

The Life Cycle of Physical Therapy for Individuals with CP

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What is Cerebral Palsy?

- Cerebral palsy refers to a group of disorders in the development of motor control and posture, occurring as a result of a non progressive impairment to the central nervous system. (CanChild)
- Cerebral palsy affects 2 cases per 1000 births worldwide.



What impairments will a child with CP experience?

Primary Impairments

- Spasticity
- Stiffness of muscles
- Reduced postural control
- Decreased ability to maintain upright posture
- Reduced selective control of muscles
- Decreased ability to isolate a muscle for voluntary movement
- Impaired sensory processing
- Decreased ability of the nervous system to receive information from the senses

Secondary Impairments

- Contractures
- A shortening of a muscle/tendon
- Skeletal deformities
- Decreased strength
- Decreased endurance



Comorbid Conditions

- Behavioral
- Speech
- Hearing
- Vision
- Cognitive delays
- Seizure disorders
- Hydrocephaly
- Sensation
- Urinary incontinence
- Constipation
- Failure to thrive
- GI issues affecting growth
- Autonomic responses
 - Cold skin, mottled skin, altered blood pressure, etc.



Why will a child with CP Benefit from PT?

- Children with CP may have decreased mobility
- Tight muscles may lead to a shortening of muscle/tendons or contractures
- Children with CP have difficulty with voluntary control of muscles
- Periods of growth may lead to the development of contractures or skeletal deformities
- Rehabilitation following interventions such as botox injections or orthopedic surgical interventions
- Children with CP may have decreased physical activity



Goals of Early Intervention

- Teach parents and caregivers about CP
- Help parents set realistic goals and expectations for their child
- Encourage gross motor function
 - Reaching, head control, tummy time, rolling, sitting, crawling, moving into and out of sitting/crawling position, standing and pre-walking skills
- Teach caregivers how to hold and handle a child with special needs
 - Infants with CP may have decreased head/trunk control, tight/stiff muscles or may be a more floppy baby
 - Activities of daily living (ADLs) such as dressing or feeding may be difficult
 - Parents can place infants in ways to encourage equal use of arms and legs and stretch tight muscles
- Encourage play and exploration of the child's environment
- Work with orthotists to determine appropriate orthotics and splinting to provide proper alignment and maintain range of motion
- Recommend equipment such as adaptive seating or supported standing equipment

Babies Can't Wait in Georgia

- The EI Program is a federal grant program run by individual states under Part C of the Individuals with Disabilities Education Act that works with children ages 0-3. Also called the "Program for Infants and Toddlers with Disabilities," EI targets children who show a delay in cognitive, social, or communication skills. These children may also have a delay in physical or motor abilities or self-care skills.

Healthychildren.org

- Services are provided in a child's natural environment including their home or child care setting
- An Individual Family Service Plan (IFSP) is a plan for special services including therapy for young children with developmental delays.



Outpatient therapy setting

- Offered in an outpatient hospital setting or community intervention service provider
- Doctors, therapists and parents work together to determine a plan of care including frequency and duration of treatment
- Goals of occupational and physical therapy often overlap from birth to 3 months of age
- 3 months of age and older
 - OT will focus on hand eye coordination, functional use of arms, sensorimotor integration and activities of daily living
 - PT will focus on gross motor development



Roles of Other Disciplines

Occupational Therapy

- Encourage use of upper extremities
- Eye-hand coordination
- Encourage play skills
- Sensory regulation
- Adapting toys for age appropriate play

Speech & Language Pathology

- Feeding therapy
- Communication skills



Goals of PT During the Preschool Years

- Make appropriate, realistic goals
 - Better able to predict a child's achievable motor skills
- Optimize gross motor skills
 - Practice skills such as standing up from the floor, going up/down stairs, tricycle riding, walking/running
 - Practice, practice, practice to achieve a skill
 - Encourage normal movement patterns through therapist handling
- Achieve independent mobility based on GMFCS level
 - Ambulatory aids such as walkers, crutches and canes
 - Manual wheelchair, power mobility device, adaptive tricycle
- Strengthen muscles through therapeutic activities
 - Transitional movements, therapy ball activities, and exercises targeting weak muscles
- Help a child participate in age appropriate play

Limiting Secondary Impairments During the Preschool Years

- Maintaining range of motion
 - Passive range of motion
 - Passive stretching over a prolonged period through casting, positioning or orthotics
- Spasticity management
 - Pharmaceutical interventions include botulinum toxin injections A and phenol injections
 - Gastrocnemius, hamstrings, hip flexors and hip adductors
 - Selective Dorsal Rhizotomy
 - Baclofen (Less popular but appropriate for some children)
 - Taken orally most used for patients with dystonia
 - May cause drowsiness
 - Intrathecal baclofen pump used in more involved children with quadriplegia
- Decreasing spasticity and maintaining ROM leads to muscle growth and lengthening helping to delay/eliminate the need for orthopedic surgery
- Monitor hip joint for signs of subluxation or dislocation
- Work with orthotists to determine if orthotics will help maintain joint alignment, prevent contractures, improve balance and gait
- Adaptive seating and mobility
 - Appropriate for children unable to sit independently
 - Increases communication, socialization, use of arms, and independence
- Weight bearing programs with standers
 - Appropriate for children unable to stand on their own
 - Maintains muscle length, maintains/increases bone density, helps hip development, reduces spasticity, improves self esteem, breathing, blood flow and bowel and bladder function
 - Recommendations range from 45 minutes 2-3 times per day to decrease contractures
 - 60 minutes 4-5 times per day to increase bone density



