
وقل رب زدني علما

Muscle energy technique

(MET)

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Muscle energy technique (MET)

Muscle energy technique (MET) is a system of manual procedures that utilizes active muscle contraction effort from the patient, usually against a controlled matching counter force from the practitioner.

The MET system was developed by osteopathic physician **Fred Mitchell** Sr in the 1950s,

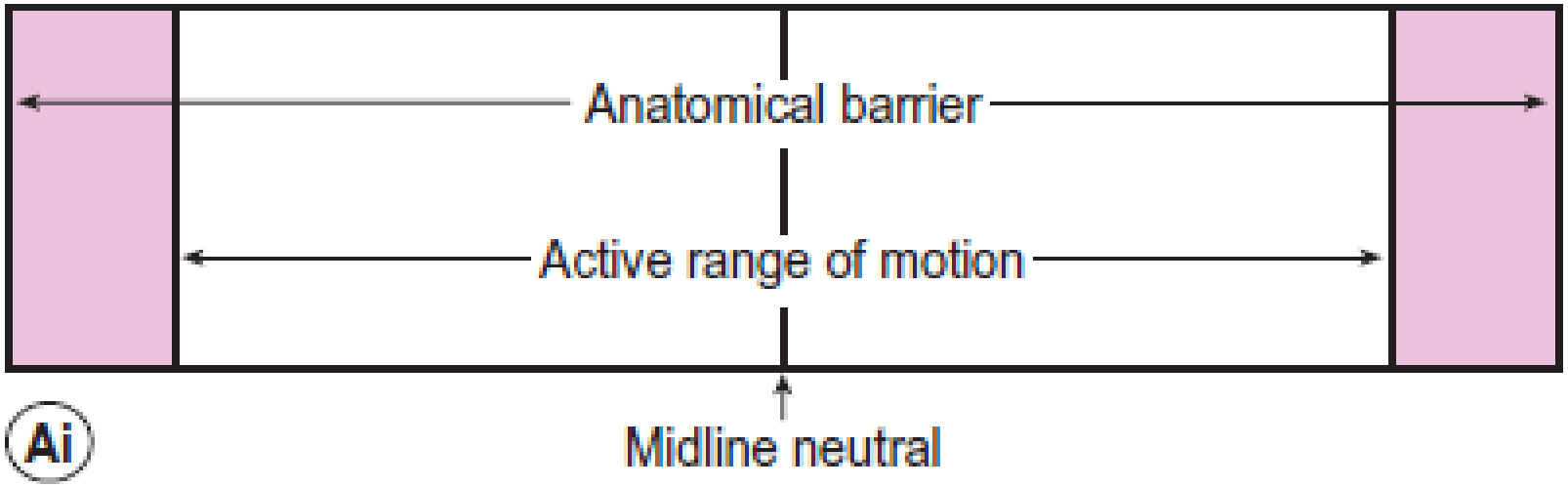
Fred Mitchell Jr.

Muscle energy technique (MET)

