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Integrative Exploration of Cardiorespiratory Interactions: An Interdisciplinary Study

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Cardiorespiratory interaction refers to the complex and dynamic interplay between the cardiovascular and the respiratory systems. This interaction is essential for maintaining homeostasis and optimizing the body's responses to various internal and external stimuli. Disorders that affect either the heart or lungs can disrupt this crucial relation. For example, heart failure can impair the ability of the heart to pump effectively, which can lead to inadequate oxygen delivery and respiratory distress. Conversely, pulmonary diseases can lead to impaired gas exchange and increased cardiac workload.

Studying interactions, especially their impact on heart rate dynamics, is essential to understand the mechanisms of cardiovascular abnormalities and crucial for better prevention, diagnosis and management of diseases that comprise respiratory, cardiovascular and autonomic nervous systems.

However, most of the known cardiorespiratory interactions require further investigation. The results of current research mainly concern healthy individuals and little is known about changes of interactions at the initial stage of cardiovascular disease. There is particularly not enough data on this topic when the respiratory pattern is irregular or changes over time.

The talk will present our study on the role of alterations in breathing patterns in cardiovascular disease. The study design, including its interdisciplinary approach, as well as results from both human and animal studies, will be discussed.