

EARLY INTENSIVE STRENGTH TRAINING WITH FIXED OVERHEAD RESISTANCE BANDS FOR PERSONS ON BEDREST

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Description

Immobility has severe health consequences¹. It increases not only the risk of pulmonary and pressure ulcer complications but also induces loss of muscle mass and muscle strength, which influences life functions². Older persons have a relatively low reserve capacity due to sarcopenia and statistics show that many elderly patients fail to regain their prior levels of function and self-care after hospital admissions³. Therefore, a great incentive exists to counteract loss of muscle mass and strength and promote meaningful movement during hospitalizations. Strength training has shown to be effective in improving and maintaining muscle strength and preventing muscle atrophy³⁻⁴. Strength training has been accomplished via use of accessible exercise equipment, such as, resistance (elastic) band, as they're easily applied and studies have demonstrated effectiveness compared to dumbbells⁵.

Summary of use

Using resistance bands, we have activated specific muscle groups and some important stabilizing muscles with persons in bed, using a fixed point above the bed for the resistance bands. An attachment to an overhead, in-room patient lift provided the basis for the point of fixation for the bands⁶.



Take home message 1:
Use it or lose it!

Design

Seven healthy females (mean age 46, range 27-56 yrs., mean BMI 24, range 20-29) volunteered.

Three elastic band strength exercises (shoulder extension, elbow extension and hip extension) using Thera-Band™ were evaluated.

Electromyography (EMG) was measured on 8 relevant muscles (5 upper and 3 lower body muscles) with wireless MYON 320 (Myon AG Switzerland) and shown as mean EMG activity in percentage of Maximum Voluntary Electrical activation (MVE) for each muscle.

Individual 8 and 15 Repetition Max (RM) was pre-defined by a combination of elastic band resistance and length of elastic band.

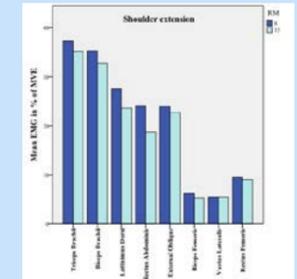
Results

The figures show the three different exercises and mean EMG in percentage of MVE for 15RM and 8RM. Shoulder and elbow extension primarily activated m. triceps brachii, biceps brachii, rectus abdominus and latissimus dorsi muscles.

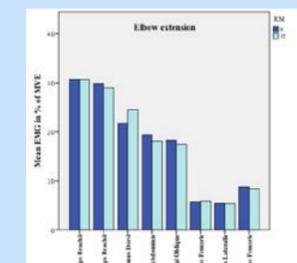
Hip extension movement with the bands activated the biceps femoris, rectus femoris, external oblique, and biceps brachii muscles.

No significant difference between 15RM and 8RM was found for any of the three exercises.

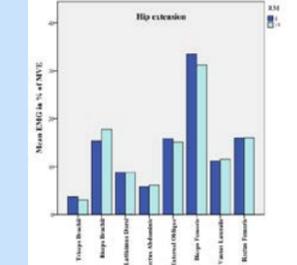
Shoulder Extension



Elbow Extension



Hip Extension



Take home message 3:
Limited only by imagination

Importance to Members

To our knowledge this is the first reported use of a fixed point above the bed to assist performance of resistance band exercises in bed. This attachment is unique and quite useful to achieve resistance in the motions of shoulder, elbow and hip extension. This, in combination with differing lengths and levels of resistance for the bands, provides individual adaptation to strength training, feasible even for bedrest patients. There is a great potential for implementing resistance band exercises into practice and begin useful movement early in order to counteract the negative consequences of immobility and bedrest. This study contributes to the ongoing discussion of the benefits of intensive strength training during a hospital stay.



Special Thanks

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