

## Advice For Families \*

### What is cerebral palsy (CP)?

Cerebral palsy is a medical condition that affects control of the muscles [A]. It appears in the first few years of life. Cerebral means the brain's two halves, and palsy means inability to move properly. Cerebral palsy is not a problem of the muscles or nerves. Instead, it is a problem with the brain's ability to adequately control movement and posture.

### What happens if someone has cerebral palsy?

If someone has cerebral palsy they are not able to use some of the muscles in their body in the normal way because of an injury to their brain. Children who have cerebral palsy may not be able to walk, talk, eat or play in the same ways as most other kids. They have difficulty with fine motor tasks, such as writing or cutting with scissors; experience trouble with maintaining balance and walking; or be affected by involuntary movements, such as uncontrollable writhing motion of the hands or drooling.

The severity of the problem is different in every child. Some have very mild problems whereas others have very severe involvement and other medical disorders, including seizures or mental impairment [B].

### Why does it occur?

CP is caused by an injury to the brain before, during, or shortly after birth. In many cases, no one knows for sure what caused the brain injury or what may have been done to prevent the injury. Brain damage in the first few months or years of life can follow head injury or brain infections, such as bacterial meningitis or viral encephalitis.

The cause of brain damage before or during birth is unknown. Risk factors that increase the likelihood of brain damage are prematurity, low birth weight and difficulties during pregnancy. Doctors should keep an eye on children who have these risk factors [C].

In the past, doctors thought that cerebral palsy occurred because of asphyxia or hypoxia during birth. However, research has shown that very few babies who have birth asphyxia develop CP. Birth complications are now estimated to account for about 6 percent of cases.

CP is not contagious and it is not inherited from one generation to the next.

### How common is CP?

CP occurs in 2 of every 1000 babies worldwide. The United Cerebral Palsy Associations estimate that more than 500,000 Americans have cerebral palsy. Despite the many technological advances in medicine, the number of children with CP remained the same over the past 30 years. This is partly because more critically premature infants are surviving through improved intensive care. Unfortunately, many of these infants have nervous system damage.

### What are the early signs?

Signs of CP appear before 3 years of age [D]. Parents first suspect that their infant is not developing normally. Infants with cerebral palsy are slow to learn to roll over, sit, crawl, smile, or walk. This is called developmental delay.

Some children have hypotonia when the baby may seem flaccid and relaxed, even floppy. Some have hypertonia, and the baby seems stiff or rigid. In some cases, the baby has an early period of hypotonia that progresses to hypertonia after the first 2 to 3 months of life. Affected children may also have unusual posture or favour one side of their body.



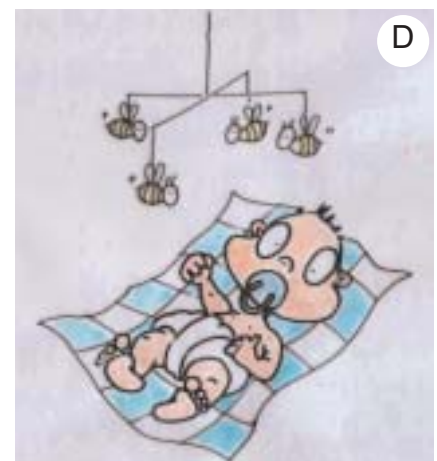
A damage to the centers that control movement in the developing brain results in cerebral palsy. The child has difficulty moving and maintaining his balance.

### Children with CP may have:

|  |
|--|
| Tight and stiff muscles called spasticity          |
| Muscle weakness                                    |
| Balance problems                                   |
| Involuntary movements                              |
| Mental problems                                    |
| Attention and perception deficits                  |
| Seizures   |
| Visual problems                                    |
| Hearing problems                                   |
| Communication problems                             |
| Poor nutrition and failure to gain weight and grow |
| Drooling   |
| Dental caries                                      |

### Risk factors

|   |
|---|
| Breech presentation                                       |
| Complicated labor and delivery                            |
| Low Apgar score   |
| Low birth weight and premature birth                      |
| Multiple births   |
| Nervous system malformations                              |
| Maternal bleeding or severe proteinuria late in pregnancy |
| Maternal hyperthyroidism, mental retardation, or seizures |
| Seizures in the newborn                                   |



The early signs of CP are apparent from 2 months of age. The baby is unable to hold the head erect, he lies in an asymmetric posture and favours one hand. He is irritable or extremely quiet and does not suck well.



The diagnosis is made by clinical examination and accurate history.



Cranial MRIs can reveal the brain abnormality from 2 months onwards in many cases. The baby has to hold still for at least 20 minutes so there is a need for anaesthesia. Repeat MRIs are generally not necessary.



Quadriplegic children may also have dystonia in his hands.



Ataxic children can walk if they can hold onto their caregivers or a walker.

A physician should be consulted when there is concern about a baby's development [A]. The physician can distinguish normal variation from a developmental disorder.

### How is it diagnosed?

CP is diagnosed by history and clinical examination. Slow development, abnormal muscle tone, and unusual posture indicate CP. The physician must determine that the child's condition is not getting worse. CP is not progressive. If a child is continuously getting worse, he probably does not have CP.

There are specialized tests to learn more about the possible cause of cerebral palsy. Computed tomography (CT), uses X rays and a computer to visualize the brain tissue. A CT scan shows abnormal brain areas. Magnetic resonance imaging (MRI) [B] uses a magnetic field and radio waves. It shows the brain lesion more clearly in certain cases. These scans do not prove whether a child has a cerebral palsy, and they do not predict how a specific child will function as she grows.

Ultrasonography bounces sound waves off the brain and uses these to view the brain structures. It can be used in infants before the bones of the skull close. It shows the abnormality in the brain, is less expensive, and does not require long periods of immobility.

An electroencephalogram, or EEG will show the natural electrical currents inside the brain and will reveal a seizure disorder if present.

Intelligence tests are used to determine if a child with CP is mentally impaired. An ophthalmologist and an otologist are necessary for vision and hearing problems.

Once the child is diagnosed with CP there is no more need for repeated MRI scans.

### Are there different types of CP?

Children with CP have damage to the area of their brain that controls movements. Their problems are: muscle weakness, tight and stiff muscles, balance problems and coordination difficulty. The muscles are either too tight, too loose, or a combination of tight and loose.

#### Spastic CP

Spastic means that the muscles are too tight. Children with spastic CP have stiff and jerky movements because their muscles are too tight. They often have a hard time moving from one position to another or letting go of something in their hand [C]. This is the most common type of CP.

#### Dyskinetic (athetoid or dystonic) CP

Children with dyskinetic CP have trouble holding themselves in an upright, steady position for sitting or walking and often show lots of movements of their face, arms and upper body that they don't mean to make (random, involuntary movements). These movements are usually big and increase when children are excited or frightened. During sleep they go away.

Children may not be able to hold onto things (like a toothbrush or fork or pencil) because of their mixed tone and trouble keeping a position.

#### Ataxic CP

The muscles are loose and the child has difficulty maintaining balance and coordinating his movements. Kids with ataxic CP look very unsteady and shaky. They shake a lot especially when they are trying to do something. They have poor balance and walk unsteadily [D].

### Mixed CP

When spasticity, ataxia and dyskinesia occur together in the same child, we call it a mixed type CP.

Besides different kinds of muscle tone, we must also define which parts of the child's body is affected. This depends on the extent of the brain injury.

### Quadriplegia

When a child has a movement problem in all four of his limbs, it is called quadriplegia. These children have trouble moving all the parts of their bodies, their face and trunk [A]. They use a wheelchair to get around. They also have trouble talking and eating.

### Hemiplegia

When a child has movement problem in one side of the body only, it is called hemiplegia. The other side of the child's body works fine. Many children with hemiplegia are able to walk and run.

### Diplegia

When a child has a movement problem just in the legs or much more severe in the legs than in the arms, it is called diplegia. Children have difficulty walking and running. They can hold themselves upright and use their arms and hands.

### What other problems may be seen in children with CP?

Children with CP may have some other problems that are caused by the same brain injury. These include:

#### Mental impairment

About one-third of children who have cerebral palsy have mild, one-third moderate or severe mental impairments. The remaining third are normal. About one-fourth to one-half of children with CP also have learning problems [B]. They may have trouble with one or two subjects in school but learn other things well. They learn at a slower rate. Children with mild mental retardation learn to read and write and do math. Many children need some special learning help in school.

If a child does not have the means to move around he will be unable to explore his surroundings and interact with his peers [C]. This will result in secondary mental and social deprivation.

