Frequency Specific Microcurrent (FSM): Non Invasive Approaches for Tethered Cord Syndrome

Jessie Tierney, PT, DPT | Resonant Frequency Medicine

October 13, 2026

Jessica Tierney, PT, DPT

- Doctor of Physical Therapy
- Certified FSM Practitioner by Dr. McMakin
- FSM Clinician Researcher
- Functional Medicine Practitioner / Coach
- Barral Visceral Manipulation, IPA Functional Mobilization, Training in Cranial Osteopathy
- Certified Trauma-Sensitive HeartMath™
- Experienced, Registered Yoga Teacher

Website: https://www.ResonantRrequencyMed.com/



FDA Statement & Compliance

⇢ The FSM devices have 510K approval in the category of TENS devices for the treatment of pain ⇢ FSM does not make any claims about being able to diagnose, cure, mitigate, treat or prevent any condition or disease ⇢ The use of frequencies as a therapeutic tool has not been evaluated by the FDA

⇢ This talk is for educational purposes only -- please work with your healthcare provider directly; this is not medical advice, and I am not your medical provider.

TALK OBJECTIVES

1. What is Frequency Specific Microcurrent (FSM)?
2. Research / Studies & How does it work?
3. How FSM Relates to TCS & OTCS
4. Clinician / Practitioners Considerations
5. Patient / Client Considerations
6. Clinical Outcomes with Dr. Patricia Stott
7. Questions / Answers

What is Frequency Specific Microcurrent?

⇢ Bio-resonant technology targeting cell-level changes

⇢ FSM introduces a mild electrical current into an area of damaged tissue in order to promote ATP production and facilitate tissue healing / manage pain

⇢ Microamperage current is applied with specific frequencies on two channels which correlate with *target tissue* and *condition* / *instruction* in order to decrease pain

Frequency Specific Microcurrent (FSM)





Dr. Carolyn McMakin, foremost researcher & international educator on FSM

Meet Dr. Carolyn McMakin, most public researcher & educator on FSM.
See also: *www.liberatedbody.com/podcast/carolyn-mcmakin-lbp-030*

DR. McMAKIN SHARES HISTORY & MORE:





FSM
Dr McMakin's

FrequencySpecific.com

FSM IN THE CLINIC



- Non Invasive
- Non Pharmaceutical
- Classified as “TENS” Therapy by the FDA
- Providers must have a Medical License to Treat

Dr. Jessie with a client | www.ResonantFrequencyMed.com

FSM IN THE CLINIC



⇢ Sub-Sensory (you don't feel the electrical pulses)

⇢ Microamperage Current (1000 x weaker than TENS)

⇢ "Talking" the language of the cells ... in Hertz (Hz)

Dr. Jessie with a client | www.ResonantFrequencyMed.com

FSM IN THE CLINIC

Delivery of Specific Frequency Instructions via:

- Moist Towels
- Electrode Sticky Pads
- Probes + Ultrasound Gel
- Conductive Rubber Strips
- PEMF / Mag Converter
- Home Unit

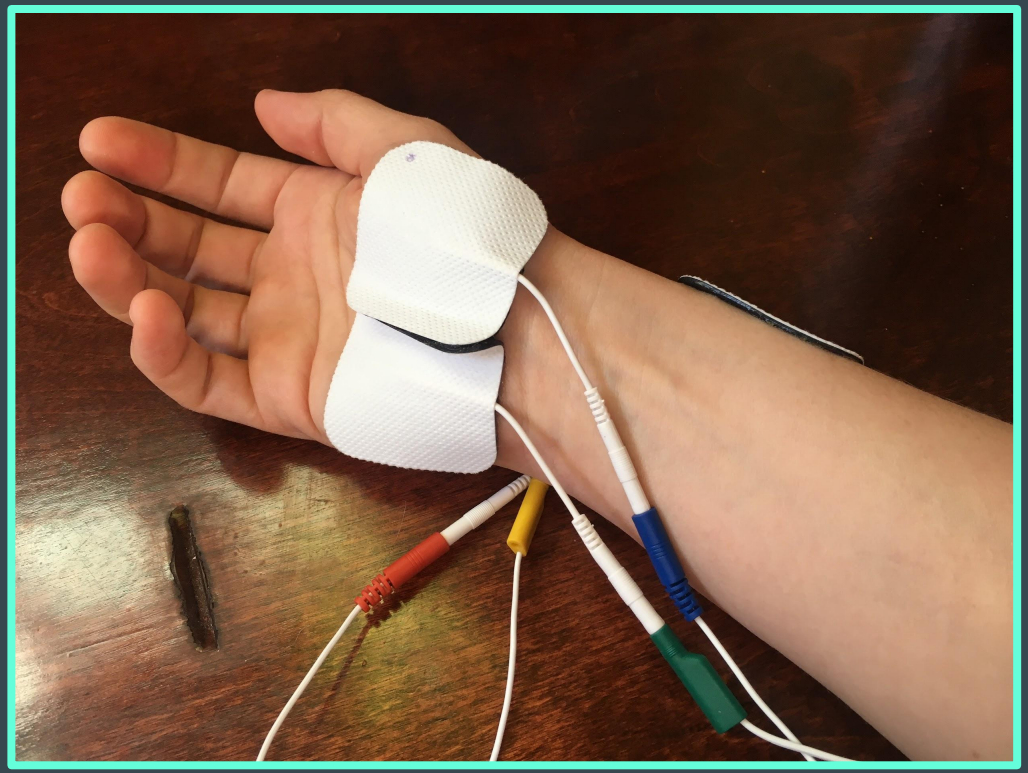


Moist Warm Towels Treatment during mobilization | www.ResonantFrequencyMed.com

FSM IN THE CLINIC

Delivery of Specific Frequency Instructions via:

