

## Heart Congress 2017-Variability of Pulmonary Blood Pressure, Splitting of the Second Heart Sound and Heart Rate- L Hamza Cherif, University Aboubekr, Algeria

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### Introduction

The heart rate increases during inspiration and decreases during expiration. The respiratory sinus arrhythmia (RSA) is a natural variation in heart rate that occurs during a respiratory cycle on an electrocardiogram this phenomenon is considered too subtle changes in the RR interval synchronized with the respiration. The RR interval on an ECG is reduced during inspiration and prolonged during expiration. The following figure 1 shows the anatomy of the heart. Against the phonocardiogram by changing the interval (split) between the aortic and pulmonary component in a normal subject is indicative since the split increases with inspiration and decreases with expiration. RSA becomes less important with age, diabetes and cardiovascular disease. The following shows the variation of the RR interval of an inspiration accompanied by a change in the split of the second heart sound. Consideration rhythmic variations in cardiovascular disease may better understand the pathophysiological mechanisms involved. Pulmonary hypertension is often accompanied by disturbances of the circadian rhythm of arterial pressure. It has been shown that the reduction in the variability of the heart rate after a myocardial infarction is a predictor of mortality and serious arrhythmias independent of other predictors. The study of the change in pulmonary arterial systolic pressure (PASP) in a same cardiac pathology is indicative. The respiratory sinus arrhythmia may be experiencing cardiac arrhythmia connected to breathing. HLs arrhythmia is observable by the heart rate variability. Generally, the heart rate increases during inspiration and decreases during expiration. The respiratory sinus arrhythmia is recognized as an index of parasympathetic activity. HLs idea was proposed by Pagani et al. [4]. Although this concept is used in many studies, it nevertheless emerges from observations without definitely know the origins. Indeed, the origins of the respiratory sinus

arrhythmia are not yet clearly identified and are the source of considerable debate within the scientific community. The three hypotheses that are proposed by the scientific community are: The direct influence of medullary respiratory neurons of neurons cardio engines; . The indirect influence of changes in heart rate and arterial pressure in response to respiratory movements via arterial baroreceptors. A reflex directly in response to lung expansion.

In the first phase we will focus on the study of variation of the heart rate during a period which comprises a plurality of cardiac cycles and the relation of this variation with the change in the split of the second heart sound S2 and the change of the estimated SPAP. It is therefore important to isolate the sound S2 of each PCG signal studied using the separation algorithm based on segmentation PCG signal [15,16]. The location moments of beginnings and ends of each S2 sound allows us to appreciate the duration of the cardiac cycle, From the results obtained, we can calculate the average duration of the cardiac cycle (over several cardiac cycles), then the frequency heart which is shown in beats per minute (bpm). (S2 is taken as a benchmark in all these calculations). As a result we will calculate the split of the second heart sound S2 by the application of the developed algorithm. The ASP will be estimated from the spectral parameters of the S2 sound conducted for each of the noise signal S2.