Hypertension: Management of hypertension in adults in primary care

NICE guideline

Second draft for consultation, February 2004

If you wish to comment on the recommendations, please make your comments on the full version of the draft guideline.
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This NICE guideline provides recommendations for the primary care management of raised blood pressure in patients with no obvious underlying disease (essential hypertension).

Hypertension is a major but modifiable contributory factor in cardiovascular diseases (CVD) such as stroke and coronary heart disease. The objective of this guideline is to decrease cardiovascular morbidity and mortality resulting from these diseases. It is important to assess risk in people before CVD develops and monitoring for persistently raised BP is one aspect of CV risk assessment.

This guideline makes recommendations on primary care management of hypertension. It includes recommendations on approaches to identifying patients with persistently raised BP, and managing hypertension (including lifestyle advice, use of BP lowering drugs).

This guideline does not address screening for hypertension, management of hypertension in pregnancy, or the specialist management of secondary hypertension (where renal or pulmonary disease, endocrine complications or other disease underlie raised blood pressure). Patients with existing coronary heart disease or diabetes should be managed in line with current national guidance for these conditions.
Key recommendations

The following have been identified as priorities for implementation.

Measuring blood pressure

Patients with a single raised blood-pressure reading of more than 140/90 mmHg should be asked to return for a minimum of two subsequent clinics where their blood pressure can be measured using the best conditions available.

The value of routinely using automated ambulatory blood pressure monitoring or home monitoring devices as part of primary care has not been established: their appropriate use in primary care remains an issue for further research.

Cardiovascular risk

A formal cardiovascular risk assessment should be conducted in patients with hypertension (persistent raised blood pressure more than 140/90 mmHg). These tests may help identify diabetes, evidence of hypertensive damage to the heart and kidneys, and secondary causes of hypertension such as kidney disease.

Consider the need for specialist investigation of patients with unusual signs and symptoms, where a secondary cause of hypertension is suspected, or in patients whose hypertension is resistant to drug treatment.

Lifestyle interventions

Lifestyle advice should be offered initially and then periodically to patients undergoing assessment or treatment for hypertension.

Pharmacological interventions

Drug therapy should be offered to (i) patients with persistent high blood pressure of 160/100 mmHg or more and (ii) patients at raised cardiovascular risk (10-year risk of CHD > 15% or CVD > 20% or existing cardiovascular
disease or target organ damage) with persistent blood pressure of more than 140/90 mmHg.

Drug therapy should begin with a low-dose thiazide diuretic or, if not tolerated or ineffective, a beta blocker.

If further blood pressure lowering is warranted, additional treatment should be offered. In addition to a thiazide diuretic, an ACE-inhibitor should be offered and then a calcium channel blocker, as necessary. In addition to a beta blocker, offer a calcium channel blocker and then an ACE-inhibitor, as necessary. Consider substituting an angiotensin receptor blocker in patients who are ACE-inhibitor intolerant.

**Continuing treatment**

Once blood pressure is managed adequately, there should be an annual review of care to monitor blood pressure, provide support and discuss lifestyle, symptoms and medication.

Patients without existing cardiovascular disease and with well-controlled blood pressure wishing to reduce or stop using drugs may be offered a trial reduction or withdrawal of therapy with careful follow-up, appropriate lifestyle guidance and monitoring.
The following guidance is evidence based. The evidence supporting each recommendation is provided in the full guideline (see Section 5). Please note that the grading scheme for evidence used in the NICE guideline (Appendix A) differs from that used in the full guideline.

