Introduction
Cerebral palsy is a condition that affects thousands of babies and children each year. It is not contagious, which means no one can catch it from anyone who has it.

The word cerebral means having to do with the brain. The word palsy means a weakness or problem in the way a person moves or positions his or her body. A kid with Cerebral palsy (CP) has trouble controlling the muscles of the body (hallmark of the condition is motor dysfunction, i.e. there is abnormal muscle tone, abnormal posture and movement). Normally, the brain tells the rest of the body exactly what to do and when to do it. But because CP affects the brain, depending on what part of the brain is affected, a kid might not be able to walk, talk, eat or play the way most kids do.

It is a non-progressive but often changing motor impairment syndromes. It is usually secondary to an insult of limited duration or anomalies of the brain arising in the early stages of development (Viz. prenatal, intranatal, neonatal and post natal up to 5 years). The changing clinical picture results from developmental maturation and intervention. The clinical expression of the case depends on the extend and area of brain damage, growth of the child, coexisting developmental problems.

Signs and symptom
Symptoms of cerebral palsy can be as simple as having difficulty with fine motor tasks like writing or using scissors or as profound as being unable to maintain balance or walk. Severely affected patients may have involuntary movements, such as uncontrollable hand motions and drooling. Others suffer from associated medical disorders, such as seizures, speech problem, hearing problem, language disorder, ocular problem (i.e strabismus, refractory errors, fields defects), feeding difficulties, behavioral problems and mental retardation.

Types of Cerebral palsy (CP)
Cerebral palsy can be classified as:
1. Physiological
   i. Spastic
   ii. Dyskinetic (dystonic and athetoid)
   iii. Hypotonic
   iv. Ataxic
   v. Mixed
2. Topographic
   i. Quadri/tetraplegia
   ii. Hemiplegia
   iii. Diplegia
   iv. Monoplegia
   v. Triplegia

Spastic cerebral palsy (CP)
Spastic cerebral palsy (CP) is the most common type of cerebral palsy. It causes the muscles to be stiff and permanently contracted. Spastic cerebral palsy is often sub classified as one of five types that describe the affected limbs. The names of these types combine a Latin prefix describing the number of affected limbs (e.g. di-means two) with the term plegia or paresis, meaning paralyzed or weak.

- Diplegia: either both arms and both legs.
- Hemiplegia: limbs on only one side of the body.
- Quadriplegia: all four limbs.
- Monoplegia: one limb (extremely rare).
- Triplegia: three limbs (extremely rare).
Spastic diplegia: Spastic diplegia affects the legs more than the arms. The legs often turn in and cross at the knees. This causes a scissors gait, in which the hips are flexed, the knees nearly touch, the feet are flexed and the ankles turn out from the leg, causing toe-walking. Learning disabilities and seizures are less common than in spastic hemiplegia.

Spastic hemiplegia: Persons with spastic hemiplegia (hemiparesis) also may experience hemiparetic tremors— uncontrollable shaking of the limbs on one side of the body. Severe hemiparetic tremors can seriously impair movement. The arm is generally affected more than the leg. Learning disabilities, vision problems, seizures and dysfunction of the muscles of the mouth and tongue are classic symptoms.

Spastic quadriplegia: Spastic quadriplegia involves all four limbs. There is dysfunction of the muscles of the mouth and tongue, seizures, medical complications and increased risk for cognitive difficulties.

Dyskinetic cerebral palsy
Dyskinetic CP is characterized by slow, uncontrolled, writhing movements of the hands, feet, arms or legs (athetosis). Patients also may have abrupt, irregular, jerky movements (chorea), a combination (choreoathetosis) or slow rhythmic movements with muscle tone abnormalities and abnormal postures (dystonia). The muscles of the face and tongue may be affected, causing grimacing and/or drooling. When the muscles that control speech are affected, the patient experiences dysarthria (abnormal pronunciation of speech). Hearing loss is commonly associated with this form of CP.

Hypotonic cerebral palsy
Hypotonic CP characterized by marked motor delay and decreased tone. Often confused as a floppy infant. Preservation or a brisk DTR differentiates it from Lower motor neuron (LMN) cause of floppy infant. Sometimes it appears to be a temporary phase before hypertonia or dystonia eventually develops.

Ataxic cerebral palsy
Ataxic CP affects balance and depth perception. Persons with ataxic CP have poor coordination and walk unsteadily, usually placing their feet far apart. Many have trouble with quick or precise movements, like writing or buttoning a shirt. Some also have intention tremor, in which a voluntary movement, like reaching for an object, sets off trembling in the limb. The tremor becomes more intense as the person nears the target object.

Mixed CP
Mixed CP involves two or more types of cerebral palsy. While any mix of types and subtypes can occur, the most common are athetodic-spastic-diplegic and athetoid-spastic-hemiplegic; the least common is athetoid-ataxic. It is possible to have a mix of all three (spastic-athetoid-ataxic).

A kid with CP can have a mild case or a more severe case—it really depends on how much of the brain is affected and which parts of the body that section of the brain controls. No one knows for sure what causes most cases of cerebral palsy. For some babies, injuries to the brain during pregnancy or soon after birth may cause CP. Children most at risk of developing CP are small, premature babies, low birth weight (less than 5 pounds), delayed crying i.e. more than 5 minutes after, brain hemorrhage, breech deliveries (babies born with their foot or buttock presentation), complication during delivery or new born seizure or any birth defects. Some time the problem in the brain occurs before the baby is born and doctors don’t know why.

