent contractures, optimise joint alignment, provide a stable base, assists with biomechanics of gait and reduces energy expenditure. Ensure the child has adequate range of movement in the ankle plantar flexors prior to prescription to comfortably position in the AFO\*. The child must have full knee extension before considering a hinged AFO.

Common options include:

- Rigid AFO
- Hinged AFO
- Dynamic AFO

#### Shoes

Considerations:

- Laces/velcro with wide opening
- Heel counter needs to be stable
- Some flexibility through the long arch of shoe
- Ability to accommodate AFO

Funding for families is sometimes available through the physiotherapy service at CDC (via the Elios Trust) where there is difficulty sourcing appropriate footwear.

#### Orthotics centre

A new referral is made by a specialist (orthopaedic, medical) to this service. Additional referrals can be made by the primary therapist.

Refer to “Orthotic management of children with cerebral palsy” to determine rationale behind prescription.

Request to physiotherapy for shoe voucher.

## 0 - 2 years

Infants have head control but trunk support is required for floor sitting. Infants can roll to supine and may roll to prone. (GMFCS E&R 2007)

Assessments	Intervention and equipment	Referral / resources
<p><b>Alberta Infant Motor Scale (AIMS)*</b></p> <p><b>Gross Motor Function Measure (GMFM)*</b></p> <p><b>Bayley Scale of Infant and Toddler Development 3rd edition (BSID III)*</b></p>	<p><b>Musculoskeletal management</b></p> <ul style="list-style-type: none"><li>• See musculoskeletal matrix</li></ul> <p>Positioning for play i.e. tummy time, weight bearing through upper limbs, hips and knees through use of various positions (4 point kneeling, propping) and use of equipment (wedges, tumbleforms,).</p> <p>Encourage active head control through tummy time, midline head orientation, side lying and supported sitting.</p> <p>Neurodevelopmental therapy (NDT) theoretical framework (Please see additional literature specific to NDT.)</p> <hr/> <p><b>Seated mobility</b></p> <p>Considerations:</p> <ul style="list-style-type: none"><li>• Laterals</li><li>• Head support</li><li>• Pommel</li><li>• Tilt/recline</li><li>• Parental ease of use</li><li>• Seat profile (may include custom fabrication)</li><li>• Availability of equipment in the Enable store</li></ul> <p>Typical systems include:</p> <ul style="list-style-type: none"><li>• Kimba - Allied Medical</li><li>• Shuttle - Medifab</li><li>• Leckey Squiggles Seating System – Allied Medical</li><li>• Xpanda – Euromedical</li></ul>	<p>VNT loan equipment can be accessed.</p> <p>Therapists new to this area are recommended to attend an introduction or intermediate paediatric NDT course (NZ Bobath Association <a href="http://www.bobath.org.nz">www.bobath.org.nz</a>)</p> <hr/> <p>Children at this level are generally considered to be level 2 wheeled mobility and postural management (WMPM). Therefore they should be referred to Seating to Go for their seated mobility needs. <a href="http://www.seatingtogo.co.nz">www.seatingtogo.co.nz</a></p>

# 2.4 Mobility – GMFCS IV

# 2.4 Mobility – GMFCS IV

## 0 - 2 years

### Assessments

### Intervention and equipment

### Referral / resources

#### Shoes

Usually shoes are the first option for providing foot stability when beginning to pull to stand, cruise and walk. With increasing complexity, stock boots and orthoses may be required but would not be indicated prior to active standing. This requires assessment of range of motion (ROM) and foot position in standing to determine what level of footwear/orthoses is required.

All children are typically wearing shoes from 8-12 months of age and parents require education on the shoe features when their child has Cerebral Palsy (CP).

Shoe features to consider:

- Laces/Velcro with wide opening
- Heel counter needs to be stable
- Some flexibility through the long arch of shoe
- Ability to accommodate AFO if required

Funding for families is sometimes available through the Physiotherapy Service at CDC (via the Elios Trust) where there is difficulty sourcing appropriate footwear.

#### Stock boots

Used to provide stability through the ankle region. Can be too heavy for some children. Ensure that the foot can be positioned appropriately within the boot. Try Stock boots prior to AFO\* use as these may be sufficient.

Features:

- High ankle support
- Maximum stability in heel counter
- Rigid materials



#### Orthoses

Used to prevent contractures, optimise joint alignment, provide a stable base, assists with biomechanics of gait and reduces energy expenditure. Ensure the child has adequate range of motion (ROM) in the ankle plantorflexors prior to prescription to comfortably position in the ankle foot orthoses (AFO)\*.

Common options include:

- Rigid AFO

Request to physiotherapy for shoe voucher.

#### Orthotic centre

If this is the first referral for a child to the orthotics centre then this will need to be done by a medical practitioner i.e. paediatrician or orthopaedic surgeon. Subsequent referrals can then be made by Allied Health staff.

#### Orthotic centre

If this is the first referral for a child to the orthotics centre then this will need to be done by a medical practitioner i.e. paediatrician or orthopaedic surgeon. Subsequent referrals can then be made by Allied Health staff.

Refer to “Orthotic management of children with cerebral palsy” to determine rationale behind prescription.

## 2 - 4 years

Children floor sit when placed, but are unable to maintain alignment and balance without use of their hands for support. Children frequently require adaptive equipment for sitting and standing. Self-mobility for short distances (within a room) is achieved through rolling, creeping on stomach, or crawling on hands and knees without reciprocal leg movement. (GMFCS E&R 2007)

Assessments	Intervention and Equipment	Referral / resources
<p><b>Gross Motor Function Measure (GMFM)*</b></p> <p><b>Functional Mobility Scale (FMS)*</b></p> <p><b>Bayley Scale of Infant and Toddler Development 3rd edition (BSID III)*</b></p>	<p><b>Musculoskeletal management</b></p> <ul style="list-style-type: none"> <li>• See musculoskeletal matrix</li> </ul> <p>Positioning for play i.e. tummy time, half kneel, standing at furniture, standing frame. Weight bearing through upper limbs, hips and knees through use of various positions (4 pt kneeling, propping) and use of equipment (wedges, tumbleforms). Encourage active head control through tummy time, midline head orientation, side lying and supported sitting.</p> <hr/> <p><b>Seated mobility</b></p> <p>Seating systems should be in place at an early age to assist with developing functional skills.</p> <p>Considerations:</p> <ul style="list-style-type: none"> <li>• Laterals</li> <li>• Head support</li> <li>• Pommel</li> <li>• Tilt/recline</li> <li>• Parental ease of use</li> <li>• Seat profile (may include custom fabrication)</li> </ul> <p>Typical systems include:</p> <ul style="list-style-type: none"> <li>• Kimba - Allied Medical</li> <li>• Shuttle - Medifab</li> <li>• Leckey Seating System – Allied Medical</li> <li>• Xpanda – Euromedical</li> <li>• Attendant controlled wheelchair</li> <li>• Power wheelchair</li> </ul>	<p>VNT loan equipment can be accessed.</p> <hr/> <p>Children at this level are generally considered to be level 2 wheeled mobility and postural management (WMPM). Therefore they should be referred to Seating to Go for their seated mobility needs.</p> <p><a href="http://www.seatingtogo.co.nz">www.seatingtogo.co.nz</a></p>

# 2.4 Mobility – GMFCS IV

# 2.4 Mobility – GMFCS IV

## 2 - 4 years

### Assessments

### Intervention and equipment

### Referral / resources

#### Walking aid

Children in this age range may be ready to progress from a standing frame to a walking frame. Readiness is dependent on a number of factors including cognition.

Common options include:

- Kidwalk – DME
- DGT – Medifab
- Rifton Pacer – Medix 21
- Pony – Euromedical
- Mustang - Euromedical

Considerations:

- Trunk support
- Pelvic support
- Hand grips
- Braking options
- Weight of walker
- Additional features i.e. anti-reverse, resistance

#### Shoes

Considerations:

- Laces/velcro with wide opening
- Heel counter needs to be stable
- Some flexibility through the long arch of shoe
- Ability to accommodate AFO

Funding for families is sometimes available through the physiotherapy service at CDC (via the Elios Trust) where there is difficulty sourcing appropriate footwear

If walking aids are indicated then an Enable assessor in walking and standing accreditation is required.  
[www.disabilityfunding.co.nz](http://www.disabilityfunding.co.nz)

Request to physiotherapy for shoe voucher.

## 2 - 4 years

### Assessments

### Intervention and equipment

### Referral / resources

#### Stock boots

Used to provide stability through the ankle region. Can be too heavy for some children. Ensure that the foot can be positioned appropriately within the boot. Try Stock boots prior to AFO\* use as these may be sufficient.

Features:

- High ankle support
- Maximum stability in heel counter
- Rigid materials



#### Orthoses

Used to prevent contractures, optimise joint alignment, provide a stable base, assists with biomechanics of gait and reduces energy expenditure. Ensure the child has adequate range of motion (ROM) in the ankle plantorflexors prior to prescription to comfortably position in the ankle foot orthoses (AFO)\*.

Common options include:

- Rigid AFO

#### Orthotic centre

If this is the first referral for a child to the orthotics centre then this will need to be done by a medical practitioner i.e. paediatrician or orthopaedic surgeon. Subsequent referrals can then be made by Allied Health staff.

#### Orthotic centre

If this is the first referral for a child to the orthotics centre then this will need to be done by a medical practitioner i.e. paediatrician or orthopaedic surgeon. Subsequent referrals can then be made by Allied Health staff.

Refer to "Orthotic management of children with cerebral palsy" to determine rationale behind prescription.

# 2.4 Mobility – GMFCS IV

# 2.4 Mobility – GMFCS IV

## 4 - 6 years

Children sit on a chair but need adaptive seating for trunk control and to maximize hand function. Children move in and out of chair sitting with assistance from an adult or a stable surface to push or pull up on with their arms. Children may at best walk short distances with a walker and adult supervision but have difficulty turning and maintaining balance on uneven surfaces. Children are transported in the community. Children may achieve self-mobility using a powered wheelchair. (GMFCS E&R 2007)

Assessments	Intervention and Equipment	Referral / resources
<p><b>Gross Motor Function Measure (GMFM)*</b></p> <p><b>Functional Mobility Scale (FMS)*</b></p> <p><b>Timed 10 meter walk test</b></p>	<p><b>Musculoskeletal management</b></p> <ul style="list-style-type: none"> <li>• See musculoskeletal matrix</li> </ul> <p>Functional, goal-directed training or task oriented training i.e. sit to stand, walking, transfers</p> <p>Treadmill training</p> <p>Outdoor mobility practice</p> <hr/> <p><b>Walking aid</b></p> <p>Assess the environments that the child will be using the walking aid in as this will determine the style of frame i.e. do they need to access tables etc at preschool. Safety issues should also be considered i.e. using walking aid on ramps.</p> <p>Common options include:</p> <ul style="list-style-type: none"> <li>• Kidwalk – DME</li> <li>• DGT – Medifab</li> <li>• Rifton Pacer – Medix 21</li> <li>• Pony – Euromedical</li> <li>• Mustang - Euromedical</li> </ul> <p>Considerations:</p> <ul style="list-style-type: none"> <li>• Trunk support</li> <li>• Pelvic support</li> <li>• Hand grips</li> <li>• Braking options</li> <li>• Weight of walker</li> <li>• Additional features i.e. anti-reverse, resistance</li> </ul>	<p>Ensure that relevant school and community therapists are aware of child</p> <hr/> <p>If walking aids are indicated then an Enable assessor in walking and standing accreditation is required.  <a href="http://www.disabilityfunding.co.nz">www.disabilityfunding.co.nz</a></p>

## 4 - 6 years

### Assessments

### Intervention and equipment

### Referral / resources

#### Seated mobility

Transition from buggy-type seating to a wheelchair should be completed by school start. Seating to Go should already be involved.

Considerations regarding seated mobility, including power:

- Lower limb strength and range
- Size of child
- Environment (access, distance, surface)
- CP type
- Cognitive ability
- Personal factors

#### Orthoses

Used to prevent contractures, optimise joint alignment, provide a stable base, assists with biomechanics of gait and reduces energy expenditure. Ensure the child has adequate range of movement in the ankle plantar flexors prior to prescription to comfortably position in the AFO\*. The child must have full knee extension before considering a hinged AFO.

Common options include:

- Rigid AFO

#### Shoes

Considerations:

- Laces/velcro with wide opening
- Heel counter needs to be stable
- Some flexibility through the long arch of shoe
- Ability to accommodate AFO

Funding for families is sometimes available through the physiotherapy service at CDC (via the Elios Trust) where there is difficulty sourcing appropriate footwear

Child should be known to Seating to Go, joint appointments can be arranged to facilitate collaborative planning of seating/mobility needs.

#### Orthotic centre

A new referral is made by a specialist (orthopaedic, medical) to this service. Additional referrals can be made by the primary therapist.

Refer to "Orthotic management of children with cerebral palsy" to determine rationale behind prescription.

Request to physiotherapy for shoe voucher.

# 2.4 Mobility – GMFCS IV

# 2.4 Mobility – GMFCS IV

## 6 - 12 years

Children use methods of mobility that require physical assistance or powered mobility in most settings. Children require adaptive seating for trunk and pelvic control and physical assistance for most transfers. At home, children use floor mobility (roll, creep, or crawl), walk short distances with physical assistance, or use powered mobility. When positioned, children may use a body support walker at home or school. At school, outdoors, and in the community, children are transported in a manual wheelchair or use powered mobility. Limitations in mobility necessitate adaptations to enable participation in physical activities and sports, including physical assistance and/or powered mobility. (GMFCS E&R 2007)

Assessments	Intervention and equipment	Referral / resources
<p><b>Gross Motor Function Measure (GMFM)*</b></p> <p><b>Functional Mobility Scale (FMS)*</b></p> <p><b>Timed 10 meter walk test</b></p>	<p><b>Musculoskeletal management</b></p> <ul style="list-style-type: none"> <li>• See musculoskeletal matrix</li> </ul> <p><b>Seated mobility</b></p> <p>Considerations:</p> <ul style="list-style-type: none"> <li>• Lower limb strength and range</li> <li>• Size of youth</li> <li>• CP type</li> <li>• Environment (access, distance, surface)</li> <li>• Cognitive ability</li> <li>• Personal factors</li> </ul> <hr/> <p><b>Orthoses</b></p> <p>Used to prevent contractures, optimise joint alignment, provide a stable base, assists with biomechanics of gait and reduces energy expenditure. Ensure the child has adequate range of movement in the ankle plantar flexors prior to prescription to comfortably position in the AFO*. The child must have full knee extension before considering a hinged AFO.</p> <p>Common options include:</p> <ul style="list-style-type: none"> <li>• Rigid AFO</li> </ul> <hr/> <p><b>Shoes</b></p> <p>Considerations:</p> <ul style="list-style-type: none"> <li>• Laces/Velcro with wide opening</li> <li>• Heel counter needs to be stable</li> <li>• Some flexibility through the long arch of shoe</li> <li>• Ability to accommodate AFO</li> </ul> <p>Funding for families is sometimes available through the physiotherapy service at CDC (via the Elios Trust) where there is difficulty sourcing appropriate footwear</p>	<p><b>Seating to Go</b></p> <p>Seated mobility should be well established by this stage and under regular review with Seating to Go.</p> <hr/> <p><b>Orthotic centre</b></p> <p>A new referral is made by a specialist (orthopaedic, medical) to this service. Additional referrals can be made by the primary therapist.</p> <p>Refer to “orthotic management of children with cerebral palsy” to determine rationale behind prescription.</p> <hr/> <p>Request to physiotherapy for shoe voucher</p>

## 6 - 12 years

### Assessments

### Intervention and equipment

### Referral / resources

#### Walking aid

Common options include:

- Rifton Pacer – Medix 21
- Kidwalk – DME
- DGT – Medifab

Considerations for utilisation of walking aid:

- Lower limb strength and range
- Size of youth
- Environment (access, distance, surface)
- CP type
- Cognitive ability
- Personal factors

Considerations for walker:

- Posture
- Handle type
- Braking system
- Height
- Amount of trunk and pelvic support required

If a walking aid is indicated then an Enable assessor in walking and standing accreditation is required.  
[www.disabilityfunding.co.nz](http://www.disabilityfunding.co.nz)

# 2.4 Mobility – GMFCS IV

# 2.4 Mobility – GMFCS IV

## 12 - 18 years

Youth use wheeled mobility in most settings. Youth require adaptive seating for pelvic and trunk control. Physical assistance from 1 or 2 persons is required for transfers. Youth may support weight with their legs to assist with standing transfers. Indoors, youth may walk short distances with physical assistance, use wheeled mobility, or, when positioned, use a body support walker. Youth are physically capable of operating a powered wheelchair. When a powered wheelchair is not feasible or available, youth are transported in a manual wheelchair. Limitations in mobility necessitate adaptations to enable participation in physical activities and sports, including physical assistance and/or powered mobility. (GMFCS E&R 2007)

Assessments	Intervention and equipment	Referral / resources
<p><b>Gross Motor Function Measure (GMFM)*</b></p> <p><b>Functional Mobility Scale (FMS)*</b></p> <p><b>Timed 10 meter walk test</b></p>	<p><b>Musculoskeletal management</b></p> <ul style="list-style-type: none"> <li>• See musculoskeletal matrix</li> </ul> <p><b>Seated Mobility</b></p> <p>Seated mobility should be well established by this stage and under regular review with Seating to Go. Wheelchair – power or attendant controlled. This will be determined by factors such as type of CP, cognition and personal factors.</p> <hr/> <p><b>Orthoses</b></p> <p>Common options include:</p> <p>Rigid AFO*</p> <p>Considerations:</p> <p>Range of movement, foot position in standing</p> <hr/> <p><b>Shoes</b></p> <p>Considerations:</p> <ul style="list-style-type: none"> <li>• Laces/Velcro with wide opening</li> <li>• Heel counter needs to be stable</li> <li>• Ability to accommodate AFO</li> </ul> <p>Funding for families is sometimes available through the Physiotherapy Service at CDC (via the Elios Trust) where there is difficulty sourcing appropriate footwear.</p>	<p>Seating to Go</p> <hr/> <p>Orthotic centre</p> <hr/> <p>Request to physiotherapy for shoe voucher</p>

# 0 - 2 years

Physical impairments limit voluntary control of movement. Infants are unable to maintain antigravity head and trunk postures in prone and sitting. Infants require adult assistance to roll. (GMFCS E&R 2007)

Assessment	Intervention and equipment	Referral / resources
<p><b>Alberta Infant Motor Scale (AIMS)*</b></p> <p><b>Gross Motor Function Measure (GMFM)*</b></p> <p><b>Functional Mobility Scale (FMS)*</b></p> <p><b>Bayley Scale of Infant and Toddler Development 3rd edition (BSID III)*</b></p>	<p>Encourage active head control through tummy time, midline head orientation, side lying and supported sitting.</p> <p>Musculoskeletal management to minimise the risk of scoliosis and hip displacement</p> <ul style="list-style-type: none"> <li>• See musculoskeletal matrix</li> </ul> <p>Weight bearing through upper limbs, hips and knees through use of various positions (4 point kneeling, propping) and use of equipment (wedges)</p> <p>Neurodevelopmental therapy (NDT) theoretical framework. Please see additional literature specific to NDT.</p> <hr/> <p><b>Seated mobility</b></p> <p>Typical systems include:</p> <ul style="list-style-type: none"> <li>Kimba - Allied Medical</li> <li>Shuttle - Medifab</li> <li>Xpanda - Euromedical</li> </ul> <p>Specific requirements may include:</p> <p>Laterals, +/- head support, +/-ommel, tilt recline, parental ease of use, seat profile (may include custom fabrication).</p> <p>See musculoskeletal matrix for static seating options to support seated position</p> <hr/> <p><b>Orthoses</b></p> <p>Used to prevent contractures, optimise joint alignment, and provide a stable base for sitting and standing activities. Ensure the child has adequate range of motion (ROM) in the ankle plantorflexors prior to prescription to comfortably position in the ankle foot orthoses (AFO)*.</p> <p>Common options include:</p> <ul style="list-style-type: none"> <li>• Rigid AFO</li> <li>• Stock boots may also be considered to provide stability for standing and positioning</li> </ul> <p>If there is difficulty in sourcing good footwear (either to be worn over AFOs or alone) then funding is sometimes available through the Physiotherapy Service at CDC via the Elios Trust.</p>	<p>VNT loan equipment can be accessed.</p> <p>Therapists new to this area are recommended to attend an introduction or intermediate paediatric NDT course (NZ Bobath Association <a href="http://www.bobath.org.nz">www.bobath.org.nz</a>)</p> <hr/> <p>Children at this level are considered to be at level 2 wheeled mobility and postural management. (WMPM). Therefore they should be referred to Seating to Go for their seated mobility needs. <a href="http://www.seatingtogo.co.nz">www.seatingtogo.co.nz</a></p> <hr/> <p><b>Orthotic centre</b></p> <p>If this is the first referral for a child to the Orthotics Centre then this will need to be done by a Medical Practitioner i.e. Paediatrician or Orthopaedic Surgeon. Subsequent referrals can then be made by Allied Health staff</p> <p>Request to Physiotherapy for a shoe voucher</p>

## 2.5 Mobility – GMFCS V

# 2.5 Mobility – GMFCS V

## 2 - 4 years

Physical impairments restrict voluntary control of movement and the ability to maintain antigravity head and trunk postures. All areas of motor function are limited. Functional limitations in sitting and standing are not fully compensated for through the use of adaptive equipment and assistive technology. At Level V children have no means of independent movement and are transported. Some children achieve self-mobility using a powered wheelchair with extensive adaptations. (GMFCS E&R 2007)

### Assessment

**Gross Motor Function Measure (GMFM)\***

**Functional Mobility Scale (FMS)\***

**Bayley Scale of Infant and Toddler Development 3rd edition (BSID III)\***

### Intervention and equipment

Encourage active head control through tummy time, midline head orientation, side lying and supported sitting.

Musculoskeletal management to minimise the risk of scoliosis and hip displacement

- See musculoskeletal matrix

Weight bearing through upper limbs, hips and knees through use of various positions (4 pt kneeling, propping) and use of equipment (wedges)

Neurodevelopmental therapy (NDT) theoretical framework. Please see additional literature specific to NDT.

#### **Seated mobility**

Typical systems include:

Kimba - Allied Medical

Shuttle - Medifab

Xpanda – Euromedical

Grow4 – Medifab

Leckey Seating System – Allied Medical

Specific requirements may include:

Laterals, +/- head support, +/- pommel, tilt recline, parental ease of use, seat profile (may include custom fabrication).

Take the child's cognitive skill level into account when considering attendant controlled vs power

Seated mobility should be well established by this stage and under regular review with Seating to Go.

See musculoskeletal matrix for static seating options to support seated position

### Referral / resources

VNT loan equipment can be accessed.

Therapists new to this area are recommended to attend an introduction or intermediate paediatric NDT course (NZ Bobath Association [www.bobath.org.nz](http://www.bobath.org.nz))

Children at this level are considered to be at level 2 wheeled mobility and postural management. (WMPM). Therefore they should be referred to Seating to Go for their seated mobility needs. [www.seatingtogo.co.nz](http://www.seatingtogo.co.nz)

## 2 - 4 years

### Assessment

### Intervention and equipment

### Referral / resources

#### Orthoses

Used to prevent contractures, optimise joint alignment, and provide a stable base for sitting and standing activities. Ensure the child has adequate range of motion (ROM) in the ankle plantorflexors prior to prescription to comfortably position in the ankle foot orthoses (AFO)\*.

Common options include:

- Rigid AFO
- Stock boots may also be considered to provide stability for standing and positioning

If there is difficulty in sourcing good footwear (either to be worn over AFOs or alone) then funding is sometimes available through the Physiotherapy Service at CDC via the Elios Trust.

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#### Orthotic centre

If this is the first referral for a child to the Orthotics Centre then this will need to be done by a Medical Practitioner i.e. Paediatrician or Orthopaedic Surgeon. Subsequent referrals can then be made by Allied Health staff

Request to physiotherapy for a shoe voucher

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# 2.5 Mobility – GMFCS V

# 2.5 Mobility – GMFCS V

## 4 - 6 years

Physical impairments restrict voluntary control of movement and the ability to maintain antigravity head and trunk postures. All areas of motor function are limited. Functional limitations in sitting and standing are not fully compensated for through the use of adaptive equipment and assistive technology. At Level V, children have no means of independent movement and are transported. Some children achieve self-mobility using a powered wheelchair with extensive adaptations. (GMFCS E&R 2007)

Assessment	Intervention and equipment	Referral / resources
<p><b>Gross Motor Function Measure (GMFM)*</b></p> <p><b>Functional Mobility Scale (FMS)*</b></p>	<p>Musculoskeletal management to minimise the risk of scoliosis and hip displacement</p> <ul style="list-style-type: none"> <li>• See musculoskeletal matrix</li> </ul> <hr/> <p><b>Seated mobility</b></p> <p>Transition from buggy-type seating to a wheelchair should be completed by school start. Seating to Go should already be involved.</p> <p>Considerations regarding seated mobility, including power:</p> <ul style="list-style-type: none"> <li>• Lower limb strength and range</li> <li>• Size of child</li> <li>• Environment (access, distance, surface)</li> <li>• CP type</li> <li>• Cognitive ability</li> <li>• Personal factors</li> </ul> <hr/> <p><b>Orthoses</b></p> <p>Used to prevent contractures, optimise joint alignment, and provide a stable base for sitting and standing activities. Ensure the child has adequate range of motion (ROM) in the ankle plantorflexors prior to prescription to comfortably position in the ankle foot orthoses (AFO)*.</p> <p>Common options include:</p> <ul style="list-style-type: none"> <li>• Rigid AFO</li> <li>• Stock boots may also be considered to provide stability for standing and positioning</li> </ul> <p>If there is difficulty in sourcing good footwear (either to be worn over AFOs or alone) then funding is sometimes available through the Physiotherapy Service at CDC via the Elios Trust</p>	<p>Ensure that relevant school and community therapists are aware of child</p> <hr/> <p>Child should be known to Seating to Go. Joint appointments can be arranged to facilitate collaborative planning of seating/mobility needs.</p> <hr/> <p><b>Orthotic centre</b></p> <p>If this is the first referral for a child to the orthotics centre then this will need to be done by a medical practitioner i.e. paediatrician or orthopaedic surgeon. Subsequent referrals can then be made by Allied Health staff</p> <p>Request to physiotherapy for a shoe voucher</p>

## 6 - 12 years

Children are transported in a manual wheelchair in all settings. Children are limited in their ability to maintain antigravity head and trunk postures and control arm and leg movements. Assistive technology is used to improve head alignment, seating, standing, and and/or mobility but limitations are not fully compensated by equipment. Transfers require complete physical assistance of an adult. At home, children may move short distances on the floor or may be carried by an adult. Children may achieve self mobility using powered mobility with extensive adaptations for seating and control access. Limitations in mobility necessitate adaptations to enable participation in physical activities and sports including physical assistance and using powered mobility. (GMFCS E&R2007)

Assessment	Intervention and equipment	Referral / resources
<p><b>Gross Motor Function Measure (GMFM)*</b></p> <p><b>Functional Mobility Scale (FMS)*</b></p>	<p>Musculoskeletal management to minimise the risk of scoliosis and hip displacement</p> <ul style="list-style-type: none"> <li>• See musculoskeletal matrix</li> </ul> <hr/> <p><b>Seated mobility</b> Seated mobility should be well established by this stage and under regular review with Seating to Go</p> <hr/> <p><b>Orthoses</b> Used to prevent contractures, optimise joint alignment, and provide a stable base for sitting and standing activities. Ensure the child has adequate range of motion (ROM) in the ankle plantorflexors prior to prescription to comfortably position in the ankle foot orthoses (AFO)*.</p> <p>Common options include:</p> <ul style="list-style-type: none"> <li>• Rigid AFO</li> <li>• Stock boots may also be considered to provide stability for standing and positioning</li> </ul> <p>If there is difficulty in sourcing good footwear (either to be worn over AFOs or alone) then funding is sometimes available through the Physiotherapy Service at CDC via the Elios Trust</p>	<hr/> <p>Seating to Go</p> <hr/> <p><b>Orthotic centre</b> If this is the first referral for a child to the orthotics centre then this will need to be done by a medical practitioner i.e. paediatrician or orthopaedic surgeon. Subsequent referrals can then be made by Allied Health staff</p> <p>Request to physiotherapy for a shoe voucher</p>

# 2.5 Mobility – GMFCS V

# 2.5 Mobility – GMFCS V

## 12 - 18 years

Youth are transported in a manual wheelchair in all settings. Youth are limited in their ability to maintain antigravity head and trunk postures and control arm and leg movements. Assistive technology is used to improve head alignment, seating, standing, and mobility but limitations are not fully compensated by equipment. Physical assistance from 1 or 2 persons or a mechanical lift is required for transfers. Youth may achieve self-mobility using powered mobility with extensive adaptations for seating and control access. Limitations in mobility necessitate adaptations to enable participation in physical activities and sports including physical assistance and using powered mobility. (GMFCS E&R 2007)