- ⇢ Moist Towels
- ⇢ Electrode Sticky Pads
- ⇢ Probes + Ultrasound Gel
- ⇢ Conductive Rubber Strip
- ⇢ PEMF / Mag Converter
- ⇢ Home Unit



Electrode Sticky Pads Treatment of a Wrist | www.ResonantFrequencyMed.com

FSM IN THE CLINIC

Delivery of Specific Frequency Instructions via:

- ⇢ Moist Towels
- ⇢ Electrode Sticky Pads
- ⇢ Probes + Ultrasound Gel
- ⇢ Conductive Rubber Strip
- ⇢ PEMF / Mag Converter
- ⇢ Home Unit

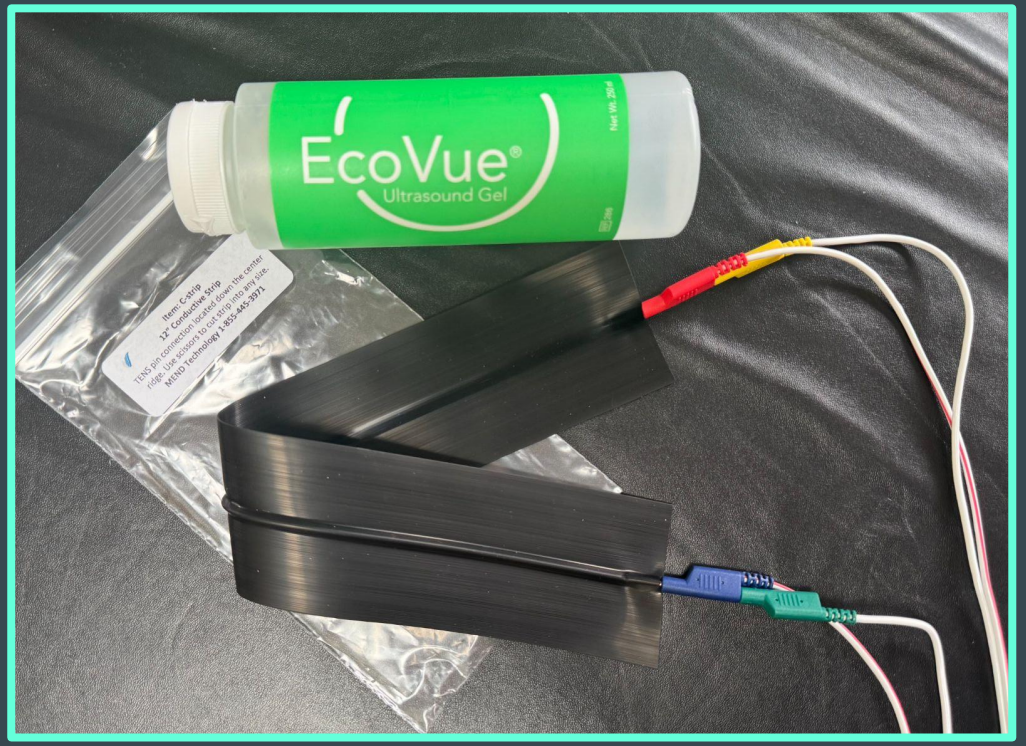


Eye Probes Treatment for Neuromotor Control | www.ResonantFrequencyMed.com

FSM IN THE CLINIC

Delivery of Specific Frequency Instructions via:

