MOTOmed Movement Therapy in Supine Position
- for patients confined to bed -

Movement Therapy – the Bed Unit
passive | motor-assisted | active movement

- utilized in clinics, rehabilitation centers, skilled nursing facilities, or at home
- simple, safe, and smart with a safety software: MovementProtector, SmoothDriveSystem, and SpasmControl
Daily Movement: The Precondition for Maintaining Mobility and Physical Function

Many important physical functions don’t run without movement - for example, blood circulation, breathing heart- and circulation activity, metabolism or bladder and bowels activity, etc. A person able to walk obtains basic movement in a daily life (on average 4,000 - 6,000 steps a day). Research shows that staying in bed for 9 days reduces the fitness of a person by 20 % and the size of the heart by 10 %. The weaker the muscles get the less physical fitness the person retains. Due to a complete loss of natural movement, many patients confined to bed must face substantial physical and psychological limitations and complaints. That is a vicious circle. Very rarely can daily and frequent mobilization of the lower extremities, be provided by the physiotherapist or caregivers. In that case, the motorized and software controlled movement therapy, the MOTOmed letto, supports and complements the manual physical therapy. By engaging in continuous training, the use of a MOTOmed letto can increase the effectiveness of manual physical therapy.

The MOTOmed letto is Principally Used for the Following Medical Conditions:

- coma or apallic syndrome (coma vigil)
- (long-term) respiration
- post surgery (early rehabilitation)
- neurological conditions (e.g. multiple sclerosis, stroke, Parkinson’s disease, Polyneuropathies)
- orthopedic joint replacements (hip, knee)
- geriatric conditions
- hemodialysis
- intensive care
- acute rehabilitation

“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”

Therapy Modes

Passive training
The motor moves the legs for warm up or constant passive movement. This very natural motion sequence stimulates the blood flow and the circulation. The large colour screen gives feedback about pedal speed, what can be adjusted by self-explaining buttons.

Servo cycling – motor assisted
Specifically for users with minimal residual muscle strength and muscle weaknesses. Residual muscle strength can be discovered and established. Any impulse coming from the legs is amplified by the MOTOmed so that an acceleration of the pedal can be achieved.

Active training
Resistances – ranging from very light to very heavy – can be adjusted in small increments. Efficient proactive training from the bed or therapy chair is possible.

Symmetry Training
Graphic analysis of right and left leg or arm activity during the active training.

Safety Software

MovementProtector
This function automatically detects any spasm that might occur. The motor stops the pedals gently.

SpasmControl
After a spasm has been detected, the SpasmControl identifies the movement direction into which the spasm can be eased smoothly, according to therapeutic principle.
3. Therapy Goals and Benefits

1. Supporting Physiotherapy
Passive mobilization of patients confined to bed, especially coma and respiratory patients, causes substantial physical strain on therapists and caregivers (working with bent back).
The MOTOmed letto MovementTherapyDevice simply enables movement several times a day, what is essential for many physical functions, even on the weekends. Therapists benefit as the patients are more flexible after the alternating movements with the MOTOmed. Following manual physiotherapy can become more effective, economical and more patient-friendly. The gentle and pleasant movement with motor assistance supports patients with a fear of movement in receiving the necessary confidence to start with active movement therapy.

2. Prevention of Decubitus and Thrombosis
By activating the venous system, the MOTOmed Therapy helps to prevent thrombosis and bedsores (without negative side effects).
In comparison to the resting position, a cycling exercise can increase the rate of the blood flow in the leg and pelvis area by up to 400%. An increased oxygen content of the blood provides a better oxygen supply for the brain, the extremities and the whole body. Cold and painful legs can become pleasantly warm and painless due to the stimulation of the blood circulation.

3. Regulating Muscle Tone and Spasticity
The gentle, harmonious and smooth movement can ease muscle tensions (increased muscle tone) immediately. The MOTOmed MovementProtector monitors the muscle condition throughout the movement and will release any sudden spasm by the MOTOmed SpasmControl. In many cases, a regular muscle relaxation results in long-term decrease in muscle tone.

4. Flexibility and Contracture Prevention
Muscles shorten and tendons harden if they are not moved regularly. Joints also get increasingly stiff. Using the MOTOmed letto, e.g. during acute care, patients confined to bed can avoid muscle shortening. In later rehabilitation stages therapy methods, counteracting these consequences become more and more time consuming. With the use of MOTOmed letto, legs can be stretched and bent hundreds of times in 10 minutes. This contributes to joint lubrication and flexibility of individual muscles and ligaments.

