

## Literatuur PEMF

1. <https://pubmed.ncbi.nlm.nih.gov/29492540/>

### **Pulsed Electromagnetic Field (PEMF) Mitigates High Intracranial Pressure (ICP) Induced Microvascular Shunting (MVS) in Rats**

**Results:** PEMF significantly dilated arterioles, increased capillary blood flow velocity and reduced MVS/capillary ratio compared to sham-treated animals. These effects led to a significant decrease in tissue hypoxia, BBB degradation and neuronal necrosis.

2. <https://pubmed.ncbi.nlm.nih.gov/25343187/>

### **Increases in microvascular perfusion and tissue oxygenation via pulsed electromagnetic fields in the healthy rat brain**

**Results:** Pulsed electromagnetic field stimulation significantly dilated cerebral arterioles from a baseline average diameter of  $26.4 \pm 0.84 \mu\text{m}$  to  $29.1 \pm 0.91 \mu\text{m}$

3. <https://pubmed.ncbi.nlm.nih.gov/37510998/>

### **Pulsed Electromagnetic Fields (PEMF)-Physiological Response and Its Potential in Trauma Treatment**

In this review, we give a birds-eye view of the vast landscape of studies that have been published on PEMF, presenting the reader with a scaffolded summary of relevant literature starting from categorical literature reviews down to individual studies for future research studies and clinical use.

4. <https://pubmed.ncbi.nlm.nih.gov/34100976/>

### **Pulsed electromagnetic field (PEMF) as an adjunct therapy for pain management in interstitial cystitis/bladder pain syndrome**

**Results and conclusions:** The use of PEMF has been evaluated as a therapeutic strategy for pain management in several clinical scenarios. Randomized, double-blinded, placebo-controlled trials have reported positive efficacy and safety profiles when PEMF was used to treat non-specific low back pain, patellofemoral pain syndrome, chronic post-operative pain, osteoarthritis-related pain, rheumatoid arthritis-related pain, and fibromyalgia-related pain.

5. <https://pubmed.ncbi.nlm.nih.gov/24106421/>

### **Pulsed electromagnetic field therapy for management of osteoarthritis-related pain, stiffness and physical function: clinical experience in the elderly**

**Conclusion:** The present study shows that PEMF therapy improves pain, stiffness and physical function in elderly patients affected by knee osteoarthritis.

6. <https://pubmed.ncbi.nlm.nih.gov/33675261/>

### **The Effect of Pulsed Electromagnetic Fields on Angiogenesis**

**Part of abstract:** PEMF plays a role in enhancing angiogenesis, and their clinical application may go far beyond the current scope. In this review, we analyzed and summarized the effects and possible mechanisms of PEMF on angiogenesis. Most studies have shown that PEMF with specific parameters can promote angiogenesis, which is manifested by an increased vascular growth rate and increased capillary density.

7. <https://pubmed.ncbi.nlm.nih.gov/34004034/>

#### **Efficacy of Pulsed Electromagnetic Fields on Experimental Osteopenia in Rodents: A Systematic Review**

**From abstract:** Our results indicate the potential benefits of PEMF selection in animal models of osteoporosis.

8. <https://pubmed.ncbi.nlm.nih.gov/7960477/>

#### **Alzheimer's disease: improvement of visual memory and visuoconstructive performance by treatment with picotesla range magnetic fields**

**From the abstract:** The report demonstrates, for the first time, that specific cognitive symptoms of AD are improved by treatment with EMF of a specific intensity and frequency.

9. <https://pubmed.ncbi.nlm.nih.gov/7829292/>

#### **Improvement by picoTesla range magnetic fields of perceptual-motor performance and visual memory in a patient with chronic progressive multiple sclerosis**

**From the abstract:** These findings confirm the beneficial effects of picoTesla range MF in the treatment of MS and demonstrate the unique efficacy of this treatment modality in improving some of the cognitive deficits of the disease.

10. <https://pubmed.ncbi.nlm.nih.gov/7558655/>

#### **Weak electromagnetic fields improve body image perception in patients with multiple sclerosis**

These findings demonstrate that treatment with pT EMFs improves body image perception in MS patients thus corroborating previous observations which demonstrated this treatment modality to exert beneficial effects on cognitive functions in patients with MS.

11. <https://pubmed.ncbi.nlm.nih.gov/22588976/>

#### **Electromagnetic field stimulation potentiates endogenous myelin repair by recruiting subventricular neural stem cells in an experimental model of white matter demyelination**

**From the abstract:** EMFs significantly reduced the extent of demyelinated area and increased the level of MBP staining within the lesion area on days 14 and 28 postlesion. EMFs also increased the number of BrdU- and nestin-positive cells within the area between SVZ and lesion as observed on days 7 and 14 postlesion. It seems that EMF potentiates proliferation and migration of neural stem cells and enhances the repair of myelin in the context of demyelinating conditions.

12. <https://pubmed.ncbi.nlm.nih.gov/34380341/>

### **Effect of pulsed electromagnetic fields stimulation on ischemic skin model**

From the abstract: The rate of necrosis in the PEMF group decreased dramatically from the 6th day, and there was a statistically significant difference between the two groups at the 7th day ( $p < .05$ ). In this study, it was confirmed that PEMF (1 Hz, 10 mT) has a blood flow improvement and skin tissue necrosis alleviation in the ischemic flap animal model.

13. <https://pubmed.ncbi.nlm.nih.gov/35476222/>

### **Evaluation of Atopic Dermatitis Improvement Caused by Low-Level, Low-Frequency Pulsed Electromagnetic Fields**

While both the PEMF and Sham groups had atopic dermatitis lesions, lesion size was significantly smaller in the two PEMF groups than in the Sham group ( $P < 0.001$ ). Additionally, changes in epithelial thickness because of skin inflammation significantly decreased for both PEMF groups, compared with the Sham group ( $P < 0.001$ ). In conclusion, these results suggest that PEMF stimulation in vivo triggers electro-chemical reactions that affect immune response.

14. <https://pubmed.ncbi.nlm.nih.gov/26940444/>

### **Pulsed electromagnetic field (PEMF) prevents pro-oxidant effects of H<sub>2</sub>O<sub>2</sub> in SK-N-BE(2) human neuroblastoma cells**

Results The PEMF increased the MnSOD-based antioxidant protection and reduced the ROS production in response to a pro-oxidant challenge.

Additionally, changes in epithelial thickness because of skin inflammation significantly decreased for both PEMF groups, compared with the Sham group ( $P < 0.001$ ). In conclusion, these results suggest that PEMF stimulation in vivo triggers electro-chemical reactions that affect immune response. © 2022 Bioelectromagnetics Society.

15. <https://pubmed.ncbi.nlm.nih.gov/29109418/>

### **Extremely low frequency pulsed electromagnetic fields cause antioxidative defense mechanisms in human osteoblasts via induction of •O<sub>2</sub><sup>-</sup> and H<sub>2</sub>O<sub>2</sub>**

In summary, our data show that ELF-PEMF treatment favors differentiation of hOBs by producing non-toxic amounts of ROS, which induces antioxidative defense mechanisms in these cells. Thus, ELF-PEMF treatment might represent an interesting adjunct to conventional therapy supporting bone formation under oxidative stress conditions, e.g. during fracture healing.