

Short description of MOTomed Indications and benefit for patients through MOTomed training

(Only for internal use at RECK and for RECK distributors)

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The following chart shows medical indications along with the benefits for patients using the MOTomed. By an evaluation the patient's main goal/ point of motivation should be filtered out (Note the 1st priority, which "problem" is most important, where does the patient get his motivation from). This should be the clear focus for future conversations. If the patient clearly sees the benefits of the MOTomed, he/she will be excited to get started with the therapy and will be receptive to the advice the representative has to offer. The main motivation of the patients always is to maintain and improve his current health situation.

Profile of indication	Typical symptoms of disorder	Patient's benefits! Why should these patients use the MOTomed ?
<p>ALS; Amyotrophic lateral sclerosis</p> <p>Neurological disease; Rapid degenerative disease of the central nervous system. Solely the motor nerve cells in the spinal cord and the nerve cells in the brain are affected. The sensory awareness, the perception of the patients, their consciousness and their intellectual skills are not affected. The disease is currently incurable and leads to death after a process of several years. The cause of this disease is still unknown.</p>	<ol style="list-style-type: none"> 1. Spasms not always come along with this disorder – depending if the first or the second motoneuron is affected. 2. Results in muscular atrophy and paralysis, mostly incomplete. 3. Consequences of lack of movement, e.g. disorders of: <ul style="list-style-type: none"> - the blood circulation - the digestion system - the flexibility of joints (contractions) - the metabolism - water accumulation (oedema) 	<ul style="list-style-type: none"> • Improve mobility by easing spasms • Improve mobility and walking ability by strengthening the muscles. Whether strengthening of the muscles is possible or not has to be clarified by the medical professional. • Prevent or reduce the consequences of lack of movement (prophylaxis) : <ul style="list-style-type: none"> - stimulate blood circulation - activate digestion - keep joints moving in order to prevent contractions - cardio training to stimulate metabolism - reduce water accumulation (oedema) • Simplify activities of daily living (see point 1 page 12) • Reduce medication and side effects (see point 3 page 12) • Arm-/ upper body trainer to support posture (see point 4 page 12) • Increased independence improves mental and general well being and therefore body fitness. • Practise of motor activity and coordination – supported by the smooth movement of the MOTomed. • Maintain the health situation and stabilize or decelerate the progressing course of the disease.
<p>Apallic syndrome (coma vigil)</p> <p>Neurological disease resulting from brain injury. Serious disorder of brain functions where the brain stem and brain mantle get separated. The most common causes are traumatic brain injuries and serious oxygen deficiency of the brain caused by acute heart-circulation disorders. The patients are awake, stare into space, they are unaware of what is happening around them and they show no reactions. The whole motor activity is seriously affected. Communication is not possible. Sitting in a chair or in a wheelchair is possible. Often patients are confined to bed.</p>	<ol style="list-style-type: none"> 1. Spasms 2. There are residual muscle strengths but they cannot be used purposefully 3. Consequences of lack of movement, e.g. disorders of: <ul style="list-style-type: none"> - the blood circulation - the digestion system - the flexibility of joints (contractions) - the metabolism - water accumulation (oedema) 	<ul style="list-style-type: none"> • Improve mobility by easing spasms (simplifies the daily tasks for the caregivers) • Maintain and stabilize the current health situation, and reduce the progressing course of the disease • Prevent or reduce the consequences of lack of movement (prophylaxis) : <ul style="list-style-type: none"> - stimulate blood circulation - activate digestion - keep joints moving in order to prevent contractions - cardio training to stimulate metabolism - reduce water accumulation (oedema) • Reduce medication and the side effects (see point 3 page 12)

