Several considerations make information on central blood pressure, that is, the blood pressure existing in the aorta and the nearby large elastic arteries, potentially important for a better understanding of the pathophysiological and clinical aspects of hypertension. One, because of the wave reflection phenomenon, central blood pressure values differ from the brachial one, and so do, in some conditions to a pronounced phenomenon, central blood pressure values differ from the aortic one, and so do, in some conditions to a pronounced phenomenon, central blood pressure values differ from the brachial one, and so do, in some conditions to a pronounced phenomenon, central blood pressure values differ from the aortic one,

Hypertension makes an important step forward by providing, via a new tonometric-based technology, central blood pressure values throughout the 24 hours and by comparing for the first time the circadian central blood pressure profile with the simultaneously measured peripheral blood pressure. The results confirm that systolic and pulse pressures are lower centrally than at brachial artery level. They further show that central blood pressure varies over the 24 hours in a fashion that is qualitatively similar to the variations seen in the brachial artery, both being characterized by short-lasting erratic changes and by consistently lower values during the night as compared with the daytime. They finally show, however, that the timing and magnitude of the circadian central and peripheral blood pressure changes are not superimposable, a noticeable difference being a smaller central than peripheral blood pressure fall at night, and that antihypertensive treatment with the renin inhibitor, Aliskiren, or the angiotensin receptor antagonist, Telmisartan, does not substantially alter the 24-hour central blood pressure profile, its main effect being just a resetting of day and night blood pressure values to a lower blood pressure level.

The study by Williams et al has further merits that deserve to be emphasized. For example, the number of patients from whom the data were collected was remarkably high, considering the technical difficulty of the study and its large multicentric nature. This adds reliability to the reported circadian central blood pressure changes, as well as to their differences with the brachial ones, even when of limited magnitude. Also, the study compared the circadian peripheral blood pressure profile obtained with the tonometric technique used to derive central blood pressure with that provided by a validated and time-honored approach, such as that based on a Spacelab device. The comparison is not presented in an impeccable fashion because no SDs of mean differences between the 2 approaches have been reported. However, the similarity of the 2 day and night profiles makes the possibility of an incorrect assessment of the peripheral day and night blood pressure variations with which the central blood pressure variations were compared unlikely.

However, the study by Williams et al also has limitations, which suggest that interpretation of the results requires a degree of caution and that further studies are desirable. Although it may have been impossible to do better, an unquestionable limitation is that Spacelab-based and tonometric blood pressure measurements were not synchronized and that the 2 sets of values were numerically different, the criteria for accepting the former (>56 of 80 values) being much more stringent than those for accepting the latter (>21 of 96 values). Also, it was not possible to provide an explanation for some puzzling phenomena, such as the slow progressive decline in the pulse pressure amplification from the central to the peripheral arterial site that was seen in the evening hours preceding night sleep. Finally, and most importantly, although the study was powered for small differences between central and peripheral blood pressures, it remains to be determined whether the attenuation of the nocturnal hypotension seen at the central as compared with the peripheral level falls within the error of the device, which may be greater for calculated variables (such as central blood pressure) than for the directly measured ones; or if real, it has any clinical significance, considering that the average

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difference was only 2.3 mm Hg, which became less when data were adjusted for the nocturnal reduction in heart rate.

The above limitations do not detract from the importance of the study performed by Williams et al. It is an easy prediction that the availability of ambulatory central blood pressure measurements will open a new field of investigation (as it happened when ambulatory peripheral blood pressure measurements became available) and that, in this context, a large number of topics will enjoy a renewed or expanded interest. Just to mention a few, the special prognostic importance attributed to brachial night-time blood pressure in the general population, as well as in patients with hypertension and diabetes mellitus, will have a chance to be reassessed via measurement of its central counterpart, with perhaps a revisitation of a popular classification of individuals into dippers and nondippers. Ambulatory central blood pressure measurements will offer an additional important tool to mechanistic and clinical studies on blood pressure variability. It also will of course be possible to perform studies on the ambulatory central blood pressure effects of antihypertensive treatment, with an extension to drugs other than the blockers of the renin–angiotensin system examined in the present study.

Disclosures
None.

References
Ambulatory Central Blood Pressure: A New Opportunity for Mechanistic and Clinical Cardiovascular Research
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