

# Reciprocal Inhibition Exercises.

## Disclaimer -

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## Physiological principle -

Sir Charles Scott Sherrington's second law, *The law of reciprocal innervation* states that when contraction of a muscle is stimulated, there is a simultaneous inhibition of its antagonist.

Sherrington Sir Charles Scott (1906) *The Integrative Action of the Nervous System*.



## Definition -

Reciprocal inhibition (RI) exercise attempts to achieve the simultaneous relaxation of one muscle by the contraction of its antagonist muscle. In reality other muscles are involved both in the contraction and the ensuing relaxation.

## The benefits -

In accordance with Sherrington's second law, a muscle can be induced to relax by applying a stretch from the opposing muscle. This is the direct benefit. The indirect benefit is that muscle tension over a given joint is equalised because of the spasmed muscle's automatic relaxation response. RI exercises thus provide for optimum joint function and longevity of the joint because the surrounding muscles are pulling with a balanced force.

### **How it works -**

When one muscle (the agonist) is stretched, the opposing muscle's (the antagonist's) stretching power is inhibited. This means that if you apply a pull by contracting the biceps, the pulling power on the opposing muscle, in this case the triceps is inhibited and so relaxation of the triceps occurs.

### **Examples of agonists and antagonists -**

| <b>Agonist</b>    | <b>Antagonist</b>                     |
|-------------------|---------------------------------------|
| Anterior Deltoid  | Levator Scapula                       |
| Biceps            | Triceps                               |
| Deltoids          | Latissimus Dorsi                      |
| Forearm Flexors   | Forearm Extensors                     |
| Hip Adductor      | Gluteus Medius                        |
| Iliopsoas         | Gluteus Maximus                       |
| Pectoralis Major  | Trapezius / Rhomboids                 |
| Quadriceps        | Hamstrings                            |
| Rectus Abdominus  | Hamstrings, when knees are extended.  |
| Tibialis Anterior | Gastrocnemius, when knee is extended. |
| Tibialis Anterior | Soleus, when knee is flexed.          |

### **Applications -**

RI exercises are one of many modalities for stretching individual muscles or muscle groups. The main role of RI exercises is to relax a specific muscle or group of muscles and thereby allow it or them to elongate without direct stretching. This is beneficial where there is spasm, shortening or tightness. It is especially useful for persons, who have been debilitated by ill-health, injury or where the muscle or muscle group has not been used and disuse atrophy has resulted.

### **The method of application -**

Using the Tibialis Anterior - Gastrocnemius from the examples above, keep the knee straight and the foot vertical, pull the foot toward you by dorsiflexing the ankle. The time to hold the stretch is seven seconds. Then relax. This can be repeated as often as one wishes.

### **The timing of stretches -**

Regarding the time of seven seconds. There is a large number of opinions relating to the length of time to hold any particular type of stretch. The writer has found seven seconds for this type of exercise to be adequate to facilitate the relaxation of the antagonist muscles.

If there are any questions, please email [brettmedlaw@yahoo.co.uk](mailto:brettmedlaw@yahoo.co.uk) or text 0780 375 5947.

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