



Novel Ultrasound Therapy *Surface Acoustic Wave*

- Hands-free, patch based therapeutic wearable ultrasound
- May be applied over bone and orthopedic hard wear
- No messy gel required
- Treatment time 6.5 hours and prn
- Easy to use anywhere & anytime – can be worn during sleep
- Opioid free pain management and soft tissue healing
- Proven, safe and effective therapy

Healing Implications of SAW US Therapy (SAWT)

One minimally-invasive technology that has the potential to both achieve high spatial accuracy and yield wide therapeutic dispersion through tissue for revascularization is therapeutic ultrasound (US):*

- an US waveform is transmitted into a region of interest when specific piezoelectric elements positioned on the face of a transducer are activated by an appropriate electrical signal. The generated acoustic energy propagates through the tissue, encountering regions of varying acoustic (i.e., mechanical) impedance. These mechanical heterogeneities modify the ultrasound beam through attenuation and diffraction as well as reflection and scattering.

*<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6627741/>

Healing Implications of SAWT cont.

A primary benefit of SAWT is neovascularization:

- neovascularization is a complex multistep process including the creation of pro-angiogenic factors in the injured tissue which stimulate the local existing blood vessels, the release of proteases, such as matrix metalloproteinases (MMPs), from activated endothelial cells with subsequent degradation of the basement membrane surrounding the blood vessel, formation of tip cells and sprouting, migration of endothelial cells into the interstitial space, proliferation of endothelial cells, and remodeling into new blood vessels.*

*<https://www.sciencedirect.com/topics/pharmacology-toxicology-and-pharmaceutical-science/neovascularization-pathology>



Ultrasound Effects

- Increases local blood circulation
- Increases vascular wall permeability
- Promotes protein secretion
- Alters cell membrane activity
- Promotes enzymatic reactions
- Accelerates Nitric Oxide production
- Angiogenesis
- Fibroblast proliferation