

ELI LILLY NATIONAL CLINICAL AUDIT CENTRE

**MANAGEMENT OF HYPERTENSION
IN PRIMARY CARE**

CT8

Department of General Practice

University of Leicester

MANAGEMENT OF HYPERTENSION IN PRIMARY CARE CT8

Protocol Developed by
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1. INTRODUCTION

A) Background for Audit Groups/Primary Care Quality Groups

You can use this audit protocol to:

- undertake a multi-practice audit with data analysis, feedback and repetition of the cycle being organised and undertaken by the Audit Group
- or
- to issue to individual practices for their own use.

It may be photocopied for use by local practices. Additional copies can also be obtained from the Centre at cost.

The protocol contains:

- instructions to the practice about organising the audit
- a summary of the criteria
- justifications based on research evidence for each criterion. The criteria are prioritised in two levels depending on the strength of research evidence and impact on outcome
- a data collection sheet
- advice about change.

B) How to use this protocol in the practice

Discuss the idea of undertaking this audit with your practice team. A summary of the criteria is included on page 3. If you want to study the criteria in greater detail, justifications for each are included on pages 4-21.

The criteria are in two levels or audits. Audit one, the "Must Do" criteria, are for all practices and Audit two ("Must Do" and "Should Do") are for practices that wish to do more.

The ultimate aim of all criteria is to achieve a standard of 100%, but local circumstances will have to be taken into account in judging the speed at which this can be achieved. You will need to compare your performance with the standards set, implement change (page 26) and re-audit after an agreed length of time.

Information on planning and data collection is set out on page 22. Instructions on identifying a random sample of patients is set out on page 33.

A summary of the audit criteria is provided for those who do not wish to read about the research evidence for each one (insert).

C) Which Patients are Included?

This audit is concerned with patients who are receiving drug treatment for hypertension. The monitoring of antihypertensive drugs is not included e.g. the monitoring of diuretics or angiotensin converting enzyme (ACE) inhibitors which would be a separate topic for audit. Children and patients with secondary hypertension are also excluded, as is pregnancy induced hypertension. Population screening for hypertension and the management of malignant hypertension are all excluded.

D) Why an Audit of Hypertension

- hypertension is common and is an important cause of strokes, heart attacks and premature death¹
- there is considerable evidence of deficient patient management^{2,3,4,5,6}
- there are readily available and broadly accepted guidelines for care^{7,8}
- there is evidence that optimal management improves outcome for patients with hypertension⁹

HYPERTENSION

Summary of Criteria

"MUST DO" CRITERIA

These are the absolute minimum criteria that practices need to audit as they have an important impact on outcome and there is firm research evidence to justify their inclusion. Every practice must include these criteria in the audit.

- 1 Patients who have been diagnosed as hypertensive have been recorded in a practice hypertension register.
- 2 The records show that in patients without target organ damage, the blood pressure has been measured at least twice on each of at least three separate occasions prior to commencement of drug therapy.
- 3 The records show that at diagnosis, the following symptoms and signs of target organ damage have been sought: retinopathy, left ventricular hypertrophy, angina, stroke, heart failure, peripheral vascular disease and renal disease.
- 4 The records show that an assessment has been made of the risk factors for cardiovascular and cerebrovascular disease and that if necessary, appropriate advice and treatment has been given: smoking habit, body mass index, diabetes mellitus, serum cholesterol (if additional risk factors present), excessive alcohol intake, physical inactivity and family history of premature coronary artery disease.
- 5 The records show that the mean pre-treatment blood pressure level was at least a diastolic of 95mmHg or greater and/or a systolic of 160mmHg or greater, or a diastolic of 90-95mmHg in the presence of other cardiovascular risk factors, and/or target organ damage.
- 6 The records show that the patient has been reviewed at regular intervals not exceeding 6 months.
- 7 The records show that the hypertension is well controlled, the average of the last three recorded diastolic blood pressure readings being 90mmHg (diastolic) or below, and 160mmHg (systolic) or below.
- 8 The records show that a patient with refractory hypertension and/or suspected secondary hypertension has been referred for specialist advice.

"SHOULD DO" CRITERIA

These are additional criteria for which there is some research evidence of their importance.

- 9 The records show that at least annually there is an assessment of side effects caused by antihypertensive drugs that the patient is taking.
- 10 The records show that at least annually the patient has been given advice about dietary salt restriction.

2. THE CRITERIA:

AUDIT 1.

"MUST DO" CRITERIA

This audit should be undertaken by all practices using the protocol. Instructions for undertaking the audit are included on page 22.

Criterion 1

Patients who have been diagnosed as hypertensive must have been recorded in the practice hypertension register.