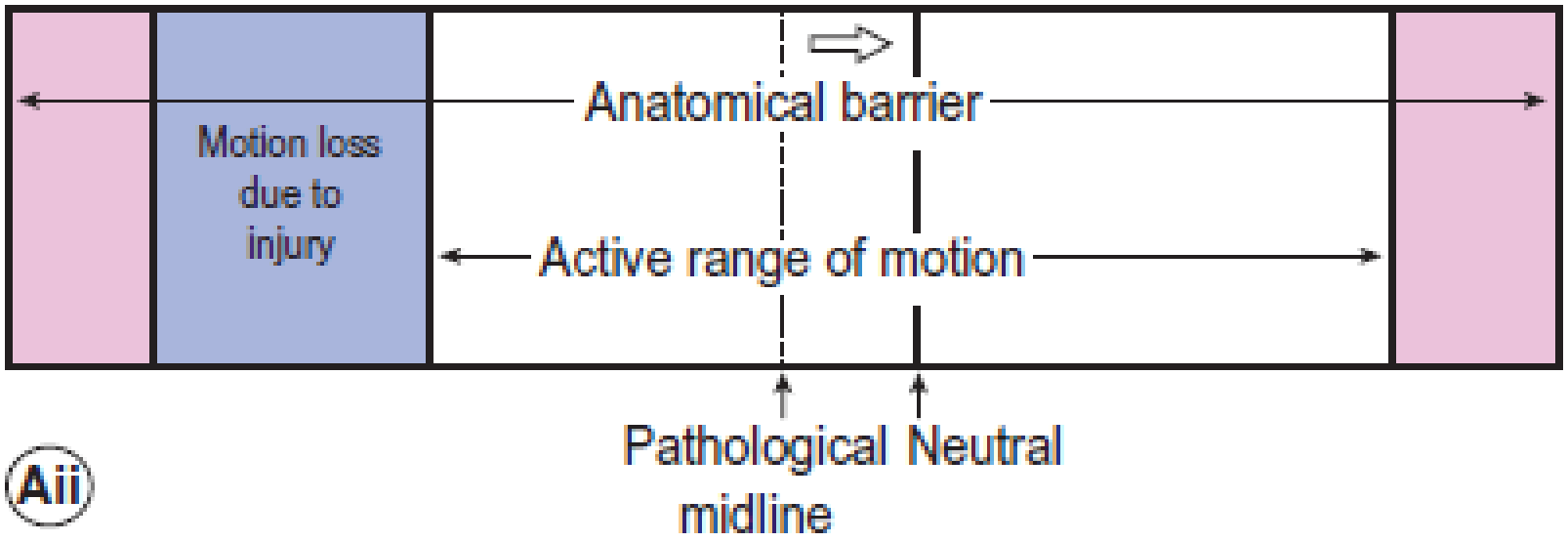
MET has been used to:

1. Lengthen shortened muscles,
2. mobilize articulations with restricted mobility,
3. strengthen weakened muscles and
4. reduce localized oedema and passive congestion

(Mitchell Jr & Mitchell 1995; Goodridge & Kuchera 1997; Chaitow 2013).


Anatomical barrier
Active range of motion
Midline neutral

Ai


Motion loss due to injury
Anatomical barrier
Active range of motion
Pathological midline
Neutral

Aii

The most commonly described MET is **the post-isometric relaxation (or 'contract–relax')** technique, which is used particularly when increasing muscle length or joint range of motion.

Other variations of this technique exist, such as the use of:

- **concentric contractions** against a yielding resistance to increase strength and recruitment of a muscle, or
- **reciprocal inhibition techniques** that facilitate relaxation of a muscle when applied to the antagonist muscle,

What are the differences between

1. **PIR**
2. **PFS**
3. **RI**

?

Muscle energy technique to lengthen the upper trapezius and levator scapulae muscles.

The number o repetitions is influenced by the response of the involved tissues, but three to five repetitions have been recommended

(Mitchell Jr & Mitchell 1995; Goodridge & Kuchera 1997; Chaitow 2013).

The force and duration of isometric effort can vary, depending on the aim of the technique and the tissues involved.

