

Osteopathic Manipulative Techniques For Lower Extremity Somatic Dysfunction

Section 1 – Articular Techniques

Section 2 – BLT techniques

Section 3 – Counterstrain Techniques

Section 4 – HVLA Techniques

Section 5 – Muscle Energy Techniques

Section 1 – Articular Techniques

Definition	Articular technique consists of direct techniques in which the physician gently and repetitively carries the body part being treated through the restrictive barrier to increase range of motion. Many of these techniques use long lever forces to achieve their effects. Also known as Low Velocity/Moderate to High Amplitude (LVMA) techniques.	
Types	Springing: The activating force is a repetitive springing motion of the joint through the restrictive barrier Concentric: The activating force is a repetitive concentric movement of the joint through the restrictive barrier	
Indications	Indicated when the restrictive barriers to motion are in a joint itself or in the periarticular tissues. It can be used to affect a single joint or for an entire region.	
Contraindications	Relative (may proceed with OMT when benefit outweighs the risk of injury or exacerbation): Pathologic vertebral artery narrowing (cervical region), stable coagulopathies, osteoporosis, osteopenia, neurologic entrapment syndromes, congenital joint abnormalities, or acquired joint degeneration.	Absolute: Lack of patient consent or cooperation, unstable coagulopathies, medically unstable patient with overt or potential life-threatening deterioration, and should not be performed if treatment delays a life-saving procedure. Treatment should not be applied directly to a site demonstrating an open wound, skin derangement, recent surgical incision, fracture, dislocation, infection, or malignancy, local vascular compromise.
Method	1. Move the affected joint or body part through its range of motion until the restrictive barrier is engaged 2. Apply a gentle but firm force, carrying the body part a short distance through the restrictive barrier. *The distance is limited by the tissues being treated and the patient's tolerance to pain or fatigue 3. This force is applied rhythmically, typically 1 or 2 seconds of stretch followed by a similar time frame releasing that stretch. 4. The joint is permitted to return to a point just short of its restrictive barrier. *As the patient responds to the technique, the restrictive barrier will shift position within the physiologic range of motion. 5. For each cycle of the applied technique, reengage the restrictive barrier and carry the affected body part a short distance further through that new barrier to normal motion 6. The technique is continued until the location of the restrictive barrier reaches a plateau or until full physiologic range of motion has been restored to the joint(s) being treated	
Treatment Principles	• Use good ergonomic positioning for patient and operator • The applied forces should be comfortable for the patient. It is generally well tolerated. • At no time is the anatomic barrier to joint motion exceeded	
Complications	The application of force used in any OMT technique can cause post treatment symptoms. Most common symptoms include mild to moderate local pain, discomfort or aggravation of the presenting complaint that typically occurs within 24 hours and resolves within	

48 hours. The forces used in articular techniques can range from very gentle with minimal traction to higher amplitude motion with more forceful traction. In general, post treatment symptoms can be minimized by reducing the force of the technique to accommodate any underlying conditions, such as osteoporosis, ankylosis, or anything that increases the frailty or stiffness of tissues.

Sample Articular Techniques

Technique	Location	Treatment	
Supine direct method LVMA (springing)	Tibia abduction with medial glide	1. Patient is supine with a small pillow under the dysfunctional knee and the physician stands on the side <u>opposite</u> the dysfunction 2. Place the heel of your cephalad hand against the medial condyle of the patient's tibia 3. Grasp the distal tibia so that the thumb is laying parallel to the tibia and is pointing toward the patient's knee. The tibia is internally rotated 4. Low velocity, moderate amplitude springing is applied laterally against the medial tibial condyle as counterforce is offered by the caudad hand 5. Recheck	
Supine direct method LVMA (springing)	Tibia adduction with lateral glide	1. Patient is supine with a small pillow under the dysfunctional knee and the physician stands on the <u>same</u> side as the dysfunction 2. Place the heel of your cephalad hand against the lateral condyle of the patient's tibia 3. Grasp the distal tibia so that the thumb is laying parallel to the tibia and is pointing toward the patient's knee. The tibia is externally rotated 4. Low velocity, moderate amplitude springing is applied medially against the lateral tibial condyle as counterforce is offered by the caudad hand 5. Recheck	
Seated, direct method, articular with traction	Talus eversion with anteromedial glide or inversion with posterolateral glide	1. Grasp the calcaneus with one hand and grasp the talus between the fingers and thumb of the other hand 2. Traction is exerted by a downward pull on the calcaneus and maintained while the physician's hands articulate the talocalcaneal joint through its full range of inversion and eversion 3. Recheck	

