What Is Cerebral Palsy?
What Causes Cerebral Palsy?

Cerebral palsy is a term which encompasses a set of neurological conditions that cause physical disability in human development - they affect the brain and nervous system. The word *cerebral* refers to the area in the brain that is affected, while *palsy* means complete or partial muscle paralysis, frequently accompanied by loss of sensation and uncontrollable body movements or tremors. Cerebral means related to the brain or cerebrum. *Cerebrum* is a Latin word meaning "brain; top of the head, skull". In the English language the cerebrum is the anterior (front) portion of the brain consisting of two hemispheres; it is the dominant part of the brain in humans.

What are the signs and symptoms of cerebral palsy?

A person with cerebral palsy will generally show symptoms during the first three years of life. A child/baby with cerebral palsy may have some of the signs and symptoms below:

- Achieves developmental milestones, such as crawling, walking, or speaking, later than his/her peers.
- Crawls in an unusual way.
- Has abnormal muscle tone - the child will slouch while sitting. Muscle tone refers to a person's automatic ability to tighten and relax muscle when required.
- Has difficulty feeding and sucking.
- Lies down in awkward positions.
- Can be easily startled.
- Favors one side of the body over the other.
- Has overdeveloped or underdeveloped muscles (has floppy or stiff movements).
- Has bad coordination and balance (ataxia).
- Has involuntary, slow writing movements (athetosis).
- Muscles are stiff and contract abnormally (spastic paralysis).
- Has hearing problems.
- Has problems with eyesight.
- Has bladder control problems.
- Has bowel movement control problems.
- Has seizures.
- Has problems swallowing.
- Range of movements are limited.

There are several types of cerebral palsy

Spastic cerebral palsy

- **Spastic hemiplegeia**

  A child with spastic hemiplegeia will typically have spasticity (muscle stiffness) on one side of the body - usually just a hand and arm, but may also involve a leg. The side that is affected may not develop properly. The child may have speech problems. In the majority of cases intelligence is not affected. Some children will have seizures.

- **Spastic diplegia**

  The lower limbs are affected, and there is no or little upper body spasticity. The child's leg and hip muscles are tight. Legs cross at the knees, making walking more difficult. The crossing of the legs when the child is upright is often referred to as scissoring.

- **Spastic quadriplegia**

  The child's legs, arms, and body are affected. This is the severest from of spastic cerebral palsy. Children with this kind of cerebral palsy are more likely to have mental retardation. Walking and talking will be difficult. Some children have seizures.

Ataxic cerebral palsy

The child's balance and depth perception are affected. Depth perception refers to a person's ability to judge where objects are in relation to where he/she is. It is the least diagnosed type of cerebral palsy. The child will find it difficult to tie his/her shoelaces, button up shirts, cut with scissors, and other fine motor skills. Because of balance difficulties, the child may walk with the feet far apart. There may be *intention tremors* - a shaking that starts with a voluntary movement, such as reaching out for a toy, the closer he/she gets to the toy the worse the tremors become. Most children with ataxic cerebral palsy are of normal intelligence and have good communication skills. Some may have erratic speech.

Athetoid or dyskinetic (or athetoid dyskinetic) cerebral palsy

This is the second most common type of cerebral palsy. Intelligence will nearly always be normal, but the whole body will be affected by muscle problems. Muscle tone is weak or tight - causing random and uncontrolled body movements. The child will have problems walking, sitting, maintaining posture, and speaking clearly (tongue and vocal cords are hard to control). Some children drool if they have problems controlling facial muscles.

Hypotonic cerebral palsy

Muscle problems will appear much earlier. The baby's head is floppy, and he/she cannot control the head when sitting up. Some parents have described their child's movements as similar to that of a rag doll. The baby gives only a moderate amount of resistance when an adult tries to move their limbs. The baby may rest with his/her elbows and knees loosely extended, compared to other infants whose elbows/knees will be flexed. Some babies may have breathing difficulties. Injury to the cerebellum can result in this type of cerebral palsy.

What causes cerebral palsy?

The control of muscles takes place in the cerebrum. Cerebral palsy may appear to be a muscle condition, but it is, in fact, caused by damage to the cerebrum. The cerebrum is also responsible for our memory, ability to learn, and communication skills - that is why some people with cerebral palsy have problems with communication and learning. Cerebrum damage can sometimes affect vision and hearing.

Some babies are deprived of oxygen during labor and delivery (birth). Because of this, doctors used to think that asphyxia (oxygen deprivation) during birth was the cause of the brain damage. However, scientists discovered during the 1980s that less than one tenth of cerebral palsy cases were caused by oxygen deprivation during birth. Most cases of damage to the brain among cerebral palsy children occurred before they were born - more specifically, during the first six months of pregnancy. Experts believe the brain damage happened because of three possible reasons:

Periventricular leukomalacia (PVL)

This refers to the damage of the brain's white matter. Experts believe that lack of oxygen may have caused destruction of the unborn baby's brain cells. PVL may have been caused by the pregnant mother catching an infection, such as rubella (German measles), having very low blood pressure, giving birth too early (premature birth), or consuming an illegal drug during the pregnancy.