1 Guidance

1.1 Measuring blood pressure

1.1.1 Healthcare professionals taking blood pressure measurements need adequate initial training and periodic review of their performance. The principles of good technique for measuring blood pressure are presented in Box 1. [D]

1.1.2 Healthcare providers must ensure that devices for measuring blood pressure are properly maintained and periodically recalibrated according to manufacturers’ instructions. [D]

1.1.3 Where possible, standardise the environment when measuring blood pressure: provide a relaxed, temperate setting, with the patient quiet and seated and with their arm outstretched and supported. [D]

1.1.4 If the first measurement exceeds 140/90 mmHg, and if practical, take a second confirmatory reading at the end of the consultation. [D]

1.1.5 To identify hypertension (persistent raised blood pressure, 140/90 mmHg), ask the patient to return for at least two subsequent clinics where blood pressure is assessed from two readings under the best conditions available. [D]

1.1.6 Measure blood pressure on both of the patient’s arms with the higher value identifying the reference arm for future measurement. [D]

1.1.7 Measurements should be made at monthly intervals unless clinical circumstances dictate otherwise. [D]

1.1.8 The value of routinely using automated ambulatory blood pressure monitoring or home monitoring devices as part of primary care has not
been established: their appropriate use in primary care remains an issue for further research. [C]

1.1.9 Consider the need for specialist investigation of patients with unusual signs and symptoms, or whose management depends critically on the accurate estimation of their blood pressure. [D]
BOX 1. Estimation of blood pressure by auscultation

- Standardise the environment as much as possible:
  - relaxed temperate setting
  - arm out-stretched, in line with mid-sternum and supported.
- Correctly wrap a cuff containing an appropriately sized bladder around the upper arm and connect to a manometer. Cuffs should be marked to indicate the range of permissible arm circumferences; these marks should be clearly seen when the cuff is being applied to an arm.
- Palpate the brachial pulse in the antecubital fossa of that arm.
- Rapidly inflate the cuff to 20 mmHg above the point where the brachial pulse disappears.
- Using one hand, place the stethoscope over the brachial artery ensuring complete skin contact with no clothing in between.
- Slowly deflate the cuff at 2–3 mmHg per second listening for Korotkoff sounds
  
  Phase I: The first appearance of faint repetitive clear tapping sounds gradually increasing in intensity and lasting for at least two consecutive beats: note the systolic pressure.
  
  Phase II: A brief period may follow when the sounds soften or ‘swish’. Auscultatory Gap In some patients, the sounds may disappear altogether.
  
  Phase III: The return of sharper sounds becoming crisper for a short time.
  
  Phase IV: The distinct, abrupt muffling of sounds, becoming soft and blowing in quality.
  
  Phase V: The point at which all sounds disappear completely: note the diastolic pressure.
- When the sounds have disappeared, quickly deflate the cuff completely if repeating the measurement.

1.2 Cardiovascular risk

1.2.1 If raised blood pressure persists and the patient does not have established cardiovascular disease, ask to formally assess the patient's cardiovascular risk. These tests may help identify diabetes, evidence of
hypertensive damage to the heart and kidneys, and secondary causes of hypertension such as kidney disease. [D]

1.2.2 Take a urine strip to test for the presence of protein in urine. Take a blood sample to assess plasma glucose, electrolytes, creatinine, serum total cholesterol and HDL cholesterol. Arrange for a 12-lead electrocardiograph to be performed. [D]

1.2.3 Consider the need for specialist investigation of patients with signs and symptoms suggesting a secondary cause of hypertension. Refer patients with suspected pheochromocytoma for immediate investigation. [D]

1.2.4 Use the cardiovascular risk assessment to discuss prognosis and healthcare options with patients, both for raised blood pressure and other modifiable risk factors. [D]

1.2.5 Management of existing coronary heart disease should be in line with current national guidance. Subsequently, patients with continuing hypertension should be offered lifestyle and pharmacological interventions in accordance with this guideline. [GPP].

1.2.6 Management of diabetes should be in line with current national guidance. [GPP]

1.2.7 The appropriate use of lipid-lowering and antiplatelet therapy should be considered alongside the use of hypertensive therapy in patients at raised cardiovascular risk. [GPP]

1.3 Lifestyle interventions

1.3.1 Healthy diet and regular exercise can reduce blood pressure. Offer appropriate guidance and written or audiovisual materials to promote lifestyle changes. [A]

1.3.2 Relaxation therapies can reduce blood pressure and individual patients may wish to pursue these as part of their treatment. However, routine provision by primary care teams is not currently recommended. [A]
1.3.3 Ascertain patients’ alcohol consumption and encourage a reduced intake where patients drink excessively. [B]

