

ABPM vital in hypertension management



Prof Eoin O'Brien analyses the contribution of Dr Thomas George Pickering to hypertension awareness and stresses the importance of ABPM in effectively managing the condition

"I believe it is now incumbent on all doctors who manage patients with hypertension to be able to offer ABPM to anyone suspected of having hypertension, which effectively means anyone whose office BP has been found to be high, and that the technique should be an integral component of ongoing management."

Dr Thomas George Pickering, physician, clinical scientist, professor and mentor, editor, husband, father, and grandfather, died on May 14, 2009, at the age of 69 from complications of brain cancer, an illness that he had fought with dignity and courage for more than a year.

Tom was the quintessential Englishman: mannerly, gentle, and gentlemanly (the two must not be confused) whose enquiring mind was tinged with that spirit of philosophy whereby he knew nothing was new under the sun, but that what was fundamental to science was the expression of fact and the style of that expression. He was aware that each small brick added to the edifice of knowledge would enhance our understanding of hypertension and ultimately benefit those for whom we graduated to serve as doctors – our patients.

Thomas Pickering's Contribution to ABPM

When Pickering wrote: "The addition of ambulatory blood pressure monitoring (ABPM) to conventional clinic measurements for defining BP status in clinical practice has added a new complexity to the process, because the separation of normotension and hypertension can be assessed independently by each of the two methods," he effectively focused research and practice on two groups of patients who are of such importance that the practice of medicine has had to change radically to facilitate their identification – namely patients with white-coat and masked hypertension.

Patients with these phenomena continue to intrigue and preoccupy researchers, but their impact on clinical practice is a tribute to Pickering's prescience in bringing them to attention.

In his seminal paper published in *JAMA* in 1988, Pickering coined the term 'white-coat hypertension' to describe patients whose BP is elevated in the medical environment, but not during daytime ABPM.

In another iconoclastic paper published in 2002, Pickering introduced the term 'masked hypertension' to describe what other researchers had called 'reverse white-coat hypertension'

and 'white-coat normotension'. This condition denotes patients who appear to be normotensive in a doctor's office but who have an elevated ABPM. Because of the proven superiority of ABPM over office BP measurement in predicting outcome, such patients can be regarded as genuinely hypertensive.

It is a sobering thought that even if masked hypertension is only present in 5 per cent of the population, this translates into 10 million people in the United States. The clinical importance of the condition is that if BP is assessed with office BP measurement in a patient with a history of cardiovascular disease, e.g. a stroke or heart attack, the doctor will prescribe aspirin and a statin but deny the patient the most important treatment to prevent a cardiovascular recurrence, namely BP-lowering medication, in the belief that the patient is normotensive.

The occurrence of masked hypertension in at least 10 per cent of children and adults and the presence of the reverse phenomenon of white-coat hypertension in some 20 per cent of hypertensive patients means that conventional office measurement has the potential for misdiagnosing more than 30 per cent of patients who present



Dr Pickering (left) in a discussion with Prof O'Brien and a colleague at the Ambulatory Blood Pressure Monitoring Working Group meeting in the Royal College of Surgeons in Ireland, Dublin, 1991

to doctors to have BP measured. Leaving aside the many advantages of ABPM, this estimate alone, which is conservative, must surely make the case for ABPM being an indispensable investigation for the diagnosis and management of hypertension in children, adolescents and adults (Figure 1).

International status of ABPM in 2012

Fourteen international guidelines are all in agreement that ABPM is indicated for the exclusion or confirmation of suspected white-coat hypertension. All but one were in agreement that ABPM is indicated for the confirmation of a

diagnosis of hypotension and to identify patients with resistant hypertension; just 80 per cent recommended ABPM to assess drug efficacy over the 24-hour period and for the assessment of the nocturnal dipping status and more than half the guidelines recommended ABPM to identify masked hypertension.

What makes the recent NICE guideline different from other international guidelines is that for the first time, it is stated unequivocally that ABPM should be offered to anyone suspected of having hypertension by virtue of having had an elevated conventional BP measurement: "If the clinic BP is 140/90mmHg or higher, offer

ABPM to confirm the diagnosis of hypertension."

In short, the NICE guideline has effectively substituted 'suspected hypertension' for what other international guidelines have been labelling as 'suspected white-coat hypertension'. This is not only a courageous step based firmly on evidence, but by doing so, NICE has laid to rest the ghost that white-coat hypertension can be suspected, when in fact there are absolutely no clinical or other criteria that give any hint of the condition.

Messages for science and society

I will now address what I believe are important messages for science and society.

Making ABPM accessible to patients: the role of the pharmacist

No matter how good a technique may be, if it is not made readily accessible and financially affordable, it will simply not achieve its potential. Towards this end, I had developed with my colleagues the *dabl* software system (*dabl* Ltd, Dublin, Ireland; www.dablhealth.ie). This was capable of: providing a succinct one-page report with standardised presentation and plotting of data, with summary statistical data for day-to-day clinical use with storage of more detailed data for research; an interpretative report validated for accuracy against expert observers, so as to remove the need for a physician to report, with substantial cost benefit; a trend report of successive ABPMs showing the efficacy or otherwise of treatment during the day-time and night-time periods; and electronic transmission of data to pharmacies and other healthcare outlets to allow ready access to ABPM by patients.