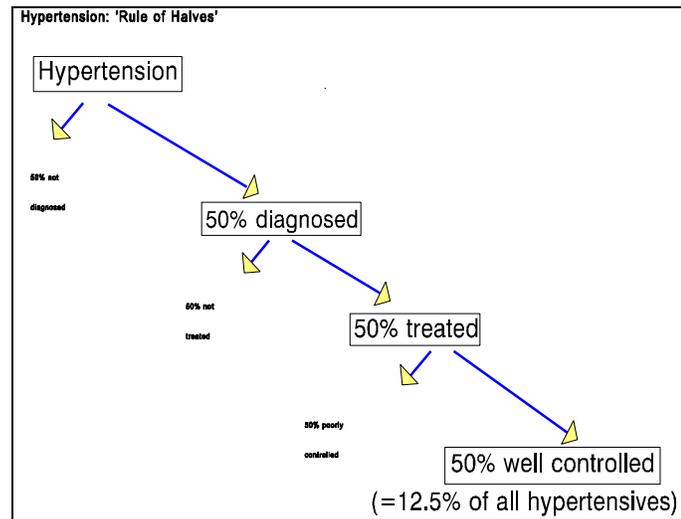
Justification:

Summary:

- It is widely accepted that a register is the cornerstone for systematic care. Although there is some evidence that a register is an important component of systematic care¹⁰ and that follow up is often inadequate, no randomised controlled trials have been undertaken to confirm this view. However, it would be difficult to justify such a trial in which some patients would be randomised to a group without a system to ensure regular follow up.

Detail:

- The 'rule of halves' *{Figure 1}* states that only about half of those patients with hypertension will ever be diagnosed. Of those who are diagnosed only half receive treatment, of whom only half have well controlled blood pressure. The net result is that only 10-15% of hypertensives receive good care^{4,11,12}.



- The principal uses of the register are to organise the call and recall of patients, to ensure regular follow up and to identify defaulters. The register can be manual or computerised.
- There have been no published randomised controlled trials of registers in the management of hypertension. The British Hypertension Society⁷ (BHS) and the World Health Organisation /International Society of Hypertension⁸ (WHO/ISH) hypertension guidelines do not refer to registers. However, it has been claimed that registers are a 'vital necessity' for managing hypertension in general practice¹³. Julian Tudor Hart's 25 years experience of hypertension¹⁰ has shown the benefits of using registers to organise systematic care for hypertensives.

Criterion 2

The records show that in patients without target organ damage, the blood pressure has been measured at least twice on each of at least three separate occasions prior to commencement of drug therapy.

Justification :

Summary :

- There is ample research evidence showing that many patients are commenced on drug treatment after only one blood pressure reading. Such patients may be receiving unnecessary treatment which may also produce side effects. All guidelines recommend several readings before treatment.

Detail:

- Many patients have been diagnosed hypertensive on the basis of a single reading, 46%³ in one study and 39%² in another and 50% in yet another¹⁴. Many of these patients do not have true hypertension: the 'defence' reaction causes a rise in blood pressure which tends to subside once the patient becomes used to the procedure and observer. The BHS recommends a minimum of three minutes sitting (or lying) before blood pressure is taken¹⁵.
- Measuring the blood pressure on more than one occasion is more important than the number of times blood pressure is measured at any single visit¹⁶. However, there is differing advice about the number of occasions BP should be measured prior to diagnosis. For instance the BHS⁷ recommend that *two* or more readings be taken at each visit on up to *four* or more separate occasions to determine the thresholds for treatment with the following guidelines:
 - in mild hypertension with no target organ damage, take BP measurements over 3-6 months
 - in severe hypertensives take BP measurements more often. The higher the blood pressure the shorter the period of observation which should be terminated in the presence of retinopathy¹⁷, or other severe target organ damage such as left ventricular failure.

One study has shown that measuring the blood pressure on *four* separate occasions is one reliable way to obtain a 'true' reading¹⁸ of the blood pressure

- The US Joint National Committee on detection, evaluation, and treatment of high blood pressure, recommends *two* or more readings at each of *two* or more visits before determining the threshold for treatment¹⁹.

-
- The Canadian guidelines¹⁶ suggest at least two readings on each of at least *three* occasions over a period of 6 months in patients without target organ damage. This is based on a systematic review of the literature, including assessing and grading the strength of evidence. This is why we advocate this criterion.
 - A cardinal rule is that the closer the blood pressure is to the threshold level for drug treatment, the greater the number of readings that should be taken, in the absence of target organ damage.
 - If it is found that a patient has been commenced on drug treatment after only one reading, in the absence of target organ damage, then withdrawal of treatment should be seriously considered and the patient reassessed. Long term follow up of BP is mandatory in such cases⁷.

Measurement of Blood Pressure and Sources of Error

- It is essential that blood pressure is measured accurately using the correctly sized bladder and regularly serviced sphygmomanometer^{15,20}. Simple guidelines issued by the BHS on the measurement of blood pressure are shown in appendix 3.
- In the elderly and diabetics, both sitting (or supine) and standing blood pressure should be measured as there is a high incidence of postural hypotension²¹. Standing blood pressure should then be used as a guide for treatment decisions.

