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# Osteoarticular Maneuvers for Pain Relief and Restoration of Ankle Mobility

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**Abbreviations:** AAOMPT: American Academy of Orthopaedic Manual Physical Therapists; IFOMPT: International Federation of Orthopaedic Manipulative Physical Therapists; OMPT: Orthopaedic Manual Physical Therapy; FLAQ: Federación Latino Americana de Quiropráctica; MWM: Mobilization with Movement

## Generalized Anxiety Disorder

Among the musculoskeletal injuries, ankle injury represents about 25% of all sports injuries, and is the second most affected body part, only behind the knee joint [1]. In 80% of the cases, this joint is affected by sprains, mainly by the inversion mechanism of the hindfoot and external rotation of the tibia, compromising the lateral ankle ligament complex, causing pain and alteration of function for weeks [2,3]. It occurs most often in women and about 74% progress to chronic instability. Even after 12 months, about 33% of patients complain of pain, swelling, and stiffness. Symptoms that after 5 years persist in 20% of those affected and are associated with inadequate rehabilitation [4,5]. The ankle supports 1.5 times the body weight during walking and 5.5 times the body weight during intense running [6]. It is the most common load-bearing joint in the human body, with malleolar fractures being the most common, and the patient may be immobilized for 6-12 weeks depending on whether the fracture is stable or unstable. The patient commonly presents a pain and restricted range of motion to be addressed in physical therapy [7,8]. For these cases, joint mobilization techniques, such as the Maitland and Mulligan concepts, can collaborate in pain relief, through the activation of ascending analgesic pathways (peripheral - Theory of the floodgates) and descending (central inhibitory pathway), and joint stiffness, by temporarily increasing the space between the articular surfaces. However, these resources are not resolutive but are part of integrated treatment, so in order not to create dependency or false expectations with the maneuvers, the real purpose of the techniques must be explained to the patient [9-13].

In the 70s-90s professional manual therapy organizations were created such as the American Academy of Orthopaedic Manual Physical Therapists (AAOMPT), International Federation of Orthopaedic Manipulative Physical Therapists (IFOMPT), Orthopaedic Manual Physical Therapy (OMPT) and Federación Latino Americana de Quiropráctica (FLAQ), with structure and criteria for learning osteoarticular maneuvers [9]. Today, Maitland's and Mulligan's concepts are part of the physiotherapist's training that seeks knowledge in manual therapy resources and will be briefly addressed in a general way below.

The objective of this scientific communication is to function as a quick reference guide for the physical therapist, based on the illustration and description of the maneuvers applicable to the ankle. Remember that these are basic techniques, with variations and alternatives, but that even so, they should be performed after a previous and specific evaluation of each patient [14]. To facilitate understanding, the techniques were compiled here as "passive, active-assisted, and active", but usually each concept is

studied individually, and these nomenclatures are rarely used. The passive articular techniques (Figure 1) are characterized by oscillatory and rhythmic accessory movements graded I - IV by Maitland or the application of short, rapid force (V - Thrust) on the end-feeling. The patient's participation is restricted to relaxation, not locking the movement, and allowing the physical therapist to work. Mobilizations I-IV should be applied in 4-6 series of 20 seconds to 2 minutes each, while thrust should be applied only once [15].


**Figure 1:** Passive joint mobilizations. E - indicates a site that must be stabilized, Arrow: indicates the direction of sliding, A - posterior sliding of the tibia for increased plantarflexion, B - inferior sliding for relief of the talocrural joint, C - anterior sliding of the talus for increased plantarflexion, D - posterior sliding of the talus for dorsiflexion gain, E - inferior gliding for subtalar joint relief, F and G - medial and lateral gliding of the subtalar joint for inversion and eversion improvement, H - malleolar gliding for plantar flexion and dorsiflexion, I - anteroposterior gliding of the navicular bone for midfoot mobility.

The techniques described here as "active-assisted" (Figure 2) would be based on the knowledge described by Mulligan. During the requested exercise, the physiotherapist should follow the movement with a facilitatory joint sliding (mobilization with movement - MWM) and analyze whether or not there was an improvement of the patient's complaint. If the answer is positive, the positioning is maintained. If it doesn't change or worsen the symptoms, then the professional should use another glide until he or she finds a way to help the joint kinematics that provides symptom improvement or decides not to use the technique. This "test" as to the ideal treatment plan (glide) should be done up to a maximum of 10 repetitions and then the MWM performed for 3-4 sets of 10 repetitions. A belt can be used to stabilize or facilitate the movements proposed by Mulligan's concept [16].

The active joint techniques (Figure 3) are orientations carried out and tested during physiotherapeutic care that should be incorporated into the patient's routine since symptom improvement has been reported with such movements and the patient can reproduce them accurately. The aforementioned concepts are adopted for active-assisted joint techniques and an overpressure at the end of the movement, to increase the final ROM [12,16].