#### Seizures or epilepsy

About 30% of all children with CP have seizures. This means some abnormal activity in their brains that interrupts what they are doing. Seizures usually last a few seconds to a few minutes, and are not dangerous. Many children take special medicine to help prevent seizures.

#### Growth problems

Children with spastic quadriparesis lag behind in growth and development despite having enough food. In babies, this lag usually takes the form of too little weight gain; in young children, it can appear as abnormal shortness; in teenagers, it may appear as a combination of shortness and lack of sexual development. The causes are poor nutrition and damage to the brain centers controlling growth and development [D].

#### Feeding problems

CP can affect the way a child moves his mouth, face and head. The child may have difficulty biting, chewing and swallowing food, which can cause poor nutrition. Poor nutrition increases risk of infection and cause or aggravate the lag in growth and development.



The most important problem in CP is inability to move.



Children with CP may have learning difficulty.



The immobile child is isolated from his peers.



Growth is retarded because the child cannot eat properly. Adequate nutrition is essential for brain development in the first 3 years of life. Get proper evaluation if the child vomits all the time, cannot chew or swallow. A gastrostomy will help you feed your child.



Improved communication strengthens self-image. The child can have friends and socialize.



Poor eyesight increases the movement problem.



The diagnosis of CP can be made around the age of one by a pediatric neurologist.



A pediatric physiatrist designs a rehabilitation program for your child according to the child's needs and the treatment team's expectations

Prepare semisolid food, vegetables and fruits to make swallowing easier. Proper position and sitting up while eating or drinking is also helpful. In severe cases doctors recommend a gastrostomy in which a tube is placed directly into the stomach.

#### Communication

The child may not be able to control her lips, jaw and tongue much. He also has trouble controlling his breath flow to make his voice work. Therefore he has difficulty talking clearly and making himself understood [A].

#### Drooling

Children with poor control of mouth and pharynx muscles have drooling. This can cause severe skin irritation and also lead to further isolation of affected children from their peers. Drugs can reduce the flow of saliva but may cause mouth dryness and poor digestion.

#### Incontinence

This is caused by faulty control over the muscles that keep the bladder closed. The child may wet the bed, leak urine during physical activities or spontaneously.

#### Impaired vision or hearing

Strabismus occurs in a large number of children. This is a condition in which the eyes are not aligned because of differences in the left and right eye muscles. In children, the brain adapts to the condition by ignoring signals from one of the eyes. This leads to very poor vision in one eye. The child may be unable to judge distance. In some cases, surgery to correct strabismus may be necessary. Children with hemiparesis may have defective vision or blindness that impairs the normal field of vision of one eye [B]. Impaired hearing is also more frequent among those with cerebral palsy than in the general population.

#### Abnormal sensation and perception

Some children with cerebral palsy feel simple sensations like touch and pain less than normal. They may also have difficulty identifying objects when their eyes are closed just by touching them.

#### Can it be cured?

The lesion in the brain cannot be cured, although the consequences can be minimized. Treatment can improve a child's capabilities. Many cerebral palsied people can live near normal lives. There is no standard therapy that works for all patients.

#### Who treats CP?

A team of health care professionals identify a child's needs and then to create an individual treatment plan for him. The members of the treatment team are knowledgeable professionals with a wide range of specialities.

#### The team includes

**A physician (a pediatrician, a pediatric neurologist, or a pediatric physiatrist)** trained to help developmentally disabled children [C,D]. This physician works to build a comprehensive treatment plan, implements treatments, and follows the patient's progress over a number of years.

**An orthopedist** who specializes in treating the child musculoskeletal system. An orthopedist diagnoses and treats muscle and bone problems associated with CP.

**A physical therapist**, who designs and implements special exercise programs to improve movement and strength.

**An occupational therapist** who helps patients learn daily living skills, also skills at school and work.

**A speech and language pathologist** who treats communication problems.

**A psychologist** who helps patients and their families cope with the special stresses of CP.

**An educator** who teaches children with mental impairment or learning disabilities.

The child with CP and his family are also members of the treatment team. As a family, be involved in all steps of planning, making decisions, and applying treatments.

Treatment plan includes drugs to control seizures and muscle spasms, special braces to make walking easier, orthopaedic surgery [A], mechanical aids to assist in daily life, counselling for emotional and psychological needs, and physical, occupational, speech, and behavioural therapy. Early treatment gives the child a better chance of learning to move.

Do not forget that the ultimate goal is to help the child have a happy life, healthy growth into adulthood and maximum independence in society [B].

### Is there a drug to cure the problem?

There is no drug that can cure CP. Physicians usually prescribe drugs to stop seizures, to relax muscles and if necessary to stop drooling.

Diazepam acts as a general relaxant of the brain and body; baclofen, blocks signals sent from the spinal cord to contract the muscles and dantrolene interferes with the process of muscle contraction. They are effective for short periods and have side effects such as drowsiness. The long-term effects of these drugs on the developing nervous system are unknown. Patients with dyskinetic cerebral palsy may need drugs that reduce abnormal movements.

### What is botulinum toxin? Is it useful in CP?

Botulinum toxin is a drug that decreases spasticity when injected into the muscle. It stops the signal for contraction from the nerve to the muscle. Children who walk on tiptoe or with bent knees benefit from botulinum toxin injections [C]. The physician decides whether botulinum toxin is suitable for your child and does the injections. The injection is not painful but sedation is necessary. General anesthesia is better if many muscles are to be injected. The effects starts at 3-10 days and continues for 3-6 months. Re-injections can be done if necessary. After the injection, the physician may decide to use a short or long leg cast. Physiotherapy is essential. Wearing braces is easier, the child walks better and has better balance. Relieving spasticity in this manner may preserve muscle length and minimize the need for orthopaedic surgery. There are almost no side-effects. A slight weakness may be observed. Botulinum toxin is not useful in generalized spasticity.

### Are physical therapy and physiotherapy the same? How much does my child need?

Physical therapy and physiotherapy are different names for the same therapy method. Physiotherapy involves treatment of the musculoskeletal system with exercises to regain joint movement, muscle strength and mobility. Physiotherapists try to teach the child how to move better and how to maintain balance. At the same time, they also try to prevent the musculoskeletal system complications that occur because of muscle tightness and weakness. They teach children with CP to walk, use their wheelchair, stand by themselves, or go up and down stairs safely. Children must perform these exercises in fun activities like running, kicking and throwing a ball, or learning to ride a bike [D].



The pediatric orthopaedic surgeon treats the musculoskeletal problems that occur because of spasticity.



Education is the most important aspect of treatment. Every child with CP should get a proper education within the limits of his capacity. Even children who have mental retardation can learn.



Botulinum toxin injections relieve spasticity and do not cause harmful long lasting side effects.



The child must enjoy therapy. Exercises must be in the form of play activities. A tricycle is great for teaching reciprocal movement.



Strengthening is crucial for effective mobility. The child who has weak muscles cannot walk. Bicycles can be supplied with side wheels for balance.



Do not be afraid to use a wheelchair. It does not cause addiction. On the contrary, children who are mobilized at an early age with a wheelchair do not lose the motivation to move. Computer aided systems attached to the chair improve communication.



The basic brace in CP is the plastic ankle foot orthosis (AFO). Do not use KAFOs or metal braces.

Physical therapy begins in the first few years of life. The most common therapy technique is called the Bobath technique, named for a husband and wife team who pioneered this approach. Therapists try to provoke advanced control of movement by stimulating the child in this technique. There are also many other techniques used in various parts of the world like the Vojta therapy or the Rood method and others. All of these techniques have the same principles. One is not better than the other. It depends on the skill of the physiotherapist to use these various techniques in the best way to improve function. Do not worry about the therapy method your physiotherapist is using. Always concentrate on how functional and how happy your child is.

Strengthening exercises are necessary to prevent weakness and stretching exercises are essential to prevent contractures [A]. Normally, a growing child stretches his muscles and tendons during daily activities. As the child runs and plays muscles and bones grow together. Spasticity prevents this stretching in CP. As a result, muscles do not grow as fast as bones. Muscles get stiff and short, they prevent joint movement. This is called a contracture. Physical therapy works to prevent contractures by stretching spastic muscles. For example, if a child has spastic hamstrings (muscles in the thigh behind the knee), the therapist and parents should encourage the child to sit with the legs extended to stretch them.

Like all children, the child with CP needs to experience the world around him in order to learn. Stimulating the child with exercises and other therapy procedures can make this possible for the child who is physically unable to explore. Giving the child a wheeled mobility device is also very helpful.