Ambulatory Blood Pressure Monitoring

- In patients in whom there is uncertainty about the diagnosis or where "white coat hypertension" is suspected, 24 hour ambulatory blood pressure monitoring may be indicated. However, it is important to state that current guidelines on the management of hypertension are based on trial data which is derived from casual readings and not from 24 hour ambulatory blood pressure readings, so that the thresholds for treatment may be different⁸. Ambulatory readings over 24 hours tend to be several mmHg lower than casual readings⁸. The BHS does not recommend this technique for routine management at present⁷.

Criterion 3

The records show that at diagnosis the following symptoms and signs of target organ damage have been sought: retinopathy, left ventricular hypertrophy, angina, stroke, heart failure, peripheral vascular disease and renal disease.

Justification:

Summary:

- There is good evidence that patients with target organ damage have a higher morbidity and mortality, which can be reduced by appropriate treatment.

Detail:

- Patients with established cardiac or cerebrovascular disease are at risk of further vascular events and control of high blood pressure is vital in secondary prevention. For example patients with a history of transient ischaemic attack have stroke rates of 5-10% per year - the absolute reduction in risk is substantial when even moderate levels of blood pressure are treated²². A history of cerebrovascular disease in patients with raised blood pressure is one of the clearest indications for treatment²³.
- *Cardiac Disease:* Clinical evidence should be sought for past or present angina, myocardial infarction and heart failure⁸, or there may be a documented event in the medical records.
- *Left ventricular hypertrophy (LVH):* A clinical examination should be carried out to detect cardiomegaly and left ventricular hypertrophy. The presence of LVH indicates a poorer prognosis with an increased risk of heart attack and stroke. It is a powerful indicator of outcome^{24,25,26}. An electrocardiogram is an insensitive way of detecting LVH²⁶. Electrocardiographic LVH did not predict risk in one study²⁶. The best way of detecting LVH is by echocardiography^{25,26}. Echocardiographic LVH has been shown to be prognostically significant^{25,26}. However, the availability of echocardiography is limited and at least one guideline has come out against its routine use in hypertension¹⁶. Blood pressure treatment can in some cases regress LVH but there is no end point evidence to show a difference in deaths or strokes or myocardial infarcts. In patients with diastolic BP (DBP) 90-99mmHg the presence of target organ damage or additional risk factors indicates the need for treatment. In such patients echocardiography may be indicated but there are no prospective controlled studies to show the merit of this approach. Indeed, when the blood pressure is in this borderline range, the likelihood of finding LVH is small. Therefore in the absence of readily available and accurate, standardised investigations it is recommended that evidence of LVH be sought clinically only.
- *Retinopathy:* Various grades of hypertensive retinopathy are recognised from minor vessel change to exudates, haemorrhages and papilloedema¹¹. The presence of retinopathy denotes significant hypertension with similar changes likely to be present in the blood vessels of the brain and heart. When retinopathy is present, treatment is always indicated. It is important to note that silver wiring and AV nipping is commonly found in the elderly and is not necessarily related to high blood pressure. However, haemorrhages and exudates are always significant.

-
- *Peripheral Vascular Disease:* Patients should be asked about intermittent claudication and the peripheral pulses examined at least once during the diagnostic phase of repeated blood pressure measurements.
 - *Renal Disease:* In a large study of over 10,000 patients with hypertension, the Hypertension Detection and Follow Up Study (HDFP)²⁷ found that patients with a raised serum creatinine had a poorer prognosis with a higher level of cardiovascular events independent of the level of blood pressure. Appropriate treatment of the blood pressure reduced the rate of decline in renal function but the trial at the time of publication could not show a reduction in death rate. It was notable that a significant proportion (58%) of patients with a raised creatinine level had proteinuria. The WHO/ISH guidelines² classify proteinuria and raised creatinine as a factor that should influence the decision to treat. All the major guidelines recommend the routine measurement of serum creatinine^{7,8,16} but the merit of the approach has not been evaluated in a randomised controlled trial.
 - However, all patients with hypertension should have their urine checked for blood, glucose (see Criterion 4) and protein. If any abnormality is found eg proteinuria, then further assessment of renal function is necessary.
 - Target organ damage must be assessed during the initial evaluation of hypertension. Subsequent assessment will depend on the clinical course of the patient but any abnormal findings must be followed up at review visits.

Criterion 4

The records show that an assessment has been made of the risk factors for cardiovascular and cerebrovascular disease and that if necessary, appropriate advice and treatment has been given: smoking habit, body mass index, diabetes mellitus, serum cholesterol (if additional risk factors present), excessive alcohol intake, physical inactivity and family history of premature coronary artery disease.

Justification:

Summary :

- There is good evidence that additional cardiovascular risk factors have a substantial impact on morbidity and mortality from hypertension. Modification of these risk factors improves outcome.

