Optimising hypertension treatment: NICE/BHS guideline implementation and audit for best practice
Introduction

The British Journal of Cardiology (BJC) recently convened a round table discussion at the Royal Society of Medicine on 12th November 2012 between representatives from primary and secondary care to discuss the most recent 2011 NICE/BHS hypertension guideline, its implementation and future progress. The meeting also considered best practice measures that could be taken to aid its implementation to improve the diagnosis of hypertension and reduce the number of uncontrolled patients with hypertension. This supplement summarises these discussions. Supporting materials (marked throughout the supplement with the following symbol ☀️) are available online at www.bjcardio.co.uk. The meeting was sponsored by and convened on behalf of Takeda UK Limited.

Round table meeting faculty

Chair
Dr Terry McCormack
General Practitioner, Whitby Group Practice, Whitby, North Yorkshire; Secretary, British Hypertension Society

Panel
Dr Chris Arden
General Practitioner, Park Surgery, Chandlers Ford; GP with a Special Interest in Cardiology, Southampton

Dr Alan Begg
General Practitioner with a Special Interest in Cardiology, Links Health Centre, Montrose, Angus; Honorary Lecturer, University of Dundee

Professor Mark Caulfield
Director William Harvey Research Institute Barts and the London School of Medicine and Dentistry, Queen Mary, University of London

Dr Kathryn Griffith
General Practitioner with a Special Interest in Cardiology, Unity Health, University Health Centre, University of York

Ms Helen Williams
Consultant Pharmacist for Cardiovascular Disease, South London Cardiac and Stroke Network
doi: 10.5837/bjc.2013.s01
Br J Cardiol 2013;20(suppl 1): S1–S16

Conflict of interest

Dr Chris Arden has received honoraria for advisory boards and speaker’s fees from Boehringer Ingelheim, Merck Sharp & Dohme, Pfizer and Takeda. Dr Alan Begg has received honoraria and educational grants from Bayer, Boehringer Ingelheim, Merck Sharp & Dohme, Pfizer, Roche and Takeda. Professor Mark Caulfield has been a member of the NICE Guideline Development Group and a past President of British Hypertension Society, where he has held various offices. He is on the Council of the European Society of Hypertension and currently chairs a group developing a Hypertension Patient Decision Aid for the Department of Health. He has received honoraria from Medtronic, Novartis and Takeda, and has undertaken research with Ardian/Medtronic, the British Heart Foundation, Servier and Takeda. Dr Kathryn Griffith has received honoraria for educational work from Boehringer Ingelheim and Roche. Dr Terry McCormack is a member of the NICE Guideline Development Group and Topic Expert Group, and Secretary of the British Hypertension Society. He has received research grants, educational grants and advisory board honoraria from AstraZeneca, Bayer, Boehringer Ingelheim, Daiichi-Sankyo, Menarini, Medtronic, Merck Sharp & Dohme, Roche Diagnostics, Servier and Takeda. Ms Helen Williams has received an honorarium from Takeda.
Optimising hypertension treatment: NICE/BHS guideline implementation and audit for best practice

Why do we need hypertension guidelines?

Hypertension is a serious public health problem because it is a major risk factor for cardiovascular events, chronic kidney disease (CKD), cognitive decline and premature death. The risk conferred by hypertension is continuous. Based on a definition of blood pressure $\geq 140/90$ mmHg or receiving treatment, 31.5% of men and 29.0% of women in England are hypertensive.

Over the last decade, there has been an improvement in the management of hypertension in the UK (figure 1). Between 2003 and 2010 in England, the proportion of adults in the population with controlled hypertension increased from 5.4% to 10.3% in men and from 6.0% to 10.9% in women. Between 2003 and 2010, the proportion of adults in the population with untreated hypertension fell from 20.1% to 14.7% among men and from 15.8% to 10.3% among women.

Randomised clinical trials demonstrate that lowering blood pressure in people with hypertension substantially reduces the risk of cardiovascular morbidity and mortality and, as a result, the management of hypertension is one of the most common interventions in medicine. The diagnosis, treatment and follow-up of hypertensive patients is a core part of primary care workload. In 2006, hypertension accounted for 12% of primary care consultations, or an estimated 400 consultations per 2,000 list patients each year. Regular blood pressure checks are now routine in the UK as part of the NHS health checks.

In contrast, the proportion of patients taking medication for blood pressure with uncontrolled hypertension has hardly changed since 2003, remaining at 6–8% in men and women. These overall statistics also mask continuing problems among people aged >60 years, who account for more than half of all people with hypertension. In 2010, 20.7% of men and 19.4% of women aged 65–74 years had uncontrolled hypertension, while 17.9% of men and 20.0% of women were untreated. Figure 2 shows the prevalence of hypertension with age in 2010.

The prevalence of hypertension and hence the...
workload for primary care can only continue to rise as the UK population becomes older, more sedentary and obese. This supplement aims to offer practical advice and guidance on implementing the National Institute for Health and Clinical Excellence (NICE) 2011 hypertension guideline in order to optimise blood pressure control in the majority of hypertensive patients who are managed in primary care.

The new hypertension guidelines

Published in August 2011 in collaboration with the British Hypertension Society (BHS), NICE Clinical Guideline 127 is a partial update of NICE Clinical Guideline 18 published in 2004 on the management of hypertension in primary care and NICE Clinical Guideline 34 published in 2006 with an update of advice on pharmacological treatment.

The new guideline concerns only the clinical management of primary hypertension in adults who may, or may not, have pre-existing cardiovascular disease (CVD). ‘Primary hypertension’ describes the approximately 90% of people encountered in clinical practice with sustained high blood pressure for which there is no obvious, identifiable cause. The recommendations do not apply to the remaining 10% of patients with secondary hypertension for which there is a specific underlying cause, such as renovascular disease, Conn’s adenoma or phaeochromocytoma. Nor does the guideline apply to people with diabetes, accelerated or acute hypertension, or to pregnant women, children, and young people aged under 18 years.