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<p>Cerebral palsy (CP, people with Spasms)</p> <p>Neurological disease resulting from infant brain injury; The child's brain injury is non progressive. Disorder in the nervous and muscular systems regarding tone, strength and coordination of motion. Frequent reasons are premature birth, oxygen deficiency, umbilical cord complications, infections, brain bleeding and accidents during pregnancy / birth.</p>	<ol style="list-style-type: none"> 1. Kicking spasms are prevalent and muscle tone is generally high 2. Patients have residual strength, often able to walk 3. Problems with coordination 4. Mental capacity is limited in many cases 5. Consequences of lack of movement, e.g. disorders of: <ul style="list-style-type: none"> - the blood circulation - the digestion system - the flexibility of joints (contractions) - the metabolism - water accumulation (oedema) 	<ul style="list-style-type: none"> • Improve mobility by easing spasms (simplifies the daily tasks for the caregivers) • Support walking ability by strengthening the muscles and ease spasms • Prevent or reduce the consequences of lack of movement (prophylaxis) : <ul style="list-style-type: none"> - stimulate blood circulation - activate digestion - keep joints moving in order to prevent contractions - cardio training to stimulate metabolism - reduce water accumulation (oedema)
<p>Friedreich's ataxia</p> <p>Neurological disease. Congenital cerebellar-spinal cord-injury with progressive atrophy of dorsal funiculus and spinal cord- cerebellum- course.</p>	<ol style="list-style-type: none"> 1. Disorders in coordination of motions (ataxia) 2. In most cases able to walk 3. Spasms (e. g. cupped foot with claw toe) 4. Surface sensitivity and bathyaesthesia 5. Disorders of speech 6. Consequences of lack of movement, e.g. disorders of: <ul style="list-style-type: none"> - the blood circulation - the digestion system - the flexibility of joints (contractions) - the metabolism - water accumulation (oedema) 	<ul style="list-style-type: none"> • Ease spasms to improve mobility • Support walking ability by maintaining and strengthening of the muscles • Improvement of coordination through steady movement with the MOTomed • Prevent or reduce the consequences of lack of movement (prophylaxis) : <ul style="list-style-type: none"> - stimulate blood circulation - activate digestion - keep joints moving in order to prevent contractions - cardio training to stimulate metabolism - reduce water accumulation (oedema)
<p>Guillain-Barré-Syndrome (GBS)</p> <p>Neuromuscular disease, GBS is a rare and unusual disease, which can occur due to an infection, poisoning or immunodeficiency. The causative organism breaks into the protective cover of the peripheral nerves.</p> <p>In the beginning there is a flabby paralysis of the legs, often disorders of sensitivity and muscular atrophy (mostly progresses within a few days to tetra plegia). In the majority of the cases the symptoms improve within 6 months.</p>	<ol style="list-style-type: none"> 1. No spasms (because injury is in periphery) 2. At the beginning of the disease there is no walking ability. Mostly there are residual strengths which can be build up (at the beginning there is a flabby paralysis up to an tetra plegia) 3. Consequences of lack of movement, e.g. disorders of: <ul style="list-style-type: none"> - the blood circulation - the digestion system - the flexibility of joints (contractions) - the metabolism - water accumulation (oedema) <p>Disorders of sensitivity</p>	<ul style="list-style-type: none"> • Prevent or reduce the consequences of lack of movement (prophylaxis) such as disorders in: <ul style="list-style-type: none"> - blood circulation - digestion - joints (avoid contractions and stiffness) - metabolism - water accumulation (oedema) • Improvement of muscle strength is possible • Compensation of fatigue

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<p>Multiple Sclerosis (MS)</p> <p>Neurological disease - more specifically an inflammable disease of the central nervous system, therefore brain and spinal cord. Through central inflammations in the brain or spinal cord the protective cover of the nerve fibre is damaged. The brain is the major control centre, sending and receiving signals to and from different parts of the body via the spinal cord. These are sent by different nerve fibres, which are surrounded by an isolating cover (or Myelinscheiden) similar to electric cables. If a centre of inflammation arises in this protective coating, the messages cannot be transmitted as effectively or they cannot be transferred at all (disorders in sight, tingling feelings occur).</p> <p>There are different progressive forms of MS.</p> <p><u>Periodic attacking process:</u> This is the most common form of MS, here single disease attacks are appearing which come along with partly significant dysfunctions. The dysfunctions caused by a periodic attack partial improve completely.</p> <p><u>Chronic progressive (proceeding) process:</u> Inflammations result to an interruption or even complete damage of the nerve impulses (irreparable damages).</p> <p>The periodic attacking MS often changes to a chronic progressive form.</p> <p>According to a study by Sports University Cologne (Sporthochschule Köln), patients with periodic attacking progressing MS profit more than patients with a chronic progressive form.</p> <p><u>Acute MS:</u> This is the rarest but the worst form of MS - the symptoms come very quickly and can even lead to death.</p>	<ol style="list-style-type: none"> 1. Spasms from high muscle tone and sudden kicking spasms (cramps) 2. In most cases there are still residual muscle strengths 3. Frequently bladder problems due to spasms in the bladder muscles 4. Limited walking ability caused by spasms. Cramps in the toes, so the foot cannot be unrolled properly. 5. Weakness in the legs, not able to lift the legs properly 6. Changing pace (= higher danger of falling) due to spasms, muscle weakness, imbalance or because one side of the body is stronger affected 7. Consequences of lack of movement, e.g. disorders of: <ul style="list-style-type: none"> - the blood circulation - the digestion system - the flexibility of joints (contractions) - the metabolism - water accumulation (oedema) 8. Paresthesia and prickling (in a later stadium even complete loss of feeling) 9. Impaired vision (e. g. in the beginning inflammation of the visual nerves) 10. Mental ability is partly limited. 	<ul style="list-style-type: none"> • General tone regulation to gain more mobility (e.g. morning stiffness) • Regaining bladder control (spastic, cramped bladder muscles become loose) • Obtaining and improving walking ability and walking security (Build up of muscle strength and muscle endurance is only conditionally possible) • Symmetry training is important for specific training of the more affected side • Prevent or reduce the consequences of lack of movement (prophylaxis) : <ul style="list-style-type: none"> - stimulate blood circulation - activate digestion - keep joints moving in order to prevent contractions - cardio training to stimulate metabolism - reduce water accumulation (oedema) • Improvement of mobility and support of independence to simplify the activities of daily life. • Improvement of mental well being (happier, more capable)