Assessment	Intervention and equipment	Referral / resources
<p><b>Gross Motor Function Measure (GMFM)*</b></p> <p><b>Functional Mobility Scale (FMS)*</b></p>	<p><b>Musculoskeletal management to minimise the risk of scoliosis and hip displacement</b></p> <ul style="list-style-type: none"> <li>• See musculoskeletal matrix</li> </ul> <hr/> <p><b>Seated mobility</b> Seated mobility should be well established by this stage and under regular review with Seating to Go</p> <hr/> <p><b>Orthoses</b> Used to prevent contractures, optimise joint alignment, and provide a stable base for sitting and standing activities. Ensure the child has adequate range of motion (ROM) in the ankle plantorflexors prior to prescription to comfortably position in the ankle foot orthoses (AFO)*. Common options include:</p> <ul style="list-style-type: none"> <li>• Rigid AFO</li> <li>• Stock boots may also be considered to provide stability for standing and positioning</li> </ul> <p>If there is difficulty in sourcing good footwear (either to be worn over AFOs or alone) then funding is sometimes available through the physiotherapy service at CDC via the Elios Trust.</p>	<hr/> <p>Seating to Go</p> <hr/> <p><b>Orthotic centre</b> If this is the first referral for a child to the orthotics centre then this will need to be done by a medical practitioner i.e. paediatrician or orthopaedic surgeon. Subsequent referrals can then be made by Allied Health staff</p> <p>Request to physiotherapy for a shoe voucher</p>

# 0 - 5 years

Assessment	Intervention	Referral / resources
<p><b>Range of movement</b></p> <ul style="list-style-type: none"> <li>• Goniometer</li> </ul> <p><b>Tone</b></p> <ul style="list-style-type: none"> <li>• Modified Tardieu*</li> <li>• Australian Spasticity Assessment Scale (ASAS)*</li> </ul> <p><b>Key muscles to assess include:</b></p> <ul style="list-style-type: none"> <li>• Hip adductors</li> <li>• Hip flexors</li> <li>• Hamstrings</li> <li>• Calves (with knee bent and straight)</li> </ul> <p><b>Strength</b></p> <ul style="list-style-type: none"> <li>• Oxford Scale</li> </ul> <p><b>Key muscles to assess include:</b></p> <ul style="list-style-type: none"> <li>• Hip abductors</li> <li>• Hip extensor</li> <li>• Knee extensors</li> </ul>	<p>Therapy needs may be provided by CDC physiotherapists, VNT's, Conductive education or McKenzie centre. Children at Conductive Education or McKenzie Centre are able to access hip surveillance and orthopaedic clinic through CDC.</p> <p><b>Hip surveillance</b></p> <p>All children with cerebral palsy should be referred for hip surveillance. This is carried out by the CDC physiotherapists. Initial referral should occur between 12-24 months of age or at diagnosis. All children will get (minimum of) a baseline pelvis x-ray. The need for ongoing hip surveillance is determined by the child's GMFCS level and stability of their hip migration percentage.*</p> <hr/> <p><b>Orthopaedic Clinic</b></p> <p>A number of children in GMFCS levels I - III will require orthopaedic intervention at some point in this age range particularly to prevent/manage soft tissue contractures.</p> <hr/> <p><b>Stretches</b></p> <p>Important to prevent contractures and loss of range at joints. Key muscles to stretch:</p> <ul style="list-style-type: none"> <li>• Hip adductors (with knee straight)</li> <li>• Hip flexors</li> <li>• Hamstrings</li> <li>• Calves (with knee bent and straight)</li> </ul> <p>When performing stretches ensure the child is settled and relaxed. It is helpful to find a quiet area where the child can lie down and stay calm. Use the child as a gauge for how far to take the stretch and ensure the stretches are performed slowly. Hold stretches for 10-20 seconds and repeat 3 times. Should be performed daily.</p> <hr/> <p><b>Strengthening</b></p> <p>Use a functional approach for strengthening.</p> <p>Lots of weight bearing activities and symmetrical positions.</p> <ul style="list-style-type: none"> <li>• Pull to stand/sit stand</li> <li>• Squatting</li> <li>• Treadmill training</li> <li>• High Kneeling</li> <li>• Stairs</li> </ul>	<p>Refer to CDC physiotherapist for hip surveillance. Consensus Statement on Hip Surveillance for Children with Cerebral Palsy: Australian Standards of Care 2008</p> <hr/> <p>Referral to be discussed with CDC physiotherapist. Children seen in either CDC ortho clinic or ortho outpatients.</p> <hr/>

## 3.1 Musculoskeletal – lower limb therapy GMFCS I – III

# 3.1 Musculoskeletal – lower limb therapy GMFCS I – III

## 0 - 5 years

### Assessment

### Intervention

### Referral / resources

#### Standing Frame

Children functioning at GMFCS level II and III may sometimes benefit from the use of a standing frame to enable prolonged practise in this position prior to being able to achieve standing at a supportive surface independently. Commonly used standing frames include:

- Moneky – EBOS
- Dandy – Medifab
- Leckey Freestander – Allied Medical

Children in GMFCS II and III may only need a standing frame for a short period of time (eg 12 months) before progressing on to a walking aid, therefore making use of equipment available in the enable store is recommended.

#### Lower limb splinting/orthoses

AFO's\* (ankle foot orthoses) are used to improve foot positioning for stability in standing/walking, maintaining ankle ROM and joint integrity and preventing deformity.

#### Types of AFO's include:

- **Solid AFO** – Holds ankle at fixed angle to prevent plantarflexion, also helps to prevent knee hyperextension.
- **Hinged AFO** – Allows dorsiflexion but blocks plantarflexion. Need to have full knee extension
- **Posterior leaf spring** – used to control foot drop, allows some ankle dorsiflexion due to flexibility of the splint.

Stockboots and gaitors are other common orthoses used for the lower limb. Stockboots help support and position the foot. They are often used in younger children as a first line orthotic before using AFO's. Gaitors can be used to help knee extension in standing and walking. They can also be used to stretch the hamstrings – often in bed at night.

#### Transition

CDC Therapist's will be involved in the transition from CDC based services to MOE-SE services as the client approaches school age. This should be a planned and coordinated transition with meetings and joint visits as/when appropriate.

If a standing frame is indicated then an enable assessor in walking and standing is required.

[www.disabilityfunding.co.nz](http://www.disabilityfunding.co.nz)

#### Referral to orthotics

New scripts for orthotics need to be completed by a paediatrician, orthopaedic surgeon or CDC physiotherapist. Scripts are open for 5 years, during this time families can contact orthotics directly when the child outgrows their orthotic. The contracted provider is Orthotic Centre, located at 43 Pembroke Street, Hamilton. Families will need to travel to Hamilton for provision of their orthotic.

#### Referral to Education

Referral for school support and specific contracts can only be made by the Ministry of Education or the client's school.

## 5 - 16 years

### Assessment

#### Range of movement

- Goniometer

#### Tone

- Modified Tardieu\*
- Australian Spasticity Assessment Scale (ASAS)\*

#### Key muscles to assess include:

- Hip adductors
- Hip flexors
- Hamstrings
- Calves  
(with knee bent and straight)

#### Strength

- Oxford Scale

#### Key muscles to assess include:

- Hip abductors
- Hip extensor
- Knee extensors

### Intervention

Therapy services are provided to children and youth who are not eligible for Education-based therapy input, usually provided via the Ongoing Resourcing Scheme (ORS) or the Physical Disability Service. Ministry of Education Special Education services can only be accessed via referral from school. Children in this group may also access CDC physiotherapy services post-operatively.

#### Hip surveillance

By school age all children with cerebral palsy should be known to hip surveillance. The need for ongoing hip surveillance is determined by the child's GMFCS level and stability of their hip migration percentage\*.

#### Orthopaedic clinic

Children will continue to be seen in orthopaedic clinic as clinically indicated. Children may be seen in either CDC orthopaedic clinic or orthopaedic outpatients.

#### Stretches

Important to prevent soft tissue contractures and loss of joint range of movement.

Key muscles to stretch:

- Hip adductors (with knee straight)
- Hip flexors
- Hamstrings
- Calves (with knee bent and straight)

When performing stretches ensure the child is settled and relaxed. It is helpful to find a quiet area where the child can lie down and stay calm. Use the child as a gauge for how far to take the stretch and ensure the stretches are performed slowly. Hold stretches for 10-20 seconds and repeat 3 times. Should be performed daily.

#### Strengthening

Use a functional approach for strengthening.

Lots of weight bearing activities and symmetrical positions.

- Pull to stand/sit stand
- High Kneeling
- Squatting
- Stairs
- Treadmill training

### Referral / resources

Liaise with CDC Physiotherapists to determine if child is known to these services.

The Local Level Agreement (LLA) between MOE and MOH outlines how therapists in Health and Education interface and work collaboratively.

## 3.1 Musculoskeletal – lower limb therapy GMFCS I – III

# 3.1 Musculoskeletal – lower limb therapy GMFCS I – III

## 5 - 16 years

### Assessment

### Intervention

### Referral / resources

#### Lower limb splinting/orthoses

AFO's\* (ankle foot orthoses) are used to improve foot positioning for stability in standing/walking, maintaining ankle ROM and joint integrity and preventing deformity.

#### Types of AFO's include:

- **Solid AFO** – Holds ankle at fixed angle to prevent plantarflexion, also helps to prevent knee hyperextension.
- **Hinged AFO** – Allows dorsiflexion but blocks plantarflexion. Need to have full knee extension
- **Posterior leaf spring** – used to control foot drop, allows some ankle dorsiflexion due to the splints flexibility
- **Ground Reaction AFO (GRAFO)** – used most often post-operatively to assist/improve knee extension

Gaitors are other common orthoses used for the lower limb. Gaitors can be used to help knee extension in standing and walking. They can also be used to stretch the hamstrings – often in bed at night.

#### Transition

As the child approaches 16 years of age transition to rehabilitation clinic is indicated if the client has ongoing needs and is not involved with Ministry of Education therapists. This should be in accordance with the Waikato District Health Board Youth Transition Policy.

#### Referral to orthotics

New scripts for orthotics need to be completed by a paediatrician, orthopaedic surgeon or CDC physiotherapist. Scripts are open for five years, during this time families can contact orthotics directly when the child outgrows their orthotic. The contracted provider is Orthotic Centre, located at 43 Pembroke Street, Hamilton. Families will need to travel to Hamilton for provision of their orthotic.

#### Rehabilitation clinic

Referral can be made by therapists or paediatrician via the single point of entry for Older Persons and Rehabilitation.

# 0 - 5 years

Assessment	Intervention	Referral / resources
<p><b>Range of movement</b></p> <ul style="list-style-type: none"> <li>Goniometer</li> </ul> <p><b>Tone</b></p> <ul style="list-style-type: none"> <li>Modified Tardieu*</li> <li>Australian Spasticity Assessment Scale (ASAS)*</li> </ul> <p><b>Key muscles to assess include:</b></p> <ul style="list-style-type: none"> <li>Hip adductors</li> <li>Hip flexors</li> <li>Hamstrings</li> <li>Calves (with knee bent and straight)</li> </ul> <p><b>Chailey Levels of Ability *</b></p>	<p>Therapy needs are typically provided by CDC VNT, McKenzie Centre or Conductive Education. Children at McKenzie Centre or Conductive Education will still access hip surveillance and orthopaedic clinic through CDC.</p> <p><b>Hip surveillance</b></p> <p>All children with cerebral palsy should be referred for hip surveillance. Initial referral should occur between 12-24 months of age or at diagnosis. All children will get (minimum of) a baseline pelvis x-ray. The need for ongoing hip surveillance is determined by the child's GMFCS level, age and their hip migration percentage*. As GMFCS level increases the risk of progressive hip displacement also increases.</p> <hr/> <p><b>Orthopaedic clinic</b></p> <p>Children in GMFCS levels IV and V will require orthopaedic intervention/surveillance on a regular basis to monitor hips, spine and other relevant joints.</p> <hr/> <p><b>Stretches</b></p> <p>Stretches are important to help with the prevention of contractures and loss of range at joints.</p> <p>Key muscles to stretch:</p> <ul style="list-style-type: none"> <li>Hip adductors (with knees bent and straight)</li> <li>Hip flexors</li> <li>Hamstrings</li> <li>Calves (with knee bent and straight)</li> </ul> <p>When performing stretches ensure the child is settled and relaxed. It is helpful to find a quiet area where the child can lie down and stay calm. Use the child as a gauge for how far to take the stretch and ensure the stretches are performed slowly to avoid the influence of spasticity. Hold stretches for 10-20 seconds and repeat 3 times. Ideally performed daily.</p>	<p>Refer to CDC physiotherapist for hip surveillance.</p> <hr/> <p>Refer to CDC orthopaedic clinic following discussion with CDC physiotherapists – this will usually be done in conjunction with hip surveillance.</p>

## 3.2 Musculoskeletal – lower limb therapy GMFCS IV – V

# 3.2 Musculoskeletal – lower limb therapy GMFCS IV – V

## 0 - 5 years

### Assessment

### Intervention

### Referral / resources

#### Standing frame

A standing frame is a good way to achieve a prolonged lower limb stretch especially for those children who don't walk. Can also be used to maintain lower limb strength for level IV's who can perform assisted standing transfers. Important considerations are the level of trunk and head control, ability to weight bear, amount of hip and knee extension and foot positioning.

#### Commonly used standing frames include:

- Leckey Freestander – Allied Medical
- R82 Toucan - Euromedical
- Leckey Squiggles – Allied Medical
- Monkey - EBOS
- Dandy - Medifab

#### Lower limb splinting/orthoses

- AFO's\* (ankle foot orthoses) are used to improve foot positioning for stability in standing, maintaining ankle ROM and joint integrity and preventing deformity. The most commonly used AFO in GMFCS level IV and V are solid AFO's. This is a rigid splint which holds the foot in a neutral position.
- Some children may use stockboots for foot positioning instead of AFO's.
- Gaitors may be used to help maintain knee extension. Can be used during the day or overnight for a prolonged stretch.

#### Wheelchair/seating system

Children in GMFCS levels IV and V should have an appropriate wheeled seating system that not only meets their mobility needs but also meets their postural needs. In the younger age group this may be in the form of a supportive buggy. As the child approaches school age it is important to consider transitioning to a wheelchair.

Refer to mobility matrices for buggy and wheelchair options and considerations.

If standing frame is indicated then an enable assessor in walking and Standing accreditation is required.  
[www.disabilityfunding.co.nz](http://www.disabilityfunding.co.nz)

#### Referral to orthotics

New scripts for orthotics need to be completed by a paediatrician, orthopaedic surgeon or CDC physiotherapist. Scripts are open for 5 years, during this time families can contact orthotics directly when the child outgrows their orthotic. The contracted provider is Orthotic Centre, located at 43 Pembroke Street, Hamilton. Families will need to travel to Hamilton for provision of their orthotic.

#### Referral to Wheelchair Solutions

Referrals can be made by therapist involved with the child. GMFCS level IV and V require complex seating systems which are provided by Seating to Go.

## 0 - 5 years

### Assessment

### Intervention

### Referral / resources

#### Sleep systems

There is a developing body of evidence to support the use of sleep systems in children with more severe cerebral palsy. These help to keep the body in a symmetrical position.

Potential musculoskeletal benefits include:

- prevention of lower limb contractures
- positioning of hips
- prevent/slow progression of scoliosis.

Other benefits include quality of sleep and reduced carer stress.

Refer to Equipment and Housing - Sleep matrix for further information regarding indications, options and considerations.

#### Transition

CDC Therapist's will be involved in the transition from CDC based services to MOE-SE services as the child approaches school age. This should be a planned and coordinated transition with meetings and joint visits as/when appropriate.

If a sleep system is indicated an Enable accredited assessor for Wheeled Mobility and Postural Management Level 1, with additional lying endorsement is required.

#### Referral to education

Referral for school support and specific contracts can only be made by the Ministry of Education or the child's school.

## 3.2 Musculoskeletal – lower limb therapy GMFCS IV – V

# 3.2 Musculoskeletal – lower limb therapy GMFCS IV – V

## 5 - 16 years

### Assessment

#### Range of movement

- Goniometer

#### Tone

- Modified Tardieu\*
- Australian Spasticity Assessment Scale (ASAS)\*

#### Key muscles to assess include:

- Hip adductors
- Hip flexors
- Hamstrings
- Calves  
(with knee bent and straight)

#### Chailey Levels of Ability \*

### Intervention

Therapy needs will be provided by the Ministry of Education –Special Education therapists or therapists at fund holder/special schools. Children will still access CDC orthopaedic clinic and hip surveillance as clinically indicated. They may access CDC physiotherapy services post-operatively.

#### Hip surveillance

By school age all children in GMFCS levels IV and V should be known to hip surveillance. The need for ongoing hip surveillance will be determined by the child's GMFCS level and stability of their hip migration percentage\*.

#### Orthopaedic clinic

Children will continue to be seen in the CDC orthopaedic clinic as clinically indicated.

#### Stretches

It is important to continue stretching once children are at school to limit the development of soft tissue contractures and loss of joint range of movement.

#### Standing frame

Standing frames are a good way to provide a prolonged lower limb stretch especially for those children who don't walk. Can also be used to maintain lower limb strength for level IV's who can perform assisted standing transfers. Important considerations include level of trunk and head control, ability to weight bear, amount of knee extension and foot positioning.

#### Common standing frames used for this age group are:

- Easystand – Medix 21
- Activera Hip series - Medifab

Considerations in older children also include transfers in/out of the frame. Sit to stand frames can work well and can sometimes be used in conjunction with a hoist. Standing frames may be provided by CDC therapists and/or MOE –SE therapists as per the Local Level Agreement.

### Referral / resources

Liaise with CDC physiotherapists to determine if child is known to these services.

The Local Level Agreement (LLA) between MOE and MOH outlines how therapists in Health and Education interface and work collaboratively.

If standing frame is indicated then an enable assessor in walking and standing accreditation is required.  
[www.disabilityfunding.co.nz](http://www.disabilityfunding.co.nz)

## 5 - 16 years

### Assessment

### Intervention

### Referral / resources

#### Lower limb splinting/orthoses

- AFO's\* (ankle foot orthoses) are used to improve foot positioning for stability in standing, maintaining ankle ROM and joint integrity and preventing deformity. The most commonly used AFO in GMFCS level IV and V are solid AFO's. This is a rigid splint which holds the foot in a neutral position.
- Some children may use stockboots for foot positioning instead of AFO's.
- Gaitors may be used to help maintain knee extension. Can be used during the day or overnight for a prolonged stretch.

#### Sleep systems

There is a developing body of evidence to support the use of sleep systems in children with more severe cerebral palsy. These help to keep the body in a symmetrical position.

#### Potential musculoskeletal benefits include:

- prevention of lower limb contractures
- positioning of hips
- prevent/slow progression of scoliosis.

Other benefits include quality of sleep and reduced carer stress.

Refer to the Equipment & Housing - Sleep Matrix for further information regarding indications, options and considerations.

#### Wheelchair

Children in GMFCS levels IV and V should already have an appropriate wheeled seating system that not only meets their mobility needs but also meets their postural needs.

#### Transition

As the child approaches 16 years of age transition to Rehabilitation Clinic or Community Living (for children who also have an intellectual disability) is indicated if the client has ongoing needs and is not involved with Ministry of Education therapists. This should be in accordance with the Waikato District Health Board Youth Transition Policy.

#### Referral to orthotics

New scripts for orthotics need to be completed by a paediatrician, orthopaedic surgeon or CDC physiotherapist. Scripts are open for 5 years, during this time families can contact orthotics directly when the child outgrows their orthotic. The contracted provider is Orthotic Centre, located at 43 Pembroke Street, Hamilton. They offer a limited outreach service, most families will need to travel to Hamilton for provision of their orthotic.

If a sleep system is indicated an Enable accredited assessor for Wheeled Mobility and Postural Management Level 1, with additional lying endorsement is required.

Ensure child is known to Seating to Go.

#### Rehabilitation clinic

Referral can be made by therapists or paediatrician via the single point of entry for Older Persons and Rehabilitation Service.

#### Community living

Accessed via needs assessment. Referral can be made by any professional to Disability Support Link (DSL).

## 3.2 Musculoskeletal – lower limb therapy GMFCS IV – V

## 2 - 7 years

### Assessment

#### Range of movement

- Goniometer

#### Tone

- Modified Tardieu\*
- Australian Spasticity Assessment Scale (ASAS)\*

#### Key muscles to assess include:

- Hip adductors
- Hip flexors
- Hamstrings
- Calves  
(with knee bent and straight)

#### Strength

- Oxford Scale
- Key muscles to assess include:
- Hip abductors
  - Hip extensor
  - Knee extensors

#### Radiological evaluation

- Hips are x-rayed as per the hip surveillance guidelines\*
- Spine when clinically indicated
- Other joints may also undergo x-ray as clinically indicated

### Intervention

Surgery is rarely carried out in the under two population.

#### Botulinum toxin A (BoNT-A)injection

Injection of BoNT-A into muscles with spasticity blocks the release of acetylcholine between the nerve and the muscle leading to temporary weakening of the muscle and reduced tone. Effects of the BoNT-A typically last from 3-6 months maximum. Often the functional benefits will last longer although the muscles will begin to 'tighten up' again. It will not work if there is a fixed contracture in the muscle. Injection of BoNT-A is therefore often combined with serial casting of the calf muscles to increase range of movement at the ankle.

Common muscles injected are

- Hip adductors
- Hamstrings
- Gastrocnemius

Sometimes tibialis posterior may also be injected if the foot is going into varus (inverting).

#### Adductor release/tenotomy

Performed to lengthen tight hip adductors and help positioning of femoral head in the acetabulum to prevent subluxation.

#### Varus derotation osteotomy (VDRO)

A small number of children in GMFCS levels I-III may require surgery for hip displacement. As these children generally walk for their mobility their risk of hip displacement is lower. Risk of hip displacement increases with GMFCS level. Surgery involves cutting the head of the femur and fixing it with plates so that it is centred in the acetabulum. Hip spica casts are not typically needed but may still be used on rare occasions or the child may be provided with an abduction brace.

### Post-op management

#### Botulinum toxin A injection

After BoNT-A injections the normal therapy programme can recommence immediately. Children will usually be in below knee plaster casts for up to 6 weeks. They will usually have at least one cast change and will be moulded for new AFO's if required (organised by CDC physio's). Stretching and strengthening exercises are needed post BoNT-A to maintain/improve ROM and improve strength and function.

#### Adductor release/tenotomy

Normal therapy programme can be resumed once the child is comfortable, usually a few days post-op. Stretches for the hip adductors are needed to maintain ROM gained following surgery.

#### Varus derotation osteotomy (VDRO)

The normal stretching programme can continue with due care of the operated hip. Weight-bearing (including standing frame) activities are not permitted for a minimum of 6 weeks post-op (usually more like 6-8 weeks depending on healing). These can be resumed after clearance from the Orthopaedic team.

#### Post-op rehabilitation

For under five's therapy continues to be carried out by their usual therapy provider. School age children are offered a burst of physiotherapy intervention at CDC or through community therapists (depending on the most appropriate option for the child/family). When intensive input is no longer required the child is discharged back to their school therapist as per the Local Level Agreement.

**Note:** Post-op precautions may vary between surgeons, procedures and individual children. The above is a guide only and further advice regarding any post-op precautions can be sought through ward therapy staff or the CDC physiotherapists.

## 3.3 Musculoskeletal – lower limb surgery GMFCS I – III

# 3.3 Musculoskeletal – lower limb surgery GMFCS I – III

## 7+ years

### Assessment

As per the above age group but could also include:

#### Gait analysis

Children are often referred for 3D Instrumented Gait Analysis\* in Auckland prior to considering SEMLS

### Intervention

#### Single event multi-level surgery (SEMLS)

Surgical intervention for the lower limb in the older age group is often combined into one surgical sitting, known as single event multi-level surgery . The goal of surgical intervention is to correct any deformities at each level (hip, knee, ankle/foot) and treat them as one rather than individual joints. Each joint in the lower limb is connected to and affects the others. This approach means there is only one period of rehabilitation. SEMLS is usually carried out when the child is between 9-12 years of age. With the correct 'dose' of surgical intervention the surgery should be a one off. Good gait analysis and evaluation of the soft tissue and bony problems at each level is critical and therefore a number of children are referred for gait analysis for precise information. SEMLS will usually be a combination of different surgical procedures as per below:

#### Botulinum toxin A injection

- There maybe a role for use in older children but in this age group is usually used in conjunction with other surgical intervention(s). Children in this age typically have developed fixed contractures or have lost significant muscle range of movement that BoNT-A alone will not improve and therefore other surgical procedures are required.

#### Tendon lengthening/release(s)

- Surgical lengthening to calves, hamstrings or adductors where there is a fixed contracture

#### Tendon transfer

- Most commonly done at the foot/ankle level (tibialis anterior or posterior) but is also performed at the knee on the quadriceps or hamstring muscles. These are performed to improve muscle function/balance and can also be done where there is a contracture.

### Post-op management

- Following surgery involving the feet, a below knee plaster cast will be applied, usually for a minimum of six weeks.
- Following surgery involving the knee a long leg cast is often used to immobilise and keep the knee in an extended position for up to six weeks post-op. Mobilising the knee after long leg casts can be painful and regular pain medication may be needed for a couple of weeks. It is important to advise families of this prior.
- Children who have had tendon releases/lengthening will be usually be in a cast for 6 weeks. They will be non-weight-bearing for about 4 weeks but may be permitted to weight-bear for the final two weeks in cast(s).
- Children with tendon transfers and bony surgery will be non weight-bearing for six weeks. This may be longer depending on the type of surgery and rate of healing.
- After the casts are removed, the child will go into AFO's\*. Children undergoing knee surgery may be in a pair of Ground Reaction AFO's (GRAFO's) for 6 months to help improve knee extension in standing. Consistent AFO use is an important part of the post-op management and long term outcome following SEMLS.

### Bony surgery

- **Osteotomy** – cut is made in the bone to enable repositioning. Most commonly performed on the femur for increased femoral anteversion
- **Epiphyodesis** – screw or plate inserted at the bone growth plate which closes the growth plate commonly done at the knee for mild fixed flexion contractures.
- **Lateral column lengthening** – insertion of bone graft between cuboid and calcaneus tarsal bones lengthening lateral aspect of foot and shortens medial aspect. Performed to correct a valgus foot deformity (severe flat foot)
- **Subtalar fusion** – fusion of the joint between the calcaneus and talus tarsal bones in the foot with bone graft. Performed to correct a valgus foot deformity (severe flat foot).

### Transition

As the child approaches 16 years of age transition to orthopaedic outpatient department (OOPD) may be indicated if there is likely to be ongoing musculoskeletal and orthopaedic issues. This should be in accordance with the Waikato District Health Board Youth Transition Policy.

### Post-op rehabilitation

Children who have lower limb surgery will usually access therapy through the CDC physiotherapy service. Community therapists may be used for those families who live out of Hamilton City (this is discussed with the family so they can decide which is the most appropriate option for them).

In some instances a child may be referred to the Wilson Centre in Auckland for a period of intensive inpatient rehabilitation.

Rehabilitation plans and timeframes are made in consultation with the school therapist involved in accordance with the Local Level Agreement. When the child no longer requires intensive input they are discharged back to their school therapist (if they are ORS funded or on the physical disabilities service).

**Note:** Post-op precautions may vary between surgeons, procedures and individual children. The above is a guide only and further advice regarding any post-op precautions can be sort through ward therapy staff or the CDC physiotherapists.

### Referral to orthopaedic outpatient department

Referral can be made by therapists but is typically done by way of a letter at the last CDC orthopaedic clinic visit.

## 3.3 Musculoskeletal – lower limb surgery GMFCS I – III

## 2 - 7 years

### Assessment

#### Range of movement

- Goniometer

#### Tone

- Modified Tardieu\*
- Australian Spasticity Assessment Scale (ASAS)\*

#### Key muscles to assess include:

- Hip adductors
- Hip flexors
- Hamstrings
- Calves  
(with knee bent and straight)

#### Radiological evaluation

- Hips are x-rayed as per the hip surveillance guidelines\*
- Spine when clinically indicated
- Other joints may also undergo x-ray as clinically indicated

### Intervention

Surgery is rarely carried out in the under 2 population

Aims of surgical management for level IV and V vary slightly, especially in the older age group.

#### Level IV aims of surgery are to optimise:

- Foot positioning for standing and walking/transferring
- Knee extension for standing and walking/transferring
- Hips to prevent progressive subluxation and dislocation

#### Level V aims of surgery are to optimise:

- Foot positioning for standing in standing frame and footplate on wheelchair
- Hips to prevent progressive subluxation and dislocation, and to maintain ease of cares.
- Occasionally the hamstrings may be injected with botox to maintain knee extension

#### Botulinum toxin injection

- Common muscles injected are adductors, hamstrings and gastrocnemius. Sometimes tibialis posterior may also be injected if the foot is turning inwards.

#### Adductor release/tenotomy

- Performed to lengthen tight hip adductors and help positioning of femoral head in the acetabulum to prevent subluxation.

#### Varus derotation osteotomy (VDRO)

- Children who's migration percentage\* continues to be greater than 30-40% may require surgery to reposition the head of the femur back into the acetabulum. This is done to stabilise the hips and minimise the long term effects of hip dislocation eg pain, difficulty with positioning. Surgery involves cutting the head of the femur and fixing it with plates so that it is centred in the acetabulum. Hip spica casts are not typically needed but may still be used on rare occasions or the child may be provided with an abduction brace

### Post-op management

#### Botulinum toxin A injection

After BoNT-A injections the normal therapy programme can recommence immediately. Children will usually be in below knee plaster casts for up to 6 weeks. They will usually have at least one cast change and will be moulded for new AFO's if required (organised by physio's).