In recent years, pharmacists have been recognised as having an important role in healthcare delivery and particularly in improving BP control. The recently-introduced, pharmacy-based service in Ireland is proving popular with patients and is being increasingly adopted by pharmacies across the country. The empowerment of patients in the management of hypertension has been one of the most gratifying aspects of the pharmacy-based ABPM service.

Establishment of national BP registries

In 2003, Pickering proposed for the first time that the pooling of data from national and other databases would provide a means of assessing the influence of different modalities of the ABPM profile and other biological markers on cardiovascular outcome and prognosis.

The purpose of a disease registry is to organise a system that uses observational study methods to collect uniform data so as to be able to define the prevalence and to study outcome related to specific strategies that

may include scientific research and epidemiological and health economic methods of analysis.

Studies from well-designed and well-performed patient registries can provide a real-world view of clinical practice, patient outcomes, safety, and comparative effectiveness and cost-effectiveness, and play an important part in improving health outcomes.

Through the use of such registries, healthcare providers can compare, identify, and adopt best practices for patients and, most importantly, disease registries can substantially reduce health costs. For example, it is estimated that a registry of hip-replacement surgery would save the United States \$2 billion (€1.62 billion) of a predicted total cost of \$24 billion (€19.5 billion). In hypertension, the most successful example of a national ABPM registry has been the Spanish ABPM registry, which has changed the demographics of high BP in that country and altered the international approach to the diagnosis and treatment of hypertension.

The medico-legal consequences of failing to provide ABPM

There is an epilogistic message that I have not seen stated elsewhere, but one which I believe the medical profession needs to acknowledge before the consequences of failing to do so rebound on it with very negative consequences.

With the overwhelming weight of international expertise in hypertension having voiced the opinion in many guidelines that ABPM should be offered to patients suffering from hypertension, surely the failure to provide such a facility for patients who experience the cardiovascular complications of mismanaged hypertension must soon be a cause for redress in the medico-legal forum?

It behoves us as caring doctors and scientists to acknowledge the weight of opinion and no longer to resist the need to make ABPM available, not only for the diagnosis, but also for the proper management of patients with hypertension.

● **Based on the First Thomas Pickering Memorial Lecture, 'Ambulatory Blood Pressure Management is Essential for the Management of Hypertension', which was delivered by Professor O'Brien at the American Society of Hypertension Annual Scientific Meeting and Exposition in New York on May 19, 2012.**

● **For the complete lecture and references see: <http://onlinelibrary.wiley.com/doi/10.1111/j.1751-7176.2012.00698.x/abstract>.**

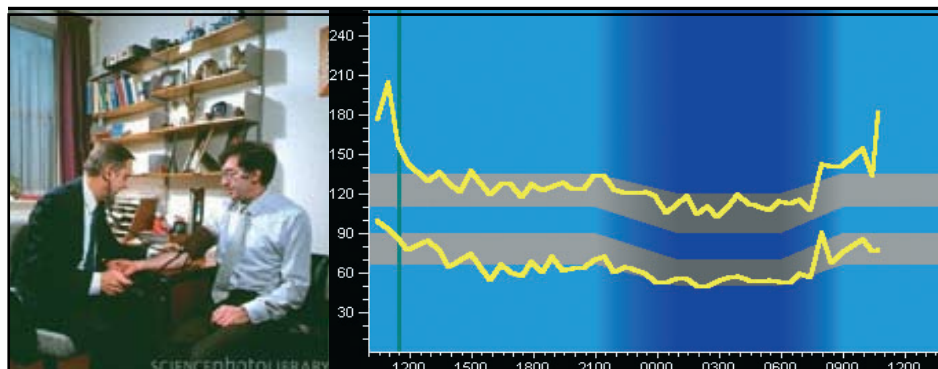


Figure 1: White-coat hypertension

The ABPM shows marked white-coat hypertension (205/100mmHg) with otherwise normal 24-hour systolic and diastolic blood pressure (128/68mmHg daytime and 112/54mmHg night-time).

OFFICE HYPERTENSION
156/88 mmHg

AMBULATORY NORMOTENSION
128/68mmHg

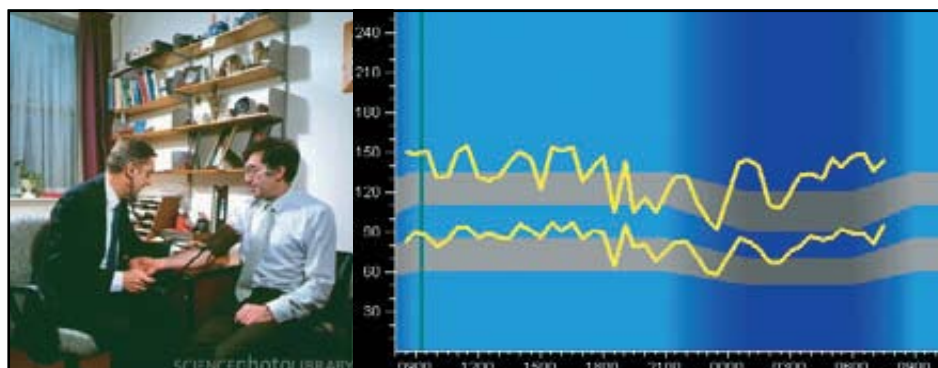


Figure 2: Masked hypertension

The ABPM shows mild daytime systolic & diastolic hypertension (147/93mmHg) and normal night-time systolic & diastolic blood pressure (111/66mmHg).

OFFICE NORMOTENSION
124/62mmHg

AMBULATORY HYPERTENSION
147/93mmHg