

## Reply to: “Clinical thresholds for ambulatory blood pressure measurement reinvented?”

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In their letter in response to our recent article “Definition of ambulatory blood pressure targets for diagnosis and treatment of hypertension in relation to clinic blood pressure: a prospective cohort study”<sup>1</sup> Staessen and O’Brien raise a number of issues that need to be addressed. Their call for target ambulatory blood pressures to be based on outcome studies is one we would fully support, but ours was clearly not an outcome study and nor was it designed to determine what should be the targets for ambulatory blood pressures. Importantly, and to reflect usual practice, we examined ambulatory blood pressure equivalents to clinic blood pressure targets, measured by either doctors or trained healthcare professionals. The response by Staessen and O’Brien has therefore missed the major novel findings of our trial which were the provision of a complete set of ambulatory blood pressure equivalents: for the three levels of hypertension, for well-defined target clinic blood pressures in subjects with a single or multiple risk factors and also equivalents for subjects with proteinuria. We further stratified these for gender and age as well as providing analysis for seated and reclining clinic blood pressure.

The suggestion that the Suntec Accutracker is not recommended for clinical practice is based on an early version of this device as evaluated by O’Brien et al.<sup>2</sup>, but this device did pass the Association for the Advancement of Medical Instrumentation (AAMI) tests.<sup>2</sup> Nevertheless, we have reanalysed our data using only those devices that have passed both British and USA guidelines. This involved removing only a small amount of data which made no difference at all (see table 1).

Our study conclusions are not at all dependent on how the subjects might be recruited or whether they were on or off treatment. We have not preselected or excluded patients but used those referred for monitoring from a wide cross-section of Australian general practices and hospital clinics and this has direct relevance to clinical practice. There was a much bigger effect on the target blood pressure depending on who took the clinic blood pressure and whether the subjects were male or female/ old or young.

Finally, our regression approach is not the same as PAMELA<sup>3</sup> and is not outdated as we used a least product regression technique which is novel in this field and is the correct statistical approach<sup>4</sup>. When both X and Y varies, the standard least squares approach is not valid and the ordinary least product regression should be used. The least squares line is far too shallow in light of being biased by very high clinic blood pressures. Staessen and O’Brien refer to studies that give confidence intervals but these will need to be reanalysed as the intervals are around the wrong regression lines.

### References

1. Head G, Mihailidou A, Duggan K, Beilin L, Berry N, Brown M, et al. Relationship between ambulatory and clinic blood pressure: Defining diagnostic and treatment targets. *Brit Med J* 2010;in press.
2. O’Brien E, Coats A, Owens P, Petrie J, Padfield PL, Littler WA, et al. Use and interpretation of ambulatory blood pressure monitoring: recommendations of the British hypertension society. *Bmj* 2000;320(7242):1128-1134.
3. Mancia G, Sega R, Bravi C, De Vito G, Valagussa F, Cesana G, et al. Ambulatory blood pressure normality: results from the PAMELA study. *J Hypertens* 1995;13(12 Pt 1):1377-90.
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**Table 1** Systolic/diastolic ambulatory blood pressure (ABP) values predicted from seated clinic blood pressure levels; values in mm Hg

	Clinic blood pressure threshold	ABP predicted from staff measured seated clinic blood pressure all devices (n=5327)			ABP predicted from staff measured seated clinic blood pressure excluding Suntec Accutacker (n=4875)		
		24 hour	Night	Day	24 hour	Night	Day
Grade 3 (severe) hypertension	>180/110	163/101	157/93	168/105	162/101	156/93	166/105
Grade 2 (moderate) hypertension	>160/100	148/93	139/84	152/96	147/93	138/84	151/96
Grade 1 (mild) hypertension	>140/90	133/84	121/76	136/87	132/84	120/75	135/87
Target blood pressure plus one condition	<130/80	125/76	112/67	128/78	124/75	111/67	127/78
Target blood pressure with proteinuria	<125/75	121/71	107/63	124/74	120/71	106/62	123/73
Normal blood pressure	<120/80	117/76	102/67	120/78	117/75	102/67	120/78