#### Adductor release/tenotomy

Normal therapy programme can be resumed once the child is comfortable, usually a few days post-op. Stretches for the hip adductors are needed to maintain ROM gained following surgery.

#### Varus derotation osteotomy (VDRO)

The normal stretching programme can continue with due care of the operated hip. Weight-bearing (including standing frame) activities are not permitted for a minimum of 6 weeks post-op (usually more like 6-8 weeks depending on healing). These can be resumed after clearance from the Orthopaedic team.

#### Post-op rehabilitation

Stretching and strengthening exercises are needed post-op to maintain/improve ROM and restore pre-op level of function.

- For under 5's therapy continues to be carried out by their usual therapy provider.
- School age children are offered a burst of physiotherapy intervention at CDC or through community therapists if there is a specific goal(s) or need.
- Level V children don't usually require a therapy burst, advice re stretches and rehab is usually offered.

**Note:** Post-op precautions may vary between surgeons, procedures and individual children. The above is a guide only and further advice regarding any post-op precautions can be sort through ward therapy staff or the CDC physiotherapists.

## 3.4 Musculoskeletal – lower limb surgery GMFCS IV – V

# 3.4 Musculoskeletal – lower limb surgery GMFCS IV – V

## 7+ years

### Assessment

#### Range of movement

- Goniometer

#### Tone

- Modified Tardieu\*
- Australian Spasticity Assessment Scale (ASAS)\*

#### Key muscles to assess include:

- Hip adductors
- Hip flexors
- Hamstrings
- Calves  
(with knee bent and straight)

#### Radiological evaluation

- Hips are x-rayed as per the hip surveillance guidelines\*
- Spine when clinically indicated
- Other joints may also undergo x-ray as clinically indicated

### Intervention

Aims of surgical management for level IV and V vary slightly, especially in the older age group

#### Level IV aims of surgery are to optimise:

- Foot positioning for standing and walking/transferring
- Knee extension for standing and walking/transferring
- Hips to prevent progressive subluxation and dislocation

#### Level V aims of surgery are to optimise:

- Foot positioning for feet on footplate of wheelchair
- Hips to prevent progressive subluxation and dislocation
- Other surgery may be indicated if impacting on child's QOL (ie pain) or ability to be positioned comfortably in their wheelchair

#### Botulinum toxin injection

- May still be used - eg for foot positioning, or to improve ease of cares eg perineal hygiene, or pain/function

#### Tendon lengthening/release(s)

- Surgical lengthening to increase ROM at a joint where there is a fixed contracture. Most commonly lengthened muscles for this group of children with CP are the calves and hip adductors, there may be a place for hamstring release or lengthening in the level IV children to maintain standing transfers.

#### Varus derotation osteotomy (VDRO)

Children who's migration percentage\* continues to be greater than 30-40% may require surgery to reposition the head of the femur back into the acetabulum. This is done to stabilise the hips and minimise the long term effects of hip dislocation eg pain, difficulty with positioning. Surgery involves cutting the head of the femur and fixing it with plates so that it is centred in the acetabulum. Hip spica casts are not typically needed but may still be used on rare occasions or the child may be provided with an abduction brace.

#### Transition

As the child approaches 16 years of age transition to orthopaedic outpatient department (OOPD) may be indicated if there is likely to be ongoing musculoskeletal and orthopaedic issues. This should be in accordance with the Waikato District Health Board Youth Transition Policy.

### Post-op management

#### Botulinum toxin A injection

After BoNT-A injections the normal therapy programme can recommence immediately. Children will usually be in below knee plaster casts for up to 6 weeks. They will usually have at least one cast change and will be moulded for new AFO's if required (organised by physio's).

#### Adductor release/tenotomy

Normal therapy programme can be resumed once the child is comfortable, usually a few days post-op. Stretches for the hip adductors are needed to maintain ROM gained following surgery.

#### Varus derotation osteotomy (VDRO)

The normal stretching programme can continue with due care of the operated hip. Weight-bearing (including standing frame) activities are not permitted for a minimum of 6 weeks post-op (usually more like 6-8 weeks depending on healing). These can be resumed after clearance from the Orthopaedic team.

#### Post-op rehabilitation

Stretching and strengthening exercises are needed post-op to maintain/improve ROM and restore pre-op level of function.

- Children are offered a burst of physiotherapy intervention at CDC or through community therapists if there is a specific goal(s) or need.
- Level V children don't usually require a therapy burst, advice re stretches and rehab is usually offered.

**Note:** Post-op precautions may vary between surgeons, procedures and individual children. The above is a guide only and further advice regarding any post-op precautions can be sort through ward therapy staff or the CDC physiotherapists.

#### Referral to orthopaedic outpatient department

Referral can be made by therapists but is typically done by way of a letter at the last CDC orthopaedic clinic visit.

# 0 - 5 years

Assessment	Intervention	Referral / resources
<p><b>Range of motion (ROM)</b></p> <ul style="list-style-type: none"> <li>Goniometer</li> </ul> <p><b>Tone</b></p> <ul style="list-style-type: none"> <li>Modified Tardieu*</li> <li>Australian Spasticity Assessment Scale (ASAS)*</li> </ul> <p><b>Key muscles/joints to assess include:</b></p> <ul style="list-style-type: none"> <li>Shoulder</li> <li>Elbow flexors</li> <li>Forearm pronators</li> <li>Wrist flexors combined with finger flexors</li> <li>Thumb CMC joint</li> </ul> <p><b>Function</b></p> <ul style="list-style-type: none"> <li>Erhardt Developmental Prehension Scale*</li> <li>Melbourne Assessment 2 (MA2)*</li> <li>Assisting hand assessment (AHA)*</li> <li>Observation of fine motor activities</li> </ul>	<p>Intervention typically provided by CDC therapy services VNT, PT and/or OT.</p> <p><b>Stretches</b></p> <p>Important to prevent contractures and loss of range at joints. Key muscles to stretch:</p> <ul style="list-style-type: none"> <li>Shoulder – extensors and internal rotators</li> <li>Elbow flexors</li> <li>Forearm pronators</li> <li>Wrist flexors combined with finger flexors</li> <li>Thumb adductor</li> </ul> <p>When performing stretches ensure the child is settled and relaxed. It is helpful to find a quiet area where the child can lie down and stay calm. Use the child as a gage for how far to take the stretch and ensure the stretches are performed slowly. Hold stretches for 10-20 seconds and repeat 3 times. Ideally performed daily.</p> <hr/> <p><b>Strengthening, sensory and weight bearing</b></p> <p>Provide developmentally appropriate positions and activities to promote strengthening, weight bearing and proprioception for muscles and joints of the upper limb.</p> <hr/> <p><b>Splinting</b></p> <p>Indications for UL splinting include</p> <ul style="list-style-type: none"> <li>Fisting of thumb and fingers</li> <li>Poor positioning of wrist or thumb for functional activities</li> <li>Reduced active/passive movement of UL.</li> </ul> <p>Common splints made/provided:</p> <ul style="list-style-type: none"> <li><b>Thumb abduction wraps</b> – holds the thumb in a slightly abducted position, gives the child sensory feedback with regards to thumb positioning. This is a soft/dynamic type splint and is not designed to hold the thumb rigidly in abduction.</li> <li><b>Wrist supports/brace</b> – Supports the wrist in a neutral position, can be reinforced to make the splint stronger if the child has high tone.</li> <li><b>Night resting splint</b> – Full forearm, wrist and finger splint that maintains muscles and joints in an optimal position for night-time positioning. Is made from thermoplastic material.</li> </ul>	<p><b>Orthopaedic clinic</b></p> <p>Upper limbs are typically assessed at the same time the child is seen for a lower limb review. If there are specific concerns regarding the upper limb(s) let the CDC ortho clinic physiotherapist know by filling out the information sheet or by attending the appointment.</p> <hr/> <p><b>Splinting clinic</b></p> <p>Referral is made via internal referral following discussion with splinting clinic therapists. This ideally occurs as early as possible to minimise the risk of contractures developing.</p>

## 4.1 Upper limb intervention – therapy MACS I-II

# 4.1 Upper limb intervention – therapy MACS I-II

## 0 - 5 years

### Assessment

### Intervention

### Referral / resources

#### Function

- **Constraint induced therapy** - Constraint of non-affected upper limb combined with targeted practice of tasks using affected upper limb. Constraint may be provided in a number of ways. Gloves can be obtained through the CDC splinting clinic. Will require referral to splinting clinic for provision of the glove. Ongoing therapy and constraint programme to be delivered by child's primary therapist.
- **Bimanual training** - Both hands are used together for functional tasks and activities
- **Self cares** - Specific training for self care tasks and adaptive skills to improve independence for activities of daily living. Specific training and adapted tools maybe indicated for functional activities.
- **Fine Motor Function** - Activities that specifically target fine motor tasks including grasp, transfer, release and reach. May consider adaptations and modification for fine motor tools such as scissors, writing utensils. Specific handwriting and curriculum access may be assessed through education.

#### Transition

As the child approaches school age therapy service may change from CDC based service to MOE-SE service. This should be a planned and coordinated transition with appropriate meetings and joint visits when appropriate. **If they child does not meet criteria for support at school their therapy input will typically continue through the physiotherapy and/or occupational therapy teams at CDC.**

#### Fine Motor Function Resources

HELP Fine Motor Home Exercise

**Fine Motor Function-** Therapy Skill Builders

**Pattersons catalogue-** has an extensive range of adaptive tools and equipment for fine motor activities.

#### Referral to education

Referral for School Support and specific contracts can only be made by the Ministry of Education

## 5 - 16 years

Assessment	Intervention	Referral / resources
<p><b>Range of motion (ROM)</b></p> <ul style="list-style-type: none"> <li>Goniometer</li> </ul> <p><b>Tone</b></p> <ul style="list-style-type: none"> <li>Modified Tardieu*</li> <li>Australian Spasticity Assessment Scale (ASAS)*</li> </ul> <p><b>Key muscles/joints to assess include:</b></p> <ul style="list-style-type: none"> <li>Shoulder</li> <li>Elbow flexors</li> <li>Forearm pronators</li> <li>Wrist flexors combined with finger flexors</li> <li>Thumb CMC joint</li> </ul> <p><b>Function</b></p> <ul style="list-style-type: none"> <li>Erhardt Developmental Prehension Scale*</li> <li>Melbourne Assessment 2 (MA2)*</li> <li>Assisting hand assessment (AHA)*</li> <li>Observation of fine motor activities</li> </ul>	<p>CDC therapy services are provided to children and youth who are not eligible for MOE-SE and all clients who require splinting management. Ministry of Education Special Education services can only be accessed via referral from school.</p> <p><b>Orthopaedic clinic</b></p> <p>Children will continue to be seen through the CDC Orthopaedic Clinic as required. Upper limbs are typically assessed at the same time the child is seen for a lower limb review. If there are specific concerns regarding the upper limb(s) let the CDC ortho clinic physiotherapist know by filling out the information sheet or by attending the appointment.</p> <hr/> <p><b>Splinting</b></p> <p>Indications for UL splinting include</p> <ul style="list-style-type: none"> <li>Fisting of thumb and fingers</li> <li>Poor positioning of wrist or thumb for functional activities</li> <li>Reduced active/passive movement of UL.</li> </ul> <p>Common splints made/provided:</p> <ul style="list-style-type: none"> <li><b>Thumb abduction wraps</b> Holds the thumb in a slightly abducted position, gives the child sensory feedback with regards to thumb positioning. This is a soft/dynamic type splint and is not designed to hold the thumb rigidly in abduction.</li> <li><b>Wrist supports/brace</b> Supports the wrist in a neutral position, can be reinforced to make the splint stronger if the child has high tone.</li> <li><b>Night resting splint</b> Full forearm, wrist and finger splint that maintains muscles and joints in an optimal position for night-time positioning. Is made from thermoplastic material.</li> </ul>	<p>Refer to CDC physiotherapists to determine if child is known to orthopaedic service.</p> <hr/> <p>Refer to CDC splinting clinic if child is not already known to this service and splinting needs are identified.</p>

# 4.1 Upper limb intervention – therapy MACS I-II

# 4.1 Upper limb intervention – therapy MACS I-II

## 5 - 16 years

### Assessment

### Intervention

### Referral / resources

#### Function

- **Self cares** – Specific training for self care tasks and adaptive skills to improve independence for activities of daily living. Specific training and adapted tools maybe indicated for functional activities.
- **Fine motor function-** activities that specifically target fine motor tasks including grasp, transfer, release and reach. May consider adaptations and modification for fine motor tools such as scissors, writing utensils. Specific handwriting and curriculum access may be assessed through education

#### Transition

As the child approaches 16 years of age transition to rehabilitation clinic may be indicated if the child requires on going splinting and for those children not currently involved with Ministry of Education therapists.

This should be in accordance with the Waikato District Health Board Youth Transition Policy.

#### Patterson medical catalogue

Has an extensive range of adaptive tools and equipment for fine motor activities.

#### Rehabilitation clinic

This referral can be made by therapists or paediatrician via the single point of entry for Older Persons and Rehabilitation

# 0 - 5 years

Assessment	Intervention	Referral / resources
<p><b>Range of motion (ROM)</b></p> <ul style="list-style-type: none"> <li>Goniometer</li> </ul> <p><b>Tone</b></p> <ul style="list-style-type: none"> <li>Modified Tardieu*</li> <li>Australian Spasticity Assessment Scale (ASAS)*</li> </ul> <p><b>Key muscles/joints to assess include:</b></p> <ul style="list-style-type: none"> <li>Shoulder</li> <li>Elbow flexors</li> <li>Forearm pronators</li> <li>Wrist flexors combined with finger flexors</li> <li>Thumb CMC joint</li> </ul> <p><b>Function</b></p> <ul style="list-style-type: none"> <li>Erhardt Developmental Prehension Scale*</li> <li>Melbourne Assessment 2 (MA2)*</li> <li>Assisting hand assessment (AHA)*</li> <li>Observation of fine motor activities</li> </ul>	<p>Intervention typically provided by CDC therapy services VNT, Conductive Education or McKenzie Centre.</p> <p>NB: Some MACS III children maybe treated according to the Upper Limb Intervention – Therapy MACS I-II matrix.</p> <p><b>Stretches</b></p> <p>Important to prevent contractures and loss of range at joints. Key muscles to stretch:</p> <ul style="list-style-type: none"> <li>Elbow flexors</li> <li>Forearm pronators</li> <li>Thumb adductor</li> <li>Shoulder extension and internal rotators</li> <li>Wrist flexors combined with finger flexors</li> </ul> <p>When performing stretches ensure the child is settled and relaxed. It is helpful to find a quiet area where the child can lie down and stay calm. Use the child as a gauge for how far to take the stretch and ensure the stretches are performed slowly. Hold stretches for 10-20 seconds and repeat 3 times. Ideally performed daily.</p> <hr/> <p><b>Strengthening, Sensory and Weight Bearing</b></p> <p>Provide developmentally appropriate positions and activities to promote strengthening, weight bearing and proprioception for muscles and joints of the upper limb.</p> <hr/> <p><b>Splinting</b></p> <p>Indications for UL splinting include</p> <ul style="list-style-type: none"> <li>Fisting of thumb and fingers</li> <li>Poor positioning of wrist or thumb for functional activities</li> <li>Reduced active/passive movement of UL.</li> </ul> <p>Common splints made/provided:</p> <ul style="list-style-type: none"> <li><b>Thumb abduction wraps</b> – holds the thumb in a slightly abducted position, gives the child sensory feedback with regards to thumb positioning. This is a soft/dynamic type splint and is not designed to hold the thumb rigidly in abduction.</li> <li><b>Wrist supports/brace</b> – Supports the wrist in a neutral position, can be reinforced to make the splint stronger if the child has high tone.</li> <li><b>Night resting splint</b> – Full forearm, wrist and finger splint that maintains muscles and joints in an optimal position for night-time positioning. Is made from thermoplastic material.</li> </ul>	<p>Refer to CDC folders for specific stretching exercises</p> <hr/> <p>Refer to HELP Fine Motor Home Exercise Positioning for play</p> <hr/> <p><b>Referral to Splinting Clinic</b></p> <p>Can be made by therapists and paediatricians involved with the child. This ideally occurs as early as possible to minimise the risk of contractures developing.</p>

## 4.2 Upper limb intervention – therapy MACS III-V

# 4.2 Upper limb intervention – therapy MACS III-V

## 0 - 5 years

### Assessment

### Intervention

### Referral / resources

#### Function

- **Self cares** – Specific training for self care tasks and adaptive skills to improve independence for activities of daily living. Adapted tools will be indicated for functional activities.
- **Fine Motor Function-** activities that specifically target fine motor tasks including grasp, transfer, release and reach. Adaptations and modifications for fine motor tools and the use of assistive technology will be required and specific to the task or functional activity. Handwriting and curriculum access will be addressed by the Ministry of Education.

#### Orthopaedic Clinic

Most children in MACS III-V should be referred for orthopaedic review. There may be role for BoTN-A injections and soft tissue surgery in the management of the upper limb. This could include maintenance of function, range of movement and for ease of care. Refer to surgical matrix for more specific details.

#### Transition

As the child approaches school age therapy service will change from CDC based service to MOE-SE service. This should be a planned and coordinated transition with appropriate meetings and joint visits when appropriate.

#### Patterson Medical catalogue

Has an extensive range of adaptive tools and equipment for fine motor activities.

Refer to the local level agreement for further information on the roles of health and education therapists

#### Referral to Orthopaedic Clinic

Therapists and paediatricians can refer children into orthopaedic clinic.

#### Referral to Education

Referral for School Support and specific contracts can only be made by the Ministry of Education or the child's school

## 5 - 16 years

### Assessment

#### Range of motion (ROM)

- Goniometer

#### Tone

- Modified Tardieu\*
- Australian Spasticity Assessment Scale (ASAS)\*

#### Key muscles/joints to assess include:

- Shoulder
- Elbow flexors
- Forearm pronators
- Wrist flexors combined with finger flexors
- Thumb CMC joint

#### Function

- Erhardt Developmental Prehension Scale\*
- Melbourne Assessment 2 (MA2)\*
- Assisting hand assessment (AHA)\*
- Observation of fine motor activities

### Intervention

Clients will have on going service through splinting clinic and orthopaedic clinic as required. All other upper limb therapy needs are provided by Ministry Of Education- Special Education (MOE-SE). Referral to MOE-SE should occur at transition to school and must be completed by MOE Early Intervention team or the school.

#### Splinting

Indications for UL splinting include

- Fisting of thumb and fingers
- Poor positioning of wrist or thumb for functional activities
- Reduced active/passive movement of UL.

Common splints made/provided:

- **Thumb abduction wraps** – holds the thumb in a slightly abducted position, gives the child sensory feedback with regards to thumb positioning. This is a soft/dynamic type splint and is not designed to hold the thumb rigidly in abduction.
- **Wrist supports/brace** – Supports the wrist in a neutral position, can be reinforced to make the splint stronger if the child has high tone.
- **Night resting splint** – Full forearm, wrist and finger splint that maintains muscles and joints in an optimal position for night-time positioning. Is made from thermoplastic material.

#### Transitions

As the child approaches 16 years of age transition to Rehabilitation Clinic may be indicated if the child requires on going splinting and for those children not currently involved with Ministry of Education therapists.

This should be in accordance with the Waikato District Health Board Youth Transition Policy

### Referral / resources

Refer to CDC physiotherapists to determine if child is known to orthopaedic service.

#### Orthopaedic clinic

Upper limbs are typically assessed at the same time the child is seen for a lower limb review. If there are specific concerns regarding the upper limb(s) let the CDC ortho clinic physiotherapist know by filling out the information sheet or by attending the appointment

#### Rehabilitation clinic

This referral can be made by therapists or paediatrician via the single point of entry for Older Persons and Rehabilitation Service.

## 4.2 Upper limb intervention – therapy MACS III-V

# All ages

## Assessment

### ROM

Key muscles to assess include:

- Elbow flexors
- Forearm pronators
- Wrist flexors combined with finger flexors
- Thumb adductor

## Intervention

Upper limb surgical intervention is rarely carried out (at Waikato Hospital) in under 7's. Botulinum toxin injection may be considered in some cases especially for tight elbow flexors or pronators.

Surgery is mostly performed on children with hemiplegia although occasionally done on children with quadriplegia (botulinum toxin injection or tendon releases may be performed on MACS level IV-V typically if there are care and hygiene issues)

### Botulinum toxin injection

- Most commonly used at the elbow and possibly pronators

### Tendon release

- Most commonly performed on the pronators or thumb abductors

### Tendon transfer

- Commonly performed at the wrist and/or thumb but need to have some voluntary grasp and release for this to be successful.

## Post-op management

### Botox

Stretching and strengthening exercises are needed post botox to maintain/improve ROM and improve strength and function. For under 5's therapy continues to be carried out by their usual therapy provider.

School age children are offered a burst of physiotherapy intervention at CDC or through community therapists. Therapy post intervention is in accordance with the Local Level Agreement between Waikato District Health Board and MOE-SE

### Soft tissue surgery

The upper limb is initially managed in a cast, Casts are in situ for 4-6 weeks and then removed for the child to begin mobilising. Splinting is arranged as required through hand therapy or the CDC splinting clinic.

Therapy is arranged through CDC physiotherapy and/or occupational therapy, community therapists and school therapists. This is dependant on the needs of the child and family and in accordance with the Local Level Agreement between Waikato District Health Board and MOE-SE

## 4.3 Upper limb intervention – surgery

# External access – all ages

## Assessment

**Home assessment (form) to collect the relevant details on the:**

### Child

GMFCS Level

Current indoor and outdoor mobility status. Projected long term mobility status (as guided by GMFCS)

- Wheelchair – self propelling or attendant propelled /buggy
- Walking aid
- Independence

### Activity

Observation of home access and the support the child is requiring from carers

### Environment

- Location of house access in relation to car parking
- Current set up of house access
  - Steps?
  - Ramp?
  - Rail?
  - Threshold lip of entrance doorway
- Internal hall and doorway widths

### Housing situation

- Privately owned
- Private rental
- Housing NZ
- Social situation
- Stability of housing arrangement

## Equipment / modification

### Considerations for external access:

- One external access into the home may gain funding through Enable NZ
- Enable NZ will fund up to \$15,000 for access – internal and external combined.
- Ramp to be 1:12 ratio minimum (1:14 is ideal)
- Threshold ramps are ideal for indoors and outdoors where a lip from the door is an issue.
- Modular ramps may be a temporary solution
- Handrails – consider growth of the child and whether two heights of rails would be beneficial. 900mm is standard height for an adult.

### Common options for external access include:

- Ramp access
- Easy steps (wide, shallow steps made by a builder)
- Hand rails
- Low rise lift may be an option when space for a ramp is not available

### Considerations for internal access:

- If home is two storey then first consider downstairs options, if unavailable then family need to consider alternative housing or private funding of modifications
- It may not be appropriate to install a ramp indoors that meets the 1:12 ratio due to space limitations. It may be that temporary ramps are the most suitable option.
- Enable will consider funding for access to one bedroom, one bathroom, and living, kitchen/dining area.

### Common options for internal access include:

- Widening of doorways
- Stair lift
- Handrails
- Modular/temporary ramps
- Easy steps (wider, shallow steps made by a builder)

## Referral / resources

If housing modifications are indicated and are to be funded through Enable NZ then an assessor with Credentialed Housing Modification accreditation is required. [www.disabilityfunding.co.nz](http://www.disabilityfunding.co.nz)

If equipment is required and is to be funded through Enable NZ then an assessor with accreditation in Personal Care and Household Management is required. [www.disabilityfunding.co.nz](http://www.disabilityfunding.co.nz)

### Waikato DHB resources/booklets

- Home alterations information
- Installing external hand rails

Applications can be co-signed by an accredited assessor.

After assessment the therapist needs to complete

**Enable Equipment Application** – Complex or List equipment as appropriate or Enable Housing Application

# 5.1 Equipment and housing – home access

# 0 – 4 years

## Assessment

**Home assessment (form) to collect the relevant details on the:**

### Child

- Balance
- Current mobility status
  - Wheelchair/Buggy
  - Walking aid
  - Independence
- Weight
- Head and trunk control
- GMFCS level

### Activity

- Observation of transfers and the support the child is requiring from carers
- Transfers in/out of bed
- Transfers in/out of wheelchair
- Transfers on/off toilet, changing table/floor
- Transfers in/out of bath/shower or relevant equipment
- Transfers in/out of the vehicle
- Transfers in/out of positioning equipment

### Environment

- Level access
- Steps
- Ramps
- Rails

### Housing situation

- Privately owned
- Private rental
- Housing NZ

## Equipment / modification

Manual lifting is appropriate at this age as child is generally under ACC safe lifting weight of 16kg

### Considerations:

How the child is held dependent on head and trunk control.

If the child is nearing or over 16kgs consider a hoist or other equipment as outlined below in ages 4+.

This Matrix refers to equipment specifically related to manual handling. For equipment the child may be transferred into refer to the specific Matrices identified below.

- Transfers in/out of bed - for equipment specific to sleep refer to Sleeping Matrix
- Transfers in/out of wheelchair
- Transfers on/off toilet – for equipment specific to toileting refer to Toileting Matrix
- Transfers in/out of bath/shower or relevant equipment - for equipment specific to bathing refer to Bathing/Showering Matrix
- Transfers in/out of the vehicle – for equipment specific to vehicles refer to Vehicles and Carseats Matrix

## Referral / resources

If housing modifications are indicated and are to be funded through Enable NZ then an assessor with Credentialed Housing Modification accreditation is required. [www.disabilityfunding.co.nz](http://www.disabilityfunding.co.nz)

If equipment is required and is to be funded through Enable NZ then an assessor with accreditation in Personal Care and Household Management is required. [www.disabilityfunding.co.nz](http://www.disabilityfunding.co.nz)

Applications can be co-signed by an accredited assessor.

After assessment the therapist needs to complete:

Enable Equipment Application – Complex or List as appropriate or Enable Housing Application

ACC Lifting guidelines

[www.acc.co.nz/PRD\\_EXT\\_CSMP/groups/external\\_ip/documents/guide/pi00212.pdf](http://www.acc.co.nz/PRD_EXT_CSMP/groups/external_ip/documents/guide/pi00212.pdf)

# 5.2 Equipment and housing – manual handling

# 5.2 Equipment and housing – manual handling

## 4+ years

### Assessment

Home assessment (form) to collect the relevant details on the:

#### Child

- Balance
- Current mobility status
  - Wheelchair/Buggy
  - Walking aid
  - Independence
  - GMFCS level
- Weight
- Head and trunk control

#### Activity

- Observation of transfers and the support the child is requiring from carers
- Transfers in/out of bed
- Transfers in/out of wheelchair
- Transfers on/off toilet
- Transfers in/out of bath/shower or relevant equipment
- Transfers in/out of the vehicle
- Transfers in/out of positioning equipment

#### Environment

- Level access
- Steps
- Ramps
- Rails

#### Housing situation

- Privately owned
- Private rental
- Housing NZ

### Equipment / modification

#### GMFCS Level I and II

No lifting equipment should be required by children GMFCS level I & II.

#### GMFCS Level III

#### Equipment:

- Transfer belts
  - Active Rehab (S,M,L – MOH List Equipment)
  - USL Medical (Paediatric sizes)
- Hand rails
- Transfer Boards (Keyport – MOH List Equipment)

### Referral / resources

If equipment is required and is to be funded through Enable NZ then an assessor with accreditation in Personal Care and Household Management is required. [www.disabilityfunding.co.nz](http://www.disabilityfunding.co.nz)

Applications can be co-signed by an accredited assessor.

After assessment is completed the therapist needs to complete:

Enable Equipment Application – Complex or List as appropriate

**OT services for children aged 5+:** Hamilton City and Thames/Hauraki – refer to CDC OT.

For all other Waikato DHB areas, refer to Community OT via the Regional Referral Centre

**Advice and joint visits are available from the Enable Housing Outreach advisor**

### GMFCS Level IV and V

#### Considerations when choosing a hoist:

- Does it need to be taken apart for travel?
- Weight of the hoist
- Width of the hoist and house doorways
- House surfaces eg carpet, lino and size of wheels of the hoist
- Storage ability and charging facilities
- Lift height of the hoist eg floor to chair.
- Consistency with equipment in the child's education setting.

#### Equipment:

##### Hoists

##### Freestanding

- Smartlift (Active Rehab – MOH Preferred Product List)
- Birdie Compact (Invacare - MOH Preferred Product List)
- Liko Light and Viking Range (USL Medical)

##### Ceiling track

- Active rehab
- USL medical

These are generally considered when there is insufficient space for a free standing hoist.

##### Slings

- A variety of slings are available through all companies who supply hoists including sit – stand, gait training slings, full body slings and hygiene slings
- Active Rehab custom Para silk slings – these are able to remain under a child in their wheelchair

Prior to submitting an application for a ceiling track hoist company reps are willing to join therapists for a joint assessment to discuss feasibility, type and placement of a ceiling track hoist. They will also provide a quote to be submitted with the application.

