Heart Rate Variability

The heart must respond to the body’s needs. So its rate varies from moment to moment, relative to respiration, physical activity, the sleep cycle, and other factors. Determining the organ’s ongoing functional variability — a key indicator of health — requires long-term measurements, computer-driven calculations and detection of subtle cyclical patterns. Such exacting, complex work yields links to disease, and within the data lie indications of a person’s risk for sudden death. This data collection, analysis and correlation with various disease risks is the work of the Heart Rate Variability Lab.

A patient wears a portable heart monitor (above) for up to 24 hours. The device records data that is later downloaded to a computer for detailed analysis (right). The computer decodes seas of data that must then be painstakingly analyzed. This number crunching reveals telltale patterns of heart rate variability.

24 hours = 100,000+ heartbeats!

This variation indicates the onset of sleep apnea. Someday, overnight heart monitoring could routinely be used to identify those who need treatment for sleep apnea.

Patterns of normal heart rate variability (left) and abnormal variability (right). The hearts on the right are not responding appropriately. Like an orchestra missing the maestro’s cues, these hearts are out of sync with the rest of the body — although here the results could be deadly.