

# An Unresolved Thyroid:



OUT OF  
ORDER!

**A Functional Medicine Approach to  
Hypothyroidism**

By: Dr. Robert Gilliland, D.C.

© Dr. Robert Gilliland D.C.

“All rights reserved. The use of any part of this publication reproduces, transmitted in any form or by any means, electronic, mechanical, photocopying, recording, or otherwise, without the prior written consent of the author is an infringement of the copyright law. To obtain permission to excerpt portions of the text, please contact the author at [drg@theladylakedoctor.com](mailto:drg@theladylakedoctor.com)”

Dr. Robert Gilliland D.C.  
510 Cr 466  
Suite 201  
Lady Lake FL 32159  
United States  
[www.theladylakedoctor.com](http://www.theladylakedoctor.com)  
P: (352) 268-0199

## **About the Author**

Meet Dr. Robert Gilliland, a compassionate and dedicated healthcare professional whose journey into the realm of healing has been driven by a deep personal commitment to finding better solutions for health challenges. With a diverse educational background and a genuine passion for holistic well-being, Dr. Gilliland is a guiding force in the world of healthcare.

Dr. Gilliland's academic journey began with a Bachelor's degree in Environmental Science, where he developed a profound understanding of the intricate relationship between human health and the environment. Building on this foundation, he pursued a Doctor of Chiropractic degree from Palmer College, equipping him with a comprehensive understanding of the body's natural healing mechanisms.

Driven by a relentless pursuit of knowledge, Dr. Gilliland embarked on a path of post-graduate training that has enriched his expertise and empowered his practice. His studies in Functional medicine, neurology, nutrition, and functional blood chemistry analysis have elevated him to the forefront of healthcare innovation. This multifaceted approach allows him to offer a comprehensive understanding of health that goes beyond the conventional and delves into the root causes of health challenges.

In addition to his professional pursuits, Dr. Gilliland finds immense joy and strength in his family. He is a loving husband to Sarah and a proud father to three wonderful children: Amber, Ashley, and Matthew. This familial foundation infuses his approach to healthcare with empathy and understanding, as he recognizes the importance of wellness for individuals and their loved ones.

Dr. Gilliland's journey into healthcare was sparked by his own battles with chronic health issues, including three autoimmune diseases. This personal experience has kindled a fire within him to explore alternative avenues of healing, to question the status quo, and to offer his patients innovative solutions for their own health challenges.

With an unwavering commitment to enhancing lives through integrative and holistic approaches, Dr. Robert Gilliland stands as a beacon of hope and healing. His unique blend of education, experience, and personal insight forms the cornerstone of his approach to healthcare –a commitment to helping others experience the transformative power of well-being.

Join Dr. Gilliland on a journey of discovery, as he shares his insights, experiences, and the remarkable potential of PEMF therapy in his book "PEMF: The Best-Kept Secret In Medicine For Pain And Chronic Disease." Through his words, you'll discover a roadmap to better health, driven by

a doctor who knows firsthand the power of finding answers  
when they matter most.

## INTENDED USE STATEMENT

The book titled 'An Unresolved Thyroid: A Functional Medicine Approach to Hypothyroidism' is intended to provide readers with insightful information and perspectives on alternative approaches to managing pain and chronic diseases. Through a comprehensive exploration of emerging medical insights, innovative therapies, and holistic strategies, this book aims to empower readers with knowledge that can supplement their understanding of pain management and chronic disease mitigation. It is important to note that the content of this book is for informational purposes only and should not be construed as medical advice or a substitute for professional medical consultation. Readers are encouraged to consult with qualified healthcare professionals for personalized guidance and recommendations tailored to their specific health conditions.

## DISCLAIMER

The information provided in this book, "An Unresolved Thyroid: A Functional Medicine Approach to Hypothyroidism," is intended for educational and informational purposes only. The author, Dr. Robert Gilliland D.C., is a healthcare professional with extensive experience in the field of PEMF therapy, functional medicine, and chiropractic care. However, the content presented in this book should not be construed as medical advice, diagnosis, or treatment.

Readers are advised to consult with qualified healthcare professionals before making any decisions related to their health, medical conditions, or treatment options. The information provided in this book is not a substitute for professional medical advice, diagnosis, or treatment.

Always seek the advice of your physician or other qualified healthcare provider with any questions you may have regarding a medical condition.

The author and publisher of this book are not responsible for any adverse effects, consequences, or damages resulting from the use or misuse of the information provided herein. Any reliance on the information presented in this book is at the reader's own risk.

Furthermore, the efficacy of PEMF therapy may vary from individual to individual and across different medical conditions. Results and outcomes discussed in this book may not be universally applicable. It is recommended to consult with healthcare professionals and conduct

thorough research before pursuing any specific therapy or treatment approach.

The author, Dr. Robert Gilliland D.C., and the publisher disclaim any liability, loss, or risk incurred as a consequence, directly or indirectly, of the use and application of any information presented in this book. The content in this book is subject to change as new information and developments emerge in the field of PEMF therapy and healthcare.

By reading this book, you acknowledge and accept the terms of this disclaimer and agree to use the information provided responsibly and in consultation with qualified healthcare professionals.



## **Introduction**

In the realm of health and wellness, few conditions are as mysterious as an unresolved thyroid. The human body's intricate web of systems and functions is often confounded by a tiny yet mighty gland – the thyroid. Situated in the neck, this unassuming organ plays an outsized role in regulating metabolism, energy levels, and overall vitality. It's no wonder, then, that when the thyroid falters, a cascade of perplexing symptoms can ensue.

For many, the journey through the meandering landscape of thyroid health is one marked by frustration, confusion, and an unsettling sense of incompleteness. Despite the persistence of debilitating symptoms, their quest for answers often leads them to the same disheartening destination: a blood test that reads “normal.”

But what if the conventional approach, which relies heavily on standard TSH (Thyroid-Stimulating Hormone) testing, is not the panacea it's believed to be? What if the vital piece of the puzzle is not readily revealed by this routine examination? What if, within the realm of thyroid health, there's a hidden antagonist – Hashimoto's thyroiditis – the most common cause of hypothyroidism, lurking in the shadows undetected?

"An Unresolved Thyroid: A Functional Medicine Approach to Hypothyroidism" embarks on a journey of exploration and revelation. It's a voyage that seeks to demystify the

complexities of thyroid disorders, bringing to light the inherent shortcomings of traditional medical protocols while unveiling the multifaceted dimensions of the thyroid's influence on our well-being.

This book is an illuminating guide that dares to venture where conventional wisdom often falls short. Within its pages, you'll encounter the enigma of an unresolved thyroid and discover why routine blood work – limited by medically necessary tests – can inadvertently obscure the very answers you seek. In contrast, you'll gain insights into the comprehensive battery of tests championed by functional medicine practitioners, each test a revealing piece of the thyroid puzzle.

As we delve into the labyrinth of thyroid health, you'll be introduced to Hashimoto's thyroiditis, the stealthy culprit behind so many unresolved thyroid cases. You'll understand the profound implications of a "leaky gut" and its intricate connection to both thyroid disorders and overall health. The book will also shed light on the intricate relationship between food sensitivities and your immune system and unveil the often-overlooked interplay between the thyroid and the adrenal glands.

Yet, this isn't a journey into obscurity without hope or direction. Alongside our exploration of these complex topics, you'll find a beacon of optimism – a functional medicine approach that champions the quest for underlying causes. We'll detail how this holistic strategy can

effectively address the multifaceted issues surrounding hypothyroidism and Hashimoto's thyroiditis.

But that's not all. We'll also introduce a powerful ally in your battle for thyroid health – PEMF (Pulsed Electromagnetic Field) therapy. Learn how this non-invasive, medication-free, and all-natural approach can amplify the effectiveness of functional medicine, ushering in a new era of hope and healing.

Your journey through the pages of "An Unresolved Thyroid: A Functional Medicine Approach to Hypothyroidism" will be a voyage of discovery, empowerment, and, ultimately, transformation. Together, we'll uncover the profound potential for renewed vitality, vibrant health, and a revitalized thyroid – leaving behind the enigma of the unresolved and embracing the promise of wellness that awaits.

# Chapter 1: An Unresolved Thyroid Mystery

## What Is An Unresolved Thyroid?

An "unresolved thyroid" isn't a standard medical term, but in general conversation or context, it refers to a thyroid condition that hasn't been effectively treated or managed. It implies that, despite receiving treatment or having "normal" test results, an individual still experiences symptoms or complications related to their thyroid disorder.

## Symptoms of an Under-Active Thyroid

Before we delve into the depths of the thyroid conundrum, it's crucial to have a clear understanding of the symptoms associated with an under-active thyroid. Hypothyroidism, a condition where the thyroid gland does not produce enough thyroid hormones, can manifest in a wide range of symptoms. Below are the symptoms associated with hypothyroidism:

**Fatigue:** One of the most commonly reported symptoms. Individuals may feel exhausted and lack the energy to carry out everyday tasks, even after a full night's sleep.

**Weight Gain:** Unexplained weight gain or difficulty losing weight can be indicative.

**Cold Sensitivity:** Those affected may constantly feel cold or have a lower tolerance to cold temperatures compared to others.

**Dry Skin and Hair:** The skin might become dry, flaky, or rough. Hair might become brittle, thin, and could fall out easily.

**Muscle and Joint Pain:** Aches and tenderness in muscles and joints are not uncommon.

**Depression and Mood Swings:** Emotional changes, including feelings of sadness, irritability, or moodiness.

**Menstrual Irregularities:** Heavier, more frequent, or more painful periods.

**Cognitive Difficulties:** Issues with memory, focus, and clear thinking.

**Constipation:** An ongoing problem for many with hypothyroidism.

**Hoarse Voice:** The voice might become deep, husky, or might crack.

**Elevated Blood Cholesterol:** High levels of LDL cholesterol can be a result of a sluggish thyroid.

**Puffy Face:** Fluid retention can lead to a swollen face, especially around the eyes.

**Brittle Nails:** Like hair, nails might also become weak and break easily.

**Thin Eyebrows:** The outer third of the eyebrows might become thin or might disappear entirely.

It's important to note that not everyone with hypothyroidism will experience all these symptoms, and some of these symptoms can overlap with other conditions. Therefore, while these symptoms provide clues, they are just one piece of the larger puzzle. It becomes essential to integrate these symptomatic insights with comprehensive thyroid testing to accurately determine the root of the issue.

## **The Enigma of "Normal" Blood Work and Persistent Symptoms**

In the realm of health and medicine, some mysteries perplex both patients and practitioners alike. Chief among these enigmas is the persistence of hypothyroid symptoms despite "normal" blood work results. It's a puzzle that defies easy solutions and often leaves those affected trapped in a bewildering cycle of discomfort and uncertainty.

### **Normalcy Measured by TSH**

The journey into this medical mystery begins with a small yet powerful hormone: Thyroid-Stimulating Hormone, or

TSH. In the conventional medical world, TSH reigns supreme as the primary marker for evaluating thyroid function. When it falls within a specific range, typically defined as "normal," it's often considered a green light for thyroid health.

However, this is where the plot thickens. TSH, while undeniably valuable, is just one piece of a complex thyroid puzzle. It reflects the activity of the pituitary gland in response to thyroid hormones but doesn't paint the full picture of what's happening within the thyroid itself.

### **The Unseen Intruder: Hashimoto's Thyroiditis**

One of the key protagonists in this medical mystery is Hashimoto's thyroiditis, an autoimmune condition that targets the thyroid gland. Hashimoto's is a master of disguise, often silently infiltrating the thyroid while TSH levels remain unremarkably "normal."

The insidious nature of Hashimoto's stems from its ability to undermine thyroid function gradually. As the autoimmune attack continues unchecked, the thyroid's ability to produce hormones declines. Unfortunately, this decline often occurs silently, without immediate symptoms.

### **The Incomplete Thyroid Panel**

The heart of this mystery lies in the incomplete evaluation of thyroid health. Traditional thyroid testing, commonly guided by TSH levels alone, can inadvertently overlook Hashimoto's. This limitation in testing procedures leaves

many individuals with unresolved thyroid symptoms in a state of confusion.

### **A Comprehensive Investigation**

To unravel this complex conundrum, functional medicine takes the lead with a comprehensive approach to thyroid evaluation. Rather than relying solely on TSH, a complete thyroid panel is employed. This panel includes markers such as free T4, free T3, reverse T3, and thyroid antibodies (TPO and TGAB).

Each of these markers contributes a unique piece to the thyroid puzzle. Free T4 and free T3 indicate the levels of active thyroid hormones available to the body. Reverse T3, a lesser-known character in the thyroid narrative, can reveal if thyroid hormones are being diverted away from their active form, potentially causing hypothyroid symptoms.

### **Unmasking Hashimoto's**

The true revelation occurs with the inclusion of thyroid antibodies in the panel. Elevated levels of antibodies, particularly thyroperoxidase antibodies (TPO) and thyroglobulin antibodies (TGAB), signify the presence of Hashimoto's thyroiditis. These antibodies represent the autoimmune assault on the thyroid gland, often occurring long before TSH levels go awry.

### **A Silent Culprit Revealed**



With the complete thyroid panel in hand, the unresolved thyroid mystery begins to unravel. Hashimoto's, previously concealed behind the curtain of "normal" TSH levels, emerges as the silent culprit responsible for the persistence of hypothyroid symptoms.

### **The Road to Resolution**

Armed with the knowledge of Hashimoto's, a path to resolution becomes clear. The unresolved thyroid is no longer a baffling enigma but a medical condition with a name and a purpose.

As we delve deeper into the pages of this book, we'll explore the comprehensive testing conducted by functional medicine practitioners, shedding light on the hidden intricacies of thyroid health. We'll discover the profound connection between the thyroid and the gut, uncovering the role of "leaky gut" in Hashimoto's thyroiditis. Food sensitivities, often intertwined with autoimmune conditions, will reveal their impact on the immune system and thyroid health.

But that's not the end of the story. The thyroid's relationship with the adrenal glands, often overlooked in conventional medicine, will step into the spotlight, offering new insights into the unresolved thyroid's persistence.

Together, we'll embark on a journey to resolve the thyroid's mystery, armed with the knowledge and tools to decipher its complexities. The unresolved thyroid will no longer be a

riddle without a solution, but a chapter in your health journey that leads to answers, understanding, and ultimately, resolution.

# **Chapter 2: The Shortcomings of Routine Testing**

In the realm of thyroid health, the quest for answers often begins with a simple blood test, the Thyroid-Stimulating Hormone (TSH) test. For many years, this test has been the cornerstone of thyroid evaluation in conventional medicine, offering what appears to be a straightforward assessment of thyroid function. However, as we dig deeper into the mysteries of thyroid health, we uncover the limitations of routine testing, particularly when it comes to identifying the root causes of hypothyroidism.

## **TSH: The Gold Standard**

Within the world of thyroid health, TSH enjoys a prominent status. It serves as the gold standard for thyroid evaluation, influencing treatment decisions and defining what is considered "normal" thyroid function. But like any measure, TSH has its strengths and weaknesses.

## **TSH and the Pituitary-Thyroid Connection**

TSH, produced by the pituitary gland, acts as a messenger to the thyroid gland. When it detects low levels of thyroid hormones (T4 and T3) in the bloodstream, it sends out a signal to the thyroid to produce more hormones.

Conversely, when thyroid hormone levels are high, TSH levels drop, instructing the thyroid to slow down hormone production.

## **The TSH Range Conundrum**

The challenge with TSH lies not in its function but in the interpretation of its results. TSH is often assessed within a range, which can vary from one laboratory to another. This range typically encompasses what is considered "normal" thyroid function. However, this concept of "normal" can be deceiving.

### **The Fallacy of Normalcy**

Thyroid health isn't a one-size-fits-all affair. What's considered normal for one individual may not be suitable for another. Moreover, TSH levels alone don't provide a comprehensive view of thyroid function.

In the world of conventional medicine, TSH levels within the established range are often interpreted as a clean bill of thyroid health. However, this narrow perspective neglects crucial aspects of thyroid function. It fails to consider the levels of active thyroid hormones, Free T4 and Free T3, which are vital for overall well-being.

### **Enter Hashimoto's Thyroiditis**

One of the most significant oversights of routine testing is its inability to identify the presence of autoimmune thyroid conditions, specifically Hashimoto's thyroiditis. This autoimmune condition, which targets the thyroid gland, is the leading cause of hypothyroidism.

Hashimoto's has a cunning ability to lurk in the background, undermining thyroid function while TSH levels remain within the range of normalcy. As a result,

individuals with Hashimoto's often experience persistent hypothyroid symptoms without a clear explanation from routine testing.

## **Looking Beyond TSH**

To unveil the full spectrum of thyroid health, a more comprehensive approach is required. Functional medicine practitioners recognize the limitations of routine testing and embark on a journey that transcends the boundaries of TSH.

Complete thyroid panels, a staple of functional medicine, delve deeper into the thyroid's intricacies. These panels include markers such as Free T4, Free T3, Reverse T3, and thyroid antibodies (TPO and TGAB). Each of these components contributes to a comprehensive understanding of thyroid function and health.

## **A Call for a Paradigm Shift**

As we delve further into the pages of this book, we'll explore the significance of each marker within a complete thyroid panel. We'll shed light on the role of autoimmune thyroid conditions like Hashimoto's in the unresolved thyroid mystery. We'll also discover the profound connections between thyroid health, the gut, food sensitivities, and adrenal function.

Through this exploration, we'll challenge the conventional understanding of thyroid health and beckon for a paradigm

shift—one that transcends routine testing to reveal the hidden truths behind the unresolved thyroid.

Our journey will illuminate the path to resolution, empowering you to take charge of your thyroid health and find answers that extend beyond the limitations of routine testing.

# **Chapter 3: Hashimoto's Thyroiditis: The Unseen Culprit**

In the labyrinth of thyroid health, there exists a formidable and often hidden adversary—an autoimmune condition known as Hashimoto's thyroiditis. For many who grapple with unresolved thyroid issues, Hashimoto's stands as the most common, yet frequently undetected, cause of hypothyroidism. This chapter is dedicated to unveiling the mysteries of Hashimoto's, exposing its insidious nature, and understanding why it holds the top position among the triggers of thyroid dysfunction.

## **The Autoimmune Intruder**

Hashimoto's thyroiditis, named after the Japanese physician Dr. Hakaru Hashimoto who first described it in 1912, is an autoimmune disorder. In this context, "autoimmune" signifies that the body's immune system, designed to protect us from foreign invaders, has gone rogue. It mistakes a part of our own body—in this case, the thyroid gland—as an enemy and launches an attack against it.

## **Thyroid in the Crosshairs**

In Hashimoto's thyroiditis, the thyroid gland becomes the unsuspecting target. The immune system produces antibodies, particularly thyroid peroxidase antibodies (TPO) and thyroglobulin antibodies (TGAB), which zero in on thyroid tissue. These antibodies trigger a relentless

assault on the thyroid, leading to inflammation and damage.

As a consequence, the thyroid's ability to produce hormones, specifically thyroxine (T4) and triiodothyronine (T3), becomes compromised. Over time, this destruction results in decreased thyroid function, leading to hypothyroidism.

### **Hashimoto's Secrecy**

The treacherous nature of Hashimoto's lies in its ability to operate silently, often concealing its presence for years. Many individuals with Hashimoto's continue to pass routine TSH tests with flying colors, appearing to have normal thyroid function. Meanwhile, beneath the surface, the immune system wages a relentless war against the thyroid.

### **A Stealthy Onset**

Hashimoto's can creep into one's life without any overt symptoms, or it can manifest in subtle ways that are easily overlooked or attributed to other causes. Fatigue, mild weight gain, brain fog, and mood fluctuations may seem like common, everyday issues. However, these can be the first whispers of Hashimoto's.

As the autoimmune attack intensifies and thyroid function declines, more evident symptoms may emerge. These can include cold intolerance, hair loss, brittle nails, and constipation. The thyroid gland, now compromised,



struggles to meet the body's demands for energy regulation, metabolism, and overall well-being.

### **A Diagnosis Delayed**

Due to its covert nature, Hashimoto's thyroiditis often evades detection in routine medical assessments. Individuals who experience hypothyroid symptoms may find themselves trapped in a seemingly paradoxical situation: feeling unwell despite "normal" blood work.

This diagnostic delay can be a source of immense frustration and confusion. Countless individuals with Hashimoto's endure the uncertainty of unresolved thyroid issues, their condition worsening over time.

### **Shifting the Paradigm**

To address Hashimoto's thyroiditis and its implications for thyroid health, a paradigm shift is necessary. We must transcend the confines of routine testing and embrace a comprehensive approach that acknowledges the autoimmune component.

