**THE “SYSTOLIC VOLUME BALANCE METHOD” FOR THE NON-INVASIVE ESTIMATION OF CARDIAC OUTPUT BASED ON PRESSURE WAVE ANALYSIS**

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**INTRODUCTION**

Monitoring of cardiac output (CO) is essential for the optimal management of patients. Either intraoperatively or in the settings of an intensive care unit, CO provides valuable insight for systemic O2 delivery and global tissue perfusion. Furthermore, monitoring of SV variation provides important information for the optimisation of diagnosis and treatment [1].

**MOTIVATION**

Widely used “pulse contour CO” (PCCO) methods are still based on invasive recording of arterial pressure waves or require invasive hemodynamic measurements for calibration purposes [2,3].

**AIMS**

- Develop a simple method for monitoring CO that requires only non-invasive tonometry measurements
- Compare CO trend estimation versus a commercial device (Nexfin, Edwards Lifesciences)

**RESULTS**

The SVB and eSVB methods presented the highest correlation and agreement and resulted in the lowest variation and error bias when compared with the “real” CO computed by the model. In all subjects the SVB presented good agreement in detecting CO trends versus Nexfin. The mean value of trend agreement was 75%.

**DISCUSSION AND CONCLUSIONS**

The proposed SVB method and the simplified eSVB, presented good accuracy and were superior when compared against other methods with in silico waveforms. The CO-trend estimation of the SVB correlated well with the CO trends reported by the Nexfin device for 6 in vivo data acquisitions. Further in vivo validation studies remain to be conducted in order to validate the performance of these methods in the clinical environment.

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