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<p>Multi-system-atrophy (MSA)</p> <p>Neurodegenerative disease – very similar to Parkinson disease. About 10% of all patients suffering from Parkinson syndrome also end up suffering from this related disease. Besides the typical Parkinson disorders further areas are affected, e.g. the cerebellum and the vegetative nervous system. Due to nerve cell disorders, the treatment with usual anti-Parkinson-medicine mostly is insufficient. On average this disease leads to death within 6 to 8 years.</p>	<ol style="list-style-type: none"> 1. Limited mobility 2. Increase of tone 3. Restricted walking ability (high risk to fall) 4. MSA patients often loose bladder control 5. Vegetative disorders: <ul style="list-style-type: none"> - low blood pressure with collapse - constipation - temperature regulation disorders - decrease of intelligence - loss of facial expression 6. Disorders of posture <ul style="list-style-type: none"> - head and body are bend to the front - high risk to fall - bend in hip joint - arms are mostly bend in the elbow area 	<ul style="list-style-type: none"> • Motion should become more evenly (by the steady movement of the MOTOMed) • Improve mobility by loosening up the muscles • Support walking ability by training and improving of muscle strength and endurance as well as by loosening the muscle stiffness • Upright posture by <u>backward</u> training with the arm trainer • Prevent or reduce the consequences of lack of movement (prophylaxis) : <ul style="list-style-type: none"> - stimulate blood circulation - activate digestion - keep joints moving in order to prevent contractions - cardio training to stimulate metabolism - reduce water accumulation (oedema)
<p>Muscle atrophies (<u>neural</u>)</p> <p>Neuromuscular diseases; "neural muscle atrophy" describes a group of diseases where the periphery nerves are destroyed slowly and progressively. In a large proportion of cases the cause is a gene defect. The motor nerves that are responsible for movement control are often worse affected than the sensory nerves which are responsible for the exchange of feelings (touch, pain, temperature, posture of the joints). The function of bladder and rectum maintains. The control of the muscles are affected, not the muscles directly. However the muscles degenerate because they can no longer be controlled and are therefore not used.</p>	<ol style="list-style-type: none"> 4. No spasms because the injury starts in the periphery 5. At first it causes muscular atrophy and weakness in the feet. The symptoms rise from the lower leg up affecting the arms and the forearms and later (but sometimes never) the thighs. Building up muscles is not possible. 6. Under no circumstances should patients overexert themselves, because the disease progress could be worse or accelerated 7. Most patients are sitting in an electronic wheelchair (sometimes they have problems to get close enough to the MOTOMed → height adjustment) 8. Consequences of lack of movement, e.g. disorders of: <ul style="list-style-type: none"> - the blood circulation - the digestion system - the flexibility of joints (contractions) - the metabolism - water accumulation (oedema) 	<ul style="list-style-type: none"> • Balance the muscle weakness. • Muscle strength should only be applied conditionally, it is not about muscle rebuilding, just training of the residual strength - maintaining of muscle strength is possible • Prevent or reduce the consequences of lack of movement (prophylaxis) : <ul style="list-style-type: none"> - stimulate blood circulation - activate digestion - keep joints moving in order to prevent contractions - cardio training to stimulate metabolism - reduce water accumulation (oedema)

