

The Working Group on Blood Pressure Monitoring of the European Society of Hypertension

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European Society of Hypertension Working Group on Blood Pressure Monitoring

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The Working Group on Blood Pressure Monitoring of the European Society of Hypertension organizes occasional seminars to discuss changing aspects of blood pressure measurement. Such a seminar was held at the 19th Scientific Meeting of the International Society of Hypertension and the 12th European Meeting on Hypertension in Prague in June 2002.

In the first paper the demise of the mercury sphygmomanometer is examined. After a little more than a century of use, the conventional Riva-Rocci/Korotkoff technique of measuring blood pressure with a mercury sphygmomanometer, and stethoscope is now being relegated to the museum shelves. Our reliance on what has been an inaccurate technique is questioned and we are urged to accept that the age of technology offers more accurate alternative methodologies. However, we must ensure that the automated devices that are replacing the conventional technique are validated independently for accuracy. The Working Group on Blood Pressure Monitoring of the European Society of Hypertension has recently published an International Protocol to facilitate the validation of more automated devices than was possible with the earlier more complicated protocols.

Thomas Pickering discusses the alternatives to the mercury sphygmomanometer and concludes that there is no generally accepted alternative; the most widely advocated candidates are aneroid or oscillometric devices. Oscillometric devices have the advantages of eliminating observer error and mechanical drift, but it is suggested that the inherent limitations of the oscillometric method mean that it cannot become the gold standard for clinical measurement in individual patients. Aneroid monitors are often deficient in practice, and are subject to the same deficiencies in observer technique as mercury devices. Two possible, but so far untested, techniques are a 'hybrid' sphygmomanometer, whereby the mercury column is replaced by an electronic transducer and display; and the wideband recording technique, which has the potential of using the same basic principle as the

auscultatory technique, while eliminating the human observer.

Jan W. Bos and colleagues present data on improvements in technology that aim at the reconstruction of brachial pressure from non-invasive finger arterial pressure measurements as implemented in the Finometer™, the successor of the Finapres™. They demonstrate that pressure level differences can be corrected by a generalized level correction equation using filtered systolic and diastolic levels and by level calibration using an additional return-to-flow systolic measurement on the ipsilateral upper arm for an individual calibration of the reconstructed brachial pressure.

Gianfranco Parati and colleagues review new devices able to record blood pressure on a beat-by-beat basis in a non-invasive fashion as alternatives to invasive procedures, which are no longer acceptable for research projects in a clinical setting. They focus on further developments of the original technology of finger blood pressure monitoring proposed by Peñáz *et al.*, as well as on newer devices that have been proposed over the last few years for non-invasive cardiovascular monitoring both in research and in clinical studies.

Jan Staessen and colleagues examine the relationship between baseline conventional, day-time ambulatory and self-measured home blood pressure measurements from the THOP trial to study the effect of gender, age, body-mass index, smoking habits and treatment status on the white-coat syndrome as assessed by ambulatory monitoring or self-measurement. They conclude that the self-measured white-coat syndrome was greater than the ambulatory white-coat syndrome but depended less on the determinants under study.

Thomas Mengden and colleagues provide an overview of studies investigating hypertensive patients with Holter monitoring for the detection of ST segment depression indicating myocardial ischaemia, and examine the

requirements for combined devices allowing simultaneous ambulatory 24-h electrocardiograph (ECG) and 24-h ambulatory blood pressure measurements.

A study from Beaumont Hospital in Dublin demonstrates the value of being able to simultaneously record ambulatory blood pressure measurement and silent ischaemia. In a small, but carefully controlled study, there was a striking preponderance of silent ischaemia in hypertensive patients with left ventricular hypertrophy, which raises the possibility that such techniques may be

helpful in detecting hypertensive patients at risk from sudden death.

Finally Yutaka Imai and colleagues from Sendai examine the predictive value of heart rate and heart rate variability for the risk of cardiovascular disease. They show that in the Ohasama study, which has been conducted since 1985 in the northern part of Japan, heart rate measured at home was linearly associated with cardiovascular mortality, while heart rate variability inversely correlated with cardiovascular mortality.