

BTS ANYMOV

Robotic hospital bed aimed
at functional recovery
of patients affected by stroke
or acquired brain injury



BTS Biomedical

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Until recently, the hospital bed was merely considered as a passive tool aimed at providing the patient with a place to sleep and rest. In time, the hospital bed evolved into a device designed to assist health practitioners: a first fundamental step was replacing with an electric motor the manual activity necessary to mobilize the patient, decreasing personnel workload.

BTS ANYMOV completes the technological evolution introducing a generational leap: the hospital bed becomes a robot for patient focused mobilization, performing the motor therapy directly in the hospital bed, as the first rehabilitation stage following a stroke or a traumatic brain injury event. Almost all the patients in post-stroke or post-traumatic brain injury condition show mobility deficits. Mobilization during the acute phase represents a key factor for a successful rehabilitation. BTS ANYMOV is the only robotic device beneficial for patient rehabilitation, even when un-cooperative, directly in the hospital bed.

Robotic rehabilitation, directly performable in the hospital bed

BTS ANYMOV is a rehabilitative robotic hospital bed that permits a specific and repeatable training made of gradual passive exercises. It allows an active, assisted, segmented and multi-segmented mobilization of hip, knees and tibiotarsal joints, through active and against-resistance exercises, coherently with patient's possibilities.

It is made of 4 movable sections using high precision motors: the whole bed base can be controlled in lift and lateral movement thanks to telescopic pillars; the back can be inclined up to 90°; the lower limb dedicated bases allow hip abduction-adduction movements. The tibiotarsal joint dorsi-plantarflexion and the knee flexi-extension are actuated by two dedicated motors, presenting clutches on guides placed under the lower limb bases.

An air compressor, providing resistance related to the patient's push force, is used for the active reinforcement exercises. The same air compressor can be by-passed by the compressed air normally provided in hospital rooms. The particular attention to design and production guarantees the highest standard of operational safety, for both the therapist and the patient.



Combined functional evaluation

During the rehabilitation process, the EMG data acquisition is an effective tool that provides important clues about the patient's recovery potential. Data from the EMG system can be evaluated as to how and when the patient is trying to generate movement (during active exercises) and also the presence of muscular activity in the passive mobilization phases.

BTS ANYMOV optionally integrates, a totally wireless surface EMG system provided with protocols for the acquisition of several muscle configurations, according to the exercises performed in bed.

1) Knee flex/extension:

Evaluation of 3 channels (muscles) for each limb: Vastus Lateralis, Recto Femoris and Semitendinosus.

2) Foot flex/extension (dorsi/plantar flexion):

Evaluation of 3 channels (muscles) for each limb: Tibialis Anterior, Gastrocnemius (Medialis or Lateralis), Soleus.

The system automatically provides a structured report showing the concept of muscle contraction intensity and the evidence of muscle contraction work. Specifically the index provides understanding as to muscle activity, quantifying it and consequently monitoring it during the patient follow up for evaluation of progress.



BTS ANYMOV EMG:
the wireless probe surface EMG device,
available as an option



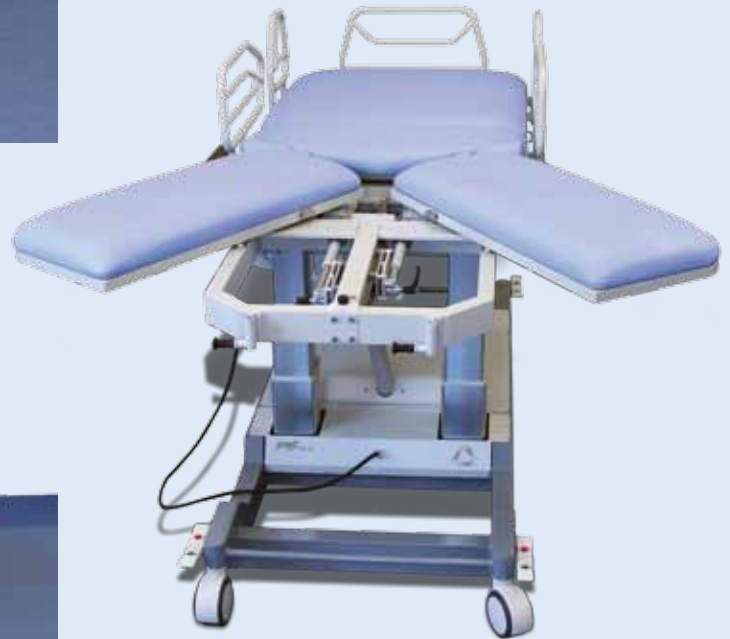
Vertical stand position. This orientation together with the trunk body harness and T-Walker (included), provide flex-extension exercises with variable load, according to the vertical angle



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Lateral bending



Lower limb bases spread position, studied for hip abduction-adduction exercises



Trendelenburg movement

Use of the T-Walker dedicated to tibiotarsal joint mobilization exercises



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The use of robotic technology as support for rehabilitation processes introduces several benefits. It offers homogeneous and measurable treatments, providing also the chance to quantify the effects and the functional results related to the rehabilitation. Moreover, it provides a solid opportunity to multiply treatments, in relation with the fast and continuous growth of the demand.