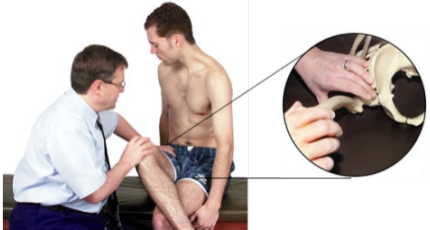
Supine, direct method, articular with patient cooperation (muscle energy)	Cuboid everted with plantar glide, or Cuneiform plantar glide, or Navicular inverted with plantar glide	1. Grasp the patient's foot with both hands. Your fingers are over the dorsum of the foot and the thumbs are on the plantar surface. The patient's ankle is dorsiflexed 2. The thumbs are then crossed. One thumb is on the plantar surface of the cuboid and the other thumb is on the plantar surface of the navicular or cuneiform 3. Opposite tension is applied by the thumbs to separate the navicular and cuboid or the cuneiform and cuboid 4. Increments of inversion or eversion and dorsal or plantar flexion are induced to adequately engage the restrictive barrier 5. Patient is instructed, "Push your foot toward my thumbs" while the physician offers isometric resistance and increases the spreading action 6. Maintain the force long enough to localize (typically 3-5 seconds) 7. Instruct patient to relax 8. Wait for the tissues to relax completely (about 2 seconds) and then move the foot to the new restrictive barrier 9. Repeat until the best motion is obtained (average is 3 times) 10. Recheck	
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Section 2 – Indirect – Balanced Ligamentous Tension Techniques

Definition	An indirect myofascial release manipulative technique where the dysfunctional structures are positioned at the point where tissue tension is balanced in each plane.	
Technique Principles	Balanced Ligamentous Tension (BLT) technique is an "indirect" technique. Similar to Ligamentous Articular Strain (LAS) technique, BLT uses three technique components: 1) exaggeration, 2) disengagement, and 3) balance. Exaggeration refers to taking the dysfunctional tissues into the direction of the injury, thus exaggerating the position of diagnosis to the shifted neutral point. Disengagement refers to a slight amount of compression or traction introduced to unload strained tissue or gap a dysfunctional joint. This may be accomplished with manually or with respiratory cooperation. The balance point is the point at which the dysfunctional tissue is in the greatest ease in all planes. The balance point is where the treatment begins.	
Activating Forces	BLT utilizes inherent forces such as circulatory, lymphatic, or primary respiratory forces to release dysfunctional tissues. Respiratory cooperation may be used to maximize the balance of the dysfunctional tissues. Manual compression or traction may be used with or without respiratory cooperation to bring tissues to maximal balance.	
Indications	Any type of clinically relevant somatic dysfunction.	
Contraindications	Relative (may proceed with OMT when benefit outweighs the risk of injury or exacerbation): Malignancy, infection, severe osteoporosis, fracture, or dislocation at dysfunctional site; gross instability of involved joint; positioning which compromises vascular flow.	Absolute: Lack of patient consent or cooperation, medically unstable patient with overt or potential life-threatening deterioration, and should not be performed if treatment delays a life-saving procedure. Treatment should not be applied directly to a site demonstrating an open wound, skin derangement, recent surgical incision.
Method	1. The dysfunctional structures are moved away from the restrictive barrier (exaggerated) in one or more planes of motion to the point of balanced ligamentous tension, also called the point of greatest ease (shifted neutral). 2. The balance point may be fine-tuned with respiration (inhalation and exhalation) to identify the point of maximal balance.	

	3. The patient holds in the inspiratory or expiratory phase which provides the best ligamentous balance. 4. The physician makes minor adjustments in all three planes as needed to maintain ligamentous balance as the tissues release. 5. Tissues will soften as they release. 6. Reassess tissues after release. 7. Repeat steps 1-6 until no further change is obtained, typically 3 times.
Complications	The application of force used in any OMT technique can cause post treatment symptoms. Most common symptoms include mild to moderate local pain, discomfort or aggravation of the presenting complaint that typically occurs within 24 hours and resolves within 48 hours. The amplitude of motion and force used with BLT is typically very small and results in minimal voluntary guarding. This technique should be very tolerable for most patients and is suitable for hospitalized patients in the intensive care unit.