As the child approaches school age, efforts to prepare the child for the classroom are necessary. Physical therapy can help the child prepare for the classroom by improving the ability to sit, move independently or in a wheelchair [B].

#### What braces can the child use?

It is important to mobilize the child. Use seating devices and head supports to enable better sitting. There are special devices called standers that help the child stand with support. These are necessary for more severely involved children. The most common braces are called AFOs [C]. The capitals stand for ankle foot orthoses. They are generally made of plastic from a plaster model of the child's foot. The physician will decide which braces are necessary and prescribe them for the orthotist to make. The KAFO (knee ankle foot orthoses) has been abandoned in CP as well as the metal uprights attached to orthopaedic shoes. Try and use the simplest and smallest brace so as not to interfere with walking. Do not use orthopaedic shoes, they are of no help.

#### Do children need speech therapy?

Speech therapy shows ways of communicating with the child. The child may learn to communicate through talking, using sign language, or using a communication aid. Children who are able to talk work with a speech therapist so that they will improve their speech for people to understand them better. They learn new words, to speak in sentences and improve their listening skills. Children who are not able to talk learn sign language or use a communication aid. A simple communication aid is a book or poster with pictures that show things the child might want, or an alphabet board that he uses to spell out his message. There are also computers that actually talk for the child.

### What is occupational therapy?

Occupational therapy is teaching the child activities of daily life. These include how to write, draw, cut with scissors, brush teeth, dress [A] and feed or control the wheelchair. Occupational therapists help children find the correct equipment to make some jobs a little easier.

### Is there time for play?

As a family, take time to have fun [B]. Do not let therapy take up all the child's time. The goal of therapy is to make the child have a normal childhood. By definition, this includes play activities. There are recreational therapists who work with children on sports skills or other leisure activities. Children may learn to dance, swim or ride a horse. They may also work on art or grow and take care of plants. Find out what your child is interested in and try to improve his capabilities [C].

### Is surgery really necessary?

Orthopaedic surgery is necessary if there are contractures or if the hips are subluxating. The surgeon first determines the exact muscles that are spastic, because lengthening the wrong muscle could make the problem worse.

Lengthening a muscle makes it weaker. Children need intensive physiotherapy after surgery and recovery takes months. For this reason, doctors try to fix all of the affected muscles at once when it is possible.

No matter how well they are cared for, contractures and deformities occur eventually in all diplegic children. Therefore almost all diplegic children need orthopaedic surgery sometime in their lives.

A neurosurgical operation known as selective dorsal rhizotomy aims to reduce spasticity in the legs. Doctors try to locate and selectively cut overactivated nerves in the spine that control leg muscles. The results are not clear.

### Are there any devices to make life easier?

Special machines and devices can help the child or adult with cerebral palsy overcome limitations. The computer makes the largest difference in the lives of those with cerebral palsy. A child who is unable to speak or write may be able to learn to control a computer using a special light pointer that attaches to a headband. Equipped with a computer and voice synthesizer, this child can communicate with others.

### What is behavioural therapy?

Behavioural therapy uses psychological theory and techniques. It might include hiding a toy inside a box to reward a child for learning to reach into the box with his weaker hand. Therapists may try to discourage unhelpful or destructive behaviors, such as hair-pulling or biting. As a child with cerebral palsy grows older, continuing physical therapy must be supplemented by vocational training, recreation and leisure programs, and special education when necessary. Counselling for emotional and psychological challenges may be needed at any age, but is often most critical during adolescence. Depending on their physical and intellectual abilities, adults may need attendant care, living accommodations, transportation, or employment opportunities.

### Can the child with CP walk? Will my child walk?

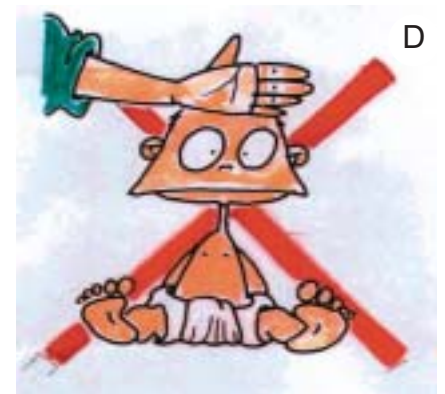
Predicting what a young child with cerebral palsy will be like or what he will or will not do is very difficult. It is only possible to a certain extent after the child is two years old. Children with cerebral palsy do not lose the skills they mastered. If a child loses a skill he previously could, look for a different cause of the child's problems [D].



Occupational therapy teaches the child daily living skills such as dressing and buttoning up.



A childhood full of fun and play is a happy childhood. It is possible even in CP.



Walking is the most important priority of parents when the child is a baby, however, being able to walk is not important for happiness in an adolescent. Being loved, being able to give and receive, being productive makes a person happy. Teach your child to love and to be productive. Love your child so that he is happy.



Motivation to move and mental retardation are two most important requirements for ambulation and independent living.



All mentally capable children should attend normal schools regardless of the degree of their movement problem.



Maintain the integrity of your family. Spend time together, have fun together. Share good and bad experiences. Spare more time for each other than for therapy.



Parents should learn how to care for their baby at home. Holding the baby in certain positions during feeding, performing the exercises and playing with the baby stimulate the central nervous system.

In order for a child to be able to walk, he must be able to hold up his head and sit independently. A child who does not sit up by himself by age 4 will not walk independently.

Mental retardation impairs a child's ability to function. It is difficult to predict early on whether the child will be mentally retarded or whether he will be able to talk. Evaluating intellectual function is also hard because of the movement problem. Children who are mentally retarded have more difficulty walking. Children who do not have the motivation to move do not become independent ambulators despite adequate motor control [A].

CP does not always cause severe handicap. A quadriplegic child might be unable to walk and need extensive, lifelong care. A hemiplegic child is slightly awkward but requires no special assistance.

**Can the child with CP go to school?**

Yes, all hemiplegic children, mentally adequate diplegic and quadriplegic children must attend mainstream education. Prepare the teachers beforehand that the child with CP will need extra time in activities that require precise movements with the hands. A proper education is the only solution to the movement problem that limits the child's independence [B].

**Can the child with CP live independently?**

Independent living depends on many factors. The most important factor is mental retardation. The child must have an adequate intelligence to earn a living and support himself. Active use of the hand and functional mobility are also important factors to consider. Walking is important but not high priority. Most hemiplegic children but no quadriplegics can live independently.

**Parents, keep in mind!**

**The joy of childhood**

Your child is a child only once. Do not get carried away by treatments. Be proud of your child and let him discover the joy of childhood [C]. Have hope for, and become close to your child.

**The joy of parenthood**

Accept your child the way he is but try and get the best of treatment for him. Do not blame yourself, lose hope or give up. The cause of CP is unknown, it is not your fault, nor anybody else's. The diagnosis is difficult and there are no tests to prove whether a child has a cerebral palsy. No test can predict how a child will function as she grows.

You may feel tired, helpless and lonely. Sometimes you may blame yourself or think that you are neglecting your family and other children. These are normal feelings. Share them with loved ones and your physician. Do not ignore your own needs and your relations. You can help your child more if you are strong [D].

**Forming alliances**

Contact those families who have similar problems. Take part in associations and organizations. Be useful to others.

Improve your knowledge. Read all available resources and try to support the foundations for CP. Join the seminars, symposia and panels and follow up on new developments.

**Parenting your child**

Do not overprotect the child. Allow your child to explore his environment. Put his toys to a certain distance away from him and encourage him to get these himself. You can motivate him to move in this way.

Support your child to gain independent self care and daily life activities. He can wash his hands and face, put on and take off his clothes, eat his food or at least help you do these. Give him ample time.

**Infancy** When your child is just a baby, learn how to hold, feed and exercise him. Infancy is a time of uncertainties. Do not be discouraged and keep loving your baby.

**Toddler** When your child is a toddler support his body so that he can use his hands in active play. Encourage him to move by himself. Get him wheeled devices [A] so that he can move around the house and explore his surroundings. Never believe those who say the child should crawl before he can walk or that his spine will bend if you make him sit. See for yourself what your child is capable of doing and support him if he wants to do that.

**Schooling** Never neglect the child's education. Defend your child's right to get the best education possible [B]. Special education is possible if your child cannot enter mainstream education. Do not allow anything to disturb his school and academic life. Walking does not make a person a human being, an active productive mind does.