If housing modifications are indicated and are to be funded through Enable NZ then an assessor with Credentialed Housing Modification accreditation is required. [www.disabilityfunding.co.nz](http://www.disabilityfunding.co.nz)

If equipment is required and is to be funded through Enable NZ then an assessor with accreditation in Personal Care and Household Management is required. [www.disabilityfunding.co.nz](http://www.disabilityfunding.co.nz)

Applications can be co-signed by an accredited assessor.

After assessment is completed the therapist needs to complete:

Enable Equipment Application – Complex or List as appropriate or Enable Housing Application

**OT services for children aged 5+:** Hamilton City and Thames/Hauraki – refer to CDC OT. For all other Waikato DHB areas, refer to Community OT via the Regional Referral Centre

**Advice and joint visits are available from the Enable Housing Outreach advisor for Housing Modifications**

## 5.2 Equipment and housing – manual handling

# 0 – 4 years

## Assessment

Home Assessment (form) to collect the relevant details on the:

### Child

- Head control
- Weight
- Contenance
- Vision
- Type of CP
- Cognition
- Behaviour of the child
- Anxiety

### Activity

- Observation of bathing and how carer typically bathes child
- Ease of transfer

### Environment

- Current bathroom setup.
- Access into the bathroom (eg proximity from the child's bedroom, door widths).
- Access into and out of the bath or shower
- Turning area for wheelchairs and commodes
- Layout of bathroom and space for transfers

## Equipment / modification

### GMFCS I - III

#### Considerations

- Can the child access the bath independently?
- Manual handling
- Strategies to increase independence: Backward chaining and visual schedules may be used to start teaching the child the skills needed to be independent with bathing/ showering. The timing of this will be dependent on the child's cognitive ability.

#### Equipment:

- Gelart Kiwi Bathlift (Medix 21)
- Paediatric Shower Commode (Cubro Rehab)
- Prima Bathstep (Cubro Rehab)

### GMGCS IV - V

#### Bathing

Some equipment can reduce the need for a manual lift. Providing the child with support allows the carer to meet the child's bathing requirements and meets the health and safety requirements for the carer.

#### Considerations

- Size/shape of bath
- Other children and family members
- Water pressure
- Head and trunk control
- Manual Handling – refer to Manual handling Matrix
- Continence

## Referral / resources

If equipment is required and is to be funded through Enable NZ then an assessor with accreditation in Personal Care and Household Management is required.

[www.disabilityfunding.co.nz](http://www.disabilityfunding.co.nz)

Applications can be cosigned by an accredited assessor.

After assessment the therapist needs to complete:

Enable Equipment Application – Complex or List as appropriate

If equipment is required and is to be funded through Enable NZ then an assessor with accreditation in Personal Care and Household Management is required.

[www.disabilityfunding.co.nz](http://www.disabilityfunding.co.nz)

Applications can be cosigned by an accredited assessor.

After assessment the therapist needs to complete:

Enable Equipment Application – Complex or List as appropriate

# 5.3 Equipment and housing – bathing and showering

# 5.3 Equipment and housing – bathing and showering

## 0 – 4 years

### Assessment

### Equipment / modification

### Referral / resources

#### Equipment:

- Gelart bath lift – (Medix 21)
- Manatee Bath Chair - (Euromedical)
- Robby/Advance Bath Chair – (Allied Medical) – The Advance has a shower trolley available as an accessory
- Columbia Bath chair – (Allied Medical)
- Lo back bath support – (Allied Medical)
- Green bathe (Medifab) – Green Bathe has a shower trolley available as an accessory
- Penguin – (Euromedical) A supportive seat that sits inside either a standard bath or the Orca
- Orca – (Euromedical) – A free standing bathtub which can be used with a hoist to reduce manual handling risks as children grow

Many of these options have several sizes available

#### Showering

#### Equipment:

- Dukki (Medifab)
- Leckey Advance (Allied Medical)
- Flamingo (Euromedical)
- Green bathe (Medifab)

These can sit in a standard shower box and the child can be lifted in if manual handling is still appropriate and the shower is the only available option.

If housing modifications are indicated and are to be funded through Enable NZ then an assessor with Credentialed Housing Modification accreditation is required. [www.disabilityfunding.co.nz](http://www.disabilityfunding.co.nz)

If equipment is required and is to be funded through Enable NZ then an assessor with accreditation in Personal Care and Household Management is required. [www.disabilityfunding.co.nz](http://www.disabilityfunding.co.nz)

Applications can be co-signed by an accredited assessor.

After assessment the therapist needs to complete:

Enable Equipment Application – Complex or List as appropriate or Enable Housing Application

If parents are self-funding equipment, the “This and That” fund from the CP society may be able to be used. [www.cpsoc.org.nz](http://www.cpsoc.org.nz)

#### Waikato DHB resources/booklets:

- Home alterations information
- Installing a level access shower
- Installing support rails at the shower

## 4+ years

### Assessment

Home Assessment (form) to collect the relevant details on the:

#### Child

- Head control
- Weight
- Contenance
- Vision
- Type of CP
- Cognition
- Behaviour of the child
- Anxiety
- Degree and type of spasticity

#### Activity

- Observation of bathing and how carer typically bathes child
- Ease of transfer

#### Environment

- Current bathroom setup.
- Access into the bathroom (eg proximity from the child's bedroom, door widths)
- Access into and out of the bath or shower
- Turning area for wheelchairs and commodes (1000X1000 is recommended)
- Layout of bathroom and space for transfers

### Equipment / modification

#### GMFCS I-II

##### Equipment: Bathing

- Standard bath

##### Equipment: Showering

- Standard shower cubicle or shower over the bath

Grab rails and/or a step with handrail/s (Carecraft) may be considered.

#### GMFCS III

##### Showering

- Standard shower cubicle with equipment

##### Common equipment options

- Paediatric Shower Commode (Cubro Rehab)
- Grab rails, inside and outside

In some cases equipment and modifications for GMFCS levels IV-V may be more appropriate to consider when the environment cannot be accessed by the child or the carer.

##### Bathing

- Swivel bathers – Enable List Equipment (Cubro Rehab)
- Bath lifters - Bath lift Orca (Invacare)
- Bath lifters – Bexley Junior (Cubro) This has sides, pommel and lapbelt for additional security.

### Referral / resources

**OT services for children aged 5+** Hamilton City and Thames/Hauraki – refer to CDC OT. For all other Waikato DHB areas, refer to Community OT via the Regional Referral Centre

If parents are self-funding equipment, the “This and That” fund from the CP society may be able to be used. [www.cpsoc.org.nz](http://www.cpsoc.org.nz)

**OT services for children aged 5+** Hamilton City and Thames/Hauraki – refer to CDC OT. For all other Waikato DHB areas, refer to Community OT via the Regional Referral Centre

If housing modifications are indicated and are to be funded through Enable NZ then an assessor with Credentialed Housing Modification accreditation is required. [www.disabilityfunding.co.nz](http://www.disabilityfunding.co.nz)

If equipment is required and is to be funded through Enable NZ then an assessor with accreditation in Personal Care and Household Management is required. [www.disabilityfunding.co.nz](http://www.disabilityfunding.co.nz)

Applications can be cosigned by an accredited assessor.

After assessment is completed the therapist needs to complete:

Enable Equipment Application – Complex or List as appropriate or Enable Housing Application

If parents are self-funding equipment, the “This and That” fund from the CP society may be able to be used. [www.cpsoc.org.nz](http://www.cpsoc.org.nz)

Advice and joint visits are available from the Enable Housing Outreach advisor for Housing Modifications

## 5.3 Equipment and housing – bathing and showering

# 5.3 Equipment and housing – bathing and showering

## 4+ years

### Assessment

### Equipment / modification

### Referral / resources

#### GMFCS IV-V

#### Showering

##### Common modification:

- Wet Area shower

By 4 years of age discussion regarding bathing vs. showering should occur as the advantages of showering include:

- minimising unsafe transfers
- improved likelihood of independence in showering

##### Wet Area Shower:

- Requires a building consent if a structural wall is being removed.
- Requires property owners consent
- Requires approximate 1200 X1200mm
- May involve the removal of a bath which will not be replaced
- Bathroom to be structural sound and ready to accommodate a modification
- Families can chose two options for funding - these are full funding from Enable or Cost Contribution.

#### Equipment

- Leckey Advance (Allied Medical)
- Flamingo (Euromedical)
- Zitzi Clozitt (Cubro Rehab)
- Dukki (Medifab)
- Paediatric Shower Commode (Cubro Rehab)
- Shower trolley or wall mounted change table. (These are rarely a first option due to space required and they also lessen the child's ability to be engaged in the activity)

**OT services for children aged 5+** Hamilton City and Thames/Hauraki – refer to CDC OT. For all other Waikato DHB areas, refer to Community OT via the Regional Referral Centre

If housing modifications are indicated and are to be funded through Enable NZ then an assessor with Credentialed Housing Modification accreditation is required. [www.disabilityfunding.co.nz](http://www.disabilityfunding.co.nz)

If equipment is required and is to be funded through Enable NZ then an assessor with accreditation in Personal Care and Household Management is required. [www.disabilityfunding.co.nz](http://www.disabilityfunding.co.nz)

Applications can be cosigned by an accredited assessor.

After assessment is completed the therapist needs to complete:

Enable Equipment Application – Complex or List as appropriate or Enable Housing Application

#### Waikato DHB resources/booklets:

- Home alterations information
- Installing a level access shower
- Installing support rails at the shower

If parents are self-funding equipment, the “This and That” fund from the CP society may be able to be used. [www.cpsoc.org.nz](http://www.cpsoc.org.nz)

Advice and joint visits are available from the Enable Housing Outreach advisor for Housing Modifications

**Considerations:**

- Head support
- Trunk support
- Tilt/recline
- Footplates
- Versatility i.e. dual purpose toileting and showering
- Growth of product
- Static vs. wheeled

\*If a wet area shower is not an option then the therapist will need to consider Bath Equipment and a Hoist system.  
The Multifit shower insert and ramp system may also be considered under the Complex Equipment application.

**Bath supports considerations:**

Size/shape of bath, other children, water needs manual handling

**Preferred supplier from the MoH Complex Equipment 2013 List**

- Manatee (Euromedical)
- DME Bathlift Orca (Invacare)

**Additional safety considerations:**

- Ease of transfer
- Behaviour of the child
- Anxiety
- Degree and type of spasticity
- Manual Handling – refer to manual handling matrix

# 5.3 Equipment and housing – bathing and showering

## 0 – 2 years

### Assessment

**VNT home assessment (form) to collect the relevant details on the:**

#### Child

- Weight
- Continence
- Type of CP
- Cognition
- Ability to roll and bridge

#### Activity

- Is nappy changing more difficult than is typical for the child's age due to the child's disability

#### Environment

- Is the toilet in a separate area
- Could the toilet area and bathroom be combined
- Is the toilet at a standard height?
- Where is nappy changing occurring, floor vs bed vs change table
- Is there room for a carer to assist the child

### Equipment / modification

#### Nappy changing:

If nappy changing is more difficult than is typical for the child's age due to the child's disability then consider equipment.

#### Equipment:

- High-low beds
  - Bock Domiflex Ultra low (Cubro)
  - Bock Belluno (Cubro)
  - Burmeier Dali (USL Medical)
- High-low cot
  - Bock Kangbo cot (Cubro). Rarely funded as generally only a short-term solution

### Referral / resources

If equipment is required and is to be funded through Enable NZ then an assessor with accreditation in Personal Care and Household Management is required. [www.disabilityfunding.co.nz](http://www.disabilityfunding.co.nz)

Applications can be cosigned by an accredited assessor.

After assessment the therapist needs to complete:

Enable Equipment Application – Complex or List as appropriate

## 5.4 Equipment and housing – toileting

# 5.4 Equipment and housing – toileting

## 2 – 6 years

### Assessment

**OT or VNT home assessment (form) to collect the relevant details on the:**

#### Child

- Weight
- Continence
- Type of CP
- GMFCS level
- Cognition
- Head and trunk control
- Ability to roll and bridge

#### Activity

- Is the child toilet trained
- Is there potential for this to occur
- Transfers: are these being done in the bathroom or elsewhere in the house?

#### Environment

- Is the toilet in a separate area
- Could the toilet area and bathroom be combined
- Is the toilet at a standard height
- Where is nappy changing occurring? Floor vs bed vs change table
- Is there room for a carer to assist the child
- Is there turning space for wheelchairs and commodes
- Is there adequate space for transfers including a hoist

### Equipment / modification

#### GMFCS I - III

##### Toilet

##### Rails:

These would be appropriate for the child who requires minimal assistance to complete a transfer onto the toilet.

- Enable NZ Housing process will fund rails only when the total cost is over \$200. Most rehab equipment companies offer rails.
- Grab rails can be privately purchased at Bunnings/Mitre10 or Life Unlimited.

##### Steps:

- Prima Bathstep (Cubro Rehab)
- Paediatric Toilet Step (Care Craft)
- Double Rail height adjustable Footstep Step (BM Enterprises)

##### Reducer Rings/Toilet seats

- Privately purchased at Kmart, Warehouse, Baby City etc.
- Nobi Family Seat (Cubro Rehab)

Some GMFCS level III children may require a higher level of toileting support (eg commode). Refer to GMFCS IV-V section below.

##### Vanity

Consider the height of the vanity, child's hand function, and tapware. Single lever is preferable.

##### Steps:

- Prima Bathstep (Cubro Rehab)

Enable will consider funding separate steps for toilet and vanity if appropriate.

### Referral / resources

From 4 years of age children can be referred to the Continence Resource Nurse at Community Services, Waikato DHB using the "Internal Referral to Community Services" form. Support around nappy provision can be provided as well as advice on toileting.

If parents are self-funding equipment, the "This and That" fund from the CP society may be able to be used. [www.cpsoc.org.nz](http://www.cpsoc.org.nz)

If equipment is required and is to be funded through Enable NZ then an assessor with accreditation in Personal Care and Household Management is required. [www.disabilityfunding.co.nz](http://www.disabilityfunding.co.nz)

If housing modifications are indicated and are to be funded through Enable NZ then an assessor with Credentialed Housing Modification accreditation is required. [www.disabilityfunding.co.nz](http://www.disabilityfunding.co.nz)

Applications can be co-signed by an accredited assessor.

After assessment the therapist needs to complete:

Enable Equipment Application – Complex or List as appropriate or Enable Housing Application.

**OT services for children aged 5+:** Hamilton City and Thames/Hauraki – refer to CDC OT. For all other Waikato DHB areas, refer to Community OT via the Regional Referral Centre.

## 2 – 6 years

### Assessment

### Equipment / modification

### Referral / resources

#### GMFCS IV-V

#### Toilet:

##### Toilet seat attachments:

These are ideal for the child who can complete a standing transfer and step up with minimal assistance.

- Nobi Family Toilet seat (Cubro Rehab). A step without handrails may also need to be provided with the Nobi.
- Viking Toilet Seat Surround (Cubro Rehab)
- Reducer Rings: privately purchased at Kmart, Warehouse, Baby City etc.

#### Steps

- Prima Bathstep (Cubro Rehab)

#### Bidets and toilet attached bidets:

These can assist the child with bottom cleaning. Available at bathroom suppliers.

#### Commodes:

Would be appropriate for the child who is unable to transfer and support themselves on a toilet seat.

- Paediatric Shower Commode (Cubro Rehab).
- Flamingo Commode (Euromedical Rehab)

These sit separately to the toilet and can be used for showering also.

Considerations when looking at a commode include postural supports (trunk, lower limb, head), arm rests, belts/harnesses

#### Vanity

- Does the child need to access the vanity?
- Is it standing or seated access?
- Consider the child's hand function, placement of the taps and faucets and type of tapware being used. Single lever is preferable.

#### Equipment:

Wheelchair accessible vanity – Euro St Michel

Height adjustable vanity- (Euromedical)

Vanities without drawers are recommended for ease of access.

Enable will not contribute towards water pressure or water temperature issues.

If parents are self-funding equipment, the “This and That” fund from the CP society may be able to be used. [www.cpsoc.org.nz](http://www.cpsoc.org.nz)

If equipment is required and is to be funded through Enable NZ then an assessor with accreditation in Personal Care and Household Management is required. [www.disabilityfunding.co.nz](http://www.disabilityfunding.co.nz)

If housing modifications are indicated and are to be funded through Enable NZ then an assessor with Credentialed Housing Modification accreditation is required. [www.disabilityfunding.co.nz](http://www.disabilityfunding.co.nz)

Applications can be co-signed by an accredited assessor.

After assessment the therapist needs to complete:

Enable Equipment Application – Complex or List as appropriate or Enable Housing Application.

**OT services for children aged 5+:** Hamilton City and Thames/Hauraki – refer to CDC OT. For all other Waikato DHB areas, refer to Community OT via the Regional Referral Centre.

As a child grows adaptations with additional pieces, (laterals, harnesses) can be requested through the ENAS007-Subcontractor-Technician-Request form.

## 5.4 Equipment and housing – toileting

# 5.4 Equipment and housing – toileting

## 6+ years

### Assessment

**OT home assessment (form) to collect the relevant details on the:**

#### Child

- Weight
- Continence
- Type of CP
- GMFCS level
- Cognition
- Head and trunk control

#### Activity

- Does the child use the toilet?  
With or without equipment/  
support?
- Transfers: are these being done in  
the bathroom or elsewhere in the  
house?

#### Environment

- Is the toilet in a separate area?
- Could the toilet area and  
bathroom be combined?
- Is the toilet at a standard height?
- If toilet is not used, where is  
changing occurring?
- Is there room for a carer to assist  
the child?
- Is there turning space for  
wheelchairs and commodes?
- Is there adequate space for  
transfers including a hoist?

### Equipment / modification

#### GMFCS I - III

#### Toilet

#### Rails:

These would be appropriate for the child who requires minimal assistance to complete a transfer onto the toilet.

- Enable NZ Housing process will fund rails only when the total cost is over \$200. Most Rehab Equipment Companies offer rails.
- Grab rails can be privately purchased at Bunnings/Mitre10 or Life Unlimited.

### Referral / resources

From four years of age children can be referred to the Continence Resource Nurse at Community Services, Waikato DHB using the “Internal Referral to Community Services” form. Support around nappy provision can be provided as well as advice on toileting.

If parents are self-funding equipment, the “This and That” fund from the CP society may be able to be used. [www.cpsoc.org.nz](http://www.cpsoc.org.nz)

If equipment is required and is to be funded through Enable NZ then an assessor with accreditation in Personal Care and Household Management is required. [www.disabilityfunding.co.nz](http://www.disabilityfunding.co.nz)

Applications can be co-signed by an accredited assessor.

After assessment the therapist needs to complete:

Enable Equipment Application – Complex or List as appropriate

**OT services for children aged 5+:** Hamilton City and Thames/Hauraki – refer to CDC OT. For all other Waikato DHB areas, refer to Community OT via the Regional Referral Centre.

### GMFCS IV-V

Is the commode required for both showering and toileting?

#### Toilet:

For those children who are toilet trained:

#### Commodes:

- Paediatric Shower Commode (Cubro Rehab).
- Flamingo Commode (Euromedical Rehab) – preferred complex product, 4 sizes available.
- Zitzi (Cubro Rehab) – two sizes available
- Dukki (Medifab)

#### For those children not toilet trained:

Toileting cares are generally completed on the high/low bed. Occasionally a shower trolley is funded if it is deemed appropriate (refer to showering). Alternatively a family may wish to self fund these; mounted change tables or freestanding shower trolleys are available in both electric or manual pumps from Equipment Companies including;

- Medifab
- Euromedical
- Cubro
- Active Rehab

Nurse at Community Services, Waikato DHB using the “Internal Referral to Community Services” form. Support around nappy provision can be provided as well as advice on toileting.

If parents are self-funding equipment, the “This and That” fund from the CP society may be able to be used. [www.cpsoc.org.nz](http://www.cpsoc.org.nz)

If equipment is required and is to be funded through Enable NZ then an assessor with accreditation in Personal Care and Household Management is required. [www.disabilityfunding.co.nz](http://www.disabilityfunding.co.nz)

If housing modifications are indicated and are to be funded through Enable NZ then an assessor with Credentialed Housing Modification accreditation is required. [www.disabilityfunding.co.nz](http://www.disabilityfunding.co.nz)

Applications can be co-signed by an accredited assessor.

After assessment the therapist needs to complete:

Enable Equipment Application – Complex or List as appropriate or Enable Housing Application.

**OT services for children aged 5+:** Hamilton City and Thames/Hauraki – refer to CDC OT. For all other Waikato DHB areas, refer to Community OT via the Regional Referral Centre.

As a child grows adaptations with additional pieces (laterals, harnesses) can be requested through the ENAS007-Subcontractor-Technician-Request form.

## 5.4 Equipment and housing – toileting

## 0 – 2 years

### Assessment

**VNT home assessment (form) to collect the relevant details on the:**

#### Child

- Head control
- Weight
- Continence
- Type of CP
- Cognition
- Range of Movement assessment
- Medical status and respiratory function

#### Activity

- Observation of how carer typically transfers the child onto bed/cot
- Position the child assumes in the bed/cot
- Cares being completed on the bed/cot
- How often the child requires turning
- Time spent in bed/cot

#### Environment

- Type of cot or bed
  - Where does the infant sleep
  - Location of bedroom
  - Space in the bedroom
- Include a one week sleep diary

### Equipment / modification

Most under two year olds will be in a standard cot and manually lifted in by parents/carers.

Adherence to the Safe Sleep Guidelines for infants. (Waikato DHB guideline currently being developed. Nov 2013)

Liaise with medical team if required for positioning advice, eg for respiratory function.

#### Equipment:

- If respiratory concerns are identified and the child is requiring head elevation equipment to consider:
  - Bed blocks 50mm, 100mm and 200mm are available in sets of 4 off the List Equipment.
- Alternatively high low cots are available eg Bock Kangbo cot (Cubro). Rarely funded as generally only a short-term solution
- Positioning aids/sleep systems
  - Sleepform (Allied Medical)
  - Hip and thigh support wedge (Medifab)
  - Custom wedges may be considered (Custom Technologies)

### Referral / resources

#### Safe sleep guidelines:

[www.kidshealth.org.nz/keeping-your-baby-safe-during-sleep](http://www.kidshealth.org.nz/keeping-your-baby-safe-during-sleep)

If equipment is required and is to be funded through Enable NZ then an assessor with accreditation in personal care and household management is required for beds, and accreditation in wheeled mobility and postural management with lying endorsement Level 1 for sleep systems.

[www.disabilityfunding.co.nz](http://www.disabilityfunding.co.nz)

Applications can be co-signed by an accredited assessor.

Seating to Go act as an advisory service for lying and sleep systems.

After assessment the therapist needs to complete Enable Equipment Application – Complex or list equipment as appropriate.

## 5.5 Equipment and housing – sleep

# 5.5 Equipment and housing – sleep

## 2+ years

### Assessment

**VNT or OT home assessment (form) to collect the relevant details on the:**

#### Child

- Head control
- Weight
- Contenance
- Type of CP
- Cognition
- Range of Movement assessment
- Medical status and respiratory function
- GMFCS level
- Chailey level \*

#### Activity

- Observation of how child transfers on and off bed
- Position the child assumes on the bed
- Cares being completed on the bed
- Pressure Sore Risk Assessment (Brayden Scale\* or Waterlow Assessment\*)
- How often the child requires turning
- Time spent in bed

#### Environment

- Location and set-up of bedroom eg other children sharing the bedroom
- Space in the bedroom

Include a one week sleep diary

### Equipment / modification

#### GMFCS Level I-III

Child generally transitions from a standard cot to a standard bed. Parents may wish to purchase cotsides.

Consider the height of the bed for optimal transferring ability and safety.

#### Equipment:

- Bed lever
- Step

#### GMFCS Level IV- V

#### Considerations:

- Provision of a specialised bed may be indicated when
  - children need to access bed at a certain height for transfers (refer to manual handling matrix also)
  - clearance under the bed required for a hoist
  - cares are being completed on the bed
- Provision of a specialised mattress may be indicated where child is at risk of pressure area complications
  - child is at risk of pressure area complications
  - air alternating mattresses are not compatible with sleep systems
- Provision of sleep systems may be indicated when:
  - children have or are at risk of developing musculoskeletal deformities
  - children who have poor sleep hygiene eg wakes regularly to be turned
  - children who have bed mobility are unlikely to qualify for a sleep system

### Referral / resources

If equipment is required and is to be funded through Enable NZ then an assessor with accreditation in personal care and household management is required for beds, and accreditation in wheeled mobility and postural management with lying endorsement Level 1 for sleep systems.

[www.disabilityfunding.co.nz](http://www.disabilityfunding.co.nz)

Applications can be co-signed by an accredited assessor.

Seating to Go act as an advisory service for lying and sleep systems.

After assessment the therapist needs to complete Enable Equipment Application – Complex or List equipment as appropriate.

As a child grows adaptations with additional pieces can be requested through the ENAS007-Subcontractor-Technician-Request form.

**OT services for children aged 5+:** Hamilton City and Thames/Hauraki – refer to CDC OT. For all other Waikato DHB areas, refer to Community OT via the Regional Referral Centre.

- Additional considerations when implementing sleep equipment:
  - Behaviour of the child
  - Anxiety
  - Degree and type of spasticity
  - Temperature regulation eg air mattresses make it difficult to keep a child warm. Sleep systems can be problematic for children who tend to overheat.

### Equipment:

- High-low beds
  - Bock Domiflex Ultra low (Cubro)
  - Bock Belluno (Cubro)
  - Burmeier Dali (USL Medical)
- Cotsides if indicated may be full length, partial, height adjustable, padded.

### Mattresses:

- Low pressure risk
- Foam eg eggshell overlay
- Softform Premier (Invacare)

### Medium pressure risk

- Overlays eg Over Mattresses (Cubro)
- Gel eg Action - Polymer Gel Positioning Products, Schon D2 Gel Mattress (Accurate Healthcare)
- Pressure redistributing mattress eg Harvest Diamond (Accurate Healthcare)

### High pressure risk

- Overlays eg Roho (Durable Medical Equipment, DME). This is also compatible with sleep systems/positioning aids.
- Pressure redistributing mattress eg Tempur (Cubro), Metzeler Viscoflo (Cubro)
- Air alternating Mattress eg Schon Premium 9 (Accurate Healthcare), Harvest Royal (Accurate Healthcare)

# 5.5 Equipment and housing – sleep

# 5.5 Equipment and housing – sleep

## 2+ years

### Assessment

### Equipment / modification

### Referral / resources

#### Sleep systems

- Full body support: eg Sleepform (Allied Medical), Snoooooze Snakes (DME)
- Bracket support: eg Snoooooze (DME), Symmetrisleep (Medifab)
- Lower limb only support: eg Off the shelf/custom wedges (Custom Technologies Limited), Full leg troughs (DME), knee troughs (Medifab)
- Temperature control sheets are available to prevent overheating if indicated eg Allied Medical, Medifab

Often it is necessary to mix and match various pieces of equipment from different companies. A common example is Snoooooze or Symmetrisleep brackets for the trunk with a custom wedge for lower limbs.

## 0 – 2 years

### Assessment

**VNT home assessment (form) to collect the relevant details on the:**

#### Child

- Current functional level
- Projected long term mobility status as determined by GMFCS level
- Weight
- Height
- Head and trunk control
- Breathing

#### Activity

- Observation of current transfers into and out of the vehicle
- Level of support required from a carer

#### Environment

- What is the type of car that the family is currently using
- What is the current car seat that the family is using
- Is this meeting the child's needs

### Equipment / modification

#### Considerations

- The back seat is the safest place for children under 12 years of age.
- Rear facing capsules or convertible car seats (typically 5 point harness that can be installed in rear facing or front facing position) are recommended for children 2 years or under.
- Children under 4 years are safest traveling in a 5 or 6 point harness.
- Ensure the recline of the carseat is suitable for the child's head control.

#### Equipment:

- Standard rear facing capsules and car seats
- 5 point convertible (rear-front facing) car seat
- Commercially available head and neck supports

### Referral / resources

In the Waikato, carseats can be hired from;  
Plunket [www.plunket.org.nz](http://www.plunket.org.nz)  
Nurtured [www.nurtured.co.nz](http://www.nurtured.co.nz)  
Baby Factory [www.babyfactory.co.nz](http://www.babyfactory.co.nz)

New Zealand Child Restraints website; includes the laws around use of restraints and descriptions of the various types of carseats commercially available  
[www.childrestraints.co.nz](http://www.childrestraints.co.nz)

## 5.6 Equipment and housing – vehicles and carseats

# 5.6 Equipment and housing – vehicles and carseats

## 2 – 4 years

### Assessment

VNT home assessment (form) to collect the relevant details on the:

#### Child

- Current mobility status and aids used
- Projected long term mobility status as determined by GMFCS level
- Weight
- Height
- Head and trunk control
- Breathing

#### Activity

- Observation of current transfers into and out of the vehicle
- Level of support required from a carer
- Does the child attempt to undo the restraint while the car is in motion

#### Environment

- What is the type of car that the family is currently using
- What is the current car seat that the family is using
- Is this meeting the child's needs

### Equipment / modification

#### GMFCS Level I -III

##### Considerations

- The back seat is the safest place for children under 12 years of age.
- Children under four years are safest traveling in a five or six point harness

##### Equipment

- Standard forward facing car seat or a convertible booster seat

---

#### GMFCS Level IV and V

##### Considerations

- At around four years of age, therapists may wish to start discussing types of vehicles and modifications with families
- The back seat is the safest place for children under 12 years of age.
- Children under four years are safest traveling in a five or six point harness
- Specialised carseats may be appropriate when a standard carseat does not provide adequate head and trunk support

##### Equipment

- Carrot - (Medifab)
- Timy – (Medifab)
- AHR – (Medifab)
- Zitzi – (Cubro Rehab)
- Houdini Harnesses (Medifab) and Buckle Guards (Baby Factory, Repco) for children attempting to undo their restraint
- Consider the growth potential of the carseat for long-term use

### Referral / resources

In the Waikato, carseats can be hired from;  
 Plunket [www.plunket.org.nz](http://www.plunket.org.nz)  
 Nurtured [www.nurtured.co.nz](http://www.nurtured.co.nz)  
 Baby Factory [www.babyfactory.co.nz](http://www.babyfactory.co.nz)

New Zealand Child Restraints website; includes the laws around use of restraints and descriptions of the various types of carseats commercially available  
[www.childrestraints.co.nz](http://www.childrestraints.co.nz)

If equipment is required and is to be funded through Enable NZ then an assessor with accreditation in wheeled mobility and postural management is required.

