Basic Concepts of Muscle Energy

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“If all you have is a hammer, everything looks like a nail.”
Muscle Energy or Not?
Purposes and Goals

• Develop a sound biomechanical approach to your evaluation.
• Change how we look at backs, hips, and groins.
• Eliminate the term “low back pain” as a diagnosis.
Purposes and Goals

• Reduce the use of the terms “groin strain”, “hip flexor strain”, and “lumbar strain/sprain”.

• Learn to treat what you see.
Muscle Energy References

• Fred Mitchell, DO, An Evaluation and Treatment of Osteopathic Muscle Energy Procedures
• Phillip Greenman, DO, Principles of Manual Medicine
• JF Bourdillion, Spinal Manipulation
Working Definition

• “Facilitates the correction of biomechanical dysfunctions by normalizing neuromuscularskeletal balance”.

• Any manipulative technique that involves the voluntary use of the patient’s muscles.
Basic Principles

• Hands on technique that stresses the importance of a good biomechanical evaluation.

• Must have a working knowledge of the anatomy and biomechanics of the pelvis and low back.

• Must understand that there is motion occurring at the small joints of the pelvis and spine.
Basic Principles

• Must become adept at discerning subtle changes in the biomechanics of movement and tissue texture.

• Can be more difficult on some athletes than others.
Basic Principles

• Look for “barriers” to motion.
• Recognize that dysfunctions and corrections are found and treated in more than one plane.
• Pain may remain for 24-72 hours after the correction is completed.
Basic Principles

• This is not a technique that can be learned from a book; it takes practice to be able to note the subtle changes of palpation and motion.

• Must establish a rule for the number of treatments before referral.
Adjunct Therapy

• Techniques utilized to eliminate muscle/soft tissue barriers-
  ✓ Myofascial Release;
  ✓ Strain- Counterstrain;
  ✓ Therapeutic Massage;
  ✓ Modalities- ice and/ or stim, hot packs, etc.
Adjunct Therapy

• Techniques utilized for diagnosis and treatment:
  ✓ McKenzie program;
  ✓ Mulligan Techniques (“NAGS”, “SNAGS”, and “MWMS”).
Differential Diagnosis

• **Spondylosis:**
  ✓ Degeneration of the intervertebral disc associated with reactive changes to the vertebral bodies above and below the derangement.

Netter, Ciba Clinical Symposia, Vol. 32, No. 6, 1980
Differential Diagnosis

**Spondylolysis:**
- Uni- or bilateral stress fracture at the pars interarticularis (isthmus) without vertebral slippage.

**Spondylolisthesis:**
- Bilateral stress fracture at the pars resulting in anterior slippage of the superior vertebra on the inferior.
Spondylolysis/ Spondylolisthesis

Netter, Ciba Clinical Symposia, Vol. 32, No. 6, 1980
Differential Diagnosis

Spondylitis:

✓ Degenerative hypertrophy (osteoarthritis); may be associated with any of the aforementioned conditions.

Netter, Ciba Clinical Symposia, Vol. 32, No. 6, 1980
Differential Diagnosis

• **Posterior Lateral Disc Derangement**
  - Usually unilateral.
  - Neurological S & S’s.
  - Decrease strength, reflex, etc.
  - Eliminate as diagnosis prior to treating with ME.
  - Special testing/ imaging to confirm.
Differential Diagnosis

- **Central Disc Derangement**
  - Present with mid-line back pain.
  - Usually no neurological S & S’s.
  - May or may not present with signs of dysfunction.
  - Special testing/ imaging to confirm.
  - Usually do well.
  - Rowing.
Differential Diagnosis

• Osteitis Pubes
  ✓ Pain in groin or hip flexor area.
  ✓ May have symptoms uni- or bilaterally.
  ✓ Usually have associated dysfunctions, which may be different day-to-day.
  ✓ Referral and special testing/imaging.
  ✓ Good luck!!!
Osteitis Pubes

Harris and Murray, British Medical Journal, 1974, 4, 211-216
Differential Diagnosis

- **Gilmore’s Groin**
  - Splitting of lower abdominal connective tissue, most specifically, tearing of the oblique aponeurosis from the inguinal ligament; a tearing of the conjoined tendon; and a splitting of the conjoined tendon from the pubic tubercle.
Differential Diagnosis

• **Athletic Pubalgia**
  ✓ Stretching or tearing of the lower abdominal connective tissue, most specifically, the inguinal ligament, the rectus abdominus, and the conjoined area.