Detail :

- Although hypertension is a potent cardiovascular risk factor, it is substantially modified by additional risk factors¹. For instance²⁸ the presence of smoking, high cholesterol and hypertension combined increases the risk of vascular events by 20 fold. This emphasises that the management of hypertension cannot be divorced from the management of other vascular risk factors: a multifactorial approach is essential. The purpose of assessing risk factors is three fold.
 - Firstly any risk factor may need treatment in its own right, such as diabetes.
 - Secondly, the presence of additional risk factors lowers the treatment thresholds for high blood pressure^{7,8,17}.
 - Thirdly, control of the risk factor (such as excessive alcohol intake) may itself lower blood pressure.
- Non-pharmacological means of treating hypertension is important advice for all patients, and is a major recommendation of both the BHS and WHO/ISH^{7,8} guidelines and must always be instituted prior to drug treatment.
- There has been much interest in systems of risk scoring and stratification. However, there are no absolute standards for identifying the high risk patient¹⁷ and there have been no prospective trials to show that such a system of risk scoring has improved clinical outcomes. Major risk factors include the following: BP, smoking, diabetes, cholesterol/HDL ratio > 6.1, BMI > 30, and a positive family history of premature death from vascular disease (death of a parent or sibling before the age of 55)²⁹.

Smoking:

- All large scale trials of mild hypertension have shown that treated hypertensives who smoke tobacco have a higher incidence of stroke and heart attacks⁸. The risk is synergistic¹¹.
- Smoking is an independent risk factor for heart attacks and stroke¹¹ and sudden death.
- There is a strong correlation between cigarette smoking and the severe form of hypertension known as malignant hypertension¹¹.
- Repeated advice, guidance and support on how to stop smoking is therefore of major importance.
- In the MRC trial of treatment in mild hypertension, the benefits of never having smoked far outweighed the benefits of blood pressure lowering^{7,30}.

Body Mass Index:

- There is a close relationship between body mass index (BMI) and blood pressure¹¹. Furthermore when obese people lose weight, their blood pressure falls^{11,31}. A 5 kg loss of weight is associated with a 5mmHg fall in blood pressure. All overweight and obese patients should be given advice about losing weight with the aim being to achieve ideal body weight⁷.
- Regular review of BMI (eg annually) is important and referral to a dietician may be necessary.

Diabetes:

- Diabetes is a potent risk factor for vascular disease especially in the presence of hypertension and vice versa^{8,32,33,34}. In the presence of diabetes, the treatment thresholds for hypertension are lower^{7,8}. Furthermore the presence of diabetes influences the choice of antihypertensive agent e.g. diuretics for hypertension may exacerbate diabetes⁷.
- For these reasons, it is important to determine whether the patient is diabetic by doing a urine check for glucose and/or a blood glucose measurement. For equivocal results further investigation may be necessary.

Serum Cholesterol:

- Hypercholesterolaemia is a major risk for cardiovascular disease. The BHS guideline and the WHO/ISH guideline both advocate the routine measurement of serum lipids in all hypertensives. However, the value of doing this in all patients has not been tested in clinical trials. But there is good evidence (4S study) to show that lowering raised serum cholesterol with drugs in patients with established coronary artery disease lowers mortality and morbidity³⁵. Previously it had been shown that cholesterol lowering is most effective at lowering mortality in patients who have multiple risk factors for cardiovascular disease such as men who smoke and have high blood pressure and high lipids³⁶.

- The key issue is whether lipids should be measured routinely in all hypertensives or whether high risk patients should be selected. However, as mentioned before, there are no absolute standards for identifying the high risk patient¹⁷ and there have been no prospective trials to show that such a system of risk scoring and stratification has improved clinical outcomes.
- But the best available evidence^{35,36} to date does support checking serum cholesterol in patients with multiple risk factors for cardiovascular disease. This would be a combination of two or more of the following: hypertension, current angina or past angina/MI, diabetes, male sex, or a family history of premature cardiovascular disease (angina, MI, death from MI) in a parent or sibling at or before 55 years of age.
- Lipid testing should be restricted to patients aged 65 or under as the benefit of lipid lowering after this age is not firmly established. The major clinical trials of cholesterol lowering have been on younger patients^{35,36}.
- Certain antihypertensive agents can raise serum cholesterol eg thiazides diuretics whereas other drugs are considered lipid neutral eg ACE inhibitors. However, the long term clinical significance of this effect is not certain and on present evidence, serum lipids should not be a significant factor in the selection of drugs for treatment.