[www.disabilityfunding.co.nz](http://www.disabilityfunding.co.nz)

Applications can be cosigned by an accredited assessor.

After assessment is completed the therapist needs to complete:

Enable Equipment Application  
 – Complex

## 4 – 6 years

### Assessment

OT home assessment (form) to collect the relevant details on the:

#### Child

- Current mobility status and aids used
- Projected long term mobility status as determined by GMFCS level
- Weight
- Height
- Head and trunk control
- Breathing

#### Activity

- Observation of current transfers into and out of the vehicle
- Level of support required from a carer
- Does the child attempt to undo the restraint while the car is in motion

#### Environment

- What is the type of car that the family is currently using
- What is the current car seat that the family is using
- Is this meeting the child's needs

### Equipment / modification

#### GMFCS Level I - III

##### Considerations

- The back seat is the safest place for children under 12 years of age.

##### Equipment

- Standard high back booster seats

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#### GMFCS Level IV and V

##### Considerations

- If the child is in a power or tilt-in-space wheelchair or is over 16kgs a specialised Passenger Assessment by the local vehicle and modification provider service (eg OTRS in the Waikato) is advised.

##### Equipment

- This is assessed and provided by the local vehicle and modification provider service eg
- Vehicle hoists
- Vehicle ramps
- Vehicles

Enable will fund modifications and Lotteries may contribute towards the vehicle. Ongoing specialised carseat use may be required if funding is unavailable for a mobility van.

##### Equipment

- Carrot - (Medifab)
- Timy – (Medifab)
- Zitzi – (Cubro Rehab)

### Referral / resources

In the Waikato, carseats can be hired from;  
Plunket [www.plunket.org.nz](http://www.plunket.org.nz)  
Nurtured [www.nurtured.co.nz](http://www.nurtured.co.nz)  
Baby Factory [www.babyfactory.co.nz](http://www.babyfactory.co.nz)

New Zealand Child Restraints website; includes the laws around use of restraints and descriptions of the various types of carseats commercially available  
[www.childrestraints.co.nz](http://www.childrestraints.co.nz)

If vehicle modifications are indicated and are to be funded through Enable NZ then an assessor with Enable accreditation is required to complete the Passenger Assessment referral form: [www.disabilityfunding.co.nz/\\_\\_data/assets/word\\_doc/0018/21177/ENAV501-Referral-For-Driver-Passenger-Assessment.doc](http://www.disabilityfunding.co.nz/__data/assets/word_doc/0018/21177/ENAV501-Referral-For-Driver-Passenger-Assessment.doc)

When a new vehicle is required families can apply to the Lotteries Foundation: [www.communitymatters.govt.nz/vwluResources/forms-lottery-IWDapplication/\\$file/forms-lottery-IWDapplication.pdf](http://www.communitymatters.govt.nz/vwluResources/forms-lottery-IWDapplication/$file/forms-lottery-IWDapplication.pdf)

Families will require a support letter from a health practitioner involved in their care. The funding is subject to income and asset testing.

Organisation of Therapy and Rehabilitation Services (OTRS) are the local vehicle and modification provider service. They will assess and advise on appropriate vehicles and apply to Enable for the modifications.

OT services for children aged 5+: Hamilton City and Thames/Hauraki – refer to CDC OT. For all other Waikato DHB areas, refer to Community OT via the Regional Referral Centre.

## 5.6 Equipment and housing – vehicles and carseats

# 5.6 Equipment and housing – vehicles and carseats

## 6+ years

### Assessment

#### Home assessment (form) to collect the relevant details on the:

##### Child

- Current mobility status and aids used
- Projected long term mobility status as determined by GMFCS level
- Weight
- Height
- Head and trunk control
- Breathing

##### Activity

- Observation of current transfers into and out of the vehicle
- Level of support required from a carer
- Does the child attempt to undo the restraint while the car is in motion

##### Environment

- What is the type of car that the family is currently using
- What is the current car seat that the family is using
- Is this meeting the child's needs

### Equipment / modification

#### GMFCS Level I and II

Height of the child, 148 cm is the advised height before a child is safe using a standard adult seat belt only.

- Standard booster seat is legally required until at least age 7

#### GMFCS Level III

When the child is unable to access the car safely, a specialised passenger assessment by the local vehicle and modification provider service (eg OTRS in the Waikato) is advised.

#### Equipment

- Swing out seats
- High Low seats

These options are suitable for children who do not require transport in a wheelchair, but require assistance with transferring.

- Vehicles (if modifications cannot be accommodated in current vehicle).

Enable will fund modifications and Lotteries may contribute towards the vehicle.

Families may reapply to the lotteries and enable after six years for reconsideration of funding for a new vehicle and modifications if the current vehicle is no longer meeting the needs of the child.

### Referral / resources

In the Waikato, carseats can be hired from;  
 Plunket [www.plunket.org.nz](http://www.plunket.org.nz)  
 Nurtured [www.nurtured.co.nz](http://www.nurtured.co.nz)  
 Baby Factory [www.babyfactory.co.nz](http://www.babyfactory.co.nz)

New Zealand Child Restraints website; includes the laws around use of restraints and descriptions of the various types of carseats commercially available  
[www.childrestraints.co.nz](http://www.childrestraints.co.nz)

If vehicle modifications are indicated and are to be funded through Enable NZ then an assessor with Enable accreditation is required to complete the Passenger Assessment referral form:  
[www.disabilityfunding.co.nz/\\_\\_data/assets/word\\_doc/0018/21177/ENAV501-Referral-For-Driver-Passenger-Assessment.doc](http://www.disabilityfunding.co.nz/__data/assets/word_doc/0018/21177/ENAV501-Referral-For-Driver-Passenger-Assessment.doc)

When a new vehicle is required families can apply to the Lotteries Foundation: [www.communitymatters.govt.nz/vwluResources/forms-lottery-IWDapplication/\\$file/forms-lottery-IWDapplication.pdf](http://www.communitymatters.govt.nz/vwluResources/forms-lottery-IWDapplication/$file/forms-lottery-IWDapplication.pdf)

Families will require a support letter from a health practitioner involved in their care. The funding is subject to income and asset testing.

Organisation of Therapy and Rehabilitation Services (OTRS) are the local vehicle and modification provider service. They will assess and advise on appropriate vehicles and apply to Enable for the modifications.

OT services for children aged 5+: Hamilton City and Thames/Hauraki – refer to CDC OT. For all other Waikato DHB areas, refer to Community OT via the Regional Referral Centre.

## 6+ years

### Assessment

### Equipment / modification

### Referral / resources

#### GMFCS Level IV and V

#### Considerations

- If the child is in a power or tilt-in-space wheelchair or is over 16kgs a specialised Passenger Assessment by the local vehicle and modification provider service (eg OTRS in the Waikato) is advised.

#### Equipment

- This is assessed and provided by the local vehicle and modification provider service eg
- Vehicle hoists
- Vehicle ramps
- Vehicles

Enable will fund modifications and lotteries may contribute towards the vehicle.

Families may reapply to the lotteries and enable after six years for reconsideration of funding for a new vehicle and modifications if the current vehicle is no longer meeting the needs of the child.

Ongoing specialised carseat use may be required if funding is unavailable for a mobility van.

#### Equipment

- Carrot - (Medifab)
- Timy - (Medifab)
- Zitzi - (Cubro Rehab)

If vehicle modifications are indicated and are to be funded through Enable NZ then an assessor with Enable accreditation is required to complete the Passenger Assessment referral form: [www.disabilityfunding.co.nz/\\_\\_data/assets/word\\_doc/0018/21177/ENAV501-Referral-For-Driver-Passenger-Assessment.doc](http://www.disabilityfunding.co.nz/__data/assets/word_doc/0018/21177/ENAV501-Referral-For-Driver-Passenger-Assessment.doc)

When a new vehicle is required families can apply to the Lotteries Foundation: [www.communitymatters.govt.nz/vwluResources/forms-lottery-IWDapplication/\\$file/forms-lottery-IWDapplication.pdf](http://www.communitymatters.govt.nz/vwluResources/forms-lottery-IWDapplication/$file/forms-lottery-IWDapplication.pdf)

Families will require a support letter from a health practitioner involved in their care. The funding is subject to income and asset testing.

Organisation of Therapy and Rehabilitation Services (OTRS) are the local vehicle and modification provider service. They will assess and advise on appropriate vehicles and apply to Enable for the modifications.

OT services for children aged 5+: Hamilton City and Thames/Hauraki – refer to CDC OT. For all other Waikato DHB areas, refer to Community OT via the Regional Referral Centre.

## 5.6 Equipment and housing – vehicles and carseats

## Assessment

### Language development

For children who have only a mild motor involvement and normal speech production or just mild dysarthria\*, the usual standardised language assessments can be used.

If the child is under two years of age consider using informal assessments and parent/carer questionnaires as the child is more likely to follow their own agenda at this age. Use everyday objects and picture cards or a simple photo booklet.

VNT or SLT section of the CDC shared drive for a sample communication case history form for use with children with C.P.

### Formal early language development assessments:

- Receptive-Expressive Emergent Language Scale-3rd Edition (REEL 3) \*
- The New Reynell Developmental Language Scales Assessment
- Preschool Language Scale-5 (PLS-5)
- Action Picture Test
- The Bus Story
- South Tyneside Assessment of Syntactic Structures
- The Pragmatics Profile of Early Communication Skills
- Cognition/Communication sections of 'The Carolina Curriculum'

### Other early language assessments

- Proctor, A (1989) Stages of normal noncry vocal development in infancy: A protocol for assessment. Topics of Language

## Considerations and therapeutic management

Children with cerebral palsy are at a higher risk of developing language delays than other children.

It is important to ascertain a child's level of cognitive ability in order to have realistic expectations of how fast a child is likely to progress with therapy intervention.

A child at CFCS Levels I-III may have mild dysarthria which is likely to have only a minimal effect on their speech intelligibility. They may have slightly lower tone which may mean that their muscles do not co-ordinate movements precisely for speech production and speech may sound less clear. Encourage the use of a loud clear voice with extra effort put into moving the lips and tongue in situations where speech intelligibility is poorer e.g., in noisy environments or when the child is tired or unwell.

When assessing and deciding when to refer on, consider the following which may affect a child's language development:-

- The child's motivation to communicate and their personality- are they naturally quiet or keen to communicate as much as they can?
- Co-morbidities such as visual or hearing impairment
- Co-existing communication disorders such as verbal dyspraxia
- Attention deficit disorders
- ASD
- Multiple medical issues
- If the child has right sided hemiplegia then be aware that the left hemisphere where the 'language centre' sits may have been affected and you are more likely to find language problems

When carrying out assessment, planning therapy, and choosing any AAC\* options consider:-

- The child's carer: cognitive abilities, time availability, and their motivation to work with the child on improving communication skills
- Geographical location and access to transport to get to therapy sessions.
- Environments in which the child needs to communicate and who their communication partners are.
- Level of stimulation in the child's language learning environment.
- Involving the caregivers and the child if possible in decision making about goals for therapy intervention.
- Who in the multi-disciplinary team will be the key co-ordinator of trialling and managing equipment.

## Referral / resources

- Consult with a clinical psychologist or early intervention teacher if there are concerns around a child's cognitive functioning.
- Liaise with the child's primary therapist as part of the assessment process to look at how muscle tone and posture may be affecting speech production. Abnormal postures may include scoliosis, kyphosis, and lordosis.

If a child presents with a moderate to severe language or speech delay refer the child to the Ministry of Education, Special Education Speech Language Therapists. If the child is over 5 the referral to the MOE Communications team needs to come from the child's school.

### Ministry of Education special education

[www.minedu.govt.nz/AboutThisSite/ContactUs.aspx](http://www.minedu.govt.nz/AboutThisSite/ContactUs.aspx)

- The 'Resource Guide to Cerebral Palsy for Speech-Language Pathologists' (2005 Thomson Delmar Learning) is an excellent resource. See p61-70 of this book for 'Assessment Protocol for Infants and Young Children'
- Rhea Paul & Courtenay Norbury in their book 'Language Disorders from Infancy through Adolescence' Elsevier publisher, p.195) have also developed a vocal assessment form which can be used to assess the vocalisations of children from birth to 12 months of age (both books mentioned above are available at CDC)

### Websites about communication development in children

For VNTs:-

- 0-5 years of age-what to expect:  
[www.talkingpoint.org.uk/resources/universally-speaking-birth-5](http://www.talkingpoint.org.uk/resources/universally-speaking-birth-5)
- Identify the stage of babbling a child is at  
[www.vocaldevelopment.com/](http://www.vocaldevelopment.com/)

For SLTs:-

- An article with an overview of normal language development, generative language & AAC. It explains Brown's stages of language development and the development of grammatical structures and what to expect at certain ages. It also clearly identifies semantic and pragmatic functions:  
[www.vantatenhove.com/files/NLDAAC.pdf](http://www.vantatenhove.com/files/NLDAAC.pdf)
- Overview of assessment and therapy of dysarthria in children  
[www2.muw.edu/~mharmon/501childdysarthria.html](http://www2.muw.edu/~mharmon/501childdysarthria.html)

# 6.1 Communication - General information

# 6.1 Communication - General information

## Assessment

- Disorders, 10(1), 26-42
- MacArthur-Bates Communicative Developmental Inventories (Fenson, Dale, Reznick, Thal, Bates, Hartung, Pethick, & Reilly, 1993)- Parent report instruments
- Rosetti Infant and Toddler Language Scale (Rossetti, 1990)

### At CDC

VNTs and SLTs may also want to use the following resources for informal assessment and therapy purposes:

- Criterion Referenced Assessment for Development of Early Language (CRADEL)
- 'Hear-Say' resource book
- 'Language Steps'
- Checklists available in 'It Takes Two to Talk' and 'More than Words'
- Communication Checklists on the VNT CDC drive.
- iPad language apps such as Speech with Milo-concepts, verbs etc.

### Functional communication assessment:

Assess the functional impact that the child's communication problems are having on their life.

- Parent-Child interaction
- Range of Communicative functions
- Frequency of communication
- Non-verbal and gesture

## Considerations and therapeutic management

### Functional Communication

Parent and Child Interaction:

- Observe interactions between the child and their caregiver noting down the style of communication the caregiver uses.
- Comment on whether the caregiver gives the child time to initiate or respond. Does the caregiver model language at an appropriate level? Does the caregiver help the child expand their utterances? Does the caregiver follow the child's lead and talk about what is of interest to the child?
- Consider the emotional, psychological and psychosocial impact of the child's communication difficulties on both the individual and the family.
- Ensure goals match family priorities and values/routines.

### Range of communication functions:

- What is language used for?
- Proto-imperatives (used to get an adult to do something or not to do

## Referral / resources

**Free functional communication assessment resource:-** Speech Participation and Activity of children (SPAA-C) version 2.0 : <http://athene.riv.csu.edu.au/~smcleod/SPAAC2.pdf>

Liaise with the child's therapist for an up to date assessment of occupational abilities and goals for participation and mobility

- something, requesting an object or action, protesting)
- Proto-declaratives which are preverbal attempts to focus attention on an object or action by pointing out objects, people or to pictures, to establish joint interaction e.g., by commenting or showing off.
  - Both protoimperatives and protodeclaratives usually appear between the ages of 18-24 months.
  - Discourse functions appear between 18-24 months and refer to a previous conversation or experience, e.g., requesting information, acknowledging that the last utterance was heard by head nodding, imitating part of the previous utterance, or answering a question with an appropriate response.

**Frequency of communication:**

- Comment on how often the child communicates and the environment they communicate most in.
- You would expect the following frequency of communication attempts in normally developing children:
  - 18 months - 2 instances of intentional communication per minute;
  - 24 months - more than 5 communication attempts per minute.
- A significantly low frequency of communication would be if a child over 18 months of age produces less than 10 total communication acts within a 15 minute observation
- Deictic (showing, giving, pointing, reaching which should be used by 12 months of age)

**Gestures:**

- Observe type of gestures used
- Symbolic gestures (play such as carrying out an action on an object to show it's function e.g., holding a toy phone to their ear; play directed towards themselves e.g., pretending to drink from a cup/feed themselves).
- Representational gestures (a body part or something is used to represent something e.g., flapping arms to pretend to be a duck, or putting their hand up to their mouth to indicate they want a biscuit).
- Symbolic and representational gestures should develop by 13 months of age.

# 6.1 Communication - General information

# 6.1 Communication - General information

## Assessment

### Speech sound assessment

The following assessments are available for use at CDC:-

- The New Zealand Articulation test (N.Z.A.T), Jayne Moyle, MOE SE, 2004
- The Diagnostic Evaluation of Articulation and Phonology (DEAP), 2004

## Considerations and therapeutic management

- Assessments such as 'The MacArthur -Bates Communicative Development Inventory and 'The Communication and Symbolic Behaviour scales can be used to assess gesture production.

Children with CP may find it more difficult to produce gestures due to gross and fine motor difficulties. They may also have difficulty with head control which may impact on their ability to use head gestures to give a clear yes/no response, or they may struggle to indicate informational gestures such as holding up a certain number of fingers to tell you 'how many', or giving descriptive gestures when they may wish to show you 'how' something looks e.g., how big, the shape of something e.g., flat/round. Careful observation of the child and consultation with primary carers/support staff will assist in clarifying what the child does to indicate basic communications such as yes/no.

Children with mild cerebral palsy who experience communication difficulties will benefit from language stimulation activities and parent education and advice on how to help their child develop communication skills. Physical activities may have to be slightly adjusted to take into account any physical limitations.

If a child's language skills are delayed then consider introducing a simple signing system such as Makaton but be aware of the impact of any mild hemiplegia

## Referral / resources

### Encouraging speech development

If the child is making speech sound errors please see SLT Caroline Bowen's website pages which have great tips on how parents should model speech for their children and has a wide range of free speech sound worksheets which can be used should the child be having difficulty with a particular sound. [www.speech-language-therapy.com/index.php?option=com\\_content&view=featured&Itemid=101](http://www.speech-language-therapy.com/index.php?option=com_content&view=featured&Itemid=101)

- See CDC VNT- Communication folder for Speech sound development chart and milestones guide.
- Refer to SLT at MOE SE or CDC for specific speech sound assessment if necessary.

### Encouraging language development

Hanen have a wealth of parent education resources designed for children with a language delay. DVDs and books are available at CDC which can be lent out to parents. [www.hanen.org/Home.aspx](http://www.hanen.org/Home.aspx) Complete loan book if lending out resources.

See the VNT Communication section of the CDC drive for early language advice sheets. You may also find it useful to

access the following resources at CDC:-

- Early Communication Skills (speechmark), Lynch & Kidd, 1999
- Cambridge Language Activity File, Bigland, Thomas, Speak, STASS publications, 1992.
- Let's Listen-Auckland Speech-Language Therapy Support Group

Books available at CDC:-

- Children's Communication Skills, from birth to five years, Belinda Buckley, Routledge, 2005
- Language Development in Children with Special Needs, Irene Johansson, Jessica Kingsley Publishers, 1994
- Talk to Me Baby! Betty S. Bardige, Paul, H. Brookes Publishing Co., 2009

**Resources on Makaton signing:** [www.makaton.org.nz](http://www.makaton.org.nz)

At CDC please refer to My First Signs (Baby Signing Book), Child's Play Int Ltd, 2004, and Makaton Core Vocabulary signs, pocket books 1 and 2

# 6.1 Communication - General information

## Assessment

### Assess the child's receptive language skills in terms of:

- Understanding of specific vocabulary items
- How many key words they can follow in an instruction
- Understanding of grammatical markers such as plurals, past tense verbs etc
- Understanding of language concepts e.g., number, time, spatial, size, descriptive concepts,

See Matrix 6.1 for examples of formal language assessments

## Considerations and therapeutic intervention

Children with Cerebral Palsy are susceptible to having both expressive and receptive language difficulties. This is because the lesion that caused the motor difficulties may have caused more diffuse damage to the language areas of the brain and therefore cognitive and language difficulties are commonly reported as co-existing alongside motor impairments.

Children with Cerebral Palsy may also have restricted access to language learning environments and altered quality of social interactions due to their physical disabilities which may impact on their receptive language development.

Increased attendance at medical appointments or time spent in hospital due to needing surgical interventions may also impact on a child's attendance at school and therefore alter the child's language experiences.

Children with Cerebral Palsy may have restricted ability to manipulate toys and their own bodies in space and may therefore need additional time spent on learning specific action words or prepositions (spatial words) which they are not able to easily experience themselves.

When assessing receptive language take into account a child's:-

- Cognition
- Attention
- Hearing- Make sure you ask whether the child has had a history of recurrent ear infections or has had grommets inserted in the past and when their last audiology assessment took place and what the results were.
- Sight- ensure child is wearing glasses if prescribed. You may need to increase size of print or background contrasts to print and pictures.
- Physical abilities to make choices- you may need to place objects in a different alignment during assessment to take account of any hemiplegia or visual field difficulties. Consider using partner assisted scanning of assessment choices if child's physical access skills are limited.
- Linking communication goals with the child's everyday life and what is meaningful to them will make implementation of communication strategies easier.

## Referral / resources

Refer to SLT at CDC or MOE SE for formal assessment of language development if concerns are highlighted from VNT developmental screening assessments.

Refer for an IDA at CDC if there are concerns around developmental delays, particularly around cognitive and language skills.

Liaise with Physio and/or O.T to ensure that the child is given required physical support and adaptations to ensure that they can physically make accurate choices during assessment.

Refer to Audiology if there are concerns around hearing acuity.

Refer to Ophthalmology to have eyes checked if necessary.

# 6.2 Communication - receptive language CFCS I-III

# 6.2 Communication - receptive language CFCS I-III

## Assessment

## Considerations and therapeutic intervention

## Referral / resources

- Keep in mind that children with cerebral palsy may have different communication priorities/interests/needs than other children of the same age.

### **Signs that a child has a problem with understanding spoken language include:**

- Ignoring spoken language
- Repeating back questions rather than answering them
- Difficulty following verbal directions, especially if the instruction is new to them and/or you're not using visual cues such as pointing or showing them what you want them to do.
- Answering a question incorrectly (Such as shaking their head "yes" when you ask them a question with 2 choices. Giving an unrelated answer such as saying "3" when you ask, "What's your name?")

### **Basic ways to help children who have difficulty understanding spoken language:**

- Be face to face with the child
- Say their name or gently touch their arm to ensure you have their attention before giving an instruction.
- Reduce noise and visual distractions if necessary. Consider where to position a child to provide optimum support, e.g., at Kindy seat the child up at the front close to the teacher or an assistant at mat time.
- Simplify your language into short simple phrases. When giving longer instructions avoid overloading the child with information. Break the instruction down into simpler steps, and saying what has to be done first, next etc. or try to give one bit of the instruction at a time.
- Emphasize and repeat key words
- Talk slowly, but naturally to give the child longer to process information, insert pauses in appropriate places
- Use nonverbal clues- Hold up an object or point to it when you talk about it, use pictures, photos, gestures and simple sign language.
- Say what you mean. Say things in a straightforward way e.g. "Ella, come and line up" rather than "I'm still waiting for someone". Avoid or explain sarcasm and jokes.

- Be aware of when you introduce new words. Explain the connections between words. Use lots of demonstration with objects and actions if possible.
- Relate new concepts to the child's own experience first then give the child the opportunity to learn words in different contexts to help them generalize their understanding of the word.
- Encourage the child to indicate when he/she doesn't understand something (shrugging, etc.) so that you can explain it.
- Notice the environment the child is in. There may be psychosocial or sensory issues affecting the child's ability to respond to communication
- Monitor the child's reaction, e.g., look at facial expression to see if the child has understood. Ask the child to repeat back the instruction you have just given them or to tell you what they are going to do before doing it to give them extra time to process it.
- Use 'build ups' and 'break downs' to help your child understand what each word in a sentence means and how words fit together. You naturally will use both

**Build ups:-**Start by saying each part of the sequence and then "build up" the parts into a complete sentence. e.g., "Shoes" (point to shoes). Put on (gesture).-Put on your shoes".

**Break downs:-** Say the whole sentence and then break it down into its parts, e.g., "Use your spoon and eat your beans-Take spoon (point to spoon). Eat (gesture). Beans" (point to beans)

**Ideas to help a child develop their understanding of spoken language:-**

- Play matching games using 2 sets of matching objects, lotto boards or simple wooden inset jigsaws which have pictures on the main board.
- Make a game out of naming objects and having your child point to them to build his vocabulary.
- Have the child practice following simple directions, but try to make them fun (i.e. "Give Mummy a hug!" and "Tickle your little brother!")

At CDC consider using resources such as:-

- 'Language Steps' which provides activity suggestions and materials for working on understanding of 1-4 key words in an instruction. Some of these core activities at 1-2 word level have been precoloured, cut and laminated and are in a folder in the VNT office.
- 'Hear-Say' Language Pack which focuses on building emerging language skills at the 1-3 word level using photocopiable picture resources and story books focusing on teaching core early words and symbolic noises.

## 6.2 Communication - receptive language CFCS I-III

# 6.2 Communication - receptive language CFCS I-III

## Assessment

## Considerations and therapeutic intervention

## Referral / resources

- Use 2 shoe boxes made into posting boxes. Stick animal faces on the front or paint the boxes in different colours that you know the child can identify. Get the child to pick up a specific picture from a lotto or choice board and then post it through the box which you name. E.g., find the apple picture and put it in the dog's box. You can adjust the number of pictures to choose from and the number of post boxes you use depending on how many key words you want the child to remember.
- Play shopping games where you give the child a little basket or bag and ask them to get a particular object. As the child improves you can increase the complexity by increasing the number of items to choose from or the contrasts between the items (size, number, colour, shape) e.g get me the **big/little** carrot; I'd like **2** apples please; find me the **green** lolly; get me the **thin/fat** crayon.
- Encourage parents to read regularly with their child. After reading a page, discuss what was just read and what might happen next to improve language comprehension. Choose books on different topics and focus on building vocabulary skills on a topic for a couple of weeks. Talk about the 'who, what, where, how, and why' of the story (include more complex questions depending on the age of the child). Encourage the child to point out the people, animals and objects in the pictures. As the child advances ask them to point out certain characteristics e.g., the tall/ fat/ thin man. Encourage understanding of how people are feeling and how you can tell e.g., she's smiling so I think she's happy or excited etc.
- Sing songs and nursery rhymes with the child.
- Encourage parents to join a toy library to give the child access to a wide range of play materials which can support language development such as jigsaws, doll's houses, toys for symbolic and pretend play such as builder's belts, doctor's kits, toy farms, garage and vehicles.
- Talk about different kinds of objects e.g., "what kind of a thing is a banana? It's a fruit- can you think of some other kinds of fruit? Or what kind of a thing is a bus? It's a kind of vehicle." If necessary explain why an item belongs to a category. E.g., it's a vehicle and we

- Early Communication Skills (speechmark), Lynch & Kidd, 1999
- Cambridge Language Activity File, Bigland, Thomas, Speak, STASS publications, 1992.
- Let's Listen-Auckland Speech-Language Therapy Support Group

See the SLT or VNT- Communication folder on the CDC shared drive for activity sheets which focus on developing understanding of a range of concepts.

See lists of practical activity suggestions in Betty S.Bardige's book 'Talk to Me Baby!' (available at CDC):-

- p49-51 'Tips for Talking with Toddlers'
- p69-73 'Twenty fun things to do with young toddlers'
- p86-87 Tips for talking with toddlers and twos'.

See the following website which have some useful information about receptive language development and ideas on how to encourage a child's development in this area:-

[www.childdevelopment.com.au/understanding-language](http://www.childdevelopment.com.au/understanding-language)

<http://teachmetotalk.com/2008/02/25/helping-your-toddler-listen-and-obey-improving-receptive-language-skills-in-your-young-child/>

know that because it's got wheels and we can travel in it etc.

