



**PNF**

**Just a method or is it a way  
of thinking?**

**Cerebral palsy**

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# *Definition*

Cerebral palsy (CP) is a physical disability that affects movement and posture.

Cerebral palsy (CP) is an umbrella term that refers to a group of disorders affecting a person's ability to move. It is a permanent life-long condition, but generally does not worsen over time. It is due to damage to the developing brain either during pregnancy or shortly after birth.

Cerebral palsy affects people in different ways and can affect body movement, muscle control, muscle coordination, muscle tone, reflex, posture and balance.

People who have cerebral palsy may also have visual, learning, hearing, speech, epilepsy and intellectual impairments.[16]

# *Forms*

- ◆ Spastic
- ◆ Hypotonic
- ◆ Fluctuating tone (athetoid, choreoathetoid, dystonic)
- ◆ Ataxic
- ◆ Mix

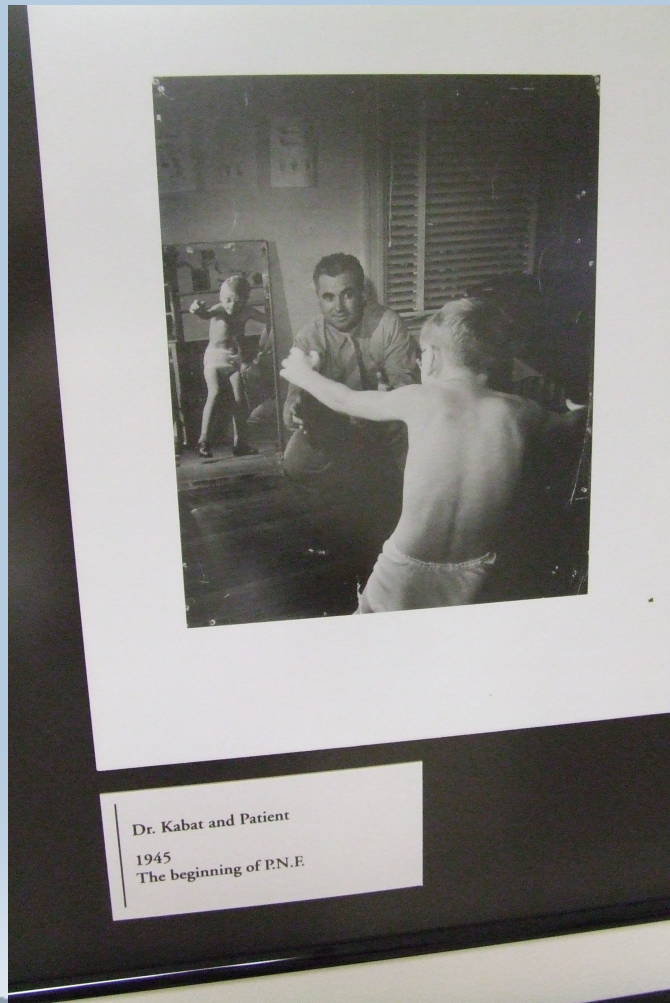
# *Question?*



**Cerebral palsy has a lot of different forms and symptoms.**

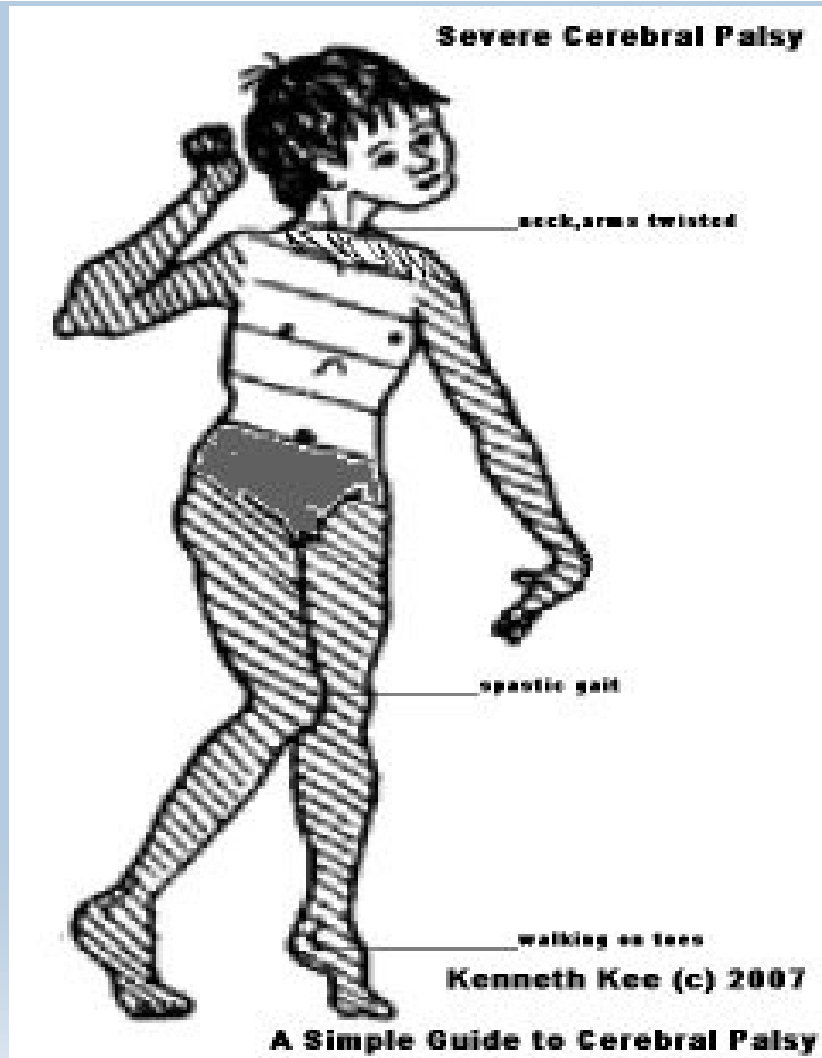
**Is it possible to treat them all with PNF?**

# *Proprioceptive Neuromuscular Facilitation (PNF)*



- Although most therapists think of Proprioceptive Neuromuscular Facilitation (PNF) as a treatment approach best suited for adults with various neurological or orthopedic problems, is important to note that it was originally designed for the treatment of children with Cerebral Palsy. [9]

