Validation of the Microlife Watch BP Office professional device for office blood pressure measurement according to the International protocol

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Objective **To assess the accuracy of oscillometric and auscultatory blood pressure (BP) measurement taken using the professional electronic device Microlife Watch BP Office according to the European Society of Hypertension International Protocol.**

Methods **Thirty-three participants were included for the assessment of each measurement mode (oscillometric and auscultatory). Simultaneous BP measurements were taken by two observers (mercury sphygmomanometers) four times, sequentially with three measurements taken using the tested device. Absolute observer device BP differences were calculated. For each participant the number of measurements with a difference within 5 mmHg was calculated.**

Results **In phase 1 the device produced 32, 40 and 40 oscillometric systolic BP (SBP) measurements within 5, 10 and 15 mmHg, respectively and diastolic BP (DBP) 30, 40 and 43 (for auscultatory SBP 29, 42, 45 and DBP 33, 43, 45). In phase 2.1 the device produced 71, 90 and 96 SBP measurements within 5, 10 and 15 mmHg, respectively and DBP 71, 88 and 97 (for auscultatory SBP 72, 96, 99 and DBP 83, 96, 99). Twenty-four participants had at least two of their SBP differences within 5 mmHg and one participant had no difference within 5 mmHg, and DBP 23 and three participants, respectively (for auscultatory SBP 29 and 0 and DBP 29 and 1). Mean SBP difference was −1.4 ± 6.3 mmHg and DBP −0.8 ± 6.0 mmHg (auscultatory SBP −1.8 ± 4.5 and DBP −0.4 ± 4.0).**

Conclusion **The Microlife Watch BP Office device used in the oscillometric or the auscultatory mode fulfills the validation criteria of the International protocol and therefore can be recommended for clinical use.**
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Introduction

The use of a conventional mercury device and the auscultatory technique is still recommended as the standard method for office blood pressure (BP) measurement [1]. This method, however, has important drawbacks [1,2], such as the white-coat phenomenon that often leads to BP overestimation [1], the observer bias and terminal digit preference [1] and the fact that physicians rarely follow the recommended methodology for BP measurement [3]. Furthermore, aiming for environmental protection, mercury is progressively being banned from medical use in several European countries [4].

Therefore, after a century of use, office BP measurement enters an era of transformation aiming to resolve several of its drawbacks and to maintain a central role in hypertension management [2–7]. Several non-mercury professional devices that differ from the conventional technique in several respects are currently being developed and tested. No agreement is still, however, present on what will replace the mercury device for the office measurement [5].

An interesting and technologically modern approach is to abandon the auscultatory technique and use validated electronic devices as currently accepted for ambulatory and home BP monitoring [1]. These devices avoid the terminal digit preference and the observer bias [1] and might minimize the white-coat effect if used in the office in the absence of an observer [7,8]. Interestingly, the French Hypertension Society recently recommended the use of electronic devices for office BP measurement [9].

This study presents the results of a validation study of the Microlife Watch BP Office professional device [10] according to the European Society of Hypertension International Protocol for validation of blood pressure measuring devices in adults [11].

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