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EDITORIAL

Who should be taking the blood pressure?

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ABSTRACT

Given the variability of blood pressure, it is often difficult to make a diagnosis of hypertension or to evaluate the effect of treatment on the basis of single blood pressure readings in the office. To obtain multiple measurements one can either turn to ambulatory blood pressure monitoring or have the patient take his or her own pressure. Both approaches require the availability of reliable, validated devices. Currently, only some instruments which measure blood pressure oscillometrically at the upper arm can be recommended for self-measurements. Studies are in progress to assess the prognostic significance of self-measured blood pressure data.

Throughout the day, considerable variations in blood pressure occur which make it virtually impossible to diagnose hypertension on the basis of one single measurement. Although it is true that one measurement of blood pressure, taken at the office, already correlates reasonably well with cardiovascular morbidity and mortality, substitution of casual pressure by 'usual blood pressure', defined as the average of a series of measurements, improves the relationship considerably.[1] Therefore, all current guidelines emphasise the importance of obtaining multiple readings, taken on separate occasions. The recent recommendations by the Joint National Committee[2] and the European Societies of Hypertension and Cardiology[3] still advocate to first and foremost measure blood pressure in the office or clinic. However, such measurements can easily elicit the white-coat effect which, incidentally, is a poorly reproducible phenomenon.[4] Consequently, treatment may be instituted or intensified on the basis of spuriously elevated blood pressure data. While a set of clinic blood pressure readings may be more or less equivalent to 24-hour ambulatory measurements for assessing usual pressure and cardiovascular risk,[5] the latter technique is much more practical and yields results within one day. Thus, a major advantage of ambulatory blood pressure monitoring (ABPM) lies in its ability to provide an estimate of usual blood pressure without observer bias in patients engaged in normal activities. Indeed, under a variety of conditions ABPM has proven to be superior to conventional blood pressure measurements for the diagnosis of hypertension. In addition, recent evidence suggests that also in treated hypertensives ABPM may predict cardiovascular prognosis over and above office pressure. The development of relatively cheap validated devices which can be easily worn by the patient make ABPM, therefore, an interesting tool to employ in clinical practice as well as in antihypertensive drug trials. Still, it will be difficult to implement ABPM in primary care and the technique will certainly not be available to every hypertensive patient. Accordingly, cheaper and easier solutions are necessary from which every patient can benefit. One such solution may be self-measurement of blood pressure which allows for the collection of multiple readings without being bothered by the white-coat effect.[6-8] In addition, self-measurements may enhance compliance to prescribed drugs[9-11] and reduce the number of clinic visits.[12-14] Over the past decade, self blood pressure monitoring (SBPM) has become very popular among patients themselves.

Before SBPM can be widely advocated, further research is needed to investigate the accuracy of home blood pressure measurements and the devices that are used for this

purpose. This issue of the Journal features two papers by Braam and colleagues which deal with exactly this aspect of SBPM.[15,16] They describe the protocols which have been developed to validate the devices and the most important conclusions that can be drawn from these validations. They focus on the oscillometric technique but it should be emphasised that there are several types of monitors available for SBPM. These include mercury sphygmomanometers, aneroid manometers and electronic devices.[17] However, the banning of mercury will lead to the disappearance of all mercury manometers, at least in Europe, and it no longer makes sense to put much effort in the validation of such equipment. Aneroid manometers are often difficult to handle and have lost popularity as well. Thus electronic devices, which all use the oscillometric technique, seem to be the most relevant ones in the near future.

Oscillometric blood pressure can be measured at the upper arm, wrist and finger. The last-mentioned technique was not discussed by Braam and colleagues, but in the context of SBPM finger oscillometry is not recommended because it is too inaccurate.[17] Although wrist devices are more accurate than finger devices, they still suffer from substantial reading error as pointed out by Braam. Hence, we should still consider these with caution. Nevertheless, the implementation of a position sensor such as in the BP 2000 may overcome the problems related to the position of the wrist and produce more reliable results.[18] So far, however, too few data are available to recommend wrist devices as part of the armature of the hypertensive patient or his doctor. This leaves us with the upper-arm devices which, true enough, are the most reliable of all but which are facing a market heavily polluted by poorly functioning instruments. It is essential, therefore, that both patients and treating physicians have rapid access to the results of validation tests. Moreover, only devices which have outstanding test results should be allowed to be sold. To some extent, one can compare the free availability of monitors for self-measurement with that of over-the-counter medications. For both, we should demand that these are safe and do exactly what patients expect them to do. Yet, there is a striking contrast in our attitude towards medications on the one hand and diagnostic devices on the other.