**Adolescence** Provide psychological support to your child during adolescence. Try and be his friend [C]. Encourage him in the things he wants to do. Allow him to make his own decisions. Guide him gently in his relationships with his surroundings. Children need other children. Help your child make friends.

**Interaction with the health care providers**

Know your child well. Define your needs and express these openly to the treatment team.

Learn and perform the exercises that your physiotherapist teaches you. Ask once more if you do not understand or have difficulty performing.

Know your demands from the health care providers and from the society in general at every point in your child's life and be ready to voice them clearly. Remember that nobody can know what your child needs better than you or him [D]. Problems can only be solved if they are defined clearly and made known. The community will respond to your efforts.

**Continuous care**

Focus on your child's strengths, assets and interests rather than his weaknesses. People excel in the things they like doing. If your child wants to do something, support him. Praise your child frequently for his accomplishments. Do not dwell on his weaknesses. It is much easier to improve his strong points than his weaknesses. Remember, your child does not need to walk to be happy. He needs your love and attention.



Mobility is essential for the toddler who needs to explore to learn and develop skills. Sports is better than all sorts of physiotherapy for the adolescent at school.



Throughout the various therapy procedures and the anxiety of rearing a child with CP, do not miss the joy of being a father or a mother. Remember the joy of parenthood.

| E | When buying clothes look for:  |
|---|--|
|   | Finger rings or other large zipper pulls   |
|   | Flat and nonskid shoes   |
|   | Raglan sleeves   |
|   | Front openings   |
|   | Short backs  |
|   | Nonrestrictive elastic   |
|   | Velcro   |
|   | Leg zippers  |
|   | Hook and loop closures   |
|   | Flat-felled seams  |
|   | Roomy  |
|   | Cut Longer in the seat to allow for sitting  |
|   | Cut shorter in the legs and arms and shorter shirts that don't get caught in wheels. |
|   | Knit fabrics   |

Table modified from the website: <http://geocities.com/aneecp/clothing.htm>

**D Talking To Your Doctor**

Here are some tips for communicating more effectively with the physician so that the visit to the doctor will be more productive.

Make a list of your concerns. Look to the list as you talk so you will not forget anything.

Try to arrive 10-15 minutes before the appointment time even if your doctor never runs on time.

Have someone with you to help you listen and for emotional support if needed.

Be conscious of the doctor's time. If you are doing well 10-15 minutes is all that is necessary.

Use the medications as prescribed. Report effects of the medications accurately. Have a list of the medications and dosages with you all the time.

Do not tell the doctor what to do. Work with your doctor. You are a team.

If you do not understand what the doctor says ask him/her to repeat it.

Do not accept ambiguous answers.

Be impressed with physicians who send you to get a second opinion, or admit that they do not have all the answers.

THANK the doctor for his/her time.

Educate yourself about CP.

## Glossary

**Apgar score** A numbered score doctors use to evaluate a baby's condition at the time of birth.

**apraxia** Impaired ability to carry out purposeful movements in the presence of sufficient motor function.

**asphyxia** Lack of oxygen because of trouble with breathing or poor oxygen supply in the air.

**cerebral** Related to the brain.

**computed tomography (CT)** An imaging technique that uses X rays and a computer to create a picture of the body.

**congenital** Present at birth.

**contracture** Inability to move the joint because of stiffness in the muscles.

**dysarthria** Speaking difficulty because of problems in controlling the muscles needed for speech.

**electroencephalogram (EEG)** A method of recording electrical currents inside the brain.

**electromyography** A method of recording muscle and nerve activity.

**failure to thrive** Being behind in terms of physical growth and development.

**gait analysis** A method of objectively measuring walking using a camera recording, force plates, electromyography, and computer analysis.

**gastrostomy** A surgical procedure to create an artificial opening in the stomach.

**hemianopia** Defective vision or blindness in half of the field of vision of one eye.

**hypertonia** Increased muscle tightness.

**hypotonia** Decreased muscle tightness, the state of being flaccid.

**hypoxic-ischemic encephalopathy** Brain damage caused by poor blood and oxygen supply.

**magnetic resonance imaging (MRI)** An imaging technique which uses radio waves, magnetic fields, and computer analysis to create a picture of body tissues and structures.

**orthoses** Splints or braces used to treat problems of the muscles, ligaments, or bones of the skeletal system.

**paresis or plegia** Weakness or paralysis.

**palsy** Paralysis, inability to control voluntary movement.

**reflexes** Movements that the body makes automatically as a response to various stimuli.

**selective dorsal root rhizotomy** A surgical procedure in which selected nerves are cut to reduce spasticity in the legs.

**spastic diplegia** A form of cerebral palsy in which the legs are more severely affected than the arms.

**spastic hemiplegia (or hemiparesis)** A form of cerebral palsy in which the arm and leg on one side of the body is affected.

**spastic quadriplegia (or quadriplegia)** A form of cerebral palsy in which all four limbs, the trunk and the neck are affected.

**stereognosia** Difficulty perceiving and identifying objects using the sense of touch.

**strabismus** Misalignment of the eyes.

**ultrasonography** A technique that uses sound waves and their echoes to form an image, called a sonogram.



This appendix covers some of the most common scales used in CP and/or information on where to find them. The Web resources that may help the readers in their further studies are also included at the very end.

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#### Developmental milestones according to Gessel and Amatruda:

|                               |   |
|-------------------------------|---|
| Gross motor behaviour         | Preambulatory skills, walking and advanced physical activities                                      |
| Fine motor-adaptive behaviour | Prehension, manipulatory hand skills, application of sensorymotor skills to daily living activities |
| Language                      | Vocalization, comprehension, expression in spoken and other modes of communication                  |
| Personal-social behaviour     | Acquisition of social and cultural standards of behaviour   |

#### Developmental milestones

| Age       | Gross motor   | Fine motor  | Language   | Personal social  |
|-----------|---|---|--|--|
| Newborn   | Flexor tone, in prone turns head to side  | Hands fistled, grasp reflex   | Cries, turns head to sound   |  |
| 2 months  | Lifts head up when prone  |   | Makes sounds, follows with eyes  | Startles to loud noise, smiles responsively  |
| 4 months  | Head midline, holds head when pulled to sit, in prone lifts head  | Hands open, midline play, reaches for an object, grasps it and puts it to his mouth               | Laughs, squeals, responds to the sounds mother makes                   | Recognizes bottle  |
| 6 months  | Lifts head when supine, rolls from prone to supine, sits with support                                   | Transfers objects from hand to hand   | Babbles, localizes direction of sound                                  |  |
| 7 months  | Sits without support, rolls to prone  | Bangs objects, reaches out for people   | Uses single words and can say ba-ba, da-da                             | Differentiates between familiar person and stranger, talks to mirror image, looks for dropped things |
| 10 months | Pulls self to sit, creeps on all fours, stands momentarily, cruises                                     | Thumb to index grasp, pincer grasp  | Uses mama and dada with meaning, shouts for attention, imitates speech | Plays peekaboo feeds himself with finger   |
| 14 months | Walks alone with arms held high, wide base, excessive knee and hip flexion, slight knee and feet valgus | Piles two cubes, scribbles spontaneously  | Uses single words understands simple commands                          | Uses spoon removes clothing  |
| 18 months | Walks with lowered arms, walks backward, sits himself in chair  | Emerging hand dominance, crude release  | Says no, points to named body part                                     | Imitates housework, carries and hugs dolls, drinks from cup  |
| 2 years   | Begins running, jumps with both feet, walks up and down stairs  | Builds eight cube tower, places pencil between thumb and fingers, draws with arm and wrist action | Two word phrases, uses verbs, follows simple directions                | Puts on clothing, uses spoon well, opens door, toilet training                                       |
| 3 years   | Runs well, pedals tricycle  | Overhand throw, catches objects, copies circle  | Three word sentences, future tense, asks who, what, where              | Washes and dries hand and face, toilet trained, can be reasoned with                                 |
| 4 years   | Hops on one foot, plantar arches develop  | Handles a pencil like adults, draws person, cuts with scissors                                    | Uses past tense, adjectives and adverbs, knows opposites               | Cooperative play, imaginative play   |
| 5 years   | Skips, tiptoes  | Catches with hands, draws details   | Fluent speech  | Self sufficient in most ADLs   |

## Developmental Tests

These tests describe the development of the child in various functional stages.

### Denver Development Screening Test

This test evaluates the developmental deficits in infants and young children from age 1 month to 6 years in the areas of global motor function, language, fine-motor adaptation and social contact.