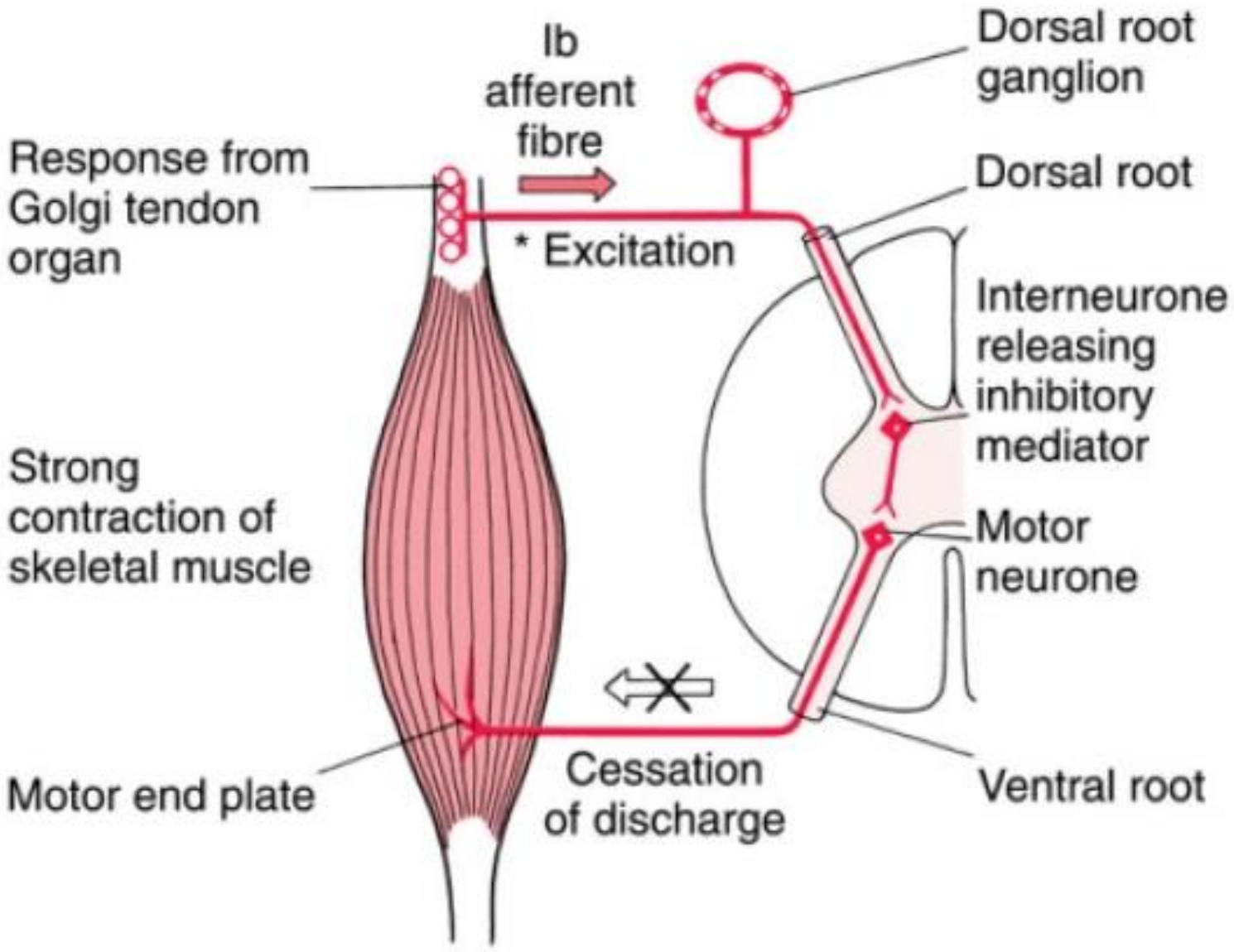
1. A gentle, controlled isometric effort is usually suitable for treatment of specific joint dysfunctions, myofascial trigger points (TrPs), or acute myofascial pain;
2. a stronger contraction can be employed for fibrotic, shortened muscles.

