Specific mechanical oscillation frequency relieved pain better than electrical stimulation (TENS).

Why Mechanical Stimulation > Electrical Gate Control Pain Relief

Mechanoreceptors fire at different mechanical frequency thresholds. Pacinian (180-250Hz)1 block pain most.2

In the brain, annoying signals (cold) inhibit pain.

In the spine, mechanical signals override pain signals’ transmission to the brain.7

TENS uses electricity (2.5Hz & 80–150Hz) to twitch skin to make motion to fire nerves.3

50% of patients tolerate the electricity amplitude needed to fire deep Pacinian.4

100% of patients tolerate mechanical amplitude to fire Pacinian mechanoreceptors.5

Mechanical waves stretch (firing Ruffini) + decay to trigger slower (Meissner) Hz.6

References
Why Mechanical Stimulation > Electrical Gate Control Pain Relief

Mechanoreceptors fire at different mechanical frequency thresholds. Pacinian (180-250Hz) block pain most.\(^1\)

In the brain, annoying signals (cold) inhibit pain.\(^2\)

TENS uses electricity (2-5Hz & 80-150Hz) to twitch skin to make motion to fire nerves.\(^3\)

50% of patients tolerate the electricity amplitude needed to fire deep Pacinian.\(^4\)

100% of patients tolerate mechanical amplitude to fire Pacinian mechanoreceptors.\(^5\)

Mechanical waves stretch (firing Ruffini) + decay to trigger slower (Meissner) Hz.\(^6\)

In the spine, mechanical signals override pain signals’ transmission to the brain.\(^7\)

In the brain, self-efficacy and distraction reinterpret pain.
**Pain Reduction by Modality**

VibraCool - - - -
TENS _________

- OA VC
- OA TENS
- Overuse VC
- Overuse TENS
- Injury VC
- Injury TENS
- Spine VC
- Spine TENS

+ VIBRACOOL

- TENS

VibraCool relieved pain 2.2/10 more than TENS units on average (heavy black lines).

-2.2 +/- 1.34 (95%CI-2.85 to -1.55, P<.0001)

Individual pain etiology lines shown in colors. (Ice was not used with VibraCool; mechanical only.)

OA – n= 6 av. age 71.2
Overuse n= 5 age 45.6
Injury n=5 age 58.6
Spine n=4 age 53.7

The TENS unit used 150Hz frequency with a pulse width of 200ms, asymmetrical biphasic square pulse waveform, and amplitude as high as comfortable on a 0-80mA using a 500 ohm load per channel.

VibraCool® has an MSRP of $90, compression strap, reusable ice pack, and is powered by 2 AAA batteries which can be replaced.

For this Crossover Trial, VibraCool was used without the ice component.

VibraCool FDA 510(k) K130631
"Temporary relief of minor injuries...also intended to treat myofascial pain caused by trigger points, restricted motion and muscle tension"  www.PainCareLabs.com