Functional evolution of critically ill patients undergoing an early rehabilitation protocol

Evolução funcional de pacientes graves submetidos a um protocolo de reabilitação precoce

Fernanda Murata Murakami¹, Wellington Pereira Yamaguti¹, Mirian Akemi Onoue¹, Juliana Mesti Mendes¹, Renata Santos Pedrosa¹, Ana Lígia Vasconcellos Maida¹, Cláudia Seiko Kondo¹, Isabel Chateaubriand Diniz de Salles¹, Christina May Moran de Brito¹, Miguel Koite Rodrigues¹

| Intervention plan | I | II | III | IV |
|----------------------------------|---|---|---|--|
| Prior functional activity | Bedridden patient | Tolerates assisted bedside sedestation | Tolerates orthostatism and exchange of steps | Tolerates ambulation with distance progression |
| In-bed mobilization training | Perform lateral decubitus movement | Move from supine to sitting at the bedside (trunk control training and assisted sedestation) | Maintain Plan II + motion from supine to sitting at the bedside (trunk control training without assistance) | Train functional independence + train relatives regarding the need for orthoses and walking aids |
| Transfer training | Perform transfer to the armchair with full assistance (gradually increase time) or remain sitting in bed-chair | Perform transfer to the armchair with assistance from the team (gradually increase time) or remain sitting in bed-chair | Perform transfer from the bed to the armchair with assistance from the multidisciplinary team and train active orthostatism | Perform transfers with minimal assistance |
| Orthostatism/ambulation training | Consider assisted orthostatism with orthostatic board | Consider assisted orthostatism with orthostatic board | Perform ambulation training assisted by the physical therapist for limited distances and focused on a gradual distance increase | Perform ambulation with minimum assistance + training involving descending and ascending flights of stairs according to patient tolerance |
| Peripheral muscle training | Passive joint mobilization (10 repetitions of joint mobilization of the shoulder girdle, pelvis and extremities with flexion, extension, adduction and abduction) + stretching + perform NMEE in cases with time > 3 days in the same training plan | Assisted and/or free, active exercises (10 repetitions of joint mobilization of the shoulder girdle, pelvis and extremities with flexion, extension, adduction and abduction) + stretching + perform NMEE in cases with time > 3 days in the same training plan | Resistance exercises with dumbbells and ankle weights (shoulder abduction, elbow flexion-extension, wrist extension, hip flexion, knee extension and ankle dorsiflexion - 10 repetitions for each joint) + stretching + perform stationary bicycle training in cases with prolonged hospitalization forecast > 7 days | Resistance exercises with load progression (load increase should be performed according to the tolerance of the patient and evaluated each session) + perform stationary bicycle leg training in cases with prolonged hospitalization forecast > 7 days |
| Length | 30 - 60 minutes | 30 - 60 minutes | 30 - 60 minutes | 30 - 60 minutes |
| Frequency | Once daily | Once daily | Once daily | Once daily |

Table S1 - Description of therapeutic strategies for each Intervention Plan (functional and peripheral muscle training)

NMEE - neuromuscular electrical stimulation.



Figure S1 - Flow chart defining the Intervention Plan according to the functional limitations of the patient. ICU - intensive care unit; MRC - Medical Research Council.