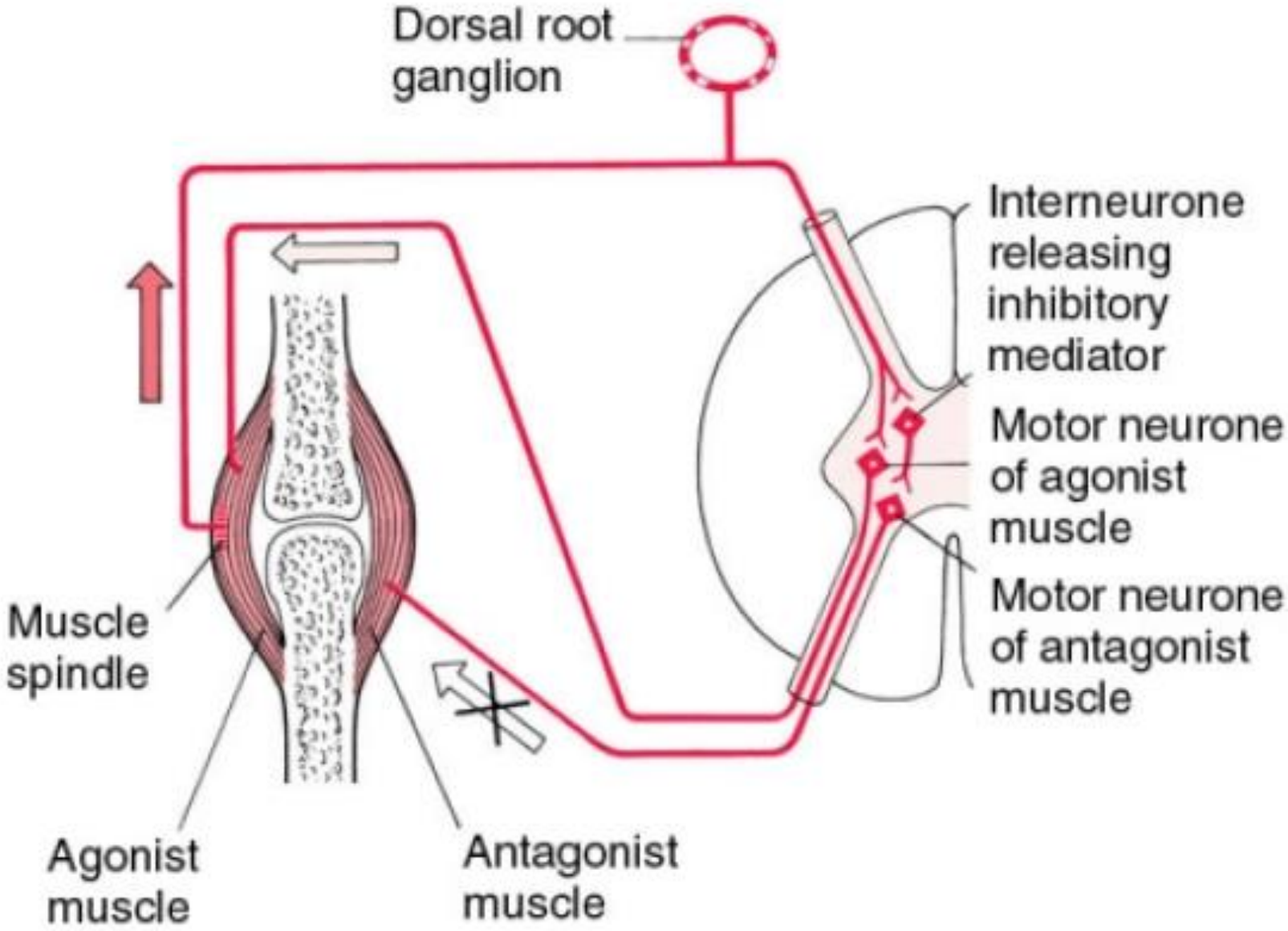
In general,

the precise localization of leverages in one or more planes to a restrictive joint barrier with a gentle contraction effort is important for the application of MET to a single joint dysfunction.

MET is an **active manual technique** in which the patient is also an active participant used to relax the muscle **as compared to static stretching** which is a passive technique in which the therapist does all the work.

What is the “inverse stretch” or the “autogenic” reflex?


Ib
afferent
fibre
Dorsal root
ganglion
Response from
Golgi tendon
organ
Dorsal root
* Excitation
Interneurone
releasing
inhibitory
mediator
Strong
contraction of
skeletal muscle
Motor
neurone
Motor end plate
Cessation
of discharge
Ventral root


Dorsal root ganglion
Interneurone releasing inhibitory mediator
Motor neurone of agonist muscle
Motor neurone of antagonist muscle
Muscle spindle
Agonist muscle
Antagonist muscle

Physiological mechanisms of METs

MET may produce neurological and biomechanical effects:

1. Traditionally, MET was thought to produce **muscle relaxation** via Golgi tendon organ and muscle spindle reflexes (Kuchera & Kuchera 1992; Mitchell Jr & Mitchell 1995), but this explanation seems unlikely as studies had reported increases in electromyographic activity following post-isometric stretching techniques (Osternig et al 1987, 1990).
2. **Increased flexibility** of muscle groups following isometric contraction is largely attributable to an increase in an individual's tolerance to stretch, rather than to lasting biomechanical change in the tissue (Magnusson et al 1996b; Fryer 2013).

Physiological mechanisms of METs

MET may produce neurological and biomechanical effects:

3. Mechanical forces, such as loading and stretching, helps changing the interstitial pressure and increasing transcapillary blood flow and reducing the concentrations of pro-inflammatory cytokines, resulting in decreased sensitization of peripheral nociceptors.

4. MET may involve **neurological mechanisms** to enhance proprioception, motor control and motor learning because it involves active and precise recruitment of muscle activity.

