A Method for generating an artificial RR tachogram of a typical healthy human over 24-hours

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Abstract

An algorithm that generates realistic synthetic 24-hour RR-tachograms by including both cardiovascular interactions and transitions between physiological states is presented. Fluctuations in the beat to beat RR-intervals of a normal healthy human over 24 hours are known to exhibit variability on a number of different time scales. Short range variability due to Mayer waves and RSA are incorporated using a power spectrum with given spectral characteristics described by its low and high frequency components. Longer range fluctuations arising from transitions between physiological states are generated using switching distributions extracted from real data. These physiological states, including sleep states, are specified using RR intervals with different means, variances and trends. This algorithm provides RR tachograms that are similar to those in the MIT-BIH Normal Sinus Rhythm Database. The resulting artificial RR times series generator was submitted for part 1 of the Physionet/Computers in Cardiology Challenge 2002 with entry number 201.