1.3.4 Discourage excessive consumption of coffee and other caffeine-rich products. [C]

1.3.5 Encourage patients to keep their dietary sodium intake low either by reducing or substituting sodium salt. [A]

1.3.6 Do not offer calcium, magnesium or potassium supplements as a method for reducing blood pressure [A]

1.3.7 Offer advice and help to smokers to stop smoking. [A]

1.3.8 A common strategy found in studies for motivating lifestyle change is the use of group working. Inform patients about local initiatives by, for example, healthcare teams or patient organisations which provide support and promote healthy lifestyle change. [D]

1.4 Pharmacological interventions

1.4.1 Offer drug therapy to (i) patients with persistent high blood pressure of 160/100 mmHg or more and (ii) patients at raised cardiovascular risk (10-year risk of CHD > 15% or CVD > 20% or existing cardiovascular disease or target organ damage) with persistent blood pressure of more than 140/90 mmHg. [A]

1.4.2 Offer drug therapy, adding different drugs if necessary, to achieve a target of 140/90 mmHg or less, or until further treatment is inappropriate or declined. [A]

1.4.3 Drug therapy should begin with a low-dose thiazide diuretic or, if not tolerated or ineffective, a beta blocker. [A]

1.4.4 Concern about the increased incidence of diabetes among patients prescribed a thiazide diuretic with a beta blocker means that this combination cannot be recommended for the early treatment of hypertension. The combination may become appropriate to manage
treatment-resistant hypertension, or if cardiovascular disease develops. [A]

1.4.5 If further blood pressure lowering is warranted, offer additional treatment. In addition to a thiazide diuretic, offer an ACE-inhibitor and then a calcium channel blocker, as necessary. In addition to a beta blocker, offer a calcium channel blocker and than an ACE-inhibitor, as necessary. Consider substituting an angiotensin receptor blocker in patients who are ACE-inhibitor intolerant. [A]

1.4.6 If treatments are not tolerated by the patient or further blood pressure lowering is warranted, offer additional treatment with an alpha blocker or another antihypertensive agent, or consider referral to a specialist. [B]

1.4.7 Offer patients with isolated systolic hypertension (systolic BP ≥ 160 mmHg) the same treatment as patients with both raised systolic and diastolic blood pressure. [A]

1.4.8 Offer very elderly patients (over 80 years of age) the same treatment as younger patients, having taken account of any comorbidity and their existing burden of drug use. [A]

1.4.9 Where possible, recommend treatment with drugs taken only once a day. [A]

1.4.10 Prescribe non-proprietary drugs where these are tolerated and minimise cost. [D]

1.4.11 There is controversy about the appropriate combination of antihypertensive drugs in patients of different age and ethnicity. [D]

1.5 Continuing treatment

1.5.1 The aim of medication is to reduce blood pressure to 140/90 mmHg or below. However, patients not achieving this target, or for whom further treatment is inappropriate or declined, will still receive worthwhile benefit from the drug(s) when these lower blood pressure. [C]
1.5.2 Patients without existing cardiovascular disease and with well-controlled blood pressure wishing to reduce or stop using drugs may be offered a trial reduction or withdrawal of therapy with careful follow-up, appropriate lifestyle guidance and monitoring. [A]

1.5.3 Patients vary in their attitudes to their hypertension and their experience of treatment. Patient organisations may provide useful forums to share views and information. [D]

1.5.4 Provide an annual review of care to monitor blood pressure, provide patients with support and discuss their lifestyle, symptoms and medication. [D]

2 Notes on the scope of the guidance

All NICE guidelines are developed in accordance with a scope document that defines what the guideline will and will not cover. The scope of this guideline was established at the start of the development of this guideline, following a period of consultation; it is available from http://www.nice.org.uk/article.asp?a=24839

This guideline provides recommendations for the care of patients with raised blood pressure. It does not address screening for hypertension, management of hypertension in pregnancy, or the specialist management of secondary hypertension (where renal or pulmonary disease, endocrine complications or other disease underlie raised blood pressure).