Functional medicine practitioners are at the forefront of this shift. They recognize the importance of testing for thyroid antibodies, TPO, and TGAB, as part of a complete thyroid panel. These markers provide invaluable insights into the presence of Hashimoto's.

In the subsequent chapters, we will delve deeper into Hashimoto's thyroiditis. We will explore its intricate connections with unresolved thyroid issues, the immune system, and overall health. We will also uncover strategies for identifying Hashimoto's, addressing its underlying causes, and moving towards resolution.

As we unveil the secrets of Hashimoto's, remember that knowledge is the first step toward empowerment. By understanding this often unseen culprit, you take a significant stride toward resolving your thyroid concerns and reclaiming your well-being.

# **Chapter 5: Medically Necessary vs. Comprehensive Testing**

## **Exploring the Reasons Behind Limited Testing and the Importance of Comprehensive Panels**

In the conventional realm of medicine, testing for thyroid function typically revolves around one primary marker: the Thyroid-Stimulating Hormone (TSH) test. This test, which measures the level of TSH in the blood, has been the cornerstone of thyroid assessment for decades. However, as we delve deeper into the complexities of thyroid health, we begin to recognize that the TSH test, while valuable, offers only a partial glimpse into the intricate workings of the thyroid gland.

### **The TSH Test: A Singular Focus**

The TSH test serves a vital purpose in thyroid evaluation. It helps gauge the feedback loop between the brain's pituitary gland and the thyroid itself. When thyroid hormone levels drop, TSH levels rise, signaling the thyroid to produce more hormones. Conversely, when thyroid hormone levels are adequate, TSH levels decrease. This feedback system allows the body to maintain thyroid hormone levels within a narrow range, crucial for overall health.

However, the TSH test, in its singularity, possesses limitations. It does not provide a comprehensive overview of thyroid function or identify underlying causes of thyroid dysfunction. For many individuals, especially those with

Hashimoto's thyroiditis or other thyroid disorders, TSH levels may remain within the "normal" range despite significant thyroid issues.

### **The Limitations of Routine Testing**

One key reason behind the predominant use of the TSH test is rooted in medical necessity. Healthcare systems worldwide face constraints related to cost, time, and resources. As a result, they often prioritize tests that are deemed "medically necessary" based on the prevalence of specific conditions. In the context of thyroid testing, routine TSH tests have become the standard due to their applicability to a broad range of thyroid disorders.

However, the term "medically necessary" does not necessarily equate to "comprehensive." While TSH testing serves as a valuable initial screening tool, it may not unveil the full scope of thyroid dysfunction, especially when autoimmune factors like Hashimoto's thyroiditis are at play.

### **Why Doctors Ignore The #1 Cause Of Hypothyroidism?**

In the conventional medical landscape, there isn't a specialized medication that targets Hashimoto's thyroiditis. Therefore, even with a confirmed Hashimoto's diagnosis, the treatment approach largely remains unchanged, relying on thyroid hormone replacement drugs such as Synthroid and levothyroxine. Consequently, insurance providers may perceive additional tests as unnecessary expenses, because the results of these tests do not alter the treatment strategy. As physicians often operate within the constraints set by

insurance companies, they avoid ordering tests that aren't deemed “medically necessary”.

## **The Importance of Comprehensive Panels**

In contrast, functional medicine practitioners offer an approach tailored to addressing the root causes of Hashimoto's and thus prioritize these additional tests. They understand that thyroid health is more complex than what the TSH test alone can reveal. By embracing a holistic view, they consider the nuanced functions of the thyroid gland, its hormones, and their systemic impact. This approach emphasizes the necessity of comprehensive thyroid panels.

### **A complete thyroid panel typically includes:**

**TSH** (Thyroid-Stimulating Hormone): As mentioned earlier, TSH provides insights into the brain-thyroid feedback loop.

**Free T4** (Thyroxine): This measures the level of free thyroxine, an essential thyroid hormone.

**Free T3** (Triiodothyronine): Free triiodothyronine represents the biologically active form of thyroid hormone.

**Reverse T3** (rT3): Reverse T3 is a less active form of T3 and can indicate issues with hormone conversion.

**Thyroid Peroxidase Antibodies** (TPO): Elevated TPO antibodies are a marker of autoimmune thyroiditis, such as Hashimoto's.

**Thyroglobulin Antibodies** (TGAB): Elevated TGAB antibodies are another indicator of autoimmune thyroid disease.

**Total T4 and T3:** These measurements provide additional insights into overall thyroid hormone production.

### **The Comprehensive Advantage**

The power of a comprehensive thyroid panel lies in its ability to uncover thyroid disorders that might otherwise remain hidden. It offers a more complete picture of thyroid function, identifies autoimmune factors, and enables early intervention for thyroid issues.

By embracing comprehensive testing, functional medicine practitioners equip themselves with the tools needed to identify and address the root causes of unresolved thyroid problems, providing a pathway to resolution and improved well-being.

In the following chapters, we will explore the specific markers within a complete thyroid panel, deciphering their significance and shedding light on their role in thyroid health. As we delve deeper into the world of comprehensive testing, you will gain a deeper understanding of how these markers can uncover the mysteries of your thyroid and pave the way toward effective solutions.

# Chapter 6: The Complete Thyroid Panel: Decoding the Data

## Demystifying Thyroid Blood Work and Its Significance in Diagnosis

The comprehensive thyroid panel is a treasure trove of information for both healthcare providers and patients seeking to unravel the mysteries of thyroid health. It's a roadmap that guides us through the intricate terrain of thyroid function and dysfunction, providing valuable insights into what might be causing those troubling symptoms. But, like any map, it can seem daunting at first glance. In this chapter, we'll embark on a journey to decode the data within a complete thyroid panel, demystifying each marker and understanding its significance in diagnosing thyroid disorders.

### **1. TSH (Thyroid-Stimulating Hormone):**

**What It Measures:** TSH, produced by the pituitary gland, stimulates the thyroid to produce thyroid hormones.

**Significance:** Elevated TSH may indicate an under-active thyroid (hypothyroidism), while low TSH can point to an overactive thyroid (hyperthyroidism). However, relying solely on TSH can miss thyroid issues, especially autoimmune ones like Hashimoto's thyroiditis.

### **2. Free T4 (Thyroxine):**

**What It Measures:** Free T4 measures the level of unbound thyroxine, an essential thyroid hormone.

Significance: Low levels of free T4 may indicate hypothyroidism, while high levels can suggest hyperthyroidism.

### **3. Free T3 (Triiodothyronine):**

What It Measures: Free T3 assesses the level of biologically active thyroid hormone in the bloodstream.

Significance: Low free T3 levels may indicate hypothyroidism, even when TSH is within the normal range.

### **4. Reverse T3 (rT3):**

What It Measures: Reverse T3 is a less active form of T3.

Significance: Elevated rT3 levels relative to free T3 can indicate thyroid issues, such as hormone conversion problems.

### **5. Thyroid Peroxidase Antibodies (TPO):**

What It Measures: TPO antibodies assess the presence of autoimmune thyroiditis, including Hashimoto's.

Significance: Elevated TPO antibodies suggest an autoimmune thyroid disorder.

### **6. Thyroglobulin Antibodies (TGAB):**

What It Measures: TGAB antibodies are another marker for autoimmune thyroid disease.

Significance: Elevated TGAB antibodies indicate autoimmune thyroiditis, which can accompany Hashimoto's.

### **7. Total T4 and T3:**

What It Measures: Total T4 and T3 measure the total amount of these hormones, both bound and unbound.

Significance: These measurements provide additional information about overall thyroid hormone production but



are often considered alongside free T4 and T3 levels for a comprehensive assessment.

Now that we've decoded the markers, it's essential to recognize that interpreting thyroid blood work isn't a one-size-fits-all endeavor. Optimal thyroid health varies from person to person, and what's "normal" for one individual might not be suitable for another.

Functional medicine practitioners understand the importance of personalized care and look beyond reference ranges. They consider the entire clinical picture, taking into account not just the numbers on the report but also your unique symptoms, medical history, and lifestyle factors.

In the next chapter, we'll explore why a personalized approach to thyroid health is essential in identifying and addressing the underlying causes of unresolved thyroid issues. We'll delve into the intricacies of functional medicine and how it goes beyond routine testing to create tailored solutions for optimal thyroid well-being.

# **Chapter 7: The Gut Barrier: Beyond Digestion**

## **Understanding Leaky Gut and Its Profound Connection to Hashimoto's Thyroiditis**

The gut, often referred to as the "second brain," plays an integral role in your overall health, far beyond the realm of digestion. In this chapter, we'll journey into the fascinating world of the gut and explore the concept of "leaky gut," shedding light on its profound connection to Hashimoto's thyroiditis and, in a broader sense, autoimmune diseases.

### **The Gut: A Complex Ecosystem**

Your gastrointestinal tract is an intricate ecosystem teeming with trillions of microorganisms, collectively known as the gut microbiome. This bustling community consists of beneficial bacteria that aid in digestion, metabolism, and the synthesis of essential nutrients. It's an ecosystem that, when in harmony, supports your immune system and maintains a strong barrier against harmful invaders.

### **Leaky Gut: When the Barrier Cracks**

Think of the gut lining as a fortress barrier, standing vigilant against the entry of undigested food, toxins, and harmful pathogens into your bloodstream. This shield is pivotal, allowing only well-processed nutrients and benign substances into your system.

But, when this fortress barrier is breached, it's like having a hole in your mosquito net. While the net's job is to let fresh air in and keep mosquitoes out, a hole defeats its purpose. Similarly, the "leaky gut" syndrome or increased intestinal permeability is when the tight connections between the cells of the intestinal wall weaken or suffer damage. This allows undesired substances to seep through these gaps and find their way into your bloodstream.

### **The Hashimoto's Connection**

So, what does this have to do with Hashimoto's thyroiditis? As it turns out, quite a bit.

Leaky gut isn't just about digestive discomfort; it can trigger a cascade of immune responses. When undigested food particles, bacteria, or toxins escape into the bloodstream, the immune system recognizes them as invaders and mounts an attack. This immune response generates inflammation, which can become chronic when leaky gut persists.

Here's where the connection to Hashimoto's comes into play. Chronic inflammation in the body can trigger or exacerbate autoimmune diseases. In Hashimoto's thyroiditis, the immune system mistakenly targets the thyroid gland, leading to inflammation and damage. Over time, this attack impairs thyroid function and results in hypothyroidism.

### **The Gut-Thyroid Axis**

The gut-thyroid axis is the intricate connection between gut health and thyroid function. When the gut is inflamed due to leaky gut or other factors like imbalanced gut bacteria, it can send signals that disrupt the delicate balance of thyroid hormones.

Moreover, the gut is responsible for converting inactive thyroid hormone (T4) into its active form (T3). When gut health is compromised, this conversion process can be impaired, leading to reduced T3 levels and hypothyroid symptoms.

### **The Role of Food Sensitivities**

Food sensitivities are another crucial piece of the puzzle. When the gut is leaky, it's more susceptible to the penetration of undigested food particles. This can trigger immune reactions to specific foods, leading to food sensitivities.

These immune responses can exacerbate inflammation and autoimmune reactions throughout the body, potentially worsening Hashimoto's symptoms. Identifying and addressing food sensitivities is often a crucial step in managing both leaky gut and autoimmune thyroid conditions.

In the next chapter, we'll explore the relationship between food sensitivities, the immune system, and thyroid health in more detail. We'll also discuss how a functional medicine

approach aims to heal the gut and mitigate the effects of leaky gut on Hashimoto's and hypothyroidism.

# **Chapter 8: Food Sensitivities and the Immune System**

## **Unraveling the Complex Relationship Between Diet, Immunity, and Thyroid Health**

In the previous chapter, we delved into the intricate world of leaky gut and its profound connection to Hashimoto's thyroiditis. Now, we're about to explore another crucial piece of the puzzle: food sensitivities. These sensitivities can significantly impact your immune system and, consequently, your thyroid health.

### **The Immune System's Food Detective**

Your immune system is like a vigilant detective, constantly patrolling your body to identify and neutralize potential threats. It's finely tuned to distinguish between foreign invaders and your body's own tissues. However, in the case of food sensitivities, this system can sometimes misinterpret harmless substances as dangerous.

### **Food Sensitivities vs. Allergies**

It's important to differentiate between food sensitivities and food allergies. Food allergies, such as those to peanuts or shellfish, involve a rapid and severe immune response. Symptoms can include hives, swelling, difficulty breathing, and even anaphylaxis.

Food sensitivities, on the other hand, elicit a more subtle, delayed immune response. This can make them challenging

to identify because symptoms might not appear until hours or even days after consuming the triggering food. Common symptoms of food sensitivities include digestive issues, headaches, fatigue, joint pain, skin problems, and, crucially, inflammation.

### **The Inflammation Connection**

Inflammation lies at the heart of many chronic health conditions, including autoimmune diseases like Hashimoto's thyroiditis. When your immune system mounts a response to a food sensitivity, it releases inflammatory substances. Over time, this chronic low-grade inflammation can damage tissues and exacerbate autoimmune processes.

For those with Hashimoto's, this inflammation often targets the thyroid gland, perpetuating the autoimmune attack and contributing to thyroid dysfunction. It's a vicious cycle: the immune system reacts to food sensitivities, inflammation ensues, and thyroid health deteriorates further.

### **Identifying Food Sensitivities**

Identifying specific food sensitivities can be a complex process, but it's a critical step in managing Hashimoto's and hypothyroidism effectively. Elimination diets, where you temporarily remove potential trigger foods and then reintroduce them one at a time, can help pinpoint sensitivities.

Food sensitivity testing is another valuable tool. These tests analyze your blood for antibodies produced in response to specific foods. High levels of antibodies indicate a sensitivity.

### **The Gut-Thyroid Connection**

Remember the gut-thyroid axis we explored earlier? Food sensitivities play a significant role here as well. When you consume foods that your immune system reacts to, it can further exacerbate gut inflammation and leaky gut. This, in turn, can disrupt the gut's ability to convert inactive thyroid hormone (T4) into the active form (T3).

### **The Functional Medicine Approach**

Functional medicine practitioners recognize the intricate connections between diet, immunity, and thyroid health. They work closely with patients to identify and address food sensitivities, aiming to reduce inflammation and support thyroid function.

In the next chapter, we'll explore another critical aspect of the functional medicine approach: adrenal health. We'll uncover the connections between adrenal glands, stress, and thyroid function, shedding light on how a comprehensive approach addresses the root causes of hypothyroidism and Hashimoto's thyroiditis.



# Chapter 9: The Thyroid-Adrenal Axis: A Delicate Balance

## Navigating the Interplay Between Thyroid Function and Adrenal Glands

As we journey deeper into the world of thyroid health, we must not overlook the role of another essential player: the adrenal glands. These tiny, pyramid-shaped glands that sit atop your kidneys play a crucial role in maintaining balance within your body. Understanding their relationship with the thyroid is key to unraveling the mysteries of hypothyroidism.

### The Adrenal Glands: Your Stress Managers

The adrenal glands are your body's stress managers. They release hormones like cortisol and adrenaline in response to stress, helping you react swiftly to threats. This "fight or flight" response is vital in survival situations, but in today's fast-paced world, it's often triggered by daily stressors, too.

### The Interconnected Web of Hormones

Your body's hormonal systems are intricate and interconnected, and the thyroid and adrenal glands are no exception. Here's a simplified overview of how they interact:

**Hypothalamus:** This brain region senses when thyroid hormone levels are low and releases thyrotropin-releasing hormone (TRH).

**Pituitary Gland:** In response to TRH, the pituitary gland releases thyroid-stimulating hormone (TSH), which signals the thyroid gland to produce thyroid hormones (T3 and T4).

**Thyroid Gland:** The thyroid gland releases T3 and T4 into the bloodstream. These hormones play a crucial role in regulating metabolism.

**Adrenal Glands:** When your body experiences stress, the adrenal glands release cortisol, which is designed to mobilize energy reserves. Cortisol can also impact the conversion of thyroid hormones, affecting thyroid function.

## **The Delicate Balance**

A healthy thyroid-adrenal axis relies on a delicate balance between these two glands. Stress, whether it's physical, emotional, or environmental, can disrupt this balance. Here's how:

**Cortisol Dominance:** Chronic stress can lead to elevated cortisol levels, a condition known as cortisol dominance. High cortisol can interfere with the conversion of T4 (inactive thyroid hormone) into T3 (active thyroid hormone), potentially causing hypothyroid symptoms.

**Adrenal Fatigue:** Prolonged stress can lead to adrenal fatigue or exhaustion. In this state, the adrenal glands struggle to produce adequate cortisol, leaving your body in a constant state of fatigue and potentially impacting thyroid function.

**The Reverse T3 Connection:** Stress can also lead to elevated reverse T3 (rT3), an inactive form of thyroid

hormone. Elevated rT3 can block the action of active T3, causing hypothyroid symptoms despite normal TSH levels.

### **The Functional Medicine Approach**

Functional medicine practitioners understand the intricacies of the thyroid-adrenal axis and the far-reaching effects of stress on thyroid health. They use comprehensive testing to assess adrenal function, looking at cortisol levels throughout the day. Based on these results, they develop tailored treatment plans that may include stress reduction techniques, dietary changes, and supplements to support adrenal health.

In the next chapter, we'll explore how a functional medicine approach addresses the underlying causes of hypothyroidism and Hashimoto's thyroiditis. We'll also uncover the role of nutrition, vitamins, and supplements in restoring thyroid balance and overall well-being.

# Chapter 10: Functional Medicine's Approach to the Underlying Causes

## Delving into Holistic Strategies to Address Hypothyroidism and Hashimoto's Thyroiditis

Now that we've uncovered the intricate web of factors contributing to hypothyroidism and Hashimoto's thyroiditis, it's time to explore a holistic approach to resolving these conditions. Functional medicine, with its emphasis on addressing the root cause of illness, offers a beacon of hope for those seeking lasting relief.

## A Paradigm Shift: From Symptom Management to Root Cause Resolution

Functional medicine stands in stark contrast to conventional medicine's "one-size-fits-all" approach. Instead of merely addressing symptoms, functional medicine practitioners aim to understand each patient's unique biochemical makeup and history.

## Comprehensive Testing: The Foundation of Functional Medicine

The journey to healing begins with comprehensive testing. A functional medicine practitioner goes beyond routine blood work to obtain a complete picture of your health. This often includes:

**Complete Thyroid Panel:** Assessing TSH, T3, T4, reverse T3 (rT3), and thyroid antibodies (TPOAb and TgAb)

to identify underlying thyroid issues, including Hashimoto's thyroiditis.

**Adrenal Function Testing:** Evaluating cortisol levels throughout the day to understand the impact of stress on thyroid health.

**Gut Permeability Testing:** Identifying a "leaky gut" that may contribute to autoimmune conditions like Hashimoto's.

**Food Sensitivity Testing:** Pinpointing specific foods that trigger an immune response and inflammation, affecting thyroid function.

**Nutritional Analysis:** Identifying nutrient deficiencies that can impact thyroid health and overall well-being.

### **Unmasking Triggers: A Personalized Approach**

Functional medicine digs deep to uncover the unique triggers that contribute to your thyroid imbalance.

Common triggers include:

**Food Sensitivities:** Specific foods, like gluten and dairy, can trigger autoimmune responses and exacerbate thyroid issues. Functional medicine identifies and addresses these sensitivities.

**Stress:** Chronic stress can wreak havoc on the thyroid-adrenal axis. Stress management techniques, lifestyle adjustments, PEMF therapy, and supplements can help restore balance.

**Gut Health:** A "leaky gut" allows harmful substances to enter the bloodstream, triggering autoimmune responses.

Healing the gut through diet and supplements is a key focus.

**Nutrient Deficiencies:** Inadequate levels of essential nutrients, such as iodine, selenium, and vitamin D, can impact thyroid function. Functional medicine identifies and corrects these deficiencies.

### **Tailored Treatment Plans: Healing from Within**

Armed with a comprehensive understanding of your unique health profile, a functional medicine practitioner crafts a personalized treatment plan. This plan often includes:

**Nutrition:** Dietary changes tailored to your specific needs, including foods that support thyroid health and those that trigger sensitivities.

**Supplements:** Targeted supplementation to address nutrient deficiencies and support thyroid function.

**Lifestyle Modifications:** Stress reduction techniques, exercise plans, and sleep optimization to promote overall well-being.

**Detoxification:** Strategies to remove toxins from your environment and body, reducing the burden on your immune system.

