

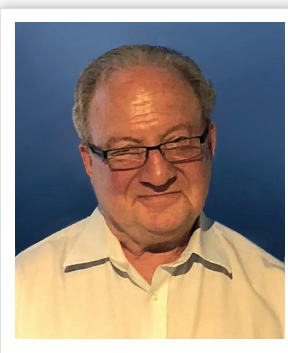
# Measuring between Heartbeats

**Cutting-edge medical equipment is helping Dr. Gary Murray save lives.**

**C**ardiologist Dr. Gary Murray likes to quote the ancient Chinese physician Wang Shuhe, who 1,700 years ago wrote, "If the pattern of the heartbeat becomes as regular as the tapping of a woodpecker...the patient will be dead in four days."

Although woodpeckers are obsolete diagnostic tools, Wang Shuhe's claim is scientifically sound. He was measuring heart rate variability (HRV): the time between heartbeats, which is dictated by the sympathetic (fight or flight) and parasympathetic (rest) nervous systems. A high HRV indicates a healthy heart, while a low HRV denotes a relentlessly beating heart that's at risk for cardiovascular disease and death.

HRV is easily measured, but the parasympathetic and sympathetic values it's comprised of are harder to determine—yet they are also more revealing about a patient's health, says Dr. Murray. This was something he discovered in 2006, when a medical equipment salesman sold him an intriguing machine that calculates parasympathetic and sympathetic values. Today, he can't imagine running his practice without it.



Dr. Gary Murray

what I've learned over the last 16 years, which is that the autonomic system has an enormous impact on the heart in terms of the progression of cardiac diseases."

After studying a cohort of 483 cardiology patients over five years, Dr. Murray identified the precise sympathetic value that leads to poor heart rate variability. "The line in the sand is a sympathovagal balance of 2.5," Dr. Murray says. "Anything over that, and people are seven times more likely to have a major adverse cardiovascular event."

He then attempted to tweak a patient's sympathetic value—which he theorized would head off cardiac events. "The heart is particularly sensitive to oxidative stress, which underlies most major adult cardiac diseases including diabetic autonomic neuropathy," Dr. Murray says. In a 12-year study of approximately 130 diabetics, he found that doses of (R) alpha lipoic acid (ALA), an over-the-counter antioxidant, reduced the risk of sudden death from diabetic autonomic neuropathy by 43%. "I found that ALA corrects bad sympathovagal numbers and stops nerve damage," he says.

Merging cardiology and neuropathy is what makes Dr. Murray's practice unique. "Only 30 cardiologists in the country have this machine, and only five people in the world are publishing papers about it—including me," he says. "This test is not in the hands of the people who could intervene and prevent people from dying. I'm just glad I have it."

## Merging Two Disciplines

The Physio PS Inc. Parasympathetic and Sympathetic (P&S) Monitor system, a machine developed by teams at MIT and Harvard, is composed of a small computer attached to an electrocardiogram with leads that measure a patient's breathing. After a few simple breathing exercises, the

machine calculates a patient's parasympathetic and sympathetic values.

Though a tool for neurologists, the P&S Monitor gathers unique data that helps Dr. Murray diagnose and treat cardiology patients. "Cardiologists typically have no training in the autonomic nervous system," he explains. "That's incredible to me because of



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