The 2011 guideline’s use of the term ‘primary hypertension’ represents a change from the 2004/2006 guidelines, which were intended for people with ‘essential hypertension’. This terminology was previously used because high blood pressure was thought to be ‘essential’ to perfuse diseased and sclerotic arteries, but this is now regarded as inaccurate since arteries become diseased and sclerotic due to the effects of high blood pressure.

Other changes in the 2011 guideline include new blood pressure targets for people on treatment, recommendations for pharmacological treatment, managing hypertension in elderly people (aged >80 years), younger adults (age <40 years) and drug-resistant hypertension. However, perhaps one of the most significant changes for primary care – and, according to the faculty, a potential challenge for implementation – may be the recommendation to use 24-hour ambulatory blood pressure monitoring (ABPM) to confirm the diagnosis of primary hypertension (figure 3).

Like all NICE guidelines, the 2011 hypertension guideline follows a review of the best available published evidence based on a pre-determined, carefully defined scope. This approach, which is designed to ensure evidence-based rather than opinion-based guideline development, is based on a thorough review of the evidence and incorporates the views of healthcare experts and patients.

Figure 2. The prevalence of hypertension* in men and women by age, 2010

Table 1. Measuring blood pressure using manual or automatic devices

- Use an independently validated, calibrated BP machine and cuff of appropriate size. Do not use aneroid or wrist monitors to diagnose hypertension
- Routinely measure sitting BP; also measure standing BP in the elderly, in patients with diabetes or in those with symptoms of postural hypotension. Measure sitting BP, followed by standing BP one minute after standing
- Feel the pulse to check if the patient is in sinus rhythm
- Ask the patient to remove any tight clothing, support the arm at heart level, ensure the arm is relaxed and avoid talking during measurement
- Measure BP in both arms at the first visit; at future visits measure BP in the higher arm if there is a continuing difference >20/10 mmHg and document the arm used
- When using a manual monitor, estimate the SBP, deflate the cuff (2 mmHg per second) and read SBP as the sounds disappear (phase V)
- If BP >140/90 mmHg, repeat measurement with a minute’s interval between measurements. Take a third reading if the second measurement is substantially different from the first
- Record the lowest of the last two measurements as the clinic BP

Data from National Statistics 2010

Key: Includes controlled, uncontrolled and untreated patients

Data from NICE1 and Terry McCormack

Key: BP = blood pressure; DBP = diastolic blood pressure; SBP = systolic blood pressure
based recommendations, is internationally recognised for its rigour and is influencing the formulation of other cardiovascular guidelines, such as the US Joint National Committee’s guidelines on cardiovascular risk reduction. The faculty noted that the NICE/BHS 2011 guideline states there is only weak evidence for fourth-line antihypertensive therapy, and a paucity of data for the management of hypertension in patients aged <40 years, but this does not mean that this patient group should not be intensively treated.

**Diagnosing hypertension**

The new NICE/BHS guideline stresses that blood pressure should be measured carefully and by adequately trained health professionals (table 1). Blood pressure devices that have been tested and meet BHS criteria are listed on the BHS website (see 1). Since automated devices may not measure blood pressure accurately in a patient with an irregular pulse, the first step is to palpate the radial or brachial pulse to check that the patient is in sinus rhythm. If the pulse is irregular, blood pressure should be measured manually using direct auscultation over the brachial artery. The faculty also felt that this could be an opportunity to recommend an ECG appointment to confirm/ exclude atrial fibrillation.

If the clinic blood pressure measurement (CBPM) is ≥140/90 mmHg on two more readings, the diagnosis of hypertension should be confirmed by ABPM. According to the NICE/BHS 2011 guideline, there are several reasons for this new recommendation. ABPM measures blood pressure regularly while patients undertake their usual activities, provides more information than either home or clinic measurements, and is a better predictor than clinic measurement of cardiovascular risk and target organ damage. ABPM is also cost effective, since initial extra costs – for example, from the acquisition of the monitors – are balanced by initial extra costs – for example, from the acquisition of the monitors – are balanced by initial extra costs – for example, from the acquisition of the monitors – are balanced by initial extra costs – for example, from the acquisition of the monitors – are balanced by initial extra costs – for example, from the acquisition of the monitors – are balanced by initial extra costs – for example, from the acquisition of the monitors – are balanced by initial extra costs – for example, from the acquisition of the monitors – are balanced by initial extra costs – for example, from the acquisition of the monitors – are balanced by initial extra costs – for example, from the acquisition of the monitors – are balanced by initial extra costs – for example, from the acquisition of the monitors – are balanced by initial extra costs – for example, from the acquisition of the monitors – are balanced by initial extra costs – for example, from the acquisition of the monitors – are balanced by initial extra costs – for example, from the acquisition of the monitors – are balanced by initial extra costs – for example, from the acquisition of the monitors – are balanced by initial extra costs – for example, from the acquisition of the monitors – are balanced by initial extra costs – for example, from the acquisition of the monitors – are balanced by initial extra costs – for example, from the acquisition of the monitors – are balanced by initial extra costs – for example, from the acquisition of the monitors – are balanced by initial extra costs – for example, from the acquisition of the monitors – are balanced by initial extra costs – for example, from the acquisition of the monitors – are balanced by initial extra costs – for example, from the acquisition of the monitors – are balanced by initial extra costs – for example, from the acquisition of the monitors – are balanced by initial extra costs – for example, from the acquisition of the monitors – are balanced by initial extra costs – for example, from the acquisition of the monitors – are balanced by initial extra costs – for example, from the acquisition of the monitors – are balanced by initial extra costs – for example, from the acquisition of the monitors – are balanced by initial extra costs – for example, from the acquisition of the monitors – are balanced by initial extra costs – for example, from the acquisition of the monitors – are balanced by initial extra costs – for example, from the acquisition of the monitors – are balanced by initial extra costs – for example, from the acquisition of the monitors – are balanced by initial extra costs – for example, from the acquisition of the monitors – are balanced by initial extr
ABPM to confirm a finding of hypertension on CBPM.