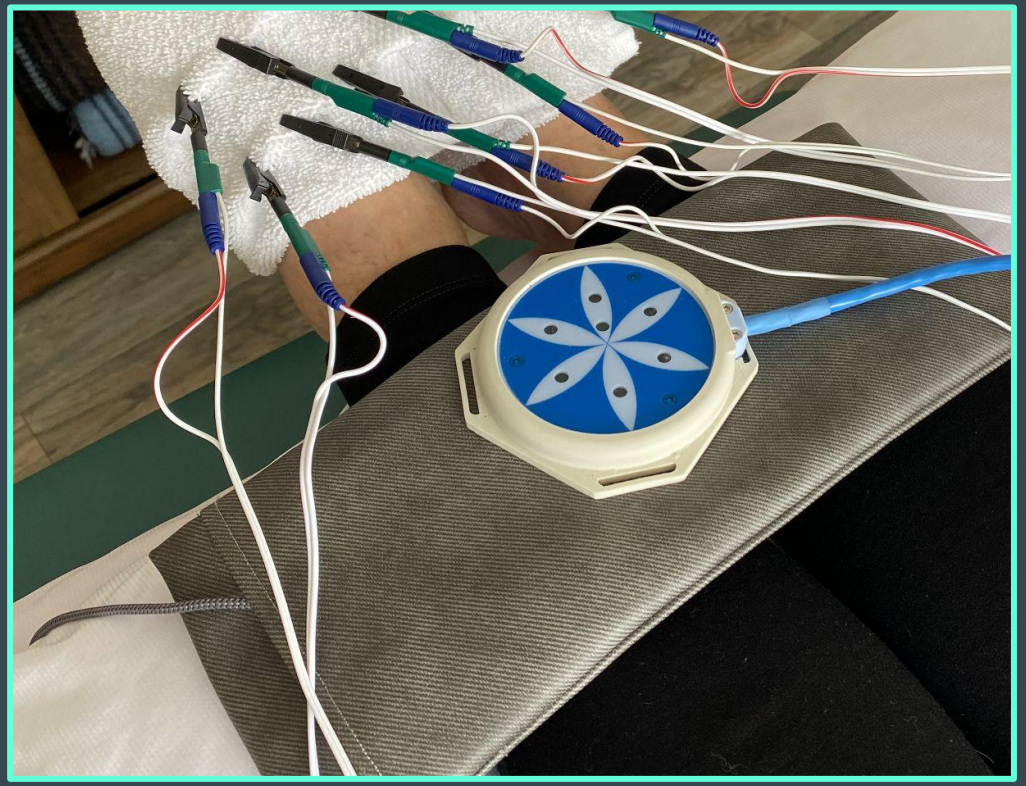
- ⇢ Moist Towels
- ⇢ Electrode Sticky Pads
- ⇢ Probes + Ultrasound Gel
- ⇢ Conductive Rubber Strips
- ⇢ PEMF / Mag Converter
- ⇢ Home Unit



FSM IN THE CLINIC

Delivery of Specific Frequency Instructions via:

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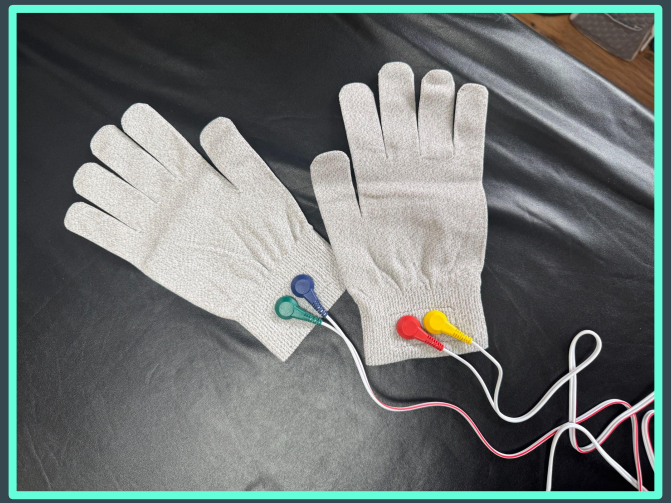


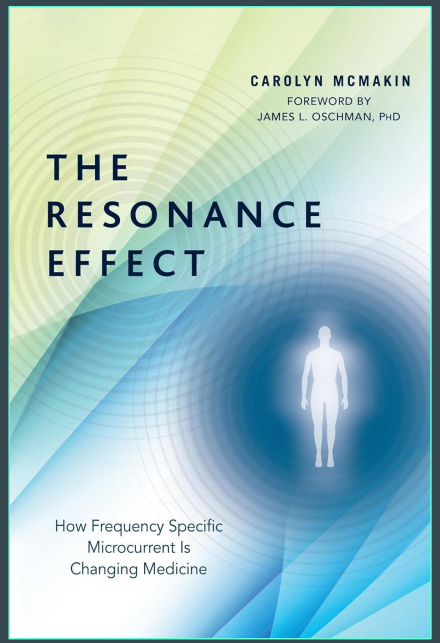
Pulsed Electromagnetic Field Magnetic Converter Treatment | www.ResonantFrequencyMed.com

FSM IN THE CLINIC

Delivery of Specific Frequency Instructions via:

→ Graphite Gloves (outdated)







