

VALLEYCARE
OLIVE VIEW-UCLA MEDICAL CENTER/HEALTH CENTERS
REHABILITATION SERVICES
POLICY & PROCEDURE

NUMBER: 1151
VERSION: 2

SUBJECT/TITLE: ULTRASOUND (THERAPEUTIC)

POLICY:	The Rehabilitation staff will use ultrasound in a safe manner as part of the therapy treatment.
PURPOSE:	To establish guidelines for the safe administration of ultrasound treatments
DEPARTMENTS:	REHABILITATION SERVICES
DEFINITIONS:	<p>Ultrasound waves are produced through the reverse piezoelectric effect. Electricity is carried from a radio frequency source to an electrode in contact with the surface of a specially cut crystal. The electrical charges applied to the crystal surface produce mechanical vibrations.</p> <p>There are two biophysical effects on the tissues: Thermal and Non-thermal Thermal Effects: elevation of tissue temperature to depths of 5 cm or more. Non-Thermal (Mechanical) Effects:</p> <ul style="list-style-type: none"> • Cavitation: vibrational effect on gas bubbles by an ultrasound beam • Acoustic streaming: movement of fluids along the boundaries of a cell membrane as a result of a mechanical pressure wave <p>Intensity: Ultrasonic energy is expressed in watts (W) or watts per square centimeter (W/cm²).</p>
PROCEDURE:	<p>A. Qualified Staff: The following staff are qualified to perform ultrasound if deemed competent:</p> <ol style="list-style-type: none"> 1. Physical Therapist 2. Physical Therapist Assistants and Rehabilitation Therapy Technicians under the supervision of the Physical Therapist of record. 3. Physical Therapy and Physical Therapy Assistant students under the supervision of the clinical instructor. 4. Occupational Therapists with an Advanced Practice in Physical Agent Modalities (PAMs) from the California Board of Occupational Therapy. 5. Occupational Therapist in the process of achieving the

	<p>competency requirements for Advanced Practice in PAMs may practice these techniques under the supervision of appropriate staff with whom they have a written agreement with.</p> <p>B. Indications for Use of Ultrasound</p> <ol style="list-style-type: none">1. Acute and subacute inflammation from strains and sprains, bruising, muscle tears, crush injuries, and other similar types of conditions (low-intensity pulsed ultrasound) 2. Chronic inflammatory problems including restriction of movement, with or without pain because of muscle spasm, chronic edema, fibrosis, connective tissue contracture, adhesions, and similar types of conditions (high-intensity continuous mode ultrasound) 3. Trigger Points 4. Hemorrhage reabsorption in soft tissue 5. Wound Care <p>C. Precautions and Contraindications</p> <ol style="list-style-type: none">1. Do not perform ultrasound over any of the following:<ol style="list-style-type: none">a. abnormal growth such as cancer and tuberculosisb. tissue being treated with radiation therapyc. lower back or abdomen of a pregnant womand. orbits of eyese. gonadsf. deep venous thrombusg. abscessesh. implanted medial device such as a pacemakeri. directed at the heartj. where there is uncontrolled bleedingk. week 0 to 6 after a tendon repairl. acute or subacute fractures 2. Precaution:<ol style="list-style-type: none">a. Impaired skin integrity—Water immersion technique should be used 3. Age Specific considerations<ol style="list-style-type: none">a. Pediatric: Do not perform on the very young child or infant.<ol style="list-style-type: none">(1) Must be able to communicate discomfort
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	<ul style="list-style-type: none">(2) Use caution over growth plate. Must use low intensity and avoid prolonged ultrasound over the area.b. Geriatric:<ul style="list-style-type: none">(1) Use caution over fragile skin(2) Must be able to communicate discomfort(3) Should not be performed on patients with dementia <p>D. Application of Ultrasound</p> <ul style="list-style-type: none">1. Orient the patient to the purpose and expectation of the ultrasound if first treatment.<ul style="list-style-type: none">a. Instruct patient that the appropriate sensation is mild warmth and that excess heat, or pain should be reported immediately.2. Position Patient so that patient is comfortable and area to be treated is adequately exposed without exposing patient more than necessary3. Check skin for skin integrity4. Mediums<ul style="list-style-type: none">a. Gel—gel is applied to the skin or to the surface of the transducer. There should be 1 to 2 mm layer that is sufficient to allow gliding of the sound head without creating a mess.b. Water—in-water technique is used where there is little soft tissue as over the wrist, ankle and foot or irregular surfaces. Air bubbles should be wiped away from the skin.c. Commercial gel pads—placed over open wound or other area being treatedd. Transparent wound dressings with a high water content (Hydrogel sheets)—placed over open wound5. Stroke<ul style="list-style-type: none">a. The sound head is moved in overlapping circles or linear paths from the moment the power is turned on. Overlap ensures even distribution of energy to the treated tissue.b. The rate of transducer movement is slow.c. Sound head should be parallel to the tissue surface.d. In-water the sound head should be at a distance of 1 to 2 cm from the skin6. Intensity<ul style="list-style-type: none">a. Should be turned up only when the sound head is movingb. Safe range is 0.5 to 2 W/cm²c. Goal of treatment, treatment site, and acuteness of the
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	<p>condition must be considered when determining intensity.</p> <ul style="list-style-type: none">(1) Connective tissue shortening should be treated with high dosages to maximize temperature increase.(2) Painful conditions may respond better to more moderate doses(3) Conditions situated within thin tissues or superficial conditions should be treated with lower doses.(4) Higher doses should be used for conditions in thicker tissue(5) The more acute the condition the lower the dose should be, reserving higher doses for chronic conditions.(6) Wounds—low intensity with 3 MHz sound head should be used for a more superficial effect <p>d. Patient’s subjective tolerance is the ultimate determinant. Pain or aching is usually a sign of too much periosteal heating—intensity should be decreased.</p> <p>7. Time</p> <ul style="list-style-type: none">a. 5 to 10 minutes per site (5 minutes for each 25 in² or 161 cm² of area treated)b. If total time required to treat the area is more than 10 minutes then another modality should be consideredc. Less than 3 minutes of treatment is ineffective for achieving any physiological response <p>E. Cleaning</p> <ul style="list-style-type: none">1. The sound head and cord must be cleaned after every use using approved hospital disinfectant.

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References:

Thermal Agents in Rehabilitation, Michlovitz, Susan; 1990

Manual For Physical Agents, Fourth Edition, Hayes, Karen; 1993

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