

Efficiency of Movement

Muscle temperature

Contraction speed

Mechanical efficiency

Neuromuscular function

Temperature and Velocity Interactions

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The Investigation

Objectives

- To investigate how contraction speed and muscle temperature influences the efficiency of locomotory performance in the older population
- To investigate the neuromuscular mechanisms that underpin skeletal muscle performance in the older population

Plan

Design

A series of exercise experiments will be performed under control muscle temperature conditions (~34°C) and after the limbs have been passively heated (~38°C).

Participants

Young: females between 18 and 35 years

Older: females between 75 and 85 years

Protocol

6 minute exercise bouts at a moderate intensity will be performed on a cycle ergometer at 4 contraction frequencies (30, 45, 60 and 90 rpm).

Measurements

- Mechanical efficiency
- Neuromuscular activity
- Muscle fibre composition

References

Ferguson, R. A., Ball, D. & Sargeant, A. J. (2002). Effect of muscle temperature on rate of oxygen uptake during exercise in humans at different contraction frequencies. *Journal of Experimental Biology* 205, 981-987.

Partners

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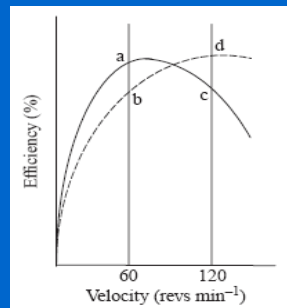
Potential Benefits

For older people

By understanding the factors that influence efficiency of movement we can provide important information that can be applied in ways that could further improve the efficiency of locomotion through specific training and rehabilitation programmes, as well as interventions that influence body temperature.

For society

This work will contribute to the understanding of why there is a decline in the mobility of older people which can have a major impact on the quality of life and ultimately increase the need for residential care.



Schematic representation of the changes in the efficiency-velocity relationship under normal (solid line) and increased (dashed line) muscle temperature conditions.



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