3 Implementation in the NHS

3.1 In general

The implementation of this guideline will build on the National Service Frameworks for Coronary Heart Disease and Older People in England and Wales and should form part of the service development plans for each local health community in England and Wales.
Local health communities should review their existing practice for the management of people with hypertension against this guideline. The review should consider the resources required to implement the recommendations set out in Section 1, the people and processes involved and the timeline over which full implementation is envisaged. It is in the interests of patients that the implementation timeline is as rapid as possible.

Relevant local clinical guidelines, care pathways and protocols should be reviewed in the light of this guidance and revised accordingly.

3.2 Audit

Suggested audit criteria are listed in Appendix D. These can be used as the basis for local clinical audit, at the discretion of those in practice.

4 Research recommendations

The following research recommendations have been identified for this NICE guideline.

- The role of ambulatory and home blood-pressure devices in improving patient care and health outcomes. The consequences for resource use (reflecting equipment purchase, maintenance, recalibration, staff, training and medication costs), patient participation in treatment and quality of life. The appropriate use of these devices either as a routine strategy or in self-selecting patients.
- The validity of cardiovascular risk prediction models in British patient populations, particularly in the young and in ethnic minorities.
- The presentation of individual benefits and risks of treatment to patients.
- The influence of class of drug upon morbidity and mortality in different age and ethnic groups.
- The relationship between thiazide diuretic/beta-blocker co-treatment and new onset diabetes.
5 Full guideline

The National Institute for Clinical Excellence commissioned the development of this guidance from the Newcastle Guideline Development and Research Unit. The Unit established a Guideline Development Group, which reviewed the evidence and developed the recommendations. The full guideline, *Hypertension: Managing Adult Patients in Primary Care*, is published by the Centre for Health Services Research, University of Newcastle upon Tyne, and is available on the NICE website (www.nice.org.uk) and on the website of the National Electronic Library for Health (www.neilh.nhs.uk).

The members of the Guideline Development Group are listed in Appendix B. Information about the independent Guideline Review Panel is given in Appendix C.

The booklet *The Guideline Development Process – Information for the Public and the NHS* has more information about the Institute’s guideline development process. It is available from the Institute’s website and copies can also be ordered by telephoning 0870 1555 455 (quote reference N0038).

6 Related NICE guidance

Prophylaxis for patients who have experienced a myocardial infarction: drug treatment, cardiac rehabilitation and dietary manipulation. *NICE Inherited Guideline A*, April 2001. Available from www.nice.org.uk/ ADD LINK. Reference numbers: NICE guidance N00XX; patient information N00XX.


Statins for the prevention of coronary events. Ongoing NICE Technology Appraisal.
7 Review date

The process of reviewing the evidence is expected to begin 4 years after the date of issue of this guideline. Reviewing may begin earlier than 4 years if significant evidence that affects the guideline recommendations is identified sooner. The updated guideline will be available within 2 years of the start of the review process.

A version of this guideline for individuals with hypertension, their families and the public is available from the NICE website (www.nice.org.uk) or from NHS Response Line (telephone 0870 1555 455 and quote reference number N0XXX for an English version and N0XXX for a version in English and Welsh).
**Appendix A: Grading scheme**

The grading scheme and hierarchy of evidence used in this guideline are shown in the table below. Please note the full guideline used a different system for grading of the evidence that was being piloted by the Newcastle Guideline Development and Research Unit.