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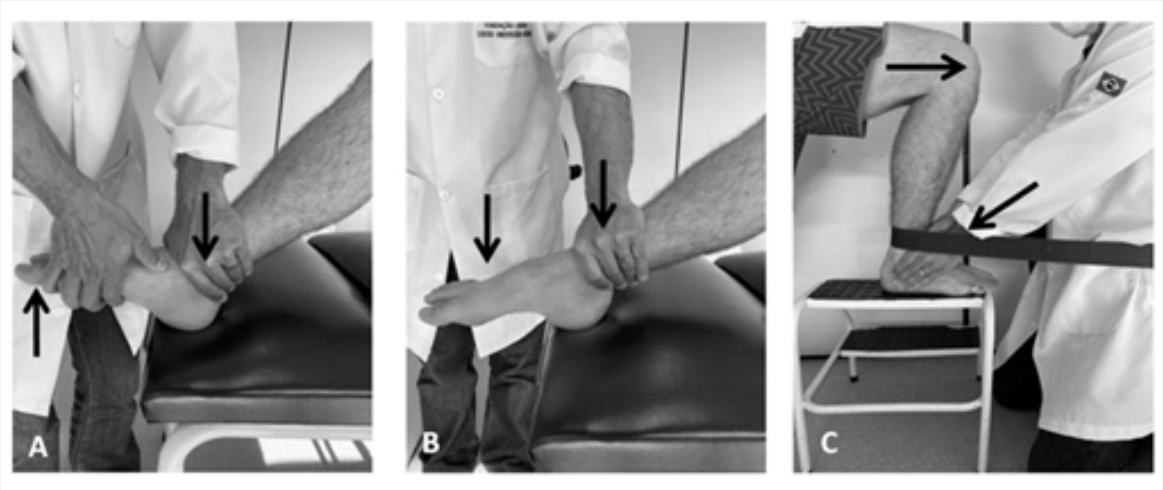


**Figure 2:** Mobilizações articulares ativo-assistidas. Arrow in hand indicates sliding, Other arrows indicate movement, A - posterior sliding of the talus while the patient performs dorsiflexion, B - posterior sliding of the tibia while the patient performs plantarflexion, C - posterior sliding of the talus while the patient performs dorsiflexion in a closed kinematic chain.

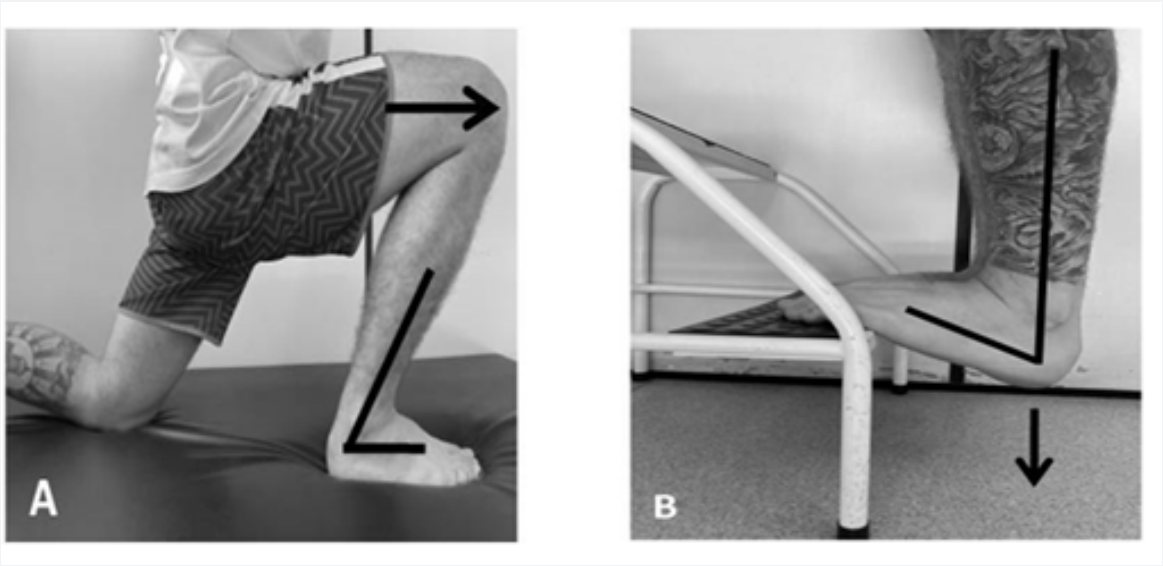


**Figure 3:** Active joint mobilizations. A - Dorsiflexion in the closed kinematic chain in the Half-kneeling position, B - Dorsiflexion in a closed kinematic chain with the aid of a step.

For these cases, joint mobilization techniques, such as the Maitland and Mulligan concepts, can collaborate in pain relief, through the activation of ascending analgesic pathways (peripheral – Gate control theory) and descending (central inhibitory pathway), and joint stiffness, by temporarily increasing the space between the articular surfaces. However, these resources are not resolutive but are part of integrated treatment, so in order not to create dependency or false expectations with the maneuvers, the real purpose of the techniques must be explained to the patient [9-13].

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