- Make scrapbooks or photo books about certain topics. Use your own photos, cut pictures out of newspapers or magazines or print pictures off the internet. Talk about and ask the child to point out different actions.
- Reinforce concept words by asking your child to give you specific items e.g., 'the **big** coin; the **small** teddy; the **long** scarf, or the **short** pair of trousers'.
- Ask your child to paint or draw you a specific picture. Think about how many key words the child needs to understand and remember, e.g., draw me a **big house (2 key words)** with **little** windows (**3-4 key words**), or instructions such as 'Draw a circle at the top of the page'.
- Use colouring books and give your child instructions on what parts to complete in different colours. For children of 4 years and older give double instructions e.g., colour the cat red, or give more detailed instructions e.g., colour the cat's eyes green.
- Work in pairs on 'barrier games' where you cannot see each other's work but have to take turns to give and receive instructions about drawing, colouring, and sticking different parts of the pictures on. At the end, compare pictures to see/check the child was listening carefully and remembering instructions.

When teaching new vocabulary give lots of pieces of information about the word that will help the child retain and recall it on future occasions.

- What type of thing is it? (an animal, an object, food etc.)
- What does it look like? (colour, size etc.)
- What is it made out of? (fabric, flesh, metal etc.)
- What do you do with it?
- Where do you find it?
- Draw a picture of the word.

**With older children encourage them to use the following strategies to help remember the meaning of new words or**

- What is the first letter of the word?
- How many syllables are there in the word?

See VNT and SLT section of CDC shared drive for more detailed information about the use of barrier games and some examples of ones to use.

## 6.2 Communication - receptive language CFCS I-III

# 6.2 Communication - receptive language CFCS I-III

## Assessment

## Considerations and therapeutic intervention

## Referral / resources

- Say a sentence with the word in it.
- Write a sentence with the word in it

### **When teaching a child how to remember a sequence of instructions you could try the following strategies:**

- Visualise the items (trying to imagine a photo or funny image e.g., a clown juggling all the items he has to remember)
- Make associations between items e.g., to remember 'ball cake and car', the child could think of a boy playing football, then having a cake as a snack, then going in the car to see his friend.

### **Practice auditory memory skills through games such as:-**

#### **Go and touch**

- This game can be carried out inside or outside. Start by asking the child to go and touch one item, e.g. 'go and touch the climbing frame'. Gradually increase the number of items a child has to touch before returning to you.

#### **I went shopping**

- Start the game by saying 'I went shopping and I bought a book'. The next child repeats this and adds on an item etc.

#### **Simon says**

- Start with one instruction, e.g. 'Simon says touch your nose' and gradually increase the number of steps in the instruction.

### **Ideas for working on developing understanding of appropriate early vocabulary include topics such as:**

#### **Body Parts**

- Try and incorporate words into daily routines where possible e.g., naming body parts on the child when in the bath and when drying. Pointing to different body parts when playing with teddy/ dolly/ toy animals, or on Mum/Dad/siblings/pets. Sing songs such as 'head, shoulders, knees and toes' or 'when you're happy and you know it'.

<http://teachmetotalk.com/2013/03/28/teaching-body-parts-to-toddlers-with-language-delays/print/>

**Food**

- Name the foods that you buy when at the supermarket and at mealtimes. Try playing shopping games where you give the child a little bag and a purse with some coins in it and ask him to go and find you specific food items that you have placed around the room. Talk about the kinds and qualities of food e.g., meat, fruit, vegetables; sweet, sour, hot, cold.

**Household**

- Talk about where different people live, and the furnishings. Make up games e.g., run and touch the sofa, the chair, the front door; go and put the teddy on the table, on the chair, on the bed etc. Talk about what we do with different things in the house e.g., we sit on the couch, we wash things in the sink/ the washing machine/ the bath etc.

**Mealtimes**

- At mealtimes name the utensils used and the action words associated with eating and drinking e.g 'chew', 'eat up', 'drink your milk', 'pick up', 'open' the yoghurt' etc.

**Other topics could include:**

- Play items
- Transport
- Places
- Animals
- Types of shops
- Basic colours and shapes e.g circle, square.
- Occupations e.g postman, policeman, fireman, doctor, dentist etc
- Holidays and special occasions

## 6.2 Communication - receptive language CFCS I-III

## Assessment

VNTs may choose to use the following assessments available at CDC to obtain information about expressive language development:-

- 'The Carolina Curriculum (for Infants & Toddlers with Special Needs-Third Edition, 2004, and for Preschoolers with Special Needs'- Second Edition,2004), Johnson-Martin, Attermeier, and Hacker
- Schedule of Growing Skills (SOGS)
- The Communication Matrix
- The Receptive-Expressive Emergent Language assessment (REEL-3)
- Criterion Referenced Assessment for Development of Early Language (CRADEL)

SLTs may choose to use the following assessment resources at CDC:-

- The New Reynell Developmental Language Scales Assessment
- Preschool Language Scale-5
- Action Picture Test, C.E Renfrew, 1989
- The Bus Story, C.E Renfrew, 1977
- South Tyneside Assessment of Syntactic Structures (STASS),S. Armstrong & M, Ainley, 2007
- Dorset Assessment of Syntactic structures (DASS)- for older children
- 'The Squirrel Story' or 'Peter and the cat' (Black Sheep press)
- Renfrew Word Finding Assessment
- Clinical Evaluation of Language Fundamentals (CELF-4)

## Considerations and therapeutic intervention

Children with an expressive language delay or disorder may have difficulty:-

- Naming and describing objects
- Explaining how words relate together
- Asking questions
- Giving explanations, news, and retelling stories
- Using gestures
- Putting words together into sentences
- Learning songs and rhymes
- Using grammar correctly e.g., confusing pronouns, like "he" and "she"
- Knowing how to start a conversation and keep it going

Children with Cerebral Palsy may have restricted ability to manipulate toys and their own bodies in space and may therefore need additional time spent on learning specific action words or prepositions which they are not able to easily experience themselves.

If language delays have been identified liaise with the SLT at CDC or MOE SE regarding appropriate resources to use for therapy intervention that can easily be carried out at home under VNT/SLT guidance.

If a child is just starting to communicate verbally consider focusing on early words such as 'more, finished, again, up, milk, baby, shoes, mine' and other words which are useful and motivating to the child.

If a child's language skills are delayed then consider introducing a simple signing system such as Makaton but be aware of the impact of any upper limb function difficulties.

Resources on Makaton signing: [www.makaton.org.nz/](http://www.makaton.org.nz/)

**My First Signs (Baby Signing Book), Child's Play Int Ltd, 2004, and Makaton core vocabulary pocket books 1 and 2.**

## Referral / resources

Refer child to CDC or MOE SE SLT if you suspect the child has a language delay or disorder. J:\Women\_Children\CDCStaff\SLT's-See CDC SLT entry criteria6.doc

See VNT- Communication folder on shared drive for '**Linguistics Guide to Communication Milestones**'.

Children with Cerebral palsy may also be referred to the McKenzie Centre or Conductive Education where they can access Early Intervention services, including SLT input.

School age children may attend special needs schools such as Patricia Avenue [www.patave.school.nz/](http://www.patave.school.nz/)

School aged children should be referred to the Communications Team at MOE SE by their school. [www.minedu.govt.nz/NZEducation/EducationPolicies/SpecialEducation/ServicesAndSupport/Communication.aspx](http://www.minedu.govt.nz/NZEducation/EducationPolicies/SpecialEducation/ServicesAndSupport/Communication.aspx)

See SLT section of CDC drive for specific activity handouts and parent advice leaflets related to language development.

**At CDC consider using resources such as:-**

- Language Steps', A. Armstrong, 1999
- Hear-Say' resource book, K.Gander, G.Close, 1998, which provides activity suggestions and materials for working on expression at 1-4 key word levels. Some of these core activities at 1-2 word

# 6.3 Communication - expressive language

# 6.3 Communication - expressive language

## Assessment

## Considerations and therapeutic intervention

## Referral / resources

### Development of Speech Production in Children with Cerebral Palsy

**Physical examination** is important as physical abnormalities can impact

Children with CP may experience dysphonia (voice problems) due to vocal abuse (e.g crying, screaming) and also because use of breath support for speaking may be difficult.

Gastroesophageal reflux is also a common problem in children with CP. Children with CP may present with a persistent hoarse voice or coughing due to reflux laryngitis.

level have been precoloured, cut and laminated and are in a folder in the VNT office.

- Early Communication Skills (Speechmark), Lynch & Kidd, 1999
- Cambridge Language Activity File, Bigland, Thomas, Speak, STASS publications, 1992.

Refer to SLT and ENT if a child's voice quality is impacting on communication.

Refer to G.P or Paediatrician to ensure reflux is well controlled.

The following book (available at CDC) contains a wide range of useful information on assessment and management of of communication issues in cerebral palsy. See the following sections in particular from Workinger's.

### Resource Guide to Cerebral Palsy for Speech-Language Pathologists':-

- 'Assessment Protocol for Infants and Young Children', p61-70
- Assessment of structural integrity of the assessment of the speech mechanism, respiratory, laryngeal and velopharyngeal function & orofacial function.p48-60

## Assessment

on speech development. Physical and perceptual assessment should look at:-

- Positioning
- Muscle tone
- Posture
- Oral postural control
- Range and strength of muscle movements
- Presence/absence of oral reflexes
- Structure and coordination of movement of the lips, tongue, soft palate, and jaw
- Oral sensation
- Laryngeal function-voice quality
- Resonance/nasality
- Control of oral secretions (drooling)
- Respiratory rate and effort for control and co-ordination of speech production.
- Articulation
- Prosody (intonation patterns-pitch, stress, modulation of loudness)

## Considerations and therapeutic intervention

Grade the touch and movements that you use in therapy and consider the loudness of your voice and the pace of the session in order not to cause startle responses from young or severely physically impaired children.

There are some oral movement patterns seen in children with cerebral palsy that are not seen in normal motor development and which can significantly interfere with speech production such as:-

- Lip retraction
- Lip pursing
- Tongue thrust
- Tongue retraction
- Jaw thrust
- Tonic bite

If jaw or tongue thrust behaviours are noted it is important to focus on reducing these so that the child can learn to use normal motor patterns. It may not be possible to completely eliminate these problems but the frequency with which the behaviours occur can be reduced. The best way to manage these behaviours is to help the child avoid postures which cause extensor thrusting. Head extension in particular is associated with jaw and tongue thrusting so it's important that the child maintains a neutral head posture with an appropriate chin tuck.

Jaw control is a technique that can be used to manage tongue thrust and jaw thrust by limiting the range of jaw opening and helping the child maintain a closed mouth posture. You would use this technique throughout the day with appropriate handling and positioning.

Lip retraction often occurs in conjunction with an overall increase in muscle tone. When this causes problems with articulation (especially likely with dentilization of bilabial consonants i.e. when lip sounds such as 'm,b,w' are pronounced with the teeth on the lips, then lip retraction can be reduced by applying firm but not forceful pressure to a child's cheeks whilst working on specific sound productions.

Consider the use of computer programs such as IBM SpeechViewer to work on improving vocal control for speech.

## Referral / resources

- Appendix E for Jaw control technique for the management of jaw and tongue thrust behaviours.

# 6.3 Communication - expressive language

# 6.3 Communication - expressive language

## Assessment

### Laryngeal function

Assessment data can be gathered using instrumentation such as the VisiPitch and Computerized Speech Laboratory

Describe laryngeal voice quality e.g., hoarse, breathy, harsh, strained/strangled (it may be helpful to use the GRBAS rating scale when rating voice quality (rate grade, roughness, breathiness, asthenicity, and strain on a scale of 0–3).

### Velopharyngeal

If you hear nasal emission, see, or hear reports of nasal regurgitation, or if the child has only developed nasalised vowels and nasal consonants then you should ask the SLT to assess for velopharyngeal incompetence.

### Respiratory support

## Considerations and therapeutic intervention

If access to computer programs is not available then consider using a stopwatch to measure maximum phonation time. Use a pitch pipe or digital pitch meter to measure pitch range, and a sound level meter to measure habitual and maximum loudness levels.

Note down any changes in voice quality throughout an utterance and any attributing factors e.g., extraneous movements, slipping posture, poor breath support. Comment on pitch breaks, voice stoppage and any rushes of air heard.

Young children with an active or hyperactive gag reflex may not be able to tolerate wearing a palatal lift until they are at school

For younger children use activities to encourage the use of long and loud phonation such as singing along to songs, or holding vowels at different loudness levels.

For older children consider the use of the Lee Silverman Voice therapy which is now starting to be trialled with children with CP. For older children also consider the use of an oral manometer.

## Referral / resources

### Information on assessment and treatment of velopharyngeal incompetence:-

[www.med.umich.edu/speechpath/MSHAHandout2006-Adobe.pdf](http://www.med.umich.edu/speechpath/MSHAHandout2006-Adobe.pdf)

<http://speechpathologyceus.net/wp-content/uploads/2011/01/ABAD-1023-Assessment-and-Treatment-of-Velopharyngeal-Dysfunction.pdf>

If moderate to severe velopharyngeal incompetence is suspected then you should refer the child to the **Combined Clinic and /or the Dental dept** for consideration of a palatal lift or surgery if required.

Article from LSVT® Global about using LSVT with children with CP

[www.lsvtglobal.com/images/uploads/CMS/11754/lsvt\\_news\\_issue4.pdf](http://www.lsvtglobal.com/images/uploads/CMS/11754/lsvt_news_issue4.pdf)

Liaise with Physio and O.T regarding

## Assessment

## Considerations and therapeutic intervention

## Referral / resources

### Articulation

Speech Intelligibility assessment  
Use a standardised articulation assessments such as:-

- The DEAP
- NZ Articulation Test
- The sentence Intelligibility Test (Yorkston, Beukelman, and Tice, 1996)
- Children's Speech Intelligibility Measure (Wilcox K, Morris S. San Antonio: Harcourt Assessment, 1999)

Obtain an estimation of speech intelligibility.

- Rate speech intelligibility on the percentage of child's speech which was understood, or
- Rate on a 7 point severity scale.
- Ask carers to rate intelligibility, for speech within a known context and when context is not known.
- You may also want to ask the carer and the child to rate their speech intelligibility at different times of day to take into account fatigue and different environmental factors which may affect background noise/acoustics.

When focusing on improving respiratory control for speech production work with an O.T or Physiotherapist to ensure good pelvic orientation, appropriate positioning and alignment. Consider conducting parts of therapy sessions whilst the child is in their standing frame and/or in a supine position to reduce extraneous movements if a child has poor head and trunk alignment.

Developmental articulation errors are not necessarily more common in children with CP however different types of CP may make particular types of speech errors more likely. Children with CP may use smaller vowel areas so clinicians need to work on accuracy of vowel production as part of a treatment program as well as the accuracy of consonant production' (Workinger's,M,2005).

Teach the child how to use appropriate lip postures for specific sounds, using visual feedback from a mirror, video recording or a visual feedback computer programme or on an iPad. Encourage the use of body postures which avoid shoulder retraction and head extension.

Therapy should aim to be holistic and work on achieving functional communication goals through the use of compensatory intelligibility strategies at a vocal level, the use of assistive and augmentative communication when required, as well as working on a physiological level.

the need for the use of a harness or straps on the child's wheelchair as this may affect a child's breath control.

- Rhea Paul and Courtney Norbury have an excellent book called 'Language disorders from Infancy through Adolescence' which gives a clear overview and form for completing an oral motor assessment (Chapter 2 p30-34). Available at CDC

Other resource suggestions:-  
Oral Motor Assessment and Treatment: Ages and Stages  
Diane Chapman Bahr, Loyola College in Maryland, 2001, ISBN-10: 0205297862  
Publisher: Allyn & Bacon  
See SLT CDC shared drive for specific speech sound resource materials, and WDHB SLT drive for resources to help with managing dysarthria.

# 6.3 Communication - expressive language

# 6.3 Communication - expressive language

## Assessment

### Pragmatics

Obtain a language sample including conversation and a narrative. You could ask the child to retell one of their favourite stories or use a narrative assessment such as 'The Squirrel Story' or 'Peter and the cat' (Black Sheep press- available at CDC).

Use Language samples from peer-to-peer interactions, and interactions with carers.

## Considerations and therapeutic intervention

Remember that a child with C.P's physical and cognitive difficulties can impact on their ability to socially initiate and participate in conversations.

### Difficulties to look out for:-

- Limited or inappropriate eye contact
- Limited interest in interacting with others. May not use language for social chat or ask questions to find out about others' interests and ideas.
- Limited or exaggerated facial expression
- Limited or over exaggerated use of gestures
- Not responding to their name being called
- Not responding when asked a question
- Difficulty taking turns in activities and conversations
- Poor ability to notice and respond to the non-verbal aspects of language (reacting appropriately to the other person's body language and 'mood', as well as their words)
- Poor initiation of communication interactions. Difficulty knowing when it's appropriate to talk and to interrupt politely.
- Poor introduction of topics or change of topics of conversation, so the listener may not understand what the child is referring to.
- Repetitive use of certain words and phrases, which may be used out of context or may sound as if they've been learnt from movies, computer games, or stories. Being fixated about talking about specific topics.
- Difficulty responding appropriately to something someone has said. The child may have difficulty using prior knowledge and with generalising understanding of words.
- Understanding words or phrases very literally. Not understanding humour.
- Poor ability to follow someone's eye gaze to direct attention.
- Difficulty using eye gaze to joint reference an item of interest by looking at the conversational partner, looking at the item or person of interest and then looking back at the conversational partner to check in that they've noticed the reference

## Referral / resources

Norm-referenced parent and teacher report measures such as the following can be used for screening children's social-communication skills:-

- 'Pragmatics Profile of Early Communication Skills, Dewart,H, and Summers,S,1988 (available at CDC)
- The Children's Communication Checklist-2 (Bishop, 2003)
- The Pragmatic Language Skills Inventory (Gilliam & Miller, 2006)
- You can also use checklists and conversational rubrics (for examples, see Kaczmarek, 2002; Paul, 2008; Prutting & Kirchner, 1987) to help you make notes about whether a particular skill or behaviour occurred, e.g., turn-taking, conversational repair)

If you have concerns about a child's social communication skills then consider referring the child for an IDA or SCA at CDC.

## Assessment

### Drooling

- Mild drooling is described as “when the saliva remains on the lips.”
- Moderate drooling “when saliva is present on the lips and chin”
- Severe drooling “When the saliva falls to the clothing from the lips and chin”
- Profound drooling “ When saliva reaches books, tables, and /or other structures or possessions”

(Allaire, Blasco, and Haberfellner, 2002, and Crysedale and White, 1989.

Look at lips, tongue and soft palate for any abnormalities, and assess range and strength of movement. Note any tongue or jaw thrust.

Gather subjective reports from caregivers and child if appropriate.

Look at the child’s awareness of the problem and motivation to change behaviour.

## Considerations and therapeutic intervention

Observe child in different positions e.g., when watching TV or when talking to someone; when doing something that requires a change in head position e.g., bubble game, reading a book and conversing; when eating. Observe in different postures e.g., seated (supported) and seated (unsupported) and when moving around either walking or crawling or on tummy.

- Make a count of the frequency of drooling during these different postures/activities.

### Child’s positioning.

- Environment – It may help to raise the level of tables or trays, place books or AAC devices on an inclined table surface or tray, or even tilt the child’s chair in space so he/she is reclined at an angle slightly greater than 90 degrees.
- Use age appropriate protective clothing - bibs, scarves, terraline wrist bands
- Ensure regular checks of skin integrity are carried out
- Use rewards or prompting to encourage swallowing
- Use exercises to increase muscle tone, improve oral-motor function and improve sensory awareness.
- Encourage dabbing rather than wiping of the mouth.
- Consider using behavioural management techniques such as using a timing device that provides an auditory signal to remind the client to swallow (swallow reminder brooch) or using praise/reward for the use of tissues pressed to the lips.
- Consider use of an intraoral appliance such as the ‘Innsbruck Sensorimotor Activator & Regulator’ as therapeutic vibratory stimulation, or muscle vibration, is a technique that is sometimes used as part of a treatment programme for drooling problems.

## Referral / resources

Consider referral to the Dental service to assess overall dental health if concerns exist.

Discussions with the Primary Paediatrician may be required in excessive cases of drooling to investigate medical/surgical management e.g Botox surgery options.

Discuss with Physio/OT to look at posture/positioning.

Consider referral to ENT to assess any airway obstructions which may be contributing to the problem.

[www.scope.org.uk/help-and-information/cerebral-palsy/drooling-and-cerebral-palsy](http://www.scope.org.uk/help-and-information/cerebral-palsy/drooling-and-cerebral-palsy)

Swallow reminder badges may be useful for older children to prompt them to swallow:

[www.winslowresources.com/swallow-reminder.html](http://www.winslowresources.com/swallow-reminder.html)

Innsbruck Sensorimotor Activator & Regulator:-

[www.ncbi.nlm.nih.gov/pubmed/14974646](http://www.ncbi.nlm.nih.gov/pubmed/14974646)

# 6.3 Communication - expressive language

## Assessment

### Assessments

Work with O.T or Physiotherapist as required to modify assessment if severe motor difficulties are present. A child may need to use fist pointing, pointing to numbers on a line to indicate choice of one of four pictures. Eye gaze or use of partner assisted scanning to make choices can also be used. Make sure you mention the modifications you used when completing the child's report.

### The Nonspeech Test (AAC)

(Huer,1988)-A test of expressive and receptive language for children who are nonspeaking (ages 0-48 month)

**Social Networks**-A Communication Inventory for Individuals with Complex Communication Needs and their communication partners by Sarah W.Blackstone, and Mary Hunt Berg is an assessment and intervention planning tool which can help professionals work with family members and individuals to determine appropriate communication strategies and technologies for clients to use with their communication partners. It is available at [www.augcominc.com](http://www.augcominc.com)

## Considerations and therapeutic intervention

### Children with severe forms of CP:

\*Are likely to have significant movement difficulties impacting on fine and gross motor functioning, muscle tone and postural control

\*These children often present with significant cognitive impairments and developmental delays combined with multiple medical complications

### Language development in children with cerebral palsy

Language difficulties and cognitive impairment are two deficits which are commonly found in children with severe dysarthria.

- Children with severe motor difficulties may have difficulty accessing their environment because of their physical limitations. This can decrease their sensorimotor interactions with people and objects, as well as affect their understanding of spatial concepts such as 'in/on/behind'.
- Paul (2012) notes that therapists should focus on developing the child's comprehension skills rather than just working towards the next developmental stage of language output.
- Seif (2005) p117, writes:-  
"it is important to focus on the development of vocabulary that will allow them to interact with their environment and express their wishes and interests as much as possible. Approximations of words such as "more", "no", "yes," or "yeah", "out," "off," "open," "away", "up," "down," "eat," and "help" will foster a child's ability to interact and control his/her environment in a socially appropriate manner.
- These children may also not always have consistent access to their modes of communication such as boards or communication devices, their communication devices also may not always meet all their communication needs.

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Refer to TalkLink if you think that the child may benefit from having a customized communication system, be it low, medium or high tech.

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## Referral / resources

Research has found that the use of voice output communication devices can stimulate speech and language development. This article by **Romski,M & PhD, Sevcik,R (2005)**, pp. 174–185, looks at some of the Myths and evidence around the use of Augmentative Communication in Early Intervention and is a very useful tool if you come across therapists, parents or teachers who don't believe that AAC could be a useful addition to their child's communication toolbox.  
[http://depts.washington.edu/isei/yc/romski\\_18\\_3.pdf](http://depts.washington.edu/isei/yc/romski_18_3.pdf) (accessed 24.01.13).  
YaaK also have a great summary sheet on the same issues:-  
<http://aac.unl.edu/yaack/b2.html> (accessed 24.01.13)

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[www.talklink.org.nz/index.php/communication/](http://www.talklink.org.nz/index.php/communication/)

[www.talklink.org.nz/index.php/referrals/](http://www.talklink.org.nz/index.php/referrals/)

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# 6.4 Communication - severe communication difficulties CFCS IV-V

# 6.4 Communication - severe communication difficulties CFCS IV-V

## Assessment

Communication Matrix  
by Charity Rowland

[www.communicationmatrix.org](http://www.communicationmatrix.org)

Order from:

[www.designtolearn.com](http://www.designtolearn.com).

The online version of this assessment is based on the parent version of the Matrix and is free.

[www.communicationmatrix.org](http://www.communicationmatrix.org)

Triple C Checklist of Communicative competencies (Revised) (Bloomberg, West, Johnson, & Iacono, 2009)

For assessment of adolescents and adults with little or no speech. This tool can be used to assess cognitive and early communication skills. It was designed for use with adults with severe and multiple disabilities.

Augmentative and Alternative Communication Profile' A Continuum of Learning by Tracey M.Kovach, Ph.D:-

This assessment tool measures 'subjective, functional skills for developing communicative competence using AAC systems; re-evaluates skill level; and monitors progress'.

Available from:

[www.linguissystems.com](http://www.linguissystems.com)

## Considerations and therapeutic intervention

### Parent-child interaction

Parents of children with severe dysarthria may offer their children less conversation opportunities. This may be due to difficulty understanding their child's communication attempts but parents also know their children so well that they often anticipate their communication, physical and emotional needs and therefore hinder the child's communication independence. Communication training for parents can play an important role for children with severe motor speech difficulties. Training may focus on helping the parents recognize their child's communication signals and helping them develop strategies to encourage their child to be as independent as possible in initiating and sustaining communication with others. Parents may need specific suggestions as to the types of activities that the child can participate in to encourage development of specific skills, as well as to identify potential communication partners. Goals may encourage wider interaction with community members such as at the local coffee shop or McDonalds, the library, the swimming pool, the park, the cinema, at camp, at the soft play area etc. Children may need specific help to encourage them to use specific communication functions such as greetings, requesting, commenting, asking questions, requesting clarification, negotiating etc.

### Literacy

Children with cerebral palsy may need to be provided with some modification as they may have difficulty physically holding a pen/pencil and turning pages in books. Work with the O.T to look at what options are available as you may need to look at the use of a big keys keyboard, switch adapted scanning with an onscreen keyboard for writing or partner assisted scanning or use of an E-Tran frame for reading/phonics work.

## Referral / resources

Literacy related websites:- [www.janefarrall.com/blog/2012/03/06/guided-reading-for-all-students/](http://www.janefarrall.com/blog/2012/03/06/guided-reading-for-all-students/)

[www.med.unc.edu/ahs/clds](http://www.med.unc.edu/ahs/clds)

[www.med.unc.edu/ahs/clds/files/adolescent-resources/NellenbachASHA2011Handout.pdf](http://www.med.unc.edu/ahs/clds/files/adolescent-resources/NellenbachASHA2011Handout.pdf)

<http://aacliteracy.psu.edu/Home.html>

Dr Sally Clendon who is a Speech & Language Therapist and a consultant in the area of literacy for children with significant disabilities particularly those with complex communication needs presented this excellent workshop in Hamilton 2012 which is full of helpful advice regarding teaching literacy development to children with severe communication difficulties:-

[www.talklink.org.nz/wp-content/uploads/2012/05/Emergent-Handout.pdf](http://www.talklink.org.nz/wp-content/uploads/2012/05/Emergent-Handout.pdf)

The Center for Literacy & Disability Studies [www.med.unc.edu/ahs/clds](http://www.med.unc.edu/ahs/clds)

have some excellent resources and ideas on teaching students with significant impairments to decode written language through the use of a key learning strategy

Cerebral palsy in The New York State Department of Health's 'Clinical Practice Guideline, Report of the Recommendations, Motor Disorders, Assessment and Intervention for Young Children (Ages 0-3 Years), (p145-149 of the report) [Online] Available from: [www.health.ny.gov/community/infants\\_children/early\\_intervention/docs/guidelines\\_motor\\_disorders\\_assessment\\_and\\_intervention.pdf](http://www.health.ny.gov/community/infants_children/early_intervention/docs/guidelines_motor_disorders_assessment_and_intervention.pdf)

### Alternative and Augmentative Communication (AAC)

When speech alone is insufficient to meet the individual's communication needs, a variety of augmentative strategies should be used. It's very important that children who use any voice output communication aids also have access to low tech communication solutions as computer technology sometimes needs repairing and it may not be appropriate to use higher tech AAC in all situations e.g., around water, during toileting and transfers. Some children may find it quicker to use low tech options in certain situations but prefer using higher tech in others.

#### 'No-tech'

e.g use of 2 handed choices-"do you want pasta (hold up one hand as reference) or beans?" (hold up other hand as reference). Child eye or fist points to his/her choice.

#### Low tech

- e.g communication boards and books such as a PODD or Pixon project book/ communication passports/ scrap books or photos albums with visual referents displayed as topic setters/acting as a diary.
- When designing or choosing communication boards for a child keep in mind that a lot of learning how to use a board is through motor pattern learning so try and keep some key messages in the same place on each page (e.g the one which says "no that's not what I meant" or "I need a break" etc.
- Also keep in mind that if you are expecting a child to make progress and move up to using more message buttons per page then it would be good to try and keep vocabulary in the

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### Assessment

### Considerations and therapeutic intervention

### Referral / resources

same place as much as possible on the more advanced versions so that the child doesn't have to start all over again with learning a completely new layout. PODD and Pixon project books are designed with these concepts in mind as well as giving quick access to core vocabulary as well as personalized vocabulary.