Sample BLT Techniques

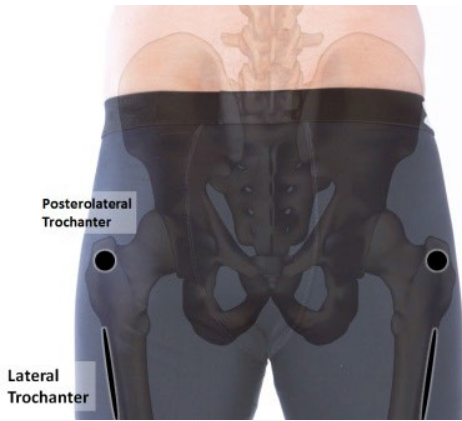
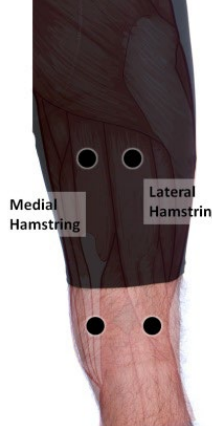
Location	Treatment	
Femoral acetabular joint Any diagnosis	1. Patient seated with dysfunctional leg crossed so calf rests on the contralateral knee, physician places one hand on the femoroacetabular joint and other hand on patient's knee. Physician seated, as shown. 2. Using the hand on the femoroacetabular joint as a fulcrum, use the hand on the knee to assess hip flexion, extension, internal and external rotation, abduction and adduction to determine preferred motion. 3. Position structures at the point of ligamentous balance. 4. Check respiratory phases and hold in best ligamentous balance. Maintain balance with minor adjustments throughout the technique. 5. Recheck and repeat until best motion obtained.	
Tibiofemoral joint Any diagnosis	1. Patient seated or supine. Physician places one hand over the tibiofemoral joint with the other hand grasping distal tibia or ankle. 2. Apply inferior traction to the distal tibia and assess flexion, extension, internal and external rotation, abduction and adduction to determine preferential motion of the tibiofemoral joint. 3. Position structures at the point of ligamentous balance. 4. Check respiratory phases and hold in best ligamentous balance. Maintain balance with minor adjustments throughout the technique. 5. Recheck and repeat until best motion obtained.	

Proximal tibiofibular joint Any diagnosis	1. Patient seated or supine. Physician grasps the proximal fibula with thumb and index finger of one hand and the distal fibula with the with thumb and index finger of the other hand. 2. Assess anterior and posterior glides of the proximal and distal ends of the fibula to determine preferential motion of the tibiofemoral joint. 3. Position structures at the point of ligamentous balance. 4. Check respiratory phases and hold in best ligamentous balance. Maintain balance with minor adjustments throughout the technique. 5. Recheck and repeat until best motion obtained.	
Interosseous joint Any diagnosis	1. Patient seated or supine. Physician supports and lifts the proximal tibia and fibula with one hand and the distal tibia and fibula and ankle with the other hand. 2. Physician carries the knee into partial flexion and assesses internal and external rotation of the knee, dorsiflexion and plantarflexion of the ankle, inversion and eversion of the subtalar joint, and compression and traction along the tibia to determine preferential motion of the structures. 3. Position structures at the point of ligamentous balance. 4. Check respiratory phases and hold in best ligamentous balance. Maintain balance with minor adjustments throughout the technique. 5. Recheck and repeat until best motion obtained.	
Talotibial and Talocalcaneal joints Any diagnosis	1. Patient seated or supine. Physician grasps the patient's calcaneus at the heel with one hand and grasps the talus with the thumb and fingers of the other hand. 2. Apply slight inferior traction to the ankle and assess talotibial dorsiflexion and plantarflexion, tibial internal and external rotation, and talocalcaneal inversion and eversion to determine preferential motion of the dysfunctional structures. 3. Position structures at the point of ligamentous balance. 4. Check respiratory phases and hold in best ligamentous balance. Maintain balance with minor adjustments throughout the technique. 5. Recheck and repeat until best motion obtained.	
Metatarso-phalangeal and Interphalangeal joints Any diagnosis	1. Patient seated or supine. Physician grasps phalanx distal to dysfunctional joint with one hand and proximal metatarsal or phalanx with the other hand. 2. Assess flexion, extension, internal and external rotation, abduction, adduction, compression, and traction to determine preferential motion of the dysfunctional joint. 3. Position structures at the point of ligamentous balance. 4. Check respiratory phases and hold in best ligamentous balance. Maintain balance with minor adjustments throughout the technique. 5. Recheck and repeat until best motion obtained.	

