

Diastolic Dysfunction: Uncovering its Cause and Finding its Solution

Heart failure affects 15 million patients worldwide. Fifty percent of these failures are caused by *poor contraction* of the ventricle (systolic dysfunction) that pumps blood throughout the body. But the other half have *poor filling (diastolic dysfunction)* of blood into the ventricle – despite there being normal heart contraction.

Yet outcomes are similarly grim. As discussed in other chapters, a dilated poorly contracting heart improves by restoring its stretched spherical shape (like a basketball) back into its normal elliptical form (like a football). But there has been uncertainty in how to treat *diastolic dysfunction* because its mechanical causes have been unknown.

Understanding Paco's "helix and wrap" structure solves this problem.

Many think ventricles fill with blood simply due to a *pressure difference* between the atrium (where the blood comes from) and the ventricle. But we found that *suction* accounts for most of filling (70%). This happens during the first 1/3 of the period when the heart relaxes (while the pressure difference between the atrium and ventricle is only 3 mm Hg). The key is that half of suction's vacuum develops just before filling starts, and is caused by how the figure-eight helix arms and its surrounding wrap interact.

A problem occurs when the ventricle's pumping of blood during a heartbeat lasts longer than it is supposed to (due to a prolonged inner arm contraction). This shortens the available time for suction to fill – and diastolic dysfunction develops.

While diastolic dysfunction can sometimes be reversed by aortic valve replacement (due to narrowed valves)... we found the underlying cause is usually a defect in how calcium moves within the heart's cells (calcium influences contraction and relaxation). A promising new drug called Cariporide was created that uniquely prevented calcium buildup. Unfortunately, the expensive pharmacological trial to confirm its benefits failed after the manufacturer disregarded advice from the study's steering committee.

Hopefully interest in similar drugs will develop and research can be pursued. But at the moment, diastolic dysfunction's cause (helix and wrap dynamics) and curative drug (Cariporide) are neither taught in medical school, nor are they known by the cardiologists who currently treat these 7.5 million suffering patients.

Summary of Chapter 22 from the book:

SOLVING THE MYSTERIES OF HEART DISEASE
Life-saving Answers Ignored by the Medical Establishment

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