The intensity control and the accurate repeatability of the motor exercises, feasible only with this technological solution, provide patients with the best quality and efficacy for rehabilitative treatment.

BTS ANYMOV benefits:

Postural and functional movement recovery boost

Prevention of secondary complications related to immobility

e.g. ligament retractions, bedsores, respiratory affections, deep-vein thrombosis.

Elimination of the risk of falling

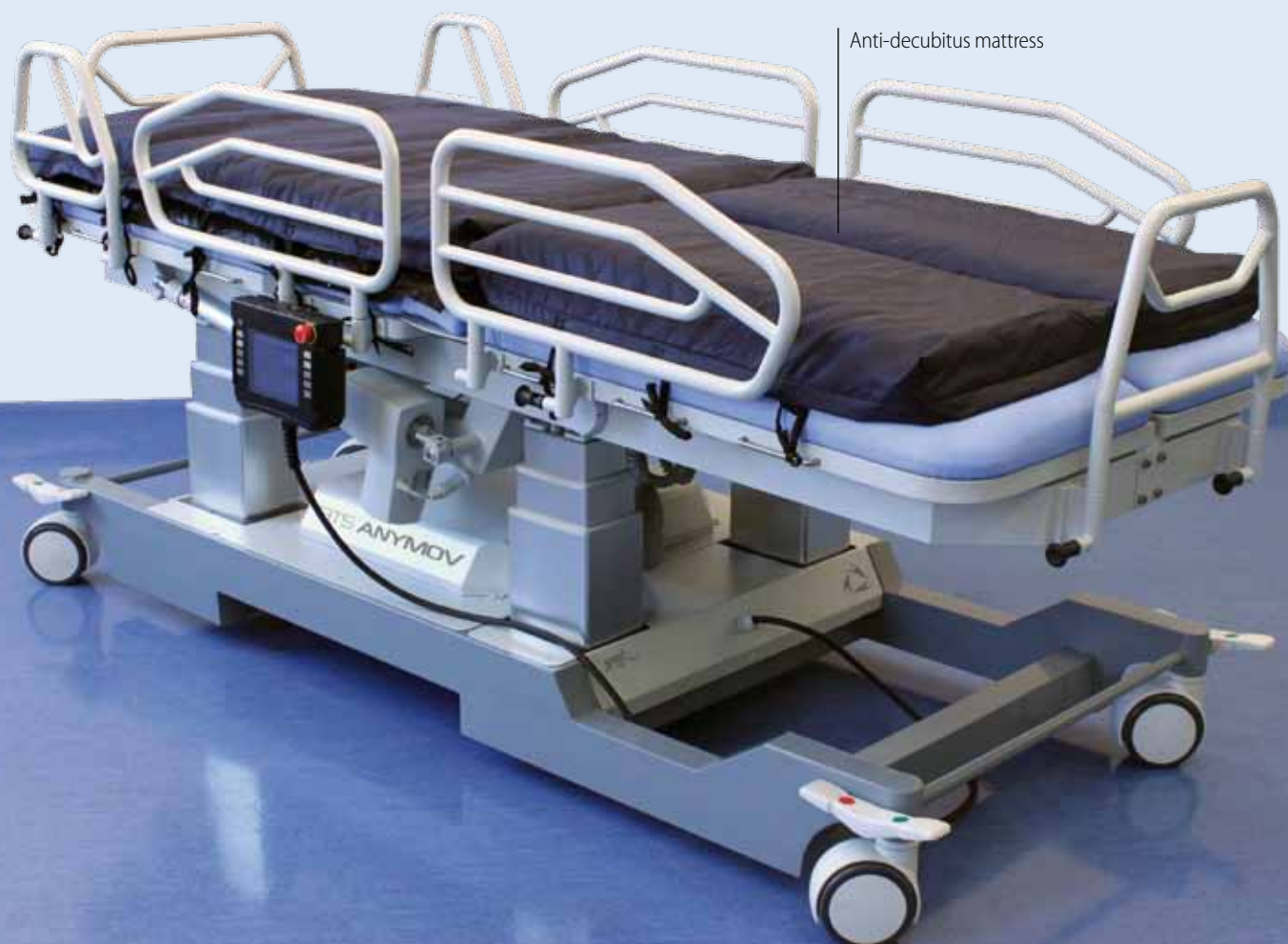
e.g. condition related to orthostatic hypotension in traditional rehabilitation.