The guideline recommends that alternative causes should be sought if a normotensive patient shows findings, such as left-ventricular hypertrophy, albuminuria or proteinuria, which would suggest target organ damage in a person with hypertension. Other normotensive patients should be offered a blood pressure check at least every five years. The faculty considered that more frequent follow-up is advisable for patients with white coat hypertension (when a patient has a consistently elevated clinic blood pressure and a normal home or ambulatory blood pressure day-time average of <135/80 mmHg) since their risk of future cardiovascular events is similar to that seen in patients with established hypertension.15

### Treating hypertension

All patients with Stages 1 and 2 hypertension should be offered appropriate lifestyle intervention. As shown in table 4, antihypertensive drug therapy should be offered to all adult patients with Stage 2 hypertension and higher-risk patients aged <80 years with Stage 1 hypertension.

Since hypertension is a cardiovascular risk factor rather than a disease, NICE strongly recommends that all patients should undergo formal assessment of their global cardiovascular risk before commencing treatment.1

The new NICE/BHS hypertension guideline1 follows NICE’s lipid modification guideline in recommending using the estimated 10-year cardiovascular risk of ≤20% (see figure 4) as the threshold for treatment.12 At the same time, NICE recognises that 10-year risk assessment will underestimate lifetime risk in people aged <40 years with Stage 1 hypertension.1 In the faculty’s opinion, the availability of lifetime risk calculators to become standard practice in the near future.

While the 2011 hypertension guideline1 retains the familiar four-step approach to therapy (figure 4), there are some important changes from the 2004/06 guidelines.6 In 2006 at Step 1, NICE recommended either a thiazide-type diuretic or a calcium channel blocker (CCB) in people aged ≥55 years or of black African or Caribbean descent of any age, but this has changed in the new guideline (figure 4).

An angiotensin-converting enzyme inhibitor (ACE inhibitor) was recommended for people aged <55 years, with angiotensin receptor blockers (ARBs) reserved for patients in whom ACE inhibitors were not tolerated or were contraindicated.6 The 2011 treatment algorithm (figure 4) recommends either ACE inhibitors or low-cost ARBs for this group and takes into account recent studies demonstrating equivalent clinical outcomes with these classes of drug.13,15 Similarly, a diuretic is no longer routinely recommended as an alternative to a CCB at Steps 1 and 2, because of superior outcomes for CCBs.
in clinical trials. It is also now more cost effective to use ARBs and CCBs since many are available as generics.¹

Thiazide-like diuretics (such as chlorthalidone [12.5–25.0 mg once daily] or indapamide [1.5 mg modified-release or 2.5 mg once daily]), should generally be introduced at Step 3, though there is the option to offer one of these drugs at Steps 1 and 2 if a CCB is inappropriate – for example, due to intolerance, oedema or risk of heart failure. In the faculty’s experience, there is a continuing lack of awareness concerning the NICE/BHS recommendation to use a thiazide-like diuretic, rather than conventional thiazide diuretics such as bendroflumethiazide.¹ This new recommendation has been prompted by the superior evidence base for thiazide-like diuretics, but there is no need to switch patients who are established on thiazide diuretics if their blood pressure is stable and well controlled.¹

Step 4 now specifically concerns patients with ‘resistant hypertension’. At first glance, the recommendations are similar to those for 2006 in terms of adding in further diuretic therapy, an alpha blocker or beta blocker, and seeking specialist advice.⁶ However, the 2011 guideline recommends use of further diuretics as fourth-choice therapy, with alpha blockers or beta blockers reserved for patients in whom further diuretic therapy is not tolerated, contraindicated or ineffective. People with serum potassium ≤ 4.5 mmol/l can be offered low-dose spironolactone (25 mg once daily), but this should be used with caution in patients with reduced estimated glomerular filtration rate (eGFR) because of a higher risk of hyperkalaemia. If serum potassium is > 4.5 mmol/l, then higher-dose thiazide-like diuretic treatment may be considered as an alternative.¹

NICE was cautious in the 2004/6 hypertension guidelines about the balance of risk and benefit in treating elderly hypertensive patients, because these patients had largely been excluded from clinical trials.⁵,⁶ Since then, studies such as HYVET¹⁶ have demonstrated the clinical benefits of treating hypertension in people aged ≥ 80, while health economic analysis has confirmed the cost effectiveness of this strategy.¹ As a result, NICE now recommends that patients

<table>
<thead>
<tr>
<th>Table 4. Initiating antihypertensive therapy¹</th>
</tr>
</thead>
<tbody>
<tr>
<td>Patients with</td>
</tr>
<tr>
<td>Stage 1 hypertension*</td>
</tr>
</tbody>
</table>
Offer antihypertensive drug therapy to people aged <80 years with Stage 1 hypertension and ≥ 1 of:
- target organ damage
- established cardiovascular disease
- renal disease
- diabetes
- 10-year cardiovascular risk equivalent ≥ 20%

| Patients with  |
| Stage 2 hypertension*  |
Offer antihypertensive drug treatment to people of any age with Stage 2 hypertension*

| Patients with severe hypertension*  |
Consider starting antihypertensive drug therapy immediately without waiting for the results of ABPM/HBPM

| Patients aged <40 years  |
Consider seeking specialist evaluation of secondary causes of hypertension and more detailed assessment of potential target organ damage in people aged <40 years with Stage 1 hypertension and no target organ damage, CVD, renal disease or diabetes. This is because 10-year CVD risk assessments can underestimate the lifetime risk of CV events in these patients

| Patients aged ≥80 years  |
Offer the same antihypertensive drug treatment as people aged 55–80 years, taking into account any co-morbidities

