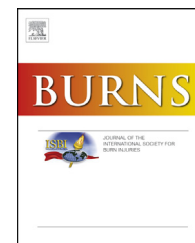


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Outpatient burn data: An untapped resource

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ABSTRACT

Introduction: The National Burn Repository (NBR) currently only contains inpatient data from participating United States burn centres. However, the majority of the patients treated in burn centres are managed as outpatients. Unfortunately, this significant demographic is not represented in the NBR annual report. The purpose of this study is to compare the difference in aetiology and demographics between inpatient and outpatient burn patients. In addition, the workload demands for data entry of inpatient and outpatient records in the burn registry will be compared.

Methods: Outpatient and inpatient burn data at an American Burn Association-Verified Burn Center were prospectively collected during fiscal year 2008. Data collected included age, burn size and aetiology of burn. Aetiology was also stratified by age group. Inpatient data were compared with outpatient data with Fisher's exact test. The amount of time taken to enter inpatients' and outpatients' data parameters in the TRACS v5.0 database was also recorded. **Results:** Data were collected for 241 inpatients and for 543 outpatients during fiscal year 2008. No significant differences in gender or race were found between the two groups. When comparing demographics, outpatients tended to be younger (26 ± 19 years vs. 32 ± 22 years, $p = 0.01$) with a smaller burn size ($2.5 \pm 7\%$ vs. $6.8 \pm 12\%$, $p < 0.001$) and a lower frequency of full-thickness burns (17% vs. 41%, $p < 0.001$).

Of the patients managed as an outpatient, a total 29.7% were eventually admitted to the hospital. Just over half of those (16.7%) initially managed in the outpatient setting were admitted for a planned surgical procedure. The other 13% were admitted for pain control and wound-care issues.

Injury was more likely to be caused by flame in inpatients ($p < 0.001$). Scald injuries were more common in the outpatient setting (34% vs. 27%), but this difference did not reach statistical significance ($p = 0.079$). Outpatients were more likely to be injured with a contact burn ($p < 0.0001$). Outpatient injury was more likely to be work-related than inpatient injury ($p = 0.0497$), but less likely to be related to recreational activity ($p = 0.006$) or arson/abuse/assault ($p = 0.0158$). An experienced TRACsv5.0 user required 11 ± 0.6 min to enter an inpatient record and 6 ± 0.6 min to enter an outpatient record in the system ($p = 0.002$).

Conclusions: Inpatient injury is more likely to be caused by flame, whereas outpatient injury is more likely to be caused by scald and contact burns. Work-related burn is more likely to be treated in the outpatient setting. Outpatient burn data also take less time to enter. Since significant differences in aetiology exist, outpatient data should be reported separately from inpatient data in order to understand the full spectrum of burn aetiology. The NBR and other registries should be modified to track outpatient burn data and outcomes.

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The 2012 National Burn Repository (NBR) reflects records of over 183,000 patients treated for burns at 87 different burn centres in the United States and Canada between 2002 and 2011 [1]. This registry includes demographic information about the patient, length of hospital stay, details of the injury, the site of injury, the length of hospitalisation and mortality [1].

The implementation of national computerised burn patient registries reflects the ideology that these registries are of prime importance. Registries have been beneficial for establishing baseline standards of care, improving survival and decreasing hospitalisation time after burn [2]. In addition, the NBR has helped clinicians develop an understanding of epidemiology and outcomes associated with burn [3–5]. However, the NBR only tracks inpatient burn data and does not report burn treated in an outpatient setting [1]. Other databases that track burn, such as the National Trauma Data Bank (NTDB) and the historical National Burn Information Exchange (NBIE), also only contain inpatient data [2–6]. This focus on inpatient data is reflected in the burn literature, which reports a paucity of outpatient burn epidemiology. Very few studies report outpatient data, although the majority of burn is treated in the outpatient setting [7–9]. Although only 35,000 of the 700,000 burns treated by a health-care professional require hospital admission [4], the epidemiology of outpatient burn is not closely tracked. Understanding data regarding thermal injury in an outpatient setting will help clinicians develop a more thorough appreciation of the full spectrum of burn. This project was designed to elucidate and compare differences between the aetiology and circumstances surrounding inpatient and outpatient burns. In addition, since entering this data becomes the responsibility of a burn registrar, the workload demand for entering inpatient and outpatient records will be compared.