Excessive alcohol intake:

- There is good evidence that a high alcohol intake raises blood pressure and increases the risk of premature morbidity and mortality. A reduction in alcohol intake reduces blood pressure and improves outcome.
- There is a close correlation between a high alcohol intake and stroke morbidity and mortality¹¹.
- It is estimated that 10% of hypertensives have alcohol induced hypertension¹¹.
- Stopping alcohol leads to a fall in blood pressure within a few days in hypertensive patients who drink moderately³⁷.
- The aim of reducing excessive alcohol intake is to lower blood pressure and to reduce the risk of stroke. The BHS recommends the avoidance of more than 21 units in men and more than 14 units in women⁷. This recommendation is based on national guidelines which take into account additional non-cardiovascular risks associated with high alcohol intake.
- Moderate amounts of alcohol intake have a protective effect against coronary artery disease - light drinking (1-2 units) per day is not contraindicated

Physical inactivity:

- A recent review on this subject has shown that a sedentary lifestyle confers a greater risk of heart attacks and strokes³⁸. Regular physical activity such as walking, cycling or swimming at least three times a week (for at least 30 minutes) lowers blood pressure and protects against heart attacks and stroke³⁸. However, caution should be exercised before recommending such levels of exercise to patients with severe uncontrolled hypertension or unstable ischaemic heart disease as there is a risk that the conditions could be exacerbated - these conditions should be stabilized first.

Family history:

- A family history (angina, MI or death from MI or stroke), in a parent or sibling at or before the age of 55 years) of premature cardiovascular disease is a risk factor²⁹. Although an adverse family history cannot be altered, it should be taken into account when making decisions about treatment and further evaluation such as a lipid screen.

Other factors:

- Other factors such as calcium supplementation, potassium supplementation, magnesium supplementation, dietary fat manipulations, biofeedback, stress management, meditation, and relaxation therapies have not been shown to lower blood pressure consistently and so cannot be recommended for this purpose³⁹. For a statement about salt restriction please see Criterion 11.

Summary:

Advice about smoking cessation is of major importance. Maintenance of ideal body weight and moderation of excess alcohol intake are the two most important non-pharmacological measures in lowering blood pressure³⁹. This may obviate the need for drug treatment or enable lower doses of drugs to be used⁷.

Criterion 5

The records show that the mean pre-treatment blood pressure level was at least a diastolic of 95mmHg or greater and/or a systolic of 160mmHg or greater, or a diastolic of 90-95mmHg in the presence of other cardiovascular risk factors, and/or target organ damage.

Justification:

Summary :

- The benefits of treatment at these levels have been established unequivocally by the most recent meta-analysis of antihypertensive drug trials⁹: drug therapy reduces vascular deaths, reduces risk of stroke by 38% and risk of heart attacks by 16%.

Detail :

- Blood pressure rises with age and is normally distributed within the population⁴⁰. The level at which hypertension is diagnosed is an arbitrary one based on epidemiological evidence of risk from vascular deaths in relation to blood pressure and the level at which treatment has been shown to reduce that risk. The cut off points are necessary for operational and pragmatic reasons. The treatment threshold may be different from patient to patient because of the impact of additional risk factors and/or target organ damage.
- Table 1 shows the thresholds for treatment recommended by the major guidelines⁴⁸:

Table 1⁴⁸				
Recommendations on diastolic blood pressure (DBP) and systolic blood pressure (SBP) thresholds for pharmacological antihypertensive therapy, period of observation usually suggested in treating mild hypertension and the lowering of diastolic threshold produced by presence of other cardiovascular risk factors				
Guideline	DBP (mmHg)	SBP (mmHg)	Period of observation (months)	DBP threshold in presence of other factors (mmHg)
Canadian	100	-	-	90
British	100	160	3-6	90
USA	90	140	3-6	-
	95	150	3-6	90
Australian	100	160	1	95
New Zealand	100	170	6	90
WHO/ISH	95	160	3-6	90

(Adapted by permission of Blackwell Science Ltd)

- The benefits of treatment of pressures lower than 90mmHg (diastolic) and/or systolic of 140-160mmHg have not been established. A diastolic of 95-100mmHg is the widely accepted treatment threshold.
- Epidemiological studies have shown that systolic blood pressure is closely correlated with cardiovascular risk, more so than diastolic blood pressure (DBP)¹. Furthermore the benefits of treating systolic hypertension (>160mmHg) have been confirmed in patients up to the age of 80²¹.

Criterion 6

The records show that the patient has been reviewed at regular intervals not exceeding 6 months.

Justification:

Summary :

- There is good evidence to show that failure of follow up is common, and is associated with poor outcome. Regular follow up is mandatory

Background:

