**SUPPLEMENTAL APPENDIX**

**Evaluation of the ability of a commercially available cuffless wearable device to track blood pressure changes**

**Authors:** Isabella TAN;1,2 Sonali R GNANENTHIRAN;1,3 Justine CHAN;4 Konstantinos G KYRIAKOULIS;5 Markus P SCHLAICH;4 Anthony RODGERS;1 George S STERGIOU;5 Aletta E SCHUTTE1,6

1 The George Institute for Global Health, Sydney, Australia

2 Macquarie Medical School, Faculty of Medicine, Health and Human Sciences, Macquarie University, Sydney, Australia

3 Concord Repatriation General Hospital, Concord West, Sydney, Australia

4 Dobney Hypertension Centre, Medical School, Royal Perth Hospital Unit, University of Western Australia, Perth, Australia and Departments of Cardiology and Nephrology, Royal Perth Hospital, Perth, Australia.

5 Hypertension Center STRIDE-7, National and Kapodistrian University of Athens, School of Medicine, Third Department of Medicine, Sotiria Hospital, Athens, Greece

6 School of Population Health, University of New South Wales, Sydney, Australia

**Address of correspondence:**

Prof. Aletta E Schutte

School of Population Health

University of New South Wales

Sydney

NSW 2052

Australia

Tel: +61 (0) 450 315 918

Email: [a.schutte@unsw.edu.au](mailto:a.schutte@unsw.edu.au)

**Supplemental Table S1. Standard deviation of mean differences (SDD) for 24-hour, daytime, and nighttime BP as obtained by cuffless BP monitoring and classic ABPM (N=41)**

|  |  |  |
| --- | --- | --- |
|  | **Difference (mmHg)** | **SDD** |
| *Cuffless monitoring (6-12 days) vs ABPM (2 days)* | | |
| **Systolic blood pressure (mmHg)** | | |
| 24-hour | 4.9 | 9.5 |
| Daytime | 1.0 | 8.9 |
| Nighttime | 15.5 | 11.5 |
| Nighttime Dip (%) | 11.0 | 5 |
| **Diastolic blood pressure (mmHg)** | | |
| 24-hour | 4.2 | 5.9 |
| Daytime | 1.4 | 5.7 |
| Nighttime | 11.8 | 7.3 |
| Nighttime Dip (%) | 12.9 | 6.1 |
| *Cuffless monitoring vs ABPM (devices worn simultaneously)* | | |
| **Systolic Blood Pressure (mmHg)** | | |
| 24-hour | 5.3 | 10.1 |
| Daytime | 1.1 | 9.2 |
| Nighttime | 15.3 | 12.2 |
| Nighttime Dip (%) | 10.9 | 4.9 |
| **Diastolic Blood Pressure (mmHg)** | | |
| 24-hour | 4.7 | 6.1 |
| Daytime | 1.8 | 5.8 |
| Nighttime | 11.9 | 7.4 |
| Nighttime Dip (%) | 12.8 | 5.6 |

**Supplemental Table S2. Total number of Aktiia BP readings and ABPM BP readings.**

|  |  |  |
| --- | --- | --- |
|  | **No. of Aktiia BP readings** | **No. of ABPM readings** |
| ***Cuffless monitoring (6-12 days) vs ABPM (2 days)*** | | |
| 24-hour | 9507 | 5133 |
| Daytime | 5927 | 3490 |
| Nighttime | 3580 | 1643 |
| ***Cuffless monitoring vs ABPM (devices worn simultaneously)*** | | |
| 24-hour | 2285 | 5023 |
| Daytime | 1554 | 3383 |
| Nighttime | 731 | 1640 |

ABPM: ambulatory blood pressure monitoring

**Supplemental Table S3. Cuffless BP and classic home BP monitoring at baseline and over two weeks post up-titration of BP lowering medication.**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | **Week 1 (baseline)** | | **Week 2** | | **Week 3** | |
| **Participant** | **Aktiia** | **HBPM** | **Aktiia** | **HBPM** | **Aktiia** | **HBPM** |
| **Systolic blood pressure (mmHg)** | | | | | | |
| 1 | 123±6 | 135±7 | 123±6 | 123±7 | 122±7 | 119±4 |
| 2 | 149±5 | 154±6 | 152±7 | 147±10 | 151±5 | 139±6 |
| 3 | 161±6 | 183±5 | 157±6 | 167±9 | 158±6 | 154±10 |
| **Diastolic blood pressure (mmHg)** | | | | | | |
| 1 | 78±4 | 90±4 | 78±4 | 85±7 | 77±5 | 82±3 |
| 2 | 73±3 | 77±5 | 74±5 | 74±7 | 73±4 | 68±3 |
| 3 | 102±4 | 111±4 | 98±3 | 101±6 | 99±4 | 94±6 |

HBPM, home blood pressure monitoring with cuff.

**Supplemental Figure S1.** Flow diagram of participant inclusion to compare 24-hour BP tracking

Visit 1 (Day 1): Fitted with Aktiia device and first ABPM (N=57)

Outpatients recruited from Hypertension Centres (N=60)

Excluded screening failures (N=3)

Excluded absent/insufficient cuffless BP data (N=11)

Excluded siesta/night-shift workers (N=2)

Visit 3 (Day 5 to 11): Second ABPM (N=49)

Data included for final analysis (N=41)

Withdrew from study (N=3)

**Supplemental Figure S2. Comparison of BP tracking across 24-hours with classic ABPM (blue dots) vs cuffless Aktiia (red dots) (N=41).** A. The weighted average 24-hour, daytime and nighttime BP with ABPM vs Aktiia (devices worn simultaneously). B. The 24-hour profile comparison per hour (bars represent 95%CI).



**Supplemental Figure S3. Comparison of BP tracking across 24-hours with classic ABPM (blue dots) vs cuffless Aktiia (red dots) with data aligned by sleep-onset (N=41).** Bars represent 95%CI.

****

**Supplemental Figure S4. Range of total Aktiia readings per participant over period of device wear (6-12 days).**



**Supplemental Figure S5. Bland-Altman plots comparing the hourly averaged 24-hour, daytime and nighttime BP between classic cuff ABPM and Aktiia cuffless BP (N=41)**