1. Materials and methods

Outpatient burn data at an American Burn Association-Verified Burn Center were prospectively collected during fiscal year 2008 (1 July 2007–30 June 2008). The data were compared to inpatient data collected at the same institution for the NBR over the same 1-year period. Data points collected included age, gender, race, burn size, accident type (i.e., work related, recreational, non-work related or arson/abuse/assault) and aetiology (flame, scald, contact, chemical and other) of burn. Aetiology of burn was also stratified according to the following age groups: 0–0.9, 1–1.9, 2–4.9, 5–15.9 and >16 years. Inpatient data were compared with outpatient data for each of the previously mentioned categories using Fisher's exact test. Two-tailed p values of <0.05 were considered to be statistically

Table 1 – No significant differences were seen when racial composition was compared between inpatients and outpatients.

Race	Inpatient (N = 241)	Outpatient (N = 543)	p value
White	176	388	0.73
Black	50	118	0.85
Hispanic	12	25	0.56
Asian	3	12	0.57

significant. The amount of time that it took to enter the data parameters of six inpatients and six outpatients in the TRACS v5.0 database was also recorded. This was an institutional review board (IRB)-approved study.

2. Results

Data were collected for 241 inpatients and for 543 outpatients. Of the 543 patients initially managed as an outpatient, a total 29.7% were eventually admitted to the hospital. Just over half of those (16.7%) managed in the outpatient setting were admitted for a planned surgical procedure. The other 13% were admitted for pain control and wound-care issues.

2.1. Demographics

When comparing demographics, outpatients tended to be younger, with a smaller burn size and a lower frequency of full-thickness burns. The mean age of outpatients was 26 ± 19 years of age, whereas inpatients were 32 ± 22 years old ($p = 0.01$). Outpatient burn size was $2.5 \pm 7\%$ vs. $6.8 \pm 12\%$ for inpatients ($p < 0.001$). Full-thickness burns were sustained by 17% of outpatients, vs. 41.7% of inpatients ($p < 0.001$).

No significant differences in gender were found between the two groups (Table 1). There was also no significant difference in the proportion of ethnicity between the groups. In total, there were 175 inpatient and 387 outpatient ($p = 0.73$) Caucasians; 50 inpatient and 118 outpatient ($p = 0.8503$) African-Americans; 12 inpatient and 25 outpatient ($p = 0.856$) Hispanics; and 3 inpatient and 12 outpatient ($p = 0.572$) Asians identified.

2.2. Aetiology of Injury

Aetiology of injury was also compared between the groups. Injury was caused by flame in 43% of inpatients and in 25% of

Table 2 – Flame burns were more likely to be treated in an inpatient setting, whereas contact burns were more likely to be treated in the outpatient setting. Work-related injury was more likely to be treated in an outpatient setting whereas injury from arson/abuse/assault and recreational injury were more likely to be treated in an inpatient setting.

Etiology	Inpatient (N = 241)	Outpatient (N = 543)	p
Flame	103 (43%)	138 (25%)	<0.001*
Scald	65 (27%)	186 (34%)	0.08
Contact	36 (15%)	153 (28%)	<0.001*
Other	37 (15%)	66(12%)	0.3
Circumstances	Inpatient	Outpatient	p
Work related	31 (13%)	101 (19%)	0.049*
Recreation	45 (18%)	61 (11%)	0.006*
Non-work	149 (62%)	366 (67%)	0.142
Arson/abuse/assault	16 (7%)	15 (3%)	0.016*

* $p < 0.05$, considered to be a statistically significant difference between inpatients and outpatients.

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