Articular proprioception stimulation

Attentive and participative processes stimulation

Therapeutic exercise customization

Thanks to the database integrated within the BTS ANYMOV information control system, accessible by touch pad, the motor therapeutic profile can be stored, used again and easily modified by the operator according with patient's improvement and evolution.



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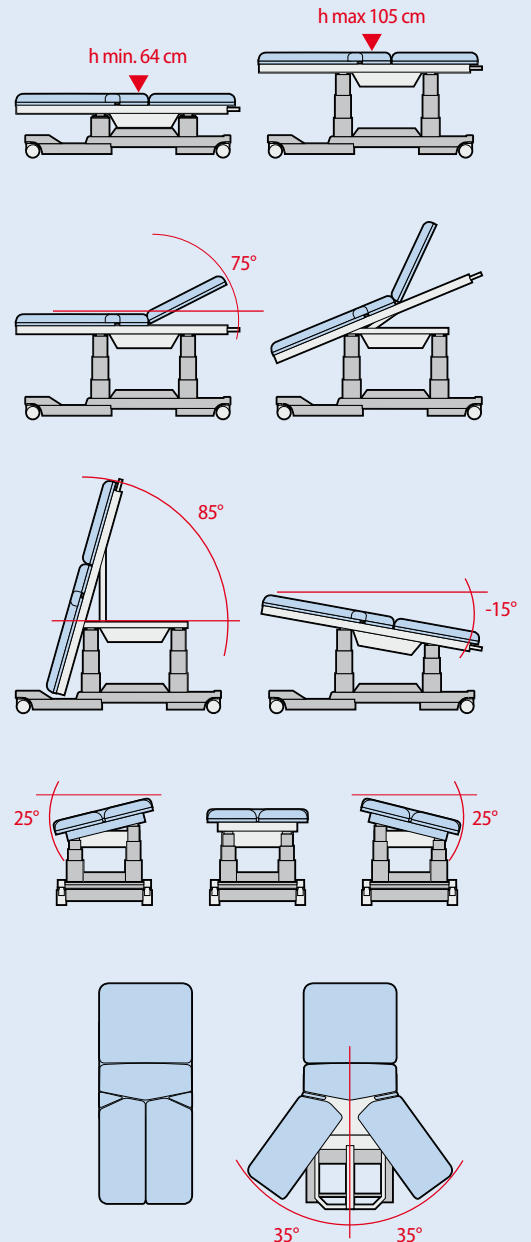
	Basic pack	Options
Components and accessories		
Robotic Hospital bed with touch screen control unit	●	
Removable side rails	●	
Anti-decubitus mattress	●	
BTS ANYMOV EMG - wireless probe surface electromyography system		●
Pillow for patient lower limb support while sitting		●
Handles for patient support while in the vertical position, complete of desk		●
Harness for trunk support during vertical movement	●	
Harness for Lower limb support during knee flex –extension exercises	●	
Leg block band for hip adb-adduction exercises	●	
T-Walker for tibiotarsal joint dorsi-plantar flexion	●	
Integrated compressor (only for active exercises)		●

Technical features*

Movements	13 motors, 4 pillars for vertical lifting, actuators for the inclination of the bed, back, footrests and segments for hip abd-adduction
Safety	Fast manual repositioning system
Certification	Class IIa in accordance with MDD 93/42/ECC**
Dimension (in horizontal position)	229 x 98 x h 90 cm (with side protections)
Maximum encumbrance	229 x 184 x h 245 cm
Weight	480 pounds (230 Kg)
Padding	PVC/Polyamide sanitary mattress

* Technical characteristics and equipment may vary without notice.

** in progress



Movements

BTS Anymov can adopt multiple positions thanks to 13 motors electronically controlled. Every movement is fluid and extremely silent.

BTS ANYMOV is a BTS S.p.A. product, manufactured by SPAS Italia. Patent Pending. Any other mentioned brand is owned by respective holder. © BTS S.p.A.



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HEADQUARTERS
VIALE FORLANINI 40
20024 GARBAGNATE MILANESE MI ITALY
TEL. +39 02.366.490.00
FAX +39 02.366.490.24

R&D CENTER
VIA DELLA CROCE ROSSA 11
35129 PADOVA PD ITALY
TEL. +39 049 981 5500
FAX +39 049 792 9260

BTS USA
TEL. +1 347 204 7027

BTS COMMERCIAL PARTNER NETWORK