<table>
<thead>
<tr>
<th>Hierarchy of evidence</th>
<th>Grade</th>
<th>Type of evidence</th>
</tr>
</thead>
<tbody>
<tr>
<td>Grade</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ia</td>
<td>Evidence from a meta-analysis of randomised controlled trials</td>
<td></td>
</tr>
<tr>
<td>Ib</td>
<td>Evidence from at least one randomised controlled trial</td>
<td></td>
</tr>
<tr>
<td>Ila</td>
<td>Evidence from at least one controlled study without randomisation</td>
<td></td>
</tr>
<tr>
<td>Ilb</td>
<td>Evidence from at least one other type of quasi-experimental study</td>
<td></td>
</tr>
<tr>
<td>III</td>
<td>Evidence from observational studies</td>
<td></td>
</tr>
<tr>
<td>IV</td>
<td>Evidence from expert committee reports or experts</td>
<td></td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Grading of recommendation</th>
<th>Grade</th>
<th>Evidence</th>
</tr>
</thead>
<tbody>
<tr>
<td>Grade</td>
<td></td>
<td></td>
</tr>
<tr>
<td>A</td>
<td>Directly based on category I evidence</td>
<td></td>
</tr>
<tr>
<td>B</td>
<td>Directly based on category II evidence or extrapolated from category I evidence</td>
<td></td>
</tr>
<tr>
<td>C</td>
<td>Directly based on category III evidence or extrapolated from category I or II evidence</td>
<td></td>
</tr>
<tr>
<td>D</td>
<td>Directly based on category IV evidence or extrapolated from category I, II or III evidence</td>
<td></td>
</tr>
<tr>
<td>GPP</td>
<td>Recommended good practice based on clinical experience of the Guideline Development Group</td>
<td></td>
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</tbody>
</table>

Appendix B: The Guideline Development Group

Susan L Brent
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General Practitioner, Stockton on Tees

Suzanne Laing
Nurse Practitioner, Tyne & Wear

James Mason
Methodologist and Technical Support, Newcastle upon Tyne

Colin Penney
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Patient Representative, Derbyshire

Penny Ross

General Practitioner, Newcastle upon Tyne

Jean Thurston

Patient Representative, Tyne & Wear

Bryan Williams

Professor of Medicine and Director, Cardiovascular Research Unit, Leicester
Appendix C: The Guideline Review Panel

The Guideline Review Panel is an independent panel that oversees the development of the guideline and take responsibility for monitoring its quality. The Panel includes experts on guideline methodology, health professionals and people with experience of the issues affecting patients and carers. The members of the Guideline Review Panel were as follows.

Professor Mike Drummond (Chair)
Director, Centre for Health Economics (CHE)
University of York

Barry Stables
Patient/Lay Representative

Dr Imogen Stephens
Joint Director of Public Health
Western Sussex Primary Care Trust

Dr Kevork Hopayian
General Practitioner
Suffolk

Dr Robert Walker
Clinical Director
West Cumbria Primary Care Trust
Appendix D: Technical detail on the criteria for audit

Audit criteria based on key recommendations

The following audit criteria have been developed by the Institute to reflect the key recommendations. They are intended to assist with implementation of the guideline recommendations. The criteria presented are considered to be the key criteria associated with the priorities for implementation.

<table>
<thead>
<tr>
<th>Criterion</th>
<th>Standard</th>
<th>Exception</th>
<th>Definition of terms</th>
</tr>
</thead>
<tbody>
<tr>
<td>Measuring blood pressure</td>
<td>100% of the individuals with a single raised blood-pressure reading of more than 140/90 mmHg is asked to return for a minimum of two subsequent clinics where the individual's blood pressure is measured using the best conditions available</td>
<td>None</td>
<td>‘Two subsequent clinics’ should normally be at monthly intervals. ‘Best conditions available’ includes taking an individual’s blood pressure in both arms in a relaxed, warm setting while the individual is quiet and seated and has his or her arm outstretched and supported. Clinicians will need to agree locally on how conditions for taking blood pressure are noted for audit purposes.</td>
</tr>
<tr>
<td>Cardiovascular risk</td>
<td>100% of individuals identified as having hypertension</td>
<td>None</td>
<td>‘Hypertension’ is persistent (or repeated) raised blood pressure more than 140/90 mmHg. ‘A formal cardiovascular risk assessment’ includes a urine test, blood tests and an electrocardiogram.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Clinicians should agree locally on the findings of a cardiovascular risk assessment that would indicate the need for referral to a specialist and also the time frame within which a referral is to be made.</td>
</tr>
<tr>
<td>Lifestyle interventions</td>
<td>4. An individual in whom hypertension is identified is offered lifestyle advice at the following times:</td>
<td>100% of individuals who are diagnosed as having hypertension</td>
<td>None</td>
</tr>
<tr>
<td>-------------------------</td>
<td>-------------------------------------------------------------------------------------------------</td>
<td>--------------------------------------------------</td>
<td>------</td>
</tr>
<tr>
<td></td>
<td>a. initially upon diagnosis</td>
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<tr>
<td></td>
<td>b. periodically to an individual who is being assessed or treated for hypertension</td>
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</tbody>
</table>

