

# The Influence of Blood Flow Restriction on the Time to Reach Oxygen Uptake Kinetics Between Males and Females



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## Introduction

### Blood flow restriction (BFR) training

Externally restricts arterial & venous blood flow  
Induces hypoxia and metabolic stress

#### Anaerobic

**Consistent Positive & Clear Findings**  
(Slysz et al., 2016 [1];  
Labarbera et al., 2013 [2])

#### Aerobic

**Inconsistent Varied & Unclear Findings**  
(Borges et al., 2021 [3];  
Yang et al., 2022 [4])

**Oxygen Uptake Kinetics** – rate at which you adapt to increased oxygen demands of exercise

### Physiological Advantages Males:

- Type II Muscle Fibres
- Lung Capacity
- Left Ventricle Size
- Red Blood Cell/Haemoglobin
- Arterial Stiffness



## Results

Figure 1: Comparing Male vs Female Time to Reach 63% of Oxygen Uptake Kinetics with and without BFR.

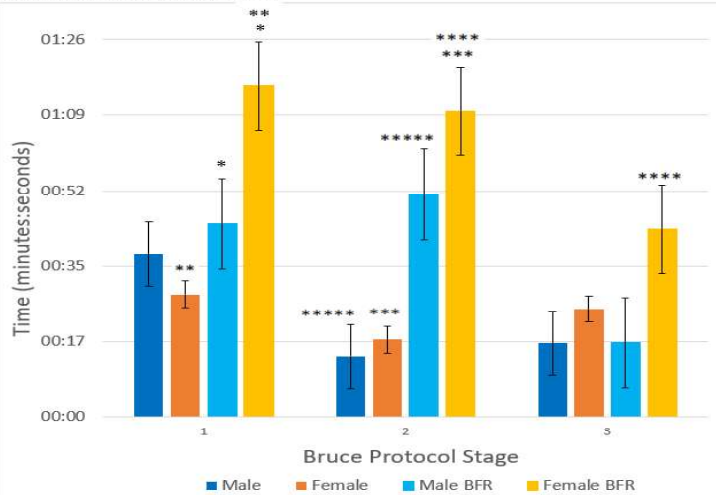


Figure 3 Key:

\* = P value 0.00 \*\* = P value 0.00 \*\*\* = P value 0.00 \*\*\*\* = P value 0.02 \*\*\*\*\* = P value 0.04

**No significance between M & F Control Trial (P = 0.89)**  
**Significance between M & F BFR Trial (P = 0.02)**

## Discussion



**Females take significantly longer to reach 63% of oxygen uptake kinetics when undergoing BFR**

**Males adapt to the metabolic stress & oxygen deficit by BFR more efficiently (physiological influences)**

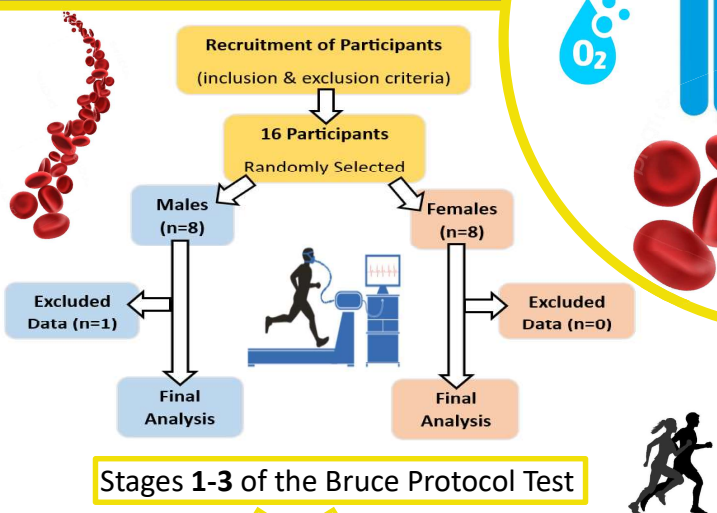


**Control Trial Oxygen Uptake M vs F Difference: 9 seconds**

**BFR Trial Oxygen Uptake M vs F Difference: 77 seconds**

Limitations – Direct Gender Effects **OR** Aerobic Capacities?

## Methods



**Control 10mmHg**

**BFR 80% Systolic Blood Pressure**

**On Both Quadriceps, above the Rectus Femoris Muscle**



## References

- [1] Slysz, J., Stultz, J., & Burr, J. F. (2016). The efficacy of blood flow restricted exercise: A systematic review & meta-analysis. *Journal of science and medicine in sport*, 19(8), 669-675. [2] Labarbera, K. E., Murphy, B. G., LaRoche, D. P., & Cook, S. B. (2013). Sex differences in blood flow restricted isotonic knee extensions to fatigue. *The Journal of sports medicine*, 53(4), 444-452. [3] Borges, R. F., Chiappa, G. R., Muller, P. T., de Lima, A. C. G. B., Cahalin, L. P., Cipriano, G. F. B., & Cipriano Jr, G. (2021). Moderate-intensity exercise with blood flow restriction on cardiopulmonary kinetics and efficiency during a subsequent high-intensity exercise in young women: A cross-sectional study. *Medicine*, 100(31). [4] Yang, Q., Li, D. Y., He, J. X., Zhang, Z. Y., Zhu, H. W., Li, G. X., ... & Sun, J. (2022). Influence of blood flow restriction training on the aerobic capacity: a systematic review and meta-analysis. *Journal of Men's Health*, 18(3).