Section 3 - Counterstrain

Definition	Counterstrain is an osteopathic system of diagnosis and indirect treatment in which the patient's somatic dysfunction, diagnosed by an associated myofascial tender point, is treated by using a position of spontaneous tissue release while simultaneously monitoring the tender point. Tender points are small, discrete hypersensitive areas within myofascial structures that result in localized pain.	
Technique Principles	The Proprioceptive Theory proposes that tender points develop when muscle fibers are maintained in a hypertonic state due to an inappropriate proprioceptive reflex following an injury. Counterstrain treatment uses precise body positioning to shorten the antagonist muscle and reduce the muscle spindle activity and abnormal muscle contractions of both the agonist and antagonist muscles. The Sustained Abnormal Metabolism Theory suggests tissue injury alters local body position, affecting local microcirculation and tissue metabolism. The precise body positioning used in Counterstrain restores local vascular circulation and reduces localized production of inflammatory mediators. The Impaired Ligamento-muscular Reflex Theory purposes that dysfunction may result from a protective reflex that occurs when ligaments are placed under strain. A localized strain in a ligament can reflexively inhibit muscular contractions that increase the ligamentous strain and can stimulate muscular contractions that reduce the strain. Counterstrain treatment removes the strain.	
Indications	Any type of clinically relevant somatic dysfunction, preferably with a palpable tender point	
Contraindications	Relative (may proceed with OMT when benefit outweighs the risk of injury or exacerbation): Pathologic vertebral artery narrowing (cervical region), patient who cannot voluntarily relax such as a severely ill patient, malignancy, infection, severe osteoporosis at dysfunctional site, fracture, dislocation, or gross instability of involved joint(s), positioning which compromises vascular flow.	Absolute: Lack of patient consent or cooperation, medically unstable patient with overt or potential life-threatening deterioration, and should not be performed if treatment delays a life-saving procedure. Treatment should not be applied directly to a site demonstrating an open wound, skin derangement, recent surgical incision.
Method	8. Find a significant tender point 9. Establish a pain scale 10. Monitor the tender point as you passively position the patient into the standard treatment position. The treatment position is typically the position of ease or the approximation of the origin and insertion of the dysfunctional structure. 11. Recheck tender point and fine tune positioning with a goal of complete tenderness reduction, through $\leq 30\%$ of original tenderness is acceptable 12. Monitor the tender point and hold treatment position for 90 seconds after patient completely relaxes 13. SLOWLY return patient to neutral 14. Recheck the tender point. The goal is Zero tenderness remaining. Maximum acceptable is 30%	
Complications	The application of force used in any OMT technique can cause post treatment symptoms. Most common symptoms include mild to moderate local pain, discomfort or aggravation of the presenting complaint that typically occurs within 24 hours and resolves within 48 hours. If patient becomes dizzy during initial positioning of a cervical spine technique, immediately return to neutral positioning and perform additional neurological evaluation.	

Sample Counterstrain Techniques

Region	Location	Treatment	
Lower Extremity Hip	Lateral Trochanter (Iliotibial band): along IT band up to 12cm inferior to greater trochanter along femur (push lateral to medial) Posterolateral Trochanter: superolateral surface of posterior aspect of greater trochanter		Lateral Trochanter: prone, moderate hip Abd and slight F Posterolateral Trochanter: prone, hip E with slight Abd and marked ER  
Lower Extremity Knee	Medial Meniscus (Medial collateral ligament): anteromedial joint line $\approx$ 5cm posterior from patellar midline Lateral Meniscus (Lateral collateral ligament): anterolateral joint line $\approx$ 5cm posterolateral from patellar midline Medial Hamstring: Proximal - just medial to midline halfway down shaft of femur in muscle belly. Distal - on medial hamstring tendon at or near distal attachment Lateral Hamstring: Proximal - just lateral to midline halfway down shaft of femur in muscle belly. Distal - on lateral hamstring tendon at or near distal attachment	 	Medial Meniscus: knee F IR Add with ankle plantar flexion and INV Lateral Meniscus: knee F ER Abd with ankle dorsiflexion and EV Medial Hamstring: marked knee F with IR and slight Add Lateral Hamstring: marked knee F with slight ER and Abd    