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<p>Muscle atrophies (spinal)</p> <p>Neuromuscular disease (According to. Ms. Thiele, PT Friedrich-Baur-Institute of DGM, Munich)</p> <p>"Spinal muscle atrophies"(SMA) summarize a group of diseases which result in a progressing decline of motor nerve cells especially in the spinal cord. So the impulses from the brain cannot be sent to the muscles anymore. This results to muscular atrophy, paralysis and less muscle tension (=muscle hypotension).</p>	<ol style="list-style-type: none"> 1. No spasm, because the 2nd motoneuron (periphery) is affected, rebuilding muscles is not possible 2. Under no circumstances should patients overexert themselves, because the disease progress could be worse or accelerated 3. Most patients are sitting in an electronic wheelchair (sometimes have problems to get close enough to the MOTOMed → height adjustment) 4. Often difficulty to breath because of reduced oxygen supply 	<p>(acc. to Ms. Thiele = the leading PT of Friedrich-Baur-Institute, Munich)</p> <ul style="list-style-type: none"> • Balance the muscle weakness. Muscle strength should only be applied conditionally, it is not about muscle rebuilding, just training of the residual strength - maintaining of muscle strength is possible • Obtaining the muscle strength and training of endurance is possible. • Prevent or reduce the consequences of lack of movement (prophylaxis) : <ul style="list-style-type: none"> - stimulate blood circulation - activate digestion - keep joints moving in order to prevent contractions - cardio training to stimulate metabolism - reduce water accumulation (oedema) 															
<p>Muscle dystrophy (muscle decrease)</p> <p>Neuromuscular disease affecting the muscle cells - can eventually lead to a total destruction of the affected muscles (reduction of the muscle tissue; disease comes from the muscle, no damage to the periphery). Muscle dystrophies are caused congenital There are 30 different forms of muscle dystrophy. Some are listed below:</p> <table border="1" data-bbox="136 837 875 1013"> <thead> <tr> <th>Type</th> <th>firstly affected area of body</th> <th>Age</th> </tr> </thead> <tbody> <tr> <td>Duchenne</td> <td>Pelvis, thigh</td> <td>3-5 years</td> </tr> <tr> <td>Becker-Kiener</td> <td>Pelvis, thigh</td> <td>6-16 years</td> </tr> <tr> <td>Leyden-Möbius</td> <td>Shoulder-,pelvis belt</td> <td>2-20 years</td> </tr> <tr> <td>Erb</td> <td>Face, shoulder belt</td> <td>7-25 years</td> </tr> </tbody> </table> <p>The difference to muscle <u>atrophy</u> is that the defect is directly in the muscle, the muscle control is well (i.e. the periphery nerve tracks); The muscle cells are modifying themselves.</p>	Type	firstly affected area of body	Age	Duchenne	Pelvis, thigh	3-5 years	Becker-Kiener	Pelvis, thigh	6-16 years	Leyden-Möbius	Shoulder-,pelvis belt	2-20 years	Erb	Face, shoulder belt	7-25 years	<ol style="list-style-type: none"> 1. No spasms, because the muscles are affected, not to the nerves 2. Rebuilding of muscles is not possible 3. Under no circumstances should patients overexert themselves. Even passive movement is often too much (usually patient informs about this at once). When the muscles are overexerted, they will degenerate even faster. 4. Training should only be done after consulting a doctor/therapist (Intensity, that means time of training, active training) → consultation of outpatient therapist is very important 5. Consequences of lack of movement, e.g. disorders of: <ul style="list-style-type: none"> - the blood circulation - the digestion system - the flexibility of joints (contractions) - the metabolism - water accumulation (oedema) 	<p>(acc. to Ms. Thiele = the leading PT of Friedrich-Baur-Institution, Munich)</p> <ul style="list-style-type: none"> • Movement should become a bit more fluently. Some movement can be good for patients. The steady movement of MOTOMed helps the patient to get some exercise. • Obtaining the muscle strength and training of endurance is possible. • Prevent or reduce the consequences of lack of movement (prophylaxis) : <ul style="list-style-type: none"> - stimulate blood circulation - activate digestion - keep joints moving in order to prevent contractions - cardio training to stimulate metabolism - reduce water accumulation (oedema)
Type	firstly affected area of body	Age															
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<p>Orthopaedic Diseases (TEP at hip or knee, arthroscopy etc.)</p> <p>Orthopaedic Disease TEP = <u>T</u>otal-<u>e</u>ndoprosthesi<u>s</u></p> <p>Surgery at hip or knee joint where bones or joints has been replaced by artificial ones.</p>	<ol style="list-style-type: none"> 1. Reduced joint mobility and flexibility (bending, tension) 2. Accumulation of liquid in the joint area 3. Reduced ability of straining the joint 4. Contractures of joints may occur 5. Inflammation of joints, Arthrosis 6. Process until the TEP <ul style="list-style-type: none"> - attrition of the articular cartilage and synovial fluid - as the bones are rubbing against each other inflammation will arise - Arthrosis and articular rheumatism occur - Malpositions, immobility, pain occur -> TEP 	<p>Advantages of MOTomed-Therapy to Continuous Passive Motion (CPM) and usual Cycling-Ergometers:</p> <ul style="list-style-type: none"> - With the MOTomed <u>both legs</u> can be trained and with the according equipment both arms as well (from the wheelchair or an ordinary chair) - The MOTomed-Therapy complies with the current efficiency of the patient. In the early stage of the rehabilitation process you can start with a gentle, <u>passive</u> movement. After that the patient starts an active training with his own muscle strength and motor-assistance (ServoCycling) and by setting a higher resistance, a fluent change into an active training against resistance succeeds. An effective, quicker and high quality rehabilitation process is possible. - Especially by using the function ServoCycling (active training with motor-assistance) the patient may start soon with using his own muscle strength - The function Symmetry-Training enables a selective coordination-training for building up the muscles and/or for prophylaxis and avoidance of relieving postures. Because of the visual feedback of the left-right-activity, the patient may use the affected, operated side consciously. - Because of TEPs and Arthrosis muscular dysbalances may occur. The tension relations in the muscles change. A change in training passive-active-passive-... may reduce these dysbalances. - An active training with motor-assistance and against an adjustable resistance is possible between app. 5 to max. 100 watt. <p>General:</p> <ul style="list-style-type: none"> - MOTomed-MovementTherapySystems do not replace the CPM. They are a continuing therapy. - In the first days after the surgery (app. 6 – 8 days) the CPM will be used. - After that the patient starts with passive training at the MOTomed (knee-bending 40-50°, hip-bending 40° necessary). It depends on the joint mobility to decide when a MOTomed or a CPM will be used. - After instruction of the doctor and physiotherapist the patient starts with ServoCycling (active training with motor-assistance and light resistance). - The MOTomed can be used sitting (chair, wheelchair). The CPM can only be used lying. - The MOTomed offers the following kinds of

