

# Cardiovascular Fitness of Children and Adolescents Following Lower Limb Burn Injury: A Cross Sectional Study

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**Aim 1:** To assess the cardiovascular fitness of children and adolescents 3-6 months post lower limb burn injury compared to age matched unaffected peers

**Aim 2:** To determine if burn location affects performance



# Participants

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- 26 Participants aged 5-16 years
- Recruited from Westmead Children's Hospital Burns Department
- Control
  - = 300 unaffected peers aged 3-19 years (50% male) from the 1000 norms study

**Cardiovascular Fitness:** 6 minute walk test (6MWT)

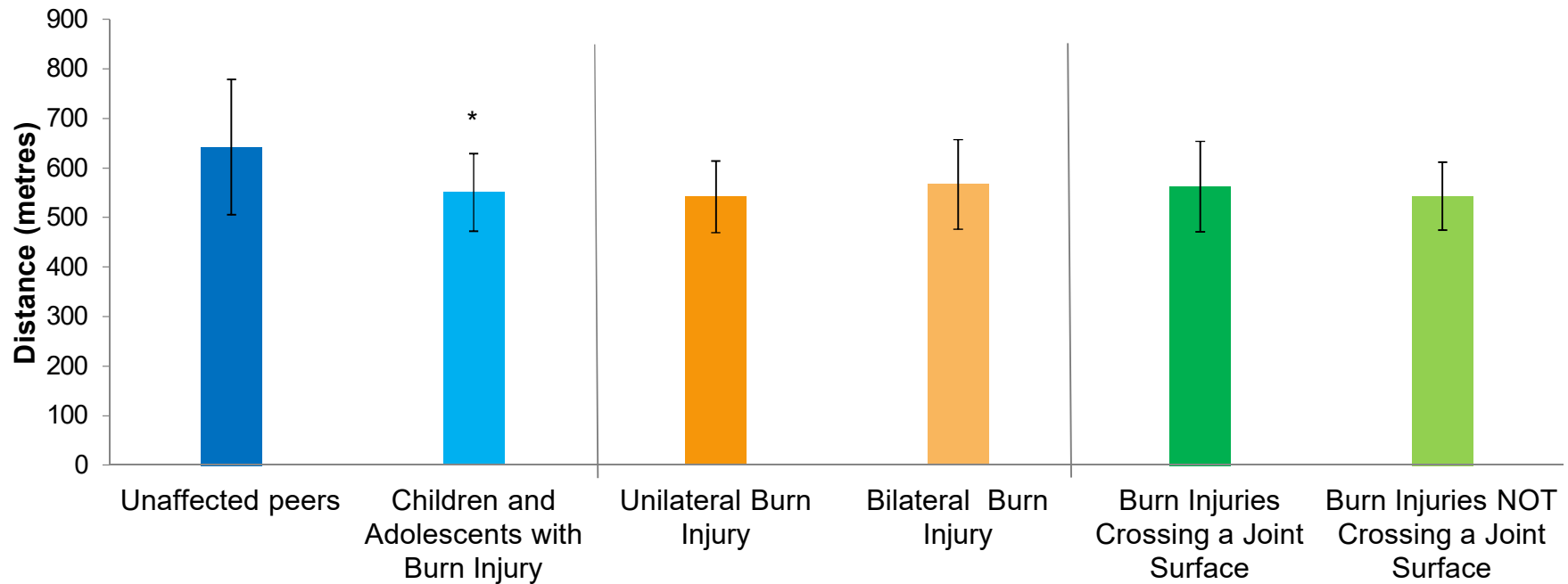
**Physical Activity Levels:** Physical Activity Questionnaire (PAQ)

- Child Version (7 to 14 years)
- Adolescent Version (>14 years)