The Denver Developmental Screening Test (DDST) II is administered to children between birth and six years of age. It can screen children who are apparently normal for possible problems and monitor children who have high risk because of past history such as perinatal difficulties. It is not an IQ test nor will it predict what the level of the child's future intelligence and ability will be. Do not use the Denver II for diagnosis. The Denver II tests the child on twenty simple tasks and on 4 different domains. Personal - social measures the child's ability to get along with people and to take care of himself / herself. Fine Motor Adaptive test identifies the child's ability to see and to use his hands to pick up objects and to draw. Language tests determine the child's ability to hear, follow direction and to speak. Gross Motor identifies the child's ability to sit, walk and jump.

Further Reading:

Denver II Training Manual, Second Edition Revised 1992

### Bayley Scales of Infant Development

This test evaluates cognition, language, social behaviour and motor functions in children from 1 to 42 months old. The purpose of the Bayley Scales of Infant Development is to diagnose developmental delay. The test takes approximately 45 minutes. The examiner gives a series of stimuli to which the child responds. The Mental Scales assess memory, learning, problem-solving ability, and verbal communication skills. The Motor Scales evaluate sitting and standing, gross motor skills and fine motor skills. The Infant Behavior Record (IBR) assesses the child's social and emotional development through a standardized description of his or her behaviour during the testing session. Scores are measured against norms for each of the 14 different age groups. The Bayley scales determine whether a child is developing normally and provide for early diagnosis and intervention in cases of developmental delay.

#### The Modified Ashworth scale

|   |  |
|---|--|
| 0 | No increase in muscle tone   |
| 1 | Slight increase in tone with a catch and release or minimal resistance at end of range |
| 2 | As 1 but with minimal resistance through range following catch                         |
| 3 | More marked increase tone through ROM  |
| 4 | Considerable increase in tone, passive movement difficult.                             |
| 5 | Affected part rigid  |

#### Tardieu Scale

##### Velocity of stretch

|    |  |
|----|--|
| V1 | As slow as possible (slower than the rate of the natural drop of the limb segment under gravity) |
| V2 | Speed of the limb segment falling under gravity  |
| V3 | As fast as possible (faster than the rate of the natural drop of the limb segment under gravity) |

#### Grading Tardieu scale

##### Quality of muscle reaction (X)

|   |  |
|---|--|
| 0 | No resistance throughout the course of the passive movement  |
| 1 | Slight resistance throughout the course of the passive movement  |
| 2 | Clear catch at precise angle, interrupting the passive movement, followed by release                               |
| 3 | Fatiguable clonus (less than 10 s when maintaining the pressure) occurring at a precise angle, followed by release |
| 4 | Unfatiguable clonus (less than 10 s when maintaining the pressure) occurring at a precise angle                    |

*Angle of muscle action (V) measured relative to the position of minimal stretch of the muscle (corresponding to angle zero) for all joints except hip where it is relative to the resting anatomical position*

## Gross Motor Function Classification System for Cerebral Palsy (GMFCS)

The Gross Motor Function Classification System for cerebral palsy is based on self-initiated movement with particular emphasis on sitting (truncal control) and walking. The GMFCS was developed by Robert Palisano, Peter Rosenbaum, Stephen Walter, Dianne Russell, Ellen Wood, Barbara Galuppi in the year 1997 at the CanChild Centre for Childhood Disability Research. The focus is on determining which level best represents the child's present abilities and limitations in motor function. Emphasis is on the child's usual performance in home, school, and community settings. It is therefore important to classify on ordinary performance (not best capacity), and not to include judgments about prognosis. Remember the purpose is to classify a child's present gross motor function, not to judge quality of movement or potential for improvement.

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### Gross Motor Function Classification System for Cerebral Palsy (GMFCS)

#### Before 2nd birthday

|                  |  |
|------------------|--|
| <i>Level I</i>   | Infants move in and out of sitting and floor sit with both hands free to manipulate objects. Infants crawl on hands and knees, pull to stand and take steps holding on to furniture. Infants walk between 18 months and 2 years of age without the need for any assistive mobility device. |
| <i>Level II</i>  | Infants maintain floor sitting but may need to use their hands for support to maintain balance. Infants creep on their stomach or crawl on hands and knees. Infants may pull to stand and take steps holding on to furniture.  |
| <i>Level III</i> | Infants maintain floor sitting when the low back is supported. Infants roll and creep forward on their stomachs.   |
| <i>Level IV</i>  | Infants have head control but trunk support is required for floor sitting. Infants can roll to supine and may roll to prone.   |
| <i>Level V</i>   | 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.   |

#### Between 2nd and 4th birthday

|                  |  |
|------------------|--|
| <i>Level I</i>   | Children floor sit with both hands free to manipulate objects. Movements in and out of floor sitting and standing are performed without adult assistance. Children walk as the preferred method of mobility without the need for any assistive mobility device.  |
| <i>Level II</i>  | 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.   |
| <i>Level III</i> | 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 an assistive mobility device and adult assistance for steering and turning. |
| <i>Level IV</i>  | 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 power wheelchair.                            |
| <i>Level V</i>   | 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 mobility and are transported. Some children achieve self-mobility using a power wheelchair with extensive adaptations.                                    |

#### Between 4th and 6th birthday

|                  |   |
|------------------|---|
| <i>Level I</i>   | Children get into and out of, and sit in, a chair without the need for hand support. Children move from the floor and from chair sitting to standing without the need for objects for support. Children walk indoors and outdoors, and climb stairs. Emerging ability to run and jump.  |
| <i>Level II</i>  | 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 on with their arms. Children walk without the need for any assistive 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.  |
| <i>Level III</i> | Children sit on a regular chair but may require pelvic or trunk support to maximize hand function. Children move in and out of chair sitting using a stable surface to push on or pull up with their arms. Children walk with an assistive mobility device on level surfaces and climb stairs with assistance from an adult. Children frequently are transported when travelling for long distances or outdoors on uneven terrain.  |
| <i>Level IV</i>  | 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 power wheelchair. |
| <i>Level V</i>   | 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 mobility and are transported. Some children achieve self-mobility using a power wheelchair with extensive adaptations.         |

| Between 6th and 12th birthday |   |
|-------------------------------|---|
| Level I                       | Children walk indoors and outdoors, and climb stairs without limitations. Children perform gross motor skills including running and jumping but speed, balance, and coordination are reduced.   |
| Level II                      | Children walk indoors and outdoors, and climb stairs holding onto a railing but experience limitations walking on uneven surfaces and inclines, and walking in crowds or confined spaces. Children have at best only minimal ability to perform gross motor skills such as running and jumping.   |
| Level III                     | Children walk indoors or outdoors on a level surface with an assistive mobility device. Children may climb stairs holding onto a railing. Depending on upper limb function, children propel a wheelchair manually or are transported when travelling for long distances or outdoors on uneven terrain.  |
| Level IV                      | Children may maintain levels of function achieved before age 6 or rely more on wheeled mobility at home, school, and in the community. Children may achieve self-mobility using a power wheelchair.   |
| Level V                       | 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 mobility and are transported. Some children achieve self-mobility using a power wheelchair with extensive adaptations. |

### The Quality of Upper Extremity Skills Test - QUEST

The QUEST is a measure designed to evaluate movement patterns and hand function in children with cerebral palsy. Validation studies have been conducted with children aged 18 months to 8 years. To evaluate quality of upper extremity function in four domains: dissociated movement, grasp, protective extension, and weight bearing. It evaluates quality of movement in children with cerebral palsy. It is administered within a play context. Items are related to quality of movement, not to chronological age. There are 36 items assessing dissociated movements, grasp, protective extension, and weight bearing. 30 - 45 minutes. Validation studies have been completed with children with cerebral palsy.

DeMatteo, C., Law, M., Russell, D., Pollock, N., Rosenbaum, P., & Walter, S. (1992). QUEST: Quality of Upper Extremity Skills Test. Hamilton, ON: McMaster University, Neurodevelopmental Clinical Research Unit

DeMatteo, C., Law, M., Russell, D., Pollock, N., Rosenbaum, P., & Walter, S. (1993). The reliability and validity of Quality of Upper Extremity Skills Test. *Physical and Occupational Therapy in Pediatrics* 13(2), 1-18.

