Noncontact Low-Frequency Ultrasound* for Healing of Thermal Burns Status Post Split-Thickness Skin Graft in a Long-Term Acute Care Hospital (LTACH)

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Background
After initial treatment of thermal burns at a burn center, patients are at risk for infection, malnutrition, cardiac arrhythmias, and respiratory complications.1 Edema and infection can inhibit graft “take” after split-thickness skin graft (STSG). Post-STSG wound care involves petroleum-impregnated gauze to maintain a moist wound environment. Intense pain during cleansing of burned skin and hypertrophic scarring are key concerns.2 Noncontact low-frequency ultrasound (NLFU)* involves painless application of ultrasound energy to wounded tissue via a sterile saline mist. NLFU promotes healing through cellular stimulation, increased blood flow, and gentle cleansing and debridement.3 4

Case Series
NLFU was administered along with petroleum-impregnated gauze to 3 patients with thermal burns status post STSG. Wounds healed in a timely manner with full graft adherence.

Conclusions
NLFU may help promote graft adherence for burn patients post STSG through painless cleansing and debridement and prevention of hypertrophic scarring.

Patient #1
Patient and Wounds: 77-year-old man with bilateral thermal burns of hands/digits underwent STSG on May 20.
Admission to LTACH: May 24 with intact, edematous skin grafts on each hand and beefy-red thigh donor site with intact wound veil. Patient pain rating was 10 (0-10 scale).
Treatment: NLFU initiated twice weekly to graft and donor sites, along with petroleum-impregnated gauze secured to each digit, bacitracin, and tubular dressing. Patients reported no pain during/after NLFU applications (pain rating 0).

Outcome: At discharge (Jun 14): significant reduction in edema and pain with full graft adherence and no hypertrophic scarring.

Patient #2
Patient and Wounds: 82-year-old man with thermal burns of the right forearm and left shoulder underwent STSG on Apr. 7.
Admission to LTACH: Apr. 15 with intact skin graft and beefy-red donor site. Patient pain rating was 8 (0-10 scale).
Treatment: NLFU initiated twice weekly with petroleum-impregnated gauze daily. Patients reported no pain during/after NLFU applications (pain rating 0).

Outcome: At discharge (May 12): full graft adherence with no edema or hypertrophic scarring.

Patient #3
Patient and Wounds: 85-year-old woman with thermal burns of the left face, left upper chest, left axilla, left arm, and left back underwent STSG on Jun. 27.
Admission to LTACH: Aug. 3 with edematous skin graft sites and delayed graft take. Bilateral donor sites intact. Patient pain rating was 10 (0-10 scale).
Treatment: NLFU initiated 2-3 times weekly with topical bacitracin and petroleum-impregnated gauze. Patients reported no pain during/after NLFU applications (pain rating 0).

Outcome: Aug. 16: Healed graft sites of face, back, and upper chest.
Aug. 23: Full graft take of face, upper chest, back, and axilla. Arm showing improved graft take and wound healing. No hypertrophic scarring.


*MIST Therapy® System, Celleration, Inc., Eden Prairie, Minnesota
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