

## Peer J review: **Practical Guidance for Firefighter Applicants Preparing for Cardiorespiratory Fitness Testing: A Secondary Analysis of Self-reported Physical Activity Levels**

### **Introduction:**

Line 41: 'puts them in harm's way daily to safe others' life'. There is a typo in this sentence but I also think it needs to be revised as it is too colloquial for scientific publication. I suggest specifying what is meant by 'harm's way'

Line 43: 'places an enormous strain on the body'. This sort language is emotive rather than backed up by evidence. I suggest consider rewording to better define the word 'enormous'. i.e what sort of strain are we talking about here?

Line 44: 'Firefighter work environments also contain toxic chemicals that may contribute to the development of heart disease over time (Kristensen, 1989)'. The connection between this toxic chemical and sudden cardiac death needs to be better explained. Are saying that this is a cause a death in firefighters? What evidence is there for this? The way it is currently written is a bit misleading.

Line 47: 'accounting for approximately 44% of all firefighter on-duty fatalities'. Is this across the world or country specific. It is important these stats are clearly articulated to help the reader understand the severity

Line 64: 'of 41.5 ml·kg<sup>-1</sup>·min<sup>-1</sup> which was, on average, equivalent to 85% of the participants  $\dot{V}O_{2max}$ . Accordingly, values between 42.5 and 45.0 ml·kg<sup>-1</sup>·min<sup>-1</sup> have been widely accepted across Canada where Newfoundland and Labrador adopted the value of 42.5 ml·kg<sup>-1</sup>·min<sup>-1</sup> as their minimum standard for firefighter applicants, which was used as the cutoff value in the current secondary analysis.' It could be argued that a value of 42.5 ml.kg.min is higher than 41.5ml.kg.min. I think a better description of how this value was determined is required as this forms the foundations for the current study.

There is a very important question that needs to be addressed - Why is the current minimum fitness standard based on a running test and not a simulation?

### **Material and methods**

Line 85: Please specify the mode of exercise for the gxt – i.e running or cycling, on a treadmill or on a bike.

Line 151: 'Raw data from the GXT were smoothed over a 30-second moving average to determine applicants' maximal physiological values'. Is this commonly done to determine maximal physiological values? A reference here is warranted.

### **Results**

Line 229: Suggest including referencing table 1 in this paragraph as it shows who was in each SG and UG – i.e mean age height etc.

## Discussion

Inclusion of an opening paragraph that highlight the main findings and significance would be beneficial rather than going straight into physical characteristics

Line 251: 'Whereas the height of applicants was almost identical between groups, SG were on average three years younger and it included the youngest applicant while UG included the oldest applicant'. I agree that this is not practically significant and I suggest the authors revise this sentence so it is not misleading.

I agree with the premise that heavier individuals are likely to have lower vo<sub>2</sub> max values when expressed relative to body mass. This poses a really important question – are these individuals unable to work as fire fighters? I think you have provided more evidence that a task specific simulation is more appropriate than an unweighted running test that does not look anything like the job tasks. I think this should be included in the discussion.

The exercise training section needs to be backed up by more references. This is the most significant aspect of the manuscript since the authors sort to identify specific training protocols that benefited applicants. There is currently a lot of text around the benefits of strength training on cardiovascular fitness but with little supporting evidence from previous published work. I suggest the authors look to incorporate this into the discussion here.

As an overall comment for the discussion, I have counted 3 references. This is currently insufficient. As written, I see these sections as observations rather than explaining them.