Therapeutic Ultrasound Therapy

Indications and Contraindications

Indications	Contraindications

• Those who have been deemed a candidate for adjunctive therapies, see "Determining Candidacy for Adjunctive Therapies"
• Wound types:
  ○ Venous leg ulcers (1)
  ○ Pressure injuries (2)
  ○ Vascular ulcers
  ○ Neuropathic ulcers
  ○ Burns
  ○ Surgical wounds
• During the inflammatory phase to stimulate the release of growth factors and accelerate the phase itself[1]
• During the proliferative phase to stimulate fibroblast migration and proliferation and to accelerate wound contraction[1-2]
• During the epithelialization phase to stimulate the release of growth factors and to increase the vascularity of the tissue[1]
• During the maturation phase (if treatment commenced in the inflammatory phase) to improve scar collagen density and organization[1, 3-4]
• To disperse the hemorrhagic material associated with bruising[5]
• To reduce bacterial burden[6-7]
• To enhance transdermal drug delivery[8]
• Debridement
	• Over the uterus during pregnancy
	• Over the gonads
	• Over malignancies and precancerous lesions
	• On patients with vascular abnormalities, i.e. deep vein thrombosis, emboli, severe atherosclerosis
	• Over the eye
	• Over the stellate ganglion
	• For hemophiliacs not covered by factor replacement
	• Over the spinal cord after laminectomy
	• Directly over metal implants
	• Over an electronic device
	• Over tissues previously treated with deep X-ray or radiation
	• Tuberculosis (local)
	• Over damaged or at risk skin, i.e. skin rash, eczema
	• Over anesthetic areas
	• Over excitable tissue, i.e. heart, exposed nerve, carotid sinus

Precautions	
• Over subcutaneous bony prominences • Over epiphyseal plates and immature bone • Over the cranium • Over plastic or cement implants • Always use the lowest intensity which produces a therapeutic effect • Ensure the applicator is moved throughout the treatment (speed and direction are not issues) • Caution in the vicinity of a cardiac pacemaker or other implanted electronic device • In those with impaired cognition or communication	

Level of Evidence	Definition
1A	Evidence obtained from meta-analysis or systematic review of RCTs
1B	Evidence obtained from at least one RCT
2A	Evidence obtained from at least one well-designed controlled study without randomization
2B	Evidence obtained from at least one other type of well-designed quasi-experimental study without randomization
3	Evidence obtained from well-designed non-experimental descriptive study, such as a comparative study, correlation study, and/or case study
4	Evidence obtained from expert committee reports or opinions and/or clinical experience of respected authority

RCT = randomized controlled trial

References

1. Sussman C. Management of wound healing with biophysical agent technologies. In: Sussman C, Bates-Jensen B (eds). Wound Care: A Collaborative Practice Manual for Health Professionals. Third edition. Baltimore: Lippincott Williams &Wilkins, 2007;495-504.
2. Dyson M. Mechanisms involved in therapeutic ultrasound. Physiother J Chartered Soc Physiother. 1987;73(3):8.
3. Frieder S, Weisberg J, Flemming B, et al. The therapeutic effects of ultrasound following partial rupture of Achilles tendons in male rats. J Orthop Sports Phys Ther. 1988;10:39-46.
4. Jackson BA, Schwane JA, Starcher BC. Effect of ultrasound therapy on the repair of Achilles tendon injuries in rats. Med Sci Sports Exerc. 1991;23:171-176.
5. McDiarmid T, Burns P. Clinical applications of therapeutic ultrasound. Physiother J Chartered Soc Physiother. 1987;73(4):14-21.
6. Kavros SJ, Wagner SA, Wennberg PW, et al. The effect of ultrasound mist therapy on common bacterial wound pathogens. Presented at the Symposium for Advance Wound Care, Baltimore, 2002.
7. Sullivan PK, Conner-Kerr T. Effectiveness of non-contact mist ultrasound therapy in removal of pseudomonas aeruginosa in vitro. Presented at the Symposium for Advanced Wound Care and Medical Research Forum on Wound Repair. Las Vegas, 2001.
8. Mitragotri S, Kost J. Low-frequency sonophoresis: a review. Adv Drug Deliv Rev. 2004;56(5):589-601.