Abnormal development of the brain

If the development of the brain is altered, the way it communicates with the body's muscles can be affected, as can other functions. Experts say that any abnormality in brain development has the potential to cause cerebral palsy. During the first six months of pregnancy the embryo/fetus is particularly vulnerable to abnormal brain development. This can be caused by mutations in the genes responsible for brain development, some infections, such as toxoplasmosis (parasite infection), herpes and herpes-like viruses, and trauma to the unborn baby's head.

Intracranial hemorrhage

This refers to bleeding inside the brain caused by the unborn baby having a stroke. Bleeding in the brain can stop the supply of blood to vital brain tissue, which consequently becomes damaged or dies. The escaped blood itself can clot and damage surrounding tissue. Several factors can cause a stroke in a baby during pregnancy and during the birth:

- A blood clot in the placenta that blocked the flow of blood
- The baby had a clotting disorder
- There were interruptions in arterial blood flow to the baby's brain
- The mother had pre-eclampsia that was not treated
- An emergency cesarean had to be performed
- The second stage of labor was prolonged
- A vacuum extraction was used during delivery
- The baby had heart anomalies
- There was inflammation of the placenta
- There were umbilical cord abnormalities
- The mother had a pelvic inflammatory infection

Experts say that anything which tends to cause either a premature birth or a low-weight baby who is not developed enough to cope with the stresses of life outside the womb will raise the risk of cerebral palsy. These factors may also contribute to a higher risk of cerebral palsy:

- Multiple births
- Damaged placenta
- STDs (sexually transmitted diseases)
- Consumption of alcohol by the pregnant mother
- Consumption of illegal drugs by the pregnant mother
- Exposure to other toxic substances by the pregnant mother
- The pregnant mother did not eat properly
- Random malformation of the baby's brain
- Small pelvic structure of the mother
- Breech delivery

Brain damage after birth

A small proportion of cerebral palsy cases happen because of damage after birth. This could have happened because of an infection, such as meningitis, a head injury, a drowning accident, or poisoning. When damage does happen, it will do so soon after the birth. Later on in life the human brain is much more resilient and can withstand far more damage.

Diagnosis of cerebral palsy

Any parent who is concerned about the development of their child should see their GP (general practitioner, primary care physician) or a pediatrician. In the UK the first person to see would be a GP, in other countries you may be able to go straight to a pediatrician. The doctor will ask the parents about the baby's history and development characteristics. The mother's medical history during her pregnancy will also be examined.

The doctor will examine the child, observing posture, movements, muscle tone, motor skills, and checking the child's reflexes. If the child is a bit older than a baby the doctor may refer the child to an educational psychologist in order to asses his/her intellectual development.

Ruling out other conditions

Other conditions may have similar symptoms and need to be ruled out, such as a tumor or muscular dystrophy. The following tests will help the doctors carry out their diagnosis:

- Blood tests
- Cranial ultrasound - an ultrasound scan can help doctors see an image of the child's brain tissue
- MRI (magnetic resonance image) scan - this uses nuclear magnetic resonance of protons to produce proton density images
- CT (computed tomography) scan - a series of X-rays are compiled by the computer to create a 3-D image of the baby's brain

When a child is two to three years old a more comprehensive diagnosis of cerebral palsy can usually be made. However, its severity is not usually fully assessed until the child is about four or five years old.

A diagnosis of cerebral palsy requires regular assessments of the child. The assessments are used to make comparisons and determine what the developmental needs and issues are. A comprehensive and confident diagnosis is possible after time has been taken to carefully assess and evaluate various factors several times.

What is the treatment for cerebral palsy?

In the UK and much of Europe and Canada, when a child is diagnosed with cerebral palsy the family will be introduced to a team of health professionals and services who will be involved with looking after the child's needs. They will include the GP, a pediatrician, a health visitor, a social worker, a physical therapist (physiotherapist), a speech and language therapist, an occupational therapist, an incontinence advisor, and an educational psychologist. In Western Europe and Canada all the professionals, services, equipment and treatments will be offered at no cost to the family. A care plan will be individually drawn up which addresses the needs

and/or problems of the child and the family. As the child gets older the plan will be reviewed. In the UK a Keyworker is assigned to the child - this Keyworker is the first point of contact between the child/parents and the support services. At first the Keyworker most likely will be a Health Visitor, later on when the child is older and his/her needs change the Keyworker will be a Social Worker.

Cerebral palsy treatment depends entirely on the needs of the person. The aim is to help the child achieve as much independence as possible throughout his/her life.

Can cerebral palsy be prevented?

There are some things people can do to minimize the risk. However, in many cases cerebral palsy cannot be prevented. The pregnant mother should:

- Make sure all her vaccinations are up-to-date
- Go to all her antenatal appointments
- Abstain from drinking alcohol throughout the whole pregnancy
- Abstain from smoking throughout the whole pregnancy
- Take regular exercise throughout the whole pregnancy (check with the doctor what you can do)
- Eat a healthy diet throughout the whole pregnancy
- Identify potential Rh incompatibility (usually for second and subsequent pregnancies)

Contact:

PEBBLES REHAB CENTER
#8/4, State Bank Officers Colony, 1st Street, Arumbakkam, Chennai - 600106.
Phone No: 044-23630667 / 23630668 / 32975552.

BRANCH:
#3, Nallappa Street, Nehru Nagar, Chrompet, Chennai - 600044.
Phone No: 044-22234872 / 9841973948.