

# MAGCELL®

Pulsating electromagnetic fields for the relief of osteoarthritis pain  
and sensory neurotoxicities



TECHNOLOGY FOR THERAPY

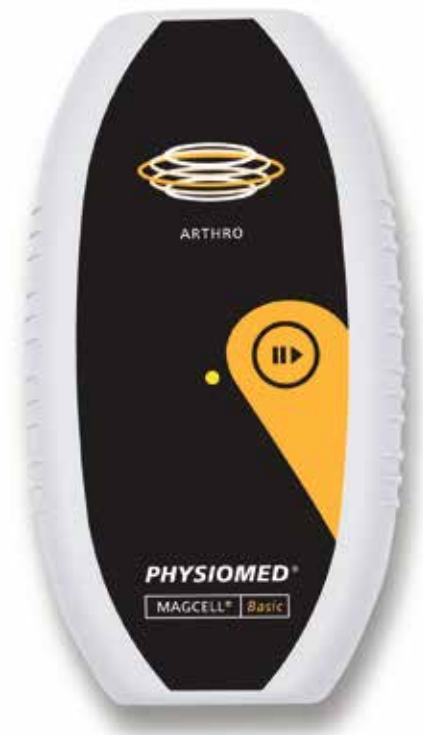
**PHYSIOMED®**



# MAGCELL® ARTHRO

Pain-alleviating and movement-promoting effect for osteoarthritis

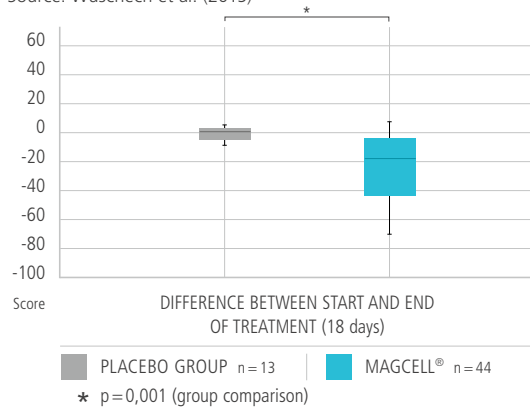
MAGCELL® ARTHRO significantly improves general symptoms (WOMAC total score) and individual scores for pain, stiffness and daily activity in osteoarthritis (ARC criteria II and III). The therapy can be applied several times daily as a complementary treatment without side effects and may thus help to reduce intake of pain medication.



Special features, technical data and standard accessories are identical to Magcell® Microcirc

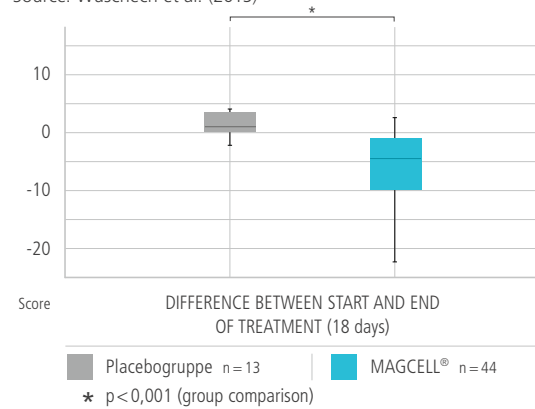
## WOMAC TOTAL SCORE

Source: Wuschech et al. (2015)



## WOMAC PAIN SCORE

Source: Wuschech et al. (2015)



In a randomised controlled study on the effect of MAGCELL® ARTHRO for knee arthritis with osteoarthritis level 2.8 ± 0.8 (American College of Rheumatology criteria) at the primary clinical end point (WOMAC total score) median increase of 0.7 P (non-significant) was recorded in the placebo group between T0 and T1 (18 days), yet in the MAGCELL®-group a significant local decrease of 21.8 P. During the study no undesirable incidents or side effects occurred related to therapy.

The WOMAC individual scores for pain, stiffness and daily activity also resulted in significant local improvements in the MAGCELL®-group compared to a slight median increase (non-significant) in the placebo group. A highly significant result (p < 0.001) in favour of the MAGCELL®-group was recorded for the individual parameter pain reduction compared to the placebo in the difference between the beginning and end of treatment.



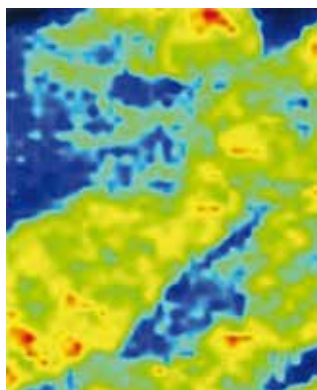
# MAGCELL® MICROCIRC

## Blood flow stimulation and reduction of sensory neurotoxicities in cytostatic-induced polyneuropathy

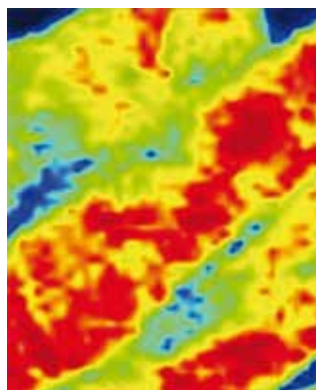
MAGCELL® MICROCIRC can positively influence symptoms of neurotoxicities like sensory ataxia, neuropathy and neuropathic pain symptoms (especially CIPN I-IV) on hands and feet as a result of chemotherapy. Moreover a significant increase in nerve conductivity speed (ulnar nerve) was achieved by the treatment.