**Mind-Body Techniques:** Practices like meditation, yoga, and mindfulness to manage stress and support healing.

### **PEMF Therapy: Enhancing the Healing Journey**

As we've explored earlier in this book, PEMF therapy plays a vital role in boosting the effectiveness of functional medicine. By increasing circulation, decreasing inflammation, and aiding in detoxification, PEMF therapy

aligns with the holistic principles of functional medicine, supporting your journey towards thyroid balance.

In the next chapter, we'll delve into PEMF therapy, highlighting how it accelerates your path to healing.

# Chapter 11: The Benefits of PEMF Therapy

## Introduction

The human body, a dynamic mosaic of countless cells working in harmony, functions optimally when each cell performs its role efficiently. Pulsed Electromagnetic Field (PEMF) therapy, a non-invasive therapy with transformative potential, interacts with the cells and the body at large, ushering in a cellular renaissance that shapes the roadmap to well-being. This chapter unveils the intriguing ways in which PEMF therapy impacts our cells and body, promoting vitality, healing, and resilience.

## The Cellular Dialog: Establishing the Groundwork

Before diving into the effects of PEMF therapy, it is pivotal to understand the role of cells as the foundational units of life. They are bustling hubs of myriad biochemical reactions, guiding the functions of tissues, organs, and ultimately, the organism. PEMF therapy steps in to modulate these cellular activities, establishing a harmonious dialog that echoes through every corner of the physiological landscape.

## Effects on Cellular Metabolism

PEMF therapy stands as a catalyst in the enhancement of cellular metabolism, driving the efficient utilization of nutrients and oxygen while expediting the removal of waste products. The stimulation of mitochondria, the powerhouse of the cell, ensures an uplift in energy production, fostering vitality and dynamism.

## Cell Membrane Permeability and Nutrient Uptake

One of the cardinal impacts of PEMF therapy is the increased permeability of the cell membrane, a gatekeeper in nutrient



uptake and waste elimination. The therapy aids in opening channels that facilitate a smooth exchange of substances, allowing oxygen and nutrients to enter more freely while enabling a more efficient detoxification process.

### **Circulatory Enhancement**

The circulatory system, a vast network of vessels ferrying nutrients and oxygen, finds a valuable ally in PEMF therapy. By encouraging vasodilation and improving microcirculation, it fosters a nurturing environment where cells can thrive, replete with the nourishment they require for optimal function.

### **Promotion of Bone and Tissue Healing**

PEMF therapy shines in the domain of healing, notably influencing bone regeneration and tissue repair. Through the activation of cellular pathways that encourage growth and repair, it hastens the healing processes, bringing relief in conditions like fractures and tissue injuries.

### **Pain Reduction**

PEMF therapy offers a respite to individuals grappling with pain, be it chronic or acute, including arthritic pain, nerve pain, and joint pain. By targeting the cellular dynamics underlying pain perception, it aids in the reduction of inflammation and promotes the healing of tissues. This effect not only alleviates pain but also rejuvenates the affected areas, fostering a recovery that is holistic and deep-seated.

### **Immune System Modulation**

The immune system, our sentinel against infections and diseases, is significantly influenced by PEMF therapy. Through modulation of immune responses and fostering a balance in

immune activities, it strengthens the body's defenses, paving the way for robust health.

### **Stress Reduction and Neurological Benefits**

The nervous system, the communication hub of the body, experiences a harmonizing effect under PEMF therapy. It aids in stress reduction by influencing the biochemical pathways linked to the stress response, offering a calming effect. Moreover, it nurtures the neural network, potentially enhancing cognitive functions and alleviating mood disorders.

### **The Many Benefits of PEMF Therapy**

PEMF (Pulsed Electromagnetic Field) therapy is renowned for its wide range of potential benefits, which can include but are not limited to:

**Enhanced Cell Regeneration:** Facilitates the body's natural healing process.

**Improved Circulation:** Enhances blood flow and oxygenation to various parts of the body.

**Pain Reduction:** Provides relief from chronic and acute pain by reducing inflammation.

**Muscle Relaxation and Stimulation:** Helps in relieving muscle tension and spasms.

**Reduced Inflammation:** Assists in reducing swelling and inflammation.

**Improved Sleep Patterns:** Helps in establishing healthy sleep patterns by affecting the circadian rhythm positively.

**Enhanced Bone Healing:** Assists in the healing of bones by promoting cellular regeneration.

**Boosted Immune System:** Fortifies the immune system to function more effectively.

**Mood Regulation:** May aid in the alleviation of symptoms related to depression and anxiety.

**Increased Energy Levels:** Elevates the body's overall energy levels by enhancing cellular energy production.

**Improved Nutrient Absorption:** Facilitates better uptake of nutrients by the cells.

**Better Neurological Function:** Enhances the functioning of the nervous system.

**Reduction of Stress:** Aids in reducing stress by balancing the body's autonomic nervous system.

**Improved Wound Healing:** Accelerates the wound healing process by promoting better circulation.

**Enhanced Cognitive Function:** Can potentially aid in improving memory and other cognitive functions.

**Improved Detoxification:** Aids in the removal of toxins from the body.

**Support in Chronic Disease Management:** Assists in managing symptoms of chronic diseases more effectively.

**Enhanced Athletic Performance:** Helps in enhancing physical performance and muscle recovery in athletes.

**Supports Cardiovascular Health:** May aid in improving heart health by promoting better circulation.

**Strengthened Respiratory System:** Supports the health of the respiratory system.

**Better Skin Health:** Promotes healthier skin by improving circulation.

**Regulation of Hormonal Balance:** Can aid in balancing the hormonal systems in the body.

**Support in Autoimmune Disorders:** Helps in the management of autoimmune disorders by modulating immune responses.

**Alleviation of Symptoms in Neurodegenerative Diseases:** May aid in alleviating symptoms of neurodegenerative diseases by enhancing neurological functions.

**Relief from Migraines and Headaches:** Offers relief from migraines and other types of headaches.

**Assists in Digestive Health:** Promotes better absorption of nutrients, supporting digestive health.

**Improved Joint Health:** Supports joint health by reducing inflammation and promoting healing.

**Enhanced Hair Growth:** Can potentially support healthier hair growth by improving circulation.

**Improved Sexual Health:** Assists in enhancing sexual health by promoting better circulation and reducing stress.

## **Conclusion**

As we traverse the intricate pathways of cellular functioning under the aegis of PEMF therapy, we witness a renaissance that is transformative and holistic. It emerges as a facilitator of harmony, a nurturer of vitality, and a guardian of well-being, guiding the body into a state of balanced health through cellular rejuvenation.

This chapter, illuminating the cellular landscapes touched by PEMF therapy, stands as a testimony to its profound impacts on the body. As we close, we hold an understanding that PEMF therapy is not just a therapy but a journey into the cellular universe, a journey of rediscovering health through the lens of harmony, balance, and revitalization.

# **Chapter 11: The Dynamic Synergy of PEMF Therapy and Functional Medicine for Hypothyroidism/Hashimoto's Thyroiditis**

## **Introduction**

In the intricate landscape of medical therapies and healing philosophies, functional medicine has emerged as a cornerstone in addressing chronic diseases at their very core. By fostering a patient-centric approach that emphasizes individualized therapies based on comprehensive lab testing and lifestyle alterations, functional medicine seeks to navigate and rectify the underlying issues rather than just treating the symptoms. It often employs a multifaceted approach, leveraging nutrition, lifestyle modifications, and personalized medicine to instigate healing from within.

However, for a subset of individuals, functional medicine's nutritional component may face barriers in realizing its full potential. This chapter delves deep into the enhanced synergy created when functional medicine integrates with Pulsed Electromagnetic Field (PEMF) therapy, a union promising to overcome the cellular barriers, facilitating a more profound healing process in patients with conditions like hypothyroidism and Hashimoto's thyroiditis.

## **Functional Medicine: The Bedrock of Comprehensive Healing**

Functional medicine's inception is rooted in a profound understanding of the individual's unique biological narrative. Through meticulous analysis of comprehensive blood work and lab tests, practitioners identify the core discrepancies and instabilities that give rise to complex metabolic and autoimmune conditions. It is a dynamic process involving a deep dive into the patient's history, genetic makeup, environmental factors, and lifestyle to fathom the disease's origin.

Nutrition becomes a potent tool in the functional medicine toolbox, curated to rectify identified deficiencies and promote an environment conducive to healing. An adept functional medicine practitioner employs nutrition to nurture the body back to a state of equilibrium, reestablishing a lost harmony and promoting wellbeing from within.

## **The Cellular Barrier: When Functional Medicine Meets a Roadblock**

Despite the comprehensive approach of functional medicine, there remains a cohort of patients where the standard interventions falter, predominantly due to barriers at the cellular level. This is a critical juncture where a multifaceted approach hits a roadblock; the nutrients essential for healing are unable to traverse into the cell due to impaired membrane function and/or diminished blood flow. The stymied nutrients at the

cellular doorway portray the imperative need for an adjunct therapy to potentiate the effects of functional medicine.

### **PEMF Therapy: The Key to Cellular Rejuvenation**

The unison of PEMF therapy with functional medicine brings forth a synergy potent enough to break through the cellular barrier, enhancing the healing environment. PEMF therapy operates on the principle of enhancing the cellular function through electromagnetic fields pulsating at varying frequencies.

This therapy remarkably increases blood flow and augments the permeability of the cell membrane, creating avenues for an efficient exchange of nutrients and oxygen into the cell. Furthermore, it facilitates the expulsion of toxins out of the cell, thus cleansing the cellular environment and promoting a state of cellular rejuvenation. The heightened cellular activity not only facilitates nutrient absorption but also fosters an environment of increased cellular energy, optimizing the cellular functions to a state of heightened efficiency and responsiveness.

### **The Symbiotic Approach to Healing**

In individuals grappling with complex metabolic conditions such as hypothyroidism and autoimmune disorders like Hashimoto's thyroiditis, the amalgamation of PEMF therapy and functional medicine opens up a pathway of profound healing. Functional medicine nurtures the body with

personalized nutritional strategies, while PEMF therapy ensures the assimilation of these nutrients at the cellular level, thus promising a synergistic effect, catalyzing a more in-depth healing process.

The outcome is a therapeutic strategy with increased potency, able to transcend barriers that once seemed insurmountable. Patients find themselves responding with an enhanced vitality, experiencing an upliftment in their energy levels as their cells learn to function at an optimal state, embodying a true synergy of functional medicine and PEMF therapy in restoring health.

## **Conclusion**

As we navigate the complexities of metabolic and autoimmune conditions through the lens of functional medicine, we find a powerful ally in PEMF therapy. Together, they forge a path of synergistic healing, overcoming cellular barriers to facilitate a nurturing environment replete with enhanced nutrient absorption and detoxification at the cellular level.

Through a conscious amalgamation of these therapeutic strategies, we stand at the cusp of revolutionizing the treatment for conditions like hypothyroidism and Hashimoto's thyroiditis, fostering an era where healing is not just a possibility, but a reality rooted in scientific foresight and a deep understanding of the cellular dynamics. This symbiotic approach heralds a future of medicine that is not only integrative but also



transformative, holding the promise of restored health and wellbeing for individuals navigating the challenging terrains of complex metabolic and autoimmune disorders.

# **Chapter 12: How A Hybrid PEMF Device & Testing Protocol Elevated Our Thyroid Recovery Program**

After integrating a hybrid PEMF device and testing protocol into our 90-day thyroid recovery program, we observed three significant changes:

1. Individuals who hadn't benefitted from functional medicine started to notice progress.
2. Patients experienced quicker recoveries.
3. Patients saw progress in areas that hadn't previously responded to functional medicine alone.

## **Helping Challenging Patients**

While functional medicine alone helped the vast majority of our hypothyroid/Hashimoto's patients, roughly 15 percent did not respond as expected. That changed significantly when we added a hybrid PEMF device and developed a testing protocol, which allowed for personalized care. Subsequently, our patient satisfaction rate soared to around 95 percent.

## **Faster Results**

Patients also reported accelerated progress in numerous areas such as fatigue, headaches, hair thinning, dry skin, brittle nails, constipation, muscle weakness, joint discomfort, depression, mental fog, and even weight reduction.

## **Additional Benefits**

Patients also began noting progress in conditions that had been unresponsive to just functional medicine - including knee, back, hip, neck, and shoulder pain, sciatica, peripheral neuropathy, arthritic discomfort, post-stroke recovery, tremors associated with Parkinson's, respiratory conditions like COPD and bronchitis, urinary issues, erectile dysfunction, an enlarged prostate, swelling in the extremities, wound healing, and more. Though medical studies have already demonstrated the effectiveness of PEMF therapy for these conditions, the consistent success we have witnessed with our patients has gone beyond expectations.

## **Desensitizing Allergies & Food Sensitivities**

A particularly intriguing advantage of PEMF therapy, not found in medical studies, is its potential to desensitize individuals to allergies and food sensitivities.

A colleague from California stumbled upon this while exploring various desensitization techniques for a young equestrian enthusiast who would react with coughs, sneezes, wheezes, and tears upon close contact with horses. Remarkably, after just one PEMF desensitization session, she could engage in horse riding without any adverse reactions.

## **PEMF Therapy: Precision is the Path to Consistent Outcomes**

I have found that the consistent achievement of exceptional

results hinges on precision. It's about mastering all elements: the right timing, exact frequency, perfect intensity, and employing the appropriate accessory at the correct location. Just as too little can be ineffective, overdoing can also be counterproductive. Hence, determining the right frequency of sessions is equally crucial.

To attain this precision, one needs a device endowed with expansive capabilities, a diverse range of accessories, and a testing protocol tailored for individualized therapy sessions.

### **The Hybrid PEMF Device Rises Above the Rest**

Having experimented with dozens of PEMF devices over nearly a decade, I firmly believe that hybrid devices stand out, offering a blend of low-intensity adaptability and the robustness of high-intensity machines. Here's a brief comparison between PEMF devices:

#### **Low-Intensity Devices:**

A premium low-intensity device is incredibly adaptable. It grants the user autonomy over time, frequency, and intensity settings. Yet, these devices woefully underpowered.

#### **High-Intensity Devices:**

Contrastingly, a top-tier high-intensity device can deliver enough power to cause muscle contractions. However, it

sacrifices versatility as users cannot customize the frequency.

### **Hybrid Device:**

The hybrid emerges as the frontrunner, marrying the best of both worlds. Users can tailor the time and frequency while adjusting intensity ranging from the subtlest levels to those potent enough to induce muscle contractions.

### **Accessories**

Choosing the appropriate accessory and positioning is yet another critical component, and the hybrid device excels in this respect. It boasts a range of robust accessories including a six-foot full-body mat, a chair pad, rings, circular paddles, and a square pad.

### **Testing Protocol**

One of the crowning accomplishments in my extensive healthcare journey was formulating a testing protocol for the hybrid device. Prior to its creation, our outcomes with PEMF therapy were inconsistent. However, with the introduction of this protocol, we've successfully aided hundreds suffering from conditions that previously seemed insurmountable. This advancement has genuinely transformed our patients' lives, enhancing their mobility, well-being, and overall quality of life.

# **Journey To Discovery: My Personal Experiences With Functional Medicine and PEMF Therapy**

My journey into functional medicine was deeply personal. At the age of twenty, I received a diagnosis of ulcerative colitis, a challenging autoimmune disease that presented a range of debilitating symptoms. The medications prescribed to me, while meant to help, came with an array of both short-term and long-term side effects - from a swollen face and acne to unpredictable mood swings. Yet, I diligently followed my gastroenterologist's advice, hoping for relief. But eight years later, even though I consumed these drugs daily, I was diagnosed with two additional autoimmune diseases. This, for me, was a turning point. I began questioning the efficacy of these treatments. If they couldn't stave off flare-ups or prevent additional autoimmune diseases, then why was I enduring their side effects? I had spend eight years living with the symptoms of my diseases, the side effect of my medications, or both. That wasn't how I intended to live the rest of my life. Seeking a more effective solution for my chronic health challenges, I ventured into the realm of healthcare.

## **In Search of Answers**

Initially, I placed my trust in traditional Western medicine, hoping their vast resources would hold the solutions I sought. However, I soon realized that the focus seemed more on symptom management than on truly addressing

the root causes. Disappointed, I decided to switch to alternative medicine.

### **Choosing an Unconventional Path**

Being raised in a family with a strong medical background - my father, a respiratory therapist, and my sister, a nurse - the world of alternative medicine was often met with skepticism. In fact, "quack" was the term my father used to describe practitioners in this field. Imagine his apprehension when I chose to pivot from conventional to alternative medicine. My reasoning was straightforward: I needed to try something different since the current approach was not yielding the desired results. I did promise my father that I would continue taking my medications until I found a safe and effective alternative.

### **Why Chiropractic?**

My choice of chiropractic wasn't because I believed it to be the panacea for all my conditions, but because chiropractors, like MDs, have the flexibility to specialize in various disciplines, including functional medicine. My time in chiropractic school was enlightening. I armed myself with knowledge about nutrition and other natural therapies.

### **Post-Graduate Studies**

After graduation, I continued with post-graduate studies in neurology, nutrition, functional endocrinology, and functional blood chemistry analysis. Then, I put my knowledge to the test, analyzing my own blood work and

lab tests, I crafted a nutritional plan targeting the core issues of my autoimmune conditions. In just a few months, I was able to transition away from all the medications that I had taken for a quarter-century. How did that work out? Below I give you a side-by-side comparison of my experiences with traditional Western medicine and Functional medicine.

## **A Tale of Two Treatments**

### **Traditional Western Medicine**

For twenty-five years, traditional medicine meant living with the daily ritual of medication, the unpleasant side effects, and the looming dread of the next flare-up, which occurred, on average, twice yearly. Prednisone was the go-to during flare-ups, but its success was unpredictable and the side effects ever-present. Life was a roller coaster of symptoms, side effects, or both. True wellness felt out of reach.

### **Functional Medicine**

Shifting to functional medicine was transformative. It began with dietary alterations and supplementation. After tapering off my long-standing medications, I was both apprehensive and hopeful about what lay ahead. The results were astounding! Over the next twelve years, flare-ups reduced drastically, from twice yearly to once every three years, and the once-constant side effects are gone. On the rare occasions when my disease does flare-up, specific enzymes swiftly puts it back into remission within a two-



week time frame. While it's not a cure-all, functional medicine undeniably elevated my quality of life.

### **Establishing A Functional Medicine Practice**

Inspired by my personal journey, and my belief that functional medicine is the best form of medicine for complex chronic diseases, I established a functional medicine clinic assisting individuals grappling with complex metabolic conditions and autoimmune diseases.

While we were able to help the vast majority of our patients utilizing functional medicine, some remained challenging. Thus, I delved into the concept of functional medicine, searching for a way to boost its effectiveness. I felt confident that we were running the tests necessary to identify the root cause, and I was equally certain that we were giving our patients the proper nutrition to address the underlying problems. I suspected the reason why some weren't respond to care was that something hindered the nutrition from making its way into the cells. Therefore, I believed, if I could find a way to increase nutrient absorption into the cells, we could help even our most challenging patients. Enter PEMF therapy.

### **PEMF Therapy**

I stumbled across PEMF therapy while searching PubMed for a way to boost the effectiveness of functional medicine by increasing nutrient absorption. Upon entering the phrase "increases nutrient absorption" into the search bar, among the hundreds of responses, PEMF therapy caught

my attention. Having never heard of PEMF therapy, I believed it to be a new therapy. However, upon further research, I ascertained that PEMF therapy had been used in hospitals and clinics around for more than fifty years, and had received its first FDA approval in the U.S. in 1979.

I also discovered a treasure trove of data demonstrating PEMF therapy's safety and efficacy for more than 80 conditions. Included in that data were thousands of double-blind, placebo-controlled medical studies, multiple FDA approvals, and a 4-year study by NASA, who, by the way, ended up filing a patent for their own PEMF device after that study.

### **Intrigued But Skeptical**

Curious yet cautious, I reached out to the physicians within my network for their take on PEMF therapy. Our functional medicine community consists of over 300 professionals from every corner of the U.S., encompassing medical doctors, chiropractors, and naturopaths. Given our size and diversity, it stood to reason that some would have experience with PEMF therapy. As luck would have it, more than twenty members had integrated PEMF therapy into their practices. Some utilized low-intensity machines, others high-intensity, and a select few engaged with a hybrid device. While all voiced contentment with their chosen devices, the collective sentiment was that the hybrid device held the most potential. In probing about the sparse adoption of the hybrid model, they explained that the hybrid device was so new and technologically advanced

that everyone was still trying to figure out how to best use it. Therefore, many physicians, constrained by their schedules, couldn't dedicate the required time to fully explore its capabilities. Nevertheless, a dedicated few were deep in their investigations with the hybrid device, regularly sharing insights with the wider community.