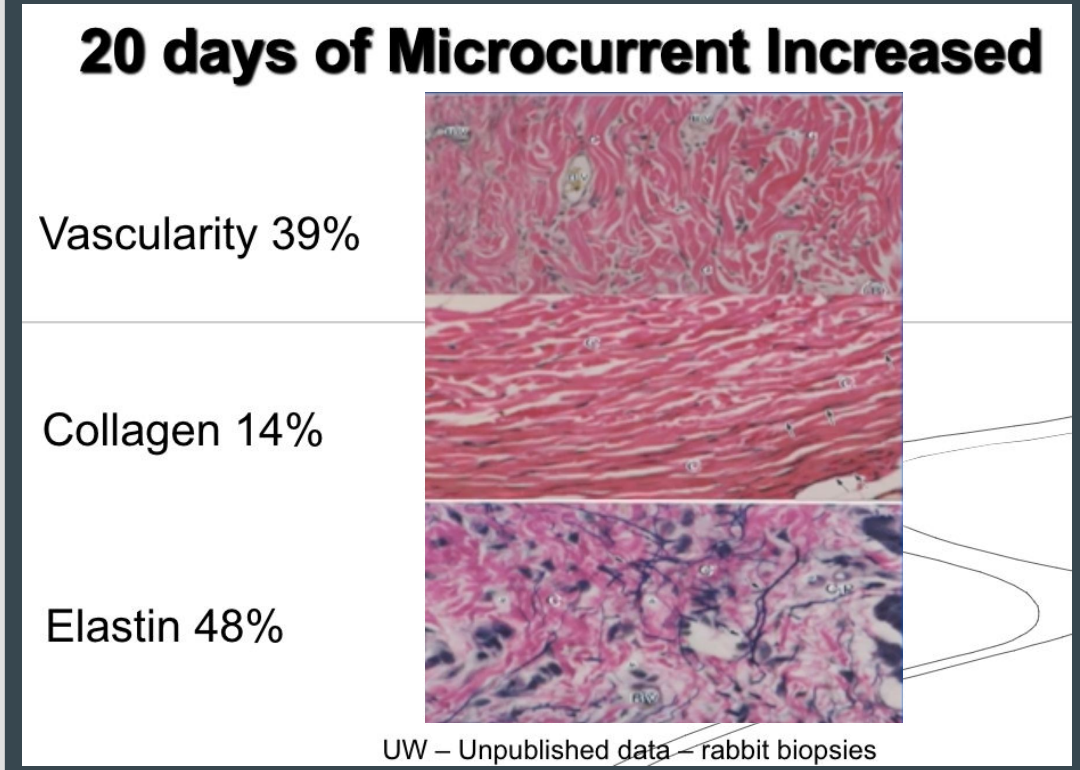
Graphite Gloves | www.ResonantFrequencyMed.com

Microcurrent Effects:

U. Wash Student thesis
(Frequency Specific Core Seminar Video 1):

Cheng et al , 1982

- ATP ⇧ up to 500%
- Protein synthesis ⇧ up to 70%
- AA transport ⇧ 40%
- Seegers, 2001 validated



↑ Simply microcurrent, not specific frequency

Microcurrent Effects on Adhesions:

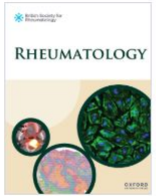
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Volume 64, Issue 10
October 2025

JOURNAL ARTICLE

Frequency-specific microcurrent improves hand function and Raynaud's symptoms in scleroderma: results of two pilot studies

Walter M Gregory, Katherine Bagley, Sookhoe Eng, Carolyn McMakin, Francesco Del Galdo

Rheumatology, Volume 64, Issue 10, October 2025, Pages 5504–5508,
https://doi.org/10.1093/rheumatology/keaf301
Published: 04 June 2025 **Article history**

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Article Contents
Abstract

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Walter M Gregory, Katherine Bagley, Sookhoe Eng, Carolyn McMakin, Francesco Del Galdo, Frequency-specific microcurrent improves hand function and Raynaud's symptoms in scleroderma: results of two pilot studies, Rheumatology, Volume 64, Issue 10, October 2025, Pages 5504–5508, https://doi.org/10.1093/rheumatology/keaf301 Accessed Online 2026/10/12: https://academic.oup.com/rheumatology/article/64/10/5504/8156779?login=false

Microcurrent Effects on Adhesions:

⇢ Population: 17 patients total in two pilot studies.

⇢ Intervention: Two-channel FSM at 100–200 μA, with combinations intended to address scarring and sclerosis in skin, connective tissue, and capillaries.

⇢ Findings: improved patient-reported hand function in a fibrotic disease. Does not establish that fibrosis was structurally reversed: (no control group; no blinding; outcome measures were subjective.

Walter M Gregory, Katherine Bagley, Sookhoe Eng, Carolyn McMakin, Francesco Del Galdo, Frequency-specific microcurrent improves hand function and Raynaud's symptoms in scleroderma: results of two pilot studies, Rheumatology, Volume 64, Issue 10, October 2025, Pages 5504–5508, https://doi.org/10.1093/rheumatology/keaf301 Accessed Online 2026/10/12: https://academic.oup.com/rheumatology/article/64/10/5504/8156779?login=false

Microcurrent Effects on Adhesions:

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Medical Group
Journal of
Novel Physiotherapy and Rehabilitation
The Open Access Journal



ISSN: 2573-6264
ICV: 83.27
Google Scholar Indexing

Frequency specific microcurrent resolves chronic pain and adhesions after ulnar transposition surgery

Check for updates



Jodie Adams
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Carolyn McMakin
Fibromyalgia and myofascial pain clinic of Portland, Portland

Adams J, McMakin C. Frequency specific microcurrent resolves chronic pain and adhesions after ulnar transposition surgery. J Nov Physiother Rehabil. 2017;1:99-103. doi:10.29328/journal.jnpr.1001012. Accessed Online 2026/10/12 https://www.rehabilityjournal.com/jnpr/article/view/jnpr-aid1012

Microcurrent Effects on Adhesions:

⇢ Patient with 10 years of post-operative pain & restrictive ROM despite 11 standard Physical Therapy sessions.

⇢ Intervention: FSM to address scarring and inflammation in the peripheral nerve

⇢ Outcome after 3 FSM Sessions: Complete resolution of pain and symptoms; remaining symptom-free at one year.

⇢ Findings: directly relevant clinical observation concerning presumed postsurgical neural adhesions; effects last a year (or more) after the intervention.

