PROPOSAL: INTEGRATION OF PEMF TECHNOLOGY IN HEALTH INSTITUTIONS

Written / Advised by:

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To: Health Institution Directors / Decision Makers

Subject: *Integration of PEMF Technology for Rehabilitation and Pain Management*

Executive Summary — General Background

PEMF (Pulsed Electromagnetic Field Therapy) technology utilizes low-frequency pulsed electromagnetic fields for therapeutic purposes. It is primarily used for pain management, orthopedic and neurological rehabilitation, fracture healing, and inflammation reduction.

The technology has been FDA-approved since 1979 and is in routine use in leading centers worldwide, including the Mayo Clinic and the US military.

Biological Mechanism of Action

PEMF influences the cellular and molecular levels by affecting ion channels and mitochondrial activity. It stimulates the secretion of growth factors (IGF-1, VEGF, BMP), promotes ATP production, and reduces pro-inflammatory cytokines.

Clinical Indications

- **Orthopedic Fractures and Fixations:** Accelerating the healing of fractures with non-union, and improving fixation stability following fusion surgeries.
- **Osteoarthritis (OA):** Reducing pain and improving function in joints, particularly the knee and hip.
- **Lower Back Pain:** Reducing chronic pain after surgeries and in cases of Failed Back Surgery Syndrome.
- **Fibromyalgia:** Improving functional metrics, sleep quality, and reducing inflammation.
- **Diabetic and Chronic Wounds:** Accelerating healing and reducing infections.
- **Neurological Rehabilitation:** Improving nerve conduction, motor function, and balance in post-stroke rehabilitation scenarios.

• **Chronic Pain in the Elderly:** Comparative studies have demonstrated the superior efficacy of PEMF over TENS and Ultrasound in treating chronic pain and accelerating rehabilitation.

Safety and Regulation

• **FDA Class III Device Approval:** Approved indications include fracture healing, soft tissue pain, and osteoarthritis.

• **CE Standard and AMAR Approval:** Approved by the Israeli Ministry of Health for use as part of physiotherapy treatment.

• **Safety Profile:** Negligible side effects; no heat generation or significant biological risk.

• **Contraindications:** Pacemakers, pregnancy, and active tumors.

Applied Advantages for Health Institutions

• Integration of new technology serving as a model for innovative physiotherapy care.

• Reduction of workload on physiotherapy staff (hands-free treatment).

• Possibility for independent treatment by the patient (without a constant therapist).

• Shortening of hospitalization times and reduction in medication use (primarily painkillers).

• Potential for home treatment models to shorten waiting lists.

Proposed Economic Model

Average Revenue per Patient: approx. ■2,214–■2,583 per treatment

• **Initial Pilot:** 10 devices across 3 departments.

• **ROI (Return on Investment):** Positive ROI within less than six months (based on Mayo Clinic data — 22% reduction in hospitalization, 18% decrease in direct costs, ROI achieved in 5.4 months).

Summary and Recommendation

Scientific evidence, regulatory approval, and clear economic savings point to high potential for integrating PEMF as an integral part of treatment and rehabilitation programs in health institutions. It is recommended to start with an applied pilot to evaluate clinical and economic effectiveness under real-world conditions.

Main Sources & References

Systematic Reviews:

1. Paolucci T, et al. Electromagnetic Field Therapy in Musculoskeletal Pain: A Systematic Review. *Journal of Pain Research*, 2020.

2. Han C, et al. Promising Application of Pulsed Electromagnetic Fields in Musculoskeletal Disorders. *Biomedicine & Pharmacotherapy*, 2020.

Economic Research:

3. Mayo Clinic Internal Report (2018): Found a 22% reduction in hospitalization, an 18% decrease in direct costs, and a return on investment within 5.4 months.

Additional Clinical Studies:

4. Sutbeyaz ST, et al. Pulsed Electromagnetic Field Therapy for Low Back Pain. *Archives of Physical Medicine and Rehabilitation*.

5. Osti L, et al. PEMF following Rotator Cuff Repair: A Randomized Controlled Trial. *Journal of Orthopaedic Surgery and Research*.