Data from NICE¹ and Terry McCormack
Key: ABPM = ambulatory blood pressure monitoring; CVD = cardiovascular disease; HBPM = home blood pressure monitoring; *See table 3

<table>
<thead>
<tr>
<th>Figure 4. Recommendations for antihypertensive drug treatment¹</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aged under 55 years</td>
</tr>
<tr>
<td>Step 1           A</td>
</tr>
<tr>
<td>A+C</td>
</tr>
<tr>
<td>A+C+D</td>
</tr>
</tbody>
</table>
| Resistant hypertension A+C+D+ consider further diuretic³,⁴ or alpha-blocker or beta-blocker⁵,⁶ Consider seeking expert advice

| Aged over 55 years or black person of African or Caribbean family origin of any age |
| Step 1           A                                         |
| C                |
| A+C              |
| A+C+D            |
| Key: A – ACE inhibitor or angiotensin II receptor blocker (ARB)¹ |
| C – Calcium-channel blocker (CCB)² |
| D – Thiazide-like diuretic |

Reproduced from NICE¹ with kind permission
Key: (i) Choose a low-cost ARB. (ii) A CCB is preferred but consider a thiazide-like diuretic if a CCB is not tolerated or the person has oedema, evidence of heart failure or a high risk of heart failure. (iii) Consider a low dose of spironolactone³ or higher doses of a thiazide-like diuretic. (iv) At time of publication (August 2011), spironolactone did not have a UK market authorisation for this indication. Informed consent should be obtained and documented. (iv) Consider an alpha-blocker or beta-blocker if further diuretic therapy is not tolerated, or is contraindicated or ineffective.
aged ≥80 years should be offered treatment only if they have Stage 2 hypertension.1

In the opinion of the faculty, the decision to prescribe antihypertensive medication in the elderly population should be made only after the individual patient has been supported to make an informed decision on the basis of the risks and benefits of treatment. The 2011 hypertension guideline also recommends that the decision to treat should be based on standing blood pressure, and should take into account the presence of co-morbidities such as dementia. The guideline also makes a distinction between initiating treatment in the over-80s and continuing long-term and well-tolerated treatment when patients reach this age. In other words, patients who were started on treatment when younger should not have their current therapy back-titrated when they celebrate their 80th birthday.1

### Blood pressure targets and audit standards

After reviewing the evidence, NICE concluded that CBPM should generally be used to monitor response to treatment in hypertensive patients. ABPM or HBPM can be used to support CBPM monitoring in patients with white coat hypertension or if the patient prefers to monitor their own blood pressure.1

With the exception of the CBPM target for patients aged ≥80 years, the current Quality and Outcomes Framework (QOF) blood pressure audit standard is higher than the 2011 NICE/BHS treatment targets (table 5). According to the faculty, since the NICE/BHS target of <140/90 mmHg has been shown to improve outcomes in treated hypertensive patients,1 there could be many patients who remain at higher risk if they are treated only to the QOF audit target. For example, while 72% of 418 patients at a community hypertension clinic achieved the current QOF blood pressure target of <150/90 mmHg six months after referral, only 46% reached the clinical target of <140/90 mmHg (figure 5),18 which suggests that some GPs may consider the audit standard as the treatment target.

A lower QOF audit standard will be introduced (see editors’ note in table 5) following NICE’s recommendations for indicators in QOF 2013/14.19 (This will not be introduced in Scotland where separate negotiations are being carried out.) The faculty suggested that it will be less challenging to achieve this more stringent target if the NICE/BHS 2011 clinical blood pressure targets are already part of the practice protocol – a strategy that is being followed by some primary care organisations (see 5).1

### Hypertension in practice

Based on QOF data for England, the prevalence of hypertension in adults increased from 11.3% to 13.6% between 2005 and 201220 and the proportion of practices achieving the QOF BP5 indicator rose from 70% in 2005 to almost 80% in 2012,20 which suggests a success for QOF. This overall statistic, however, hides some important variations in exception reporting. In 2010/11, there was ±5% exception reporting in more than 78% of GP practices, but the range for exception reporting was 0–50% across England with 5% of practices reporting over 10% exceptions for this indicator.21

According to the faculty, this indicates that there are likely to be wide variations in the implementation of the 2011 hypertension guidelines.
South of England
Regional prescribing data* suggest that the 2011 NICE/BHS hypertension guideline is being implemented. Since 2009, there has been an approximately 11% decline in diuretic prescribing, while CCB prescribing has increased by about 4% and ACE inhibitor and ARB prescribing by 5% each. However, despite NICE guidance and the availability of generic ARBs, there has been no significant change since 2009 in the prescribing ratio between ACE inhibitor and ARB with about 2.5 times more ACE inhibitor prescribing, which probably reflects previous efforts to curtail prescribing costs.

The local Clinical Commissioning Group’s focus on the 2011 hypertension guideline, especially during health checks, is identifying many patients with Stage 1 hypertension. This had led to an expanding role for ABPM, which is increasingly being administered by community pharmacists. Locally, the next challenge is to ensure that patients are taking optimal tolerated therapy. In one practice for example, two-fifths of patients are receiving monotherapy, which may represent an under-treated group, who might need to be moved to Step 2 combination therapy to achieve their NICE/BHS target blood pressures.

*Courtesy of the Associate Director of Medicines Management, Southampton, Hampshire, Isle of Wight and Portsmouth PCT Cluster

York
By contrast, data from York suggest little uniformity of approach, and it appears that NICE guidelines are not optimally followed. In some cases, patients are started on inappropriate treatment – for example, some patients have been started on a diuretic at Step 1. Locally, there have been delays in obtaining ABPM devices, but now most practices will offer this test to confirm a diagnosis of hypertension or monitor response to treatment. There has been a comprehensive training scheme for the clinical staff who will be fitting the devices. This is important, since in the past, where ABPM has been used, technical problems have led to a high number of repeat tests, thus becoming much less cost effective. Using ABPM also appears to have led to fewer patients being offered treatment, and there is no clear follow-up for those who have proven white coat hypertension, who remain at increased risk.