- Failure to follow up patients with high blood pressure is a common finding. In one study only 56% of patients had a follow up reading after a raised BP reading⁴. In another study only 61% of patients had a follow up reading². A further study showed that 69% of patents who were found to have raised blood pressure had not had a follow up reading for over a year³.
- A confidential inquiry into avoidable factors in deaths from stroke and hypertensive disease in Sheffield showed that the largest single avoidable factor was failure to follow up and treat hypertension once diagnosed. This was a factor in 25 out of 36 deaths⁵.
- The optimal follow interval for hypertension is not known. In a small audit of 305 treated hypertensives in a practice of 7150 patients it was found that the follow up interval ranged from 3 to 12 months⁴¹. A survey of 116 family physicians in the USA could not reach a consensus on the most appropriate revisit interval for a hypothetical patient with hypertension⁴². An audit of 287 patients with hypertension in a practice in Northern Ireland showed that 42.9% had had a follow up BP reading in the last three months and 78.9% in the last year prior to the audit⁴³.
- The two main guidelines differ in their recommendation. The BHS guidelines state a follow up interval of 3 months whereas the WHO/ISH guidelines state an interval of 3-6 months. The optimal interval for follow up is therefore uncertain but should never exceed 6 months even in the most well controlled patient. The follow up interval cannot be the same for every patient - it needs to be individualised and agreed with the patient.

Criterion 7

The records show that the hypertension is well controlled, the average of the last three recorded diastolic blood pressure readings being 90mmHg (diastolic) or below, and 160mmHg (systolic) or below.

Justification:

Summary

- There is good evidence that blood pressure control is often inadequate leading to a poorer outcome. Better control of blood pressure lowers the risk of vascular deaths, stroke and heart attacks. The benefit of treatment is greatest in those patients who are well controlled⁴⁴.

Detail :

- The optimal target blood pressure is not precisely known . For instance there is a premise that the lower the blood pressure the lower the risk from vascular disease. Within the range of DBP 70-110mmHg a lower pressure was always associated with a lower risk of CHD and strokes⁹.
- Table 2 shows the recommended target pressures of the major guidelines:

Guideline	DBP (mmHg)	SBP (mmHg)
Canadian	-	-
British	<90	<160
USA	<90 ? 85	<140 ? 130
Australian	-	-
New Zealand*	<90	-
WHO/ISH	<90	<140
*(Younger patients)	≤80	120-130

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- However, there is concern that lowering diastolic blood pressure (DBP) excessively may increase the risk of myocardial infarction in patients with coronary artery disease as coronary artery perfusion is dependent on DBP⁴⁵ ('J shaped curve'). But this was not confirmed in the most recent meta-analysis, in which no threshold effect was identified⁹. However, there have been no published prospective studies to define the lower limit of blood pressure reduction. The result of two prospective trials ('BBB', 'HOT') investigating the optimal level of treated diastolic

blood pressure and the significance of the J-shaped curve is awaited⁴⁶.

- In the absence of such precise data, it is pragmatic to set treatment goals at 90mmHg or less for diastolic blood pressure and 160mmHg or less for systolic blood pressure.
- The BHS recommends that in patients in whom diastolic blood pressure is 80mmHg or less, reduction or withdrawal of treatment should be considered provided there is no target organ damage.
- It may be difficult to achieve ideal control (≤ 160 mmHg) of systolic hypertension without producing diastolic hypotension, especially in the elderly. In such cases the best possible control of systolic hypertension should be aimed for.

Criterion 8

The records show that a patient with refractory hypertension and/or suspected secondary hypertension has been referred for specialist advice.

Justification:

- The BHS recommends referral to a specialist in the following instances⁷:
 - Malignant hypertension
 - Suspected secondary hypertension
 - Refractory hypertension (on two or more drugs)
 - Poor or worsening control
 - Labile (widely fluctuating) hypertension
 - Patients aged 35 or under
 - Patients with multiple cardiovascular risk factors
- However there is a lack of data on outcome as there are no randomised controlled trials (RCTs) of GP versus hospital care of such groups of patients.
- There is some data available for hospital versus general practice care of patients with mild to moderate hypertension. An RCT was performed of patients with mild-moderate hypertension randomised to either hospital or general practice care⁴⁷. 376 patients were followed up for two years. After that time there was a reduction in BP in the hospital group by a DBP of 1.6mmHg and a rise in the GP group of 1.4mmHg. However the confidence intervals were wide. The hospital follow up group had twice as many investigations as the GP group but the clinical value of this was uncertain. Thus this study failed to show conclusively the superiority of hospital care for patients with mild-moderate hypertension.
- Indication for referral are not absolute and will vary according to a wide range of issues including practitioner and patient factors.
- *Compliance*: Poor compliance with medication is probably the most common cause of treatment failure⁴⁸. There is wide variation in the reported compliance rates with antihypertensives with a mean of approximately 60%⁴⁹. Every effort should be made to detect low compliance although there is no single ideal method by which to do this. Asking directly about compliance is probably the most practical and inexpensive way of addressing this issue⁴⁹.
- *Secondary Hypertension*: Younger patients (eg aged 35 or under) are more likely to have secondary hypertension eg mineralocorticoid hypertension. High blood pressure may also be caused or worsened by medication such as the combined oral contraceptive pill and non-steroidal anti-inflammatory drugs in which case the offending drug should be stopped and the blood pressure reassessed.
- Hypertension which is proving difficult to control (eg on two or more drugs) may indicate secondary hypertension eg renal artery stenosis - the incidence in this group of patients with refractory hypertension (uncontrolled BP on 2 or more drugs) is about 30%⁵⁰.

