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Intro to Physical Therapy for Neuromuscular Conditions

PTA 103
Introduction to Clinical Practice 2

Slide 2

PT Evaluation

• Mental status: consciousness, attention, orientation, cognition
• Communication: speech and language disorders
• Motor control (volitional vs involuntary movements, isolated or synergistic, movement patterns)
• Postural control and balance (also part of functional mobility)
• Tone
• Reflex integrity (deep tendon reflexes and pathological)
• Cranial nerve integrity

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PT Evaluation

• Muscle performance (MMT)
• Functional task/mobility analysis (bed mobility, transfers, gait, locomotion)
• Outcome Measures (for baseline testing)
  – Functional Independence Measure
  – Performance Oriented Assessment of Mobility (Tinetti)
  – Functional reach tests
  – Timed Get Up and Go Test
  – Timed Walking Test
  – Berg Balance Scale
  – Barthel Index
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PT Evaluation

• Sensation and Perception
• Nerve conduction (EMG)
• Flexibility
• Motor learning: ability to learn skills, retain performance and transfer skills to different environments
• Integument

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PT Evaluation

Tests and Measures
• Aerobic capacity and endurance
• Arousal, attention and cognition
• Cranial and peripheral nerve integrity
• Motor function (control)
• Range of motion / flexibility
• Reflex integrity
• Gait, locomotion, balance
• Orthotic, protective, and support devices
• Pain
• Sensory integrity
• Sensory integration

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Definition of Coordination

• muscle activity during voluntary movement
• muscle groups working together to perform a task (timing, accuracy, sequence) = synergy
• level of skill and efficiency
• start, control and stop according to activity/environment demand
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PT Evaluation

PT Diagnosis and Prognosis
• Classification of neuromuscular impairment
• Guide to Physical Therapist Practice suggests specific treatment patterns
• PT determines potential for rehabilitation based on evaluation findings
• Potential for rehabilitation and indications for PT is documented in the POC, including frequency, duration, and expected outcomes.

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Guide to PT Practice Patterns

Impaired balance and falling
- Age-related: widespread slowing of nerve conduction speed and effectiveness of sense organs (vision, hearing, touch receptors, etc.)
- Vestibular disorders
- Includes prevention and risk reduction
Peripheral nerve injury: e.g., (sever, crush, stretch, impinge from overuse, degenerative joint changes (e.g., spine))
- Acute or chronic polyneuropathy: metabolic conditions (e.g., diabetes, alcoholism), toxins (e.g., Agent Orange), nutritional deficits (B12), infection (Herpes, polio, leprosy)

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Guide to PT Practice Patterns

Progressive – Acquired (MS, Tumors, ALS, Parkinson’s, Huntington’s, Alzheimer’s, Myasthenia Gravis)
Non-progressive - Acquired (TBI, SCI, CVA, TIA, Burns)
Birth-related conditions and impaired development
- Cerebral palsy
- Epilepsy
- Spina Bifida
- Muscular Dystrophy
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Role of the PTA

• Perform interventions to achieve goals in POC
• Complete tests and measures to document progress/barriers toward goals
• Repeat outcome measures for comparison to demonstrate progress
• Educate patients and family members in use of positioning, equipment, assistive devices, energy conservation, home and community safety
• Coordinate with nursing, physicians, allied health care providers
• Educate in techniques for fall prevention

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Selected tests and measures: light touch

• The primary sensations include pain, touch, vibration, joint position sense (proprioception) and thermal.
• Light touch (LT) is mediated by a combination of small and larger nerve fibers and is tested with a wisp of cotton.

Assessment Techniques
• Eliminate bias by asking the patient to close their eyes
• Touch the patient in various areas with cotton (LT)
• Typically begin with the face and move down the body noting any asymmetry between the right and left sides; follow dermatomal pattern
• Can also randomize location to assess touch localization

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Assessing Light Touch

• Use a fine wisp of cotton or your fingers to touch the skin lightly.
• Ask the patient to respond whenever a touch is felt.
• Test the following areas:
  – Shoulders (C4)
  – Inner and outer aspects of the forearms (C6 and T1)
  – Thumbs and little fingers (C6 and C8)
  – Front of both thighs (L2)
  – Medial and lateral aspect of both calves (L4 and L5)
  – Little toes (S1)
Selected Tests and Measures:

**DTR**

Evaluation of deep tendon reflexes (DTRs) examines the spinal reflex arc. DTRs are usually tested by tapping on a tendon with fingers or a reflex hammer. This causes a stretching of certain muscles and results in contraction. When damage occurs to higher centers (upper motor neurons), the spinal reflex arc is uninhibited and the DTRs are hyperactive. When damage occurs to the peripheral nerve or dorsal roots (lower motor neurons), the reflex arc is interrupted and the DTRs are decreased. The rapidity and strength of the reflexes should be symmetrical when comparing one side with the other.

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**DTRs**

- The reflexes most often tested are the biceps, brachioradialis (wrist), triceps, patellar (knee), and Achilles (ankle).
- Biceps (C5-C6)
- Brachioradialis (C6)
- Triceps (C7-C8)
- Patellar (L2-4)
- Achilles (S1)

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**DTR Testing**

**Assessment Techniques**

- Reflexes are graded on a scale of 0 to 4.
  - 0 ............Not present
  - 1+ ..........Present but diminished
  - 2+ ..........Normal
  - 3+ ..........Hyperactive, may have clonus but not sustained
  - 4+ ..........Hyperactive with sustained clonus
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**Selected Interventions**

- **Slide board transfers**
  - Transfer technique for individuals who are unable to accept and bear weight in the LEs
  - Indications are paraplegia, quadriplegia, peripheral LE neuropathy, and orthopedic trauma

- **Dependent one person transfers (Total A)**
  - Patient is unable to actively WB/accept weight in LEs; poor trunk control
  - Facilitation techniques optimize elicitation of a weight-bearing response

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**Discussion and Forum Posts**

- Check Moodle for discussion/blog and forum post assignments on topics related to patients with neuromuscular conditions

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