

We describe a novel algorithm for identification of sleep/wake periods based on actigraphy signals designed to be used for a proper estimation of ambulatory blood pressure monitoring (ABPM) parameters. Automatic and accurate determination of sleep/wake periods is critical in cardiovascular risk assessment applications including the evaluation of dipper vs non-dipper status and diagnosis of hypertension. The algorithm is based on adaptive rank-order filters, rank-order decision logic, and morphological processing. The algorithm was validated on a database of 104 subjects including actigraphy signals for both the dominant and non-dominant hands (i.e. 208 actigraphy recordings). The algorithm achieved a mean performance above 94% with an average number of 0.04 invalid transitions per 48 hours.