Lower Extremity Foot/Ankle	Extension Ankle (Gastrocnemius and Soleus): Proximal - within bellies at lower popliteal margin. Distal - on medial and lateral Achilles tendon 3cm superior to calcaneus. Soleus - inferior musculotendinous junction Flexion Calcaneus (Quadratus plantae): anterior aspect of plantar surface of calcaneus Lateral ankle (Peroneus longus): Proximal - 2-4cm inferior to lateral aspect of fibular head. Distal - 2cm anterior and inferior to lateral malleolus in talocalcaneal sulcus Medial Calcaneus (Abductor hallucis): medial aspect of calcaneus 2-3cm inferior and posterior to medial malleolus Medial Ankle (Tibialis anterior): medial aspect of calcaneus in an arc 2cm inferior to medial malleolus Navicular: on plantar surface of navicular	 The diagrams illustrate the locations of tender points on the lower leg and foot. The first diagram shows the posterior view of the leg with points for Proximal Gastrocnemius, Soleus, and Distal Gastrocnemius. The second diagram shows the lateral view of the leg with points for Proximal Lateral Ankle and Distal Lateral Ankle. The third diagram shows the plantar view of the foot with points for Medial Ankle, Navicular, Medial Calcaneus, and Flexion Calcaneus.	Extension Ankle: marked plantar flexion, translating calcaneus proximally Flexion Calcaneus: marked plantar flexion, translating calcaneus distally Lateral Ankle: ankle eversion with slight plantar flexion Medial Calcaneus: subtalar inversion, forefoot pronation/eversion Medial Ankle: marked subtalar inversion Navicular: talotibial plantar flexion, subtalar inversion, and forefoot supination/inversion	 The photographs show a therapist performing tender point treatments on a patient's lower leg and foot. The treatments are labeled: Extension Ankle Tender Point Treatment, Flexion Calcaneus Tender Point Treatment, Lateral Ankle - Distal Tender Point Treatment, Medial Calcaneus Tender Point Treatment, Medial Ankle Tender Point Treatment, and Navicular Tender Point Treatment.
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Section 4 – HVLA Techniques

High Velocity, Low Amplitude Technique

Definition	High Velocity, Low Amplitude (HVLA) technique is an osteopathic technique employing a rapid, therapeutic force of brief duration (high velocity) that travels a short distance (low amplitude) within the anatomic range of motion of a joint, and that engages the restrictive barrier in one or more planes of motion to elicit release of restriction. Also known as thrust technique. (AOA Glossary of Osteopathic Terms). The goal of the treatment is to restore proper physiologic motion to the affected joint.	
Types	Direct HVLA applies a brief thrust at the pathologic or restrictive barrier of a dysfunctional joint Indirect HVLA applies a brief thrust after positioning the dysfunctional joint into a direction of ease. Short lever HVLA uses a force applied directly at level of dysfunction such as cervical HVLA Long lever HVLA uses a force directed from a distance to the level of dysfunction such as iliotibial traction tug for unilateral sacral flexion.	
Indications	Limitation of motion at an articular joint as indicated by passive range of motion that falls short of the physiological barrier. Typically, an abrupt restrictive barrier is present.	
Contraindications	Relative (may proceed with OMT when benefit outweighs the risk of injury or exacerbation): Pathologic vertebral artery narrowing (cervical region), stable coagulopathies or inflammatory arthritis, osteoporosis, osteopenia, neurologic entrapment syndromes, marked joint hypermobility, congenital joint abnormalities, acquired stable joint degeneration (including spinal stenosis, spondylolysis, and spondylolisthesis), and acute herniated nucleus pulposus, sprains, or strains	Absolute: lack of patient consent or cooperation, unstable coagulopathies, medically unstable patient with overt or potential life-threatening deterioration, and should not be performed if treatment delays a life-saving procedure. Treatment should not be applied directly to a site demonstrating an open wound, skin derangement, recent surgical incision, local vascular compromise, unstable spinal cord conditions (including Chiari malformation or cord compression), and any condition resulting in locally compromised bone or joint stability including unstable joint degeneration or congenital anomalies (including joint instabilities due to Downs syndrome or Achondroplastic dwarfism fracture), dislocation, surgical or congenital joint fusion or fixation, infection (including septic arthritis and intramuscular abscess), severe inflammatory arthritis, or malignancy
Method	1. Initial positioning is accomplished by locally engaging the restrictive barriers in all three planes (flexion/extension, rotation, and sidebending) by stacking the individual barriers one after the other. 2. Localize by fine tuning the positioning to best localize without causing patient guarding. 3. Activating force is a quick (high velocity), short (low amplitude) force (thrust) through the restrictive barrier, stopping short of the anatomic barrier. May result in audible “click” or “pop”. 4. Reassess motion restriction.	
Treatment Principles	• Dosage should be metered to the patient. Younger, healthier patients generally tolerate and respond to HVLA better than older, sicker patients. Repeated HVLA to the same structures suggests a separate underlying cause for somatic dysfunction that ought to be investigated. • Thrusting through restrictive barrier should results in prompt, immediate improvement in articular range of motion. • Corrective thrust is often applied during exhalation when the body is naturally more relaxed.	
Complications	The application of force used in any OMT technique can cause post treatment symptoms. Most common symptoms include mild to moderate local pain, discomfort or aggravation of the presenting complaint that typically occurs within 24 hours and resolves within 48	