Frequency of PT During Preschool

- Dependent on cost, accessibility, time, available resources, community resources, goals of treatment, parent needs and child's response to treatment
- Conventional therapy
- 1-2 times per week for \geq 3-6 months
- Periods of intensive therapy
 - Short periods of therapy followed by a break from therapy



Roles of Other Disciplines

Occupational Therapy

- Dressing skills
- Feeding
- Toileting
- Playing
- Fine motor skills

Speech Therapy

- Feeding
- Communication



Selective Dorsal Rhizotomy

- Surgery to decrease spasticity (increased muscle tone) by cutting sensory fibers that are sending atypical signals to the muscles
- Goals of SDR
 - Decrease spasticity
 - Improve walking pattern
 - Decrease energy expenditure
 - Improve ROM and mobility
 - Improve hygiene and self care activities
- Who would benefit from SDR?
 - Children age 2-7
 - Children with spastic diplegia (GMFCS level I, II and III)
 - Children who demonstrate selective motor control
 - Children are able to follow directions to participate in rehab post-op
 - More involved children/adolescents (GMFCS level IV and V) may benefit for improved hygiene and decreased pain

SDR

- Benefits of PT prior to SDR
 - LE strengthening and ROM
 - Equipment and orthotic management
- **Phase 1:** POD 3 PT 2-3 times per day
 - LE AAROM, bench sitting and transfer training
- **Phase 2:** POD 4-week 1 or 2 PT 4-5 x week
 - LE ROM and strengthening, bench sitting, begin standing, pre-walking activities, supervised walking, encourage gross motor skills
- **Phase 3:** weeks 2-6 PT 4-5 x week in CIRU/Day Rehab/Outpatient
 - LE ROM and strengthening, core strengthening, gait training, gross motor skills, electrical stimulation, aquatic therapy, serial casting as needed
- **Phase 4:** Outpatient weeks 6-12 4-5 x week
 - Continue with plan of care with more focus on strengthening, balance reactions and gait training
- **Phase 5:** outpatient weeks 12-24 3-4 x week
 - Strengthen trunk muscles, LE strengthening, monitor ROM, gait training and mobility
- **Phase 6:** outpatient weeks 24-56 1-3 x week
 - LE strengthening, muscle endurance, coordination, refine gait, transition to community activities (swimming, dance, karate)



Intensive Physical Therapy

- Intermittent therapy for 3-5 times a week for a short duration (2-6 weeks) followed by a break from therapy
- Focus on specific treatment goals for child
- Critical period when child is naturally progressing increases effectiveness of therapy
- Skills are maintained when incorporated into daily activities
- May decrease “burnout” from conventional PT
- May be less demanding on families and patients
- Allows opportunity for children to be a typical child
- Dependent on available resources (costs, accessibility, time)

Goals of PT During School-Age

- Optimize level of function
 - Most children achieve optimal level of function during early school years
 - Some may improve motor skills
- Maintaining activity level
- Achieve age appropriate participation
- Children are challenged by increasing size, pain, decreased range of motion, puberty and increased demands of participation and activity
- For more involved children with CP, care focuses on decreasing impairments for caregiving and comfort
- Maintain muscle length, strength, joint integrity & fitness
 - Decrease secondary impairments (decreased endurance, pain, contractures)
 - Decrease spasticity, increase strength, improve control of selective muscles, functional activities and gait training
- Spasticity management
 - Botulin Toxin A and serial casting
- Rehab and orthopedic surgeries
 - Address contractures & bony deformities, improve gait, posture and hygiene, pain control
 - Muscle/tendon lengthening and transfers, tenoties, neurectomies, osteotomies and fusions
 - Preoperative: Prepare patient on what to expect following surgery with positioning, lifting, transferring, transportation, respiratory care, feeding and pain management
 - Postoperative: Strengthening, functional mobility, range of motion,
- Increase physical activity



Serial Casting and Splinting

- A series of casts placed on arm/leg to help stretch the muscle over a prolonged period
 - Improves range motion and joint function
 - May be applied following botox/phenol injections to maximize benefits
- Therapist applies a cast to the child's arm/leg
- Each week the old cast is removed and a new cast is applied stretching the joint more each time
- Typically 2-6 weeks of serial casting is recommended
- When placed on the leg a child is usually still to walk with the cast
- Following casting, the therapist may make a splint to help maintain the increased range of motion
 - Splint is worn for ≥ 4 hours
 - Often worn at night

Roles of Other Disciplines

Occupational Therapy

- Increase independence with activities of daily living
- Functional use of arm
- Rehab post orthopedic surgical
- Spasticity and contracture management

Speech & Language Pathology

- Communication
- Assistive communication
- Help coordinate breathing and talking