Locally, there are no plans to commission a hypertension service. Although there is a need to reduce referrals to secondary care, there is also no local pathway that includes advice on the investigation and management of resistant hypertension. This is an important issue, since many of these patients have multiple co-morbidities and it can be difficult to decide whether to refer them to renal, cardiology or endocrine secondary care services.

Scotland
In Scotland as a whole, the number of prescribed items for diseases of the cardiovascular system (British National Formulary Group 2) rose from <18 million in 2002 to >24 million in 2011, but the cost has remained approximately the same due to increasing availability of generic versions of recommended drugs.

There is no specific Scottish Intercollegiate Guideline Network (SIGN) hypertension guideline, so practices are encouraged to follow the NICE guideline. The SIGN 97 guideline on prevention of cardiovascular disease endorses the previous JBS 2/BHS guidance on targets and the A/CD algorithm. There are, however, wide variations between health boards in use of all classes of antihypertensive drug. For example, NHS Western Isles is the highest user of ARBs with the relative number of defined daily doses being 160* – double the amount of the lowest user, NHS Lothian. Prescribing of thiazide diuretics remains high, with low-dose bendroflumethiazide the most commonly prescribed antihypertensive medication in Scotland. A study is planned that involves substitution of bendroflumethiazide with chlortalidone, but it has yet to get underway.

*Data courtesy of Information Services Division, Scotland. Comparisons are based on the ‘defined daily dose’ – the assumed average maintenance dose of a drug per day and a proxy measure for the number of patients taking the drug.
## Table 6. Implementing ambulatory blood pressure monitoring (ABPM)

<table>
<thead>
<tr>
<th>Advice for practices</th>
<th>Advice for patients</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Documentation</strong></td>
<td><strong>Instruct the patient to:</strong></td>
</tr>
<tr>
<td>• Devise local standard operating procedures/competencies and documentation</td>
<td>• Undertake normal activities</td>
</tr>
<tr>
<td>• Devise procedures to ensure return of monitors</td>
<td>• Stand/sit still and not talk during measurement</td>
</tr>
<tr>
<td></td>
<td>• Keep the arm supported during measurement</td>
</tr>
<tr>
<td></td>
<td>• If advised to keep the monitor attached at night, place it under the pillow or at the side of the bed</td>
</tr>
<tr>
<td></td>
<td>• Ensure the monitor is kept dry</td>
</tr>
<tr>
<td></td>
<td>• Limit cardiovascular exercise</td>
</tr>
<tr>
<td></td>
<td>• Record daily activities</td>
</tr>
<tr>
<td><strong>Logistics</strong></td>
<td><strong>Details of the procedure</strong></td>
</tr>
<tr>
<td>• Use independently validated monitors*</td>
<td>• Frequency of inflation</td>
</tr>
<tr>
<td>• Allow time and resources for regular service, maintenance and calibration of monitors</td>
<td>• Duration: when to turn off the monitor/return it to the clinic</td>
</tr>
<tr>
<td>• Ensure that batteries are always in stock</td>
<td>• Unsuccessful readings: check for kinked tubing, excessive movement and/or talking</td>
</tr>
<tr>
<td>• Ensure that the cuff is cleaned between patients</td>
<td>• What to do if the monitor fails</td>
</tr>
<tr>
<td><strong>Fitting the monitors</strong></td>
<td><strong>Safety</strong></td>
</tr>
<tr>
<td>• Assess the patient’s suitability/ability to undertake ABPM</td>
<td>• Remove the cuff if you experience bruising/pain/swelling of the arm</td>
</tr>
<tr>
<td>• Allow about 30 minutes to fit the monitor and explain the procedure to the patient</td>
<td>• Consider potential hazards of wearing the monitor at work</td>
</tr>
<tr>
<td>• Choose the correct cuff size for each patient</td>
<td>• Consider safety when driving</td>
</tr>
<tr>
<td>• If there is ≤20 mmHg difference between arms, fit the cuff on the non-dominant arm</td>
<td>• Procedure for manual deflation if the cuff does not deflate automatically</td>
</tr>
<tr>
<td>• If there is &gt;20 mmHg difference between arms, fit the cuff on the arm with the higher blood pressure</td>
<td></td>
</tr>
<tr>
<td><strong>Cautions</strong></td>
<td></td>
</tr>
<tr>
<td>• Anticoagulated patients</td>
<td></td>
</tr>
<tr>
<td>• Arm affected by stroke</td>
<td></td>
</tr>
<tr>
<td>• Arm affected by mastectomy or lymphoedema</td>
<td></td>
</tr>
<tr>
<td>• Injured arm</td>
<td></td>
</tr>
<tr>
<td>• Friable skin</td>
<td></td>
</tr>
<tr>
<td>• Latex allergy</td>
<td></td>
</tr>
<tr>
<td>• Infection control issues</td>
<td></td>
</tr>
</tbody>
</table>

Data from Louise Beesley with kind permission

*A list of validated ABPM monitors is available from the British Hypertension Society ([10](#))

---

Continued from page S8

guideline – a suggestion borne out by faculty members’ own experience (see panels page S9).

Equally, there is some evidence of changes in prescribing habits that may to some extent reflect the influence of the 2011 NICE/BHS treatment recommendations. The number of annual prescriptions for ACE inhibitors rose from about 8.4 million in June 2007, for example, to 10.5 million in June 2012, and there has been similar growth in ARB prescribing, which has risen from 3.2 million to over 4 million. CCB prescribing has also increased, rising from 6.5 million annual prescriptions in June 2007 to about 8.5 million in June 2012. There has, however, been little change in diuretic prescribing. Although there is some indication of growth in use of indapamide, bendroflumethiazide remains by far the most commonly prescribed diuretic.

