

Epidemiology and Outcomes of Pavement Burns Among Unhoused Patients

Samuel Matthys MD¹, Christopher Gonzalez DO¹, Vidhani Goel BS¹, Alexander Rowan MD¹, Brenna Chen MD¹, Ryan Grinnell BA¹
Lateef Omidiji Jr BS¹, Avni Joshi BA¹, Shane Jung BS¹, Stephanie Martinez MD^{1,2}, Kavita Batra PhD¹, Rabia Nizamani MD^{1,2}
¹Kirk Kerkorian School of Medicine, University of Nevada, Las Vegas; ²Lions Burn Care Center



BACKGROUND

- Unhoused individuals are **disproportionately** vulnerable to climate-related injuries due to prolonged outdoor exposure and limited access to shelter, especially in desert climates.
- Burns from **contacting hot pavement** are a risk for these individuals in these climates.
- At our regional burn center, the unhoused disproportionately account **for 13% of pavement burn admissions** (0.33% of population).

PURPOSE

This study examines the **epidemiology, hospital course, and outcomes of pavement burn injuries** among unhoused patients, highlighting a preventable & growing public health concern.

METHODS

- A retrospective review of burn registry data from 2014–2024 identified unhoused patients with pavement burn injuries. [IRB UMC-2024-583]
- Demographics, burn size (TBSA%), length of stay (LOS), ICU admission, mechanical ventilation, and mortality were recorded.
- Continuous variables were compared with t-tests and categorical variables with chi-square or Fisher's exact tests.
- Trends were assessed using chi-square, with significance at $p < 0.05$.

Table 1 Comparison of outcomes and health resource utilization among patients who are unhoused compared to housed (n = 727)

Variable	Categories	Unhoused Yes (n = 95, 13.1%)	Unhoused No (n = 632, 86.9%)	P-value
Initial Temp (C)		37.5 ± 1.6	37.0 ± 1.8	0.004
TBSA %		5.4 ± 4.5	4.7 ± 5.5	0.241
Mortality	Died	3 (3.2%)	38 (6.0%)	0.260
LOS (Days)		25.8 ± 46.0	15.3 ± 20.9	0.032
Required ICU	Yes	28 (29.5%)	137 (21.7%)	0.091
ICU LOS (Days)		6.9 ± 8.4	11.2 ± 18.6	0.240
On Ventilator	Yes	18 (18.9%)	78 (12.4%)	0.077
Ventilator Days		5.7 ± 6.6	13.6 ± 21.5	0.126

Summary of maximum temperature readings for sunlight and shaded materials and times to return to baseline temperature.

Material	Max Surface Temp (°F)	Time to Max Temp (h)	Time Period at Max Temp (h)	Time to Baseline Temp (h)	Max Surface Temp (°F)	Time to Max Temp (h)	Time Period at Max Temp (h)	Time to Baseline Temp (h)
	Sunlight				Shade			
Asphalt	166	14	2:00–4:00 PM	10	108	15	3:00–5:00 PM	7
Brick	152	14	2:00–4:00 PM	11	107	15	3:00–5:00 PM	6
Concrete	144	14	2:00–4:00 PM	9	105	14	2:00–4:00 PM	7
Sand	143	13	1:00–4:00 PM	11	104	14	2:00–4:00 PM	8
Rock	170	13	1:00–4:00 PM	10	106	15	3:00–5:00 PM	6
Metal	144	13	1:00–4:00 PM	9	108	14	2:00–4:00 PM	7

Chestovich et al.

RESULTS

Among 95 unhoused contact burn patients, 92 (96.8%) sustained pavement burns. Mean age was 49.9±12.9 years, 87.4% were male, and most injuries occurred in summer (85.3%), peaking in 2024 (38.4%, $p < 0.001$). Mean TBSA was 5.4±4.5%, GCS 12.9±4.1, and initial body temperature higher than those who are housed (37.5 vs. 37.0 °C, $p = 0.004$). **Hospital LOS was longer** in unhoused patients (25.8 vs. 15.3 days, ($p = 0.032$)). ICU admission (29.5%) and ventilator use (18.9%) were more frequent but not significant. Mortality was 3.2%, similar to housed patients (Table 1).

CONCLUSIONS

- Pavement burns are a growing source of morbidity in the unhoused community
- While TBSA and ICU use were higher but not statistically different, **hospital stay was significantly longer**, reflecting challenges with disposition, housing insecurity, and complex wound care
- The sharp rise in admissions in recent years highlights the urgent need for **targeted prevention and heat-response strategies** for unsheltered populations.

REFERENCES

Scan QR code for references