**Medical Records:** Participant demographics

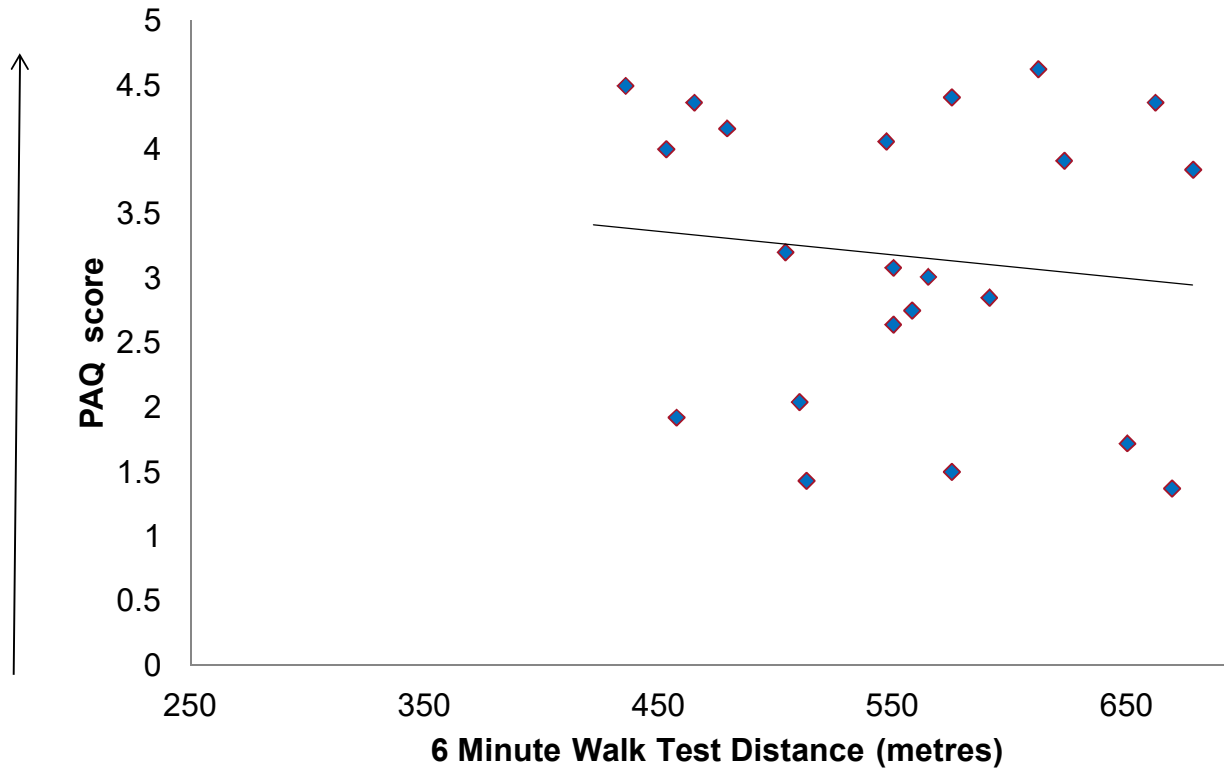


## 6 MINUTE WALK TEST



**Figure 1.** 6 Minute Walk Test distance of children and adolescents with lower limb burn injury of various locations and overall results compared to unaffected peers<sup>1</sup>. Values are means  $\pm$  SD. \* indicates statistically significant at  $p < 0.05$ .

## PHYSICAL ACTIVITY LEVELS



**Figure 2.** Correlation between 6 Minute Walk Test distance and Physical Activity Questionnaire (PAQ) score. Higher PAQ scores indicate greater activity levels, while lower scores indicate lower activity levels.



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### AIMS

To assess the cardiovascular fitness of children and adolescents post lower limb burn injury compared to unaffected peers

To determine if burn location affects performance

### METHODS

Participant characteristics and burn location were recorded.

The 6 minute walk test was used to measure cardiovascular fitness. Physical activity levels were determined using the Physical Activity Questionnaire for children (PAQ-C) and adolescence (PAQ-A).