### Canadian Occupational Performance Measure (COPM)

The Canadian Occupational Performance Measure (COPM) is a measurement tool that assists therapists in using a family-centred approach to service delivery by indicating the family's priorities. It assists therapists in using a client-centred approach to service delivery by indicating the family's priorities. It thus enables therapy to be individualized and targeted to the areas of greatest need and offers an effective system of measuring the outcomes of therapy. This measure is available from the Canadian Association of Occupational Therapists (CAOT). [www.caot.ca](http://www.caot.ca)

### The Pediatric Evaluation of Disability Inventory (PEDI)

The PEDI is developed to measure functional status and functional change in self care activities, mobility activities and social function. Self care consists of feeding, grooming, dressing and toileting, mobility consists of car, chair, tub and toilet transfers, indoor, outdoor walking and stairs; social function consists of comprehension, speech, interactions with friends and in the community. Capability is measured by the identification of functional skills for which the child has demonstrated mastery and competence. Functional performance is measured by the level of caregiver assistance needed to accomplish major functional activities such as eating or outdoor locomotion. A modifications scale provides a measure of environmental modifications and equipment used by the child in routine daily activities.

The PEDI compares the child's scores to an age matched normal group of children, or the child's performance with a total possible score of 100 which corresponds to the maximum score a normal 7 year old can get. It is useful both for the diagnosis of functional delay and also for assessing progress in therapy. The PEDI was designed primarily for children from 6 months of age to 7 years, however, it can also be used for the evaluation of older children if their functional abilities fall below that expected of seven-year-old children without disabilities. Scores are recorded in a booklet which also contains a summary score sheet that can be used to construct a profile of the child's performance across the different domains and scales. A software program for data entry, scoring, and generation of individual summary profiles is also available for IBM-compatible computers.

The PEDI can be administered by clinicians and familiar with the child, or by interview of the parent. The amount of time required for the parent interview is about 45 minutes. Administration guidelines, criteria for scoring each item, and examples are given in the manual. The manual also contains information on instrument development and validation, including normative information as well as data from several clinical samples.

The PEDI can be ordered from: Center for Rehabilitation Effectiveness, Sargent College of Health and Rehabilitation Sciences, Boston University, Boston, MA 02215 Phone: 617-358-0175 Fax: 617-388-1355 email: [pandres@bu.edu](mailto:pandres@bu.edu) website: [www.bu.edu/cre/pedi](http://www.bu.edu/cre/pedi)

## GROSS MOTOR FUNCTION MEASURE (GMFM) SCORE SHEET (GMFM-88 and GMFM-66 scoring)

Version 1.0

Child's Name: \_\_\_\_\_

ID #: \_\_\_\_\_

Assessment date: \_\_\_\_\_  
year / month / dayGMFCS Level:       
I II III IV VDate of birth: \_\_\_\_\_  
year / month / dayChronological age: \_\_\_\_\_  
month / day

Testing conditions (eg. room, clothing, time, others present):

Evaluator's Name:

The GMFM is a standardized observational instrument designed and validated to measure change in gross motor function over time in children with cerebral palsy. The scoring key is meant to be a general guideline. However, most of the items have specific descriptors for each score. It is imperative that the guidelines contained in the manual be used for scoring each item.

**SCORING KEY** 0= does not initiate  
1= initiates  
2= partially completes  
3= completes  
NT= Not tested [used for the GAME scoring]

*It is now important to differentiate a true score of "0" (child does not initiate) from an item which is Not Tested (NT) if you are interested in using the GMFM-66 Ability Estimator Software.*

\* The GMFM-66 Gross Motor Ability Estimator (GMAE) software is available with the GMFM manual (2002). The advantage of the software is the conversion of the ordinal scale into an interval scale. This will allow for a more accurate estimate of the child's ability and provide a measure that is equally responsive to change across the spectrum of ability levels. Items that are used in the calculation of the GMFM-66 score are shaded and identified with an asterisk (\*). The GMFM-66 is only valid for use with children who have CP.

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GMFCS level is a rating of severity of motor function. Definitions are found in Appendix I of the GMFM manual (2002).

Modified from © Mac Keith Press, 2002

Check (✓) the appropriate score: if an item is not tested (NT), circle the item number in the left column.

| Item                     | A: LYING & ROLLING  | SCORE   |
|--------------------------|---|---|
|                          | 1. SUP: HEAD IN MIDLINE: turns head with extremities symmetrical            | 0 <input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> |
| *                        | 2. SUP: brings hands to midline, fingers one with the other                 | 0 <input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> |
|                          | 3. SUP: lifts head 45°  | 0 <input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> |
|                          | 4. SUP: flexes r hip and knee through full range                            | 0 <input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> |
|                          | 5. SUP: flexes l hip and knee through full range                            | 0 <input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> |
| *                        | 6. SUP: reaches out with r arm, hand crosses midline toward toy             | 0 <input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> |
| *                        | 7. SUP: reaches out with l arm, hand crosses midline toward toy             | 0 <input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> |
|                          | 8. SUP: rolls to pr over r side   | 0 <input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> |
|                          | 9. SUP: rolls to pr over l side   | 0 <input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> |
| *                        | 10. PR: lifts head up right   | 0 <input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> |
|                          | 11. PR ON FOREARMS: lifts head upright, elbows ext, chest raised            | 0 <input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> |
|                          | 12. PR ON FOREARMS: weight on r forearm, fully extends opposite arm forward | 0 <input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> |
|                          | 13. PR ON FOREARMS: weight on l forearm, fully extends opposite arm forward | 0 <input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> |
|                          | 14. PR: rolls to sup over r side  | 0 <input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> |
|                          | 15. PR: rolls to sup over l side  | 0 <input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> |
|                          | 16. PR: pivots to r 90° using extremities                                   | 0 <input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> |
|                          | 17. PR: pivots to l 90° using extremities                                   | 0 <input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> |
| <b>TOTAL DIMENSION A</b> |   |   |

Check (✓) the appropriate score: if an item is not tested (NT), circle the item number in the left column.

| Item B: SITTING   | SCORE   |
|---|---|
| *18. SUP: HANDS GRASPED BY EXAMINER: pulls self to sitting with head control                        | _____ 0 <input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> |
| 19. SUP: rolls to r side, attains sitting   | 0 <input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/>       |
| 20. SUP: rolls to l side, attains sitting   | 0 <input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/>       |
| *21. SIT ON MAT, SUPPORTED AT THORAX BY THERAPIST: lifts head upright, maintain 3 seconds           | 0 <input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/>       |
| *22. SIT ON MAT, SUPPORTED AT THORAX BY THERAPIST: lifts head midline, maintains 10 seconds         | 0 <input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/>       |
| *23. SIT ON MAT, ARM(S) PROPPING: maintains 5 seconds   | 0 <input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/>       |
| *24. SIT ON MAT: maintains, arms free, 3 seconds  | 0 <input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/>       |
| *25. SIT ON MAT WITH SMALL TOY IN FRONT: leans forward, touches toy, re-erects without arm propping | 0 <input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/>       |
| *26. SIT ON MAT: touches toy placed 45° behind child's r side, returns to start                     | 0 <input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/>       |
| *27. SIT ON MAT: touches toy placed 45° behind child's l side, returns to start                     | 0 <input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/>       |
| 28. R SIDE SIT: maintains, arms free, 5 seconds   | 0 <input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/>       |
| 29. L SIDE SIT: maintains, arms free, 5 seconds   | 0 <input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/>       |
| *30. SIT ON MAT: lowers to pr with control  | 0 <input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/>       |
| *31. SIT ON MAT WITH FEET IN FRONT: attains 4 points over r side                                    | 0 <input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/>       |
| *32. SIT ON MAT WITH FEET IN FRONT: attains 4 point over l side                                     | 0 <input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/>       |
| 33. SIT ON MAT: pivots 90°, without arms assisting  | 0 <input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/>       |
| *34. SIT ON BENCH: maintains, arms and free, 10 seconds   | 0 <input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/>       |
| *35. STD: attains sit on small bench  | 0 <input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/>       |
| *36. ON THE FLOOR: Attains sit on small bench   | 0 <input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/>       |
| *37. ON THE FLOOR: attains sit on large bench   | 0 <input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/>       |

**TOTAL DIMENSION B**

Check (✓) the appropriate score: if an item is not tested (NT), circle the item number in the left column.

