

# Acoustic Pressure Wound Therapy\* for Mixed Partial- and Full-Thickness Burns in a Rural Wound Center

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## Introduction

Full-thickness burn wounds are difficult to manage outside of tertiary care centers as outpatients because of the need for specialized care, which is often time-consuming and painful. Such burns are frequently complicated by infection and unacceptable scarring. A case series of outpatient burn management using acoustic pressure wound therapy (APWT)\* at a rural wound center is presented. APWT is a noncontact, low-frequency, nonthermal ultrasound therapy that accelerates healing through positive pressure, stimulating fibroblasts, clearing bacteria and debris,<sup>1</sup> and relieving pain.<sup>2</sup>

## Methods

Medical records of 14 patients with mixed partial- and full-thickness burns who received APWT were retrospectively evaluated. APWT was administered 3 times per week for cleansing, debridement, bacterial clearance, and to promote healing. Moist wound care, including topical antimicrobials, were provided. Thirteen patients had thermal burns; 1 had a chemical burn (pt #1). Eight patients had extremity burns, 2 had truncal burns and 4 had burns involving both trunk and extremities. Burns ranged in size from 1% to 24% (mean 7%) body surface area (BSA). Treatment effectiveness was evaluated based on scarring characteristics of healed wounds and pain resolution. Pain was patient-rated using a 10-point visual analog scale (0 = no pain, 10 = severe pain). Patients were followed for 6 months post healing.

## Results

Patient	Age	%BSA	APWT treatments	Pain (VAS)		Healing Time (weeks)	Scarring
				Pre	Post/#		
1	48 y	4	38	5	0/0	14.5	Nonhypertrophic, Hypopigmented
2	41 y	2	48	6	4/-	16.5	Nonhypertrophic, Hypopigmented
3	54 y	1	13	8	0/1	10 <small>(pain cont. after healing)</small>	Slightly hypertrophic, Pigment irregular
4	78 y	24	31	7	0/3	10	Nonhypertrophic, Pigment irregular
5	19 y	16	4	0	0	1.5	Nonhypertrophic, Mostly repigmented
6	45 y	10	13	10	0/10	6	Nonhypertrophic, Mostly repigmented
7	33 y	4	6	8	0/4	1.5	Nonhypertrophic, Pigment irregular
8	54 y	9	108	0	0	45	Nonhypertrophic, Hypopigmented
9	5 mo	4	2	6	0/2	7	Nonhypertrophic, Repigmented
10	14 mo	7	2	0	0	<1	Nonhypertrophic, Repigmented
11	39 y	2	15	0	0	14	Normal
12	70 y	1	2	10	0/2	2.5	Nonhypertrophic, Pigment irregular
13	50 y	9	36	2	0/2	39	Nonhypertrophic, Pigment irregular
14	9 y	9	9 <small>(treatment &lt; 3/ week)</small>	3	0/2	3.5	Hypertrophic, Pigment irregular

## Summary

Pain improved during the course of APWT (range: 2 to 10 treatments). No patient required hospitalization or developed complications related to infection. Pliable, nonhypertrophic scars developed in 86% of patients and hypertrophic scars developed in 14%. Repigmentation was seen in 79% of patients, with only minor irregularities; hypopigmentation occurred in 21%. Scars available for 6-month follow-up (71%) remained unchanged.

## Conclusions

Use of APWT as an adjunct to standard burn care in the outpatient management of mixed partial- and full-thickness burns resulted in reduced pain and cosmetically acceptable outcomes without infectious complications, surgery, or skin grafts. Further study of this novel ultrasound therapy is warranted to evaluate treatment of partial- and full-thickness burns, including more severe or extensive full-thickness burns, in both inpatient and outpatient settings.

## References

<sup>1</sup> Unger P. Low- frequency, noncontact, nonthermal ultrasound therapy: a review of the literature. *Ostomy Wound Manage.* 2008;54(1):57-60.

<sup>2</sup> Gehling ML, Samies JH. The effect of noncontact, low-intensity, low-frequency therapeutic ultrasound on lower-extremity chronic wound pain: a retrospective chart review. *Ostomy Wound Manage.* 2007;53(3):44-50.

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### Patient #3



Initial evaluation  
6/19/06



Initiation of  
APWT 6/26/06



Healed  
7/14/06

### Patient #4



Initial evaluation  
6/18/07



Healed  
10/4/07