Government of **Western Australia**
South Metropolitan Health Service
Fiona Stanley Fremantle Hospitals Group

Early ambulation after a lower limb burn is associated with reduced length of stay: A quantitative longitudinal study.

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Introduction

A lower limb burn arguably has a significantly greater impact on the time (days) to effect acute service discharge than an upper limb burn due to the detrimental impact on ambulation and return to normal daily roles and function. The patterns of functional recovery following a lower limb burn are poorly understood and has only been studied in small cohorts. It was hypothesized that patients, following an early ambulation pathway will have a reduced length of stay (LOS), and improved functional outcomes compared to patients with delayed ambulation after burn or after surgery.

Aim

The study aimed to explore if the timing of ambulation after lower limb burn and after skin grafting influenced acute LOS and functional outcomes.

Method

The study examined patients between January 2011-January 2019 who sustained a lower limb burn injury. Patients were included if they were 18 years of age or over, has sustained a lower limb burn, and had confirmed dates of ambulation post injury and post-surgery. The definition of 'early ambulation' varies significantly and is poorly described in the literature.

This study defined early and late ambulation through the categorization of four ambulatory pathways in surgically managed patients. The ambulation pathways were defined with <=2 days categorized as early, and >2 days as late. The outcomes modelled were: acute LOS, and the Lower Limb Functional Index (LLFI-10) Domain 1 score last recorded at or before 12 weeks after the burn. The maximum LLFI score is 10 and a zero score indicates no measurable disability of lower limb function. A negative binomial regression was employed to model LOS (truncated) and LLFI.

Results

Ambulatory data was available for 1383 patients with 1074 surgically managed patients included in the final LOS model. The cohort had a mean age of 37.3 years and 71.3% were male. Late (delayed) ambulation was associated with TBSA; presence of a foot burn; and, when patients burn occurred in a rural area. Figure 1 depicts the median LOS by ambulation pathway and Table 1 demonstrates that these differences endure after adjusting for age and TBSA except in the late/late group.

Table 1: Groupwise median LOS by ambulation pathway compared to those adjusted for age and TBSA.

Model	Early / Early	Late / Early	Early / Late	Late / Late
Ambulation pathways alone	5.2 (4.8 to 5.7)	9.9 (6.9 to 12.8)	12.0 (8.5 to 15.6)	45.7 (20.7 to 70.6)
Adjusted for age and TBSA	8.3 (7.1 to 9.5)	11.8 (8.9 to 14.6)	13.8 (10.4 to 17.3)	11.3 (7.0 to 15.6)

For the functional outcomes, LLFI data were available for 302 patients. Figure 2 demonstrates the association of lower limb disability associated with ambulation pathway (unadjusted). The significant effect of early ambulation was lost when adjusted for TBSA.

Length of stay analysis

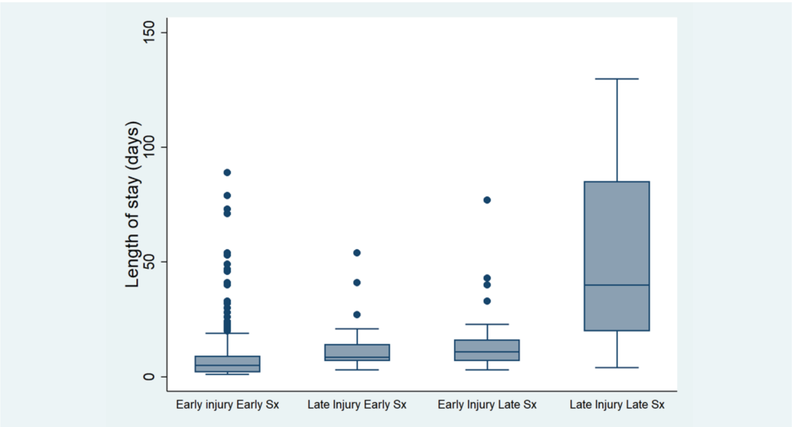

Figure 1: Box plot for LOS demonstrating the unadjusted differences in median LOS between the four ambulatory pathways (chi2(3) = 97.1, p<0.0001).

LLFI data set

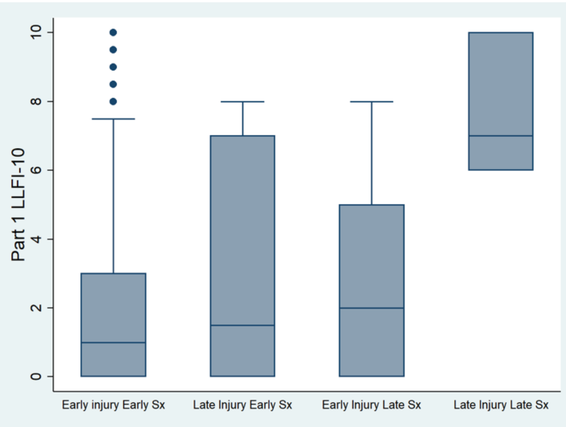

Figure 2: Box plot for LLFI by ambulation pathway, demonstrating a significant difference between the unadjusted median LLFI scores (chi2(3)=9.04, p=0.0288).

Discussion

Ambulation by 48 hours after lower limb grafting surgery is associated with reduced acute burn unit length of stay. To tease out the interaction of TBSA, age and admission to ICU will require additional data and enhanced statistical modelling.

Applicability of Research to Practice

Where appropriate, achieving early ambulation within two days after surgery will assist patients to progress more rapidly on their journey towards desired participation goals.

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