### **Choosing A PEMF Device**

Having familiarized myself with various devices, I tested more than a dozen, including low-intensity, high-intensity, and hybrid ones. Ultimately, I settled on a hybrid device. The disparity in performance between the hybrid and the rest was too significant for me to overlook.

### **Introducing PEMF Therapy Into Our Practice**

Initially, our intention was to introduce PEMF therapy exclusively to our more complex cases and observe any improvement. However, due to overwhelming interest, every patient was treated with a 30-minute session. Since PEMF was a novel experience for both patients and our team, we decided to commence with half-hour sessions to gauge its impact. The initial feedback was varied: approximately 50% felt no difference, a third noticed improvements, and roughly 20% felt worse. Not content with these outcomes, I opted to personally delve deeper into the hybrid device's capabilities at home, aiming to harness its full potential for our patients.

### **Physician, Heal Thy Self**

I harbored a few health concerns I hoped PEMF therapy could address: a swollen left knee, lower back stenosis, and an enlarged prostate. My chief concern was my knee, as it hindered my ability to play with my 7-year-old son. Being 6'5", engaging with my son without constantly bending down was a challenge. Therefore, I focused on my knee first.

My left knee had remained persistently swollen for 18 months and hadn't responded to over a dozen therapies. Fixing it would undoubtedly be an incredible success.

Thus, I dedicated three months to extensively reviewing medical studies, meticulously noting the various parameters such as times, frequencies, intensities, and pad placements utilized in various knee studies. Additionally, I reached out to fellow doctors in our group, experimented with every conceivable variation, and still, my knee displayed no improvement.

The core issue became evident: everyone employed a different approach for the same problem. Although each approach yielded some degree of success, there was no universal solution. Three months of unyielding effort left me at the same starting point, and I realized I'd be long retired before uncovering protocols for over 80 conditions.

## Unlocking The Hybrid's Potential

## **Seeking a New Approach**

What I required was a more effective methodology. The systematic approach in use was proving impractical. I needed to devise a way to test each individual, pinpointing their specific needs. Turning back to PUBMed, I sought a solution.

## **Exploring New Avenues**

While uncertain about what exactly I was seeking, I began searching for alternative testing methods. The search yielded a staggering 70,000 results. Although I knew sifting through all of them would be time-consuming, I believed it to be a better path than persisting with my current approach.

## **Uncovering a Promising Method**

Eventually, my exhaustive search led me to a testing method pioneered by an American trained Japanese medical doctor and researcher during the 1980s. This test was introduced as a non-invasive means to assess the body's energetic equilibrium and detect potential health imbalances.

## **Taking a Leap of Faith**

The testing method might have seemed unconventional, but after watching a series of informative videos and delving into medical studies on PUBMed, I decided it was worth a shot. After all, what did I have to lose?

## **Personal Experimentation**

After making a few tweaks to this unique testing method, I resolved to apply it to myself. My goal was to uncover the best strategy for addressing the swelling in my knee.

## **Surprising Outcome**

To my surprise, my modified testing method yielded intriguing results. It revealed that I needed to employ the round paddles on the right side of my head, utilizing a specific frequency and intensity. Since PEMF therapy is considered safe for use over any part of the body, including the eyes and brain, I decided to go for it. Remarkably, within just two weeks, the swelling in my knee had completely disappeared!

## **Expanding the Experiment**

However, I remained cautious, considering the possibility of coincidence. Eager to explore further, I employed the same test to discern the optimal treatment for my enlarged prostate. After undergoing 10 sessions, I noticed improved urinary flow. Remarkably, after 20 sessions, I was sleeping through the night without interruption. Before, I had struggled to empty my bladder and woke up 3 or 4 times during the night to use the bathroom.

## **A Journey to Pain-Free Living**

For my final test, I aimed to determine the most effective approach for my stenosis, which resulted from a Grade 2 spondylolisthesis—a condition where L5 slides forward over the sacrum up to 50 percent. This one required about 5

months, but the outcome was nothing short of astounding. Previously, my back pain had prevented me from participating in activities like Trick or Treating with my children. Now, I am able walk for miles without experiencing pain.

### **Applying the Method**

Brimming with confidence, believing that I had devised a testing method that would unlock the hybrid's true potential, I returned to the office. Enthusiastically, I delved into tailoring plans that catered to the distinct needs of our patients, anticipating the impressive results I had personally seen. Yet, the initial outcomes echoed the prior encounter: approximately fifty percent saw no improvement, a third observed improvements, and roughly twenty percent felt worse.

### **Acknowledging Varied Responses**

Subsequently, recognizing the inherent complexity of human responses, I've come to understand that even with our therapy tailored to each patient's unique needs, variations in reactions are inevitable. Some individuals exhibit a slower response compared to others, and in certain cases, initial sessions may even trigger a temporary worsening of symptoms. For a more detailed exploration of this phenomenon, refer to the upcoming 'Frequently Asked Questions' section.

### **Setting Patient Expectations**

In the initial introduction of PEMF therapy to new patients, we make sure to elucidate the three potential outcomes: "You might experience an immediate improvement, which is truly encouraging. Alternatively, you could notice a temporary exacerbation of symptoms, which paradoxically indicates that the therapy is catalyzing positive changes within your body. On the other hand, you might not observe any immediate changes, as some individuals require a longer period to perceive noticeable results." In emphasizing these possibilities, we stress that any temporary discomfort experienced the following day is likely to resolve by day's end. We provide a clear understanding of the underlying reasons for this phenomenon, reassuring our patients that it's an integral part of their healing journey.

### **Commitment to Healing**

Amidst these diverse responses, our unwavering goal remains centered on expediting each individual's recovery process as swiftly and smoothly as possible.

## Revolutionizing Patient Care: Unveiling Our Novel Testing Method

### **Celebrating Success**

The first group of patients to utilize our new testing protocol exhibited such extraordinary results that I found it



imperative to immortalize their achievements through video testimonials.

### **Sharing Success Stories**

The intention behind these recordings was to disseminate their success stories among the esteemed colleagues within our professional community. I promptly uploaded these videos onto my YouTube channel and shared the corresponding link on our dedicated group's message board.

### **Nurturing a Culture of Collaboration**

Within our group, a spirit of knowledge-sharing prevails. Whenever a doctor makes a breakthrough discovery or gains mastery over a new technique, an informal meeting is organized where interested colleagues can gather to learn and adopt the new knowledge. This collaborative approach is integral to our group's ethos of continuous improvement.

### **Gathering for Growth**

Intriguingly, approximately 30 doctors within our network expressed keen interest in learning about our novel testing method. To facilitate this knowledge exchange, we convened in Chicago, where the manufacturer of the hybrid device that we employ in our practice was conducting a seminar.

### **From Skepticism to Advocacy**

Among the attendees was the very doctor who founded our group, even though he had been initially skeptical of PEMF

therapy due to a past negative experience. Despite his reservations, I selected him as one of the doctors to experience my testing method firsthand. After the demonstration, his perspective underwent a significant shift, leading him to acquire six hybrid devices for his clinic and one for personal use.

### **Harnessing the Power of Precision**

I believe that our testing method demonstrates the critical role of precision in achieving the best possible outcomes.

### **Precision in Healing: The Crucial Role of Our Testing Method**

In the realm of PEMF therapy, unlocking the full potential of healing hinges on precision. As we explore the intricacies of tailoring each session to the unique needs of individual patients, the significance of employing our testing method becomes clear. This test, a gateway to personalized therapy, is a powerful tool that enables practitioners to determine the correct frequencies and intensities that resonate harmoniously with each patient's distinct energy pathways.

### **Understanding Individual Resonance**

Every individual's body is a symphony of frequencies, with various organs, tissues, and systems vibrating at specific resonant frequencies. These frequencies offer insights into the state of health and balance within the body. By conducting our unique testing method, practitioners can tap into this resonance, identifying the frequencies that

promote healing for each patient's unique condition. This individualized approach not only enhances the effectiveness of PEMF therapy but also embraces the holistic nature of healing, addressing the root causes rather than merely alleviating symptoms.

### **Precision and Personalization**

Our unique testing method offers a personalized dimension to PEMF therapy. Rather than adopting a one-size-fits-all approach, this test empowers practitioners to fine-tune therapy sessions according to the patient's needs. By determining the correct frequencies and intensities, practitioners can optimize the therapy's impact, facilitating cellular repair, enhancing circulation, and igniting the body's innate regenerative processes. This precision-driven approach sets the stage for comprehensive healing, encouraging the body to restore its balance and vitality.

### **Revolutionizing Personalized Healing: Our Innovative Testing Method**

In the dynamic world of PEMF therapy, our testing method stands as a beacon of personalized healing. Through this test, practitioners navigate the intricate landscape of vibrational frequencies, forging a path toward tailored sessions that resonate with each patient's unique energy patterns.

### **Holistic Healing at the Core**

This approach not only enhances the effectiveness of PEMF therapy but also reinforces the fundamental principles of

holistic healing, placing patients at the center of their journey and paving the way for transformative wellness.

### **Embracing Unorthodox Methods**

Maintaining an open-minded approach and welcoming unconventional methods beyond the traditional medical realm has profoundly impacted my life. While I concede that I've occasionally been drawn to promising ideas that didn't quite live up to their potential, in the long run, it proved to be worth the journey.

Without exploring these uncharted waters, I might still be ensnared in a cycle of ineffective medications that brought forth more complications than resolutions. This is why I remain willing to embrace calculated risks, particularly when the potential gains stand substantial.

As we draw the curtains on this book, I extend to you a compelling challenge. If you find yourself at the crossroads of your journey, having explored every avenue in search of relief from unyielding symptoms, the time for action is now. Reach out to our office and take the step to arrange an appointment.



## **FREQUENTLY ASKED QUESTIONS**

### **How do I schedule a consultation?**

To schedule a consultation call our office at 352-268-0199.

### **What can I expect during my initial consultation?**

A functional medicine consultation for hypothyroidism takes a comprehensive and individualized approach, focusing on identifying and addressing the root causes of the condition rather than just treating its symptoms. Here's a general outline of what such a consultation might look like:

We'll discuss your health concerns and what you hope to achieve. If we believe we can help you achieve your goals, we'll move to the next step. The next step is ordering comprehensive blood work. This will include a complete thyroid panel plus 54 non-thyroid specific markers to assess your overall health, including blood sugar, cholesterol, infections, inflammation, liver and kidney function, vitamin levels, etc. The cost of a consultation is \$75. The cost of the comprehensive blood panel is \$350. We do not accept insurance, or file insurance claims. We will also offer a free 30-minute PEMF therapy session.

### **What occurs on the follow-up session?**

Once your blood work comes back, we will contact you and schedule a time for you to come in so we can go over your blood work together. After reviewing your blood work, the

Dr. Gilliland will likely recommend additional tests, such as a gut permeability test, a food sensitivity test, and/or an adrenal stress test. At this time, Dr. Gilliland will go over the cost of your 90-day thyroid recovery program.

### **What happens during my 90-day thyroid program?**

Based on what we find on your blood work and laboratory tests, we will customize a diet and supplement program to address your specific issues. You will also come in twice weekly for a one-hour session of PEMF therapy. During these twice weekly visits, Dr. Gilliland will assess your progress and make adjustments if needed.

### **What Is PEMF Therapy?**

PEMF therapy stands for "Pulsed Electromagnetic Field" therapy. It's a non-invasive approach that involves using electromagnetic fields to stimulate the body's cells, promoting various physiological responses. This therapy aims to improve overall wellness, address pain, and aid in the recovery process for various health conditions. It's thought that these electromagnetic fields can influence cellular functions, such as enhancing circulation, reducing inflammation, and supporting the body's natural healing processes.

### **How Does PEMF Work?**

PEMF therapy, or Pulsed Electromagnetic Field therapy, operates on the principle of electromagnetic fields to interact with the body's cells and tissues. It involves the use of electromagnetic pulses at specific frequencies to generate

pulsating magnetic fields. When these magnetic fields pass through the body, they induce small electrical currents within the cells. These currents can stimulate cellular activities and biochemical processes, which in turn can have various effects on the body.

PEMF therapy is thought to influence cell behavior in several ways:

**Cellular Resonance:** Each cell has its own natural frequency. PEMF devices can be tuned to emit frequencies that match these natural frequencies, leading to resonance. This resonance can promote optimal cell function and communication.

**Improved Blood Flow:** PEMF therapy has been shown to enhance blood flow by causing blood vessels to expand and contract rhythmically. This can lead to improved oxygen and nutrient delivery to cells and removal of waste products.

**Enhanced Cellular Energy:** PEMF therapy may boost the production of adenosine triphosphate (ATP), which is the primary energy molecule in cells. Increased ATP can support cellular repair and overall energy levels.

**Reduction of Inflammation:** Some studies suggest that PEMF therapy can help reduce inflammation by modulating inflammatory responses at the cellular level. This can be particularly beneficial for conditions like neuropathy where inflammation plays a role.

**Stimulation of Healing Processes:** The gentle electrical currents induced by PEMF therapy can encourage the healing of



tissues, including nerves. This may promote the regeneration of damaged nerves and tissues.

**Normalization of Cellular Activity:** PEMF therapy can help regulate abnormal cellular processes by influencing ion flow across cell membranes. This can restore normal cellular activities and support overall health.

It's important to note that the exact mechanisms of how PEMF therapy works are still being researched and understood. The effects of PEMF therapy can vary depending on the specific parameters used, including frequency, intensity, and duration of the sessions. While PEMF therapy has shown promise in various health conditions, including peripheral neuropathy, it's recommended to consult with a healthcare professional before starting any new treatment approach.

## **What Are Some Of The Benefits Associated With PEMF Therapy?**

Pain relief

Improved circulation

Reduced inflammation

Enhanced tissue healing

Accelerated recovery from injuries

Increased cellular oxygenation

Relaxation and stress reduction

Better sleep quality

Enhanced muscle function

Improved range of motion

Reduction in muscle stiffness

Enhanced immune system function

Balancing of neurotransmitters  
Improved mood and mental clarity  
Increased energy levels  
Reduction in swelling  
Enhanced wound healing  
Promotion of bone healing  
Regulation of blood pressure  
Support for nerve regeneration  
Relief from chronic pain conditions  
Reduction in muscle tension  
Management of arthritis symptoms  
Support for neurological disorders  
Enhanced detoxification  
Boosted cellular metabolism  
Improvement in skin health  
Alleviation of migraines and headaches  
Support for digestive issues  
Enhancement of overall well-being

### **How does PEMF therapy influence our cells?**

Pulsed electromagnetic field (PEMF) therapy has been studied for its effects on human cells, and it is believed to have several potential impacts at the cellular level. Here are some of the effects that PEMF therapy may have on human cells:

**Cellular metabolism:** PEMF therapy has been suggested to enhance cellular metabolism, which refers to the biochemical processes occurring within cells to generate energy and maintain cellular function. By promoting cellular metabolism, PEMF therapy may potentially support optimal cellular activity and overall cellular health.

**Calcium ion influx:** PEMF therapy has been shown to influence calcium ion influx in cells. Calcium ions play a crucial role in various cellular processes, including signaling, muscle contraction, and gene expression. Modulating calcium ion levels can impact cellular function and may contribute to the effects of PEMF therapy.

**Electromagnetic resonance:** PEMF therapy involves the application of electromagnetic fields to the body, and these fields can interact with the charged particles within cells. This interaction can lead to electromagnetic resonance, where the electromagnetic fields induce vibrations and oscillations within the cells, potentially influencing cellular behavior and signaling pathways.

**Gene expression:** Studies have suggested that PEMF therapy may modulate gene expression, influencing the activation or suppression of specific genes within cells. This modulation of gene expression can impact various cellular processes and may contribute to the therapeutic effects of PEMF therapy.

**Cellular communication and signaling:** PEMF therapy has been proposed to influence cellular communication and signaling pathways. It may affect the release and response to various signaling molecules, such as cytokines and growth factors, which play critical roles in cell-to-cell communication and the regulation of cellular processes.

**Anti-inflammatory effects:** PEMF therapy has been associated with anti-inflammatory effects in some studies. It may help reduce the production of pro-inflammatory

molecules and promote a more balanced inflammatory response within cells, potentially contributing to the alleviation of inflammation-related conditions.

**Cellular proliferation and differentiation:** PEMF therapy has been studied for its potential effects on cellular proliferation (cell division and reproduction) and differentiation (cell specialization). It may influence the growth and differentiation of certain cell types, which can be relevant for tissue repair and regeneration processes.

**Oxidative stress and antioxidant activity:** PEMF therapy has been suggested to modulate oxidative stress and antioxidant activity within cells. Oxidative stress occurs when there is an imbalance between the production of reactive oxygen species (ROS) and the body's antioxidant defense mechanisms. PEMF therapy may help restore the balance by promoting antioxidant activity and reducing oxidative stress levels within cells.

It's important to note that the exact mechanisms by which PEMF therapy affects human cells are still being investigated, and the specific effects can vary depending on the parameters of the therapy, the type of cells studied, and other factors. Further research is needed to fully understand the cellular responses to PEMF therapy and its clinical implications.

### **Can Everyone Use PEMF Therapy?**

No. While Pulsed Electromagnetic Field (PEMF) therapy is generally considered safe and well-tolerated by most individuals, there are certain groups of people who should

exercise caution or avoid using PEMF therapy. It's important to consult with a healthcare professional before starting any new therapy, including PEMF, especially if you fall into any of the following categories:

**Pregnant Women:** Pregnant women should avoid using PEMF therapy, particularly during the first trimester, as the effects on the developing fetus are not fully understood.

**Individuals with Implantable Devices:** People with implantable electronic devices such as pacemakers, defibrillators, or cochlear implants should avoid PEMF therapy. The electromagnetic fields could potentially interfere with the functioning of these devices.

**Epilepsy and Seizure Disorders:** People with a history of epilepsy or seizure disorders should use PEMF therapy cautiously, as the electromagnetic fields could potentially trigger seizures in some individuals.

**Organ Transplants:** Individuals who have undergone organ transplantation might need to avoid PEMF therapy, as it could potentially affect the transplanted organ or the immune system.

**Active Bleeding or Hemorrhage:** People with active bleeding, or hemorrhagic conditions should avoid PEMF therapy, as it might interfere with blood clotting mechanisms.

**Why Do Some People Feel Worse After Their Initial Session?**

The experience of feeling worse after the first couple of sessions of PEMF (Pulsed Electromagnetic Field) therapy, could be attributed to a phenomenon known as the "healing crisis" or "detoxification reaction." Here's a possible explanation:

**Detoxification Process:** PEMF therapy is believed to stimulate various processes within the body, including increased circulation and cellular activity. These processes can lead to the release of toxins that were stored in the body's tissues. As the body begins to eliminate these toxins, individuals may experience temporary symptoms such as fatigue, headache, muscle aches, and even a worsening of their existing symptoms. This initial period is often referred to as a detoxification or healing crisis.

**Cellular Activation:** PEMF therapy works at the cellular level to promote healing and balance. It's possible that as cells become more active and efficient due to the therapy, they begin to process waste products and toxins more effectively. This sudden increase in cellular activity can lead to the release of accumulated toxins into the bloodstream.

**Individual Variability:** People's bodies respond differently to therapies, and their individual health conditions, toxin levels, and overall wellness play a role. Some individuals may have a higher toxin load or greater cellular dysfunction, leading to a more pronounced initial reaction.

**Adjustment Period:** As the body adapts to the changes brought about by PEMF therapy, the initial negative reactions tend to subside over time. With repeated sessions, the body's detoxification pathways become more efficient, and the healing crisis symptoms typically subside.

**Activation of Self-Healing:** Over time, PEMF therapy can activate the body's self-healing mechanisms. As these mechanisms become more engaged, the body's natural ability to heal and recover improves, leading to an overall improvement in symptoms.

It's important to note that while some people may experience a temporary worsening of symptoms initially, this is not the case for everyone. Many individuals may notice immediate improvements or gradual relief from their symptoms after starting PEMF therapy. If you're considering PEMF therapy and experience a temporary worsening of symptoms, it's advisable to consult with a healthcare professional who is knowledgeable about PEMF therapy to ensure that the reactions are managed appropriately.

### **How Long Will The Results Last?**

The duration of the results obtained from PEMF (Pulsed Electromagnetic Field) therapy can vary based on several factors, including the individual's health condition, the frequency and duration of the therapy sessions, the underlying causes of the condition being treated, and the maintenance of a healthy lifestyle. Here are some factors to consider when evaluating how long the results of PEMF therapy might last:

**1. Health Condition:** The nature of the health condition being treated plays a significant role in determining the longevity of the results. Some acute conditions might respond quickly to PEMF therapy, while chronic conditions

may require ongoing or periodic sessions to maintain the benefits.

