

**Title: Efficacy of Countermeasures during Bed Rest: A systematic review**

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**Backgrounds and aims:** Maintaining skeletal muscle mass and function in aging is crucial for preserving quality of life and health. Experimental bed rest (BR) protocol is a suitable model to explore muscle decline on ageing during inactivity. This systematic review focuses on the efficacy of potential countermeasures during experimental BR in healthy older adults.

**Methods:** This work was conducted in accordance with PRISMA guidelines

**Results:** Neuro-Muscular-Electrical-Stimulation combined with proteins supplementation don't prevent leg muscle quantity and performance loss, although body mass is preserved ( $p < 0.05$ ) [1,2]. Daily intake of 15g essential amino acids isn't effective to contrast leg lean mass decline even though muscle power is maintained ( $p < 0.05$ ) [3] as well as muscle protein fractional synthesis rate [4], Leucine supplementation seems to protect leg lean mass loss ( $p = 0.01$ ) but it is associated with a greater reduction of Knee Extension Power during BR ( $p = 0.05$ ), with no significant differences in whole body mass reduction between the intervention group and controls [4]. Hydroxy-methylbutyrate supplementation, a leucine metabolite, allow a non-significant loss of leg lean mass respect control group (controls:  $-1.01 \pm 0.35$  kg, intervention group:  $0.08 \pm 0.17$  kg;  $p = 0.02$ ) [5].

**Conclusions:** Apparently, nutritional and physical countermeasures are not fully effective in blunting muscle mass loss, although they seem able to counteract inactivity-related anabolic resistance. Further studies are needed.

**Bibliography:**

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