

# Key Market Segment of Pulsed Electromagnetic Field Therapy- Vision 2040

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## Abstract

The progress in the therapeutic modalities has more focus on the growing alternate strategies for diagnosis of the disease with less pain or injury to human body. The investigations in the management of the repair, healing and pain management process is increasing which led to the use of electric currents at low voltage as sensors to detect the movements and components in the cell that laid the foundation to PMEF (Pulsed Electromagnetic Field Therapy). The steep increase of this technique in 2020 due to its applications in hospitals, home care settings and diagnostic centers with worldwide market of 10.8 billion is fascinating and may rise even to 25 billion in 2040 market forecast. The frequency operation regions include low to high frequency which is modulated and hence plays a key role in the pain relief, one repair and also aids in the detailing of *in vitro* and *in vivo* studies. The present review describes about the advantages and market scenario of PMEF therapy. Further the outcome of the therapy in the different sectors of health care is emphasized.

**Keywords:** PMEF; market; Applications; PMEF devices

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## Introduction

Modern therapeutic modalities refer use of electric and magnetic field based therapies as safe and effective by US FDA witnessing wide therapeutic application in bone nonunion and pain management[1]. The substantial evidences prove that the pulsed electromagnetic field therapy (PEMF) therapy is effective as it stimulates the repairing/healing activities in the body. The electric currents induced by PMEF in the tissues are exactly similar to those of the natural electrical activities in the bones during the physical movements. The Pulsed magnetic fields initiate the series of activities inside the cell towards the nucleus and moreover extend to the gene level with few specific differences[2]. There are certain areas of bone which are lack of proper movement, bone deposition and electronegative in nature, thus need a electrical stimulation which could be offered by PMEF with low intensity provoking the bone regeneration and development[3]. The management of chronic pain is also an application of PMEF where it offers therapeutic advantage of improved blood supply leading increased oxygen pressure, activating and regenerating cells[4]. Thus the global market has increased the share of PMEF for pain management, bone development etc which could be expected to rise sharp by 2040. The market scenario current is expected to rise in 2027 with a share of 10.86 billion dollars globally for the pain management devices, 28 billion dollars for cryotherapy and 4 billion for the nanocapsules[5,6]. The PMEF therapy have shown a promising approach in hospitals, diagnostic centers and home care settings(Figure 1). The frequency regions include low and high which offer wide advantage to project the electric currents suitable to tissue region and precision recording[7]. The PMEF device have key role in pain relief, bone growth and also found to have application in other *in vivo* and *in vitro* studies[8]. The key market players for the PMEF devices include Bedfont Scientific, I-Tech Medical Division, OSKA, Medithera, Orthofix Holdings, Oxford Medical Instruments Health, Bemer, LLC etc. The frequency set ups of these medical devices suggest a strong market force of 62 billion in 2020[9]. The US FDA approval for the usage of PMEF devices has compromised usage of invasive devices and promoted use of low to high frequency electrical signal based devices like PMEF in bone and trauma

related disorders. Thus the market extended to other countries like Europe, Asia pacific, Germany, UK, Saudi Arabia, South pacific, Columbia, UAE etc[9]. The Asia pacific market share was observed to be fastest growing PMEF market due to high number of Sports and trauma surgeries[10].

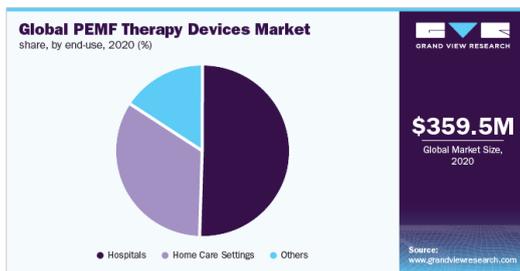
**Key alterations induced by the PMEF currents- Advantage**

**Pain and trauma:**

The pain and trauma cases have rose steeply to 20.5% in 2019 and expected to have manifold increase in chronic cases especially in the adults. Thus the PMEF currents could be a promising approach where in the device induce the expansion and contraction within the cells and thereby also promotes the healing by regeneration of the cells[11].

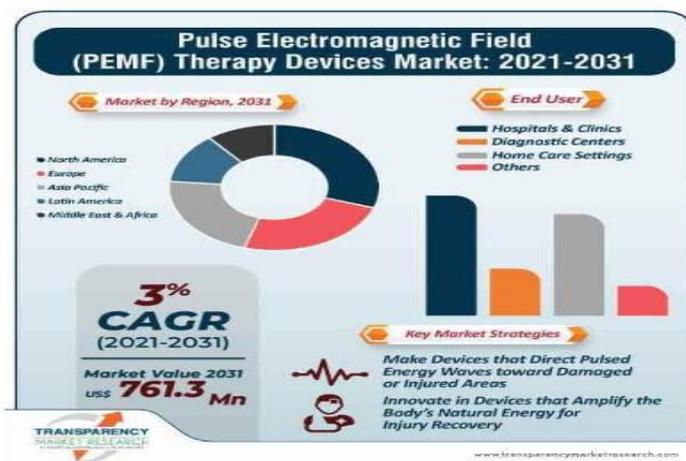
**Bone growth, regeneration, repair and development**