5. Improve Bladder and Bowel Functions
Abdominal muscles maintain and encourage the bowel movements. However, with paralysis and lack of exercise, the abdominal muscles can become inactive and unusable to the digestive process. Due to the indirect effect of the MOTOmed training on the abdominal muscles, bowel movement can be stimulated and digestion complications can be prevented. Bladder problems are often intensified by tension (spasticity) in the bladder, the pelvic floor and the thigh muscles. This tension can be eased with a few minutes of passive MOTOmed training which in turn can have a positive effect on emptying the bladder.
6. Muscle Strength and Coordination -
Preconditions for Walking

Many patients confined to bed have some residual muscle strength. However, it is sometimes concealed or inhibited by spasticity. This residual strength is often insufficient to make a whole movement, or it fades quickly. The MOTOmed letto has a special function to help to rediscover and to use this residual strength: the MOTOmed ServoCycling. This function works similar to a power-assisted steering system and simplifies a complete and smooth cycle movement, even with minimal muscle strength.

With that, movements can be initialized from a relaxing starting position. Long-lost movement patterns can be initiated again. Patients with more residual muscle strength are able to cycle actively for a longer period, as the resistance levels are finely adjustable. This contributes to promotion of walking ability, particularly for patients who are yet unable to get out of the bed. Further benefits of the MOTOmed movement therapy are improvement of coordination and increase in leg muscles.

7. Improving of the General Condition

To be able to move the legs continuously has a positive effect on the mental well-being of impaired patients. Usually the sensory stimulation of the movement therapy can stimulate the improvement of the patient’s overall condition. At the same time, patient training with chronic obstructive bronchitis has shown that purely passive, as well as additional active exercise, with the MOTOmed letto increases the oxygen uptake, respiratory frequency and respiratory minute volume.

8. Save Cost and Time

The additional daily movement therapy with the MOTOmed letto can improve the anastasis and enables early recovery (e.g. stroke patients). Primarily, the MOTOmed therapy is a preparation, facilitation, and support to subsequent therapies.

“Improvements in measures of fatigue, activities of daily living, symptoms of peripheral neuropathy and myopathy, breathlessness, depression, and anxiety, as well as general wellbeing after exercise training are also reported (9,10,14).”

(C.P. Evangelia Kouidi, M.D., Greece; Artif Organs, Vol. 26, No. 12, 2002)
### 4. Special Accessories for a Simple Operation

<table>
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<tr>
<th>Item No.</th>
<th>Description / Features</th>
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| 168      | **TrainCare leg guides comfort with adjustable knee protection (pair)**  
• holds and guides the legs safely, prevents unintentional lateral movement of the legs  
• individual adjustment of the knee bending for both sides  
• prevents the knee joints from overstretching and blocking  
• fixation with velcro straps |
| 152      | **Dip-coated safety foot shells (pair)**  
• extra stable foot shells made of metal, completely coated with soft plastic  
• with extra high safety side panel to cover the pedal crank  
• easy to clean and disinfect |
| 164      | **Leg guides with plastic calf shells (pair)**  
• made out of plastic  
• easy to clean and disinfect  
(only available in combination with item no. 168) |
| 162      | **Ground fixation (4-Brake-Stop)**  
• secure and quick ground fixation by foot pedal  
• stable stand even in active mode against resistance  
• no additional fixation on the dialysis chair or bed necessary |
| 160      | **Expandable chassis**  
• easy and quick positioning in front of the dialysis chair or bed  
• the chassis width can be adjusted with a lever  
• suitable for all common chairs and bed models |
| 162      | **Knee bending adjustment**  
• manual: by thumb wheel (see pict.)  
• electrical: by remote control, independently adjustable for the user (no pict.)  
• to set the power of the knee bending  
• to set the perfect position for the user  
• can be set quickly and easily – even when legs/arms are inserted |
| 166      | **Extended rotary arm for operating panel**  
• recommended for patients who are able to operate the menu independently  
• supports motivation and activity of the patients by providing constant feedback during the training and data analysis at the end of the training  
• cannot be retrofitted  
(instead of standard operating panel with remote control) |
Improve the dialysis treatment

Hemodialysis patients are generally limited in their everyday life. Limited performance is often caused by side effects of kidney functional disorders, e.g. high blood pressure, lack of muscle strength, lipometabolism- and leg circulation disorders, bone loss, as well as heart- and circulatory diseases. Additional related causes are the degradation products remaining in the body. Dialysis patients are often affected by a depreciating performance due to an inactive lifestyle and a 3-4 hour per week hemodialysis treatment.

