Exercise Training Recommendations for Adults With and Without Chronic Disease to Improve Endothelial Health

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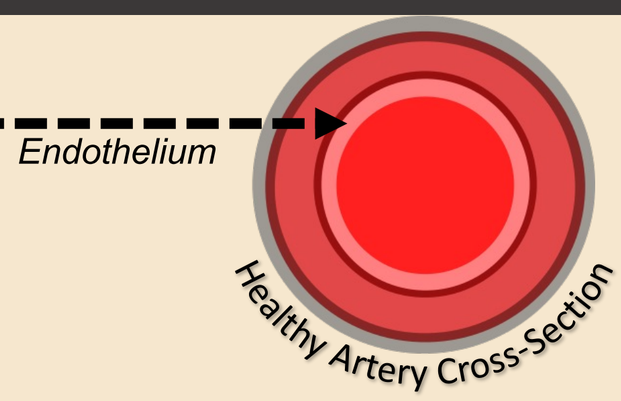
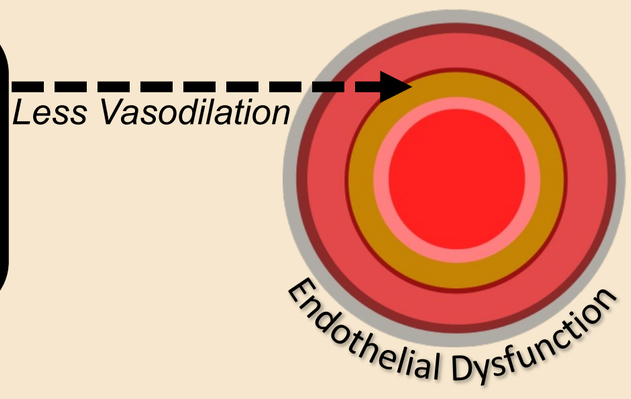
The **endothelium** is the innermost layer of blood vessels. Endothelial cells are highly responsive to changes in blood flow and produce chemicals that regulate arterial diameter.



THE ISSUE:

Dysfunction of the endothelium is a key precursor of **cardiovascular disease**. Specific exercise training interventions that may mitigate this dysfunction are unclear.



POTENTIAL SOLUTIONS:

Based on reviewing existing evidence, exercise training can ↑ endothelial function in:

- Type 2 Diabetes Mellitus
- Cardiovascular Conditions
  Example: Peripheral artery disease, heart failure, etc.
- Healthy Adults

RECOMMENDATIONS

Type 2 Diabetes Mellitus

Exercise recommendation:

- Low-moderate intensity resistance training
- Low-moderate intensity aerobic training
  Example: slow to brisk walking being able to maintain conversation but not sing

Cardiovascular Conditions

Exercise recommendation:

- Higher intensity aerobic training
  Example: running/jogging or swimming laps, not being able to say more than a few words without pausing for a breath

FOR BETTER ENDOTHELIAL HEALTH

Healthy Adults

Exercise recommendation:

- Frequent low-moderate intensity resistance training
  Example: lifting 8-12 repetitions of a load you could do a max of ~15 repetitions with
- Higher intensity aerobic training

Other Chronic Conditions

Exercise improves endothelial function in other chronic conditions (i.e., cancer and autoimmune rheumatic disease) but specific recommendations are unclear.

TAKE-AWAYS

Exercise recommendations to promote endothelial health for adults with and without chronic disease are based on a **high level of evidence.**

Movement is beneficial for endothelial health.

Exercise recommendations to optimally ↑ endothelial health vary between disease condition.

This information may help guide the design of specific exercise programs.

Presented information is based off an umbrella review of 27 reviews including 5464 unique participants (10.1007/s40279-023-01837-w).