Walter M Gregory, Katherine Bagley, Sookhoe Eng, Carolyn McMakin, Francesco Del Galdo, Frequency-specific microcurrent improves hand function and Raynaud's symptoms in scleroderma: results of two pilot studies, Rheumatology, Volume 64, Issue 10, October 2025, Pages 5504–5508, https://doi.org/10.1093/rheumatology/keaf301 Accessed Online 2026/10/12: https://academic.oup.com/rheumatology/article/64/10/5504/8156779?login=false

Microcurrent Effects on Adhesions:



Thompson R, Kaplan SL. Frequency-Specific Microcurrent for Treatment of Longstanding Congenital Muscular Torticollis. Pediatr Phys Ther. 2019 Apr;31(2):E8-E15. doi: 10.1097/PEP.0000000000000576. PMID: 30664049. Accessed Online 2026/10/12: https://pubmed.ncbi.nlm.nih.gov/30664049/

Microcurrent Effects on Adhesions:

⇢ Patient: 19-month-old boy with severe congenital muscular torticollis with fibrotic nodules.

⇢ Intervention: Stretching, strengthening, massage, and parent education; FSM added during weeks 3–10

⇢ Outcome Week 8: passive cervical range of motion was full, strength & head tilt improved, fibrotic nodules no longer palpated.

⇢ Findings: Conservative care for an individual poor prognosis and likelihood of surgical referral resulted in improvements from integrative care involving FSM.

Thompson R, Kaplan SL. Frequency-Specific Microcurrent for Treatment of Longstanding Congenital Muscular Torticollis. Pediatr Phys Ther. 2019 Apr;31(2):E8-E15. doi: 10.1097/PEP.0000000000000576. PMID: 30664049. Accessed Online 2026/10/12: https://pubmed.ncbi.nlm.nih.gov/30664049/

Microcurrent Effects on Adhesions:

The Use of Micro Current and Autocatalytic Silver Plated Nylon Dressings in Human Burn Patients: A Feasibility Study

R. Huckfeldt, M.D., D. Mikkelson, R.N., K. Larson, M.D.
L. Hammond, O.T., B. Flick, M.D., C. McMakin, D.C.

February 21, 2003
Proceedings of John Bowswick Burn and Wound Symposium in Maui, HI

Background: The use of autocatalytic silver plated nylon dressings (Silverlon®) as an antimicrobial agent in wound management is well documented in both animal and human studies. Also, the use of micro current in the treatment of wound healing in association with Silverlon has been shown to enhance silver release, improve anti-microbial properties of the silver, and increase wound epithelialization and healing in animal models.

Huckfeldt R, Mikkelson D, Larson K, Hammond L, Flick B, McMakin C. The use of micro current and autocatalytic silver plated nylon dressings in human burn patients: a feasibility study. Presented at: John Boswick Burn and Wound Symposium; February 21, 2003; Maui, HI. Accessed Online 2026/10/12: https://frequencyspecific.com/wp-content/uploads/2019/02/Scar-Tissue-Reduction-in-Human-Burn-Patients.pdf

Microcurrent Effects on Adhesions:

⇢ Intervention: Silverlon silver-plated nylon dressings plus frequency-specific microcurrent for 60 minutes daily on three consecutive days. Measurable changes in range of motion, skin sensitivity, and scar discoloration, with varying persistence at one-week and one-month follow-up.

Huckfeldt R, Mikkelson D, Larson K, Hammond L, Flick B, McMakin C. The use of micro current and autocatalytic silver plated nylon dressings in human burn patients: a feasibility study. Presented at: John Boswick Burn and Wound Symposium; February 21, 2003; Maui, HI. Accessed Online 2026/10/12: https://frequencyspecific.com/wp-content/uploads/2019/02/Scar-Tissue-Reduction-in-Human-Burn-Patients.pdf

Microcurrent Effects on Adhesions:

THE JOURNAL OF ALTERNATIVE AND COMPLEMENTARY MEDICINE
Volume 19, Number 2, 2013, pp. 170–177
© Mary Ann Liebert, Inc.
DOI: 10.1089/acm.2012.0384

Paradigm

Visceral and Somatic Disorders: Tissue Softening with Frequency-Specific Microcurrent

Carolyn R. McMakin, MA, DC,[1] and James L. Oschman, PhD[2]

Abstract

Frequency-specific microcurrent (FSM) is an emerging technique for treating many health conditions. Pairs of frequencies of microampere-level electrical stimulation are applied to particular places on the skin of a patient