# Spastic Cerebral Palsy



- ◆ Spastic cerebral palsy refers to the increased tone, or tension, in a muscle. Spasticity negatively affects the patient's muscles and joints of the extremities, causing abnormal movements, and can disrupt normal growth in children. [17]

# *PNF treatment (spastic CP)*

- ◆ Goals: decrease muscle tone, correct postural deviations, increase ROM, decrease pathological reflexes and synergies, increase voluntary strength
- ◆ Basic principles/philosophy: Pt position, manual contact, appropriate resistance, irradiation, quick stretch, traction/approximation, normal timing, patterns, verbal/visual, etc.
- ◆ Techniques : rhythmic initiation, repeated stretch from beginning of ROM, stabilizing/dynamic reversals, combination of isotonics (holds), contract – relax, hold – relax [6]

# *PNF treatment (spastic CP)*

- ◆ Activities: upper extremity – address scapular mobility, irradiation from trunk/UE patterns, activities in UE weight bearing position, ice towel/neutral heat to scapula/UE, sustained lengthening
- ◆ Activities: lower extremity – foot mobilization, address dynamic posture, trunk static/dynamic stability, address pelvic mobility, trunk/pelvic activities, rotation, weight bearing, prolonged proximal holds, sustained lengthening, ice towels/neutral heat [6]

# *PNF treatment (spastic CP)*

- ◆ Suggestions:
  - ★ position the patient so gravity will assist the weaker movements
  - ★ use the rotation component to reduce spasticity
  - ★ use approximation to promote postural responses where flexor reflexes are dominant and to simulate weight bearing to reduce spasticity
  - ★ use stretch to aid initiation of desired movement and to increase rate of movement [1]