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		<p>therapy: passive training with motor, active training with motor-assistance (ServoCycling), active training against adjustable resistance. CPM is only a passive training.</p> <ul style="list-style-type: none"> - After Instruction the patient can train with the MOTomed on his own. For training with the CPM an auxiliary person is necessary. - CPM is suitable for a smaller group of patients directly after surgery. - MOTomed-MovementTherapySystems have various uses in facilities like clinics, hospitals, reha-centres, private physiotherapy-centres, nursing and old people's homes.
<p>Parkinson's disease</p> <p>Neurologic disease which leads to movement disorders. This is caused by a disorder of the metabolism function of the brain.</p>	<ol style="list-style-type: none"> 1. Slowing down of movement = akinesia (psycho motor reduction) 2. Muscle stiffness = rigor (steady tone increase (increased tension) in bending and stretching muscles. The affected limbs are not able to move or only with a lot effort) 3. Limited walking ability, very short gaits. 4. Shaking when relaxed = tremor (is also called resting tremor; hands and feet are moving rhythmically back and forth) 5. Disorder of the posture <ul style="list-style-type: none"> -head and body are bent over -arms are bend in the elbow area -bend in the hip joint -toes are bend down in the shape of claws 6. Vegetative disorders: (examples) <ul style="list-style-type: none"> -disorder of temperature regulation -circulation problems -digestion problems -decrease in intelligence -depressive disgruntlement -amimia (face stiffness) 	<ul style="list-style-type: none"> • motions should become more fluently (by steady motions of the MOTomed) • loosening muscle stiffness (rigor) to support the mobility of the legs • Support walking ability by training and improving of muscle strength and endurance as well as by loosening the muscle stiffness • supporting upright posture by backward training with the arm trainer • Prevent or reduce the consequences of lack of movement (prophylaxis) : <ul style="list-style-type: none"> - stimulate blood circulation - activate digestion - keep joints moving in order to prevent contractions - cardio training to stimulate metabolism - reduce water accumulation (oedema) •
<p>Polio / Poliomyelitis</p> <p>Polio is a neurological disease. Polio is an acute fevered virus disease. The virus breaks into the body through the stomach-bowel-channel. The infection results to an inflammation and cicatrization of motor nerve tracts in the spinal cord. The results are flabby palsies (no spasm) of those muscles which are provided by the affected motor nerve fibres.</p> <p>Depending on the inflammation there are single muscles or larger muscle groups affected. There is still sensibility (feeling). The flabby paralysed muscles reduce their muscle mass and tend to over-stretch. The opposite muscles become shorter. That results to defective joint positions and contractions.</p>	<ol style="list-style-type: none"> 1. No spasm, as only the 2nd motoneuron is affected. 2. In most cases, they still have residual muscle strength; patients are often even able to walk. 3. Often asymmetrical posture, because some limbs are more affected than the others 4. Consequences of lack of movement, e.g. disorders of: <ul style="list-style-type: none"> - the blood circulation - the digestion system - the flexibility of joints (contractions) - the metabolism and water accumulation (oedema) 	<ul style="list-style-type: none"> • Training to build up muscle strength and endurance • Prevent or reduce the consequences of lack of movement (prophylaxis) : <ul style="list-style-type: none"> - stimulate blood circulation - activate digestion - keep joints moving in order to prevent contractions - cardio training to stimulate metabolism - reduce water accumulation (oedema)