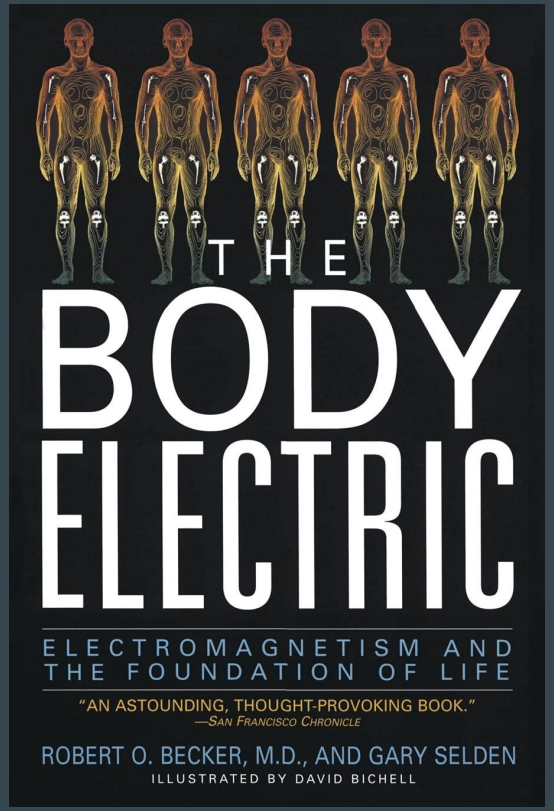
McMakin CR, Oschman JL. "Visceral and Somatic Disorders: Tissue Softening with Frequency-Specific Microcurrent." Journal of Alternative and Complementary Medicine. 2013;19(2):170–177. DOI: 10.1089/acm.2012.0384. Accessed Online 2026/10/12: https://pmc.ncbi.nlm.nih.gov/articles/PMC3576917/pdf/acm.2012.0384.pdf

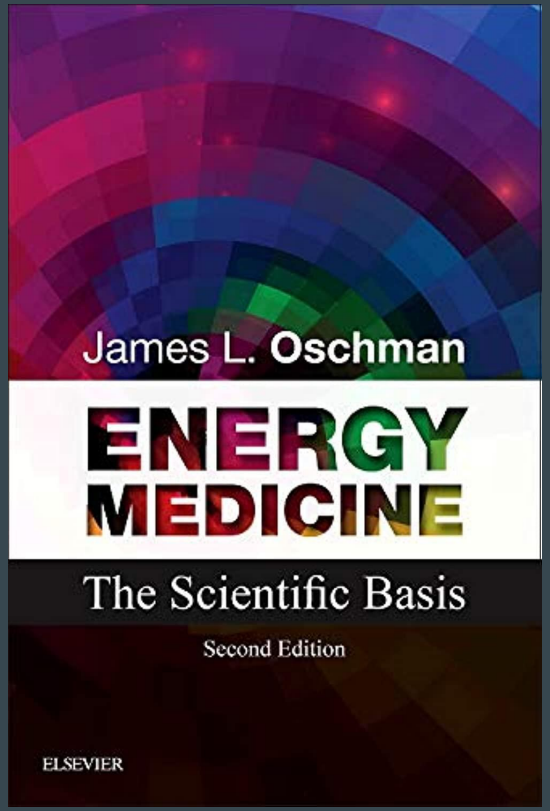
Microcurrent Effects on Adhesions:

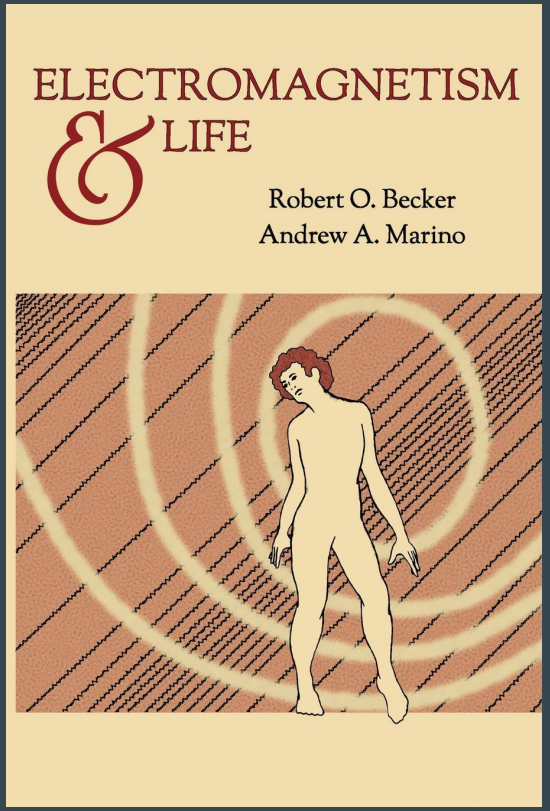
⇢ FSM applies paired, microampere-level direct current (DC) electrical pulses through the skin. Its proposed mechanism combines frequency-dependent interactions with electrical tissue processes & modulation of the neural systems that regulate pain, muscle tone, and autonomic activity. These effects may reduce excessive resting muscle tension and alter local circulation, potentially accounting for the rapid tissue softening and warming reported during treatment. Changes in fascial tension and cellular repair processes have also been proposed as contributors to longer-term improvement.

McMakin CR, Oschman JL. "Visceral and Somatic Disorders: Tissue Softening with Frequency-Specific Microcurrent." Journal of Alternative and Complementary Medicine. 2013;19(2):170–177. DOI: 10.1089/acm.2012.0384. Accessed Online 2026/10/12: https://pmc.ncbi.nlm.nih.gov/articles/PMC3576917/pdf/acm.2012.0384.pdf

Deeper Dives into Mechanisms







THE HOW: RESONANCE WITH FSM

Clinicians observe every day that it works ... but HOW?

What is RESONANCE in Life & FSM?





Image Credit: 2026 October Canva.com

What is RESONANCE in Life & FSM?



Image Credit: 2026 October Canva.com

What is RESONANCE in Life & FSM?



