Abstract Title:	**Correlating Burn Wound Depth And Scar Depth After Contact Burns: A Histological Assessment In Porcine Models**
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Objective:	1) Discuss variation among providers regarding burn depth. 2) Learners should consider that histology provides a more accurate description of burn depth. 3) Recognize that there is a differential relationship between burn duration and depth assessed early vs. late after burns.
Abstract:	**Disclaimer**: The views expressed in this are those of the author(s) and do not reflect the official policy or position of the U.S. Army Medical Department, Department of the Army, DoD, or the U.S. Government. **Intro/Background**: Objective non-invasive determination of burn wound depth to guide clinical decision making has been a long-standing and unresolved question. At present, clinicians evaluate burn depth subjectively. A few emerging modalities are being studied but none have been implemented widely. Histological analysis supposedly is the gold standard to which all these non-invasive modalities would compare their results against. However, there are currently no clear histological features pathologists can agree on that distinguish dead from alive. In this study, we assessed the relationship between burn contact time, burn depth and scar depth. We hypothesized that burn duration, burn depth and scar depth would be linearly correlated. **Methods/Design**: Two different burn models were used in this ongoing study, one with a larger 7.5 cm2 burns and another with a smaller 3cm diameter burns with durations of 10, 13, 15, 17, and 20 seconds using a thermocoupled burn block heated to 100 degrees Celsius. Burn depths at day seven and corresponding scar depths at day 90 were measured by locating levels of deepest injured tissue of wound biopsies that were immunohistochemically stained. Samples were observed under a microscope at powers ranging from 4-40x in both hematoxylin and eosin (H&E) and Mason's trichrome (MTC) stains. Extent of injured collagen, signifying the zone of coagulation, were marked in two different locations using a slide marker and then averaged for an absolute value using a micrometer. Measurements were converted properly to each

power. Day 3 injuries were scored for various indicators such as deepest injured collagen, hair follicle injury, and inflammatory markers, amongst others. These were standardized to a cumulative burn score and analyzed accordingly. Research was conducted in compliance with the Animal Welfare Act, the implementing Animal Welfare regulations, and the principles of the Guide for the Care and Use of Laboratory Animals, National Research Council. The facility's Institutional Animal Care and Use Committee approved all research conducted in this study. The facility where this research was conducted is fully accredited by "AAALAC International.

Results/Findings: Data from the porcine burn model showed 10s burns resulted in a more shallow depth of injury and less scarring as compared to 20s burns, but showed no clear progression for the 13-17s burns. Day 3 cumulative burn scores progressed linearly with increasing burn duration (r2 of 0.8607, p<0.0001).

Conclusion/Implications: We have observed a nonlinear relationship between burn duration, depth of injury, and scarring with the exception of smaller burns assessed early after injury. Further research may establish a threshold where burn depth predicts scarring outcomes with a high degree of certainty.