

Poster III, Miscellaneous, Robotics and Innovations II

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PIII1: ACCURACY OF A WRIST-WORN WEARABLE DEVICE FOR MONITORING HEART RATES DURING LAPAROSCOPIC PEDIATRIC PROCEDURES

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Background The ability of wearable photoplethysmography sensors to reliably measure heart rate in the output population and in hospital inpatients has been demonstrated in adults. Their accuracy in pediatrics has not been described. We evaluated the accuracy of heart rate (HR) monitoring by a personal fitness tracker (PFT) among pediatric patients undergoing to elective surgery.

Materials and methods HR monitoring are performed using a wrist-worn PFT (Fitbit Charge HR®) in 14 children (7M, 7F; mean age 8.74±3.14 yrs) underwent laparoscopy (LAP Group, n=8) or open surgery (OPEN Group, n=6). HR values are analyzed preoperatively (at the induction of anesthesia) and during surgery, every 5 minutes for 30 minutes. Accuracy of HR recordings is compared with gold standard measurements derived from continuous electrocardiographic (cECG) monitoring. The accuracy of HRs measured by pulse oximetry (Spo2R) is also measured as a positive control. Lin's concordance correlation coefficient and the Bland and Altman limits of agreement (LOA) are used as statistical methods.

Results HR monitoring are performed using a wrist-worn PFT (Fitbit Charge HR®) in 14 children (7M, 7F; mean age 8.74±3.14 yrs) underwent laparoscopy (LAP Group, n=8) or open surgery (OPEN Group, n=6). HR values are analyzed preoperatively (at the induction of anesthesia) and during surgery, every 5 minutes for 30 minutes. Accuracy of HR recordings is compared with gold standard measurements derived from continuous electrocardiographic (cECG) monitoring. The accuracy of HRs measured by pulse oximetry (Spo2R) is also measured as a positive control. Lin's concordance correlation coefficient and the Bland and Altman limits of agreement (LOA) are used as statistical methods.

Conclusions PFT-derived HR showed a good accuracy compared to HR derived from cECG and Spo2.R during laparoscopic pediatric procedure. Further clinical evaluation is needed to define if PFTs can use in health care settings.