**2. Frequency of Treatment:** Consistent and regular PEMF therapy sessions are more likely to yield longer-lasting results. Skipping sessions or not following the recommended treatment plan might reduce the sustainability of the effects.

**3. Underlying Causes:** Addressing the underlying causes of a condition is essential for sustained results. PEMF therapy can provide relief and support, but if the root causes are not managed, the benefits might diminish over time.

**4. Maintenance of Lifestyle:** A healthy lifestyle that includes proper nutrition, exercise, stress management, and adequate sleep can contribute to the longevity of the results obtained from PEMF therapy. Lifestyle factors can either enhance or detract from the effects of therapy.

**5. Chronic Conditions:** For chronic conditions, maintenance sessions might be necessary to manage symptoms and maintain the improvements achieved. Some individuals may choose to integrate PEMF therapy as part of their long-term wellness routine.

**6. Individual Variation:** Responses to PEMF therapy can vary among individuals. Some people might experience long-lasting results, while others might need additional 'maintenance' sessions.

**7. Environmental Factors:** Environmental factors, such as exposure to toxins or stressors, can influence the sustainability of the results. Minimizing exposure to



harmful substances can support the effectiveness of therapy.

**8. Combination Therapies:** In some cases, combining PEMF therapy with other treatments, such as physical therapy, chiropractic care, or medication, might lead to more durable results.

**9. Personal Goals:** Personal goals for therapy can impact the duration of results. Some individuals might seek short-term relief, while others aim for long-term management and wellness.

It's important to note that while PEMF therapy may provide benefits, it might not offer permanent solutions for all health conditions. Consultation with a qualified healthcare professional [How To Reverse Peripheral Neuropathy](#) provide insights into the expected duration of results based on your specific condition, treatment plan, and health goals. Maintaining open communication with your healthcare provider and following their recommendations may contribute to achieving the best possible outcomes from PEMF therapy.

## **How Might PEMF Therapy Lessen The Symptoms Of Peripheral Neuropathy?**

PEMF therapy may alleviate symptoms of peripheral neuropathy through various mechanisms:

**Improved Blood Flow:** PEMF therapy can enhance blood circulation, delivering more oxygen and nutrients to nerve cells in the affected area. This improved circulation can help repair damaged nerves and reduce symptoms.

**Nerve Regeneration:** PEMF therapy may stimulate nerve cell regeneration and growth, helping to repair damaged nerve fibers and improve nerve function.

**Pain Reduction:** By promoting the release of endorphins and reducing inflammation, PEMF therapy can help alleviate the pain associated with peripheral neuropathy.

**Reduced Nerve Irritation:** PEMF therapy might help reduce nerve irritation and inflammation, leading to a decrease in the tingling, burning, and numbness often experienced in peripheral neuropathy.

**Enhanced Cellular Communication:** PEMF therapy's electromagnetic fields may facilitate better communication between nerve cells, promoting healthier nerve signaling and reducing symptoms.

**Muscle Relaxation:** For cases where peripheral neuropathy leads to muscle stiffness or cramps, PEMF therapy's muscle-relaxing effects could provide relief.

**Better Sleep:** Improved pain management through PEMF therapy can lead to better sleep quality, which is essential for overall well-being and nerve healing.

**Stress Reduction:** Stress can exacerbate peripheral neuropathy symptoms. PEMF therapy's ability to induce relaxation and reduce stress can indirectly alleviate symptoms.

**Neurotransmitter Balance:** PEMF therapy may help regulate neurotransmitter levels, contributing to more stable nerve function and symptom reduction.

## **How Might PEMF Therapy Benefit Someone With Arthritis In Their Knees?**

PEMF therapy has the potential to alleviate symptoms of peripheral neuropathy through various mechanisms:

**Improved Blood Flow:** PEMF therapy can enhance blood circulation, delivering more oxygen and nutrients to nerve cells in the affected area. This improved circulation can help repair damaged nerves and reduce symptoms.

**Nerve Regeneration:** PEMF therapy may stimulate nerve cell regeneration and growth, helping to repair damaged nerve fibers and improve nerve function.

**Pain Reduction:** By promoting the release of endorphins and reducing inflammation, PEMF therapy can help alleviate the pain associated with peripheral neuropathy.

**Reduced Nerve Irritation:** PEMF therapy might help reduce nerve irritation and inflammation, leading to a decrease in the tingling, burning, and numbness often experienced in peripheral neuropathy.

**Enhanced Cellular Communication:** PEMF therapy's electromagnetic fields may facilitate better communication between nerve cells, promoting healthier nerve signaling and reducing symptoms.

**Muscle Relaxation:** For cases where peripheral neuropathy leads to muscle stiffness or cramps, PEMF therapy's muscle-relaxing effects could provide relief.

**Better Sleep:** Improved pain management through PEMF therapy can lead to better sleep quality, which is essential for overall well-being and nerve healing.

**Stress Reduction:** Stress can exacerbate peripheral neuropathy symptoms. PEMF therapy's ability to induce relaxation and reduce stress can indirectly alleviate symptoms.

**Neurotransmitter Balance:** PEMF therapy may help regulate neurotransmitter levels, contributing to more stable nerve function and symptom reduction.

## **How Might PEMF Therapy Benefit Someone With Urinary Incontinence?**

PEMF therapy may offer several potential benefits for individuals dealing with urinary incontinence:

**Muscle Stimulation:** PEMF therapy's ability to stimulate muscles could be beneficial for strengthening pelvic floor muscles, which play a crucial role in maintaining urinary continence.

**Improved Nerve Function:** By potentially enhancing nerve cell communication and function, PEMF therapy might contribute to better control over the bladder muscles and reduce involuntary contractions.

**Enhanced Blood Circulation:** PEMF therapy's effects on blood circulation could help improve the health of tissues and muscles in the pelvic region, aiding in bladder control.

**Relaxation of Pelvic Muscles:** Tense pelvic muscles can contribute to urinary incontinence. PEMF therapy's muscle-relaxing effects could alleviate tension and improve muscle coordination.

**Inflammation Reduction:** Inflammation of the bladder or surrounding tissues can worsen urinary incontinence. PEMF therapy's potential to reduce inflammation might help alleviate related symptoms.

**Support for Nerve Regeneration:** Some studies suggest that PEMF therapy could support nerve regeneration, which might aid in improving bladder control.

**Non-Invasive Option:** PEMF therapy offers a non-invasive approach to addressing urinary incontinence, potentially reducing the need for more invasive treatments.

**Complementary Treatment:** When used alongside other therapies such as pelvic floor exercises, dietary changes, and lifestyle modifications, PEMF therapy could provide an additional layer of support for managing urinary incontinence.

**Improved Quality of Life:** By addressing the underlying factors contributing to urinary incontinence, PEMF therapy might improve an individual's overall quality of life by reducing the impact of this condition on daily activities and self-esteem.

**Potential for Reduced Medication Dependence:** If PEMF therapy helps improve urinary control, individuals may rely less on medications or other interventions to manage their symptoms.

## **Explain The Differences Between Harmful and Beneficial EMFs?**

Electromagnetic fields (EMFs) are generated by the movement of electrically charged particles. They are present in both natural and man-made environments. EMFs are often categorized into two main types: harmful EMFs and beneficial EMFs.

### **Harmful EMFs:**

Harmful EMFs, also known as non-ionizing radiation, are associated with potential negative health effects when exposure levels are high or prolonged. These types of EMFs are primarily generated by sources such as power lines, electrical appliances, cell phones, Wi-Fi networks, and microwave ovens. Here are some characteristics of harmful EMFs:

**Frequency and Intensity:** Harmful EMFs are often generated at frequencies that are commonly encountered in daily life, such as radio frequencies and microwaves. Their intensity can vary depending on the source and proximity.

**Potential Health Concerns:** There is ongoing debate and research regarding the potential health effects of prolonged exposure to harmful EMFs. Some studies suggest a possible link between high exposure to certain types of EMFs and increased risk of cancer, neurological disorders, and other health issues.

**Regulation:** Many countries have established safety guidelines and exposure limits for harmful EMFs to protect the public from potential health risks. These limits are designed to minimize potential harm.

## **Beneficial EMFs (PEMF Therapy):**

Beneficial EMFs, also known as pulsed electromagnetic fields (PEMFs), are specifically designed to have positive effects on biological systems. PEMF therapy involves applying electromagnetic pulses to the body to promote various health benefits. Unlike harmful EMFs, PEMF therapy is used in controlled settings and has been studied for its potential healing effects. Here are some characteristics of beneficial EMFs, as seen in PEMF therapy:

**Specific Frequencies and Intensity:** PEMF therapy uses specific frequencies and intensity levels that are thought to interact positively with cells and tissues. These frequencies are carefully chosen based on research and clinical studies.

**Biological Response:** Beneficial EMFs, when applied correctly, can stimulate cellular activities, enhance circulation, support tissue repair, reduce inflammation, and promote overall wellness.

**Controlled Application:** PEMF therapy is administered under controlled conditions by trained professionals. The devices used for therapy are designed to provide specific therapeutic benefits without causing harm.

**Research and Clinical Studies:** Over the years, there has been research into the potential therapeutic effects of PEMF therapy for various conditions, including pain management, wound healing, bone health, and more.

**Individualization:** The frequencies and parameters used in PEMF therapy can be tailored to the individual's needs, ensuring a personalized approach to treatment.

It's important to note that while there is ongoing research and interest in the potential benefits of PEMF therapy, it's advisable to consult with a healthcare professional before starting any new treatment. Beneficial EMFs used in PEMF therapy should not be

confused with the harmful EMFs associated with some common electronic devices.

## **What Are The Differences Between A Magnet and PEMF Therapy?**

Static magnets and Pulsed Electromagnetic Field (PEMF) therapy are both forms of magnetic therapy, but they differ in terms of their mechanisms, applications, and potential health benefits.

Here are the key differences between using a static magnet and PEMF therapy for health benefits:

### **1. Mechanism of Action:**

**Static Magnets:** Static magnets work by creating a constant magnetic field. The idea is that the magnetic field interacts with the body's own magnetic fields and energy pathways to potentially promote healing and alleviate discomfort.

**PEMF Therapy:** PEMF therapy involves the use of pulsating electromagnetic fields that change in intensity and direction over time. These pulsed fields are believed to penetrate deeper into tissues and cells, affecting cellular activities and promoting various physiological responses.

### **2. Strength of Magnetic Field:**

**Static Magnets:** The strength of the magnetic field in static magnets is relatively weaker compared to the intense and dynamic electromagnetic pulses used in PEMF therapy.

**PEMF Therapy:** PEMF devices are capable of producing stronger magnetic fields that can penetrate tissues more effectively, potentially influencing cellular activities.

### **3. Applications:**

**Static Magnets:** Static magnets are commonly used for localized applications, such as attaching them to specific body parts. They are often used for managing pain and discomfort.



PEMF Therapy: PEMF therapy can be used for both localized and whole-body applications. It's applied through devices that emit pulsed electromagnetic fields, making it suitable for addressing a wider range of health concerns, including pain, inflammation, bone health, wound healing, and more.

#### **4. Dynamic vs. Static Fields:**

Static Magnets: The magnetic field generated by static magnets remains constant and doesn't change over time.

PEMF Therapy: PEMF therapy involves the use of dynamic and pulsating electromagnetic fields that change in intensity and direction, mimicking the body's natural electromagnetic rhythms.

#### **5. Depth of Penetration:**

Static Magnets: The magnetic field of static magnets has limited penetration and might primarily affect the skin and superficial tissues.

PEMF Therapy: PEMF therapy's dynamic fields can penetrate deeper into tissues and cells, potentially influencing cellular activities and processes.

#### **6. Research and Clinical Studies:**

Static Magnets: While static magnet therapy has been explored, the evidence supporting its effectiveness is relatively limited and controversial.

PEMF Therapy: PEMF therapy has been the subject of more extensive research, with studies investigating its potential benefits for various conditions such as pain management, wound healing, osteoarthritis, and more.

In summary, static magnets and PEMF therapy both involve the application of magnetic fields for potential health benefits. However, PEMF therapy offers a more dynamic and targeted approach with stronger and pulsating electromagnetic fields that

can potentially penetrate deeper into tissues and cells. While research is ongoing for both approaches, PEMF therapy has gained more attention in the medical and scientific community due to its versatility and potential for a broader range of health applications. Always consult with a healthcare professional before using any form of magnetic therapy for health benefits.

## **PEMF MEDICAL STUDIES**

### **ALZHEIMER'S DISEASE**

Impairments in visual memory and visuoconstructive functions commonly occur in patients with Alzheimer's disease (AD). Recently, I reported that external application of electromagnetic fields (EMF) of extremely low intensity (in the picotesla range) and of low frequency (in the range of 5Hz-8Hz) improved visual memory and visuoceptive functions in patients with Parkinson's disease. 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. The rapid improvement in cognitive functions in response to EMF suggests that some of the mental deficits of AD are reversible being caused by a functional (i.e., synaptic transmission) rather than a structural (i.e., neuritic plaques) disruption of neuronal communication in the central nervous system. - International Journal of Neuroscience PMID: 7960477

Repetitive transcranial magnetic stimulation applied to the dlPFC improves naming performance also in the advanced stages of AD. Moreover, in the severe group the effect is not specific for action naming, as in the case of the mild AD group. These findings suggest that rTMS can affect the intrinsic ability of the brain to restore or compensate for damaged function and may represent an useful new tool for cognitive rehabilitation. - European Journal of Neurology PMID: 19049544

### **AMYOTROPHIC LATERAL SCLEROSIS (LOU GEHRIG'S DISEASE)**

A study of three patients with Amyotrophic Lateral Sclerosis were treated with a pulsed magnetic field administered by a Magnobiopulse apparatus. Given three times a week for approximately 75 sessions to achieve maximum benefits, all three experienced beneficial effects.

A. Bellosi & R. Berget, "Pulsed Magnetic Fields: A Glimmer of Hope for Patients Suffering from Amyotrophic Lateral Sclerosis," Second World Congress for Electricity and Magnetism in Biology and Medicine, 8-13 June 1997, Bologna, Italy.

### **ANKLE SPRAIN**

Acutely sprained ankles represent a frequent and common injury among active duty troops in training, and are a significant source of morbidity with respect to days lost to training. In a randomized, prospective, double blind study of 50 grade I and II (no gross instability) sprained ankles, a statistically significant decrease in edema was noted following one treatment with pulsed electro magnetic field (PEMF) therapy. The application of this modality in acutely sprained ankles could result in significant decreases in time lost to military training. - Military Medicine PMID: 8441490

### **ARTHRITIS**

A total of 33 patients were screened, and 28 patients, aged between 60 and 83 and affected by bilateral knee osteoarthritis, were enrolled in this study. They received PEMF therapy on the right leg for a total of three 30-minute sessions per week for a period of 6 weeks, while the left leg did not receive any treatment and served as control. An intravenous drip containing ketoprofen, sodium clodronate, glucosamine sulfate, calcitonin, and ascorbic acid, for a total volume of 500 mL, was administered during PEMF therapy. At baseline and 3 months post-PEMF therapy, Visual Analog Scale (VAS) was used to assess

knee pain and Western Ontario McMaster Universities Osteoarthritis Index (WOMAC) was used to measure knee pain, stiffness and physical function.

#### RESULTS:

Changes in VAS and WOMAC scores were calculated for both knees as baseline minus post-treatment. A two sample Student's t-test, comparing change in knee-related VAS pain for PEMF-treated leg ( $49.8 \pm 2.03$ ) vs control leg ( $11 \pm 1.1$ ), showed a significant difference in favor of PEMF therapy ( $P < 0.001$ ). A two sample Student's t-test comparing change in knee-related WOMAC pain, stiffness, and physical function for PEMF-treated leg ( $8.5 \pm 0.4$ ,  $3.5 \pm 0.2$ ,  $38.5 \pm 2.08$ , respectively) vs control leg ( $2.6 \pm 0.2$ ;  $1.6 \pm 0.1$ ;  $4.5 \pm 0.5$  respectively), also showed a significant difference in favor of PEMF therapy ( $P < 0.001$ ). No adverse reactions to therapy were observed.

#### CONCLUSION:

The present study shows that PEMF therapy improves pain, stiffness and physical function in elderly patients affected by knee osteoarthritis. PMID: 24106421

Low frequency pulsed electromagnetic field (PEMF) can provide noninvasive, safe and easy to apply method to treat pain, inflammation and dysfunctions associated with rheumatoid arthritis (RA) and osteoarthritis (OA) and PEMF has a long term record of safety. This review focusses on the therapeutic application of PEMF in the treatment of these forms of arthritis. The analysis of various studies (animal models of arthritis, cell culture systems and clinical trials) reporting the use of PEMF for arthritis cure has conclusively shown that PEMF not only alleviates the pain in the arthritis condition but it also affords chondroprotection, exerts antiinflammatory action and helps in bone remodeling and this could be developed as a viable alternative for arthritis therapy. PMID: 20329696

## **BACK PAIN**

Back pain and the whiplash syndrome are very common conditions involving tremendous costs and extensive medical effort. A quick and effective reduction of symptoms, especially pain, is required. Magnetic fields appear to have a considerable and statistically significant potential for reducing pain in cases of lumbar radiculopathy and the whiplash syndrome. - Neuro Rehabilitation PMID: 12016348

## **BACK PAIN - LOW BACK**

This randomized, double-blind, placebo-controlled clinical trial studied the effectiveness of pulsed electromagnetic therapy (PEMT) in patients with chronic lower back pain. PEMT produced significant pain reduction throughout the observation period compared with baseline values. The percentage change in the NRS score from baseline was significantly greater in the PEMT group than the placebo group at all three time-points measured. The mean revised Oswestry disability percentage after 4 weeks was significantly improved from the baseline value in the PEMT group, whereas there were no significant differences in the placebo group. In conclusion, PEMT reduced pain and disability and appears to be a potentially useful therapeutic tool for the conservative management of chronic lower back pain. - Journal of International Research PMID: 16749411

We evaluate the efficacy and safety of therapeutic electromagnetic fields (TEMF) on chronic low back pain. Secondary objectives included the investigation of the effects of TEMF on psychometric measures. Both groups improved over time. Although groups were similar during the treatment period, treated subjects (TEMF of 15 mT) improved significantly over

sham treatment during the 2-week follow-up period (20.5% reduction in pain); There were no reported serious adverse events. This study demonstrates that TEMF may be an effective and safe modality for the treatment of chronic low back pain disorders. - Pain Practice PMID: 17714104

### **BONE DENSITY**

To determine the effect of a 72 Hz pulsating electromagnetic field (PEMF) on bone density of the radii of osteoporosis-prone women, the nondominant forearms of 20 subjects were exposed to PEMF 10 h daily for a period of 12 weeks. The data suggest that properly applied PEMFs, if scaled for whole-body use, may have clinical application in the prevention and treatment of osteoporosis. - The Journal of Bone and Mineral Research PMID: 2195843

### **BONE FRACTURES**

A group of 83 adults with ununited fractures were examined for the effects of bone grafting and pulsed electromagnetic fields for this study. Results showed a successful healing rate of 87 percent in the original 38 patients treated with bone grafts and PEMF for ununited fractures with wide gaps, malalignment, and synovial pseudarthrosis. Of the 45 patients that were not successfully treated with PEMF and had bone grafting, when re-treated with pulsing electromagnetic fields, achieved a 93 percent success rate. (I hope you can comprehend this - there was no union, meaning the bone did not heal until they used pulsed magnetic field therapy) PMID: 6752151

### **BPH (ENLARGED PROSTATE)**

Ten patients with BPH, aging 68-78 years old (y.o), were treated for 2 weeks with a very short wave duration, pulsed electromagnetic field at radiofrequencies generated by an ion

magnetic inductor, for 30 min daily, 5 consecutive days per week. There was a significant improvement in clinical symptoms. Follow-up of the patients of this group for one year revealed that results obtained by EMFs treatment are still remaining. PMID: 21537858

PEMF was performed on 20 dogs affected by BPH. 3 weeks of PEMF produced a significant reduction in prostatic volume (average 57%) without any interference with semen quality, testosterone levels or libido. The efficacy of PEMF on BPH in dogs, with no side effects, suggests the suitability of this treatment in humans and supports the hypothesis that impairment of blood supply to the lower urinary tract may be a causative factor in the development of BPH. PMCID: 4145661

### **BRONCHITIS**

Results of this double-blind, placebo-controlled study indicated that both low-frequency electromagnetic field treatment and treatment with pulsed electromagnetic fields proved effective in patients suffering from chronic bronchitis when coupled with standard drug therapies. Magnetic field treatment consisted of a total of 15 15-20-minute daily exposures.