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Post-polio-syndrome PPS (post-term results of polio)		
After a stable phase, mostly after 20-30 years new disorders appear which are caused by previous virus infections.	See polio!	See polio!
Polyneuropathy (also periphere Polyneuropathy)		
<p>Polyneuropathies are <u>neuromuscular</u> diseases which affect the peripheral nervous system. Motor, sensitive and vegetative nerve fibres connect the spinal cord to the muscles, tendons, joints, bones and organs. If these are injured results can be paralysis, sensory and vegetative disorders. The first symptoms are pain and discomfort, itching, burning or unpleasant temperature perception as well as disorders in sensitivity.</p> <p>The most common reasons are advanced diabetes, alcoholism, and kidney malfunction. Very rarely the disease is congenital. All these causes lead to destruction of the peripheral nerves.</p>	<ol style="list-style-type: none"> 1. No spasm because the periphery is injured 2. They are usually still able to walk 3. Strong muscle pain 8. Consequences of lack of movement, e.g. disorders of: <ul style="list-style-type: none"> - the blood circulation - the digestion system - the flexibility of joints (contractions) - the metabolism - water accumulation (oedema) 	<ul style="list-style-type: none"> • Maintain and improve walking ability by training of residual strengths. • Prevent or reduce the consequences of lack of movement (prophylaxis) : <ul style="list-style-type: none"> - stimulate blood circulation - activate digestion - keep joints moving in order to prevent contractions - cardio training to stimulate metabolism - reduce water accumulation (oedema)
Paraplegia (Para- or Tetraplegia)		
<p>Neurological disease, relating to damage of the spinal cord. At the damage, the whole cross-section of the spinal cord or only a part of it, are affected. So there is complete (Plegia) and incomplete (Parese) cross-section-paralysis.</p> <p>The spinal cord runs in the spine's bone cover. It contains motor and sensoric nerve fibres which run from the brain to the body's limbs and back again to send information.</p> <p>The extent of the paralysis depends on the damage's position.</p> <p>Plegy = complete paralysis, i.e. total loss of muscle strength and sensitivity.</p> <p>Parese = incomplete paralysis, there is not a total loss of motoric (ability of movement) and/or sensitivity. Somebody may e.g. not have any muscle strength left but may still be able to feel (partly), so it is termed 'incomplete paralysis'.</p> <p><u>Paraplegia</u> means, depending on the location of the spinal cord injury, complete paralysis of body and leg muscles (damage to the motor nerve fibres), loss of sense of touch and register of pain, as well as temperature and sense of position. There can be additionally a disorder of intestine and bladder functioning.</p> <p><u>Tetraplegia</u> means that there is also a paralysis of the arms, therefore all four limbs (tetra = four) are affected. The injury of the cervical spinal cord leads to an interference in breathing.</p>	<ol style="list-style-type: none"> 1. Spasms (note: some paralysis patients use spasm in order to stand up or to change their sitting position e.g. etc.) Spasms occur at paralysis patients often during the night 2. With complete paralysis there is no residual strength 3. With incomplete paralysis there is usually some, although limited residual strength - patients are sometimes able to walk 4. Mostly no bladder control (=Incontinence) ATTENTION: with the MOTomed training bladder problems unfortunately cannot be relieved for completely paralysed patients. The problem is not caused by spasms, it is a result of damaged nerve fibres. With incomplete paralysis, bladder control can be affected by spasms. In this case pelvic and bladder muscles can be improved. 9. Consequences of lack of movement, e.g. disorders of: <ul style="list-style-type: none"> - blood circulation - digestion; no function of rectum; often bowel movement is only possible with laxative - flexibility of joints (contractions) - metabolism - water accumulation (oedema) 	<ul style="list-style-type: none"> • Tone regulation (spasm) to improve and maintain mobility • With incomplete paralysis – strengthening of the muscles to be able to use them again for daily activities and sometimes it is even possible to learn to walk. • Prevent or reduce the consequences of lack of movement (prophylaxis) : <ul style="list-style-type: none"> - stimulate blood circulation - activate digestion - keep joints moving in order to prevent contractions - cardio training to stimulate metabolism - reduce water accumulation (oedema) • With incomplete paralysis - strengthening of the muscles can bring back bladder control