School-Based Therapy Programs

- Therapy to increase a child's participation and accessibility in the school
- Active therapy for students with specific treatment goals
 - Student receives therapy 2-4x/month
 - Younger students often receive more active therapy to reach optimal participation & independence at school
 - May be appropriate as students transition to a new school environment such as elementary school to middle school
- Consultative Therapy
 - Monitoring a student ~1 time/month who has met optimal level of function in the school environment
- Individual Education Program
 - A plan developed for each public school child who qualifies for special education.
- 504 plan
 - A plan developed for each public school child that may not qualify as special needs but requires accommodations, services, and support.
- Goals
 - Provide instruction for positioning, lifting and transferring
 - Implement exercise programs
 - Adapt recess and PE activities
 - Make the school environment accessible



Aquatic Therapy

- Therapeutic exercise performed in a pool often heated to 78-91° F
- Buoyancy of water provides optimal environment
 - ↓ impact of gravity and stress on joints
 - ↑ range of motion
 - ↓ weight bearing
 - ↓ spasticity
 - ↓ influence of poor balance and postural control
- Especially beneficial for children that are non-ambulatory
- Therefore a child with CP is able to move more freely in the water
- Studies have shown improvements in flexibility, respiratory function, muscle strength, walking ability and gross motor skills



Robotic Assisted Technology

- Guides a child's movement through activities such as walking
- Guidance and body weight is decreased over time
- Video games provide feedback on quality of movement
- Designed to promote faster progress with intensive therapy
- Children may participate in robotics 2-4 times per week
- Expanded talk: Robotics & Technology to Facilitate Extremity Movement
 - Erin Eggbracht, PT, DPT



Constraint Induced Movement Therapy

- Also called CI Therapy: Constraint Induced Therapy
- Forces use of affected limb while restraining unaffected limb
 - Cast, glove, mitten, sling acts as a restraint
- Improves function of affected limb through repetition and increased intensity
- Rewires brain to improve quality of movement and use of affected limb
- Offered as intensive therapy program
 - 3-4 hours/day, 5 days/week for 2-3 weeks
- Better results when completed in home based setting rather than a clinic
- Patients perform better when CI coupled with bimanual therapy
- Research suggests results not maintained 1 year following treatment
- May be considered experimental and investigational therapy and therefore not covered by insurance companies
- May be billed as therapeutic exercise

Adeli Suit Therapy

- A suit is worn as an exoskeleton with bungee cords placed to maintain posture and decrease muscle tone
- The bungee cords support the child to eliminate gravity
- Muscles are re-educated to promote normal movement patterns
- Plasticity of the brain allows the child to learn these new movement patterns through repetition
- Offered as intensive therapy for 5-6 days per week, 3-5 hours per day for 3-4 weeks
- May or may not be covered by insurance
- Lacking evidence on effectiveness, often viewed as experimental therapy



Complementary & Alternative Medicine

Medical practices that are not part of standard care

- Acupuncture
- Hyperbaric Oxygen Therapy
- Craniosacral Therapy
- Patterning
- Hippotherapy
- Hydrotherapy
- Dolphin Therapy for CP
- Stem Cell Research



Goals of CP During the Transition to Adulthood

- Maintain function
 - Decline in walking skills has been related to decreased endurance, pain, fear of falling and fatigue
 - Strength training has been shown to maintain functional mobility
 - Promote community and recreational programs for fitness and activity
- Prevent deterioration
 - Choose aerobic exercise that limits stress placed on joints, use additional walking aids or orthoses and surgical interventions
- Reach optimal independent living
 - Dependent on independence with activities of daily living, mobility, cognitive skills, communication and available resources and support
 - Planning should begin in adolescence and includes preparation for vocational rehab or college, living accommodations, transportation, community involvement and financial planning

Reimbursement for Therapies

- Babies Can't Wait
 - Accepts private insurance and public benefits such as PeachCare and Medicaid
 - Family Cost Participation
 - Applies to services not covered by third party funding
 - Based on 200 percent of the annual federal poverty level, family size, gross income and deductions associated with child's disability or eligible medical condition.
- Private Insurance
 - Predetermined number of visits established by plan for medically necessary therapy
 - May require prior authorization



PeachCare for Kids

- Partnership between Department of Community Health and private Case Management Organizations
- Offers comprehensive healthcare program to uninsured children in Georgia
- Free/Low Cost insurance plan
- Amerigroup, Wellcare, Peachstate
- 8 units/month for each therapy provided by Children’s Intervention Services
- More visits require prior authorization that therapy is medically necessary
- Authorization effective for 90 days
- Hospital-based therapy requires prior authorization
 - Typically approved for acute conditions and specialty services
- <https://dch.georgia.gov/peachcare-kids>



Katie Beckett Deeming Waiver

- Department of Community Health provides Medicaid for eligible children under 18 with a disability whose parents income is too high to qualify for other Medicaid
- Deeming Waiver bases the decision on the child's medical needs
- 8 units/month for each therapy provided by Children's Intervention Services
- Prior authorization following acute episodes for more intensive therapy
- <https://dch.georgia.gov/tefra>

QUESTIONS?