V.M. Iurlov, et al., "The Efficacy of the Use of Low-Frequency Electromagnetic Fields in Chronic Bronchitis," Voen Med Zh, 3, 1989, 35-36.

### **CANCER - BLADDER**

The study deals with immune status of patients operated for bladder cancer and exposed postoperatively to alternating magnetic field (MF). MF application was followed by higher T- and B-lymphocyte and CD4+, CD16+ cell levels as well as



enhanced T-cell activity; no postoperative complications were registered and tumor relapse rates were relatively low. The effect was likely to be due to antistressor influence of MF. The procedure may substitute drug therapy for immunocorrection and to avoid recurrence of bladder cancer. - Volpr Onkol PMID: 11544830

### **CANCER - BREAST TUMORS**

The study was concerned with effect of alternating magnetic field (AMF) on immunobiological characteristics of lymphocytes from patients with locally-advanced breast tumors. Patients received infusions of treated autoblood and changes in their immunological status were followed up. Stimulation of T-, B- and NK- cells was observed. Immuno-regulating effect was apparent when autoblood was treated with 50 H/25 mT1 and 100 H/50 mT1. - Volpr Onkol PMID: 15088521

### **CANCER - CELLS**

PEMF promotes the growth of undifferentiated cells but progressively suppresses the growth of more differentiated cells, i.e., PEMF controls cell growth depending on the degree of cell differentiation. This study also shows the potentiality of PEMF as an adjunctive treatment method for malignant tumors. - Bioelectromagnetics PMID: 10653622

No adverse side-effects were reported in an investigation of the antitumor effect of turbulent magnetic field (TMF) carried out as a component of preoperative chemoradiotherapy for breast cancer at the Center's Clinic. The study group included 114 patients with locally advanced tumors(T3, N1-N3, M0). According to the clinical, roentgenological and histological evidence on the end-results, the procedure was highly effective. Also, it was

followed by shorter and less extensive postoperative lymphorrhea. - Volpr Onko PMID: 14976921

## **CANCER**

Results of this study found that prolonged exposure to a 7-tesla uniform static magnetic field for a period of 64 hours inhibited growth of three human tumor cell lines in vitro.

R.R. Raylman, et al., "Exposure to Strong Static Magnetic Field Slows the Growth of Human Cancer Cells in Vitro," Bioelectromagnetics, 17(5), 1996, . 358-363.

∴  
This study examined the effects of a rotational magnetic field on a group of 51 breast cancer patients. Results showed a significant positive response in 27 of them.

N.G. Bakhmutskaa, et al., "The Assessment of the Efficacy of the Effect of a Rotational Magnetic Field on the Course of the Tumor Process in Patients with Generalized Breast Cancer," Sov Med, (7), 1991, . 25-27.

Results of this study indicated that pulsed magnetic field stimulation increased the incorporation of antitumor agents into cells, and thus increased antitumor activity shifting the cell cycle to a proliferative from a nonproliferative phase.

Y. Omote, "An Experimental Attempt to Potentiate Therapeutic Effects of Combined Use of Pulsing Magnetic Fields and Antitumor Agents," Nippon Geka Gakkai Zasshi, 89(8), August 1988, .. 1155-1166.

Results of this study found that 20-30 sessions of magnetotherapy administered preoperatively exhibited antitumor effects in patients suffering from lung cancer.

L.S. Ogorodnikova, et al., "Morphological Criteria of Lung Cancer Regression Under the Effect of Magnetotherapy," Vopr Onkol, 26(1), 1980, . 28-34.

This study examined the effects of microwave resonance therapy (MRT) in patients suffering from various forms of cancer. Results showed that MRT treatment prior to surgery reduced the spread of cancer-associated conditions and reduced the risk associated with surgery in 87 percent of patients. MRT applied postoperatively had beneficial effects in 68 percent.

D.V. Miasoedov, et al., "Experience with the Use of Microwave Resonance Therapy as a Modifying Factor in Oncological Therapy," Abstracts of the First All-Union Symposium with International Participation, May 10-13, 1989, Kiev, Ukraine, .. 313-315.

Results of this study proved that the combination of weak pulsed electromagnetic fields with antioxidant supplementation is beneficial in the treatment of patients suffering from tongue cancer, improving speech, pain control, and tolerance to chemotherapy.

U. Randoll & R.M. Pangan, "The Role of Complex Biophysical-Chemical Therapies for Cancer," Bioelectrochem Bioenerg, 27(3), 1992, 341-346.

Results of this controlled study indicated that treatment with a constant magnetic field significantly improved long-term (3-year) survival time in patients undergoing radiation therapy for cancer of the throat. Constant magnetic field therapy consisted of the application of 300 mT for 30 minutes to tumor and metastasizing regions immediately prior to each irradiation.

V.G. Andreev, et al., "Radiomodifying Effect of a Constant Magnetic Field in Radiation Therapy of Patients with Cancer of the Throat," Fizicheskaia Meditzina, 4(1-2), 1994,. 92.

Results of this Russian study indicated that the use of whole body eddy magnetic fields, coupled with more conventional cancer therapies (including magnetotherapy) is effective in the treatment of patients suffering from a variety of different malignancies. V. Smirnova, "Anti-Tumorigenic Action of an Eddy Magnetic Field," Vrach, 2, 1994, . 25-26

This article reports on the case of a 48-year-old-woman with breast cancer who was treated successfully with magnetotherapy. Infiltration showed a marked decrease following 30 whole body exposures to an eddy magnetic field for 60 minutes. One metastatic node disappeared while the size of others was reduced following 60 such exposures. A total regression of tumor and metastases was seen following the completion of a course of 110 exposures.

N.G. Bakhmutskii, et al., "A Case of Successful Treatment of a Patient with Breast Cancer Using a Rotating Electromagnetic Field," Soviet Medicine, 8, 1991, . 86-87.

This study examined the effects of whole body magnetic fields (16.5-35 G, 50- 165 Hz) on patients suffering from different forms of cancer. Treatment consisted of 15 cycles, each 1-20 minutes in duration, and was coupled with more traditional cancer therapies. Results showed that the magnetotherapy had overall beneficial effects, particularly with respect to improved immune status and postoperative recovery.

V.A. Lubennikov, et al., "First Experience in Using a Whole-Body Magnetic Field Exposure in Treating Cancer Patients," Vopr Onkol, 41(2), 1995, . 140-141.

## **CARPAL TUNNEL SYNDROME**

PEMF exposure in refractory carpal tunnel syndrome provides statistically significant short and long-term pain reduction and mild improvement in objective neuronal functions. Neuromodulation appears to influence nociceptive-C and large A-fiber functions, probably through ion/ligand binding. - Pain Medicine PMID: 18777606

### **CARTILAGE**

Severe joint inflammation following trauma, arthroscopic surgery or infection can damage articular cartilage, thus every effort should be made to protect cartilage from the catabolic effects of pro-inflammatory cytokines and stimulate cartilage anabolic activities. Previous pre-clinical studies have shown that pulsed electromagnetic fields (PEMFs) can protect articular cartilage from the catabolic effects

### **CHRONIC PAIN**

Specific pulsed electromagnetic fields (PEMFs) have been shown to induce analgesia (antinociception) in healthy human volunteers. These findings provide some initial support for the use of PEMF exposure in reducing pain in chronic pain populations and warrants continued investigation into the use of PEMF exposure for short-term pain relief. - Pain Research & Management PMID: 16770449

### **DENTAL PAIN**

Two hours of exposure to a weak, oscillating magnetic fields induced a significant decrease in three parameters (dental sensory and cutaneous pain and tolerance thresholds), whereas the other two parameters showed a similar tendency. When the same subjects were exposed to a sham treatment, only marginal, nonsignificant variations in all parameters were observed. These results represent the first piece of evidence that weak alterations

of the magnetic field may induce hyperalgesia in humans. -  
Bioelectromagnetics PMID:8554630

## **DEPRESSION**

This review article examined the literature concerning the use of transcranial magnetic stimulation in the treatment of depression. Results showed the high-frequency, repetitive transcranial magnetic stimulation treatment to be an effective, side-effect free therapy for depression that may hold promise for treating related psychiatric disorders as well. M.T. Kirkcaldie, et al., Transcranial Magnetic Stimulation as Therapy for Depression and Other Disorders.” Aust N Z J Psychiatry, 31(2), April 1997, . 264- 272.

Noting that there is good reason to believe the pineal gland is a magnetosensitive system and that application of magnetic fields in experimental animals has a similar effect to that of acute exposure to light with respect to melatonin secretion, the authors propose that magnetic treatment could be a beneficial new therapy for winter depression in humans.

R. Sandyk, et al., “Magnetic Felds and Seasonality of Affective Illness: Implications for Therapy,” International Journal of Neurosci, 58(3-4), June 1991, . 261-267.

This review article notes that transcranial magnetic stimulation has been shown to elicit antidepressant effects, electrically stimulating deep regions of the brain.

C. Haag, et al., “Transcranial Magnetic Stimulation. A Diagnostic Means from Neurology as Therapy in Psychiatry?” Nervenarzt, 68(3), March 1997, . 274-278.

In this theoretical paper, the author argues that deep, low-rate transcranial magnetic stimulation can produce therapeutic effects equivalent to those of electroconvulsive therapy but without the dangerous side effects.

T. Zyss, "Will Electroconvulsive Therapy Induce Seizures: Magnetic Brain Stimulation as Hypothesis of a New Psychiatric Therapy," Psychiatr Pol, 26(6), November-December 1992, . 531-541.

This study examined the effects of millimeter wave (MW) therapy as a supplemental treatment in patients suffering from various types of depression. MW therapy involved the use of a "Yav'-1? apparatus (5.6 mm wavelength, 53 GHz), and consisted of up to 60 minutes of exposure per day, 2 to 3 times per week, for a total of as many as 15 exposures. Results showed that combined MW/conventional treatment produced a complete recovery in over 50 percent of cases studied, a significant improvement in 41 percent, and some improvement in 8 percent. Recovery rates among controls (conventional treatment only) were 4, 48, and 41 percent, respectively.

G.V. Morozov, et al., "Treatment of Neurotic Depression with a Help of Extremely High Frequency Electromagnetic Radiation," Zh Nevropatol Psikhiatr Im S S Korsakova, 96(6),1996, . 28-31.

Results of this study led researchers to conclude that patients suffering from major depression experienced a significant reduction of depressive symptoms following treatment with transcranial magnetic stimulation coupled with standard medication relative to patients taking the medicine. This was true after just three TMS treatments.

Conca, et al., "Transcranial Magnetic Stimulation: A Novel Antidepressive Strategy?" Neuropsychobiology, 34(4), 1996, . 204-207.

## **DERMATITIS**

This study examined the effects of conventional treatments combined with millimeter wave (MW) therapy (54- to 70-GHz frequency, 8-15 daily exposures of 15-30 minutes each) on patients suffering from atopic dermatitis. Results indicated that the MW therapy was well-tolerated all patients, with the rash generally regressing after 7-8 exposures. Marked recovery was seen among 78 percent of patients receiving the combination treatments. Two-year follow-up showed a 23-percent relapse rate among combination patients, compared to 54 percent among controls.

V.P. Adaskevich, "Effectiveness of the Use of Millimeter-Range Electromagnetic Radiation in Complex Treatment of Atopic Dermatitis

Patients," Millimetrovie Volni v Biologii i Meditsine, (3), 1994, . 78-81

## **DIABETES**

In this study, 320 diabetics received impulsed magnetic field treatment while 100 diabetics (controls) received conservative therapy alone. Results showed beneficial effects with respect to vascular complications in 74 percent of the patients receiving magnetotherapy combined with conservative methods, compared to a 28-percent effectiveness rate among controls.

I.B. Kirillovm, et al., "Magnetotherapy in the Comprehensive Treatment of Vascular Complications of Diabetes Mellitus," Klin Med, 74(5), 1996, . 39-41.



This study involving 72 diabetics with purulent wounds found that

magnetic fields aided healing significantly.

R.A. Kuliev & R.F. Babaev, "A Magnetic Field in the Combined Treatment of Suppurative Wounds in Diabetes Mellitus," Vestn Khir I I I Grek, 148(1), January 1992, . 33-36.

### **DIABETIC NEUROPATHY/ANGIPATHY**

Significant improvement of symptoms, and of all registered parameters of peripheral circulation was established after the therapy. High-frequency pulsating electromagnetic field is recommended for the treatment of diabetic angiopathy. In patients with neuropathic changes it can be used as an introduction procedure. Srpski arhiv za celokupno lekarstvo PMID: 7725151

This study demonstrates that pulsed electromagnetic fields are able to accelerate wound healing under diabetic and normal conditions by up- regulation of FGF-2-mediated angiogenesis. They also prevented tissue necrosis in response to a standardized ischemic insult, suggesting that noninvasive angiogenic stimulation by pulsed electromagnetic fields may be useful to prevent ulcer formation, necrosis, and amputation in diabetic patients. - Plastic and Reconstructive Surgery PMID: 18176216

### **DUCHENNE-ERB DISEASE**

This study examined the effects of electromagnetic fields in the treatment of 5- year-old children suffering from Duchenne-Erb disease. Children were exposed to either UHF or DMW therapy for 8-12 minutes per day on alternating days over a period of approximately 10 days. Following the electromagnetic fields course, children received mud applications on the collar area

and injured extremity. Results showed that treatment decreased contractures in shoulder and elbow joints, increased mobility and muscle strength, and improved general function of the arm.

A.D. Burigina, et al., “Electromagnetic Waves in Complex Therapy of Children with Birth Trauma: Effects of Ultra-High-Frequency Electric Fields on Central Hemodynamics and the Shoulder Plexus,” Vopr Kurortol Fizioter Lech Fiz Kult, (4),1992, 35-38.

### **ENDOMETRIOSIS**

This study found that a combined treatment consisting of magnetic-infrared-laser therapy (10-15 min/day every other day over a period of 10-14 exposures, then repeated in 2-3 months) and conventional drug therapy proved highly effective in women suffering from endometriosis.

M. Damirov, et al., “Magnetic-Infrared-Laser Therapeutic Apparatus (MILTA) in Treatment of Patients with Endometriosis,” Vrach, 12, 1994, . 17-19.

### **ENDOMETRITIS**

Results of this study found that the administration of constant magnetic field in combination with other treatment modalities led to significant beneficial effects in patients suffering from acute

endometritis following abortion.

V.M. Strugatskii, et al., “A Permanent Magnetic Field in the Combined Treatment of Acute Endometritis After an Artificial Abortion,” Vopr Kurortol Fizioter Lech Fiz Kult, (6), November-December 1996, 21-24.

### **EPILEPSY**

This article reports on the cases of three patients with partial seizures who received treatment with external artificial magnetic

fields of low intensity. Such treatment led to a significant attenuation of seizure frequency over a 10-14- month period.

P.A. Anninos, et al., “Magnetic Stimulation in the Treatment of Partial Seizures,” International Journal of Neurosci, 60(3-4), October 1991, . 141-171.

Experimental results indicated that the administration of modulated electromagnetic fields of 2-30 Hz suppressed epilepsy in rats.

G.D. Antimonii & R.A. Salamov, “Action of a Modulated Electromagnetic Field on Experimentally Induced Epileptiform Brain Activity in Rats,” Biull Eksp Biol Med, 89(2),February 1980.

This review article cites one study in particular in which results showed that pretreatment with 30 minutes of exposure to a 75-mT pole strength, DC-powered magnetic field significantly prevented experimentally induced seizures in mice.

M.J. McLean, et al., “Therapeutic Efficacy of a Static Magnetic Device in Three Animal Seizure Models: Summary of Experience,” Second World Congress for Electricity and Magnetism in Biology and Medicine, 8-13 June 1997, Bologna, Italy.

This double-blind, placebo-controlled study examined the effects of 2- hour exposure to weak magnetic fields (0.2-0.7 G, irregularly oscillating 0.026-0.067 Hz) produced 3 pairs of orthogonal Helmholtz coils on pain perception in healthy subjects. Results showed that magnetic treatment significantly reduced the perception of pain.

F. Sartucci, et al., “Human Exposure to Oscillating Magnetic Fields Produces Changes in Pain Perception and Pain-Related Somatosensory Evoked Potentials,” Second World Congress for

Electricity and Magnetism in Biology and Medicine, 8-13 June 1997, Bologna, Italy.

This article reports on the case of a severe epileptic who experienced a significant lessening of behavior disturbances and seizure frequency following treatment with low-frequency, external artificial magnetic fields.

R. Sandyk & P.A. Anninos, "Magnetic Fields Alter the Circadian Periodicity of Seizures," International Journal of Neurosci, 63(3-4), April 1992, . 265-274.

### **ERECTILE DYSFUNCTION**

Combined treatment with local negative pressure and pulsating magnetic field conducted in 116 patients with erectile dysfunction aged 20-60 years produced optimal treatment results. Recovery and improvement of the erectile function were achieved in 85.7% patients given local vacuum magneto-therapy. - Vopr Kurortol Fizioter Lech Fiz Kult PMID: 17882824

An effect was studied of appliances for magneto-therapy on sexual function of 105 men presenting with sexual problems. A total of 96 sexological patients were examined according to a general program, to study placebo-effect. The magnetic field beneficial effect was recordable in 70-80% of the patients, that of placebo in 33% men. It is suggested that augmentation of sexual activity is associated with an increase in cavernous blood flow. - Lik Sprava PMID: 8819933

### **FIBROMYALGIA**

Exposure to a specific pulsed electromagnetic field (PEMF) has been shown to produce analgesic (antinociceptive) effects in

many organisms. In a randomized, double-blind, sham-controlled clinical trial, patients with either chronic generalized pain from fibromyalgia (FM) or chronic localized musculoskeletal or inflammatory pain were exposed to a PEMF (400 microT) through a portable device fitted to their head during twice-daily 40 min treatments over seven days. PEMF may be a novel, safe and effective therapeutic tool for use in at least certain subsets of patients with chronic, nonmalignant pain. -

Pain Research & Management PMID: 18080043

### **GASTRODUODENITIS**

Results of this study indicated that treatment with decimeter-band electromagnetic fields improved motor function of the stomach and reduced dyspepsia and pain in children suffering from chronic gastroduodenitis. Treatment made use of the “Romashka” apparatus (a cylinder applicator, 100 mm in diameter, power of 6-8 W) applied to the gastroduodenal region, and consisted of 6-12 minute exposures every other day for a total of 8-12 exposures.

L.M. Petrukhina, et al., “Effect of a Decimeter Wave Electromagnetic Fields on the Motor Function of the Stomach in Children with Strong Gastroduodenitis,” Vopr Kurortol Fizioter Lech Fiz Kult, (1),1987, . 54-56.

This controlled study examined the effects of sinusoidally modulated currents (100 Hz) coupled with conventional therapy in children suffering from chronic gastroduodenitis. Children received 8-10 exposures lasting between 6 and 10 minutes. Results showed that the treatment reduced inflammation in 72 percent of patients relative to just a 45-percent rate among controls. About 77 percent of treatment patients experienced elimination of gastro-esophageal and duodeno-gastral refluxes, compared to 29 percent of controls.

O.V. Bukanovich, et al., "Sinusoidally-Modulated Currents in the Therapy of Chronic Gastroduodenitis in Children," Vopr Kurortol Fizioter Lech Fiz Kult, 2, 1996, . 22-26.

General Results of this study indicated that the optimal frequency of pulsed magnetic fields ranges between 10.0 and 25.0 Hz in the treatment of chronic inflammatory conditions of the locomotor apparatus, ischemia of the blood vessels of the lower extremities, dyspeptic syndrome, lactation mastitis, and other diseases. Treatment proved best when the therapeutic cycle was repeated after a 2-3 month period.

L. Navratil, et al., "Possible Therapeutic Applications of Pulsed Magnetic Fields," Cas Lek Cesk, 132(19),October 11, 1993, . 590-594.

This article reviews the use of magnetotherapy in Czechoslovakia. Noting that this modality has been used for more than a decade, the author states that magnetotherapy has been shown to be effective in treating rheumatic diseases, sinusitis, enuresis, and ischemic disorders of the lower extremities. Positive findings have also been shown with respect to multiple sclerosis and degenerative diseases of the retina.

