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Central hemodynamics and arterial health research insights

Sports Medicine Edition

107 papers and abstracts
published between 2014-2024*

Here are some of the highlights.

Collegiate Football & Cardiovascular Risks | June 2023

Longitudinal Aortic Root Dilatation in Collegiate American-Style Football Athletes

Aortic dilatation and cardiovascular risk are common among retired professional American-style football (ASF) athletes, while the impact on younger athletes is not fully understood. A team

led by Jason Tso at Emory University conducted the first longitudinal analysis of aortic root size in 247 collegiate ASF athletes. They found that over their collegiate careers, these athletes exhibit progressive aortic root dilatation associated with cardiac and vascular functional impairment.



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Impact of Exercise Intensity | October 2020 and Frequency

Association of the Amount and Pattern of Physical Activity With Arterial Stiffness: The Maastricht Study

A group led by Evelien Vandercappellen from Maastricht University analyzed data from 1,699 subjects to examine the associations between higher intensity physical activity and arterial stiffness. They found that higher intensity physical activity was associated with lower carotid-femoral pulse wave velocity, regardless of whether the activity was performed regularly throughout the week or only on weekends. These findings suggest that incorporating higher intensity physical activity into one's routine, even if only on weekends, can effectively reduce arterial stiffness and improve cardiovascular health.



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Left Ventricular Structural Remodeling | March 2012

Left Ventricular Mechanics in Humans with High Aerobic Fitness: Adaptation Independent of Structural Remodelling, Arterial Haemodynamics and Heart Rate

A research team led by Eric Stöhr examined the relationship between left ventricular (LV) mechanics and cardiovascular variables in healthy young individuals with varying aerobic fitness levels. Despite similar cardiovascular demand and output between moderate and high fitness groups, individuals with high aerobic fitness exhibited lower LV strain and rotation at rest. This indicates reduced stress on the heart muscle and more efficient cardiac function. This finding suggests potential benefits for exercise training in older individuals and patient populations.



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Spinal Cord Injury | September 2019

Effects of Robotic-Assisted Gait Training on the Central Vascular Health of Individuals with Spinal Cord Injury: A Pilot Study

James Faulkner and colleagues explored the use of robotic-assisted gait training (RGT) with an exoskeleton in individuals with spinal cord injury (SCI). They demonstrated that five consecutive days of RGT can decrease arterial wave reflection and mean arterial pressure in individuals with SCI. This suggests that robotic exoskeletons have the potential to increase physical activity and reduce sedentary time, thereby improving functional and health outcomes in individuals with SCI.



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Aerobic vs. Resistance Training | April 2024

Aerobic, Resistance, or Combined Exercise Training and Cardiovascular Risk Profile in Overweight or Obese Adults: The CardioRACE Trial

In a randomized controlled trial, Duck-chul Lee and his colleagues studied 406 adults aged 35–70 years with overweight or obesity and elevated blood pressure to examine the effects of resistance, aerobic, and combined exercise on cardiovascular disease risk factors.

They found that aerobic exercise alone, or combined with resistance exercise, improved the composite CVD risk profile of the participants, whereas resistance exercise alone did not.

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Racial Differences in | April 2023
Autonomic Recovery

Racial Differences in Blood Pressure and Autonomic Recovery Following Acute Supramaximal Exercise in Women

High-intensity interval exercise offers various health benefits and can help manage chronic conditions. Nicole Bajdek and colleagues compared blood pressure and autonomic recovery in Black and White women following

supramaximal exercise. They found that Black women had higher blood pressure and lower heart rate variability compared to White women, suggesting the potential need for personalized exercise plans based on race.

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As of May 2024, results from PubMed Central using “SphygmoCor” as the search term.

Yoga & Arterial Stiffness | May 2023

Association Between Yoga Participation and Arterial Stiffness: A Cross-Sectional Study

Yoga has been proposed as a useful non-pharmacological treatment for improving vascular health, especially for older individuals and those unable to engage in high-intensity aerobic exercise. A research group led by Tilak Raj studied 383 participants to determine yoga's impact on aortic health.

They found that yoga participants had significantly lower carotid-femoral pulse wave velocity after adjusting for age, sex, mean arterial pressure, and resting heart rate.



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Beyond the Lab | March 2016

Evaluation of Cardiovascular Risk-Lowering Health Benefits Accruing from Laboratory-Based, Community-Based and Exercise-Referral Exercise Programmes

A team led by Richard Webb conducted three studies to assess the impacts of laboratory-based, community-based, and exercise-referral programs on cardiovascular health. They found that while the laboratory-based program achieved more intense exercise and more pronounced beneficial effects, significant cardiovascular risk-lowering benefits related to biomolecular markers, blood pressure, arterial stiffness, and blood lipids were also achieved through both community and referral-based delivery modes. Furthermore, the team found that regular exercise over periods of more than 8 weeks can lead to sustained changes in gene expression related to cardiovascular health.



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