Comparison of Physical Performance Recovery of Healthy Older Adults after Bed Rest and Hospitalized Older Adults

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Purpose/Hypothesis: Physical inactivity results in a decline of physical function. Acute illness, injury and hospitalization impose further and more rapid rates of decline due to complicated sequelae including disease, inactivity, aging and poor nutrition. A bedrest model allows isolation and comparison of the effects of inactivity alone on functional loss. The objective was to compare functional outcomes of healthy older bed rest subjects (BR) to those of hospitalized older adults (HS) at the post bedrest/hospitalization point, after one week of exercise intervention, and at one month post bedrest/hospitalization and exercise intervention.

Number of Subjects: 10

Materials/Methods: Subjects from two ongoing larger studies were age and gender matched for comparison. Five BR subjects (72.2+3.56 yrs) were tested before and after one week of inpatient bedrest and after one week of inpatient exercise. Subjects were sent home with a daily exercise program and reassessed at 4 weeks post bedrest. Five HS subjects (75.8+4.02 yrs) were tested before discharge to home and after 1 and 4 weeks of supervised home exercise sessions. Both groups received intervention protocols consisting of muscle strengthening, walking, and balance training.

Results: Short physical performance battery (SPPB) scores declined an average of 1.6 points from pre bed rest to post bed rest in the healthy elderly. Their mean SPPB score after BR was 9.6(8-11); HS average SPPB was 6.8(2-10). After one week of exercise intervention, BR subjects’ scores improved: mean = 11.2(10-12); HS subjects were similar: mean = 6.6(4-10). At one month, both groups showed improvement: BR mean = 11.6(11-12); HS mean = 8.4(6-12). Repeated chair stands were the lowest scores for the BR group; balance, gait and chair stands were more varied and lower in the HS group.

Conclusions: Healthy elderly subjects had a clinically meaningful loss of function after just one week of bed rest. While both groups showed improved physical performance measures after the 4 week exercise intervention, the comorbidities of the hospitalized subjects result in lower
physical performance scores with 3 of 5 HS subjects completing the study with SPPB scores of 7 or lower indicating continued functional limitations.

Clinical Relevance: The relationship between multiple catabolic stimuli in hospitalized older adults is complex, but these findings indicate that simple physical inactivity has the potential to be a major contributor to the loss of physical function.