[22](#)
Implementing the guideline: overcoming the challenges

Coding

Accurate data entry has been essential for practices since the introduction of the QOF and, more recently, audit and revalidation. In the faculty’s experience, uncertainty about precise Read coding has been an unforeseen consequence of the change of terminology from ‘essential’ to ‘primary’ hypertension in the NICE/BHS 2011 hypertension guideline. Since there is currently no Read code for primary hypertension, the faculty strongly recommended that practices should continue to use the G20 Read code designated for essential hypertension and also for people with secondary hypertension so these patients will be included in monitoring and follow-up.

It is also important that private patients with newly diagnosed hypertension have a cardiovascular risk assessment at the time of diagnosis and are coded appropriately.

Recording blood pressure readings with a Read code means they are less likely to be lost to computerised searches. Read code 662L can be used for ABPM to record 24-hour blood pressure; Read code 246d can be used for HBPM to record the average home systolic blood pressure levels, although diastolic values can also be entered.

The faculty considered that failure to appropriately code patients, including individual blood pressure values, increases the risk that some patients, e.g. those with white coat hypertension, will not be recalled for follow-up – a potentially serious issue given their known cardiovascular risk.11

For this reason, and to support audit and revalidation, the faculty recommended that practices consider using embedded computer templates to record blood pressure and related data when patients with hypertension attend for review, since this is more likely to ensure correct coding for subsequent searches of the practice registers. The use of clinical templates also improves the accuracy of data and coding.

Measuring blood pressure

The importance of careful blood pressure measurement in the clinic (Table 3) is well established. However, the faculty considered that some practices might be less aware of potential problems when implementing ABPM. Table 6 outlines some practical advice for practices and patients. More detailed information, including standard operating procedures and a clinic checklist, is available from the BHS (©7). The BHS also provides a patient information leaflet on ABPM (©8) and a patient diary (©9) to help ensure that daily activities are recorded during monitoring.

The faculty considered that using HBPM will help patients to self-monitor their hypertension. Some patients may also record their blood pressure on devices that link with smartphone apps or computer programs and record measurements for output in graphic format. Although these technologies have yet to be validated, they represent, in the opinion of the faculty, an important opportunity to engage with patients who are sufficiently motivated to bring their own readings for discussion during clinic appointments.

Patients should be encouraged to keep written diaries (see ©2, ©3, ©5 for downloadable patient diary forms).

Concordance

Concordance with antihypertensive drug regimens is an especially important challenge since long-term persistence is known to be low. Based on drug dispensing records from community pharmacies and linked hospital discharge records, a Dutch study on patients with hypertension found that only 39% of patients used their medication continuously during the 10 years of follow-up. About 22% temporarily discontinued and restarted treatment but 39% discontinued permanently.23

It is clearly important to check that hypertensive patients are taking their medication and also to check the prescribing records when performing a hypertension review. The faculty strongly endorsed a non-judgemental approach when making these enquiries. Comments such as “It can be difficult to remember to take tablets. How many doses do you think you miss?” are more likely to lead to an open, positive discussion with the patient than accusatory remarks such as “You haven’t been taking your drugs, have
**Table 7. Resistant hypertension checklist**

1. Check blood pressure has been measured correctly (table 1)
2. Consider home blood pressure monitoring
3. If the patient is overweight, ensure that the correct cuff size has been used to measure blood pressure and advise that weight loss will lower blood pressure (and sleep apnoea)
4. Reduce salt intake
5. Check that the patient is adherent to and persistent with therapy
6. Check that the patient is not taking other substances which may interact with medication, such as NSAIDs or liquorice
7. Optimise medication doses and use the most potent agents in class, according to NICE 2011 guidance
8. Consider step 4 with spironolactone: check U&E regularly, be aware of hypotension and warn patient to temporarily stop treatment during acute illnesses (e.g. nausea and vomiting)
9. Consider a secondary cause for hypertension and look again for target organ damage before referral
10. Individualise care remembering that blood pressure targets may have to be modified to reflect competing risk factors (for example, in patients at high risk of falls)
11. Maximise all other interventions e.g. smoking cessation, statin, and remember that hypertension is only part of cardiovascular risk
12. Try re-starting at Step 1 treatment and moving on to next steps as needed

Data compiled from faculty and Myat 2012

**Key**
- NSAIDs = non-steroidal anti-inflammatory drugs
- U&E = urea and electrolytes

---

**Table 8. Indications for referral**

<table>
<thead>
<tr>
<th>Community hypertension clinic</th>
<th>Secondary care</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Resistant hypertension</td>
<td>• Accelerated or malignant hypertension, especially if grade III-IV retinopathy, suspected TIA or aortic dissection</td>
</tr>
<tr>
<td>• Multiple adverse reactions to antihypertensive therapy</td>
<td>• Suspected secondary hypertension, diagnosed obstructive sleep apnoea, pheochromocytoma, rapidly worsening hypertension</td>
</tr>
<tr>
<td>• Persistent non-adherence despite primary-care team’s best efforts</td>
<td>• Hypertension in people aged &lt;40 years, especially with no family history of hypertension, where a secondary cause is suspected</td>
</tr>
<tr>
<td>• Complex prescribing due to comorbidities (e.g. CKD and ACEI/ARB)</td>
<td>• Pseudo-hypertension in elderly patients</td>
</tr>
</tbody>
</table>

Data from Helen Williams

**Key**
- ACEI = angiotensin-converting enzyme inhibitor; ARB = angiotensin receptor blocker; CKD = chronic kidney disease; TIA = transient ischaemic attack
agents in enabling more patients to achieve clinical targets and reduce their cardiovascular risk. A key challenge for primary care is to reduce the number of unplanned admissions and reducing cardiovascular risk could help achieve this.