# *Hypotonic Cerebral Palsy*



- ♦ Hypotonia is defined as lower than normal muscle tone. A condition in which muscles become floppy and lacking in strength. [3]

# *PNF treatment (hypotonic CP)*

- ♦ Goals: increase muscle tone and strength
- ♦ Basic principles/philosophy: Pt position, manual contact, appropriate resistance, irradiation, quick stretch, traction/approximation, normal timing, patterns, verbal/visual, etc.
- ♦ Techniques: timing for emphasis, repeated stretch, combination of isotonic, dynamic/stabilizing reversals
- ♦ Activities: upper extremity – scapula/ UE stabilization activities (holds, activities in UE weight bearing position, irradiation from trunk/UE patterns) [6]

# *PNF treatment (hypotonic CP)*

- ◆ Activities: lower extremity – weight bearing/co-contraction, irradiation from trunk/LE patterns, quick ice[6]
- ◆ Suggestions:
  - ★ use “threat” to increase tonus and response to stretch
  - ★ use total flexion and total extension to promote response to stretch
  - ★ use total patterns of posture to promote postural response[1]

# *Ataxic Cerebral Palsy*



- ◆ Ataxic cerebral palsy affects balance and depth perception. Children will often have poor coordination and walk unsteadily with a wide-based gait, placing their feet unusually far apart. They have difficulty with quick or precise movements, such as writing or buttoning a shirt. They may also have intention tremor, in which a voluntary movement. [14]

# *PNF treatment (ataxic CP)*

- ♦ Goals: increase stability, increase coordination of movement
- ♦ Basic principles/philosophy: Pt position, manual contact, appropriate resistance, irradiation, quick stretch, traction/approximation, normal timing, patterns, verbal/visual, etc.
- ♦ Techniques: rhythmic initiation/replication, repeated stretch, timing for emphasis, combination of isotonic, stabilizing/dynamic reversal [6]

# *PNF treatment (ataxic CP)*

- ◆ Activities: trunk stability (recruitment of the lower abdominals, setting the scapula for posterior depression, “rotatory” stability, correct postural deviations), controlled weightshifting, eccentric muscle recruitment, relation of center of gravity to base of support, once patient has stability, progress towards controlled mobility[6]
- ◆ Suggestions:
  - ★ graded and emotionally supportive treatment to help overcome fear of movement
  - ★ sustained and deep input
  - ★ facilitory tapping
  - ★ facilitate the balance reaction
  - ★ facilitate refined grading of muscle activity [5]

# *Athetoid Cerebral Palsy*



- ◆ Athetoid cerebral palsy is characterized by slow and uncontrollable writhing movements of the hands, feet, arms, or legs. They find it difficult to sit straight or walk. Children may also have problems coordinating the muscle movements required for speaking. [18]

# *PNF treatment (athetoid CP)*

- ◆ Goal: increase stability, increase functional mobility, increase coordination of movements
- ◆ Basic principles/philosophy: Pt position, manual contact, appropriate resistance, irradiation, quick stretch, traction/approximation, normal timing, patterns, verbal/visual, etc.
- ◆ Techniques: rhythmic initiation/replication, repeated stretch, timing for emphasis, combination of isotonic, stabilizing/dynamic reversal [6]
- ◆ Activities: symmetrical postural alignment (close body contact – approximation), exaggerated weight shifting, trunk static/dynamic stability, address trunk/pelvis activities, rotation, eccentric muscle recruitment, scapula/UE stabilization activities (progression from SL-pron on ball-prone on elbow), stabilize one UE as a base of support, freeing the other for function, as the child gains control of the trunk, the need for distal stability will be reduced, vibration for respirations [5, 6]