- Low tech may also include very simple voice output communication devices such as Big Mack or sequencers which involve the child activating a single switch to play one or a sequence of voice output messages.
- When encouraging children to use switches it's important that everyone working with the child understands how to position the switch correctly for the child as well as the distance the child should be from the switch. Encouragement needs to be given to tell the student what is coming up on the screen to motivate them to press the switch rather than just saying 'press it'.
- For children who are at a stage where they need to work on developing cause and effect skills Ian Bean has developed some wonderful free downloadable resources which can be used with a range of assistive input devices such as switches, touch screens and whiteboards. These can be very motivating for children who enjoy music.

#### **Working with switches:-**

Work with the child's O.T to try and find 2 ways of the child accessing a switch so that each child has a back up way of using switches (this is particularly important for children with CP who may have varying levels of spasticity).

This article from ACE Centre North gives some ideas on activities that a child can communicate in using a single message voice output communication device such as a Big Mack or One Step:-

[www.acenorth.org.uk/pages/resources/documents/IdeasforsinglemessageVOCA\\_003.pdf](http://www.acenorth.org.uk/pages/resources/documents/IdeasforsinglemessageVOCA_003.pdf) (accessed 24.01.13)

[www.priorywoods.middlesbrough.sch.uk/page\\_viewer.asp?page=Free+Program+Resources&pid=161](http://www.priorywoods.middlesbrough.sch.uk/page_viewer.asp?page=Free+Program+Resources&pid=161)

#### See:-

[www.priorywoods.middlesbrough.sch.uk/page\\_viewer.asp?page=Free+Program+Resources&pid=161](http://www.priorywoods.middlesbrough.sch.uk/page_viewer.asp?page=Free+Program+Resources&pid=161)

DTSL also stock some lovely switch adapted toys as well as cause and effect computer software such as 'switch it' and 'big bang' series:- <http://assistive.dtsl.co.nz/category/109-cause-effect.aspx>; <http://assistive.dtsl.co.nz/search.aspx?searchterms=big+bang>

SwitchItMaker2 is a very easy to use programme which can be used to

**Partner assisted scanning**

Can be very useful with children who have very limited motor movements to be able to access switches.

- Voice amplifiers may be an option if a child's speech intelligibility is compromised by poor breath support but when articulation is relatively preserved. Voice amplifiers are not however always useful when children have severe dysarthria as the voice amplifier can just amplify the distorted articulation.
- E-tran frames (for eye pointing)-these are useful when a child has very limited motor movements and when it is difficult to find a suitable switch site (E.g., head, knee, hands, feet)

**Low tech AAC****Communication passports**

A 'communication passport is a simple and practical guide to help people communicate with a non-verbal child. It contains personal information about the child's needs, such as their medical condition, likes and dislikes etc. The passport is their personal identity and is owned by them, NOT the parents or professionals. It values the child, gives them a voice and helps others to understand them. It also gives the child some control. Passports should give positive problem-solving solutions to help the child and not be a catalogue listing the child's additional needs. Passports can be very useful in helping new staff/strangers to quickly understand the child's personal needs. Passports can be used for any non-verbal child or adult of any age. They should be reviewed at least once a year or every six months if the child is very young (Scope Communication Passport, introduction)

make up switch accessible computer activities for a child.

There are some lovely software options available for children who are working on developing switch skills such as the 'Switch it' series (farm, transport, hygiene, opposites, weather, people, jigsaw maker). See DTSL website and [www.inclusive.co.uk/software/switch-accessible-software](http://www.inclusive.co.uk/software/switch-accessible-software)

Partner assisted scanning information:-[http://en.wikipedia.org/wiki/Partner-assisted\\_scanning](http://en.wikipedia.org/wiki/Partner-assisted_scanning) (accessed 24.01.13)

See the following resource links for further details about partner assisted scanning:-

[www.lburkhart.com/isaac\\_instructional\\_06.pdf](http://www.lburkhart.com/isaac_instructional_06.pdf) (accessed 24.01.13)

[www.youtube.com/watch?v=nGpSXQKrmR4](http://www.youtube.com/watch?v=nGpSXQKrmR4) (accessed 24.01.13)

**Communication passports**

Download a free copy from [www.scope.org.uk/services/early-years/products/communication](http://www.scope.org.uk/services/early-years/products/communication)

See also 'Personal Communication Passports, Guidelines for Good Practice' which has many tips and ideas.

[www.callcentrescotland.org.uk](http://www.callcentrescotland.org.uk)

## 6.4 Communication - severe communication difficulties CFCS IV-V

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## Assessment

## Considerations and therapeutic intervention

## Referral / resources

### 'PODD' books

Pragmatic Organisation of Dynamic Displays has been developed by Gayle Porter who is a Speech-Language Therapist who works in Australia for the Cerebral Palsy Education Centre. PODD communication books are light tech communication systems for children and adults who are learning to communicate using aided symbols (symbols and/ or words).

### PIXON Boards

These are low tech, manual communication boards which can be used with children with cerebral palsy although some use of partner assisted scanning may be required with them.

### Medium tech

Options may involve devices such as Go Talks, Message Mates, Attainment Talkers, Cheap Talk8, FL4SH, QuickTalker, Smart/Talk, SuperTalker, Talktrac, TechTalk, SmartSpeak

### High Tech

Device examples include the Alt Chat (Saltillo), Nova chat, Say it Sam Tablet, Smart/Scan, DynaVox devices, Tobii Communicators, Springboard Lite, Vantage Lite, Eco2. For children with severe physical impairments physically accessing a communication aid may be difficult and it is therefore essential to work in conjunction with an O.T who will be able to give advice about accessing solutions (e.g., use of key guards, changing touch sensitivity of buttons, use of switches for scanning access, use of eye gaze technology).

A child needs to communicate in a range of environments and with a range of different people. It is important that all of a child's team is included in communication training so that effective reinforcement of strategies can consistently occur.

### PODD books

- website: [www.cpec.com.au](http://www.cpec.com.au)
- PODD can be purchased from Spectronics [www.spectronics.co.nz](http://www.spectronics.co.nz).

### Pixon Kit

Comprehensive information is available at: [www.aacoinstitute.org/Resources/ProductsandServices/Pixons/PixonSheet.pdf](http://www.aacoinstitute.org/Resources/ProductsandServices/Pixons/PixonSheet.pdf)

See [www.zabonne.com/?action=product&id=10702&category=10055](http://www.zabonne.com/?action=product&id=10702&category=10055) for details of how to purchase this in New Zealand.

For children with severe physical impairments physically accessing a communication aid may be difficult and it is therefore essential to work in conjunction with an O.T who will be able to give advice about accessing solutions (e.g use of key guards, changing touch sensitivity of buttons, use of switches for scanning access, use of eye gaze technology).

### Joy Zabala's SETT framework

helps focus the team on the student, environments, and tasks when considering which assistive technology options should be trialled with a child.

[www.joyzabala.com/uploads/Zabala\\_SETT\\_Scaffold\\_Consideration.pdf](http://www.joyzabala.com/uploads/Zabala_SETT_Scaffold_Consideration.pdf)

[http://joyzabala.com/uploads/Zabala\\_CTG\\_Ready\\_SETT\\_.pdf](http://joyzabala.com/uploads/Zabala_CTG_Ready_SETT_.pdf)

**iPads versus other AAC options**

The increasing popularity of iPads and iPhones are offering more affordable assistive technology options and decreasing the stigma associated with the use of voice output communication aids. They may not however always be the best solution for children with severe cerebral palsy who may require significant adjustments for accessing touch screen computer communication systems.

iPads may however be useful as communication therapy tools as they are often highly motivating for children and can help with developing receptive language and social skills.

iPads also have some great apps which can be used to help a child work on self monitoring skills (e.g., for speech clarity) and for developing photo books (e.g., using an app such as Pictello or loading power point presentations on).

- Your local speech and language therapist may have their Enable Communication in Assistive Technology (CAT) accreditation and therefore may be able to access the Enable store of communication aids which is held at TalkLink branches around New Zealand.
- Refer to TalkLink for specialist AAC assessment (which is particularly important for trialling dynamic display communication aids and for when a child needs alternative access options).

Burkhart L., Norwell, S, Lariviere, J& Rosen, J have put together the following interesting handout which looks at the use of iPads with children with communication and physical difficulties:- (See Appy Tyme handout under 'Linda's').  
<http://rettworldcongressipad.wikispaces.com/Handouts>  
 (accessed 24.01.13)

Jane Farrell's website also has some great information on switch adaptable apps [www.janefarrall.com/html/resources/Switch%20Accessible%20Apps%20for%20iPad.pdf](http://www.janefarrall.com/html/resources/Switch%20Accessible%20Apps%20for%20iPad.pdf). as well as information on The APPLICATOR (also sold as the Switch4Apps) which is an interface which can make an iPad switch adaptable:-[www.janefarrall.com/blog/2012/04/11/the-applicator-switch-access-to-more-apps-and-music-too/](http://www.janefarrall.com/blog/2012/04/11/the-applicator-switch-access-to-more-apps-and-music-too/)

**Reviews of ipad apps**

Consider looking on the following websites to get reviews of apps and more information about using the iPad. Sometimes you can view samples of apps on youtube. There are many apps which have been designed to encourage speech and language development.

<http://a4cwsn.com/apps/apps-a-z/>  
[www.geekslp.com/](http://www.geekslp.com/)

## 6.4 Communication - severe communication difficulties CFCS IV-V

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## Assessment

## Considerations and therapeutic intervention

## Referral / resources

### General AAC principles

When teaching children to use AAC keep in mind the following:-

You need to create opportunities for the child to communicate with a range of different people, in a range of contexts. Give specific functional goals e.g the child will greet his parents, teacher and 3 classmates; the child will ask for 'more' snack at morning and afternoon tea; the child will comment on what he/she thinks of an activity by choosing from 3 messages e.g Don't like it /It sucks, It's O.K, Great!

Learning to use AAC is like any language learning activity- the child needs to see and hear the core messages/ target vocabulary modeled again and again before the child is going to know how to spontaneously use a board/book or communication device. The language used for modeling needs to be kept short, include key vocabulary and be more repetitive than normal.

You will probably need to use graded levels of prompting e,g :

- Point to your own board and model the message
- Nudge the child's elbow to prompt them to point
- Eye point to the target message,
- Verbally prompt with information like "look at the top/bottom of the page",
- Physically point or use a light pointer to identify the general area where the target message is located
- If really necessary use hand over hand prompts
- When choosing vocabulary targets for a child consult the child, parents/whānau, carers, teachers, siblings, and peers to find out what the child is really motivated to communicate about and when key communication opportunities arise in the child's daily routine or can be created.

See the following NZ suppliers' websites for further information or call Talk Link to discuss your child's AAC needs.

<http://assistive.dtsl.co.nz/category/83-communication.aspx>  
[www.spectronics.co.nz/catalogue/communication-tools](http://www.spectronics.co.nz/catalogue/communication-tools)  
[www.zabonne.com/?action=list&category=10001](http://www.zabonne.com/?action=list&category=10001)

You may also find the following websites of use:-

[www.tobii.com/en/assistive-technology/global/](http://www.tobii.com/en/assistive-technology/global/)

<http://nz.dynavoxtech.com/conditions/cerebral-palsy/>

[www.prentrom.com/](http://www.prentrom.com/)

[www.aaclanguage.com/](http://www.aaclanguage.com/)

<http://janefarrall.com/>

This excellent article by ACE Centre North talks about how you can use technology to introduce and develop choice making skills with people with physical and communication impairment:-  
<http://acecentre.org.uk/Websites/aceoldham/images/InfoSheets/IntroducingandDevelopingChoices.pdf> (accessed 24.01.13)

## Assessment

**Assessments for use with older children:-**

**InterAACTION: Strategies for Intentional and Unintentional Communicators Manual** by Karen Bloomberg, Denise West, Hilary Johnson and Communication Resource Centre – SCOPE

This resource is based on the Triple C Assessment and can be used by people who live or work with late teens/ adults who 'communicate at an unintentional or early intentional level of communication. The comprehensive package allows you to match assessment results to age-appropriate communication ideas, train people to be more effective communication partners, develop your own communication aids, and adapt strategies for different ability levels.'

## Considerations and therapeutic intervention

**Resources for older children**

For older children it is important to consider their independent access to all types of communication including internet and phone communication.

**The NZ Relay System**

Is a free government funded national relay service for the Deaf, Hearing Impaired and Speech Impaired communities of New Zealand. It provides free calls to local and national landlines, as well as a skype and internet service. A trained relay assistant can introduce the caller and be ready to help clarify any communication breakdowns should the caller require this. There is also the option of using a TTY device which enables the communicator to type his message out and the relay assistant then reads the message aloud to the person being called.

## Referral / resources

**InterAACTION assessment**

[www.spectronics.co.nz/product/interaaction-strategies-for-intentional-and-unintentional-communicators-manual](http://www.spectronics.co.nz/product/interaaction-strategies-for-intentional-and-unintentional-communicators-manual)

**NZ Relay System**

[www.nzrelay.co.nz/Home/](http://www.nzrelay.co.nz/Home/)

**Online training in communication matters for children with severe communication difficulties**

The following online training modules and podcasts give very comprehensive information on how to choose and use AAC with children with severe communication difficulties.

See:-[www.scope.org.uk/help-and-information/communication/aac](http://www.scope.org.uk/help-and-information/communication/aac)

'This package contains 12 modules. It aims to help parents, teachers and professionals to support individuals who may benefit from using AAC. The modules are available to download from this link as pdfs.

Each module stands alone and addresses a specific topic or a particular group of users. However, each module is cross-referenced.'

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## Assessment

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### Podcasts

See the podcasts below re education on cerebral palsy and the use of AAC with children with severe communication difficulties:-

- AAC Interventions to Maximize Language Development for Young Children: <http://aac-rerc.psu.edu/index.php/webcasts/show/id/7>
- An Introduction to the Use of AAC for Children with Complex Communication Needs: <http://aac-rerc.psu.edu/index.php/webcasts/show/id/17>
- See Podcasts at [www.cpresearch.org.au/news\\_podcasts\\_parentwise.html](http://www.cpresearch.org.au/news_podcasts_parentwise.html)
- 'Number 21: The ABC of AAC Speech pathologist, Anna Bech, explains the benefits of Augmentative and Alternative Communication - the use of gestures, facial expression, body language, signing, photos, picture symbols and voice output technology to communicate.
- Number 27: Literacy development in children with cerebral palsy
- Number 28: Language development in children with cerebral palsy
- Number 29: Articulation in children with cerebral palsy.
- Number 30: All about saliva: in children with cerebral palsy

## Assessment

### Observe feeding

Areas to consider

- Oral motor skills
- Positioning of the pelvis, trunk, extremities and head and neck
- Environment
- Range of movement/tone
- Sensory processing
- Attainment of milestones

### Swallow

Assess the consistencies the child is currently taking ie:

- Thin liquid
- Thick liquid
- Thin puree
- Thick puree
- Soft solids
- Lumpy solids
- Mixed consistencies

### Phases of swallow

Consideration of:

- Lip closure
- Tongue control
- Palate closure (is food or drink coming out the nose)
- Mastication (chewing)

### Pharyngeal phase:

Check for safety of swallow, and coordination of swallow/breathing.

Indicators of difficulties include:

- Coughing and choking (may occur before swallow if premature spillage of bolus occurs)

## Therapeutic Intervention

### Oral motor skills

Consider movement of lips and tongue visually when child is feeding. If able, check movement of soft palate, does it move up and back.

Oral motor skills will be consistent with level of motor and cognitive impairment. Other reflexes and motor patterns may be seen in some children including tongue thrust and tonic bite.

### Positioning

During feeding the infant and child should be in a supported position to allow for gentle flexion of the neck with head in midline. Any compensatory patterns or increased tone or spasticity should also be noted as many children may use side flexion to protect their airway or extension to support breathing. Children should have freedom of movement during feeding to slightly extend head and neck for swallow. Encouragement of lower extremity flexion may be helpful in children who have increased or fluctuating tone. If indicated, specialised seating should be used consistently for feeding the child.

### Environment

This includes physical environment, cultural environment and family structure. Unrealistic caregiver expectations, family structure, poor mealtime routines, distractions such as a TV can all impact on feeding. Consideration should be given to use of consistent feeders, the child's comfort and a feeding seat or high chair.

### Equipment/feeding tools

Feeding tools should be carefully selected:

- Teats should be selected specific to the infant's oral motor skills with particular attention to the rate of flow ie: mls per minute.
- Syringe feeding is strongly discouraged.
- Spoons: sized according to the child's mouth. Spoons with a gentle bowl and soft plastic coating are recommended to prevent hurting particularly if a tonic bite is present.
- Transitioning to cup and straw drinking: Children should be encouraged to transition from the bottle to more age appropriate cups and straws from 12-18 months.

### Transition to textures and solids

Modification of texture, consistency, sensory and feeding equipment may assist development

## Referral / resources

SLT consultation for joint clinical feeding assessment should occur particularly if concerns regarding swallow and safety are present.

Referral to Videofluoroscopy (VFSS) to assess for safety of swallow may be actioned by the SLT if there are clinical concerns regarding this.

Referral to appropriate services eg Paediatrician or dietician re growth and nutrition.

Referral to CDC Feeding Clinic when indicated following completion of the Feeding Screening Tool\* via CDC internal referral process. Review feeding clinic entry criteria\* to determine suitability for referral.

### Therapy books

Pre-Feeding Skills: A Comprehensive Resource for Feeding Development

Suzanne Evans Morris, Ph.D., CCC-SLP and Marsha Dunn Klein, M.Ed., OTR/L

Feeding and Nutrition for the Child with Special Needs: Handouts for parents.

# 7.0 Feeding

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## Assessment

- Increased airway congestion during and after feeding (wet, gurgly or transmitted upper airway sounds)
- Change in vocal quality on crying or vocalisation (wet, raspy or hoarse quality)
- Frequent or multiple swallows or gulping
- Watery eyes
- Increased irritability
- Feeding refusal
- Finger splaying

Referral to SLT for Videofluoroscopy (VFSS) may be indicated

### Growth and nutrition

Growth and nutrition should be assessed by the primary care clinician as part of a comprehensive assessment. Growth charts should be reviewed and consultation should occur with paediatrician and/or dietitian regarding growth and nutritional status.

If concerns regarding growth or failure to thrive are present and not being managed a referral is indicated. Growth and failure to thrive will impact the child's feeding, resulting in poor energy, endurance and lack of interest in feeding.

Many children will require supplemental or tube feeding eg NG Tube\*, G Tubes\*, GJ Tubes\*, J Tube\*

## Therapeutic Intervention

of oral motor skills specifically; selecting textures that are smooth, provide increased sensory input (flavour and temperature) in the thin-thick puree consistency range. This will provide maximal opportunity to control the bolus, glean sensory input and organise bolus for swallow. For children who are able to move to finger feeding soft and dissolvable foods it may be acceptable to skip lumpy textures altogether.

Sensory issues related to texture and increased gagging: If the child presents with significant gagging and limited progression to lumpy textures and soft solids gradually increase texture in food that the child will accept. To encourage biting skills the introduction of dissolvable solids such as "poppa jacks" is recommended.

### Gastroesophageal Reflux (GORD)

There is a high prevalence of GORD in children which is different to typical infant spilling. GORD can have a significant impact on the child's willingness to feed orally, development of oral motor skills, safety of swallow and growth and nutrition. Associated aspiration from refluxed material is also a risk and can further damage lung tissue and impact respiratory status.

Signs and Symptoms of GORD may include:

- Vomiting
- Coughing and choking
- Pain and discomfort
- Irritability
- Apnoea
- Refusal to eat
- Failure to Thrive
- Changes in vocal quality with hoarse and raspy vocal quality
- Chronic cough or wheeze
- Acid smelling breathe
- Poor teeth from increased acid

### Drooling

Drooling is a problem for some children and can impact the child's ability to feed and swallow safely as a result of excess saliva. Aspiration of saliva is also a concern for lung and respiratory health.

## Referral / resources

Drooling therapy management programs may be successful. These are cognitive or sensory programs that cue the child to swallow and are often associated with patting the mouth. Children with high cognition will have increased success using a therapeutic approach to management of drooling.

A referral for medical management is often required for children with excessive drooling and low cognition.

#### **Caregiver and child relationship and attachment**

Caregiver behaviour, thoughts and feelings should be considered as feeding is a dynamic relationship between the child and carer. This may be completed with clinical observations as well as interview with carers who feed the child. Feeding and feeding dysfunction can have a profound emotional, physical and psychological impact on carers. The literature has found the infant and child's motor level has a greater impact on feeding than can be attributed to attachment or quality of relationship. Therefore therapists should be careful not to attribute behaviours observed during feeding such as refusal, increased irritability, crying as simply behavioural with infants and children.

The degree to which the child can direct their care including their feeding will be largely determined by their level of cognition and communication.

The integrity of the individual should always be the most important factor considered when feeding or making changes to feeding.

#### **Transition to other environments**

Children often transition into the care of other professionals or caregivers such as child care, respite care or school. It is critical that all carers who will be feeding and/or managing tube feeding for children are fully trained and aware of the safety needs of the child. This training will need to occur over a number of sessions and require ongoing monitoring and support as the carers change or the needs of the child change.

**If difficulties persist despite consideration of the above factors, complete Feeding Screening Tool\* and refer as appropriate to feeding clinic at CDC.**

# 7.0 Feeding

## 0 – 5 years

### Assessment

COPM to address specific occupational performance goals that family may have regarding community access and recreational activities

Other quality of life measures may include Cerebral Palsy Quality of Life (CPQoL)

Paediatric Interest Profiles

### Accessible options

#### Community life

Playgroups, home based or centre based: e.g. Plunket, Playcentre, churches, libraries. Ministry of Education may assist with access for over two year olds.

Family based activities: e.g. church, community sports groups, arts.

Civic services: e.g. parks, gardens, zoo's, pools. Most councils will have a disability strategy to ensure that services and facilities are accessible to everyone in the community. Wheelchair and scooter hire, accessible toilets and disability parking often available.

- **Variety liberty swings.** These are safe, robust, hydraulic swings which allow easy access for children in wheelchairs or simply a supported, secure seat for those who need it. They meet all current safety standards and are licensed to hold up to 250kgs. Currently these are located at Hamilton Lake and Cambridge.
- **Walkways:** Consideration for accessible walkways are less than 1:12 gradient, paved services, limited stairs, handrails and accessible parking. Some accessible pathways in the Waikato include: Hamilton Gardens. Most paths in the gardens are at less than a one in twelve grade. Garden staff advise parking in the Camellia Car park at Gate 2 for easier access to the top areas of Hamilton Gardens. Accessible parking is reserved in each of the main car parks. Hamilton Lake this path has access right around the Lake, accessible parking and fully paved surface. Cambridge: Karapiro walkway.
- **Zoos and animals:** E.g. Zoos may provide volunteers who can assist disabled people (such as Hamilton Zoo) and wheelchair accessible walkways (e.g. Otorohanga Kiwi House)
- **Museums**

Natural Environments: e.g. Waitomo Caves Ruakuri cave, accessible walks

Service Clubs: e.g. Lions "Disabled day at the zoo", Special Needs Children's Christmas party, CCS Disability Action access campaigns.

### Referral / resources

[www.plunket.org.nz](http://www.plunket.org.nz)

[www.playcentre.org.nz](http://www.playcentre.org.nz)

[www.variety.org.nz/swing-locations-xidc32030.html](http://www.variety.org.nz/swing-locations-xidc32030.html)

[www.waitomo.com](http://www.waitomo.com)

[www.accessiblewalks.co.nz](http://www.accessiblewalks.co.nz)

[www.lionsclub.org.nz](http://www.lionsclub.org.nz)

[www.sccpnz.co.nz](http://www.sccpnz.co.nz)

[www.ccsdisabilityaction.org.nz](http://www.ccsdisabilityaction.org.nz)

# 8.0 Community access

# 8.0 Community access

## 0 – 5 years

### Assessment

### Accessible options

### Referral / resources

#### Recreation and leisure

**Community sports facilities:** e.g. Horse riding (may include Riding for the Disabled), Swimming (consideration may need to be given to medical issues), Recreational Gymnastics.

**Sport Waikato:** Provides resources and groups eg KiwiPreschooler guide

**Halberg disability sport foundation:** Administers the Allsport activity fund which provides funding assistance for coaching or equipment to access sports. May fund customized trikes, swimming lessons etc

**Cerebral palsy society** offers several programmes for members to support various recreation and leisure pursuits eg getOnYourTrike programme: 3 trikes available for lease suitable for children from 3 years up. getPhysical Programme, discounted national attractions.

**Charitable trusts** – E.g. Variety - The Children's Charity may assist with providing toys or other recreational equipment including specialised trikes. Angles for Children Trust, Make a Wish, CJB Norwood Crippled Children Trust

**LIFE unlimited:** No Limits programme and discretionary fund.

**Private and public playgrounds:** e.g. council parks, Lollipops Playland.

**Toy libraries** e.g. CCS toy library has specific toys and resources suitable for children with disabilities.

**Arts:** Mainly Music (a fun music group for parents or primary caregivers to enjoy together with their child), Music Therapy.

#### Education

All children 3 years and over are entitled to 20 hours free early childhood education, there are various providers of this. Refer to individual childcare providers for further information..

Parent provided Education: Supported by Parents as First Teachers (PAFT) and Ministry of Education, Special Education where eligible.

Home based care: E.g. PORSE. Support for accessing educational programmes may be provided by Ministry of Education Early Intervention teachers (EIT), specialist teachers for vision and hearing, support workers and speech therapists.

Centre Based: Kohanga Reo, Kindergarten, playcentre, Private Centres, Montessori, Steiner, Barnardo's. Supported by Ministry of Education Special Education or CCS.

Support Services: Specialist vision and hearing services may also provide support.

[www.rda.org.nz](http://www.rda.org.nz)

[www.nzgymnastics.co.nz](http://www.nzgymnastics.co.nz)

[www.jumpingbeans.net](http://www.jumpingbeans.net)

[www.sportwaikato.org.nz](http://www.sportwaikato.org.nz)

[www.halberg.co.nz](http://www.halberg.co.nz)

[www.cpsoc.org.nz](http://www.cpsoc.org.nz)

[www.variety.org.nz](http://www.variety.org.nz)

[www.angelsforchildrencharitabletrust.org.nz](http://www.angelsforchildrencharitabletrust.org.nz)

[www.makeawish.org.nz](http://www.makeawish.org.nz)

[www.life.nzl.org](http://www.life.nzl.org)

[www.ccsdisabilityaction.org.nz](http://www.ccsdisabilityaction.org.nz)

[www.mainlymusic.org.nz](http://www.mainlymusic.org.nz)

[www.musictherapy.org.nz](http://www.musictherapy.org.nz)

[www.minedu.gov.nz](http://www.minedu.gov.nz)

[www.porse.co.nz](http://www.porse.co.nz)

## 0 – 5 years

### Assessment

### Accessible options

### Referral / resources

#### **Specialist early intervention/therapy providers**

In addition to CDC there are various other service providers for children (0-5) with disabilities.

#### **Conductive education**

Holistic intensive programme where neuro-motor disorders are treated as a cognitive learning challenge rather than as a primary medical problem. Established in Hamilton 20 years ago by a group of parents. Families can self refer or be referred by CDC therapists.

#### **McKenzie Centre**

Licensed Early Childhood Centre and an Accredited Early Intervention Service Provider. Provides a service for children with special needs and their families throughout the greater Hamilton region. Transdisciplinary team with Early Intervention Teachers, OTs, Physiotherapist, Psychologist, SLT, Education Support Workers, SW. Families can self refer or be referred by CDC therapists.

#### **Ministry of Education special education**

Provide home or centre based early intervention teachers (EIT) and/or speech language therapy intervention to eligible children. Children may also be eligible for education support workers (ESW). Generally will see children over 2 years of age. Refer to website for entry criteria. Families can self refer or be referred by CDC therapists.

#### **ACC contracted providers**

There are a number of providers who are contracted by ACC to provide therapy to children who have a disability as a result of an injury. Children covered by ACC are eligible for CDC specialist services such as orthopaedic and splinting clinic but are not eligible for CDC therapy input.

#### **Transportation**

**National travel assistance:** Retrospective funding for long distance travel to hospital appointments. Requires application to be enrolled by scheme which needs to be completed by specialist.

**Variety sunshine coaches:** 50% shared funding between an organisation (such as a school) and the Variety Club.

[www.conductive-education.org.nz](http://www.conductive-education.org.nz)

[www.mckenziecentre.nzl.org](http://www.mckenziecentre.nzl.org)

[www.minedu.gov.nz](http://www.minedu.gov.nz)

[www.health.govt.nz](http://www.health.govt.nz)

[www.variety.org.nz](http://www.variety.org.nz)

# 8.0 Community access

# 8.0 Community access

## 0 – 5 years

### Assessment

### Accessible options

### Referral / resources

**Total mobility scheme:** Subsidised taxi services for people with serious mobility constraints. This service is usually managed by the regional council. CCS may also be involved.

**Cerebral palsy society getOutThere programme.** This programme is designed to get people with cerebral palsy engaging with their community. It is a voucher system that helps fund the part of the taxi fare that is not covered by the Total Mobility Scheme.

**Mobility parking permits:** Provides a permit for parking in disability parking spaces. Applications can be accessed from services such as CCS and LIFE Unlimited

There are various hospital shuttles, health shuttles and community bus services (e.g. St Johns) which are available. Waikato Hospital has a brochure available with full list of community transport options.