J. Jerabek, "Pulsed Magnetotherapy in Czechoslovakia-A Review," Rev Environ Health, 10(2), April-June 1994, . 127-134.

This review article notes that pulse-type electromagnetic fields (PEMF) are the most frequently used type of electromagnetic therapy. Another form is pulsed radio frequency; PRF therapy generally includes daily sessions of 30-minute exposure and is primarily used in cases of pain and edema, with results being apparent quickly when the therapy is effective. PEMF treatment

is most successful when used in bone healing, with results occurring over a longer period of time.

A.A. Pilla, "State of the Art in Electromagnetic Therapeutics: Soft Tissue Applications," Second World Congress for Electricity and Magnetism in Biology and Medicine, 8-13 June 1997, Bologna, Italy.

This study examined the effects of electromagnetic fields administered over a period of 10 days on 354 patients suffering from various orthopedic conditions. Results showed the effects to be positive, with the greatest benefit experienced among patients with acute lesions.

G. Annaratone, et al., "Magnetotherapy in Clinical and Ambulatory Practice," Minerva Med, 74(14-15), April 7, 1983, . 823-833.

## **GLAUCOMA**

In this study, patients with primary open-angle glaucoma with compensated intraocular pressure were administered magnetotherapy using an ATOS device with 33-mT magnetic field induction. The procedure was administered to a patient in a sitting posture with a magnetic inductor held before the eye. Sessions lasted 10 minutes and each course included 10 sessions. Following 4-5 months of therapy, results showed improved vision acuity 0.16 diopters, on an average of 29 out of 30 eyes with vision acuity below 1.0.

Bisvas, et al., "Possibilities of Magnetotherapy in Stabilization of Visual Function in Patients with Glaucoma," Vestn Oftalmol, 112(1), January-March 1996, p. 6-8.

## **HAIR LOSS**

This double-blind, placebo-controlled study examined the effects of pulsed electromagnetic fields on hair loss in men

suffering from male pattern baldness. PEMF exposures were administered to the head for 12 minutes and were given weekly or twice weekly over a period of 36 weeks. Results found the PEMF treatment both prevented hair loss and promoted regrowth without side effects.

W.S. Maddin, et al., “The Biological Effects of a Pulsed Electrostatic with Specific Reference to Hair: Electrotrichogenesis,” International Journal of Dermatology, 29(6), 1990, p. 446-450.

## **HEADACHE**

Results of this double-blind, placebo-controlled study demonstrated that the administration of a pulsed magnetic field for less than one hour to headache patients produced significant beneficial effects, as shown subjective patient reports, as well as EEG activity.

O. Grunner, et al., “Cerebral Use of a Pulsating Magnetic Field in Neuropsychiatry Patients with Long-term Headache,” EEG EMG Z Elektroenzephalogr Verwandte Geb, 16(4), December 1985, p. 227-230

This article reports on the case of an acute migraine patient who was successfully treated with external magnetic fields.

R. Sandyk, “The Influence of the Pineal Gland on Migraine and Cluster Headaches and Effects of Treatment with picoTesla Magnetic Fields,” International Journal of Neurosci, 67(1-4), November- December 1992, p. 145-171.

This article examined the effects of millimeter wave therapy in the treatment of 107 patients suffering from headaches of varying causes. Treatment consisted of the Nao-Hu, Bai-Huei, and Hua-Chai acupuncture points being exposed to 5.6- and 4.9-mm wavelengths via the use of “Yav’-1-5.6? or



“Elektronka-KVCh” devices, respectively. Exposure lasted up to 60 minutes per day over a course of 10 days. All patients experienced positive results following 3-5 exposures. After one year, 48 percent of patients remained free of headaches, with a significant decrease in another 41 percent.

B.M. Popov & T.A. Al'shanskaya, “Use of Traditional and Non-traditional Methods in the Treatment of Headache,” Millimeter Waves in Medicine and Biology. Digest of Papers of the 11th Russian Symposium with International Participation, April 21-24, 1997, Zvenigorod, Moscow Region, Russia, p. 68-71.

In this study, 90 headache patients were treated with pulsating electromagnetic fields via large coils to the body for 20 minutes per day for a total of 15 days. Results found the treatment to be either excellent or good for those patients suffering from migraine, tension, and/or cervical headaches. Patients experiencing post-traumatic or cluster headaches did not experience such benefits.

A. Prusinski, et al., “Pulsating Electromagnetic Field in the Therapy of Headache,” Journal of Bioelectr., 7(1), 1988, p. 127-128.

## **HEART DISEASE**

Results of this study found that the addition of magnetotherapy to the treatment of patients suffering from ischemic heart disease and osteochondrosis led to clinical improvements.

I.Rodin, et al., “Use of Low-Intensity Eddy Magnetic Field in the Treatment of Patients with Skin Lymphomas,” Voen Med Zh, 317(12), 1996, . 32-34.

## **HEART RATE VARIABILITY**

Exposure to PEMF for 20 minutes resulted in more rapid recovery of heart rate variability, especially in the very low frequency range after physical strain. The study also showed the moderating influence of the subjects' constitutional VLF power on their response to PEMF treatment. These findings have since been replicated in a clinical study and should be taken into consideration when PEMF treatment is chosen. - European Journal of Applied Physiology PMID: 17674028

### **HERNIATED DISK**

This double-blind, placebo-controlled study examined the effects of magnetotherapy in patients following herniated disk surgery. Results showed that 52 percent of patients receiving the treatment compared to 30 percent of controls reported being free of symptoms at the time of hospital release.

K. Perjes, et al., "Effect of Magnetotherapy on Recovery After Herniated Disk Surgery," Hungarian Symposium on Magnetotherapy, 2nd Symposium, May 16-17, 1987, Szekesfehervar, Hungary, p. 159-162

### **HIP PROBLEMS**

This double-blind study examined the effects of pulsed electromagnetic fields on loosened hip prostheses. Results showed an increase of bone density in all patients receiving PEMF treatment compared to only 60 percent of controls. The authors argue such findings suggest PEMF elicits early bone reconstruction, which enhances early weight bearing.

G. Gualtieri, et al., "The Effect Pulsed Electromagnetic Field Stimulation on Patients Treated of Hip Revisions with Trans-Femoral Approach," Second World Congress for Electricity and Magnetism in Biology and Medicine, 8-13 June 1997, Bologna, Italy.

## **JOINT DISEASE**

Results of this 11-year study involving 3014 patients found pulsed magnetic field treatment at low frequencies and intensities to be a

highly effective, side-effect free therapy for joint disease.

E. Riva Sanseverino, et al., “Therapeutic Effects of Pulsed Magnetic Fields on Joint Diseases,” Panminerva Med, 34(4), October- December 1992, p.187-196.

## **KIDNEY PROBLEMS**

This review article notes that placebo-controlled studies have shown positive results concerning the use of pulsed magnetic field therapy in the treatment of secondary chronic pyelonephritis.

V.A. Kiyatkin, “Pulsed Magnetic Field in Therapy of Patients with Secondary Chronic Pyelonephritis,” Second World Congress for Electricity and Magnetism in Biology and Medicine,8-13 June 1997,Bologna, Italy.

## **INFLAMMATION**

It is well known that electromagnetic fields (EMFs) can induce repair of non-healing bone fractures. It is generally believed that non- invasive, EMF therapy might have a broad, albeit currently unrecognized clinical potential. Since T cells are key modulators of inflammation, the development of EMF based therapeutic devices to regulate their activity can be expected to provide important tools to treat numerous human inflammatory diseases such as psoriasis and arthritis. - Biomedical Sciences

Instrumentation PMID: 10834201

## **KNEE PAIN**

Low-amplitude, extremely low frequency magnetic fields are safe and effective for treating patients with chronic knee pain due to osteoarthritis. Reduction in pain after a treatment session was significantly greater in the magnetic field-on group (46%) compared to the magnetic field-off group (8%). - Alternative Therapies in Health and Medicine PMID: 11565402

### **KNEE ARTHRITIS**

In patients with symptomatic osteoarthritis of the knee, PEMF treatment can reduce impairment in activities of daily life and improve knee function. - Wiener Klinische Wochenschrift PMID: 12602111

### **LUMBAR FUSION**

Sixty-one randomly selected patients who underwent lumbar fusion surgeries for discogenic low back pain between 1987 and 1994 were retrospectively studied. All patients had failed to respond to preoperative conservative treatments. Forty-two patients received adjunctive therapy with pulsed electromagnetic field (PEMF) stimulation, and 19 patients received no electrical stimulation of any kind. Average follow-up time was 15.6 months postoperatively. Fusion succeeded in 97.6% of the PEMF group and in 52.6% of the unstimulated group. The use of PEMF stimulation enhances bony bridging in lumbar spinal fusions. Successful fusion underlies a good clinical outcome in patients with discogenic low back pain. - Advances in Therapy PMID: 11010056

### **LUNG DISEASE**

This study examined the effects of low-frequency magnetic fields coupled with conventional therapies in rats suffering from inflammatory lung disease. Results showed that rats receiving the magnetic fields experienced significant reductions in lung

abscesses and associated symptoms, and similar beneficial effects were seen among a group of 165 human patients receiving comparable treatment.

L.V. Iashchenko, "Low-Frequency Magnetic Fields in the Combined Therapy of Inflammatory Lung Diseases," Probl Tuberk, 3, 1988, p.53-56.

### **LUPUS ERYTHEMATOSUS**

This review article examined the data concerning impulsed magnetic fields in the treatment of lupus erythematosus. Studies indicate that the treatment can be beneficial due to its anti-inflammatory and analgesic effects, its positive action on microcirculation, and immunological reactivity.

I.V. Khamaganova, et al., "The Use of a Pulsed Magnetic Field in the Treatment of Lupus Erythematosus," Ter Arkh, 67(10), 1995, p. 84-87.

### **MIGRAINE/HEADACHES**

In the active-treatment group, all assessed criteria were significantly improved at the end of the migraine/headache study. 76% of active-treatment patients experienced clear or very clear relief of their complaints. Only 1 placebo-patient (2.5%) felt some relief; 8% noted slight and 2% reported significant worsening of symptoms. No side effects were noted. - Advances in Therapy PMID: 11571822

Ten of the 22 subjects who had actual exposure received 2 additional weeks of actual exposure after their initial 1-month follow-up. All showed decreased headache activity (50% good, 38% excellent). Thirteen subjects from the actual exposure group elected not to receive additional exposure. Twelve of them showed decreased headache activity by the second month (29%

good, 43% excellent). Eight of the subjects in the placebo group elected to receive 2 weeks of actual exposure after the initial 1-month follow-up with 75% showing decreased headache activity (38% good, 38% excellent). In conclusion, exposure to pulsing electromagnetic fields for at least 3 weeks is an effective, short-term intervention for migraine, but not tension headaches. - Headache PMID: 11279973

### **MULTIPLE SCLEROSIS**

There is a growing literature on the biological and clinical effects of pulsed electromagnetic fields. Some studies suggest that electromagnetic therapies may be useful in the treatment of chronic illnesses. This study is a follow-up to a placebo controlled pilot study in which multiple sclerosis (MS) patients exposed to weak, extremely low frequency pulsed electromagnetic fields showed significant improvements on a composite symptom measure. Evidence from this randomized, double-blind, placebo controlled trial is consistent with results from smaller studies suggesting that exposure to pulsing, weak electromagnetic fields can alleviate symptoms of MS. - Alternative Therapies in Health and Medicine PMID: 12868251

Fatigue is the most common symptom of multiple sclerosis. 75%-90% of patients with multiple sclerosis report having fatigue, and 50%-60% describe it as the worst symptom of their disease. Fatigue is significantly associated with reduced quality of life and is also a major reason for unemployment, especially for patients with otherwise minor disability. There is evidence that pulsing electromagnetic fields may improve fatigue associated with multiple sclerosis. - Wien Med Wochenschr. PMID: 12658965

Recent clinical reports have suggested that treatment with extremely weak magnetic fields (MF) in the picoTesla range is an efficacious modality for the symptomatic therapy in patients with multiple sclerosis (MS) during the remission and exacerbation periods of the disease. The report attests to the unique efficacy of extremely weak MF in the symptomatic treatment of patients with MS including those patients with a chronic progressive course of the disease and supports the hypothesis that dysfunction of synaptic conductivity due to neurotransmitter deficiency specifically of serotonin rather than demyelination underlies the neurologic deficits of the disease. - International Journal of Neuroscience PMID: 8063544

### **MUSCLE INJURY**

This study examined the effects of pulsed electromagnetic fields on recovery following muscle injury in rats. Results showed that both pulsed and constant magnetic fields were equally effective, with the constant field being more intense.

I.E. Detlav, The Influence of Constant and Pulsed Electromagnetic Fields on Oxidation Processes in Muscle, in I.E. Detlav, (ed.),

Electromagnetic Therapy of Injuries and Diseases of the Support-Motor Apparatus. International Collection of Papers, Riga, Latvia: Riga Medical Institute, 1987, p. 12-16.

### **MYOFASCIAL PAIN**

The repetitive magnetic stimulation (rMS) group showed a significant improvement in VAS, NPDVAS, algometry, as well as in the characteristics of the therapy device after conclusion of treatment. Improvements in the ROM were also present in rotation and contralateral bending. This improvement persisted after 1 month. On the other hand, the placebo group did not show any significant improvement in the tests considered. The

results of this study show that peripheral repetitive magnetic stimulation (rMS) may have positive short- and medium-term therapeutic effects on myofascial pain. -

Clinical Neurophysiology PMID: 12559244

## **NERVE DAMAGE**

This controlled study found that exposure to pulsed electromagnetic fields enhanced the speed and degree of peripheral nerve regeneration twofold in rats with experimentally severed sciatic nerves.

H. Ito C.A. Bassett, Effect of Weak, Pulsing Electromagnetic Fields on Neural Regeneration in the Rat, Clin Orthop, (181), December 1983, p. 283-290.

Results of this study indicated that the use of pulsed electromagnetic fields on experimentally divided and sutured nerves in rats sped up regeneration of damaged nerves and the time it took for limb use to be recovered.

A.M. Raji, An Experimental Study of the Effects of Pulsed Electromagnetic Field (Diapulse) on Nerve Repair, Journal of Hand Surg, 9(2), June 1984, p. 105-112.

This study examined the effects of a Soviet Polyus-1 low-frequency magnet therapy device used to administer approximately 10 mT for approximately 10 minutes in patients with optic nerve atrophy. Patients underwent 10-15 sessions per course. Results showed that vision acuity in patients with low acuity values (below 0.04 diopters) improved in 50 percent of cases. It was also found that the treatment improved ocular blood flow in cases of optic nerve atrophy. Optimal benefits were experienced after 10 therapy sessions.



L.V. Zobina, Effectiveness of Magnetotherapy in Optic Nerve Atrophy. A Preliminary Study, Vestn Oftalmol, 106(5), September-October 1990, p. 54-57

## **NEUROLOGICAL DISORDERS**

This article summarizes clinical results obtained by the authors in using pulsed electromagnetic fields (Gyuling-Bordacs device) in the treatment of neurological and locomotor disorders among a group of 148 patients in a hospital setting over a period of 3 years. The authors claim that 58-80 percent of such patients experienced benefits of some kind over the course of magnetotherapy.

G. Terlaki, Clinical Experiences Magnetotherapy, Hungarian Symposium on Magnetotherapy, 2nd Symposium, 16-17 May 1987, Szekesfehervar, Hungary, p. 175-179.

This study examined the effects of magnetotherapy on patients suffering from nervous system diseases. Treatment consisted of 10-12 6-minute exposures (10- 20 kG, 0.1-0.6 Hz). Results indicated

beneficial effects in 25 of the 27 patients receiving the treatment.

A.A. Skorometz, Magnetic Impulse Therapy of Patients with Spondylogenic Diseases of the Nervous System, Fizicheskaia Meditzina, 3(1-2), 1993, p. 41-43.

Results of this study found that the use of magnetic fields (30-35 mT, 10 and 100 Hz) produced beneficial effects in 93 percent of patients suffering from nerve problems.

A.G. Shiman, Use of Combined Methods of magnetoelectrotherapy in the Treatment for Polineuropathies, Vopr Kurortol Fizioter Lech Fiz Kult, (5), 1993, p. 38-41.

## **NEURALGIA**

Pulsed radiofrequency treatment has been described as a minimal invasive alternative to radio-frequency thermocoagulation for the management of chronic pain syndromes. We present here our first five high-risk patients with idiopathic trigeminal neuralgia who were treated with pulsed radiofrequency after multidisciplinary assessment; with a mean follow-up of 19.2 months (range 10-26). These patients were at high risk due to age, co-morbidities or previous interventional and surgical treatments. An excellent long-term effect was achieved in three of the five patients, a partial effect in one patient and a short-term effect in one patient. No neurological side effects or complications were reported. - International Association for the Study of Pain PMID: 12927617

## **NEUROPATHY**

Ilioinguinal neuropathy is a rare but disabling condition. The condition may arise spontaneously or in the setting of pelvic surgery. To date, most therapeutic options have been limited to neuropathic pain medications, anti-inflammatory medications, nerve blocks with local anesthetics, or neurectomy. Long-term results of non-surgical interventions are fair at best. Pulsed radio frequency lesioning may be a good treatment for chronic ilioinguinal neuropathy in cases refractory to conservative management. - Journal of Hernias and Abdominal Wall Surgery PMID: 17273814

The largely unsatisfactory results reported for the pharmacological treatment of diabetic neuropathy has spurred the search for alternative therapies. Frequency-modulated

electromagnetic neural stimulation (FREMS) induced a significant reduction in daytime and night-time VAS pain score (all  $p < 0.02$ ). Furthermore, FREMS induced a significant increase in sensory tactile perception, as assessed by monofilament; a decrease in foot vibration perception threshold, as measured by a biothesiometer; and an increase in motor nerve conduction velocity (all  $p < 0.01$ ). No significant changes were observed after placebo. Comparison of measurements at the 4-month follow-up with those at baseline revealed that a significant benefit persisted for all measures that showed an improvement at the end of treatment, with an additional improvement in quality of life (Short Form-36 questionnaire) No significant side effects were recorded during the study. Frequency-modulated electromagnetic neural

stimulation (FREMS) is a safe and effective therapy for neuropathic pain in patients with diabetes and is able to modify some parameters of peripheral nerve function. - Diabetologia  
PMID: 15834546

Clinical and electroneuromyographic studies were performed in 121 patients with diabetic polyneuropathy (DPN) before and after courses of treatment with pulsed electromagnetic fields with complex modulation (PEMF-CM) at different frequencies (100 and 10 Hz). The earliest and most significant electroneuromyographic signs of DPN were found to be decreases in the amplitude of the H reflex and the Hmax/Mmax ratio in the muscles of the lower leg. Application of PEMF-CM facilitated regression of the main clinical symptoms of DPN, improved the conductive function of peripheral nerves, improved the state of Ia afferents, and improved the reflex excitability of functionally diverse motoneurons in the spinal cord. PEMF-CM at 10 Hz was found to have therapeutic efficacy,

especially in the initial stages of DPN and in patients with diabetes mellitus for up to 10 years. - Neuroscience and Behavioral Physiology PMID: 14635988

Neuropathic pain (NP) from peripheral neuropathy (PN) arises from ectopic firing of unmyelinated C-fibers with accumulation of sodium and calcium channels. Because pulsed electromagnetic fields (PEMF) safely induce extremely low frequency (ELF) quasirectangular currents that can depolarize, repolarize, and hyperpolarize neurons, it was hypothesized that directing this energy into the sole of one foot could potentially modulate neuropathic pain. These pilot data demonstrate that directing PEMF to refractory feet can provide unexpected short term analgesic effects in more than 50% of individuals. The role of placebo is not known and was not tested. The precise mechanism is unclear yet suggests that severe and advanced cases are more magnetically sensitive. Future studies are needed with randomized placebo-controlled design and longer treatment periods. - Neurorehabilitation and Neural Repair PMID: 15035963

## **OSTEOARTHRITIS**

An average improvement of 23-61% occurred in the clinical variables observed with active treatment, while 2 to 18% improvement was observed in these variables in placebo treated control patients. No toxicity was observed. The decreased pain and improved functional performance of treated patients suggests that this configuration of PEMF has potential as an effective method of improving symptoms in patients with OA. This method warrants further clinical investigation. - Journal of Rheumatology PMID: 8478852

## **OSTEOARTHRITIS - KNEE/CERVICAL SPINE**

We conducted a randomized, double blind clinical trial to determine the effectiveness of pulsed electromagnetic fields (PEMF) in the treatment of osteoarthritis (OA) of the knee and cervical spine. Matched pair t tests showed extremely significant changes from baseline for the treated patients in both knee and cervical spine studies at the end of treatment and the one month follow up observations, whereas the changes in the placebo patients showed lesser degrees of significance at the end of treatment. PEMF has therapeutic benefit in painful OA of the knee or cervical spine. -

Journal of Rheumatology PMID: 7837158

## **OSTEOCHONDROSIS**

This study examined the effects of alternating magnetic fields (50 Hz, 10-50 mT) combined with conservative therapy in patients suffering from spinal osteochondrosis. Treatment consisted of 20-minute exposures over a total of 20- 25 such exposures per course. Results showed clinical benefits in 95 percent of patients receiving the combination treatment compared to just 30 percent among controls.