• **Sportsman’s Hernia**
  ✓ A hole or a weak spot in the posterior wall of the inguinal canal.
Differential Diagnosis

ASIS Avulsion Fracture

Pavlov, Clinics in Sports Medicine, Vol. 6, No. 4, October, 1987
Differential Diagnosis

• Tumor

• Pubic Stress Fracture

• Facet Joint Inflammation

• Hip Joint (Acetabulum) Pathology
Barrier Concept

• Types:
  • **Physiological**: limit of active range.
  • **Anatomical**: limit of passive range.
    – Going beyond anatomical barrier results in joint disruption.
Barrier Concept

• **Restrictive**: point in the range of motion where all of the slack is taken out.

• **Muscle**: spasm can be a cause or an effect of biomechanical changes.
Barrier Concept

TOTAL RANGE OF MOTION

ANATOMICAL LIMITS

MIDLINE
Barrier Concept

NEW MIDLINE

OLD MIDLINE

PROM

ACTIVE RANGE OF MOTION

PHYSIOLOGICAL LIMITS

ANATOMICAL LIMITS

MOTION LOSS

RESTRICTIVE BARRIER
Barrier Concept

• Interbarrier Zone
  ✓ Located a few degrees before the muscle barrier is engaged.
  ✓ Before the first muscle fiber goes into a state of contraction due to action of the muscle spindle.
  ✓ A “loose packed” position of a sort.
Barrier Concept

• Three Planar Technique
  ✓ The joint being treated is positioned on three planes in the direction of least mobility.
  ✓ Move to the barrier and back off to the interbarrier zone.
    ➢ Sagital plane = flexion/extension
    ➢ Coronal plane = sidebending
    ➢ Transverse plane = rotation
Direct vs. Indirect Techniques

• Direct Techniques
  – The tissue is moved toward the barrier, on one or more planes.
  – The direction of movement is toward the least mobile, most restricted, and most limited tissue.
  – Muscle Energy is an example of “Direct Treatment Technique”.
Direct vs. Indirect Techniques

• Indirect Techniques
  – The tissue is moved away from the barrier on one or more planes.
  – The direction of movement is toward the most mobile, least restricted, and least limited tissue.
  – Strain-Counterstrain is an example of “Indirect Treatment Technique”.
Leg Length Discrepancies

• Do not underestimate the effect of small differences in leg length.

• Use of good heel lifts can be very effective at correcting leg length discrepancies and eliminating muscle barriers.

• Felt or cork lifts will only last a short time, especially in a heavier athletes.
Leg Length Discrepancies
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Leg Length Discrepancies

- Evaluate in supine with knees bent, feet aligned from side and front views.
- Eliminates muscle barrier discrepancies.
Biomechanical Evaluation

• History- key component.

• Inspection- dominant eye.

• Palpation- subtle changes.

• Functional movement- normal biomechanics.
History

• What are your motion limitations?
• What are your activity limitations?
History

• How does this affect the rest of your activities? Sitting in class? Riding in a car?

• Does the pain interrupt your sleep? Is sleep position affected or changed?

• Any other related previous injury? Lower leg fracture?
Inspection

- View from front, back, and each side.
- Begin with static standing.
- Looking for anatomical differences between each side.
- Begins at the feet and ends at the head.
Spinal Alignment

• Spinal alignment in extension and flexion.

• Shoulder height.

• Discernable “C” curve or “S” curve.
Inspection
Static Standing

Anterior View
Inspection
Static Standing

Lateral View
Inspection
Static Standing

Posterior View
Freyette’s Laws of Physiological Spinal Motion

• When movement is introduced in one plane, the available motion in the two other planes is reduced.

• When one is flexed the ability to side bend and rotate is reduced.
Freyette’s Laws of Physiological Spinal Motion

• In extension and nearly full flexion, the facets are in control and rotation occurs to the side of the concavity (same side) of the side bend.

• Right side bending will accompany right rotation; left side bending will accompany left rotation.
Freyette’s Laws of Physiological Spinal Motion

• With the spine in neutral ("easy normal"), the facets are "idling" (unlocked) and rotation occurs to the side of the convexity of the sidebend (opposite side).

• Right side bending will accompany left rotation; left side bending will accompany right rotation.
Treatment Order

• Pubes
• Iliosacral
• Sacroiliac
• Lumbar
• Thoracic
• Cervical
Basic Concepts of Muscle Energy

• Let the history tell the story; let the hands confirm the history.