

Airway Clearance Indications: Neurological Disorders

Cerebral Palsy

The term cerebral palsy refers to a group of related, non-progressive neurological disorders in infants and very young children. While the causes of cerebral palsy are not completely understood, it is believed that roughly 70% of all cerebral palsy can be attributed to genetic factors or intra-uterine events such as toxic exposure or trauma to the fetus. An additional 20% is believed to be related to incidents occurring during childbirth, including hypoxic (lack of oxygen) injury or head trauma. The final 10% is thought to occur as the result of acquired defects during the first few months or years of life. Infections such as meningitis and encephalitis or traumatic injury to the brain through accident or abuse have been implicated in acquired cerebral palsy. 9,500 infants and young children are diagnosed with cerebral palsy each year, and more than 750,000 Americans are currently living with the disorder.

What Happens in Cerebral Palsy?

The most striking feature of cerebral palsy is difficulty controlling movement, balance and posture. Muscle tone may also be affected, being either too weak (hypotonia) or too rigid (hypertonia). Skeletal deformities, difficulty swallowing, gastric difficulties and seizures may be present in varying degrees. Developmental and learning disabilities may also be present, although many people with cerebral palsy have normal intellectual abilities.

Respiratory infections are the most common reason people with cerebral palsy require hospital admission. Pseudobulbar palsy (difficulty swallowing) and increased secretion production due to the use of benzodiazepine medications for muscle relaxation and to control seizures may result in aspiration of oral secretions. An ineffective cough, secondary to poor muscle tone, further complicates secretion management. Gastroesophageal reflux, immobility and skeletal deformities may also contribute to impaired airway clearance. Eventually the mucociliary clearance system becomes overwhelmed and a vicious cycle of secretion retention, infection, inflammation and airway damage may set in.

How Airway Clearance Therapy Can Help Cerebral Palsy

There is currently no cure for cerebral palsy so therapeutic goals focus on maximizing function and improving quality of life. Keeping the airways clear of excess secretions and thereby reduce the incidence of inflammation and/or infection and is crucial to maintaining respiratory health. Airway clearance therapy using High Frequency Chest Wall Oscillation (HFCWO) has been demonstrated by clinical study to promote excess mucus clearance and improve bronchial drainage. Shear forces are created by HFCWO treatment that mechanically releases adhered secretions from the walls of the pulmonary tract. HFCWO has also been shown to reduce the viscosity of secretions which significantly improves mobilization of excess mucus. By replicating cough, HFCWO can effectively mobilize pulmonary secretions from smaller airways to larger airways where they can be coughed out, swallowed or suctioned.



Symptoms of Cerebral Palsy

- Abnormal muscle tone, either too rigid or too weak
- Unusual posture
- Favoring one side of the body over another
- Failure to meet developmental milestones
- Seizures
- Difficulty swallowing
- Digestive disorders
- Learning disabilities in some individuals

For More Information on Cerebral Palsy:

1. United Cerebral Palsy: <http://www.ucp.org/>
2. Fact sheet on cerebral palsy from the National Institute of Neurological Disorders and Stroke (NINDS): http://www.ninds.nih.gov/disorders/cerebral_palsy/cerebral_palsy.htm
3. Fact sheet from the Alfred I. Dupont Children's Hospital:
http://gait.aidi.udel.edu/res695/homepage/pd_ortho/clinics/c_palsy/cphome.htm
4. Information for children with cerebral palsy from Kid's Health (Nemours Foundation):
http://kidshealth.org/kid/health_problems/brain/cerebral_palsy.html