Resistant hypertension

According to the NICE/BHS 2011 guideline, hypertension is truly resistant when blood pressure remains uncontrolled to <140/90 mmHg despite treatment with at least optimal or best-tolerated doses of Step 3 treatment (i.e. ACE inhibitor or ARB plus CCB plus thiazide-like diuretic). Device-based therapies, such as renal denervation, are emerging as an option for patients with resistant hypertension. Before considering such an interventional procedure or referral to secondary care, UK guidelines recommend that patients should have confirmed sustained systolic blood pressure ≥160 mmHg on CBPM, and >150 mmHg daytime average on ABPM (>150 mmHg CBPM and >140 mmHg ABPM for patients with diabetes). In addition, because patients in trials of renal denervation were taking an average of five medications before intervention or referral, all patients should have tried medical therapy, up to and including Step 4 of the NICE/BHS 2011 guideline (figure 4), with additional diuretic therapy. In light of these consensus recommendations and the challenges discussed above, the faculty recommended adopting the pathway demonstrated in table 7 to exclude alternative explanations for resistant hypertension.

Insufficient medical therapy is the most common reason for apparently resistant hypertension. According to the faculty, this ‘pseudoresistance’ can be addressed, first, by ensuring that the patient is concordant with medication, and then by optimising medication by adjusting the dose, adding in additional therapies and using the most effective drugs in a particular class. Similarly, ensuring that ABPM has been administered correctly will help to rule out ‘white coat’ hypertension in many patients. For example, a study using data from the Spanish Ambulatory Blood Pressure Monitoring Registry found that of 8,295 patients with resistant hypertension on clinic readings, 37.5% had white coat hypertension on ABPM. Finally, since 10% of patients have secondary hypertension, a thorough medical history and examination is essential to ensure that uncontrolled blood pressure is not caused or exacerbated by other diseases or drugs.

Referral options

Table 8 outlines indications for referral suggested by the faculty. In some areas it may be possible to refer patients to community hypertension clinics run by GPs with a Special Interest or community pharmacists. These facilities can not only deal with much of the workload involved in identifying patients with truly resistant hypertension but can also manage other challenging patients.

Future developments

Initiatives are now underway that could help to support practices in meeting the challenges of managing primary hypertension, including more stringent QOF audit standards.

A patient decision aid relating to the NICE/BHS 2011 guideline is being developed in co-operation with the Department of Health. By taking patients step-by-step through the effects of high blood pressure, and the role of lifestyle measures and drug treatment in improving outcomes, the aim is to help patients to make an informed decision about their treatment that may help to improve their concordance. According to the faculty, similar motivating information could also be provided by universal adoption of lifetime risk calculation, which may be recommended by the Joint British Societies in their next guidelines (JBS3).

Preparations for a UK ABPM hypertension register are also in their early stages. Such registers already exist in Ireland and Spain, where they enable the collection of more accurate retrospective data that has helped, for example, to identify patients with truly resistant hypertension. The system used in Ireland also makes it possible to produce an online summary report that can be discussed with each patient during the consultation – again, offering a tool that could potentially improve concordance so that more patients can achieve the clinical targets in the new NICE 2011 hypertension guideline.

Revalidation

If you would like to reflect on what you have learned from this supplement and use it towards your revalidation activities, this can be done on BJC online (see 12).
Take home messages

• Hypertension is the most common cardiovascular risk factor condition and its diagnosis, treatment and management are a significant part of primary care workload

• While more people are being treated for hypertension, the numbers of people with uncontrolled blood pressure remain largely unchanged, and many people still remain undiagnosed

• This persisting burden of hypertension results in part from non-concordance, medication intolerance, undiagnosed secondary causes, white coat and true resistant hypertension

• Clear messages about diagnosis and treatment are needed to help support primary care to implement current guidance

• Audit can help identify where practices are not following guidance and can provide the support and encouragement
to implement current guidelines. It can also identify people newly diagnosed in private practice

• More effective strategies need to be developed to identify patients not already diagnosed who would benefit from treatment

• ABPM and HBPM are useful tools for accurate diagnosis

• Uniform coding of patients at practice level is required. Patients with ‘primary’ hypertension need to be identified as such and differentiated from those with raised blood pressure who are in disease categories that can be considered end organ damage (vascular disease) or high-risk category for vascular damage (diabetes) where the targets and audit standard for treatment are more stringent

• There is a trend towards more rational prescribing in line with the NICE/BHS ACD algorithm

• Reluctance and barriers to the use of newer agents need to be addressed at clinical and medicine management levels

• Efforts should be made to address non-adherence, including identifying and addressing any underlying health beliefs

• A check list for those people who are thought to have resistant hypertension is a useful tool to help identify those who truly do have drug-resistant hypertension and to reduce unnecessary referrals

• There remains a case for development of new medicines and interventions to address these needs

• The introduction of new lower QOF targets for hypertension in England and Wales will help prevent more heart attacks and stroke

• Successful treatment of hypertension requires a partnership between educated and motivated clinicians to educate and motivate patients

Online extras at www.bjcardio.co.uk

Visit BJC Online for an interactive version of this supplement, where additional materials helpful for patients and healthcare professionals can be downloaded. The materials available (cited in this supplement by the © sign) are:

1. Blood pressure monitors recommended by the BHS
   www.bhsoc.org/bp-monitors/bp-monitors

2. Patient HBPM diagnosis diary
   www.bjcardio.co.uk/patientdiary-HBPM-1/

3. Patient HBPM follow-up diary
   www.bjcardio.co.uk/patientdiary-HBPM-2/

4. Joint British Societies (JBS2) cardiovascular risk assessor
   http://heartuk.org.uk/health-professionals/resources/risk-calculators/jbs2-cv-risk-assessor

5. QRISK® lifetime cardiovascular risk calculator
   http://www.qrisk.org/lifetime/

6. South London Cardiac and Stroke Network protocol on ‘Managing uncomplicated hypertension’

7. British Hypertension Society advice on ambulatory blood pressure monitoring patient information leaflet

9. British Hypertension Society ambulatory blood pressure monitoring patient diary

10. British Hypertension Society blood pressure monitors validated for clinical use

11. NICE clinical guideline 76: Medicines adherence: involving patients in decision about prescribed medicines and supporting adherence
    www.nice.org.uk/CG76

12. BJC reflection and revalidation activity
    http://bjcardio.co.uk/category/supplements/2013-volume-20-supplement-1/
References


18. Williams H (personal communication).


Abbreviated Prescribing Information

Edarbi® ▼ (azilsartan medoxomil)

(Rrefer to the Summary of Product Characteristics before prescribing).