**City Council services:** some buses allow access for wheelchairs and buggies e.g. kneeling buses

**Vehicle modifications:** May be supported by ENABLE and Lotteries

[www.ccsdisabilityaction.org.nz](http://www.ccsdisabilityaction.org.nz)

[www.cpsoc.org.nz](http://www.cpsoc.org.nz)

[www.stjohn.org.nz](http://www.stjohn.org.nz)

[www.busit.co.nz](http://www.busit.co.nz)

(refer to the Housing and Vehicle Modification matrix)

## 6 – 16 years

### Assessment

COPM to address specific occupational performance goals that family may have regarding community access and recreational activities

Paediatric Interest Profiles

### Accessible options

#### Community life

**Family based activities:** e.g. church, community sports groups, arts, special interest (such as Junior Naturalists).

**Civic services:** e.g. parks, gardens, zoo's, pools. Most councils will have a disability strategy to ensure that services and facilities are accessible to everyone in the community (see examples of accessible civic services above in 0-5 years band). Waterworld in Te Rapa has a hydrotherapy pool available for public use.

**Service clubs:** e.g. Lions "disabled day at the zoo", Special Needs Children's Christmas party, CCS access campaigns and swim schools in some areas.

**Natural environments:** e.g. Waitamo Caves Ruakuri cave, accessible walks

**Movie theatres:** Typically have accessible toilets. Rehab Rental has a stair climbing chair that could be used to enable access.

**Pool access:** Floatation devices and water access wheelchairs.

**"Off Road":** Beach access and all terrain wheelchairs. Available for purchase or hire.

**Camps:** Christian Camps, YMCA, Parent to Parent summer camp. Carer support can be utilised.

**Drama, dance and art:** InterACT Festival, StarJam, Art Therapy and Drama

### Referral / resources

[www.hamiltonpools.co.nz](http://www.hamiltonpools.co.nz)

[www.lionsclub.org.nz](http://www.lionsclub.org.nz)

[www.sccpnz.co.nz](http://www.sccpnz.co.nz)

[www.ccsdisabilityaction.org.nz](http://www.ccsdisabilityaction.org.nz)

[http://www.waitomo.com](http://http://www.waitomo.com)

[www.accessiblewalks.co.nz](http://www.accessiblewalks.co.nz)

[www.rehabrental.co.nz](http://www.rehabrental.co.nz)

[www.swimjoy.co.nz](http://www.swimjoy.co.nz)

[www.beachwheels.co.nz](http://www.beachwheels.co.nz)

[www.mobilitycarrental.co.nz](http://www.mobilitycarrental.co.nz)

[www.disabilityresource.org.nz](http://www.disabilityresource.org.nz)

[www.a1wheelchairservices.co.nz](http://www.a1wheelchairservices.co.nz)

[www.christiancamping.org.nz](http://www.christiancamping.org.nz)

[www.ymca.org.nz](http://www.ymca.org.nz)

[www.parent2parent.org.nz](http://www.parent2parent.org.nz)

[www.interacting.org.nz](http://www.interacting.org.nz)

[www.starjam.org](http://www.starjam.org), [www.danz.org.nz](http://www.danz.org.nz)

[www.artsaccess.org.nz](http://www.artsaccess.org.nz)

# 8.0 Community access

# 8.0 Community access

## 6 – 16 years

### Assessment

### Accessible options

### Referral / resources

#### Recreation and leisure

**Community sports facilities:** e.g. Horse riding (may include Riding for the Disabled), Swimming (consideration may need to be given to continence issues, physical access, changing facilities), Recreational Gymnastics.

**Sport Waikato:** Provide various sports programmes including the after school sports programme for young people with disabilities.

**Parafed Waikato:** provides disability specific sport programmes.

**Cerebral palsy society** offers several programmes for members to support various recreation and leisure pursuits eg getOnYourTrike programme: trikes available for lease suitable for children from 3-14 years of age. getPhysical Programme, discounted national attractions.

**Halberg disability sport foundation:** Administers the Allsport activity fund which provides funding assistance for coaching or equipment to access sports. May fund customized trikes, trampolines

**Charitable trusts** – E.g. Variety - The Children's Charity may assist with providing toys or other recreational equipment including specialised trikes. Angels for Children Trust, Make a Wish, CJB Norwood Crippled Children Trust

**LIFE unlimited:** No Limits programme and discretionary fund

**Electronic devices:** Support may be needed for access.

Snow sports

Paralympics

Special Olympics

[www.rda.org.nz](http://www.rda.org.nz)

[www.nzgymnastics.co.nz](http://www.nzgymnastics.co.nz)

[www.sparc.org.nz](http://www.sparc.org.nz)

[www.sportwaikato.org.nz](http://www.sportwaikato.org.nz)

[www.parafedwaikato.co.nz](http://www.parafedwaikato.co.nz)

[www.cpsoc.org.nz](http://www.cpsoc.org.nz)

[www.halberg.co.nz](http://www.halberg.co.nz)

[www.variety.org.nz](http://www.variety.org.nz), [www.angelsforchildrencharitabletrust.org.nz](http://www.angelsforchildrencharitabletrust.org.nz), [www.makeawish.org.nz](http://www.makeawish.org.nz)

[www.life.nzl.org](http://www.life.nzl.org)

[www.talklink.org.nz](http://www.talklink.org.nz)

[www.disabledsnowsports.org.nz](http://www.disabledsnowsports.org.nz)

[www.paralympics.org.nz](http://www.paralympics.org.nz)

[www.specialolympics.org.nz](http://www.specialolympics.org.nz)

## 6 – 16 years

### Assessment

### Accessible options

### Referral / resources

#### Education

**School:** Local school and special school options. Access and support is provided by the Ministry of Education for eligible children.

Children with High or very high and complex needs may be eligible for Ministry of Education ORS (Ongoing Resourcing Scheme) funding to provide specialist education, therapy and support at school. Children who are accepted onto the ORS scheme may either attend local mainstream schools or attend a special school such as Hamilton North, Patricia Avenue, Goldfields (Paeroa) or Tokoroa North.

Children with a moderate physical disability may be eligible for the Ministry of Education Special Education Physical Disabilities Service to provide support and consultation to the school regarding the child's disability to help them access the school curriculum.

Correspondence School / Home schooling: Parental support, Ministry of Education for eligible children. Some home schooling organisations have a religious or unschooling philosophy.

**Support services:** Specialist vision and hearing services may also provide support.

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#### Transportation

**National travel assistance:** Retrospective funding for long distance travel to hospital appointments. Requires application to be enrolled by scheme which needs to be completed by specialist.

**Variety sunshine coaches:** 50% shared funding between an organisation (such as a school) and the Variety Club.

**Total mobility scheme:** Subsidised taxi services for people with serious mobility constraints. This service is usually managed by the regional council. CCS may also be involved.

Cerebral Palsy society getOutThere programme. This programme is designed to get people with cerebral palsy engaging with their community. It is a voucher system that helps fund the part of the taxi fare that is not covered by the Total Mobility Scheme.

[www.minedu.govt.nz](http://www.minedu.govt.nz)

[www.correspondence.school.nz](http://www.correspondence.school.nz)

[www.homeeducationnz.co.nz](http://www.homeeducationnz.co.nz)

[www.homeschoolingnz.org](http://www.homeschoolingnz.org)

[www.rnzfb.org.nz](http://www.rnzfb.org.nz)

[www.hearinghouse.co.nz](http://www.hearinghouse.co.nz)

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[www.health.govt.nz](http://www.health.govt.nz)

[www.variety.org.nz](http://www.variety.org.nz)

[www.ccsdisabilityaction.org.nz](http://www.ccsdisabilityaction.org.nz)

[www.cpsoc.org.nz](http://www.cpsoc.org.nz)

# 8.0 Community access

# 8.0 Community access

## 6 – 16 years

### Assessment

### Accessible options

### Referral / resources

**Mobility parking permits:** Provides a permit for parking in disability parking spaces.

Applications can be accessed from services such as CCS and LIFE Unlimited

There are various hospital shuttles, health shuttles and community bus services (e.g. St Johns) available to transport people to and from hospital appointments. Waikato Hospital has a brochure available with full list of community transport options.

**City Council services:** some buses allow access for wheelchairs e.g. kneeling buses

**Vehicle modifications:** May be supported by ENABLE and Lotteries

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#### Transition to adult services

Parent and Family Resource Centres Transition Expo

CCS transition services

Community Living transition services

IDEA Services Transition Services

**Employment services:** e.g. Workbridge, Catapult Employment Services trust, Career Services, Equal Employment Opportunities Trust: list of employers who are members of the trust.

**Scholarships:** Ian Campbell scholarship for Tertiary students

**Driver training:** Many driving schools have accessible vehicles (such as Drive Rite, A1 Driving school). Driver assessment may also be required and may be funded by Ministry of Health for youth undertaking full-time tertiary education or full-time employment. OTRS are the current providers of this service

[www.stjohn.org.nz](http://www.stjohn.org.nz)

[www.busit.co.nz](http://www.busit.co.nz)

(refer to the Housing and Vehicle Modification matrix)

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[www.parentandfamily.org.nz](http://www.parentandfamily.org.nz)

[www.ccsdisabilityaction.org.nz](http://www.ccsdisabilityaction.org.nz)

[www.communityliving.org.nz](http://www.communityliving.org.nz)

[www.ihc.org.nz](http://www.ihc.org.nz)

[www.workbridge.co.nz](http://www.workbridge.co.nz)

[www.careers.govt.nz](http://www.careers.govt.nz)

[www.catapult.org.nz](http://www.catapult.org.nz)

[www.eeotrust.org.nz](http://www.eeotrust.org.nz)

[wppdt.org/iancscholarship.htm](http://wppdt.org/iancscholarship.htm)

[www.otrs.co.nz](http://www.otrs.co.nz)

## Assessment

### Psychosocial interview with child and family/whānau

## Support options / providers

### True colours

Provide support to children and their families through illness and grief. Services are provided Waikato DHB wide.

### Rainbow place

Provide support to children, young people and their families through serious illness. Operates Waikato, King Country and Thames Valley.

### Disability support link:

Provides local Needs Assessment Service Co-ordination (NASC). Can provide respite care funding or Medically Fragile Funding. Referrals can be made by any health professional. Services can be provided in the family home or in respite facilities (such as Te Whare Poipoi). Regional services (such as Family Options and Health Care NZ) also offer short term respite for medically fragile children who require daily nursing care and/or have significant risk of a life-threatening event.

### Incredible years programme

Incredible Years is a 12-16 week parenting programme for parents of children aged 3-8 years. It involves weekly sessions of around two hours. Over the weeks, parents develop strategies to build positive relationships with their children and to manage problem behaviours. They come to group sessions each week, talk through what has, or hasn't worked, set goals for what they want to happen and ways to achieve those goals during the following week. CDC provides a programme with a disability focus for children who are eligible for CDC services. Other Incredible Years providers include Ministry of Education, Family Works and Life Community Services.

### Cerebral palsy society

Offers a range of support services to members eg the getThis&That programme which allows members with cerebral palsy to purchase small items that are needed to manage the affects of having or living with cerebral palsy. getStructured is a programme that assists with legal structures, eg parents can be assisted financially to set up a legal framework..

## Referral / resources

[www.truecolours.org.nz](http://www.truecolours.org.nz)

[www.hospicewaikato.org.nz](http://www.hospicewaikato.org.nz)

[www.moh.govt.nz](http://www.moh.govt.nz)

(Disability Services)

[www.minedu.govt.nz](http://www.minedu.govt.nz)

[www.lifecommunityservices.org.nz](http://www.lifecommunityservices.org.nz)

[www.northern.familyworks.org.nz](http://www.northern.familyworks.org.nz)

[www.parent2parent.org.nz](http://www.parent2parent.org.nz)

[www.cpsoc.org.nz](http://www.cpsoc.org.nz)

# 9.0 Interpersonal Interactions

# 9.0 Interpersonal Interactions

## Assessment

## Support options / providers

## Referral / resources

### CCS disability action

Provides information, advocacy and support to children, youth, adults and their families and whānau. This includes Home to Home, Te Whare Poipoi, Wheelchair Solutions, social work support and can offer information to education providers about disability.

### Family works

Offer a range of services, programmes and community development initiatives throughout the wider Waikato region; including social work, counselling, family work and parent education groups. Specific programmes include Incredible Years (see above)

### Transition to adulthood

People with a physical disability together with an intellectual disability can access a range of services for work, day programmes and supported living options. Idea Services and Community Living are the agencies that typically provide these services. These agencies can be accessed following a needs assessment by DSL.

For youth and adults with physical disabilities CCS Disability Action offer services to support transition from school to work or further study and support/independent living options

### Legal issues

Services such as IHC, CCS and community law centres can provide advice on legal issues such as the PPPR act. The CP society offer the getStructured programme which provides financial assistance with setting up good legal structures for members.

[www.ccsdisabilityaction.org.nz](http://www.ccsdisabilityaction.org.nz)

[www.familyworks.org.nz](http://www.familyworks.org.nz)

[www.moh.govt.nz](http://www.moh.govt.nz)  
(Disability Services)

[www.communityliving.org.nz](http://www.communityliving.org.nz)

[www.ihc.org.nz](http://www.ihc.org.nz)

[www.ccsdisabilityaction.org.nz](http://www.ccsdisabilityaction.org.nz)

[www.cpsoc.org.nz](http://www.cpsoc.org.nz)

### **Primary therapist**

Refers to the therapist who is providing ongoing therapy and case oversight for a child – this could be a Visiting Neurodevelopmental Therapist, Physiotherapist, Occupational Therapist or an Education-based therapist.

## **2. Mobility matrix**

### **Alberta Infant Motor Scale (AIMS)**

An observational assessment scale constructed to measure gross motor maturation in infants from birth through to independent walking. Based upon the literature, 58 items were generated and organized into four positions: prone, supine, sitting and standing. Each item describes three aspects of motor performance--weight-bearing, posture and antigravity movements.

### **Gross Motor Function Measure (GMFM)**

A clinical tool designed to evaluate change in gross motor function in children with cerebral palsy. There are two versions of the GMFM - the original 88-item measure (GMFM-88) and the more recent 66-item GMFM (GMFM-66). Items on the GMFM-88 span the spectrum from activities in lying and rolling up to walking, running and jumping skills. The GMFM-66 is comprised of a subset of the 88 items identified (through Rasch analysis) as contributing to the measure of gross motor function in children with cerebral palsy. The GMFM-66 provides detailed information on the level of difficulty of each item thereby providing much more information to assist with realistic goal setting.

### **Functional Mobility Scale (FMS)**

The FMS describes the functional mobility of children with cerebral palsy, as an aid to communication between orthopaedic surgeons and health professionals.

The scale can be used to classify children's functional mobility, document change over time in the same child and to document change seen following interventions, for example after orthopaedic surgery. The FMS rates walking ability at three specific distances, 5, 50 and 500 metres, (or 5, 50, 500 yards). This represents the child's mobility in the home, at school and in the community setting. It accounts for different assistive devices used by the same child in different environments.

### **Peabody Developmental Motor Scale 2nd edition (PDMS-2)**

Designed to evaluate children from birth through age 5, the PDMS-2 is composed of six subtests that assess related motor abilities that develop early in life: Reflexes, Stationary (body control and equilibrium), Locomotion, Object Manipulation, Grasping, and Visual-Motor Integration. The PDMS-2 can be used to estimate a child's overall motor competence relative to peers, or to evaluate his or her fine versus gross motor abilities. The test is useful in educational therapy because it assesses both qualitative and quantitative aspects of the child's motor performance. The quantitative information generated by the PDMS-2 is helpful in monitoring the child's progress during remediation.

### **Bayley Scales of Infant and Toddler Development 3rd Edition (BSID-III)**

The Bayley is a standardised assessment of the motor, cognitive and language development of infants and young children. It can be used with children from 1 month to 42 months of age. It is used to identify children with developmental delays.

### **Hemiplegic gait classification**

Winters, Gage and Hicks (WGH) classification of hemiplegic gait describes four types of gait patterns based on the sagittal plane kinematics of the ankle, knee, hip and pelvis (Winters et al. 1987). The characteristic of each group is as follows:

**Group I** – foot drop in the swing phase of gait, normal dorsiflexion range in stance phase of gait

**Group II** – excessive plantarflexion of the ankle in both stance and swing phase of gait

**Group III** – Group II deviations as above plus limited flexion /extension range of motion at the knee during stance and swing phases of gait

**Group IV** – Group III deviations as above plus limited flexion/extension range of motion at the hip during stance and swing phases of gait

### **Diplegic gait classification**

**Group I, true equinus.** The ankle is in equinus. The knee extends fully or goes into mild recurvatum. The hip extends fully and the pelvis is within the normal range or tilted anteriorly.

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**Group II, jump gait.** The ankle is in equinus, particularly in late stance. The knee and hip are excessively flexed in early stance and then extend to a variable degree in late stance, but never reach full extension. The pelvis is either within the normal range or tilted anteriorly.

**Group III, apparent equinus.** The ankle has a normal range but the knee and hip are excessively flexed throughout stance. The pelvis is normal or tilted anteriorly.

**Group IV, crouch gait.** The ankle is excessively dorsiflexed throughout stance and the knee and hip are excessively flexed. The pelvis is in the normal range or tilted posteriorly.

**Group V, asymmetric gait.** The gait pattern is asymmetrical to the degree that the subject's two lower limbs are classified as belonging to different groups; e.g. right lower limb group III, apparent equinus and left lower limb group II, jump gait.

## Ankle Foot Orthoses

Ankle-foot orthoses (AFOs) are orthoses, usually made of plastic, encompassing the ankle joint and all or part of the foot. AFOs are externally applied, and are intended to control position and motion of the ankle, compensate for weakness, or correct deformities.

## 3. Musculoskeletal matrix

### Modified tardieu

Measures the degree of spasticity present in a muscle. The selected muscle is moved slowly through the full available range of movement – angle measured is R2. The muscle is then moved as fast as possible through range; the angle where the muscle first 'catches' is recorded as R1. The difference between R2 and R1 is called the dynamic range and measures the degree of spasticity in the muscle.

### Australian Spasticity Assessment Scale ASAS

The ASAS is a combination of the modified Ashworth Scale and the modified Tardieu. The muscle is first moved slowly through full available range of movement and then moved rapidly to determine the angle of catch, the degree of spasticity is then graded as below:

0 No catch on rapid passive movement (RPM) [ie no spasticity]

1 Catch occurs on RPM followed by release. There is no resistance to RPM throughout rest of range

2 Catch occurs in second half of available range (after halfway point) during RPM and is followed by resistance throughout remaining range.

3 Catch occurs in first half of available range (up to and including halfway point) during RPM and is followed by resistance throughout the remaining range.

4 When attempting RPM, the body part appears fixed but moves on slow passive movement

Contracture is recorded separately

### Hip surveillance guidelines

The hip surveillance guidelines were developed to provide consensus for the process of monitoring for the critical early signs of hip displacement in all children with CP. They are endorsed by the Australian Academy of Cerebral Palsy and Developmental Medicine. They are available at: [www.ausacpdm.org.au/professionals/hip-surveillance](http://www.ausacpdm.org.au/professionals/hip-surveillance)

### Hip migration percentage

A radiographic measure of the amount of ossified femoral head which is not covered by the ossified acetabular roof (Reimers 1980). A normal migration percentage is considered to be zero or even negative as displacement should not occur in a normal hip (Perkins 1928). Normal MP is less than 10% after the corrected age of 4 years.

MP's above 30% are high and are considered at risk/abnormal.

### Ankle foot orthoses

Refer to definitions above from the mobility matrix.

### Chailey levels of ability

Is a reliable and valid measure of postural ability in children with neurological impairments. It can be used to assess the child's postural ability, plan treatment, evaluate change and prescribe postural management equipment. They describe a child's posture in supine, prone, sitting and standing.

### **3-Dimensional gait analysis**

In CP 3-D gait analysis is used to capture a 3-D model of a person's walking pattern on a specialised computer modelling programme to collect data about the person's walking pattern and how it deviates from a 'normal' or conventional walking model. The programme is able to accurately calculate when and how much a joint is being moved through the different phases of the gait cycle. The data can be used to help determine what impairments (e.g. spasticity, decreased ROM) may be contributing to a person walking pattern which can help to guide intervention, in particular surgical management.

## **4. Upper limb matrix**

### **Modified tardieu**

Refer to the definitions above from the musculoskeletal matrix

### **Australian Spasticity Assessment Scale ASAS**

Refer to the definitions above from the musculoskeletal matrix

### **Melbourne Assessment 2 (MA2)**

The Melbourne Assessment 2 is a test of unilateral upper limb function. It is a validated and reliable tool for evaluating quality of upper limb movement in children with neurological conditions aged 2.5 to 15 years. It measures four elements of upper limb movement quality: movement range, accuracy, dexterity and fluency.

### **Assisting hand assessment (AHA)**

The AHA is an assessment of hand function used to measure and describe how children with a unilateral upper limb disability use their affected hand collaboratively with the non-affected hand in bimanual play. The AHA is a measure of usual performance through observation of the child's spontaneous and normal way of handling objects when playing with specifically designed toys and activities. It is not an assessment of their best capacity to grasp, release or manipulate objects when prompted to use their affected hand. The AHA can be used on children 18 months and up to 12 years of age. Clinicians carrying out the assessment are required to be specifically trained in the use of the AHA.

## **5. Equipment and housing matrix**

### **Enable New Zealand**

Enable is contracted by the Ministry of Health to provide equipment and housing modification services for the Health and Disability Sector in New Zealand.

### **Chailey levels of ability**

Refer to definitions from the musculoskeletal matrix.

### **Brayden scale**

This is a clinical tool used to assess the risk of a patient/client developing a pressure ulcer. The primary aim of this tool is to identify patients/clients who are at risk, as well as determining the degree of risk of developing a pressure ulcer.

### **Waterlow assessment**

The Waterlow pressure ulcer risk assessment/prevention policy tool is, used by healthcare professionals and carers at the patient/client interface and is used in determining the pressure area/ulcer risk status of the patient/client.

## **6. Communication matrix**

### **Augmentative and Alternative Communication (AAC)**

A set of procedures and processes designed to improve (temporarily or permanently), the communication skills of individuals, with little or no functional means of communication. AAC involves supplementing or replacing natural speech and / or writing with aided (eg picture communication symbols, line drawings, alphabet based methods) and / or unaided symbols (eg manual signs, gestures and finger spelling). Aided symbols are used with assistive devices including electronic devices (speech generating devices) and non-electronic aids (eg communication books).

### **The Carolina Curriculum for Infants and Toddlers with Special Needs 3rd Edition**

An assessment and intervention program designed for use with young children from birth to five years who have mild to severe disabilities. Developed for use with children from birth to 36 months, it is an easy-to-use, criterion-referenced system that clearly links assessment with intervention.

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## **The Carolina Curriculum Preschoolers with Special Needs 3rd Edition**

An assessment and intervention program designed for use with young children from birth to five years who have mild to severe disabilities. Developed for use with children from 24 to 60 months, it is an easy-to-use, criterion-referenced system that clearly links assessment with intervention.

## **Receptive-Expressive Emergent Language Scale-3rd Edition (REEL 3)**

A parent interview style standardised assessment designed to identify major receptive and expressive language problems in infants and toddlers.

## **Dysarthria**

Dysarthria can be associated with any type of CP and can arise from any part of the vocal tract. Children with dysarthria associated with CP often have shallow, irregular breathing for speech (for instance speaking on small pockets of residual air; trying to produce a whole utterance rapidly on one short breath) and this may affect the rate at which they attempt to speak. They may also have what is perceived as a low-pitched, harsh-sounding voice, with little pitch variation. Hyper-nasal speech with audible escape of air through the nose and poor articulation may further reduce intelligibility. Disorders are more severe for children with dyskinetic CP than for those with spastic forms, but most of the perceptual characteristics (e.g. low pitch, poor breath control and imprecise articulation) are observed in children across the different types of CP. Pennington et al 2010.

As they get older, children with spastic diplegia or quadriplegia spend increasing amounts of time in fixed positions and may develop contractures and deformities which may lead to a regression in speech skills, particularly effecting loudness, resonance (increasing hypernasality) and voice quality. This regression can be particularly noticeable during times of rapid growth.

- Wit, Maasen, Gabreels, & Thoonen, 1993; Workinger, 1986, found that 'one indicator of reduced vital capacity is seen in shortened maximum phonation times in children with spastic cerebral palsy', and to a greater extent in children with dyskinetic cerebral palsy.
- Speech errors may include omissions, vowel errors, substitutions and nasalization errors.

## **Spastic Cerebral Palsy**

Children with spastic diplegia and mild-moderate spastic quadriplegia may develop speech skills early on. Articulation is normally quite good but they often have dysphonia secondary to a disorder of breathing.

- May have breathy voice quality, monotonous pitch, hypernasality, and voice quality changes throughout an utterance. (Seif, Netsell, & Kent, 1981; Workinger & Kent, 1991)
- Variability and a decrease in loudness may result from an inability to maintain constant subglottal air pressure across an utterance. These children may start a sentence with appropriate adduction/abduction of the vocal folds but then are unable to sustain adequate subglottal air pressure, and so the voice quality may become strained/strangled.
- Breathily and often quieter voice quality occurs when the vocal folds aren't properly adducting (coming together to produce voicing)
- It is also possible that part of the reason why children with spastic CP use lower speech volume, is because it becomes a 'learned behaviour related to the fact that there is often an overflow of muscle tone in the arms and legs when speech is produced loudly. By using a lower vocal intensity, the muscle tone in the extremities can remain more normal'. (p32)
- Workinger and Kent (2000) described consistent hypernasality in speakers with spasticity' (p33)

## **Ataxic CP**

- May attain speech motor skills along normal developmental lines.
- Speech tends to be intelligible but there may be problems with speech rate, and timing. Articulatory distortions may also occur.
- Speech production tends to improve as the child gets older but the above types of speech difficulties mentioned may persist to some extent.

## **Dyskinesias**

- Hardy (1964) found that these children demonstrate faster rest breathing rates and reduced expiratory reserves, inspiratory capacities, and vital capacities
- Hardy (1983) noted that if an individual with CP has loss of air during speech production due to inappropriate valving at the level of the larynx, velopharynx, or

the orofacial structures then it may seem like there is much greater respiratory involvement needed to produce speech(p31 paraphrased).

- Tend to demonstrate severe oral motor involvement from birth.
- Some children are limited to vowel production for the first 18-24 months. \*May be significant problems with co-ordinating movements of the vocal tract, and sound repertoire might be limited to only a few phonemes.
- Typically late to speak.
- Receptive language may be significantly better than verbal skills therefore these children may particularly benefit from early introduction of AAC.
- As they gain body weight, stability and more oral motor control, some children may develop functional verbal communication. This can occur as late as puberty to early adult years.

### **Athetoid CP**

- In athetoid CP variations of loudness may be caused by fluctuations in valving the air stream at the level of the larynx (p32)
- Children with athetoid CP or mixed types of CP tend to show more abnormal oral movement patterns and postures.
- Workinger and Kent (1991) found that ‘children with athetosis showed more articulation errors than children with spasticity. The primary type of error for both groups was omission. Vowel errors and substitutions were next most frequent errors for the group with athetosis.’ Then ‘voicing errors and additions’.(p34)
- Kent and Netseell (1978) and Hardy (1961) described ‘intermittent velopharyngeal closure in individuals with athetosis caused by an instability of velar elevation and resulting in intermittent hypernasality. Very young children or individuals with severe athetosis may produce only nasalized vowels because of their inability to valve at the level of the velopharynx.’ (p33)

## **7. Feeding matrix**

### **Feeding screening tool**

A structured interview/questionnaire to be completed by a clinician together with the child's parent/caregiver to help determine what the feeding issue is and whether

referral to feeding clinic is appropriate. The screening tool can be downloaded from the CDC shared drive. There are 4 documents which relate to the different age ranges: J:\Women\_Children\CDCStaff\Feeding clinic\Feeding assessment tools

Feeding clinic entry criteria can be found on the CDC shared drive in the feeding clinic folder

### **Tube feeding**

**NG tube** - Naso-gastric tube is inserted into the nose and into the stomach. This is a short term solution not recommended for long term feeding. There are safety concerns associated with a child pulling or the NG tube migrating. Long term use and frequent insertion of an NG tube can also cause sensory and tissue damage. NG tubes may also increase GORD.

**G tubes** - Gastrosotomy tubes are inserted into the wall of the abdomen and supplements can be placed directly into the stomach. This can occur with gravity feeds or with use of a feeding pump to control rate.

**GJ tubes** - Gastrojejunal tubes are inserted into a gastrosotomy and threaded into the jejunum. GJ tubes are used for children who cannot tolerate feeding into the stomach, usually due to gastroesophageal reflux (GORD). Feeding must be continuous as the small bowel can not handle bolus feeds like the stomach. These feeds also typically run over much longer times.

**J tube** - A jejunostomy tube is inserted through the abdomen and into the jejunum (the second part of the small bowel) to assist with feeding and to provide nutrition. J tubes are similar to GJ and must be run continuously at a very slow rate.

## **8. Community Access**

### **Canadian Occupational Performance Measure (COPM)**

Is a tool designed to enable individuals to identify and prioritise everyday issues that restrict or impact their occupational performance. The COPM can be used to identify problem areas, rate client's priorities, evaluate performance and satisfaction and measure change in perception of occupational performance.

# 10.0 Definitions

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