hours. HVLA thrusts against actively contracted muscles such as patient guarding will likely result in increased post treatment soreness. HVLA thrusts in the upper cervical spine, especially when performed with regional cervical extension, have been associated with vertebral artery and spinal cord shock injuries. If patient becomes dizzy during initial positioning of a cervical spine technique, immediately return to neutral positioning as perform additional neurological evaluation.

Sample HVLA Techniques

Region	Location	Treatment	
Knee	Fibular head posterior	1. Patient may be supine or prone 2. Physician places their one hand in the popliteal area with the thumb or hand in contact with the posterior aspect of the head the of fibula acting as a fulcrum 3. Physician grasps the patient's foot with his/her caudad hand, flexes the knee, externally rotates the tibia, everts and dorsiflexes the foot and brings the fibular head to the restrictive barrier 4. A high velocity, low amplitude thrust is applied further flexing the knee and externally rotating the tibia, carrying the fibular head anteriorly on the externally rotating tibia 5. Recheck	  Supine Setup Prone Setup
	Fibular head anterior	1. Patient is supine with the knees extended 2. With one hand, internally rotated the ipsilateral tibia and the plantar flex and invert the ankle and foot 3. With the other hand contact the anterior aspect of fibular head and apply anterior to posterior pressure to move the fibular head posteriorly to its restrictive barrier 4. A high velocity, low amplitude thrust is applied posteriorly through the fibular head 5. Recheck	
Ankle	Anterior Talus	1. Physician grasps the dysfunctional foot and curls the 5th finger of one hand around the head of the talus and reinforces it with the 5th finger of the other hand. The remaining fingers of both hands are interlaced over the dorsum of the patient's foot. The pads of both thumbs are placed on the plantar surface of the metatarsal bones near the midline of the foot 2. The ankle is dorsiflexed to engage the restrictive barrier and the barrier is maintained as steady caudad traction is applied to the ankle joint 3. A high velocity, low amplitude tug is applied to the dorsiflexed ankle with the force carried through to the talus by the contact of the physician's 5th fingers 4. Recheck	

Foot	Hiss Whip Cuboid everted with plantar glide Navicular inverted with plantar glide Cuneiform plantar glide	- Physician bends the knee on the dysfunctional side and grasps the foot with both hands. The fingers are interlaced around the dorsum of the foot and then the thumb is placed on plantar surface of one of the following: <i>For cuboid eversion:</i> the midline prominent margin of the cuboid bone <i>For navicular inversion:</i> the midline prominent margin of the navicular bone <i>For cuneiform plantar glide:</i> the plantar surface of the dysfunction cuneiform - The dysfunctional tarsal bone is carried dorsally to the restrictive barrier - A high velocity, low amplitude thrust is applied to the tarsal bone in one of the following directions: <i>for cuboid:</i> dorsolaterally <i>for navicular:</i> dorsomedially <i>for cuneiform:</i> dorsally - Recheck	
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Section 5 – Muscle Energy Techniques