| Item C: CRAWLING & KNEELING  | SCORE   |
|--|---|
| 38. PR: creeps forward 1.8 M (6')  | 0 <input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> |
| *39. 4 POINT: maintains, weight on hands and knees, 10 seconds                     | 0 <input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> |
| *40. 4 POINT: attains sit arms free  | 0 <input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> |
| *41. PR: attains 4 point, weight on hands and knees                                | 0 <input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> |
| *42. 4 POINT: reaches forward with r arm, hand above shoulder level                | 0 <input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> |
| *43. 4 POINT: reaches forward with l arm, hand above shoulder level                | 0 <input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> |
| *44. 4 POINT: crawls or hitches forward 1.8 M (6')                                 | 0 <input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> |
| *45. 4 POINT: crawls reciprocally forward 1.8 M (6')                               | 0 <input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> |
| *46. 4 POINT: crawls up 4 steps on hands and knees/feet                            | 0 <input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> |
| 47. 4 POINT: crawls backwards down 4 steps on hands and knees/feet                 | 0 <input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> |
| *48. SIT ON MAT: attains high kn using arms, maintains, arms free, 10 seconds      | 0 <input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> |
| 49. HIGH KN: attains half kn on r knee using arms, maintains, arm free, 10 seconds | 0 <input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> |
| 50. HIGH KN: attains half kn on l knee using arms, maintains, arm free, 10 seconds | 0 <input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> |
| *51. HIGH KN: kn walks forward 10 step, arms free                                  | 0 <input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> |
| <b>TOTAL DIMENSION C</b>   |   |

Check (✓) the appropriate score: if an item is not tested (NT), circle the item number in the left column.

| Item D: STANDING   | SCORE   |
|--|---|
| *52. ON THE FLOOR: pulls to std at large bench                             | 0 <input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> |
| *53. STD: maintains, arm free, 3 seconds                                   | 0 <input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> |
| *54. STD: holding on to large bench with one hand, lifts r foot, 3 seconds | 0 <input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> |
| *55. STD: holding on to large bench with one hand, lifts l foot, 3 seconds | 0 <input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> |
| *56. STD: maintains, arms free, 20 seconds                                 | 0 <input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> |
| *57. STD: lifts l foot, arms free, 10 seconds                              | 0 <input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> |
| *58. STD: lifts r foot, arms free, 10 seconds                              | 0 <input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> |
| *59. SIT ON SMALL BENCH: attains std without using arms                    | 0 <input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> |
| *60. HIGH KN: attains std trough half kn on r knee,without using arms      | 0 <input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> |
| *61. HIGH KN: attains std trough half kn on l knee,without using arms      | 0 <input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> |
| *62. STD: lowers to sit on floor with control, arms free                   | 0 <input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> |
| *63. STD: attains squat, arms free   | 0 <input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> |
| *64. STD: picks up object from floor, arms free, returns to stand          | 0 <input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> |
| <b>TOTAL DIMENSION D</b>   | <input style="width: 150px; height: 20px;" type="text"/>  |

Check (✓) the appropriate score: if an item is not tested (NT), circle the item number in the right column

| Item | E: WALKING, RUNNING & JUMPING   | SCORE   |
|------|---|---|
| *65. | STD, 2 HANDS ON LARGE BENCH: cruises 5 steps to r                               | 0 <input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> |
| *66. | STD, 2 HANDS ON LARGE BENCH: cruises 5 steps to l                               | 0 <input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> |
| *67. | STD, 2 HANDS HELD: walks forward 10 steps                                       | 0 <input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> |
| *68. | STD, 1 HANDS HELD: walks forward 10 steps                                       | 0 <input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> |
| *69. | STD: walks forward 10 steps   | 0 <input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> |
| *70. | STD: walks forward 10 steps, stops, turns 180°, returns                         | 0 <input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> |
| *71. | STD: walks forward 10 steps   | 0 <input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> |
| *72. | STD: walks forward 10 steps, carrying a large object with 2 hands               | 0 <input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> |
| *73. | STD: walks forward 10 consecutive steps between parallel lines 20 cm (8") apart | 0 <input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> |
| *74. | STD: walks forward 10 consecutive steps on a straight line 2 cm (3/4") wide     | 0 <input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> |
| *75. | STD: steps over stick at knee level, r foot leading                             | 0 <input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> |
| *76. | STD: steps over stick at knee level, l foot leading                             | 0 <input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> |
| *77. | STD: runs 4.5 M (15'), stops & returns  | 0 <input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> |
| *78. | STD: kicks ball with r foot   | 0 <input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> |
| *79. | STD: kicks ball with l foot   | 0 <input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> |
| *80. | STD: jumps 30 cm (12") high, both feet simultaneously                           | 0 <input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> |
| *81. | STD: jumps forward 30 cm (12"), both feet simultaneously                        | 0 <input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> |
| *82. | STD ON R FOOT: hops on r foot 10 times within a 60 cm (24") circle              | 0 <input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> |
| *83. | STD ON L FOOT: hops on l foot 10 times within a 60 cm (24") circle              | 0 <input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> |
| *84. | STD, HOLDING 1 RAIL: walks up 4 steps, holding 1 rail, alternating feet         | 0 <input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> |
| *85. | STD, HOLDING 1 RAIL: walks down 4 steps, holding 1 rail, alternating feet       | 0 <input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> |
| *86. | STD: walks up 4 steps, alternating feet   | 0 <input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> |
| *87. | STD: walks down 4 steps, alternating feet                                       | 0 <input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> |
| *88. | STD ON 15 cm (6") STEP: jumps off, both feet simultaneously                     | 0 <input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> |

**TOTAL DIMENSION E**

Was this assessment indicative of this child's "regular" performance?

YES

NO

COMMENTS:

## GMFM RAW SUMMARY SCORE

| DIMENSION                     | CALCULATION OF DIMENSION % SCORES  | GOAL AREA                  |
|-------------------------------|--|----------------------------|
| A. Lying & Rolling            | $\frac{\text{Total Dimension A}}{51} = \frac{\quad}{51} \times 100 = \quad \%$ | A <input type="checkbox"/> |
| B. Sitting                    | $\frac{\text{Total Dimension B}}{60} = \frac{\quad}{60} \times 100 = \quad \%$ | B <input type="checkbox"/> |
| C. Crawling & Kneeling        | $\frac{\text{Total Dimension C}}{42} = \frac{\quad}{42} \times 100 = \quad \%$ | C <input type="checkbox"/> |
| D. Standing                   | $\frac{\text{Total Dimension D}}{39} = \frac{\quad}{39} \times 100 = \quad \%$ | D <input type="checkbox"/> |
| E. Walking, Running & Jumping | $\frac{\text{Total Dimension E}}{72} = \frac{\quad}{72} \times 100 = \quad \%$ | E <input type="checkbox"/> |

$$TOTAL SCORE = \frac{\%A + \%B + \%C + \%D + \%E}{\text{Total \# of Dimensions}}$$

$$= \frac{\quad + \quad + \quad + \quad + \quad}{5} = \frac{\quad}{5} = \quad \%$$

$$GOAL TOTAL SCORE = \frac{\text{Sum of \% scores for each dimension identified as a goal area}}{\text{\# of Goal areas}}$$

$$= \frac{\quad}{\quad} = \quad \%$$

GMFM-66 Gross Motor Ability Estimator Score <sup>1</sup>

GMFM-66 Score = \_\_\_\_\_ to \_\_\_\_\_  
95% Confidence Intervals

previous GMFM-66 Score = \_\_\_\_\_ to \_\_\_\_\_  
95% Confidence Intervals

change in GMFM-66 = \_\_\_\_\_

<sup>1</sup> from the Gross Motor Ability Estimator (GMAE) Software

**TESTING WITH AIDS/ORTHOSES**

Indicate below with a check (✓) which aid/orthosis was used and what dimension it was first applied. (There may be more than one).

| <b>AID</b>       | <b>DIMENSION</b>                                   | <b>ORTHOSES</b>    | <b>DIMENSION</b>               |
|------------------|--|--------------------|--------------------------------|
| Rollator/Pusher  | <input type="checkbox"/> _____                     | Hip Control        | <input type="checkbox"/> _____ |
| Walker           | <input type="checkbox"/> _____                     | Knee Control       | <input type="checkbox"/> _____ |
| H Frame Crutches | <input type="checkbox"/> _____                     | Ankle-Foot Control | <input type="checkbox"/> _____ |
| Crutches         | <input type="checkbox"/> _____                     | Foot Control       | <input type="checkbox"/> _____ |
| Quad Cane        | <input type="checkbox"/> _____                     | Shoes              | <input type="checkbox"/> _____ |
| Cane             | <input type="checkbox"/> _____                     | None               | <input type="checkbox"/> _____ |
| None             | <input type="checkbox"/> _____                     | Other              | <input type="checkbox"/> _____ |
| Other            | <input type="checkbox"/> _____<br>(please specify) |                    | (please specify)               |

