Manual Therapy Techniques: Joint Mobilization and PNF Diagonal Patterns

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Joint Mobilizations

- Assist in restoring joint motion by decreasing pain and stiffness

- Arthrokinematics (joint motion)
  - Physiologic
  - Accessory: roll, spin, glide/slide, traction/distraction, compression

- Effects
  - Nutritional—increases synovial fluid to improve nutrition
  - Mechanical—capsular stretch deforms collagen to improve motion
  - Neurophysiological—mechanoreceptors are stimulated => inhibit nociceptive stimulation => causes muscle relaxation
Joint Mobilizations

- **Indications**
  - Joint pain
  - Joint stiffness

- **Contraindications**
  - Fracture
  - Ligament rupture
  - Herniated disk with nerve compression
  - Joint effusion
  - Joint replacement
  - Hypermobile joints
  - Patient’s inability to relax
Joint Mobilizations

- **Convex-concave rule**
  - If a concave surface is moving on a stationary convex surface, then the glide is performed in the same direction of the restricted movement.
  - If a convex surface is moving on a stationary concave surface, then the glide is performed in the opposite direction of the restricted movement.
Joint Mobilizations

- Closed-packed vs. open-packed positions
- Glides performed parallel to the treatment plane
  - Treatment plane located on concave joint surface, perpendicular to a line from the axis of rotation from center of the convex surface

Joint Mobilizations

- Grades of movement for oscillations
  - Grade I—to relieve pain, small amplitude at beginning ROM
  - Grade II—to relieve pain, large amplitude at beginning through mid range ROM
  - Grade III—to decrease joint stiffness, large amplitude from mid range to normal limit of motion
  - Grade IV—to decrease joint stiffness, small amplitude at normal limit of motion
  - Grade V—manipulation, small amplitude beyond end range
Joint Mobilizations

- **Application (audience participation)**
  - **Shoulder**
    - resting position 55 deg. abduction, 30 deg. horizontal abduction
    - to increase flexion (stationary glenoid, glide humeral head posteriorly)
    - to increase abduction (stationary glenoid, glide humeral head inferiorly)
  - **Patella**
    - resting position—knee in extension
    - to increase knee extension (glide patella inferiorly)
  - **Knee**
    - resting position 25 deg. flexion
    - to increase flexion (stationary femur, glide tibia posteriorly)
    - to increase extension (stationary femur, glide tibia anteriorly)
  - **Ankle**
    - resting position 10 deg. plantarflexion
    - to increase plantarflexion (stationary tibia, glide talus anteriorly)
    - to increase dorsiflexion (stationary tibia, glide talus posteriorly)
Joint Mobilizations

- **Traction/distraction**
  - To decrease compression, decrease pain, increase mobility by stretching structures
  - Motion perpendicular to the treatment plane
  - Grades of movement:
    - Grade I—loosen (open-packed position), beginning of range
    - Grade II—tighten, to end range
    - Grade III—stretch, to normal joint’s limit

- **Application (audience participation)**
  - Shoulder
  - Wrist
Proprioceptive Neuromuscular Facilitation Diagonal Patterns

- **Purpose**
  - Increase flexibility
  - Increase strength
  - Increase kinetic chain coordination

- **Diagonal patterns of movement** (Houglum, 2005)
Proprioceptive Neuromuscular Facilitation Diagonal Patterns

- Principles
  - Tactile
  - Verbal
  - Visual
  - Prestretch
  - Rotational movements
  - Proximal to distal movement completion
Proprioceptive Neuromuscular Facilitation Diagonal Patterns

- Description of PNF techniques
  - Rhythmic initiation
  - Rhythmic stabilization
  - Slow reversal
  - Slow reversal-hold

- Application (audience participation)
  - Upper extremity D1 and D2 with shoulder as pivot
  - Lower extremity D1 and D2 with hip as pivot