Definition	Muscle Energy (ME) technique is a form of osteopathic manipulative diagnosis and treatment in which the patient's muscles are actively used on request, from a precisely controlled position, in a specific direction, and against a distinctly executed physician counterforce.	
Technique Types and Principles	Postisometric relaxation takes advantage of the reflex relaxation that occurs right after a muscle contraction. Joint mobilization using muscle force uses a strong voluntary muscle contraction to gap an affected joint (example: pubic compression). Respiratory assistance uses voluntary motion of the respiratory muscles as the activating force. Oculocephalogyric reflex uses eye muscles initiate reflex muscle contractions in the cervical spine. Reciprocal inhibition uses a contraction in an agonist muscle to reflexively relax an antagonistic muscle. Crossed extensor reflex uses muscle contraction in one extremity the treat the contralateral extremity.	
Types of Muscle Contraction	Isokinetic Strengthening: Isokinetic strengthening allows the affected muscle to slowly shorten during a sustained concentric muscle contraction in order to build strength in the affected muscle. Isometric Muscle Contraction: Most common form of contraction used in muscle energy technique. The origin and insertion of the muscle are maintained in a stationary position while the muscle is contracted against resistance. Isotonic Muscle Contraction: This basic principle is applied to joint restriction by activating a specific muscle while fixing only one end of the muscular attachment, with the goal of restoring normal mechanics. Hypotonic, reflexively inhibited muscles are frequently treated with isotonic contractions. Isolytic Muscle Contraction: Used for the treatment of fibrotic or chronically shortened myofascial tissues. The applied counterforce is greater than the patient force, resulting in lengthening of the myofascial tissues.	
Indications	Any type of clinically relevant somatic dysfunction	
Contraindications	Relative (may proceed with OMT when benefit outweighs the risk of injury or exacerbation): Pathologic vertebral artery narrowing (cervical region), stable coagulopathies, osteoporosis, osteopenia, neurologic entrapment syndromes, congenital joint abnormalities, or acquired joint degeneration.	Absolute: lack of patient consent or cooperation, unstable coagulopathies, medically unstable patient with overt or potential life-threatening deterioration, and should not be performed if treatment delays a life-saving procedure. Treatment should not be applied directly to a site demonstrating an open wound, skin derangement, recent surgical incision, fracture, dislocation, infection, or malignancy, local vascular compromise.
Method	15. Initial positioning is accomplished by engaging the restrictive barriers in all three planes, then localize by fine tuning of the positioning at the dysfunction without causing patient guarding 16. Physician establishes an appropriate counterforce 17. Patient introduces appropriate muscle energy effort against physician counterforce for 3-5 seconds with the amount of force dependent upon the type of muscle energy technique being performed 18. The patient must completely relax following muscle effort for 1-2 seconds (post-relaxation phase) 19. Physician repositions the patient at the new restrictive barrier 20. Repeat steps 2-5 until no further change is obtained, typically 3-5 times. 21. Reassess for appropriate change	

Complications	The application of force used in any OMT technique can cause post treatment symptoms. Most common symptoms include mild to moderate local pain, discomfort or aggravation of the presenting complaint that typically occurs within 24 hours and resolves within 48 hours. Depending on the somatic dysfunction present, the style of muscle energy may vary. In addition, the length of contraction may be altered from one body region to another or one patient to another as muscle morphologies are different. If the technique is unsuccessful, the somatic dysfunction might be severe/chronic or there was an inaccurate diagnosis. Specific patient positioning in combination to the force/duration of contraction is important to maximize success and minimize post treatment symptoms. Additional somatic dysfunction may develop if the patient does not completely relax during the repositioning between contractions.
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Sample Muscle Energy Techniques

Region	Location	Treatment	
Hip	Shortened hip extensors	1. Patient is supine and his/her heels or distal portion of leg is placed on physician's medial shoulder while physician grasps patient's distal thigh above patella with both hands 2. Physician raises extended leg and flexes patient's hip to muscular barrier by lifting his/her shoulder upward and/or walking toward patient's head 3. Patient pulls heel down toward physician's shoulder while physician offers isometric counterforce for 3 to 5 seconds 4. Patient and physician relax completely (1-2 seconds) and then physician moves leg to new muscular barrier 5. Repeat steps 3 and 4 until best motion is obtained, typically 3-5 times 6. Recheck	
	Shortened hip flexor (iliopsoas)	1. Patient is supine at end of table with both legs hanging off 2. Physician flexes leg opposite of restriction and places that knee against his/her chest while physicians hand on side of restriction is placed on other knee to extend to muscular barrier 3. Patient pulls knee up toward ceiling while physician offers isometric counterforce for 3 to 5 seconds 4. Patient and physician relax completely (1-2 seconds) and then physician moves leg to new muscular barrier 5. Repeat steps 3 and 4 until best motion is obtained, typically 3-5 times 6. Recheck	
	Shortened hip abductors	1. Patient is supine and physician crosses dysfunctional extremity over the opposite thigh and places his/her forearm under the dysfunctional leg below knee and grasps opposite knee to provide counterforce 2. Physician's other hand is placed on patient's other ASIS to stabilize pelvis 3. Physician adducts thigh to its muscular barrier without pelvis lifting from table 4. Patient pushes knee of dysfunctional leg toward physician while physician offers isometric counterforce for 3 to 5 seconds 5. Patient and physician relax completely (1-2 seconds) and then physician moves leg to new muscular barrier	