Image Credit: 2026 October Canva.com

What is RESONANCE in Life & FSM?



⇢ Every tissue, organ, and structure in the body has an *optimal resonant frequency* (Hz).

⇢ FSM can be thought of as *reminding* or *entraining* the tissues back to their optimal resonance.

Image Credit: 2026 October Canva.com

How does FSM Actually Work?

CLICK EACH FOR MORE INFO

WHAT'S THE BASIC SCIENCE BEHIND FSM?

This field is still emerging – here's what we know –



The RESONANT RECOGNITION MODEL

(RRM) : How Proteins Communicate via Frequencies - Explained for **FSM** Practitioners -

What does ENTRAIN-MENT have to do with FSM?

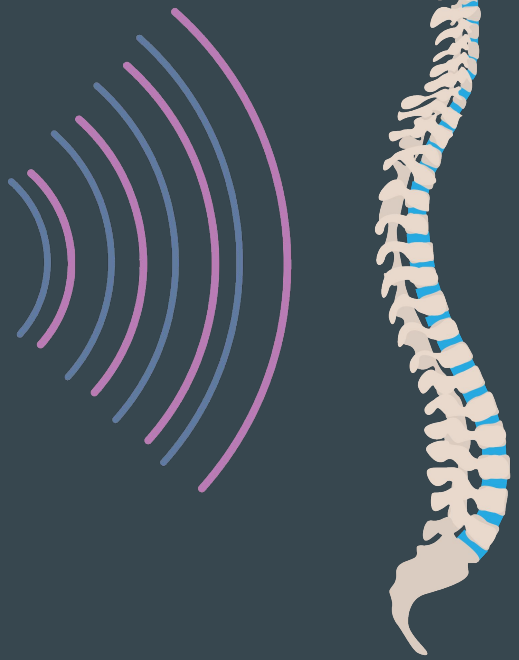
Could the Kuramoto Model explain what we see clinically?

How do Specific Frequencies Work?

CHANNEL A

"Quality" or "Instruction"

(what to do)



CHANNEL B

"Target Tissue"

(where to do it)

How do Specific Frequencies Work?

CHANNEL A Instruction Frequency (Hz)		CHANNEL B Target Tissue Frequency (HZ)
40/__ Reduce Inflammation, Pain*	*INFLAMMATION PRECAUTION**	__/396 Peripheral Nerve
13/__ Remove Scarring !	*SCARRING PRECAUTION !!!*	__/443 Dura Mater
51/__ Remove Fibrosis !	*SCARRING PRECAUTION !!!*	__/142 Fascia
3/__ Remove Sclerosis !	*SCARRING PRECAUTION !!!*	__/100 Ligament
58/__ Abnormal Cellular Stroma !	*SCARRING PRECAUTION !!!*	__/191 Tendon
19/__ Reduce Calcification, Hardening		__/77 Connective Tissue
20/__ Neutralize Pressure, Pain		__/780 Periosteum
284/__ Reduce Chronic Inflammation		__/62 Muscle Belly, Artery
49/__ Restore Vitality		__/79 Vein

Source: McMakin, Carolyn. Frequency-Specific Microcurrent in Pain Management. Churchill Livingstone Elsevier; 2010.

Examples : 13/443 will "remove scarring / in the dura mater"

40/396 will "reduce inflammation / in the nerve" (pain)

McMakin C. Frequency Specific Microcurrent in Pain Management. Churchill Livingstone Elsevier; 2010.

TREATING TETHERING WITH FSM

FSM has potential to be very effective supporting tethered cord symptoms when COMBINED with MOVEMENT and MANUAL THERAPY.

TREATING TETHERING WITH FSM

Treatment, Position & Movement:

- Breathwork, Pressure Systems
- Functional Mobilization, Visceral Manipulation
- Low trunk rotation in supine, Eye Movements
- Dural Mobs, Neural Mobs; Nerve Glides
- Release work in Supine, Seated, & Standing

In FSM Treatment of TCS / OTCS … the Important Questions: WHERE & WHY ?

⇢ What TISSUES or ORGANS are impacted, and

⇢ What is WRONG with those tissues? / What caused it?

⇢ The way FSM works always depends on the correct diagnosis, or the accurate ROOT CAUSE. Everyone is unique.

⇢ With tethering, we can look at SCAR TISSUE / ADHESIONS, and we also address the underlying INFLAMMATION & why.

CLINICIAN CONSIDERATIONS: Channel A "Instruction" Frequencies

⇢ **Frequency Channel A Instructions to Test for** :

Calcification, *Congestion*, *Pain |Pressure*, *Scarring*, *Fibrosis*, *Sclerosis*, *Abnormal Cellular Stroma* (caution; address embryologic origins?), *Heal Torn & Broken*

⇢ During functional movements, manual therapy, Frequency Response Test ('smoosh' palpation), change and adapt to effects in real time.

CLINICIAN CONSIDERATIONS: Channel B "Target Tissue" Frequencies

⇢ **Frequency Channel B Targets** :

Dura Mater, Pia Mater, Spinal Cord, Adipose, Myelin, Fascia, Periosteum, Collagen, Tendon, Connective Tissue (caution in EDS/HSD), *Ligament* (caution in EDS/HSD), *Capillary, Vein, Artery.*

⇢ Note that some listed frequencies are from Advanced Trainings - required!