# *PNF treatment (athetoid CP)*

- ◆ Suggestion:
- ★ use diagonal patterns of head and neck to promote balance and control of head and neck and upper trunk
- ★ use both diagonals and directions of extremity patterns to promote balance of antagonist and control of movements
- ★ use isometric-holding in the shortened range to increase ability to perform from lengthened range, to correct severe imbalances in distal parts, and to control range, timing, and rate of movements
- ★ use approximation and rhythmic stabilization to promote control posture [1]

# *Final consideration*

- ♦ PNF is a way of thinking, observing and facilitating movement. PNF is simply harmony of knowledge, consciousness and movement [15]
- ♦ If the therapist understands the basic principles, the PNF approach can be as effective or more effective than other well-known treatment approaches, for both children and adults [9]

# *Final consideration*

- The therapist individualizes treatment for every patient and decides how to apply the PNF approach according to the goals of each treatment
- Success of PNF treatment is dependent upon our skills and knowledge
- The above considerations we can use for treatment of patients of any age and with every kind of disorder

*Thank you for your attention*



[www.beatawnuk.pl](http://www.beatawnuk.pl)

# Reference

## ◆ Books:

0. Voss Dorothy E. “Proprioceptive Neuromuscular Facilitation: the PNF method” In: Pearson,PH, Williams CE, eds. *Physical Therapy Services in the Developmental Disabilities*. Springfield: Charles C. Thomas, 1976, 223-282
1. Adler Susan S., Beckers Dominiek, Buck Math “PNF in Practice” An illustrated guide Third edition (2008) Berlin Springer
2. Miller Freeman “Physical Therapy of Cerebral Palsy” 2007 Springer
3. Levitt Sophie “Treatment of Cerebral Palsy and Motor Delay” Fourth edition 2003 Blackwell Publishing
4. Boehme Regi “Developing Mid-Range Control and Function in Children with Fluctuating Muscle Tone”, 1990 *Therapy Skill Builders*
5. 3 Monthers Binder – Sections: Philosophy & Basic Principles, Gait, Techniques, Review

# Reference

## ◆ Articles:

6. Knott Margaret “Neuromuscular Facilitation in the Child with Central Nervous System Deficit” J Amer Phv Ther Assoc. 1966; 46(7); 721-724
7. Knott Margaret “Specialized Neuromuscular Technics in the Treatment of Cerebral Palsy” Phys Ther Rev 1952; 32(2):73-75
8. Williams-Meyer Ardith “PNF in the treatment of children: moving through the tone, moving into tone” 2007 [www.ipaconed.com/pdf/section8.pdf](http://www.ipaconed.com/pdf/section8.pdf)
9. Levitt Sophie “Proprioceptive Neuromuscular Facilitation Techniques in Cerebral Palsy” Physiotherapy 1966 Feb.; 52(2):46-51
10. Levitt Sophie “Physiotherapy in Cerebral Palsy Today” Phys Ther Rev. 1955 Aug; 35(8):430-435
11. Koman L., Smith B., Shilt J. “Cerebral palsy “ The Lancet , 2004 May, Volume 363 , Issue 9421 , Pages 1619 - 1631

# Reference

## ♦ **WWW:**

12. <http://www.faqs.org/health/Sick-V1/Cerebral-Palsy.html>

13. <http://fromyourdoctor.com/drgeroulis/patient/viewLibrary.do?dispatch=displaySubtopic>

14. [http://www.freestylerpro.nl/revalidatie/pnf\\_concept.html](http://www.freestylerpro.nl/revalidatie/pnf_concept.html)

15. [http://www.buddybeartrust.com/cerebral\\_palsy.htm](http://www.buddybeartrust.com/cerebral_palsy.htm)

16. <https://www.cerebralpalsy.org.au/what-is-cerebral-palsy/>

17. <http://www.special-needs-hope.com/athetoid-cerebral-palsy.html>

## ♦ **Another:**

19. Williams-Meyer Ardith “PNF in Pediatric” IPNFA conference Sept. 18 1998