- improvement of overall performance and condition
- regular movement stabilizes blood circulation and blood pressure
- fewer complications such as faintness, shocks, and loss of consciousness will prevail during dialysis and the patient tolerates the treatment better
- strengthening of the heart, circulation, and immune system
- animation of the metabolism
- improvement of the leg circulation
- training of coordination and mobility
- education about own body awareness
- the quality (effectiveness) of dialysis improves
6. MOTOmed letto2 for Leg and Arm Training

Leg and arm training in supine position

The new model MOTOmed letto2_leg/arm provides leg and arm training. A quick release system allows for simple and quick alternation between foot shells and arm trainer handles. This model is independent from any bed or chair and can be operated from all three bedsides (from the left, or right side and from the foot part of the bed)

- activation of respiratory muscle groups
- simple and various operation from 3 bedsides
- helps to maintain mobility of lower and upper body muscles
- loosening of muscles
- quick release system for simple alternation between leg and arm trainer
- including ground fixation and knee adjustment for convenient use

PLEASE CONTACT THE RECK COMPANY FOR MORE DETAILED INFORMATION ABOUT THE LEG/ARM MODEL:
info@motomed.com
1. "Importantly, the increase in exercise tolerance seems to be correlated with symptomatic improvements and enhancements in health-related quality of life measurements (9,10). Improvements in measures of fatigue, activities of daily living, symptoms of peripheral neuropathy and myopathy, breathlessness, depression, and anxiety, as well as general wellbeing after exercise training are also reported (9,10,14)."
(C.P. Evangelia Kouidi, M.D., Greece; Artif Organs, Vol. 26, No. 12, 2002)

2. "Those who continued to exercise showed an increase in walking distance of just under 100m during a shuttle walk test, and this was statistically significant. The increase in walking distance was associated with an improvement in well-being as judged by the quality-of-life scores, which in turn were likely related to improved physical fitness […]"
(C.P. Matthew Torkington et al., Renal Unit, Dumfries, UK: Uptake of and adherence to exercise during hospital haemodialysis, Physiotherapy 92 (2006) 83–87)


4. "Strategies aimed at minimizing prolonged immobilization during critical illness may prevent the development of neuromuscular complications after critical illness. […] and cycle ergometry may be especially valuable as a component of early rehabilitation during the acute phase of critical illness, where sedation and immobilization may limit patients' ability to participate in active rehabilitation interventions.”
(C.P. Dale M. Needham, MD, PhD et al., Johns Hopkins University, USA: Technology to enhance physical rehabilitation of critically ill patients Crit Care Med 2009 Vol. 37, No. 15)

5. "In patients with severe COPD oxygen uptake, breathing frequency and minute ventilation increased not only during active, but even during passive movement of a bedside ergometer. With this method an exercise training is possible even in COPD patients confined to bed."
(C.P. Galetke W. et al., Universität Witten, Germany: Spiroergometry in patients with severe chronic obstructive pulmonary disease confined to bed, Pneumologie - 01-FEB-2002; 56(2):98-102)

6. "All patients responded well to exercise and expressed better muscular performance during and after exercise time. […] all patients improvement of Kt/V and URR index after physical exercise period, compared to exercise free time (p < 0.005). We suggest that exercise during dialysis treatment is safe and consents either better psychophysical performance or better dialytic efficiency.”
8. Other MOTOmed Models

MOTOmed viva1
The pretty little basic model is upgradeable in many steps - up to a leg and arm / upper body trainer combination model.

MOTOmed viva2
Specifically designed for the needs of people with additionally limited motor skills in the arms, hands, and fingers, and for those with an impaired vision. Easy operation by the comfortable big color screen with well-legible font in 26 languages, big graphics and its easy-to-reach buttons. We offer different handles and hand fixations to suit your medical condition.

MOTOmed gracile
Guaranteed optimal training for children and adolescents with a minimal height of 90 cm /3 ft., height adjustable. The display is identical to the MOTOmed viva2 display.

Arm/Upper Body Trainer
Upgrade your viva1, viva2 and gracile! You can train up to 90% of all your muscles by using the leg and arm/upper body trainer. We offer different handles and hand fixations to suit your medical condition.

PLEASE REFER TO GENERAL MOTOmed PRODUCT OVERVIEW FOR FURTHER INFORMATION OR CONTACT THE RECK COMPANY: info@motomed.com