

BRINGING NEW LIFE TO ELASTIC BAND & TUBING EXERCISES



► Is there anyone who can't find space for some form of elastic resistance in their workplace? When you prescribe exercises using this form of resistance do you know how to properly position your patient, how many repetitions, and what colour should be prescribed?

Physiotherapists prescribe elastic resistance most commonly due to its low cost, simplicity, portability, and versatility. But do we really know the basic material properties governing elastic resistance and the biomechanics of elastic material that would be most helpful in prescribing exercises. Did you know that elastic resistance has the same strength curve profile as isotonic resistance and it has similarly been shown to increase muscle strength in many different populations between 10 % and 20% and even up to 150%?

Elastic resistance cannot be classified as isotonic, isokinetic, or isometric training. IT IS UNIQUE. This is because the force changes when an elastic band is stretched (see isotonic) and there can also be a change in stretch rate or velocity as the band is stretched (see isokinetic).

There are many variables that must be taken into account when prescribing exercise. The length of the band and the position of the patient can dictate changes in the joint load (torque) encountered during elastic exercise. The size of the elastic material, rate or velocity of stretch, and cyclic loading and deformation will also impact the load on the joint.

Basic rules to learn and remember when using elastic bands:

1. Use a starting length of band or tubing equal to the length of the lever arm.
2. Don't stretch bands more than 3 times their resting length (> 200% elongation)
3. Align the origin of the band with the axis of rotation and plane of motion.

Researchers have attempted to quantify the amount of force generated during stretching of elastic material. The resultant force-elongation curves for various resistance of Thera-Band elastic bands have been documented (Page et al. 2000). They can be used as a baseline and as progressions in an exercise regime. For instance, if a Thera-Band red resistance band is elongated to 100% of its original length (double its resting length), then the force generated is just under 2 kg. Remember that a thicker band provides more resistance than thinner ones, so the force generated will increase with the thicker blue or black band.

The torque (strength curve) created when an elastic band is stretched throughout its ROM is similar to the strength capacity curve in humans. In other words, the elastic band generates its greatest torque at approximately the same point that the muscles are able to create their maximum force generation when patients are properly positioned. When using a length of band equal to the lever arm over 180 degrees, maximum resistance torque will occur at mid-range, or approximately 100% elongation. Therefore, elastic resistance training that loads muscle to its capacity throughout the ROM should safely and effectively result in optimal muscle activation and greater strength gains. (Page P., Ellenbekker T., The Scientific and Clinical Application of Elastic Resistance, 2003)

Hopefully this will give the clinician some guidance when prescribing elastic resistance and an appreciation that there is more potential that can be gained from this 'piece of rubber'!



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► **For more information, visit www.Thera-BandAcademy.com**

Photo: This is NOT Karen tangled amidst her theraband, but rather what is known as a '**Bruegger wrap**' involving both the upper and lower extremities. It combines ankle dorsiflexion & eversion, hip abduction & external rotation, finger & wrist extension, elbow extension, and shoulder external rotation...a great exercise for the computer geek!!

