

# A Retrospective Review of the Utilization of Burn Admission Criteria

KN Foster, MD, MBA, FACS; L Krueger; KJ Richey, BSN, RN

## Introduction

Evidence-based criteria for burn patient admission are poorly defined. Attempts have been made by commercial entities to align payors and providers with evidence-based admission criteria to optimize resource use. However, these admission criteria have not been examined critically to see if they are appropriate and effective. We developed an admission criteria algorithm based on these existing standards and have utilized it for nearly 18 months. The purpose of this study is to retrospectively review this algorithm with respect to inpatient needs and outcome to assess its effectiveness.

## Methods

A retrospective chart review of patients admitted to the burn center over a 1 year period was performed. Incomplete datasets were excluded. Patients were grouped by TBSA, < 10%, 10-20% and > 20%. Appropriateness of admission was measured using length of stay (LOS) as a surrogate marker, hospitalizations of < 3 days, unless deceased, were deemed inappropriate (IAP) and 3 days or more as appropriate (AP).

## Results

There were complete datasets for 530 patients, < 10% (n=423), 10-20% (n= 72), >20% (n=35). There were no significant differences in age, gender, or payor sources between the groups. Patients with larger TBSA burns were more likely to have suffered a flame/flash injury. All patients in the two larger TBSA groups met admission criteria per algorithm. All IAP were in the < 10% group. When compared to AP, IAP were younger, 31.6 vs. 44.0 years (p<.0001), had smaller TBSA injuries 2.8% vs. 3.5% (p=.0045), had fewer clinical findings 1.4 vs 1.8 (p<.0001), fewer interventions 1.8 vs 2.6 (p<.0001) but were more likely to have suffered burns to the head 30% vs 13% (<.00001) and neck 9% vs 3% (=0.0164). AP patients were more likely to have suffered contact burns 27% vs. 17% (p=.0323), full-thickness injuries 39% vs 14% (p<.0001), involvement of a major joint 42% vs 29% (p=.0085), combined burn and trauma 3% vs. 0% (p=.0444) and burns to the buttocks 7% vs 2% (p=.0357). AP patients were also more likely to require IV analgesia 82% vs 71% (p=.0107) and evaluated as likely needing surgery 82% vs 15% (p<.00001).

## Conclusion

The admission criteria algorithm performed perfectly in patients with a ≥ 10% TBSA injury. For patients with burn < 10% TBSA the algorithm was not followed as closely leading to some inappropriate admissions. Patients with smaller burns admitted appropriately were more likely to have full thickness burns, contact burns, burns over joints and to require surgery. The algorithm was highly accurate in patients with large burns, however additional refinement is needed for those patients with smaller burn injuries.

DEMOGRAPHICS			
	< 10%	10-20%	> 20%
n	423	72	35
Age	39.9	35.5	45.7
Gender, male	286 (68%)	51 (71%)	25 (71%)
Average TBSA	3.2 (±2.39)	13.8 (±3.43)	49.9 (±26.6)

CLINICAL FINDINGS			
	< 10%	10-20%	> 20%
n	423	72	35
FT Burn	128 (30%)	19 (26%)	22 (63%)
Special Areas	301 (71%)	55 (76%)	34 (97%)
Major Joint	158 (37%)	49 (68%)	34 (97%)
Circumferential Ext	35 (8%)	19 (26%)	19 (54%)
Chemical	23 (5%)	1 (1%)	1 (3%)
Electrical	7 (2%)	0 (0%)	1 (3%)
Combined burn/trauma	8 (2%)	2 (3%)	4 (11%)
Poss. Inhalation Inj	20 (5%)	3 (4%)	6 (17%)
Poss. Intentional Inj	9 (2%)	4 (6%)	5 (14%)

TBSA < 10% APPROPRIATENESS OF ADMISSION			
	< 3 days	≥ 3 days	p
n	140	283	
Average Age	31.6	44.0	< 0.0001
Average TBSA	2.8	3.5	0.0045
Mechanism	24 (17%)	75 (27%)	0.0324
Location Head	42 (30%)	36 (13%)	< 0.00001
Location Neck	12 (9%)	9 (3%)	0.0164
Location Buttocks	3 (2%)	20 (7%)	0.0357

## Applicability to Practice

This study helps to define appropriateness of inpatient care following burn injury.