		6. Repeat steps 4 and 5 until best motion is obtained, typically 3-5 times 7. Recheck	
	Shortened hip adductors	1. Patient is supine and physician grasps patient's leg and abducts thigh to muscular barrier. 2. Physician stands between table and patient's thigh and supports distal thigh, knee, or possibly ankle against his/her hip 3. Physician's opposite hand is place over opposite ASIS to stabilize pelvis 4. Patient pushes knee against physician's hip while physician offers isometric counterforce 5. Patient and physician relax completely (1-2 seconds) and then physician moves leg to new muscular barrier 6. Repeat steps 4 and 5 until best motion is obtained, typically 3-5 times 7. Recheck	
Knee	Tibial external rotation with anteromedial glide	1. Patient sits with legs hanging off table and physician places palm of his/her hand on medial side of patient's proximal tibia while fingers wrap around posterior aspect of tibia and thumb bridges medial joint space to monitor motion and palm creates posterolateral glide 2. Physician grasps patient's ankle and foot with other hand to apply traction, internal rotation, and posterolateral glide to restrictive barrier 3. Patient turns foot outward while physician offers isometric counterforce for 3 to 5 seconds 4. Patient and physician relax completely (1-2 seconds) and then physician internally rotates and allows posterolateral glide of tibia to new restrictive barrier 5. Repeat steps 3 and 4 until best motion is obtained, typically 3-5 times 6. Recheck	
	Tibial internal rotation with posterolateral glide	1. Patient sits with his/her legs hanging off table and physician lays palm of his/her hand on medial side of patient's proximal tibia with the fingers around the posterior surface of the thumb bridging the medial joint space to monitor motion and create posterolateral glide 2. Physician grasps patient's foot and ankle with other hand to apply traction, external rotation, and anterolateral glide to restrictive barrier 3. Patient turns foot inward while physician offers isometric counterforce for 3 to 5 seconds 4. Patient and physician relax completely (1-2 seconds), then physician externally rotates and allows anteromedial glide of tibia to new restrictive barrier 5. Repeat steps 3 and 4 until best motion is obtained, typically 3-5 times 6. Recheck	

	Fibular head anterior	1. Patient sits with his/her legs hanging off the table and physician grasps fibular head between index and middle fingers and the thumb of one hand 2. Physician's other hand grasps the patient's foot 3. The tibia is internally rotated and the foot is plantar flexed and inverted, carrying the fibular head posteriorly to the restrictive barrier 4. Patient turns foot outward while the physician offers isometric counterforce for 3 to 5 seconds. 5. Patient and physician relax completely (1-2 seconds) and then physician moves fibular to new restrictive barrier. 6. Repeat steps for and 5 until best motion is obtained, typically 3-5 times 7. Recheck	
	Fibular head posterior	1. Patient sits with legs hanging off table and physician places thumb behind fibular head to carry it in an anterolateral direction 2. Physician's other hand dorsiflexes and everts foot and externally rotates tibia. 3. Patient turns foot inward while physician offers isometric counterforce for 3-5 seconds. 4. Patient and physician relax completely (1-2 seconds) and then physician moves fibula to new restrictive barrier 5. Repeat steps 3 and 4 until best motion is obtained, typically 3-5 times 6. Recheck	
Ankle	Anterior talus	1. Patient sits with legs hanging off table and physician grasps patient's heel in palm of one hand and grasps talus between index and middle fingers and thumb of other hand. 2. Apply slight traction to ankle joint, plantar flex foot and internally or externally rotate, evert or invert to reach point of balanced ligamentous tension 3. Patient pulls toes upward while physician offers isometric counterforce for 3-5 seconds. 4. Patient and physician relax completely (1-2 seconds) and then physician moves let to new point of ligamentous balance. 5. Repeat steps 3 and 4 until best motion is obtained, typically 3-5 times 6. Recheck	

Sources:

Foundations of Osteopathic Medicine 4th Ed

Kimberly Manual

The Glossary of Osteopathic Terminology 3rd Edition