

Cerebral Palsy

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ETIOLOGY

Cerebral palsy (CP) is a group of non-hereditary developmental disorders that are non-progressive and affect 1-4 per 1,000 births worldwide (Centers for Disease Control and Prevention [CDC], 2020). CP, the most common childhood motor disability, occurs due to damage to the brain or abnormal brain development that impacts voluntary motor control and posture. The majority of individuals have congenital CP, possibly resulting from: low birthweight, premature birth, multiple births, assistive reproductive technology, infections during pregnancy, jaundice and kernicterus, medical conditions of the mother, or birth complications (CDC, 2021).

GENERAL CHARACTERISTICS

The medical community identifies different types of CP according to the location of the brain that is involved and the extent of the involvement. Common types of CP are: spastic, ataxic, dyskinetic (including athetoid), hypotonic (flaccid), and mixed. Some general characteristics include: variations in muscle tone such as tight muscles or flaccid muscles, lack of motor coordination and voluntary motor control, disturbances in balance and posture, exaggerated reflexes, limited head control, and disorders of gait pattern (National Institute of Neurological Disorders and Stroke [NINDS], 2019). In addition, the number of limbs involved, and the location of the movement disorders, can characterize CP, including hemiplegia (arm and leg on same side), spastic quadriplegia (all extremities involved), diplegia (two limbs, generally legs), and monoplegia (one limb involved) (CDC, 2021). Individuals with CP have a higher incidence than the general population for secondary disabilities and conditions including: seizures, intellectual disabilities, autism spectrum disorder, learning disabilities, Deafness or hearing loss, visual impairments, bladder and bowel control issues, and pain or abnormal sensations. (NINDS, 2019).

VISUAL IMPAIRMENT AND CEREBRAL PALSY

Between 50-75% of individuals with CP have visual impairments. The most common diagnoses include: difficulty with oculomotor functioning, cortical visual impairment (CVI), homonymous hemianopia, and refractive errors (Park et al., 2016; Salt & Sargent, 2014). Additionally refractive errors such as myopia (nearsighted), hyperopia (farsighted), and presbyopia (difficulty focusing on nearby objects) can result in loss of visual acuity, or clarity of vision. Oculomotor concerns, such as strabismus (eye misalignment) and nystagmus (involuntary eye movement) are common among people with CP (Salt & Sargent, 2014). Homonymous hemianopia results in vision loss in half of the visual field in each eye, and often occurs on the same side on which a person with CP experiences hemiplegia (Bassile & Hayes, 2016). Vision loss related to CVI is due to damage to the visual cortex of the brain, rather than damage or disease in the eye itself (Henderer, 2019). The individual with CVI has difficulty processing visual input and recognizing items and people in their environment.

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SPECIFIC MODIFICATIONS IN A UNIVERSALLY DESIGNED PHYSICAL EDUCATION LESSON

- Provide the class with a choice of distances when targets are involved, including bringing the target closer or placing it at an angle.
- Use a cascade of time intervals for students to select from, when performing exercise for time (e.g., planks for 90 seconds, 60 seconds, or 30 seconds).
- Add a contrast of colors in your selection of equipment. Some students can better see equipment that is in a high contrast color to the background or playing surface.
- Provide a wide range of sizes, colors, and weights of bats, balls, racquets, sticks, and other manipulatives, including equipment that can be Velcroed onto a hand, leg, or wheelchair.
- Offer sound devices such as a recorded doorbell, kitchen timer, buzzer, or music at places in the gym where students need to move towards or behind targets for auditory cues.
- Get student attention in ways other than using an abrupt whistle, as children with CP often startle easily.
- Prepare a chart that has alternate movements for locomotor skills or general movement that is always on the wall. Children who cannot do a certain movement can look at the chart and select a different movement. For example, shadow-boxing instead of skipping.
- Allow for priority seating during demonstrations and explanations. Priority seating for someone with CP may include positioning the student so the demonstration is in the functional side of their visual field.
- Arrange for handouts, signs, quizzes and task cards to be in a large print, sans serif, black font (such as Arial 18pt font or larger) with white background.
- Place an iPad in an easily accessible location, with a video model of the task, activity or skill on a repeat loop. Those that need to can go to the iPad to review what the demonstration looks like, or zoom in for an up-close view.
- Suspend bright colored balls from the basketball backboard or a volleyball standard for those who need a striking task slowed down or stationary.
- Utilize small groups for instruction, practice, and game play.
- Use phrases that describe how a movement is used in everyday life when you are teaching new skills. For example, “move your hands like you are opening the curtains on a window” as a cue for swimming the breaststroke.
- Provide a safe place to place canes, crutches or wheelchairs, when the student does not need it (e.g., sitting on mat or in the squad, sitting on a chair working on catching).
- When assessing, consider those who need alternative assessment such as doing parts of the skills or skills in a closed environment.
- Pre-teach the skills during an open-gym time for students who want or need additional instruction.
- Provide paraeducators and classroom teachers with specific actions or words they should use to support the students.
- Utilize peer buddies for anyone who might need additional demonstrations or motivation to stay on task.
- Allow students to select their speed of movements during warm-ups.

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- When assessing using worksheets, provide means of expression such as pointing to pictures, answering yes/no questions, sending home worksheets to be transcribed in text to talk, using a scribe, reading out loud, and using braille when requested.
- Have equipment accommodations available for anyone to use, such as: larger ball size; tee for putting the ball on; taping the ball to a string and suspend string/ball on basketball net; using ball with bells or rattles in them; providing a chair for those who need to sit.

CONTRAINDICATIONS

- Due to the wide range of characteristics that individuals with cerebral palsy may present with, the physical activity specialist should explore any health and medical concerns with the family, student, if appropriate, and the school nurse. This will determine the possible contraindications for the individual student.
- If the individual is seizure prone, it is best that additional spotters are used on climbing apparatus.
- If the individual has visual field loss, use caution in fast ball sports where a hard ball may not be seen coming from the periphery, such as in lacrosse or baseball/softball.
- If the student lacks protective reflexes— such as hands going out in front of them for a forward fall— or has balance issues, closely monitor the individual during fast moving activities with a large group due to increased potential for being bumped and pushed over.
- If the individual has delayed reaction time, modify ball activities that rely on quick reaction to protect the face and head from flying balls.
- If the person has limited head/neck control, and/or poor mouth closure, provide a one-on-one assistant in the pool. Consider a Coast Guard approved personal floatation device during aquatics.

SPECIFIC RESOURCES

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