'Lifestyle advice' includes the following: advice on diet, regular exercise, drinking alcohol, drinking caffeine-rich drinks, eating salt and smoking; and reference to relaxation therapies such as stress management, meditation, yoga, cognitive therapies, physical exercises and biofeedback.
Clinicians will need to agree locally on how lifestyle advice is documented, for audit purposes. 'Initially' means at the time hypertension is diagnosed.
Clinicians need to agree locally on how the offering of lifestyle advice is documented on a periodic basis as an individual is being assessed or treated.

<table>
<thead>
<tr>
<th>Pharmacological interventions</th>
<th>5. Drug therapy is offered as follows:</th>
<th>100% of individuals who either have persistent high blood pressure of 160/100 mmHg or more and</th>
<th>None</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>a. an individual has persistent high blood pressure of 160/100 mmHg or more and</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>b. an individual is at raised cardiovascular risk with persistent blood pressure</td>
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<td></td>
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</tbody>
</table>

'Drug therapy' means a low-dose thiazide diuretic or if not tolerated or ineffective, a beta blocker. For an individual in whom further blood pressure is warranted, an ACE-inhibitor and a calcium channel blocker are offered, as necessary. An individual who is ACE-inhibitor intolerant may be prescribed an angiotensin receptor blocker.
Clinicians will need to agree locally
of more than 140/90 mmHg

<table>
<thead>
<tr>
<th>Continuing treatment</th>
<th>6. There is an annual review of care for an individual whose hypertension is in control</th>
<th>100% of individuals whose blood pressure has been reduced to 140/90 mmHg or below and maintained</th>
<th>None</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>The 'annual review' includes monitoring of blood pressure, and discussion of lifestyle, symptoms and medication. Clinicians will need to agree locally on how an annual review of an individual with hypertension is documented for audit purposes.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>7. An individual who has no existing cardiovascular disease and has well-controlled blood pressure who wishes to reduce or stop using drugs is offered a trial reduction or withdrawal of therapy</th>
<th>100% of individuals who have no existing cardiovascular disease, well-controlled blood pressure and wish to reduce or stop using drugs</th>
<th>None</th>
</tr>
</thead>
<tbody>
<tr>
<td>'A trial reduction or withdrawal of therapy' includes evidence of careful follow-up, appropriate lifestyle guidance and monitoring. Clinicians will need to agree locally on how follow-up and monitoring of people who have reduced or stopped taking drugs will be documented for audit purposes.</td>
<td></td>
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</tr>
</tbody>
</table>

on how people who warrant treatment with an ACE-inhibitor, a calcium channel blocker and an angiotensin receptor blocker are identified, for audit purposes.

‘Raised cardiovascular risk’ means 10-year risk of CHD >15% or CVD >20% or existing cardiovascular disease or target organ damage. Clinicians will need to agree locally on how raised cardiovascular risk is documented for audit purposes.
**Calculation of compliance**

Compliance (%) with each measure described in the table above is calculated as follows.

Number of patients whose care is consistent with the criterion

\[
\text{Number of patients whose care is consistent with the criterion} + \text{number of patients who meet any exception listed} \times 100
\]

\[
\text{Number of patients to whom the measure applies}
\]

Clinicians should review the findings of measurement, identify whether practice can be improved, agree on a plan to achieve any desired improvement and repeat the measurement of actual practice to confirm that the desired improvement is being achieved.

**Routine Data Collection**

A series of general practice database queries were identified as part of the process of guideline development: these data can be routinely captured using the MIQUEST system. MIQUEST is funded by the NHS Information Authority and is the recommended method of expressing queries and extracting data from different types of practice systems.

