

MBST · mode of action in wound healing

Scientific data show that MBST technology has an effect on connective tissue cells and the extracellular matrix (ECM):

- Potential phase shift of 2 hours in the oscillation of the genes per1 and cry1 as well as a significant change of the transcription level of hif1 in the whole circadian cycle³
- Can cause a shift resp. readjustment of the circadian clock in fibroblast cells³
- Positive effect on bone mineral content and increase of bone mass density^{6,7,8}
- A highly significant decrease of the subjectively assessed intensity as well as frequency of pain^{4,5,9,10}
- Influences the function of cells in an inflammatory state¹¹
- Influences the activity of protein kinases and changes the protein profile of skin fibroblasts¹²
- Leads to a significant increase of soluble ECM collagens and a decrease of sparingly or non-soluble ECM collagens^{13,14}
- Enriches cell biomass with soluble glycosaminoglycan^{13,14}
- Influences resp. regulates hypoxia processes and oxygen-sensitive signalling pathways¹⁵
- Stimulation of the migration of macrophages and the proliferation and migration of endothelial cells¹²

Further information on MBST magnetic resonance therapy

Patients with chronic or persisting postsurgical wounds are an enormous challenge for the medical profession.

A thorough diagnosis always forms the basis for a successful MBST therapy. Clean wound area and wound margin are a prerequisite for good wound healing. Patients with diabetes mellitus and high blood pressure should be correctly medicated.

At first, incorrect past wound treatment should be excluded. A differential diagnosis of the wound healing disorder should follow.

Postsurgical · Post in-patient · Accompanying rehabilitation

Aim of all postsurgical MBST wound treatment is a functionally stressable and aesthetically inconspicuous scar. A resilient scar is the best protection for the tissue against renewed opening or infections.

MBST magnetic therapy is used with the therapeutic objective to repair defects of the tissue as fast as possible, thus reestablishing the natural protective function of the skin and positively influencing scar formation.



Postsurgical therapy approach

MBST magnetic resonance therapy

Support of endogenous natural biological processes after invasive operations



MBST®

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Our vision:

To support the patient
in regaining his ability
for self-sufficiency!

Consequences of invasive interventions

In the course of an outpatient or inpatient invasive intervention in the body, surgical sectioning of tissues like skin, mucous membranes or organs usually occurs. Consequences may be:

■ Simple wounds

External wounds without a large loss of tissue situated in areas with good blood circulation, wounds with straight edges or only affecting the skin (epidermis).

■ Complicated wounds

Internal or external wounds with considerable loss of tissue, with fissured wound edges or situated in areas with reduced blood circulation. They can reach deep into the body and also injure bones, muscles, nerves or blood vessels.

Pain following surgery

The development of pain following surgery is closely dependent on the exact procedure of incisions into the skin and the displacement of tissue such as bones or bone fragments. In this case, the surrounding tissue may be severely affected, which can result in postsurgical pain.

This pain can vary greatly in its intensity and duration and can also affect different bodily functions.

Chronified pain syndrome

Following invasive surgery, patients may also develop a chronic pain syndrome, which makes postsurgical care particularly important.

Postoperative care

Postoperative care is defined as the measures that a patient receives after a surgical resp. invasive procedure. It is usually a combination of wound care and pain management.

Physical activity is important for a fast recovery, as rapid mobilisation has a positive effect on circulation and metabolism. The individual postsurgical care depends on the patient's physical condition, his medical history and the type and course of the operation. The surgeon and/or the attending doctor determines the necessary measures after the procedure.

Wound healing disorders after surgery

Postsurgical pain is not only very unpleasant for the patient, but can also have an adverse effect on the respective healing process and prevent normal wound healing. The following conditions of the wound area can also lead to postsurgical complications or wound healing disorders:

- **Reduced blood circulation**
- **Poor oxygen supply**
- **Necrosis of wound margin or soft tissue**
- **General condition of the skin tissue (i. e. increased capillary fragility due to higher age)**

This is the startingpoint of MBST magnetic resonance therapy. The aim is to actively influence wound healing processes by a targeted energy transfer into injured or functionally impaired tissue.

MBST therapy approach · Postsurgical wound healing

Wounds disturb the function of the tissue and lead to a reduced oxygen supply and blood circulation compared to undamaged skin areas. As a result, the healing process is slowed down. New research results in molecular and cell biology have broadened our understanding of postsurgical care and physiological wound healing, thus enabling an improvement.

The internal clock of cells influences wound healing

Depending on the time of day of the injury resp. the invasive operation, a skin wound heals up to twice as quickly, as for example actin production and the mobility of the fibroblasts fluctuates rhythmically in the course of a day.¹

The fibroblasts are responsible for building a new extracellular matrix. The formed capillaries supply the tissue with the oxygen necessary for the metabolism. The primary blood clots are broken down by fibrinolysis system factors: u-PA (urokinase plasminogen activator) and t-PA (tissue plasminogen activator). The different matrix metalloproteinases (MMP) also transform the extracellular matrix.² Circadian cell rhythm influences cell migration into injured tissue and the formation of firm cell connections.¹

This new knowledge can help patients after surgery, as the accelerated response can support wound healing.

Misregulated body cells are no longer able to carry out important processes, which can, among other things, result in disorders in metabolic regulation and the interaction of molecular mechanisms. Tissue degeneration, disturbed regeneration processes and the associated inflammatory reactions can be the consequences.

Scientific data shows that MBST technology can actively influence the functions of cells and the internal clocks of cells, which also play an important role in wound healing.¹ In this way, the natural clocks of our cells can be readjusted to again enable smooth running.

Fastest possible wound healing is clinically relevant as it reduces the risk of infection, postsurgical pain and a chronification of wound healing disorders.

MBST therapy approach · Postsurgical pain

Patients report significant relief or even disappearance of pain and improved mobility after MBST therapy.^{4,5}

In this way, MBST therapy can enable the operated patient to perform physiotherapeutic exercises much earlier and more effectively. Also an earlier reduction of the amount of painkillers required is possible. This can help the patient to be able to sit up, get up and walk sooner. An early mobilisation after an operation has a positive effect on metabolism and the overall condition.

Postsurgical MBST therapy also aims at preventing a weakening of the immune system by postsurgical pain and thus strengthens the body's defence against infections.

These complex biological processes can only work as intended if activating and inhibiting reactions are in balance. The biological rebuilding of damaged tissue into structured extracellular matrix out of migrating fibroblasts and capillary sprouts requires energy.

MBST magnetic resonance therapy can help reduce the risk of complications after surgery and support the recovery process by transferring energy into damaged tissue in a targeted manner.

MBST therapy approach · Wound healing disorders

A healing process of more than 4 weeks that shows no healing tendencies defines a chronic wound. At this time, at the latest, the cause of the wound healing disorder should be examined by the attending doctor. Permanent open wounds are an unacceptable state because they are a burden and a danger for the patient.

Chronic wounds are often accompanied by permanent pain. A large amount of patients' reports shows that MBST therapy can reduce the pain level.^{4,5}

The acceleration of biological healing processes, that is the therapeutic aim of MBST magnetic resonance therapy, may reduce complaints and downtimes. No side effects have been observed in this non-drug therapy as yet.