AUDIT 2.

"SHOULD DO" CRITERIA

Audit 2 includes all the criteria in Audit 1 ("Must do") plus the criteria listed in this section. Instructions are contained on page 22.

Criterion 9

The records show that at least annually there is an assessment of side effects caused by antihypertensive drugs that the patient is taking.

Summary:

- Hypertension is generally a condition without symptoms. However there are often side effects arising from drug treatment. It is important to ascertain the presence or absence of these side effects.

Detail:

- Common side effects are shown in Table 4:

Table 4 - Checklist of known and common or important side effects with different classes of drug. (Side effects not listed in ranking order for different classes of drugs)⁷

Common side effects	Diuretic	β blocker	Angiotensin converting enzyme inhibitor	Calcium antagonist	α_1 blocker
Headache	-	-	-	+	-
Flushing	-	-	-	+	-
Dyspnoea	-	+	-	-	-
Lethargy	-	+	-	-	-
Impotence	+	+	-	-	-
Cough	-	-	+	-	-
Gout	+	-	-	-	-
Oedema	-	-	-	+	-
Postural hypotension	+	-	-	-	+
Cold hands and feet	-	+	-	-	-
Cardiac failure		+			
Renal failure			+		

(Adapted by permission of the British Medical Journal (BMJ Publishing Group))

- A meta-analysis of quality of life studies in treated hypertension has shown that quality of life is well maintained during treatment with the commonly used antihypertensive agents⁵¹.

Criterion 10

The records show that at least annually the patient has been given advice about dietary salt restriction.

Summary:

- Salt restriction can lower blood pressure³⁹. However meta-analysis of salt restriction trials have shown conflicting results about the magnitude of blood pressure fall^{52,53}. Impact on outcome is uncertain (other than blood pressure) ie there is no end point data to show reduction in mortality or in stroke or heart attack.

Detail:

- Salt restriction can be difficult to implement eg restriction of 50mmol per day or greater are required to lower blood pressure. Merely asking patients to avoid table salt may not achieve this.
- Moreover, in some patients BP can rise ie the response to salt restriction is heterogenous. Long term data on the safety of salt restriction is not available³⁹.
- Advice about salt restriction is best given as part of a package of advice on non pharmacological means of lowering blood pressure which includes advice on ideal body weight, physical activity and alcohol intake. The advice may be especially relevant in patients with hypertension who do not wish drug treatment, or in whom drug withdrawal is being attempted or in whom control is proving difficult.

3. COLLECTING INFORMATION ABOUT CARE

A) Planning the Audit

Before proceeding you need to:

- agree the criteria and standards
- appoint one or more members of the practice to undertake the audit (the audit team)
- study the instructions
- agree the procedure for reporting the findings
- agree a time schedule for:
 - i the first data collection
 - ii the review of results
 - iii implementation of changes
 - iv the next data collection

These steps will help you introduce a programme to monitor and improve the care of your hypertensives, rather than simply carry out a single data collection.

Before undertaking the data collection you should have discussed what you are going to do with the results, otherwise there is a risk that the findings will not lead to any improvements in care. It is recommended that the results should be formally presented to the practice by the audit team, together with recommendations for change.

B) Audit 1

1. Identification of Patients

A manual or computerized register of affected patients with hypertension may be helpful in carrying out this audit.

- If you are using a practice computer

You can use the practice computer to provide information about your management of patients with hypertension. You should be recording the diagnosis for each patient using an agreed system, perhaps using Read codes (eg searching for patients with a diagnosis of hypertension). The computer should also be asked to list medications. Patients may also be identified from computer-held records of anti-hypertension medication.

- Prevalence: In a study of 12 practices in Oxfordshire the prevalence of treated hypertensives varied from

10.5 cases/1000 patients to 51/1000 patients¹⁴. In a study of 5400 patients in Northern Ireland the practice prevalence was 5.31% but for those aged 30-80 the prevalence was 10.8%⁴³. In the large American hypertension detection and follow up (HDF) study only 6.9% of a screened population had diastolic pressures that were persistently elevated (90mmHg or higher) after rechecking⁵⁴. In a study of four practices in Scotland involving 14000 patients a screening programme for hypertension established a prevalence rate of sustained hypertension of 6.7% for men aged 35-69⁵⁵.

- If you do *not* use the computer

You could compile a list of patients as they attend for consultations. However, this can be very time consuming.

The repeat prescription system can be used to identify patients with hypertension. Patients receiving anti-hypertension medications are identified when they request a new prescription.

