Heart Rate Variability (HRV) Signal Analysis: Clinical Applications

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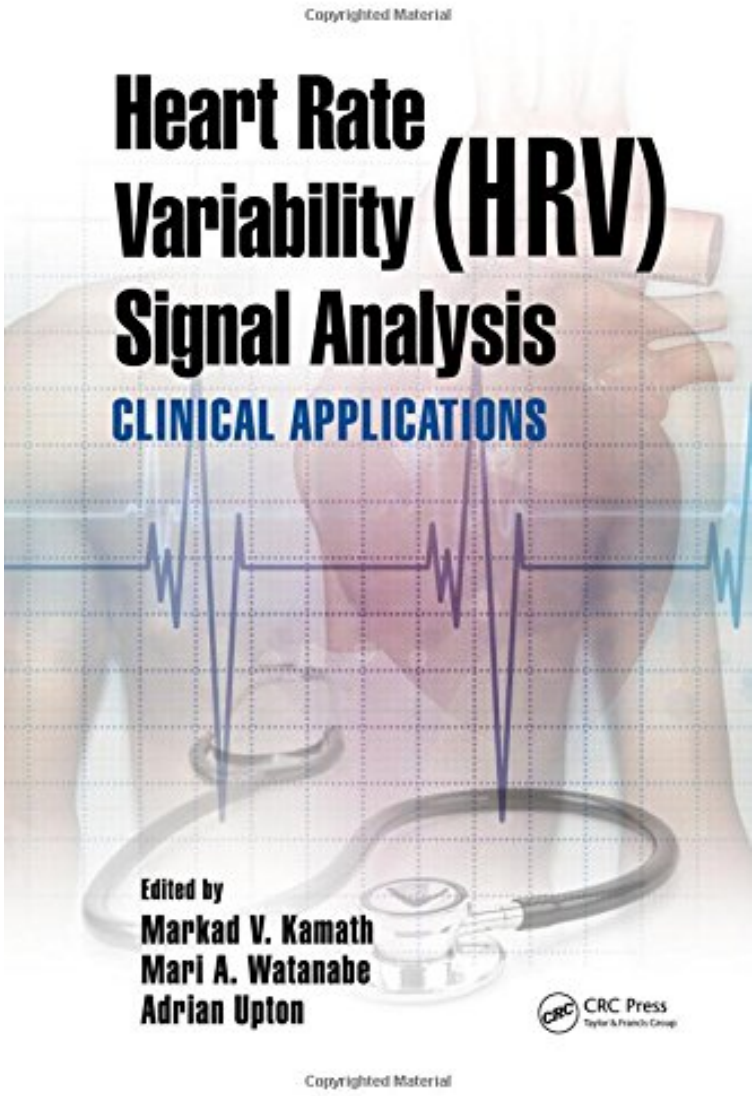

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From CRC Press : Heart Rate Variability (HRV) Signal Analysis: Clinical Applications before purchasing it in order to gage whether or not it would be worth my time, and all praised Heart Rate Variability (HRV) Signal Analysis: Clinical Applications:

Open a Window into the Autonomic Nervous System Quantifying the amount of autonomic nervous system activity in an individual patient can be extremely important, because it provides a gauge of disease severity in a large number of

diseases. Heart rate variability (HRV) calculated from both short-term and longer-term electrocardiograms is an ideal window into such autonomic activity for two reasons: one, heart rate is sensitive to autonomic activity in the entire body, and two, recording electrocardiograms is inexpensive and non-invasive unlike other techniques currently available for autonomic assessment, such as microneurography and metaiodobenzylguanidine (MIBG) scanning. Heart Rate Variability (HRV) Signal Analysis: Clinical Applications provides a comprehensive review of three major aspects of HRV: mechanism, technique, and clinical applications. Learn Techniques for HRV Signal Analysis Edited by an engineer, a cardiologist, and a neurologist, and featuring contributions by widely published international researchers, this interdisciplinary book begins by reviewing the many signal processing techniques developed to extract autonomic activity information embedded in heart-rate records. The classical time and frequency domain measures, baroreceptor sensitivity, and newer non-linear measures of HRV are described with a fair amount of mathematical detail with the biomedical engineer and mathematically oriented physician in mind. The book also covers two recent HRV methods, heart-rate turbulence and phase-rectified signal averaging. Use of HRV in Clinical Care The large clinical section is a must-read for clinicians and engineers wishing to get an insight into how HRV is applied in medicine. Nineteen chapters altogether are devoted to uses of HRV in: Monitoringfor example to predict potential complications in pregnancies, fetal distress, and in neonatal critical care Acute carefor gauging the depth of anesthesia during surgery and predicting change in patient status in the intensive care unit Chronic disordersfor assessing the severity of congestive heart failure, stroke, Parkinsons disease, and depression Bringing together the latest research, this comprehensive reference demonstrates the utility and potential of HRV signal analysis in both the clinic and physiology laboratory.

About the AuthorMarkad V. Kamath, Ph.D. is a professor in the department of Medicine, with associate memberships in the Computing and Software Engineering and Electrical and Computer Engineering departments at McMaster University, Hamilton, Ontario, Canada. He received a B.Eng. from Karnataka Regional Engineering College (now the National Institute of Technology), India, a Ph.D. in biomedical engineering from the Indian Institute of Technology (Madras), and a Ph.D. in medical sciences from McMaster University. He is the editor of the journals Critical s in Biomedical Engineering and Critical s in Physical and Rehabilitation Medicine and the founding editor of Visualization, Image Processing and Computation in Biomedicine. He is a registered professional engineer in the province of Ontario, Canada. Mari A. Watanabe, M.D., Ph.D., is currently an assistant professor in the cardiology department at St. Louis University. She received her M.D. from Nippon Medical School in Tokyo and Ph.D. in physiology and applied mathematics from Cornell University. She has conducted research in cardiology, mathematics and physics at various institutions, including the University of Pennsylvania, Beth Israel Deaconess Medical Center in Boston, University of Utah, and Glasgow University in Scotland. She has received research grants from the American Heart Association, National Institute of Health and British Heart Foundation. She publishes papers in both clinical and basic science journals. Adrian R.M. Upton, M.D., FRCP(C), FRCP(E), FRCP(G), is a professor of medicine at McMaster University. Dr. Upton qualified as a physician in the United Kingdom and has held a number of senior positions, including the director of the neurology department and director of the Diagnostic Neurophysiology Laboratory at Chedoke-McMaster hospitals, Canada. He has published over 400 papers in areas such as autonomic stimulation, evoked potentials, electroencephalography and electromyography, among others. He has also trained many student physicians, residents, graduate students, and post-doctoral fellows. He holds 12 patents.