

## Early exercise in critically ill patients enhances short-term functional recovery\*

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**Objectives:** To investigate whether a daily exercise session, using a bedside cycle ergometer, is a safe and effective intervention in preventing or attenuating the decrease in functional exercise capacity, functional status, and quadriceps force that is associated with prolonged intensive care unit stay. A prolonged stay in the intensive care unit is associated with muscle dysfunction, which may contribute to an impaired functional status up to 1 yr after hospital discharge. No evidence is available concerning the effectiveness of an early exercise training intervention to prevent these detrimental complications.

**Design:** Randomized controlled trial.

**Setting:** Medical and surgical intensive care unit at University Hospital Gasthuisberg.

**Patients:** Ninety critically ill patients were included as soon as their cardiorespiratory condition allowed bedside cycling exercise (starting from day 5), given they still had an expected prolonged intensive care unit stay of at least 7 more days.

**Interventions:** Both groups received respiratory physiotherapy and a daily standardized passive or active motion session of upper and lower limbs. In addition, the treatment group performed

a passive or active exercise training session for 20 mins/day, using a bedside ergometer.

**Measurements and Main Results:** All outcome data are reflective for survivors. Quadriceps force and functional status were assessed at intensive care unit discharge and hospital discharge. Six-minute walking distance was measured at hospital discharge. No adverse events were identified during and immediately after the exercise training. At intensive care unit discharge, quadriceps force and functional status were not different between groups. At hospital discharge, 6-min walking distance, isometric quadriceps force, and the subjective feeling of functional well-being (as measured with "Physical Functioning" item of the Short Form 36 Health Survey questionnaire) were significantly higher in the treatment group ( $p < .05$ ).

**Conclusions:** Early exercise training in critically ill intensive care unit survivors enhanced recovery of functional exercise capacity, self-perceived functional status, and muscle force at hospital discharge. (Crit Care Med 2009; 37:2499–2505)

**KEY WORDS:** exercise therapy; physiotherapy; critical illness; intensive care; muscle weakness; bed rest