If SBPM is to become an indispensable tool in the management of hypertensive patients, far more information is needed about the optimal timing and frequency of measurements. Despite the currently proposed recommendations,[17] there is no evidence yet to support this advice. There is a need also to standardise the type of instruments. Generally, automatic devices are preferred above semi-automatic ones and each device should be checked on each patient. Ideally, the instrument should be equipped with a memory so that data can be stored until the clinic visit. The usefulness of telemetry is still under evaluation. A further problem is that home pressures usually represent the level of pressure at the lower end of the waking range, when the patient is relatively relaxed. Thus, they do not necessarily provide a good guide to what happens to the patient's pressure when undergoing the stresses of daily life, such as occur during work. In theory home monitoring could also be used to record the pressure at work, but this has not been fully investigated. Obviously, home monitoring cannot assess the sleeping pressure, which is assuming increasing importance as an independent predictor of cardiovascular risk. This raises the question whether SBPM has any role at all in assessing cardiovascular risk. Several large-scale trials have been designed which address these issues. The Ohasama study has demonstrated that SBPM correlates better with mortality than conventional pressures[19] and in cross-sectional studies SBPM is superior to clinic pressures in predicting target organ damage. Recently, the THOP trial has been completed which examined the question whether treatment based on SBPM compares favorably with office measurements in terms of blood pressure control.[20] The results of that trial are expected shortly. A study of similar design, the HOMERUS trial, is currently being conducted in the Netherlands. This trial started in April 2002 and has just closed enrolment of patients; final results are expected by the end of 2004. We anticipate, therefore, that in a few years time we will have more definitive data to answer the question 'who should be taking the pressure: the patient or the doctor?'

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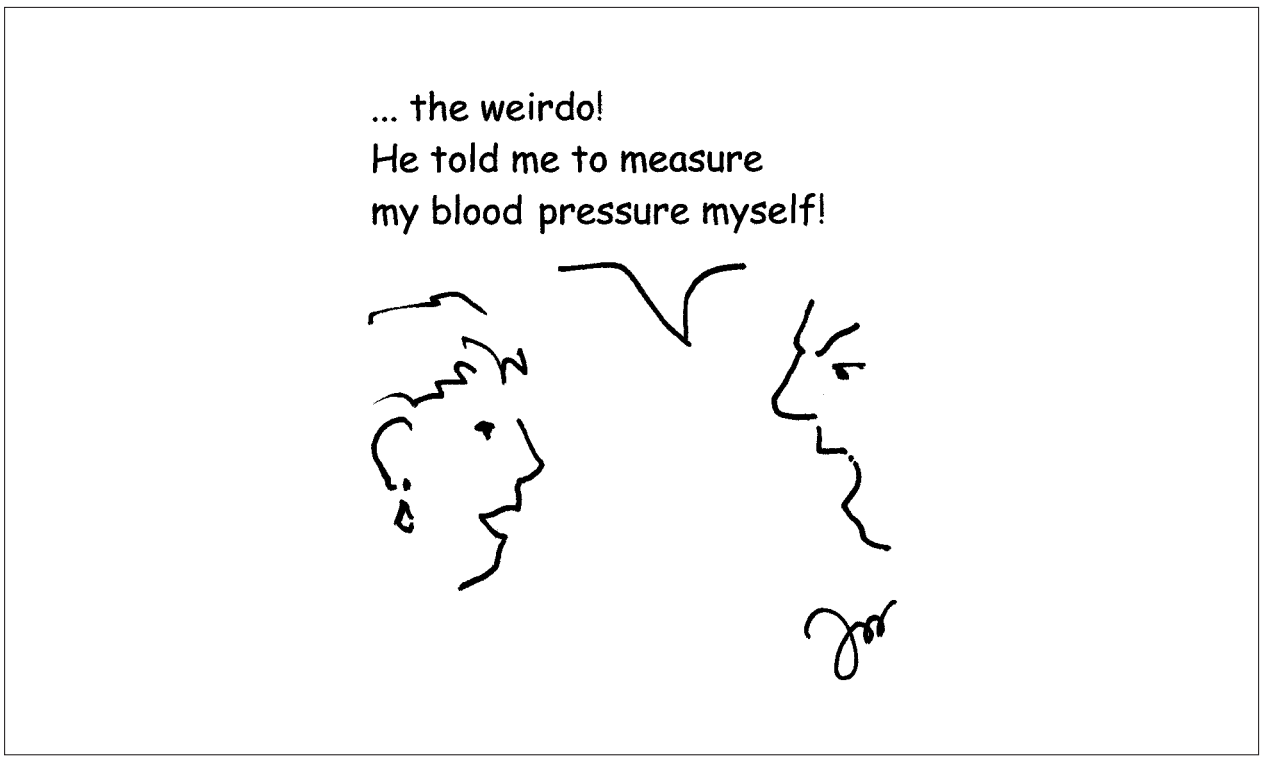

De Leeuw, et al. Home blood pressure measurement.