Unpaired t-tests were used to compare results of children with a burn injury to contemporary normative data, and to compare children with burns in different locations.

### RESULTS

#### Participants

26 participants (77% male) aged between 5 and 16 years (mean: 10.4 years, SD 3.21) were assessed at a mean of 125 days post lower limb burn injury. TBSA of burns ranged from 0.7% to 30% (mean 5.41%, SD 6.99%). 9 participants had bilateral injuries. 10 participants had burns crossing a joint surface.

#### Cardiovascular Fitness

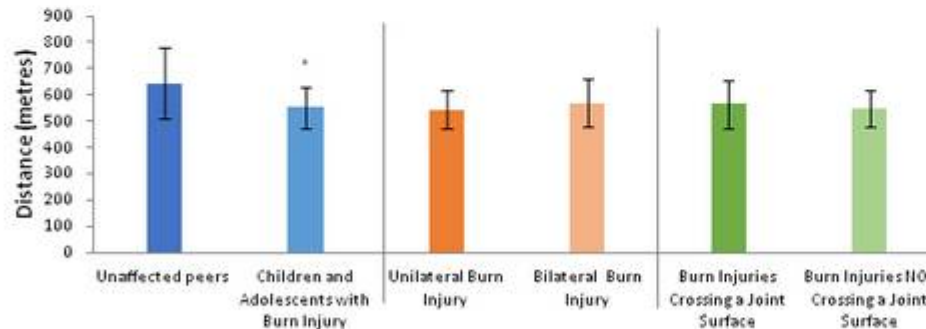
Performance was significantly reduced overall on the 6 minute walk test compared to normative data<sup>1</sup> (mean difference -90.49 metres, 95% CI -143.87 to -37.11,  $p = 0.001$ ).

#### Burn location

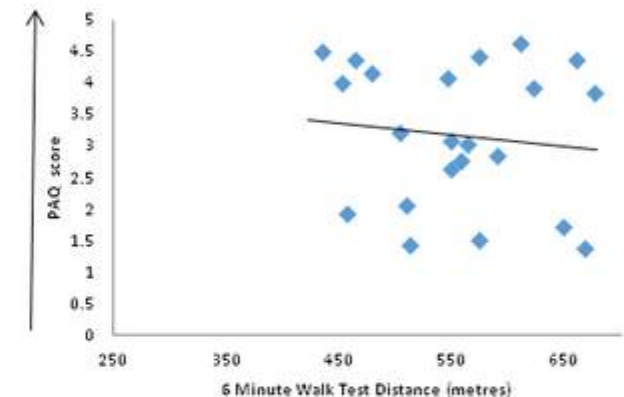
Burn location did not significantly alter performance (all  $p < 0.38$ ).

#### Physical Activity Levels

Participants PAQ scores ranged from 0 – 4.58/5 (mean 2.98, SD 1.30) suggesting high variability in the physical activity levels of children with burns. A moderate non-significant correlation was found between physical activity levels and 6 minute walk distance ( $r^2 = 0.43$ ,  $p = 0.05$ ).



**Figure 1.** 6 Minute Walk Test distance of children and adolescents with lower limb burn injury of various locations and overall results compared to unaffected peers<sup>1</sup>. Values are means  $\pm$  SD. \* indicates statistically significant at  $p < 0.05$ .



**Figure 2.** Correlation between 6 Minute Walk Test distance and Physical Activity Questionnaire (PAQ) score. Higher PAQ scores indicate greater activity levels, while lower scores indicate lower activity levels.

### CONCLUSION

Cardiovascular fitness is reduced in children and adolescents 3 – 6 months post lower limb burn injury, irrespective of burn location.

Physiotherapy interventions should focus treatment on reconditioning to address these impairments.

### REFERENCE

1. McKay MJ, Baldwin Jn, Ferreira P, Simic M, Vanicek N, Burns J. Reference Values for Developing Responsive Functional Outcome Measures Across the Lifespan. *Neurology*. 2017;88:1-8