

MAGNETOLITH®
EMTT® – EXTRACORPOREAL
MAGNETOTRANSDUCTION THERAPY



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Extracorporeal Magnetotransduction Therapy (EMTT®) from STORZ MEDICAL

STORZ MEDICAL AG is based in Tägerwil (Switzerland) and has been developing innovative therapeutic solutions for more than 30 years trusted by medical professionals and patients worldwide. Nowadays STORZ MEDICAL is the internationally leading specialist for extracorporeal shockwave therapy (ESWT) and has conducted pioneering work in this field.

Extracorporeal magnetotransduction therapy (EMTT®) offered by STORZ MEDICAL provides a new non-invasive procedure for treating

chronic musculoskeletal diseases. The powerful therapy device – the MAGNETOLITH® – is impressive with its wide range of applications, patient comfort and ease of use.

EMTT® relies on a different operating mechanism to ESWT: Whereas ESWT acts using high-energy acoustic/physical signals in a local treatment area, EMTT® acts using high-energy electromagnetic radiation in a regional treatment area.

Advantages of EMTT®

- Non-invasive, outpatient therapy – with almost no side effects
- Used for musculoskeletal diseases
- Wide range of therapies
- High level of patient comfort and easy to use
- EMTT® is a useful addition to ESWT

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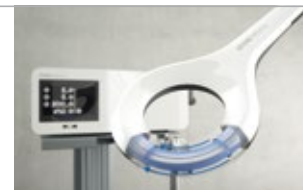
09 | EMTT® treatment using the MAGNETOLITH®

