MUSCLE (mm) CONTRACTIONS

There are 3 types of mm contractions, Isometric, Isotonic and Isokinetic.

ISOMETRIC: is a type of strength training in which the joint angle and mm length DO NOT change during the contraction of the mm. Isometric training provides strength gains with minimal to no hypertrophy depending on the intensity of training. Regrettably, Isometrics are virtually non-existent in training today unless the trainer or athlete understands the benefit of this type of training and mm contraction. A brief routine of Isometrics after the initial warm up and prior to isotonic training has shown, in some studies, to functionally prepare the mm's for isotonic training and improve overall mm function.

ISOTONIC (concentric/eccentric): during this type of training, the mm's change length during the contraction that moves the levers of the body and body parts. The **concentric contraction shortens the mm length** while the **eccentric contraction lengthens the mm length**. Using the Bicep mm, or the mm of the front of the upper arm for an example, with the arm in complete extension hanging by your side in the standing position, move the hand toward the upper arm. That is the concentric or shortening contraction of the Bicep mm. Now, move the hand back down. That is the eccentric or lengthening contraction of the Bicep mm. Isotonic training and contractions increase lifting capacity or strength and hypertrophy or size of muscle. This is the type of resistance training that you will predominately see in a gym. It can be done with body weight or resistance training equipment.

ISOKINETIC: this mm contraction is one in which the mm shortens and lengthens at constant rate of speed and load during movement. This training necessitates specialized equipment that increases load as it senses mm contraction is speeding up. The theory of this training is that the agonist and antagonist mm's gain strength in a more balanced manner through the entire AROM (active range of motion) and is considered to be one of the fastest ways to gain strength while providing joint articulation integrity and functional joint kinematics. This type of equipment is commonly found in college athletic training facilities and physical therapy clinics and utilized for rehabilitation purposes and the development of sport specific athleticism.
The equipment can and has been also utilized for injury risk assessment in pre-employment screenings for specialized jobs such as a snow ski instructor and the like. It is very rare to see this type of equipment in public health clubs unless supervised and mainly due to the expense and need to know how to operate the machinery properly without causing injury.