Profile of indication	Typical symptoms of disorder	Patient's benefits! Why should these patients use the MOTomed ?
<p>Stroke (Apoplex)</p> <p>Neurological disease; A stroke is a sudden interruption of brain blood circulation, insufficient oxygen supply or a brain bleeding. This way nerve cells can be injured or even damaged completely, therefore certain movement abilities might be "deleted" (e.g. walking, co-ordination).</p> <p>An interruption of the circulation can be caused by an acute incident such as an emboli (Embolus) or thrombosis, or by arteriosclerosis (over the years plaques are built up which narrow the vessels or close them completely)</p> <p>After a stroke often one side of the body is completely or partly paralyzed. (hemiplegic or hemiparesis)</p> <p>hemi = half sided plegic = complete paralysis parese = incomplete paralysis</p>	<ol style="list-style-type: none"> 1. Spasm: At the beginning the muscles are often without any tension. Directly after a stroke most patients don't have any spasms. Spasms often develop later on in the paralysed side. Limited or even no walking ability caused by: <ol style="list-style-type: none"> a) No muscle tension (flabby paralysis) at beginning b) Spasms later on c) Reduced muscle strength (muscle atrophy) 2. Consequences of lack of movement, e.g. disorders of: <ul style="list-style-type: none"> - blood circulation - digestion; no function of rectum; often bowel movement only possible with laxative - flexibility of joints (contractions) (the arm/upper body area is often stronger affected) - circulatory - metabolism - water accumulation (oedema) 3. Problems with co-ordination and motor activity 4. Limited range of vision 	<ul style="list-style-type: none"> • Tone regulation/ ease spasm to improve mobility • Improve walking ability (muscle strength and muscle endurance can be built up) • Better fitness –so patients don't get out of breath so quickly (experience from a stroke group in Laupheim/Germany) • Practising motor activity and co-ordination • The symmetry training allows the patient to focus on the weaker side during the training and therefore to reduce compensatory patterns • Prevent or reduce the consequences of lack of movement (prophylaxis) : <ul style="list-style-type: none"> - stimulate blood circulation - activate digestion - keep joints moving in order to prevent contractions - cardio training to stimulate metabolism - reduce water accumulation (oedema) • Improvement of mental well being • Simplify activities of daily living (see point 1 page 12)