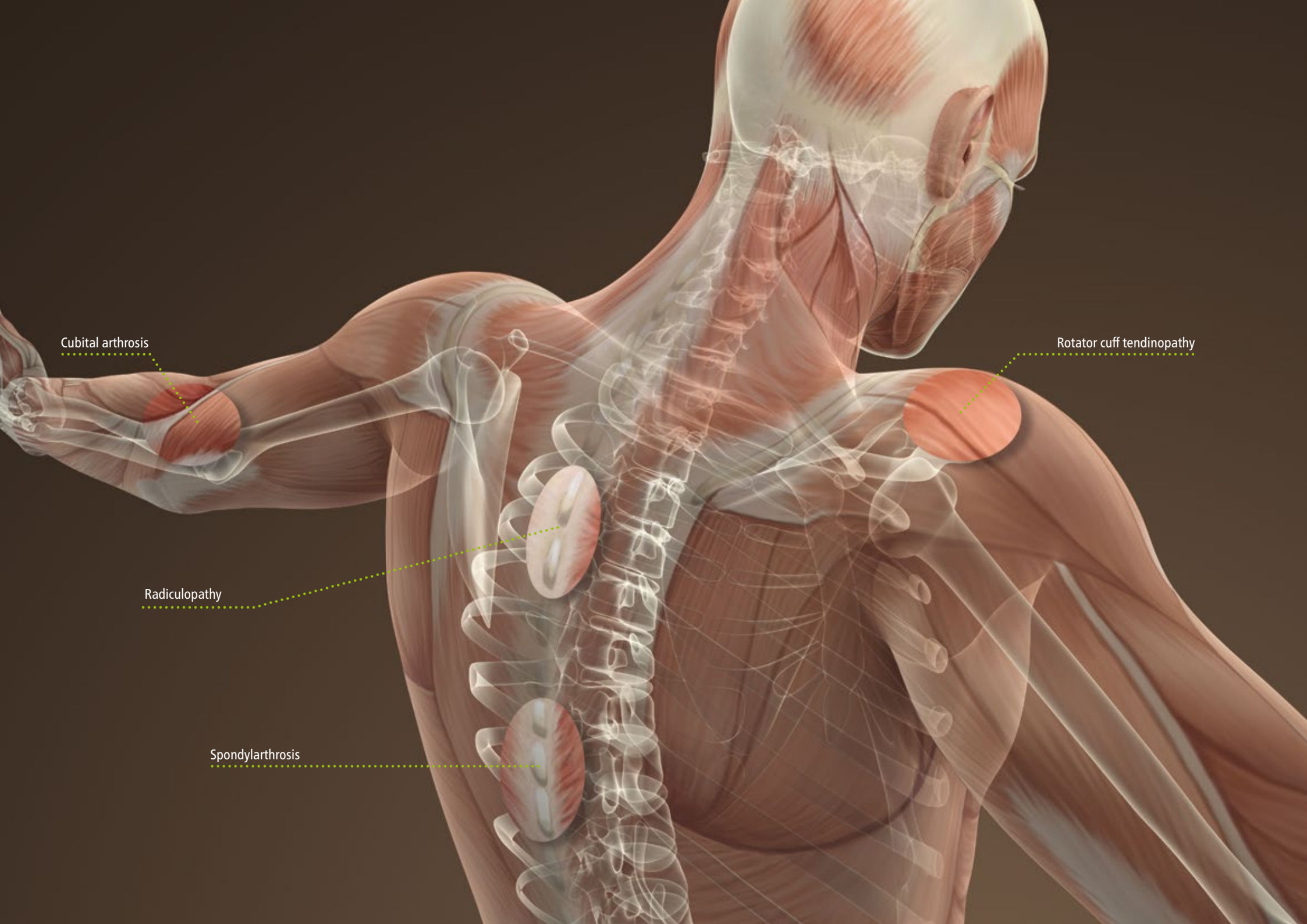


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Cubital arthrosis

Rotator cuff tendinopathy

Radiculopathy

Spondylarthrosis

EMTT® – New possibilities in therapy and rehabilitation

Application areas of Extracorporeal Magnetotransduction Therapy (EMTT®) include diseases of the musculoskeletal system such as pain in the lower back, arthrosis as well as inflammation in tendons and joints. EMTT® differs from other general forms of magnetic field therapy or PEMF in its higher oscillation frequency and magnetic field strength, resulting in a strong »effective transduction power«. It can be assumed that the faster the magnetic field pulses or the higher the effective transduction power, the more pronounced the bioelectrical activity in the organism will be. These properties also allow the EMTT® to reach a large penetration depth (18 cm) and to cover a wide range of applications.

Typical EMTT® application areas are presented by musculoskeletal diseases

- Degenerative joint diseases
Wear and tear conditions such as osteoarthritis (knees, hips, hands, shoulders, elbows), herniated discs, spondylarthrosis
- Pain treatment
(Chronic) pain, for example, back pain, lumbago, tension, radiculopathy
- Sports injuries
Chronic inflammation of tendons and joints, tendon overuse syndromes, inflammation of the pubic bone

EMTT® highlights

- High effective transduction power (MAGNETOLITH®: 65,300 T/s)
- Wide range of applications
- Efficacy and safety proven in studies

Evidence of the significant therapeutic effects of using EMTT® devices

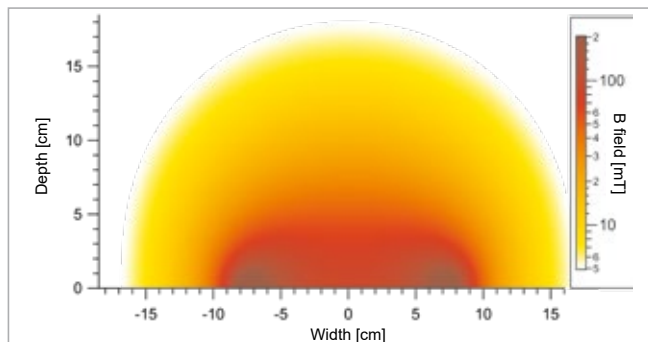
Krath, A. et al., J Orthop. 2017;14(3):410-415.
doi: 10.1016/j.jor.2017.06.016.

Klüter, T. et al., Electromagn Biol Med. 2018;37(4):175-183.
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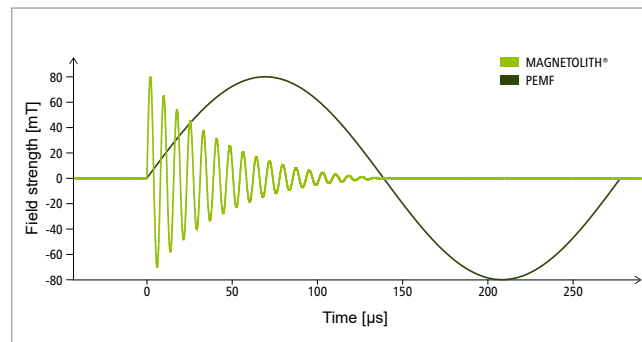
Klüter, T. et al., J Orthop Ther. 2018: JORT-1113.
doi: 10.29011/2575-8241.001113

Gerdemeyer, L. et al., J Foot Ankle Surg. 2017;56(5):964-967.
doi: 10.1053/j.jfas.2017.06.014.

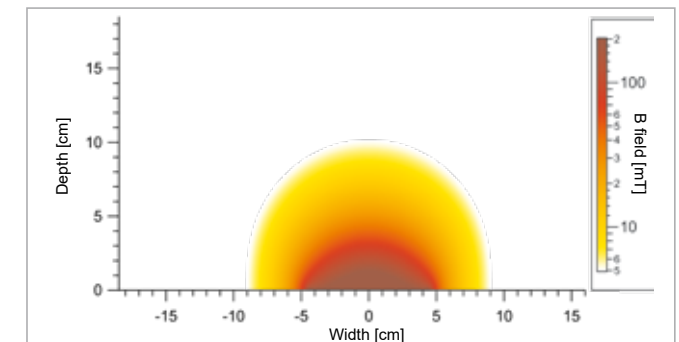
Field strength behaviour at the applicator of the **MAGNETOLITH®**



