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Jarvis, Hannah and Reeves, Neil and Brown, Steve and Price, M and Butterworth, C and Jackson, K and Groenevelt, R and Walker, L and Rees, N and Clayton, A (2019) Stroke in Young Adults: Walking speed as an indicator for return to work. In: European Stroke Organisation Conference, 22 May 2019 - 24 May 2019, Milan, Italy.

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**Downloaded from:** <http://e-space.mmu.ac.uk/624531/>

**Publisher:** SAGE Publications

**DOI:** <https://doi.org/10.1177/2396987319845578>

Please cite the published version

<https://e-space.mmu.ac.uk>

AS08-048

## STROKE IN YOUNG ADULTS: WALKING SPEED AS AN INDICATOR FOR RETURN TO WORK

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### Background and Aims

One in ten adults who experience a stroke are under the age of fifty years. Most are unable to return to employment or participate in social activities from their difficulties walking. No research study has comprehensively analysed how a stroke affects walking performance or efficiency in young adults. This study aimed to investigate how a stroke in young adults affects walking performance and energy cost during walking compared to healthy age-matched controls.

### Methods

Participants who had experienced a stroke (18-40years: n = 6, 41-54years: n = 20, 55-65years: n = 15) and controls (n = 15) were recruited from six health boards in Wales, UK. Type, location and cause of stroke, occupation and smoking status were recorded. Walking performance was measured using three-dimensional gait analysis and energy cost through measurement of energy expenditure during three minutes of walking.

## Results

Stroke participants walked slower and had a higher energy cost of walking than control (Figure 1a and 1b). 96% were in full-time employment pre-stroke, but only 22% returned to employment post-stroke. Those who returned to employment post-stroke walked significantly faster, with lower energy cost and with greater walking symmetry than those who did not return to employment (Figure 2).

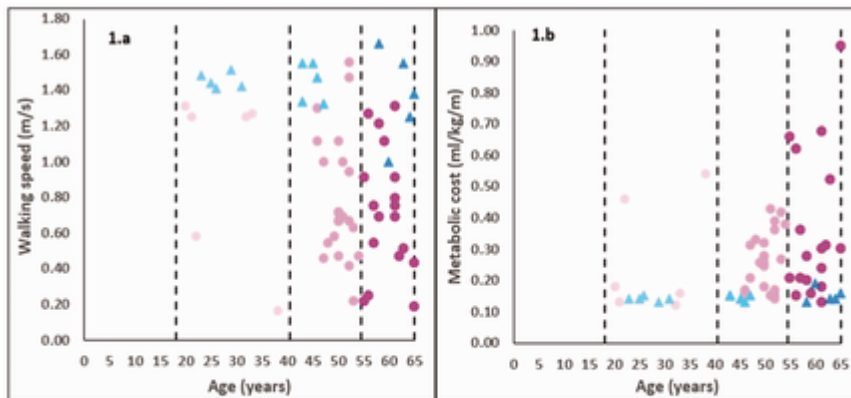


Figure 1a presents a correlation between age and walking speed ( $r = -0.216$  ( $p = 0.145$ )) and Figure 1.b presents a correlation between age and metabolic cost of walking ( $r = 0.246$  ( $p = 0.100$ )). Pink circles represent stroke participants and blue triangles represent controls with light colour representing 18-40years, medium colour 41-54years and dark colour 55-65years. Vertical black dotted lines represent age groups.

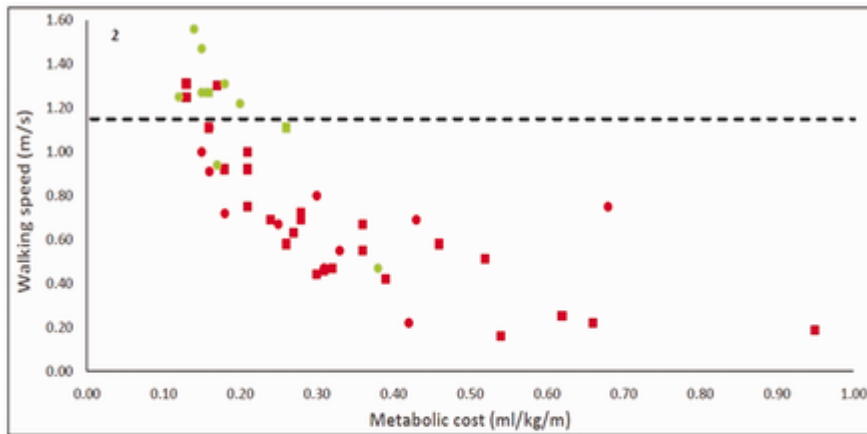


Figure 2 presents a correlation between walking speed and metabolic cost of walking ( $-0.862$  ( $p < 0.001$ )) for stroke participants. Red represents participants who are unemployed, and green represents participants who are employed. Squares represent participants with an affected upper limb post-stroke and circles represent participants who do not have an affected upper limb post-stroke. This suggests that walking speed is potentially a greater determinant of return to work than upper limb function. Black dotted horizontal line represents walking speed (1.15m/s) cut off.

## Conclusions

Young adults who have had a stroke and are unable to walk faster than  $\sim 1.15$ m/s post stroke are unlikely to return to work post-stroke. It is recommended that walking speed is used as an indicator of performance post stroke. Rehabilitation for return to work should be aimed at increasing walking speed and reducing energy cost.