**Presentation:** Tablets containing 20mg, 40mg or 80mg of azilsartan medoxomil.

**Indication:** Essential hypertension in adults.

**Dosage:** Starting dose is 40mg once daily with or without food. The dose may be increased to 80mg in patients not adequately controlled at lower dose. Maximal antihypertensive effect is attained by 4 weeks. No initial dose adjustment in the elderly (≥75 years), in patients with mild to moderate hepatic impairment and in patients with possible depletion of intravascular volume or salt depletion. Additional blood pressure reduction can be achieved when Edarbi® is co-administered with other antihypertensive medicinal products, including diuretics and calcium channel blockers.

**Contra-indications:** Hypersensitivity to any component of Edarbi®. Second and third trimester of pregnancy.

**Warnings and Precautions:** In patients with an activated renin-angiotensin-aldosterone system (e.g. congestive heart failure, severe renal impairment or renal artery stenosis) the use of angiotensin II receptor antagonists, has been associated with acute hypotension, azotaemia, oliguria or, rarely, acute renal failure. The possibility of similar effects cannot be excluded with Edarbi®. Edarbi® should be used with caution in hypertensive patients with severe renal impairment, congestive heart failure or renal artery stenosis or those who have recently undergone kidney transplantation as there is no experience of use of Edarbi® in these patients. In patients with ischaemic cardiomyopathy or ischaemic cerebrovascular disease excessive blood pressure decreases could result in myocardial infarction or stroke. Edarbi® is not recommended in patients with severe hepatic impairment or primary hyperaldosteronism. In patients with marked volume- and/or salt-depletion symptomatic hypotension could occur after initiation of treatment with Edarbi®. Hypovolaemia should be corrected prior to treatment which should start under close medical supervision. Concomitant use of Edarbi® with potassium-sparing diuretics, potassium supplements, salt substitutes containing potassium and other medicinal products that may increase potassium levels (e.g. heparin) may lead to hyperkalaemia in hypertensive patients. The risk of hyperkalaemia is increased in the elderly, in patients with renal insufficiency, in diabetic patients and in patients with other comorbidities. Monitoring of potassium should be undertaken as appropriate. Special caution in patients suffering from aortic or mitral valve stenosis, or hypertrophic obstructive cardiomyopathy (HOCM). Edarbi® should not be initiated during pregnancy. When pregnancy is confirmed treatment with Edarbi® should be stopped immediately. Edarbi® is not recommended during breastfeeding.

**Drug Interactions:** No clinically significant interactions with amlodipine, antacids, chlortalidone, digoxin, fluconazole, glyburide, ketoconazole, metformin, and warfarin. Use with lithium is not recommended. If the combination proves necessary, careful monitoring of serum lithium levels is recommended. Attenuation of the antihypertensive effect may occur with NSAIDs and use with NSAIDs may lead to worsening of renal function and increase in serum potassium. Therefore adequate hydration and monitoring of renal function at the beginning of treatment is recommended.

**Side-effects:** Prescribers should consult the Summary of Product Characteristics in relation to other side-effects. In clinical studies of up to 56 weeks, adverse reactions were mostly mild or moderate, with an overall incidence similar to placebo. The incidence of adverse reactions with Edarbi® was not affected by gender, age, or race. These are ranked by frequency, using the following convention: very common (≥1/10); common (≥1/100, <1/10); uncommon (≥1/1,000, <1/100); rare (≥1/10,000, <1/1,000); very rare (<1/10,000), including isolated reports. The most common adverse reaction was dizziness. Other adverse reactions seen commonly in clinical trials include diarrhoea and increased blood creatine phosphokinase. Uncommon adverse reactions include hypotension, fatigue, peripheral oedema, increased blood creatinine and hyperuricaemia. Angioedema, including circumoral oedema and periorbital oedema, was rarely seen in patients during open label treatment. Co-administration with chlortalidone increased the frequencies of increased blood creatinine and hypotension from uncommon to common. Co-administration with amlodipine increased the frequency of peripheral oedema from uncommon to common, but was lower than amlodipine alone.

**Legal category:** POM.

**Packs and Basic NHS Price:** Edarbi® 20mg, £16.80 for 28 tablets (EU/1/11/734/002), Edarbi® 40mg, £16.80 for 28 tablets (EU/1/11/734/006) and Edarbi® 80mg, £19.95 for 28 tablets (EU/1/11/734/009).

**PI approval code:** AZL120107a

**PI Date of Preparation:** February 2012

**Marketing Authorisation Holder:** Takeda Global Research and Development Centre (Europe) Ltd., 61 Aldwych, London, WC2B 4AE, UK.

**Further information can be obtained from:** Takeda UK Ltd, Takeda House, Mercury Park, Wooburn Green, High Wycombe, Bucks HP10 0HH. Tel: 01628 537900 Fax: 01628 526617 ®Registered trademark owned by Takeda Pharmaceutical Company Ltd.

Please refer to the Summary of Product Characteristics for details on the full side-effect profile and drug interactions of Edarbi®. Adverse events should be reported. Reporting forms and information can be found at www.mhra.gov.uk/yellowcard. Adverse events should also be reported to Takeda UK Ltd. on 01628 537900.