Comparison of a single pulse from **MAGNETOLITH®** and **PEMF**



Field strength behaviour at the applicator of a typical **PEMF device**





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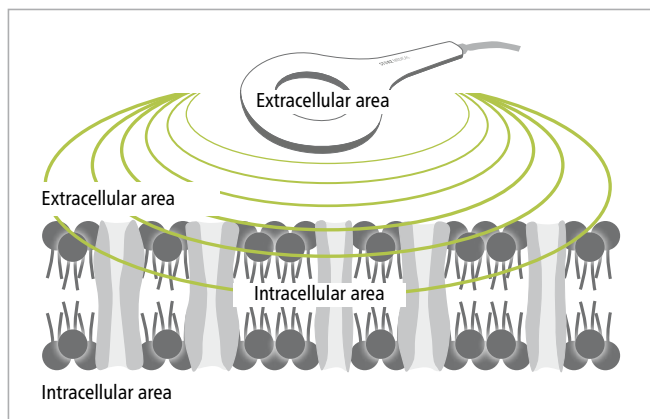
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EMTT® operating principle

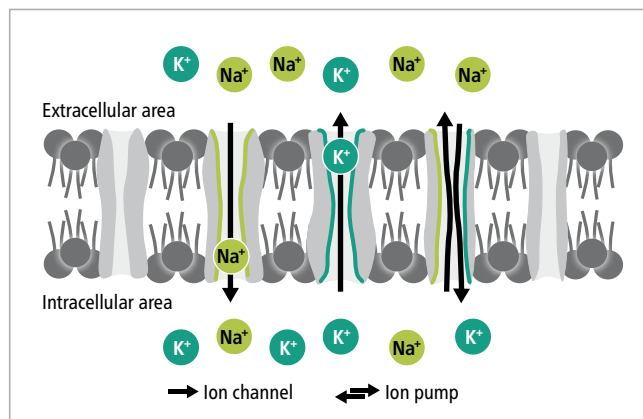
In the course of EMTT®, painful areas of the body are treated with high-energy magnetic pulses, the field strength of which lies within the therapeutically effective range – 10 mT (millitesla) and upward. With this pulse intensity, it is possible to achieve a therapeutic effect in the cell. The generated energy is transferred via an applicator to the body areas to be treated. The individual pulses penetrate the tissue so that even deeper tissue layers can be reached. There is no temperature increase in the tissue, due to the short duration of the individual pulses.

High-energy magnetic waves make contact with cell structures.



EMTT® treatment can cause positive biological effects. Every cell undergoes chemical reactions that drive metabolism. The prerequisite for this is membrane permeability. A stable cell membrane ensures permeability for vital substances. A pathological change leads to dysfunction – a metabolic disorder that can ultimately lead to disease. The chemical reactions of the cell potential can be positively influenced by EMTT®. The sodium-potassium pump can be reactivated and physiological cell processes can be normalised.

An intact cell membrane ensures the physiological cell processes.



Biological effects of EMTT®

- Therapeutically effective magnet field
- Normalisation of the membrane potential
- Mechanical activation of the ion channels ^{1,2}

Publications

¹Weaver, J. et al., Bioelectrochemistry, 87, 236–243.
doi: 10.1016/j.bioelechem.2012.02.007 (2012)

²Ahn, A. C. et al., Medical Engineering & Physics, 31: 7, 733 741.
doi: 10.1016/j.medengphy.2009.02.006 (2009)



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EMTT® treatment using the MAGNETOLITH®

Treatment with the MAGNETOLITH® requires little effort, is non-invasive and has almost no side effects. It is comfortable and uncomplicated for patients: The applicator is positioned directly above the region of the body to be treated without the need to remove clothing. The user can employ the practical holding arm for fatigue-free treatment. If required, the applicator can also be guided by hand during the therapy.

The EMTT® treatment is performed with a frequency of up to 10 pulses per second. The pulse intensity is adjusted depending on the clinical picture. Treatment takes 5 – 20 minutes depending on the indication and frequency and can be repeated up to 8 times over a period of several weeks. The treatment can be carried out by the attending physician as well as by medically trained personnel.

Highlights

- Patients do not have to remove their clothes
- Effective and fatigue-free operation
- Adjustable frequency up to 10 pulses per second
- Also used by medically trained specialist staff

Dynamic treatment: Ankle example



Static treatment with the holding arm: Lumbago example



Static treatment with the holding arm: Shoulder example





MAGNETOLITH® – Functional design and ergonomics

The MAGNETOLITH® is convincing due to its modern design, high-quality processing and user-friendly functionality. The powerful applicator ensures optimum transmission of the therapeutically effective magnetic field to the patient. Its effective cooling system enables interruption-free therapy in continuous operation even at the highest device output. Thanks to the flexible holding arm, the applicator can be placed in any position. The individual joints are secured exactly with one simple movement. For dynamic treatment, the applicator can also be disconnected from the holding arm at any time via the click & connect

mechanism. The applicator's special plug connection guarantees fast replacement and smooth operation in day to day practice.

The touch display was also developed with a clear focus on the user. It is simple and intuitive to use. Parameters such as intensity, application frequency and the number of pulses can be adapted to individual needs. The integrated equipment trolley allows the MAGNETOLITH® to be used flexibly in practice rooms.

Highlights

- Modern design and very easy to use
- Easy-to-secure holding arm (central lock)
- Click & connect mechanism for flexible applicator usage
- Continuous and reliable operation thanks to water-cooled applicator
- Safe and easy applicator replacement

Intuitive operation thanks to the clear touch display



Applicator for ease of use



Equipment trolley for flexible use in practices





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