### BLOOD FLOW STIMULATION

Source: Funk et al. (2014)



1. Control (without MAGCELL® MICROCIRC)



2. Two minutes after treatment with MAGCELL® MICROCIRC

MAGCELL® MICROCIRC significantly increases micro-circulation ( $p < 0.001$ ) while nitric oxide (NO) has a blood vessel dilatory effect. The authors recommend the therapy for clinical situations where an improvement in micro circulation is identified, like for instance in the case of chronic tissue repair.

### TECHNICAL DATA

Protection class	Internal power supply
Power supply	2 x 1.5 V R6 alkaline batteries
Magnetic field strength max.	200 mT
Treatment duration	MAGCELL® ARTHRO 2.5 min.
Treatment duration	MAGCELL® MICROCIRC 5 min.
Dimensions (W x H x D)	83 x 152 x 25 mm
Weight	0.21 kg

### STANDARD ACCESSORIES

- [2] Batteries
- [1] Metal case
- [1] Operating instructions



### SPECIAL FEATURES

#### Electrode-free electrotherapy

- Electrode-free electrotherapy for therapists and patients
- Pulsating electromagnetic fields (PEMF)
- Field strength more than 1000 gauss
- Effective treatment concept due to repeatable short-treatment periods
- Through-textile treatment (even through shoes)

### GENERAL FEATURES

- Very easy one-button operation
- Battery-driven
- Optical and acoustic function control
- Automatic switch-off at the end of the therapy period

# MAGCELL®

MAGCELL® is a portable hand device for electrode-free electrotherapy. Magnetic alternating fields are produced over rotation by permanent magnets. A sinusoidal pulsating electromagnetic field (PEMF) is generated over the special magnet arrangement and device function principle. However, with a value of 0.105 tesla field strength it is many times higher than for commercially available magnetic field therapy devices with coils or mats, which generally operate with field strengths of maximum 100 gauss or 0.01 tesla. By contrast MAGCELL®-therapy units produce field strengths, which are generally stronger by factor 10 than these devices.

According to induction law induced time-variable magnetic fields induce electric fields. The physical effects of MAGCELL® derive from the electric fields produced in living cells and tissue based on induction law. Depending on tissue conductivity the field incites an electric current. Taking into account the specific conductivity for various body tissue and liquids, this electric current can be calculated. Its strength, or more precisely, current density (= current strength per area, A/m<sup>2</sup>) determines biological effectiveness.

All calculated current densities exceed 10 mA/m<sup>2</sup> and are thus within the range of effects internationally confirmed and classified as 'good': above the 'subtle biological effects' and within the range of 'confirmed macro effects' (10–100 mA/m<sup>2</sup>). Induced current densities are much higher again in blood and body fluids. The term 'electrode-free electrotherapy' for MAGCELL® derives from the distinctly strong induced current densities and exceeding of the threshold value of 10 mA/m<sup>2</sup>: both of which are not found on equipment using coils or mats.

Body fluids (e. g. joint fluid) play a key role in the relevant therapy indications for MAGCELL® devices. The cells in this fluid or adjacent tissue are exposed to the established current densities. MAGCELL® exceeds by far the recognised effective current densities so that treatment is effective even at a tissue depth of 3–5 cm. MAGCELL® also induces above-threshold current densities in the blood, which are crucial for clinical therapy effects, for instance in respect of blood flow stimulation and immunomodulatory processes. The same applies for interstitial liquids, which moreover are found in virtually all organs and tissue. In bones and fatty tissue with low conductivity current densities are well below the effectiveness threshold of 10 mA/m<sup>2</sup>, so a therapeutic effect in this tissue can scarcely be envisaged.

The following effects of electrode-free electrotherapy with MAGCELL® are clinically recorded:

- » pain alleviation and movement stimulation
  - e. g. in the case of osteoarthritis
- » substantial improvement in circulation
- » reduction of sensory neurotoxicities (polyneuropathy)

## ADDRESS

**PHYSIOMED ELEKTROMEDIZIN AG**  
Hutweide 10  
91220 Schnaittach  
Germany

## PHONE

+49 (0) 91 26 / 25 87- 0

## FAX

+49 (0) 91 26 / 25 87- 25

## E-MAIL

[info@physiomed.de](mailto:info@physiomed.de)

## WEB

[www.physiomed.de](http://www.physiomed.de)

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