

Ultrasound Protocols

Frequency

1 MHz deep penetration (3.0-5.0cm)

3.3MHz superficial penetration (0.8-2.5cm)

ERA

Effective radiating area

Application	Thermal Effect	Frequency/Intensity/Time	Duty Cycle	Freq. of Treatment	Effect
Inflammation					
Acute	Non-Thermal (approx. 0.5°C)	1 MHz, 1.0 W/cm², 10 minutes 3.3 MHz, 0.5 W/cm², 7 minutes	Pulsed – 20%	3x ERA 3-5x per week	Alters tissue permeability, increases blood flow/cellular activity, pain reduction (thermal)
Subacute	Mild Thermal (approx. 1.0°C)	1 MHz, 1.0 W/cm², 10 minutes 3.3 MHz, 0.5 W/cm², 7 minutes	Pulsed – 50%	3x ERA 3-5x per week	
Chronic	Moderate Thermal (approx. 2.0°C)	1 MHz, 1.0 W/cm², 10 minutes 3.3 MHz, 0.5 W/cm², 7 minutes	Continuous	3x ERA 3-5x per week	
Pain					
Acute	Non-Thermal (approx. 0.5°C)	1 MHz, 1.0 W/cm², 10 minutes 3.3 MHz, 0.5 W/cm², 7 minutes	Pulsed – 20%	3x ERA 3-5x per week	Increases blood flow/cellular activity, removes inflammatory chemicals, pain reduction
Subacute	Mild Thermal (approx. 1.0°C)	1 MHz, 1.0 W/cm², 10 minutes 3.3 MHz, 0.5 W/cm², 7 minutes	Pulsed – 50%	3x ERA 3-5x per week	
Chronic	Moderate Thermal (approx. 2.0°C)	1 MHz, 1.0 W/cm², 10 minutes 3.3 MHz, 0.5 W/cm², 7 minutes	Continuous	3x ERA 3-5x per week	
Tissue Healing					
Wound Care	Non-thermal	3.3 MHz, 0.5 W/cm², 1-2 minutes increasing to 3 minutes per ERA	Pulsed – 20%	1-2x ERA 5x/week	Tissue healing, increases blood flow and cellular metabolism, alters tissue permeability
Acute Soft Tissue Healing	Non-Thermal (approx. 0.5°C)	1 MHz, 1.0 W/cm², 10 minutes 3.3 MHz, 0.5 W/cm², 7 minutes	Pulsed – 20%	2-3x ERA 3-5 x per week	
Subacute Soft Tissue Healing	Mild Thermal (approx. 1.0°C)	1 MHz, 1.0 W/cm², 10 minutes 3.3 MHz, 0.5 W/cm², 7 minutes	Pulsed – 50%	3x ERA 3-5x per week	
Chronic Soft Tissue Healing	Moderate Thermal (approx. 2.0°C)	1 MHz, 1.0 W/cm², 10 minutes 3.3 MHz, 0.5 W/cm², 7 minutes	Continuous	3x ERA 3-5x per week	
Soft Tissue Extensibility					
Contractures	Vigorous Heating (approx. 4.0°C)	1 MHz, 1.5 W/cm², 13 minutes 3.3 MHz, 1.0 W/cm², 7 minutes	Continuous	3x ERA 3-5x per week	Increases in non-elastic tissues Increases mobility
Contractures GTO activation	Non-Thermal	3.3 MHz, 0.5 w/cm², 2 minutes at each musculotendinous junction of affected muscle	Pulsed – 20%	1-2x ERA 5x/week	