Profile of indication	Typical symptoms of disorder	Patient's benefits! Why should these patients use the MOTomed ?
<p>Traumatic Brain Injury (TBI)</p> <p>Head callosity, cranium and brain are injured, mostly by accident, and often come along with heavy complications. The brain can be damaged immediately after the accident or even later due to brain bleeding (cerebral hemorrhage) or brain swelling (cerebral oedema).</p> <p>There are different conditions of TBI, depending on the grade of unconsciousness, e.g. the apallic syndrome (awake coma) often is caused by a very bad TBI.</p>	<ol style="list-style-type: none"> 1. The injury's dimension and the typical signs of the disease, depend on which brain region is injured. 2. Usually there is an increase in tone and sudden spasms 3. Mostly residual force is still left, usually no walking ability 4. At the state of the beginning the patients are mostly bedridden 5. Results of lack of movement, disorders <ul style="list-style-type: none"> - of blood circulation - of digestion; no function of rectum; often bowel movement is only possible with laxative - flexibility of the joints (contractures) (the arm/upper body area is often stronger affected.) - of circulatory - of metabolism - water accumulation (oedemas) 	<ul style="list-style-type: none"> • tone regulation to support mobility • training of residual force • Prevent or reduce the consequences of lack of movement (prophylaxis) : <ul style="list-style-type: none"> - stimulate blood circulation - activate digestion - keep joints moving in order to prevent contractions - cardio training to stimulate metabolism - reduce water accumulation (oedema)
<p>Spina bifida (paraplegia hereditary)</p> <p>Neurologic disease, Spina bifida, literally "divided spine", is a malformation of spine and spinal cord ("open back").</p> <p>The spine and spinal cord are growing from the neural tube. Naturally both arch vertebrae melt into a ring which secures the spinal cord. With spina bifida they are not melted correctly.</p> <p>The medical condition depends on the grade of damage of the spinal cord, ranging from light limitation of walking ability until complete paraplegia.</p> <p>Mostly the area of sacral bone and lumbar spine are affected by spina bifida which explains why most patients don't have any spasms.</p>	<ol style="list-style-type: none"> 1. Rarely spasms, only if the area above the lumbar vertebra is affected 2. Can be a complete or an incomplete paralysis 3. Consequences of lack of movement, e.g. disorders of: <ul style="list-style-type: none"> - the blood circulation - the digestion system - the flexibility of joints (contractions) - the metabolism - water accumulation (oedema) 4. Problems with bladder control (=incontinence) <p>ATTENTION: Complete paraplegia patients mostly cannot improve their bladder control trough MOTomed training as the problem is caused by damaged nerves. Bladder control only can be improved if it is caused by spasms and cramps.</p>	<ul style="list-style-type: none"> • With incomplete paralysis – strengthening of the muscles to be able to use them again for daily activities (e.g. using the bathroom) • Prevent or reduce the consequences of lack of movement (prophylaxis) : <ul style="list-style-type: none"> - stimulate blood circulation - activate digestion - keep joints moving in order to prevent contractions - cardio training to stimulate metabolism - reduce water accumulation (oedema)

Appendix– general explanations:

1. ADL's (Activities of daily living)

The handling of daily life activities (ADL's) such as for example have a wash, get dressed or going to the bathroom shall get a lot easier by maintaining and supporting mobility.
Tone regulation, maintaining and gaining back the muscle strength, flexibility of the joint and general well being increases independence and self confidence.

2. SymmetryTraining

The SymmetryTraining is important to prevent/reduce pattern of compensation, by practising the weaker side more specifically. A pattern of compensation is when the patient uses his stronger body part much more in order to balance his weaker side. This is important to avoid as it often results to disorders in posture, muscles, joints and the general motions.

3. Medication and side effects

Reduce medication and their side effects and therefore extremely high costs. Medication often results to inactivity of organs and metabolism.

Movement can stimulate the self-activity of the body in order to support the natural activities of organs and metabolism.

Examples for medication and side effects:

→ medication to reduce tone:

high tiredness, because the medication effect the CNS (central nervous system) and not directly on affected muscles / muscle group.

→ abstergent agents:

Destruction of bowel flora (bowl gets inactive and used to it), electrolyte balance (mineral nutrient) is disturbed, body looses a lot of water (over a long-term, it can lead to a kidney disorder)

→ dehydration medication:

The body looses a lot of water, therefore many important mineral nutrients are excreted.

(Electrolyte balance decreases) - Examples:

magnesium shortage = can lead to calf cramps

kaliium shortage= can restrict the cardiac activity

Water loss weakens the circulation what often results to fatigue.

4. False body posture – limited function of the upper body

The backward training with the upper body trainer helps straightening the body posture. The upper and backward movements force the body to orientate to the back. It is important to improve abdominal and trunk muscles. Daily upper body training can improve the posture significantly.