The global rise in the accidents and also sports injuries has proposed a lot of care settings in the dealing with the bone health that has occupied a huge market segment. The bone cells and the regions require a low activation to regenerate and sense with the impulse. Hence the PMEF therapy was found to be most applicable since ages in the post operative care as an innovative approach which could induce tissue proliferation and vascular flow[12-14]. Further the literature reports that the application of PMEF therapy with the electric currents induced often promote osteogenesis and also promote mineral density[15]. The healing of bones can be reported in the cases of delayed reunion, spinal fusions, fresh fracture and fracture non unions. Further the advantage of usage in delayed bone union and hard tissues could be found. The market segments could propose the usage of Low frequency PMEF devices in arthritis[16]. The use of High frequency devices can be applicable for the soft tissues with muscles and tendons where in the induced currents promote edema and pain relief [17].



**Figure 1: Global market share of PMEF devices**

The market segments promotes the PMEF devices which is estimated to have 28.3 billion share in 2028 and may have increase to 761.3 billion by 2031 as reported by Grand view research. Inc (Figure 2). This emphasizes the usage of PMEF devices and may augment by increase in the number of sports injuries and the road accidents.



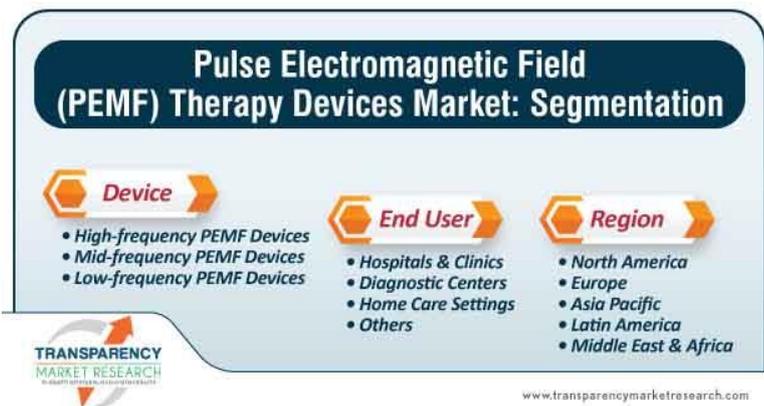
**Figure 2: Augmented market for the PMEF devices and end users**

### Special impact by COVID 19- low market

The strict restrictions imposed by the lock down during Covid-19 created havoc and increased cancellations of the no urgent consultations and electrical based surgeries which had huge negative impact on the traumatology and orthopedics[1-3].

### Forecast of market by 2040- reducing Data driven technological vulnerabilities

The increase in the market of PMEF devices has generated huge revenue i.e 409.5 million USD in 2021. This is expected to increase to 693.3 million USD by 2030[1,19]. The increase in the number of sports injuries, trauma, chronic pain and also the road accidents would project the usage of PMEF devices even in the under developed countries. The implementation of funded research in designing and development of electrical based devices for safe and effective use have to be promoted. Further researchers and scientist should orient in developing alternated systems which can utilize the principle of PMEF for effective management of trauma and bone repair cases as well as emergencies. The covid 19 pandemic impact has made the investors to collectively sponsor for the testing scenarios along[20-22] with reducing the technological vulnerability as a data driven strategy thereby enhancing raw material supply to specialized labs and further monitoring the funds retrieve from the vendors and partners.



**Figure 3:** KEY usage of PMEF devices with divide market segments

The pulse electromagnetic field (PEMF) therapy devices [23-2] global market reported a US\$ 550 market in 2020 and forecasted to expand at a CAGR of 3% from 2021 to 2031. The major driving factors for increased market include high number of body pain indications, pain, accidents, Fall, Sports injuries, Chronic pain cases in adults. Further certain countries like Atlanta, Georgia have also reported the usage of PMEF as natural healing energy source which generates energy in the cells without invasive procedure. This innovation has extended the application of PMEF for chronic fatigue, osteoporosis, and poor wound healing. Also certain companies are oriented toward s designing energy driving devices as modification of PMEF that help to reduce pain, swelling and increase movements in affected areas of injury.

Strategic decisions by national health providers, government agencies and supply chain managements have to be provided in order to extend the import to underdeveloped countries. Thus increased use of PMEF is safe effective and proven beneficial in the current market especially to handle sever trauma and bone repair and management process. Nevertheless, physiotherapists are key end users for PMEF devices who can steadily focus towards income and improving patient outcome.

### Conflicts of interest

The authors declare no conflicts of interest.

### Acknowledgement

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