**RAW SUMMARY SCORE USING AIDS/ORTHOSES**

| <b>DIMENSION</b>              | <b>CALCULATION OF DIMENSION % SCORES</b> |    |                |   | <b>GOAL AREA</b> |
|-------------------------------|--|----|----------------|---|------------------|
| F. Lying & Rolling            | $\frac{\text{Total Dimension A}}{51} =$  | 51 | $\times 100 =$ | % | A                |
| G. Sitting                    | $\frac{\text{Total Dimension B}}{60} =$  | 60 | $\times 100 =$ | % | B                |
| H. Crawling & Kneeling        | $\frac{\text{Total Dimension C}}{42} =$  | 42 | $\times 100 =$ | % | C                |
| I. Standing                   | $\frac{\text{Total Dimension D}}{39} =$  | 39 | $\times 100 =$ | % | D                |
| J. Walking, Running & Jumping | $\frac{\text{Total Dimension E}}{72} =$  | 72 | $\times 100 =$ | % | E                |

**TOTAL SCORE =**  $\frac{\%A + \%B + \%C + \%D + \%E}{\text{Total \# of Dimensions}}$

=  $\frac{\quad + \quad + \quad + \quad + \quad}{5} = \frac{\quad}{5} = \quad\%$

**GOAL TOTAL SCORE =**  $\frac{\text{Sum of \% scores for each dimension identified as a goal area}}{\text{\# of Goal areas}}$

=  $\frac{\quad}{\quad} = \quad\%$

**GMFM-66 Gross Motor Ability Estimator Score <sup>1</sup>**

GMFM-66 Score = \_\_\_\_\_ to \_\_\_\_\_  
 95% Confidence Intervals

previous GMFM-66 Score = \_\_\_\_\_ to \_\_\_\_\_  
 95% Confidence Intervals

change in GMFM-66 = \_\_\_\_\_

<sup>1</sup> from the Gross Motor Ability Estimator (GMAE) Software

**WEE Functional Independence Measure (WeeFIM) ®**

The WeeFIM is an adaptation of the Functional Independence Measure for adults. It was developed to measure the need for assistance and the severity of disability in children between the ages of 6 months and 7 years. It may be used with children above the age of 7 years as long as their functional abilities are below those expected of children aged 7 who do not have disabilities. It measures level of independence in self-care, sphincter control, mobility, locomotion, communication and social function. It is a data set of 18 items that measure functional performance in 3 domains:

| <b>The WeeFIM</b>    |                             |                    |
|----------------------|-----------------------------|--------------------|
| <i>Self-Care</i>     | <i>Mobility</i>             | <i>Cognitive</i>   |
| Eating               | Transfers: Chair/Wheelchair | Comprehension      |
| Grooming             | Transfers: Toilet           | Expression         |
| Bathing              | Transfers: Tub/Shower       | Social Interaction |
| Dressing: Upper Body | Locomotion: Walk/Wheelchair | Problem Solving    |
| Dressing: Lower Body | Stairs                      | Memory             |
| Toileting            |                             |                    |
| Bladder Management   |                             |                    |
| Bowel Management     |                             |                    |

## Web Resources

### [www.aacpdm.org](http://www.aacpdm.org)

This organization is a multidisciplinary scientific society devoted to the study of cerebral palsy and other childhood onset disabilities, to promoting professional education for the treatment and management of these conditions, and to improving the quality of life for people with these disabilities.

### [www.ucpa.org](http://www.ucpa.org)

This organization tries to ensure the inclusion of persons with disabilities in every facet of society. The UCP's mission is to advance the independence, productivity and full citizenship of people with cerebral palsy and other disabilities, through commitment to the principles of independence, inclusion and self-determination.

### [www.wemove.org](http://www.wemove.org)

This website is a comprehensive resource for movement disorder information and movement disorder activities on the web.

### [www.mdvu.org](http://www.mdvu.org)

The Movement Disorder Virtual University is the healthcare professional's source for movement disorder news, resources and educational activities. Explore the MDVU virtual campus to find the latest information on emerging clinical advances and therapeutic approaches, interactive learning modules (with CME credit), case studies, practice tools, teaching materials and opportunities for peer interaction.

### [www.nlm.nih.gov/medlineplus/cerebralpalsy.html](http://www.nlm.nih.gov/medlineplus/cerebralpalsy.html)

The MedlinePlus is a source of good health information from the world's largest medical library, the National Library of Medicine. Health professionals and consumers alike can find information that is authoritative and up to date.

### [www.fhs.mcmaster.ca/canchild/](http://www.fhs.mcmaster.ca/canchild/)

CanChild is a centre for childhood disability research that seeks to maximize the life quality of children and youth with disabilities and their families.

### [www.ninds.nih.gov/health\\_and\\_medical/disorders/cerebral\\_palsy.htm](http://www.ninds.nih.gov/health_and_medical/disorders/cerebral_palsy.htm)

National Institute of Neurological Disorders and Stroke is dedicated to support biomedical research on disorders of the brain and nervous system. The website provides information about cerebral palsy and the latest research being done on the subject.

### [www.hemikids.org](http://www.hemikids.org)

The Children's Hemiplegia and Stroke Association is a non-profit organization, offering support and information to families of infants, children, and young adults who have hemiplegic cerebral palsy.

### [www.gait.aidi.udel.edu/res695/homepage/pd\\_ortho/clinics/c\\_palsy/cpweb.htm](http://www.gait.aidi.udel.edu/res695/homepage/pd_ortho/clinics/c_palsy/cpweb.htm)

This is part of the website of the DuPont Hospital for Children at the the Alfred I. DuPont Institute. The cerebral palsy program gives information to parents and the public about cerebral palsy.

### [www.scope.org.uk](http://www.scope.org.uk)

The Scope is a disability organisation in England and Wales whose focus is people with cerebral palsy. Its aim is that disabled people achieve equality in a society in which they are as valued and have the same human and civil rights as everyone else.

### [www.pediatricapta.org/index.cfm](http://www.pediatricapta.org/index.cfm)

This website is the pediatrics section of the American Association of Physical Therapists. It contains comprehensive information on pediatric physical therapy.

### [www.kidsource.com/NICHCY/cerebral\\_palsy.html](http://www.kidsource.com/NICHCY/cerebral_palsy.html)

This is part of the website of National Information Center for Children and Youth with Disabilities (NICHY) It contains general information about cerebral palsy.

### [www.bobath.co.uk](http://www.bobath.co.uk)

The Bobath Center's website provides information on CP as well as the Bobath method of treatment.

### [www.neuro-www.mgh.harvard.edu/neurowebforum/CerebralPalsyMenu.html](http://www.neuro-www.mgh.harvard.edu/neurowebforum/CerebralPalsyMenu.html)

This site provides articles on CP.

### [www.modimes.org/professionals/681\\_1208.asp](http://www.modimes.org/professionals/681_1208.asp)

The March of Dimes is a foundation to help children with birth defects. This website provides information on CP.

### [www.nlm.nih.gov/medlineplus/tutorials/cerebralpalsy/nr209101.html](http://www.nlm.nih.gov/medlineplus/tutorials/cerebralpalsy/nr209101.html)

A multimedia patient education program that describes CP and its treatment options.

### [www.groups.yahoo.com/group/KidPower](http://www.groups.yahoo.com/group/KidPower)

A support and information list for families whose children are mildly affected by cerebral palsy and/or other disabilities. Therapists, doctors, caretakers or parents of a special needs child are welcome.

### [home.nordnet.fr/~hlagache/vojcong.html](http://home.nordnet.fr/~hlagache/vojcong.html)

This website is a detailed description of Vojta method of therapy.

### [www.vojta.com/cgi-local/ivg\\_eng.cgi](http://www.vojta.com/cgi-local/ivg_eng.cgi)

This is the official site of Vojta method of therapy

### [www.conductive-education.org.uk](http://www.conductive-education.org.uk)

This site provides extensive information on conductive education.

### <http://www.udsmr.org/>

This site provides information about the Wee functional independence measure.

## Non-English Sites

### [www.turkortopedi.net/serebralpalsi.htm](http://www.turkortopedi.net/serebralpalsi.htm)

This Turkish website provides information, multimedia presentations and advice for families about CP.

### [www.appc.pt](http://www.appc.pt)

Portuguese

Associação Portuguesa de Paralisia Cerebral — Portugal

### [www.defnet.org.br](http://www.defnet.org.br)

DefNet: Centro de Informatica e Informacoes sobre Paralisias Cerebrais — Brazil