2. Data collection

- if you have a large number of hypertensive patients you can select a random sample for the audit (See Appendix 2.)
- pull the records from the filing system and appoint a member of the practice (e.g. GP, practice nurse) to extract the data
- alternative data collection forms have been provided. With one version, a separate form is filled in for each patient. The other form allows you to record data from ten patients on a single sheet. Make sufficient photocopies of the forms before you start. Whichever data collection form used, you must compile a master list of patient names and code numbers on copies of the patient recording form.

One form per patient

- enter the findings for each criterion into the Audit 1 section on a separate data collection form for each patient (see appendix 3). Be sure to enter a patient identification number onto the form and the same information onto the separate patient recording form so that the practice can relate code numbers to patient names in the future. The completed patient recording forms are kept within the practice to protect confidentiality.
- for most of the entries on the data collection form you will need to place a tick (✓) in the appropriate box.

One form per ten patients

- as before, make sure that the patient code number is entered onto both the data collection sheet and the patient recording form. This is essential so that the practice can relate code numbers to patient names in the future. The patient recording forms must all be kept within the practice to protect confidentiality.
- for each patient, enter the required information in the appropriate boxes:

Sex	Medical Treatment	Criteria
M Male	bB beta blocker	✓ yes

F Female	Diur diuretic	x no
	CaI calcium antagonist	n not known
	aB alpha blocker	blank not applicable
	ACE ACE inhibitor	
	O other	

Analysis

- you may analyse the data in the practice yourself. You should not assume that the Audit Group will analyse the data unless you have discussed this with them before undertaking the audit. If the audit is being organised by the Audit Group, follow their instructions, sending the completed data collection forms to the Audit Group for analysis.

To analyse the findings yourself, the most convenient method is to use a commercial database programme on a personal computer. Open a field for each of the data entry points on the data collection form. If you do not have a programme with which you are familiar the Audit Group can let you have a copy of a programme called Epi Info which is relatively easy to use. If you are using Epi Info you will have to create a data entry screen with the same questions as the data collection form. An instruction manual for Epi Info can be purchased from the Audit Centre.

3. Displaying the data

- if the Audit Group is undertaking the data analysis, it should provide practices with the results together with anonymous comparative information about performance for each criterion, including details of actions taken in response to findings.
- the display should include comparison with the chosen standards.
- most Audit Groups will have computer programmes to help display data in an attractive and clear way. The Centre can provide advice if requested.
- If you are analysing the data in the practice your computer database programme should be able to produce reasonable bar charts, or you can use Epi Info.

C) Audit 2

1. Identification of patients

If you did not have a register of patients with hypertension you will have compiled one in Audit 1. As before you may select a sample. You may be undertaking Audit 1 and Audit 2 at the same time, the procedure is the same but as more data has to be extracted from the records you will need more time.

2. Data collection

Follow the instructions included for Audit 1 but complete the sections on the appropriate data forms for both Audit 1 and Audit 2.

3. Displaying the data

As for Audit 1.

- Once you have collected the information the findings should be compared to the Criteria and Standards you set.

4. INTRODUCING CHANGE

The Practice

- Make sure that all concerned have the opportunity to study the findings. Circulate the report.
- You must discuss the findings - a meeting is required, the arrangements will depend on how you manage your practice.
- Identify the criteria and standards you have failed to meet and possible reasons for the failures.
- You need an agreed policy on improving care. Consider the following suggestions:
 - an educational programme for GPs and nurses
 - a revised policy for the diagnosis and management of patients with hypertension
 - the introduction of a structured record card
 - use of a computer record for patients with hypertension
 - liaison with local cardiologists, dietitian, specialist nurses
 - support from other agencies such as the British Heart Foundation, BHS (see Addresses of Useful Organisations page 31).
 - a patient information leaflet or record card
- Agree a time to repeat the data collection phase of the audit, but do not leave this longer than 12 months.
- Keep any change simple to implement.

The Audit Group

- Provide feedback that enables practices to identify strengths and weaknesses. Consider including with the feedback local or national guidelines on care of patients with hypertension .
 - Study the combined information from practices. Are there particular aspects of care that are weak in most practices? If so consider:
 - providing an educational programme for GPs and teams
 - seeking improved provision from certain agencies
 - discussion of local policies with secondary care services.
 - Consider offering practices visits by a facilitator or specialist nurse, or advice about seeking additional funding from the Health Authority to help certain practices.
 - Develop a local hypertension record card for general practice.
 - Repeat the data collection.
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5. ADDRESSES OF USEFUL ORGANISATIONS

British Hypertension Society
c/o Mrs Gerry McCarthy
Hampton Medical Conferences Ltd
185 Uxbridge Road
HAMPTON
Middlesex
TW12 1BN

Tel: 0181 783 0810
Fax: 0181 783 0292

British Heart Foundation
14 Fitzhardinge Street
LONDON
W1H 4DH

Tel: 0171 935 0185
Fax: 0171 486 5820

The Stroke Association
CHSA House
Whitecross Street
LONDON
EC1Y 8JJ

Tel: 0171 490 7999
Fax: 0171 490 2686

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