1. Number of patients (and practice prevalence) of persistent raised blood pressure

2. Proportion of patients in (1) with a previously completed cardiovascular risk assessment

3. Proportion of patients in (1) given lifestyle advice in the last year including (as appropriate) smoking cessation, diet and exercise

4. Proportion of patients in (1) prescribed a thiazide in the last 6 months

5. Proportion of patients in (1) prescribed a beta-blocker in the last 6 months
6. Proportion of patients in (1) prescribed an ACE-inhibitor in the last 6 months

7. Proportion of patients in (1) prescribed a calcium channel blocker in the last 6 months

8. Proportion of patients in (1) prescribed an angiotensin receptor blocker in the last 6 months

9. Proportion of patients in (1) prescribed another antihypertensive drug in the last 6 months

10. Proportion of patients in (1) prescribed no medication in the last 6 months

11. Proportion of patients in (10) with recorded refusal to accept medication

12. Proportion of patients in (1) prescribed aspirin in the last 6 months

13. Proportion of patients in (1) prescribed an alternative antiplatelet in the last 6 months

14. Proportion of patients in (1) prescribed a statin in the last 6 months

15. Proportion of patients in (1) prescribed an alternative lipid reducing agent in the last 6 months

16. Proportion of patients in (1) with latest systolic BP reading less than or equal to 140 mmHg

17. Proportion of patients in (1) with latest diastolic BP reading less than or equal to 80 mmHg

18. Proportion of patients in (1) with latest systolic BP reading less than or equal to 140 mmHg and diastolic BP reading less than or equal to 80 mmHg

19. Proportion of patients in (1) without a blood pressure reading in the last year
Appendix E: The algorithm*

1. See the NICE Guideline ‘Management of Type 2 Diabetes – management of blood pressure and blood lipids’

2. See the NICE Guideline ‘Prophylaxis for patients who have experienced a myocardial infarction: drug treatment, cardiac rehabilitation and dietary manipulation.’

3. Raised BP>140/90 mmHg. Take a second confirmatory reading at the end of the consultation.

4. Explain the potential consequences of raised BP. Provide guidance and materials to promote a healthy diet, regular exercise and smoking cessation.

5. To confirm raised BP, ask the patient to return for at least two subsequent clinics at monthly intervals where blood pressure is assessed under the best conditions available.

6. Hypertension: persistent raised BP>140/90 mmHg averaged over the last two visits.

7. CV risk assessment may identify other modifiable risk factors and help explain the value of BP lowering and other treatment. Risk charts and calculators are not valid in patients with diabetes, CVD or on treatment.

Either: (A) BP>160/100 mmHg; or, (B) BP>140/90 mmHg and (10 year CHD risk ≥ 15%, CVD risk ≥ 20% or existing CVD, stroke or TCD).

Consider other treatments for raised cardiovascular risk including statin lowering and anticoagulant therapy.

8. Refer patients with signs and symptoms of secondary hypertension to a specialist. Refer patients with suspected pheochromocytoma for immediate investigation.

A secondary cause more likely in younger patients (<30 yrs), suddenly worsening BP, with accelerated hypertension (BP>180/110 mmHg with signs of papilloedema and/or retinal haemorrhage) or poor treatment response.

Labile or orthostatic hypotension, headache, palpitations, pallor & diaphoresis are potential signs of pheochromocytoma.

9. As needed, add drugs in the following order:

† Thiazide diuretic prescribed with a beta blocker may increase the risk of diabetes and this combination is no longer recommended in the early treatment of hypertension although it may become appropriate to manage treatment resistant hypertension, or if cardiovascular disease develops.

+ Limit ARB use to patients intolerant of ACEi

‡ Only dihydropyridine calcium channel blockers should be prescribed with a beta blocker

10. BP≤140/90 mmHg or further treatment is declined.

11. Check BP, reassess CV risk and discuss lifestyle.


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* Deriving an evidence-based rationale for managing hypertension in primary care brings together understanding of health-care delivery and a vast literature providing evidence about tests and treatments. Flowcharts are inevitably a simplification and cannot capture all the complexities and permutations affecting the clinical care of individuals managed in general practice. This flowchart is designed to help communicate the key steps, but is not intended for rigid use or as a protocol.