**Supplemental Digital Content 1: Site of each device.**

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**Supplemental Digital Content 2: Agreement between intra-arterial and noninvasive measurements of mean blood pressure (BP).**



Legend: Bland-Altman analysis of the agreement of CNAP™ readings of mean BP with intra-arterial measurements ***over 15 minutes between 2 calibrations (1638 pairs of measurements)***.

The 3 thick horizontal lines represent the mean bias, the upper and the lower limits of agreement. The dotted lines represent their 95% confidence interval.

**Supplemental Digital Content 3: Factors impacting the reliability of CNAP™ readings.**

|  |  |  |
| --- | --- | --- |
| **Clinical factor** | **N (patients)** | **ISO Mean bias±SD****(mmHg)**  |
| **Cardiac rhythm** | Regular rhythm | 114 | 6.7 ± 6.1 |
| Arrhythmia | 68 | 5.7 ± 6.3 |
| **Gender** | Male | 140 | 6.6 ± 6.2 |
| Female | 42 | 5.2 ± 6.0 |
| **BMI** | < 30 | 135 | 6.1 ± 5.9 |
| ≥ 30 | 43 | 7.0 ± 7.2 |
| **Vascular disease** | Established | 87 | 6.7 ± 5.4 |
| Absent or Unknown | 95 | 6.0 ± 6.8 |
| **Mechnical ventilation** | Yes | 144 | 6.6 ± 6.5 |
| No | 38 | 5.3 ± 4.8 |
| **Circulatory failure** | Yes | 111 |  6.9 ± 6.5 |
| No | 71 | 5.5 ± 5.6 |
| **Tissue edema** | None | 86 | 5.1 ± 5.9 |
| Moderate | 59 | 7.3 ± 6.0 |
| Important | 37 | 7.5 ± 6.7 |
| **Vasopressive drug** | Yes | 69 | 7.4 ± 7.0 |
| No | 113 | 5.6 ± 5.5 |
| **Mean BP** | ≤ 65 mmHg | 43 | 7.8 ± 5.2 |
| > 65 mmHg | 139 | 5.8 ± 6.4 |
| **Capillary refill time** | < 2 seconds | 105 | 6.4 ± 5.2 |
| 2 to 4 seconds | 62 | 6.3 ± 6.8 |
| > 4 seconds | 12 | 6.0 ± 5.8 |
| **Hypothermia** | ≤ 36ºC | 14 | 2.7 ± 5.7 |
| >36ºC | 161 | 6.9 ± 6.0 |
| **Intra-arterial catheter Site** | Radial artery | 154 | 6.5 ± 6.1 |
| Femoral artery | 26 | 5.3 ± 6.8 |

Vascular disease: Coronary artery disease and/or Atherosclerosis of the lower limbs and/or Carotid stenosis and/or Aortic calcifications

Tissue edema: None ; Moderate (only ankles, hands, elbows, loin) ; Important

Vasopressive drug: norepinephrine or epinephrine

**Supplemental Digital Content 4: Ability to detect hypotension, response to therapy and hypertension.**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Detection of** | **Device** | **AUCROC** | **Cutoff** | **Se****(%)** | **Sp****(%)** | **Positive LR** | **Negative LR** |
| **Mean BP <65 mmHg** | **CNAP™ finger cuff****CNAP™ brachial cuff****Alternative brachial cuff** | **0.94 [0.91-0.96]****0.94 [0.92-0.96]****0.92 [0.90-0.96]** | 75 mmHg78 mmHg66 mmHg | 89 [82-94]87 [80-93]83 [75-90] | 85 [82-89]87 [83-90]90 [86-92] | 6.1 [4.8-7.8]6.7 [5.2-8.6]7.6 [5.7-10.0] | 0.13 [0.07-0.2]0.15 [0.09-0.2]0.19 [0.1-0.3] |
| **Systolic BP <90 mmHg** | **CNAP™ finger cuff****CNAP™ brachial cuff****Alternative brachial cuff** | **0.93 [0.91-0.95]****0.92 [0.89-0.94]****0.91 [0.88-0.93]** | 99 mmHg102 mmHg106 mmHg | 83 [70-92]89 [75-96]88 [76-96] | 84 [81-87]81 [77-84]71 [67-75] | 5.3 [4.2-6.7]4.6 [3.8-5.7]3.0 [2.6-3.6] | 0.20 [0.1-0.4]0.14 [0.06-0.3]0.17 [0.08-0.4] |
| **Systolic BP >140 mmHg** | **CNAP™ finger cuff****CNAP™ brachial cuff****Alternative brachial cuff** | **0.88 [0.85-0.90]****0.90 [0.87-0.92]****0.89 [0.87-0.92]** | 121 mmHg122 mmHg123 mmHg | 89 [81-94]87 [79-92]84 [76-91] | 75 [71-79]78 [73-81]80 [76-84] | 3.6 [3.0-4.3]3.9 [3.2-4.7]4.2 [3.4-5.2] | 0.15 [0.09-0.3]0.17 [0.1-0.3]0.19 [0.1-0.3] |
| **>10% increase in mean BP**  | **CNAP™ finger cuff****CNAP™ brachial cuff****Alternative brachial cuff** | **0.92 [0.87-0.95]****0.89 [0.84-0.93]****0.90 [0.85-0.94]** | 10 %10 %8 % | 79 [70-87]80 [71-87]81 [72-88] | 85 [77-91]87 [80-93]89 [82-94] | 5.2 [3.4-7.9]6.2 [3.9-10.1]7.4 [4.3-12.6] | 0.24 [0.2-0.4]0.23 [0.2-0.3]0.21 [0.1-0.3] |

Legend: AUCROC: area under the receiver operating characteristic curve; Se: sensitivity; Sp: specificity; LR: likelihood ratio; BP: blood pressure.Intra-arterial measurements were reference BP.

**Supplemental Digital Content 5: Consequence of CNAP™ drift: misclassification of patients who responded to therapy.**

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Responders were defined as patients who increased their intra-arterial mean blood pressure (BP) of more than 10% after a cardiovascular intervention.

The downward drift of CNAP™ readings between minute 1 and minute 14 after the calibration contributed to misclassify 18/24 (75%) of responders into nonresponders according to CNAP™ readings. The corresponding area under the ROC curve was

0.67 (95% CI: 0.55-0.77).

**Supplemental Digital Content 6: If CNAP™ failed to display a beat-to-beat BP value, was the oscillometric brachial cuff measurement less reliable?**

|  |  |  |
| --- | --- | --- |
|  | **No CNAP™ beat-to-beat measurement displayed**n = 31 patientsa | **CNAP™ beat-to-beat measurement could be displayed**n = 182 patients |
| **CNAP™ brachial cuff (Dräger Infinity)** | Mean bias ± SD9.7 ± 9.1 mmHg | Mean bias ± SD10.3 ± 7.0 mmHg |
| **Alternative brachial cuff****(Philips MP70)** | Mean bias ± SD-1.6 ± 6.2 mmHg  | Mean bias ± SD-2.2 ± 7.1 mmHg |

a: in addition, one patient failed to display a value of CNAP brachial cuff measurement (but the alternative brachial cuff could display a BP measurement in this patient).

Mean bias: noninvasive minus intra-arterial measurement of blood pressure.