L.L. Butenko, The Use of Alternating Magnetic Fields in Spinal Osteochondrosis, Mechanisms of Biological Action of Electromagnetic Fields, 27-31 October 1987, Pushchino, USSR, USSR Academy of Sciences, Research Center for Biological Studies, Inst. of Biological Physics, Coordination Council of Comecon Countries and Yugoslavia for Research in the Fields of Biological Physics, p. 183.

## **OSTEONECROSIS**

An average improvement of 23-61% occurred in the clinical variables observed with active treatment, while 2 to 18%

improvement was observed in these variables in placebo treated control patients. No toxicity was observed. The decreased pain and improved functional performance of treated patients suggests that this configuration of PEMF has potential as an effective method of improving symptoms in patients with OA. This method warrants further clinical investigation. - Journal of Rheumatology PMID: 8478852

## **OSTEOPOROSIS**

The objective was to understand the effects of low-frequency pulsed electromagnetic fields (PEMFs) on chronic bony pain, bone mineral density (BMD), bone strength and biochemical markers of bone metabolism in the patients of osteoporosis. Low-frequency PEMFs relieves the pain of primary osteoporosis quickly and efficiently, enhances bone formation and increases BMD of secondary osteoporosis. - Chinese Medical Journal PMID: 19080282

Results of this double-blind, placebo-controlled study indicated that exposure to pulsed electromagnetic fields had beneficial effects in the treatment of patients suffering from painful osteoarthritis of the knee or cervical spine. PEMF therapy consisted of 18 exposures lasting 30 minutes and administered 3-5 times per week.

D.H. Trock, The Effect of Pulsed Electromagnetic Fields in the Treatment of Osteoarthritis of the Knee and Cervical Spine. Report of Randomized, Double Blind, Placebo Controlled Trials,” Journal of Rheumatology, 21(10), 1994, p. 1903-1911.

## **PAIN**

PEMF exposure in refractory CTS provides statistically significant short- and longterm pain reduction and mild improvement in objective neuronal functions. Neuromodulation appears to

influence nociceptive-C and large A-fiber functions, probably through ion/ligand binding. - Pain Medicine PMID: 18777606

## **PANCREATITIS**

This study found that sinusoidal and continuous low-frequency alternating magnetic field generated a Polius-1 apparatus exhibited beneficial effects in patients suffering from chronic pancreatitis.

A.A. Fedorov, The Use of a Low-frequency Magnetic Field in the Combined Therapy of Chronic Pancreatitis, Vopr Kurortol Fizioter Lech Fiz Kult, (5), September-October 1990, p. 28-30.

## **PARKINSON'S DISEASE**

Since brief, extracerebral applications of pico-tesla (pT) range flux intensity electromagnetic fields (EMFs) of low frequency have been shown to produce rapid improvement in motor and cognitive symptoms in PD, it is expected that application these EMFs would lead also to an increase in the amplitude of visual evoked potential (VEP) response. The study demonstrates that in Parkinsonian patients extracerebral application of these EMFs rapidly increases in amplitude of the VEP response and, by inference, cerebral dopamine levels presumably by increasing dopamine release. - International Journal of Neuroscience PMID: 8707479

This article reports on the case of a 73-year-old male Parkinson's patients suffering from disabling resting and postural tremors in the right hand, as well as other symptoms. Two successive 20-minute treatments with AC pulsed electromagnetic fields of 7.5-picotesla intensity and 5-Hz frequency sinusoidal wave led to improvements in visuospatial performance and a legible

signature. Significant improvements in Parkinsonian motor symptoms were also seen following additional treatments.

R. Sandyk, Brief Communication: Electromagnetic Fields Improve Visuospatial Performance and Reverse Agraphia in a Parkinsonian Patient, International Journal of Neurosci, 87(3-4), November 1996, p. 209-217

This article reports on the case of a medicated 61-year-old Parkinson's patient who experienced rapid reversal of symptoms following a single external application of picotesla-range magnetic fields.

R. Sandyk R.P. Iacono, Reversal of Visual Neglect in Parkinson's Disease Treatment with picoTesla Range Magnetic Fields, International Journal of Neurosci, 73(1-2), November 1993, p. 93-107.

This article reports on four Parkinson's patients who experienced significant improvement in symptoms following treatment with picotesla-range magnetic fields. Two additional patients suffering from Parkinson's-related dementia experienced significant improvements in visuospatial impairment.

R. Sandyk, Magnetic Fields in the Therapy of Parkinsonism, International Journal of Neurosci, 66(3-4), October 1992, p. 209-235.

Noting that transcranial magnetic stimulation (TMS) is a new and noninvasive method of direct cortical neuron stimulation, this review article discusses recent studies showing that TMS has led to improvements in symptoms associated with Parkinson's disease and depression.



M.S. George, et al., "Transcranial Magnetic Stimulation: A Neuropsychiatric Tool for the 21st Century," Journal of Neuropsychiatry Clin Neurosci, 8(4), Fall 1996, p. 373-382.

This article reports on the cases of two Parkinson's patients who experienced improvements in motor symptoms following treatment with external application of weak electromagnetic fields in the picotesla range.

Parkinsonian Micrographia Reversed Treatment with Weak Electromagnetic Fields, International Journal of Neurosci, 81(1-2), March 1995, p. 83-93.

### **PELVIC PAIN**

Unusually effective and long-lasting relief of pelvic pain of gynecological origin has been obtained consistently by short exposures of affected areas to the application of a magnetic induction device producing short, sharp, magnetic-field pulses of minimal amplitude to initiate the electrochemical phenomenon of electroporation within a 25 cm<sup>2</sup> focal area. Treatments are short, fast-acting, and economical and in many instances have obviated surgery. - European Journal of Surgery PMID: 7531030

### **PERIPHERAL NEURITIS**

In this study, patients suffering from peripheral neuritis were exposed to high-frequency electromagnetic radiation on acupuncture points. EMR was generated Electronica-EnF, Aria, and Porog devices with tunable frequencies ranging between 53 and 78 GHz. Treatments were daily and lasted 25 minutes. Results showed full restoration of nerve function in 87 percent of patients.

O. Vassilenko and N.F. Vassilenko, Use of Extremely High Frequency Electromagnetic Radiation for Treating Peripheral

Neuritis, Second World Congress for Electricity and Magnetism in Biology and Medicine, 8-13 June 1997, Bologna, Italy.

### **PERIPHERAL NEUROPATHY**

The efficacy of different types of electrotherapy for painful diabetic peripheral neuropathy has been evaluated in 15 studies; the effects of transcutaneous electrical nerve stimulation are consistent. The beneficial effects of prolonged use have been reported in three large studies and one small study. The effects of frequency-modulated electromagnetic neural stimulation were assessed in one large study, and a significant reduction in pain was reported. Treatment with pulsed and static electromagnetic fields has been investigated in two small and three large studies, and analgesic benefits have been reported. PMID:20461329

### **PNEUMONIA**

Results of this study showed that magnetic laser therapy decreased the severity of acute respiratory insufficiency and treatment course, and prevented destructive complications in children with infiltrative acute destructive pneumonia between the ages of 1 and 12 years.

E.A. Gaidashev, An Evaluation of the Effect of Magnetic-laser Therapy on External Respiratory Function in Complicated Forms of Acute Pneumonia in Children, Vopr Kurortol Fizioter Lech Fiz Kult, (3), May-June 1995, p. 2-14.

### **POST-HERPETIC NEURALGIA**

This study found both pulsed magnetic field treatment (20-30 minutes per day) and whole body alternating current magnetic field treatment (30 minutes per day) to be effective therapies for post-herpetic neuralgia in older patients. Pulsed magnetic field treatment consisted of 0.6-T (6-kG) samarium/cobalt magnets

surrounded spiral coils generating a maximum 0.1-T pulse. Pads were pasted on the sensory

## **PROSTATE**

Therapeutic use of pulsed electromagnetic field therapy reduces prostate volume and lower urinary tract symptoms in benign prostatic hyperplasia.

Tenuta M, Tarsitano MG, Mazzotta P, Lucchini L, Sesti F, Fattorini G, Pozza C, Olivieri V, Naro F, Gianfrilli D, Lenzi A, Isidori AM, Pofi R. *Andrology*. 2020 Sep;8(5):1076-1085. doi: 10.1111/andr.12775. Epub 2020 Mar 16. PMID: 32090492

## **PSYCHIATRIC DISORDERS**

Noting the well-established dangers associated with electroconvulsive therapy, the author, in this theoretical article, argues that transcranial magnetic stimulation should be looked at as an alternative psychiatric treatment. The author asserts that TMS has several advantages over ECT in that it is painless, noninvasive, and more effective on deep structures of the brain.

T. Zyss, *Deep Magnetic Brain Stimulation - The End of Psychiatric Electroshock Therapy? Medical Hypotheses*, 43(2),1994, p. 69-74.

## **RESPIRATORY PROBLEMS**

Results of this study showed that the use of low-frequency magnetic fields helped to prevent and treat critically ill patients suffering from pyoinflammatory bronchopulmonary complications, and to prevent such complications as well.

G.A. Mozhaev Iiu Tikhonovskii, *The Prevention and Treatment of Suppurative-inflammatory Complications in the Bronchopulmonary System During Prolonged Artificial*

Ventilation, Anesteziol Reanimatol, (4), July-August 1002, p. 47-51.

### **ROTATOR CUFF TENDONITIS**

The value of pulsed electromagnetic fields (PEMF) for the treatment of persistent rotator cuff tendonitis was tested in a double-blind controlled study in 29 patients whose symptoms were refractory to steroid injection and other conventional conservative measures. At the end of the study 19 (65%) of the 29 patients were symptom-less and 5 others much improved. PEMF therapy may thus be useful in the treatment of severe and persistent rotator cuff and possibly other chronic tendon lesions. - The Lancet PMID: 6143039

### **SACRAL PAIN**

Magnetic stimulation of the sacral nerve roots is used for neurologic examination. However, no one has reported therapeutic efficacy of pain relief from pudendal neuralgia with sacral magnetic stimulation. Sacral magnetic stimulation immediately eliminated the pain. The pain relief lasted between 30 minutes and 56 days (median, 24 hours). Adverse effects were not observed. This pilot study indicates that magnetic stimulation of the sacral nerve roots may be a promising therapeutic modality for pain relief from pudendal neuralgia and sciatica. Further studies should be performed to determine the appropriate intensity and frequency, as well as the utility of a second course, of magnetic stimulation treatment. - Diseases of the Colon and Rectum PMID: 11852346

### **SEXUAL DISORDERS**

Results of this placebo-controlled study showed that magnetotherapy exhibited beneficial effects with respect to cavernous blood flow in male patients suffering from sexual problems.

I.I. Gorpinchenko, The Use of Magnetic Devices in Treating Sexual Disorders in Men, Lik Sprava, (3-4), March-April 1995, p. 95-97.

This study examined the effects of a combination pulsing magnetic field (PMF)/vacuum therapy in the treatment of impotence. Vacuum therapy consisted of the penis being placed into a hermetic cylinder with a negative pressure of 180-260 mmHg for 10-12 minutes per exposure for a total of 12-15 exposures. PMF therapy consisted of the same length and number of exposures, with 6 Hz, 30mT being applied to the penile area at the same time as vacuum therapy. Results showed that, following the combination therapy, sexual function was restored in about 71 percent of patients, was improved in 17 percent, and did not change in 17 percent. For those patients receiving vacuum therapy only, the numbers were 51, 24, and 24 percent, respectively.

I.V. Karpukhin V.A. Bogomol'nii, Local Vacuum-Magnetotherapy of Impotency Patients, Vopr Kurortol Lech Fiz Kult, (2), ` 1996, p. 38-40.

This double-blind, placebo-controlled study examined the effects of weak magnetic fields in men suffering from various sexual disorders, including decreased erection and premature ejaculation. The three different magnetic stimulators used included the BiopotenzorEros, Bioskan-1 devices. All patients wore one of the three devices for a 3- week period. Results showed full restoration of sexual function in 38 percent of patients in the Biopotenzor group, 31 percent in the Eros group,

36 percent in the Bioskan-1 group, and in just 15 percent of the controls. Improvements in sexual function were seen among 42 percent, 39 percent, 47 percent, and 18 percent, respectively.

I.I. Gorpichenko, "The Use of Magnetic Devices in Treating Sexual Disorders in Men," Lik Sprava, (3-4),1995, p. 95-97.

## **SLEEP DISORDERS**

Results of this double-blind, placebo-controlled study indicated that low-energy emission therapy significantly improved sleeping patterns among patients suffering from chronic psychophysiological insomnia. Therapy was administered 3 times per week, always in late afternoon and for 20 minutes, over a period of 4 weeks.

R. Hajdukovic, "Effects of Low Energy Emission Therapy (LEET) on Sleep Structure, First World Congress for Electricity and Magnetism in Biology and Medicine, 14-19 June 1992, Lake Buena Vista, FL, p. 92.

This double-blind, placebo-controlled study examined the effects of low-energy emission therapy (27 MHz amplitude-modulated electromagnetic fields) in patients suffering from insomnia. Treatment consisted of 3 exposures per week over a 4-week period. Results showed significant increases in total sleep time among patients in the treatment group relative to controls.

M. Erman, "Low-Energy Emission Therapy (LEET) Treatment for somnia," Bioelectromagnetics Society, 13th Annual Meeting, 23-27 June 1991, Salt Lake City, UT, p. 69.

## **SPINAL CORD INJURY**

The use of oscillating field stimulator treatment in patients with spinal cord injury is safe, reliable, and easy. Compared with the outcomes obtained in compliant National Acute Spinal Cord

Injury Study III plegic patients, the results of the present study indicate efficacy, and the FDA has given permission for enrollment of 10 additional patients. - Journal of Neurosurgery: Spine PMID: 15658119

Results of this study found that exposure to constant magnetic fields improved healing in rats with experimentally induced spinal cord injury, and in human patients suffering from spinal cord trauma as well.

E.V. Tkach, Characteristics of the Effect of a Constant Electromagnetic Field on Reparative Processes in Spinal Cord Injuries, Zh Nevropatol Psikhiatr, 89(5), 1989, p. 41-44.

This study examined the effects of functional magnetic stimulation used to treat spinal cord injury in seven male patients. Results showed the treatment to be an effective noninvasive approach.

M.K. Sheriff, Neuromodulation of Detrusor Hyper-reflexia Functional Magnetic Stimulation of the Sacral Roots, British Journal of Urology, 78(1), July 1996, p. 39-46.

## **STROKE**

New methods of rehabilitation should be introduced in order to reduce disability resulting from stroke. During the twelve months of follow-up, effect of low frequency magnetic field on the course of patient rehabilitation following ischemic stroke was evaluated on in-patient (acute and subacute period of the stroke) and outpatient (chronic period) basis. The results obtained indicate beneficial effects of groups of patients. - Przegląd Lekarski PMID: 17892036

There is evidence that electromagnetic stimulation may accelerate the healing of tissue damage following ischemia. We undertook this study to investigate the effects of low frequency

pulsed electromagnetic field (PEMF) exposure on cerebral injury. Exposure to pulsed electromagnetic field attenuated cortical ischemia edema on MRI at the most anterior coronal level by 65%. On histologic examination, PEMF exposure reduced ischemic neuronal damage in this same cortical area by 69% and by 43% in the striatum. Preliminary data suggest that exposure to a PEMF of short duration may have implications for the treatment of acute stroke. - Bioelectromagnetics PMID: 8074737

Results of this study pointed to the efficacy of magnetic field therapy in the treatment of patients suffering from a variety of conditions associated with different brain vascular diseases. N.Y. Gilinskaia, Magnetic Fields in Treatment of Vascular Diseases of the Brain, Magnitologiya, 1, 1991, p. 13-17.

### **TENDONITIS**

Results of this double-blind, placebo-controlled study indicated that pulsed electromagnetic field therapy exhibited significant beneficial effects in the treatment of patients suffering from persistent rotator cuff tendonitis. PMID: 6143039

### **TINNITUS (Ringing or buzzing in ears)**

At the end of one week of treatment, each patient noted whether their tinnitus had completely disappeared, was improved, unchanged or made worse by the treatment. 45% of the patients who completed the trial were improved by the active device, but only 9% by placebo). We suggest that electromagnetic stimulation may be an effective treatment in some tinnitus sufferers. - Clinical Otolaryngology and Allied Sciences PMID: 8877185



The experimental group showed a significant increase in mouth opening (mean = 34.95 to 41.70 mm,  $p = 0.002$ ), right lateral movement (mean = 7.85 to 10.80 mm,  $p = 0.001$ ) and left lateral movement (mean = 7.65 to 10.85 mm,  $p < 0.0001$ ). No significant ( $p > 0.1$ ) change in the control group occurred for mouth opening (mean = 38.50 to 39.65 mm), right lateral movement (mean = 8.60 to 8.75 mm) and left lateral movement (mean = 8.50 to 8.80 mm). No side effects were reported during the treatment and the two week follow-up. These results suggest strongly that PRFE is a safe and effective treatment for TMJ arthralgia as well as for increasing mandibular range of motion. - Cranio PMID: 14964334

### **ULCERS (GASTRIC AND DUODENAL)**

Results of this study showed that the administration of millimetric electromagnetic waves helped to normalize blood properties, subsequently improving the effectiveness of more conventional gastric and duodenal ulcer treatment.

M.V. Poslavskii, Treatment of Peptic Ulcer Electromagnetic Irradiation of the Millimetric Range, Sov Med, (1),1989, p. 29-31.

### **ULCERS (TROPIC)**

This study examined the use of magnetotherapy coupled with galvanization and intratissue electrophoresis in 86 patients suffering from trophic ulcers. A “Potok1? apparatus with a density of current equal to 0.05-0.1 mA/cm<sup>2</sup> was used to create an electrical field. The “MAG-30 apparatus for low-frequency magnetotherapy with induction of 30 mT and area of exposure of 20 cm<sup>2</sup> was applied to a trophic ulcer site at the same time. Results led the authors to conclude that magnetogalvanotherapy is the recommended treatment for trophic

ulcers of the lower extremities.

A.V. Alekseenko, Use of Magnetic Therapy Combined with Galvanization and Tissue Electrophoresis in the Treatment of Trophic Ulcers, Klin Khir, (7-8), 1993, p. 31-34.

### **VENOUS INSUFFICIENCY (CHRONIC)**

This study examined the effects of alternating magnetic fields (15-20 minutes per day over a period of 20 days) in patients suffering from chronic venous insufficiency, varicose veins, and trophic shin ulcers. Results showed good effects in 236 of the 271 patients receiving the treatment. Thirty-four patients reported satisfactory effects. Only one patient experienced no effects.

E.I. Pasyukov, et al., "Therapeutic Use of Alternating Magnetic Field in the Treatment of Patients with Chronic Diseases of the Veins of the Lower Limbs," Vopr Kurortol Fizioter Lech Fiz Kult, 5,1976, . 16-19

### **WOUNDS**

Treatment for wounds included two modalities: standard medication and alternating or pulsating magnetic field. Magnetic therapy proved highly effective: wound healing was 3-3.5 times faster while duration of treatment-2-3 times shorter than in standard procedure. Clinically- verified partial adhesion-related intestinal obstruction was eliminated by magnetic procedure in 18 children after combined treatment for lymphosarcoma involving the ileum. - Volpr Onkol PMID: 11147428

Pulsed radio frequency energy was used as an adjunct to basic wound care of 3 large, long-standing (6 years) stage III and IV pressure ulcers that were unresponsive to conventional therapy. The ulcer on the right foot healed within 4 weeks, the left heel ulcer reduced in size by 95% at 7 months, and the large sacral

ulcer healed to closure in 11 months. Conclusion: Pulsed radio frequency energy treatment with basic wound care, if administered early in the course of pressure ulcer therapy, might avoid the lengthy hospitalizations and repeated surgical procedures necessary for treatment of uncontrolled ulcers, reducing the overall cost of treatment and improving the quality of life for chronically ill or injured patients. - Journal of Plastic and Reconstructive Surgery PMID: 19008935