Complication
Some people with CP have associated disorders, such as impaired intellectual development, seizures, failure to grow and thrive and vision and sense of touch problems. Roughly a third of patients with CP also have mild intellectual impairment, another third are moderately or severely impaired and the
remainder, intellectually normal. Mental impairment is most common in children with spastic quadriplegia.

As many as half of all patients with cerebral palsy have:

**Seizures:** In seizures uncontrolled bursts of electricity disrupt the brain's normal pattern of electrical activity. Seizures that recur without a direct trigger, such as a fever, are classified as epilepsy. Seizures generally are tonic-clonic or partial.

**Tonic-clonic seizures:** Tonic-clonic seizures spread throughout the brain, typically causing the patient to cry out, followed by unconsciousness, twitching legs and arms, convulsive body movements and loss of bladder control.

**Partial seizures:** Partial seizures are confined to one part of the brain and may be simple or complex. Simple partial seizures cause muscle twitching, chewing movement and numbness or tingling. Complex partial seizures can produce hallucinations, staggering, random movement and impaired consciousness or confusion.

**Failure to grow or thrive:** Children with moderate-to-severe cerebral palsy, especially those with spastic quadriplegia, often experience failure to grow or thrive and infants fail to gain weight normally. Young children may be abnormally short and teenagers may be short for their age and may have slow sexual development. These phenomena may be caused by a combination of poor nutrition and damage to the brain centers that control growth.

**Spastic hemiplegia:** Some patients, particularly those with spastic hemiplegia, have muscles and limbs that are smaller than normal. Limbs on the side of the body affected by CP may grow slower than those on the other side. Hands and feet are most severely affected. The affected foot in cases of hemiplegia usually is the smaller of the two, even in patients who walk, suggesting the size difference is due not to disuse but to a disrupted growth process.

**Vision and hearing problems:** Vision and hearing problems are more common in people with cerebral palsy than in the general population. Differences in the left and right eye muscles often cause the eyes to be misaligned. This condition, called strabismus, causes double vision; in children, however, the brain often adapts by ignoring signals from one eye. Because strabismus can lead to poor vision and impaired depth perception, some physicians recommend corrective surgery.

**Hemianopia:** Patients with hemiparesis may have hemianopia, a condition marked by impaired vision or blindness in half of the visual field in one or both eyes. A related condition, called homonymous hemianopia, causes impairment in the right or left half of the visual fields in both eyes.

**Stereognosis:** Sensations of touch or pain may be impaired. A patient with stereognosis, for example, has difficulty perceiving or identifying the form and nature of an object placed in their hand using the sense of touch alone.

**Diagnosis**
The diagnosis of CP is essentially involves detail history of prenatal, natal and postal history and careful physical and neurodevelopment examination to identify deficit type and topography, which is required for management. Early identification has significant implication for the family and necessitates early intervention to achieve the maximum holistic potential of the child. The philosophy behind early intervention is based on the following facts:

1. A neurological insult recovers better with stimulation.
2. I.Q. Of emotionally deprived children is poorer than stimulated children.
3. The plasticity of the brain in the first decade of life provides a window of opportunity for active intervention.
4. Actually a child with CP is not hopeless. Half of the child with CP have average or above I.Q
5. With timely help and proper guidance a vast majority can lead active, self supporting and long lives.
6. Thus early diagnosis is prerequisite.

**Evaluation**
The diagnosis of CP is essentially clinical. It involves a detail prenatal, natal and postnatal history and careful physical and neurodevelopmental examination to identify deficit type and topography which is required for management.

**Investigation**
Laboratory test are not necessary to confirm diagnosis. Brain imaging studies including USG, CT and MRI may be useful in elucidating the etiology of CP and suggesting prognosis. Vision, auditory screening along with EEG should be done if patient is not improving after adequate physiotherapy.

**Management**
It is multidisciplinary approach.

*Physical therapy:* Through this helps the child walking, sitting and keeping his/her balance. Also to prevent contracture

*Occupational therapy:* Help the child develop fine motor skills such as dressing, feeding, writing and other daily living skills.

*Speech therapy:* To develop communication skill.

*Feeding problem:* Initially start with soft, small frequent feed. Drooling can be minimized by improving swallowing. Drugs are not very effective.

**Educational problem:** Mild CP does well in mainstream schools. Moderate to severe CP need to be educated in special school.

**Communication:** Discourage sign language and encourage speaking.

**Epilepsy:** Should be treated. Many CP children may have subclinical seizure, so EEG is encouraged if the child does not improve. Subclinical seizure is very common, i.e you cannot see the seizure but it is going on inside the brain. And for this CP child is not improving, even you are doing regular physiotherapy.

**Spasticity:** If it does not improve with physiotherapy, then Botulinum Toxin Type an injection can be given, which block release of acetylcholine from presynaptic terminal and blocks signal transmission at neuromuscular junction. It works for 3 - 5 months. Sometimes orthopedic help such as tendon lengthen can be done. Beclophen orally or intrathecal continuous pump can be implanted.

**Conclusion**
So early intervention is the key for improvement of CP, specially the first 2 years is most important. This is the time when brain is growing very fast. In simple word this is the express train. Try to catch it. If you miss it try to catch the local train, which is up to 5 years. Still it is better than something.

**References**
1. www.neurology channel.
2. www.NINDS: Cerebral palsy information page.