Hypoalgesia effect

- **Increased stretch tolerance may be a result of a decrease in pain perception (hypoalgesia) through:**
- **centrally mediated pathways**:
- the activation of muscle and joint mechanoreceptors involving centrally mediated pathways, such as the periaqueductal grey in the midbrain region and non-opioid serotonergic and noradrenergic descending inhibitory pathways (Souvlis et al 2004; Fryer & Fossum 2010).
- **peripheral mechanisms:**
- Additionally, MET produces hypoalgesia via peripheral mechanisms associated with increased fluid drainage.
- Rhythmic muscle contractions increase muscle blood and lymph flow rates

Muscle energy technique to lengthen the latissimus dorsi muscle.

General principles

The elements comprising the application of MET :

1. Restrictive barrier engagement,
2. force of contraction,
3. duration of contraction
4. and post-isometric stretch,
5. number of repetitions

These can be varied according to:

1. the tissue or joint,
2. the aim of the technique
3. and the response of tissues to treatment.

Definition of the barrier	Point of the first resistance during movement
Initial position	At the barrier
Force of the patient: isometric isotonic	 From light to moderate From moderate to maximum
Duration of contraction	2–3 seconds
Number of repetitions	Generally 3–5 times
Direction of patient's force	Away from the barrier

MET Techniques

1. Hold relax
2. Contract – hold relax
3. Agonist contraction

Indications of MET

Muscle energy technique Indications include :

1. muscular shortening as in low back pain
2. Muscle imbalance
3. limited range of motion
4. somatic dysfunction,
5. cervicogenic headaches
6. Trigger points

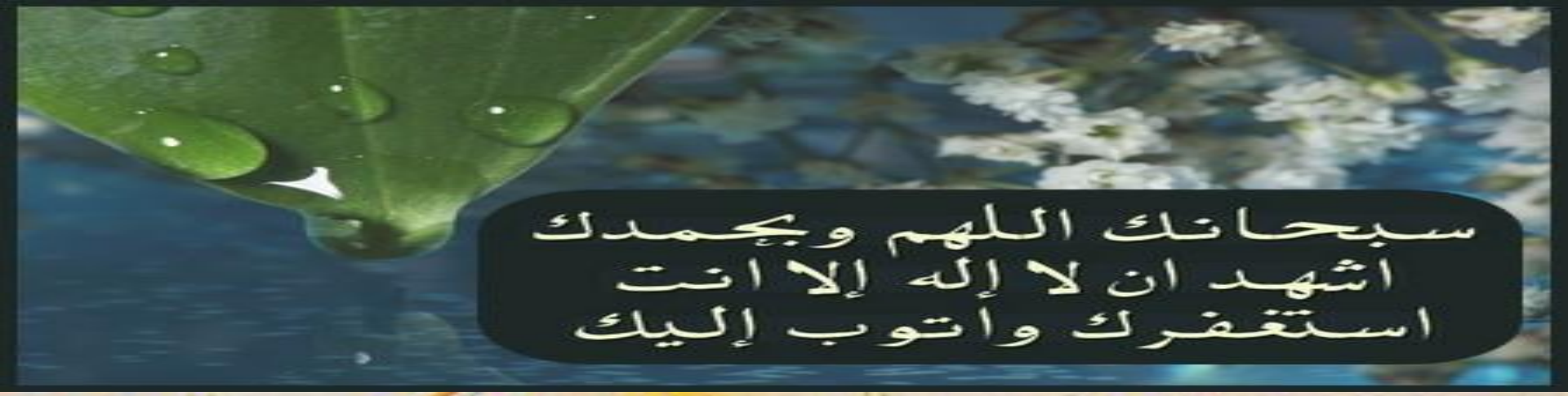
contraindications

Muscle energy technique Contraindication include :

1. fractures,
2. avulsion injuries,
3. severe osteoporosis,
4. open wounds,
5. metastatic disease
6. patient who is unable to cooperate.

Common errors in muscle energy application

1. Joint barrier is overlocked.
2. Patient pushes too hard.
3. Patient's contraction duration is too short.
4. The use of too few repetitions (wait for tissue change).
5. Patient does not relax.
6. Practitioner does not offer stable support of limb, region or patient.
7. Practitioner allows movement during contraction phase.
8. Practitioner is uncomfortable, awkward, poorly positioned, unbalanced or tense.


سبحانك اللهم وبحمدك
اشهد ان لا إله إلا انت
استغفرك واتوب إليك


THANK
You