CLINICIAN CONSIDERATIONS — Other Considerations — NERVOUS SYSTEM

⇢ **FSM frequencies & protocols** to down- or up-regulate: *Dorsal Vagus Nerve, Ventral Vagus Nerve, Enteric Plexus, Solar Plexus; PTSD, trauma, Calm amygdala, Calm Sensory, Calm Midbrain*, etc. We can be **very** specific.

⇢ These frequencies / protocols should be customized, monitored for treatment effect especially the first time run.

CLINICIAN CONSIDERATIONS — Other Considerations — PAIN RELIEF

⇢ **FSM frequencies & protocols** to mobilize vagal adhesions, neural / dural adhesions, reduce pain, reduce pressure. Support for centrally-mediated pain & local pain.

⇢ Protocols for ligament and connective tissue stability give pain relief and provide structural nervous system regulation.

⇢ Exploring root causes of chronic inflammation: toxins, exposures, virus, infection, stress, emotions, etc.

CLINICIAN CONSIDERATIONS — Other Considerations — PRE & POST OP

⇢ **FSM** with protocols overnight before surgery, morning of surgery, immediately after surgery can offer significant improvements in surgical outcomes (home unit customization).

⇢ Frequency Instructions (Channel A) to:
Stop Leaking, Stop Hemorrhage, Reduce Inflammation, Reduce Histamine, Reduce Edema, Repair Torn & Broken, etc — standard pre & post op with correct Channel B Targets

TREATING HOLISTICALLY WITH FSM

The Good News:
There are frequencies that can address nearly all TCS / OTCS sequelae.

Frequency Specific Microcurrent Treatment





Eye Probes Practitioner Training: https://courses.frequenciesthatmend.com/collections

Dr. Jessie with clients using FSM, PEMF and eye probes | www.ResonantFrequencyMed.com

CLIENTS / PATIENTS: GET SUPPORTED

How to Find an FSM Practitioner?

CLIENTS / PATIENTS: GET SUPPORTED

- Find an FSM Practitioner Near You:
  - FrequencySpecific.com/frequency-specific-microcurrent-practitioners-2/
  - FrequenciesThatMend.com/business-directory/

+Tips to Find a Practitioner

PRACTITIONERS: GET TRAINED

- Start with the CORE SEMINAR
  - FrequencySpecific.com/product-category/core/ (in person or online)
- Attend the ADVANCED SYMPOSIUM
  - Every Feb/March in Phoenix

    FrequencySpecific.com (in person or online)

BEST PLACE to FIND DR. JESSIE



- ResonantFrequencyMed.com is the best starting place.
  - You can book a free 15-minute phone call with Dr. Jessie to get your questions answered (For both patients & practitioners)
  - Join the email list (scroll to bottom of site)
- Learn more & Follow on Socials -- @ResonantFrequencyMed
  - Instagram - @ResonantFrequencyMed/
  - YouTube - YouTube.com/@ResonantFrequencyMedicine
  - FB - https://www.facebook.com/ResonantEquus/

Thank you

Dr. Patty is next, then Q&A

Q: What is the difference between FSM and Laser?

Microcurrent produces electrons and increases ATP production in cells. Laser produces photons and oscillate at set frequencies, but usually only provide one frequency at a time instead of the dual frequencies used in FSM treatment.

—www.FrequencySpecific.com

Q: What is the difference between FSM and Ultrasound?

Ultrasound produces ultrasonic vibrations and creates heat by vibrating the water molecules in the tissue. It does not provide current nor does it change ATP status.

—www.FrequencySpecific.com

Q: What is the difference between FSM and TENS?

Microcurrent is approved in the category of TENS devices by the FDA. TENS delivers milliamp current to block nociceptive messages that travel up the spine to the brain. Microcurrent delivers subsensory current, 1000 times less than milliamperage current. TENS decreases ATP production while FSM increases ATP production.

—www.FrequencySpecific.com.

FDA TENS Warnings:

⇢ The safety of TENS devices in pregnancy has not been established

⇢ TENS is not effective for pain of central origin

⇢ TENS devices have no curative value

⇢ TENS provides symptomatic treatment and as such suppresses sensation of pain which may be protective

FSM Warnings / Contraindications

- Never run current through a Pregnant Uterus
- Never run microcurrent over the eyes
- Never run microcurrent over the ears
- Never place electrodes over the carotid sinus

Source: MendTechnology.com

FSM Contraindications & Precautions

- ⊘ Demand-type pacemaker
- ⊘ Injury less than 6 weeks old (cannot use *remove scarring*; *repair tissue* tx is safe)
- ⊘ Recent Organ Transplant
- ⊘ Fibromyalgia due to cervical trauma (some tx can aggravate – must use correct protocol / experienced provider)
- ⊘ Spinal cord compression or stenosis (may temp ↑pn if wrong protocol)
- ⊘ Infection (avoid 40 Hz)
- ⊘ Insulin pump (must be *unplugged* from insulin reservoir)

It is Safe to use FSM

The current is *physiologic* ⇒ if implant / metal, etc is okay to be in the body current, it is okay to be in microcurrent.

- ✓ Pins
- ✓ Plates
- ✓ Artificial joints
- ✓ Stents