Muscle Energy
Technique
Applied to the Shoulder
MUSCLE ENERGY

- **Theory**
- Muscle energy technique is a manual therapy procedure which involves the voluntary contraction of a muscle in a precisely controlled direction at varying levels of intensity against a distinct counterforce applied by the operator.
Muscle Energy Technique

Uses:

- Lengthen a shortened, contractured, or spastic muscle.
- Strengthen a weakened muscle or group of muscles.
- To reduce localized edema.
- Relieve passive congestion.
- To mobilize an articulation with restricted mobility.
Types of Contraction

- Isometric
- Concentric Isotonic
- Eccentric Isotonic
- Isolytic

These can also be biased by adding either distraction or compression to alleviate pain.
Principles Employed

- Reciprocal Inhibition
- Autogenic (post-isometric) Inhibition
Isometric Contraction

- Primarily reduce the tone in a hypertonic muscle and reestablish its normal resting length.
- Shortened and hypertonic muscles are frequently identified as the major component of restricted motion of an articulation.
- Length and tone are governed by the fusiform motor system to the intrafusal fibers.
- The gamma system is the neurological control for this system.
- Works on a reflex arc.
Autogenic (post-isometric) Inhibition

- Afferents from both Golgi tendon receptors and gamma afferents from muscle spindle receptors feed back to the cord.
- Gamma efferents return to the intrafusal fibers resetting their resting length.
- This changes the resting length of the extrafusal fibers of the muscle.
- After an isometric contraction, a hypertonic muscle can be passively lengthened to a new resting length.
Reciprocal Innervation & Inhibition

- When an agonist muscle contracts and shortens, its antagonist must relax and lengthen so that motion can occur under the influence of the agonist muscle.

- The contraction of the agonist reciprocally inhibits its antagonist allowing smooth motion.

- The harder the agonist contracts, the more inhibition in the antagonist, causing relaxation.
Improved Tone & Performance

- The second principle of isotonic MET is increasing the tonus and improving the performance of a muscle that is too weak for its musculoskeletal function.

- As a series of reps of isotonic contraction occur in the muscle, against progressive resistance, extrafusal muscle fiber participation in the contraction increases.

- Isotonic ME procedures reduce hypertonicity in a shortened antagonist and increase the strength of the agonist.
Overall Effect

- These muscle contractions affect the surrounding fascia, connective tissue ground substance interstitial fluids, and alter muscle physiology by reflex mechanisms.
- Fascial length and tone is altered by muscle contraction.
- Alteration in fascia influences biomechanical function, biochemical, and immunological functions.
- The contraction produces metabolic processes to occur and the patient may experience soreness within 12-36 hours after treatment.
Elements of Muscle Energy

- Patient-active contraction
- Controlled Joint Position
- Direction specific muscle contraction
- Operator applied specific counterforce
Muscle Energy Technique Lab

The Principles of diagnosis and treatment are:

- To evaluate ROM in all planes
- To evaluate strength of all muscle groups
- To treat restricted ROM by isometric technique at the restrictive barrier
- If weakness is detected, to treat by a series of concentric isotonic contractions
Muscle Energy Procedure

- Athlete is seated.
- Operator stands behind.
- Operator sets the scapula.
- Operator controls the athlete’s arm at the elbow.
- Operator induces movements.
- ROM and EOR isometrics are tested.
- Strength tested
- Retest

3-5 repetitions of muscle effort for 3-7 seconds each
Muscle Energy Lab

- ARTICULAR & Muscle Energy Techniques

- Glenohumeral Joint
  - Primary movement loss is of ER and abduction.
  - Loss of the ability for the humeral head to move from the cephalic to caudal end of the glenoid during abduction.
Muscle Energy Lab

Glenohumeral Joint

Easy mechanics, but must be specific

- Flexion/extension
- Lateral Rotation
- Medial Rotation
- Abduction
- Horizontal Adduction
Muscle Energy Lab

**Acromioclavicular Joint**

Little motion = very significant
Check motion with operator behind the athlete ER and adduct the arm feeling for gapping.

**Restricted Abduction**

Horizontal flex to 30 degrees and abduct and monitor
Athlete pulls elbow to the side of the body, operator maintains fixation.

**Restricted ER & IR**

Horizontal flexion to 30 degrees then abduct to barrier.
For IR restriction, thread arm under elbow and over athlete’s wrist IR to barrier. Athlete induces ER.

For ER restriction, operator’s forearm is on posterior aspect of the elbow, grasping the anterior wrist, inducing ER. Athlete induces IR.
Muscle Energy Lab

Sternoclavicular Joint

Restricted Abduction (inferior glide with posterior rotation)

Palpate & Shrug

1. Superior pressure with PNF pattern
   One hand over medial clavicle/ hand on forearm
   IR/extension, athlete raises to ceiling (IR, AR)

2. In sitting, superior pressure, 90/90, resist adduction (ER, PR)

Restricted Horizontal Flexion

Test with hands in fly position in supine
ME with operator on opposite side and athlete grabbing operators neck. Athlete pulls while operator creates equal opposing pressure into posterior compression.

Rotation (corrected as conjunct motion with Abduction)
## Muscle Energy Lab

- **Scapulothoracic Joint**
  - Anterior Elevation: Latissimus Dorsi (C6C7)
  - Posterior Depression: Serratus Anterior (C6C7)
  - Anterior Depression: Levator Scapulae (C4C5)
  - Posterior Elevation: Pectoralis Minor (C7C8)
Muscle Energy Lab

- First Rib
  - Depression
  - Positional Tests: During inspiration and expiration.
Muscle Energy Lab

- **Thoracic Extension**
  - Seated thoracic mobes
  - Prone thoracic mobes
  - Sitting with and without arm elevation
7 Step Procedure of Spencer

- Athlete is laterally recumbent
- Operator stands and faces the athlete.
- ONE Gently flex and extend the arm in the sagittal plane, elbow flexed
- TWO Flex arm elbow extended with rhythmic swinging movement.
- THREE Circumduct the abducted humerus with the elbow acutely flexed in CW and CCW concentric circles while stabilizing the scapula.
- FOUR Circumduct the humerus around the stabilized scapula with elbow extended, gradually increasing ROM in pain-free fashion.
- FIVE Abduct the arm against the stabilized scapula with the elbow flexed.
- SIX Athlete’s hand behind the lower ribs, gently pull the elbow forward and slightly inferior increasing the IR of the humerus in the glenoid. Springing repetitions to increase ROM but without increase in pain.
- SEVEN Operator grasps the proximal humerus with both hands and tractions laterally with alternating pumping fashion.
- RETEST