



**BLOOD PRESSURE
CONTROL PROGRAMME
FOR
NORTHERN IRELAND**

September 1996

This booklet was prepared by CREST (the Clinical Resource Efficiency Support Team).

CREST is a small committee of doctors established under the auspices of the Central Medical Advisory Committee, to promote clinical efficiency in the health service in Northern Ireland while ensuring that the highest possible standard of clinical practice is maintained.

CREST wishes to express its appreciation to all those who participated in the workshops. Special thanks are due to Dr Margaret Boyle for the major contribution she made to the production of this booklet.

CONTENTS

Page

Introduction	3
Northern Ireland Blood Pressure Strategy	4
Objectives of the Programme	5
Public Awareness	6
Risk Factors and their Management	7
Professional Awareness	9
Blood Pressure Measurement	10
Screening	11
Management	12
Baseline Data	13
Monitoring and Evaluation of the Programme	13
Way Forward	14
Appendices	
1. Members of CREST Working Group	15
2. EHSSB Strategy Summary	16
3. British Hypertension Society Management Guidelines	23

BLOOD PRESSURE CONTROL PROGRAMME FOR NORTHERN IRELAND

Introduction

In Northern Ireland the incidence rates of stroke and coronary artery disease are amongst the highest in the world. Campaigns aimed at reducing their occurrences have been developed and over the last 10-15 years there has been a marked decrease in death due to stroke and myocardial infarction. Although raised blood pressure (hypertension) is known to be an important contributor to vascular disease, especially cerebrovascular disease, prevention, screening and risk factor management have never been tackled at a population level in Northern Ireland.

Through the MONICA project Professor Evans and his colleagues have shown that almost 20% of men and women over 25 years have raised blood pressure (160/95) (after one reading) or are on treatment for raised blood pressure. These findings concur with survey results from other industrialised countries where up to 15% of the adult population have hypertension. Better prevention, detection (with raised blood pressure confirmed only after repeated measurements) and control of blood pressure should positively influence health and health care costs.

The Clinical Resource Efficiency Support Team (CREST) held a workshop on control of blood pressure in February 1994. Subsequent to this workshop, it was agreed that there should be a unified approach to tackling this problem in Northern Ireland and CREST was asked to develop a Blood Pressure Control Programme. A working group was established with the following terms of reference.

- (1) To develop a Population Strategy for the Control of Blood Pressure in Northern Ireland.
- (2) To formulate a Northern Ireland Programme for the rapid implementation of the Strategy.

The membership of the Working Group is given in [Appendix 1](#).

It was felt that Northern Ireland is ideally placed to introduce a blood pressure control programme as its size and relatively small population should make implementation considerably easier.

Although these guidelines do not deal with childhood blood pressure problems the Group recognised that it is an area which should receive attention in the future.

NORTHERN IRELAND BLOOD PRESSURE STRATEGY

Early in the course of its deliberations the CREST Working Group learned that an Eastern Health and Social Services Board Working Group was drawing up a blood pressure strategy for its Board area. To avoid duplication of work it was agreed that the CREST Group and the Eastern Board Group should work together on this project. Thus the Eastern Board Strategy was published with the support of both Working Groups. Discussions were held with the Northern, Southern and Western Boards and it was agreed that the EHSSB Strategy should be adopted for Northern Ireland*. A CREST conference was arranged in October 1995 to:

- a. officially launch the Eastern Board Strategy document; and
- b. examine ways of implementing the strategy.

At the conference there was unanimous endorsement of the strategy. It was recommended that the next step was for CREST to produce a Northern Ireland Blood Pressure Control Programme aimed at early implementation of the strategy. The programme should identify key priority areas that need to be addressed and suggest appropriate courses of action in each area. The conference also suggested that when the implementation programme was produced consideration should be given to appointing a regional co-ordinator for blood pressure, possibly with a primary care background, to co-ordinate activities in the implementation process.

***A summary of the Eastern Board Strategy is included at [Appendix 2](#).**

OBJECTIVES OF THE PROGRAMME

The Working Group agreed the following key objectives based on the EHSSB Strategy:

1. to inform the public about the nature, causes and effects of raised blood pressure;
2. to reduce the prevalence of risk factors which increase blood pressure in individuals and the population;
3. to raise professional awareness about blood pressure control and gain consensus on management;
4. to ensure that staff are properly trained to measure blood pressure accurately and adequately using appropriate and properly serviced equipment;
5. to detect, investigate and treat raised levels of blood pressure safely, effectively and efficiently;
6. to ensure that hypertension is placed in the wider context with other risk factors;
7. to intervene only in those individuals for whom there is agreement that the benefits of intervention will outweigh the risks;
8. to consider ways of ensuring that Regional Strategy objectives are achieved; and
9. to make best use of resources for the benefit of the whole population.

In order to implement the strategy the Working Group considered that the action programme should concentrate initially on objectives 1-5. There was a general discussion of the issues around each objective in order to highlight key areas and identify appropriate courses of action.

OBJECTIVE - TO INFORM THE PUBLIC ABOUT THE NATURE, CAUSES AND EFFECTS OF RAISED BLOOD PRESSURE

Public Awareness

The public needs to be informed about the nature, causes and effects of raised blood pressure and the importance of having blood pressure measured regularly. There is also a need to promote greater public awareness and understanding of the risk factors and lifestyle changes required to reduce the incidence of elevated blood pressure. Individuals should be provided with the knowledge and skills to allow them to make informed choices about their diet and lifestyle.

A regional public awareness campaign should therefore be developed. It should:

- (i) outline the increased risks of heart disease and stroke;
- (ii) emphasise the importance of a person having his or her blood pressure measured on a regular basis;
- (iii) inform the public how dietary and lifestyle risk factors should be modified.

The development and implementation of such a campaign requires co-operation and collaboration between the voluntary and statutory agencies and organisations. Where possible it should build on existing programmes, for example, “**HEALTHY EATING**” and “**ACTIVATE**”.

Prior to the development of such a campaign a Public Awareness Survey should be undertaken to establish a baseline in terms of knowledge and attitudes.

Key areas for attention

- Ensuring that messages are consistent.
- Raising awareness of lifestyle changes.
- Highlighting the importance of screening.
- Informing the public of the consequences of raised blood pressure.

Action required

- Survey of knowledge and attitudes
- Public awareness campaign
- Collaboration between voluntary and statutory agencies and organisations.

Lead responsibility

- Health Promotion Agency
- Health Promotion Agency
- Health Promotion Agency

OBJECTIVE - TO REDUCE THE PREVALENCE OF RISK FACTORS WHICH INCREASE BLOOD PRESSURE IN INDIVIDUALS AND THE POPULATION

Population Prevention Initiatives

There are a number of factors linked to diet and lifestyle which affect the level of blood pressure including obesity, diet, alcohol and physical inactivity. Desired lifestyle changes include:

- Reduction of energy intake to achieve target body weight. Other dietary recommendations are: -
 - (a) limit saturated fat intake.
 - (b) limit sodium (salt) intake.
 - (c) ensure an adequate potassium intake by eating plenty of fruit and vegetables.
- Avoidance of excessive alcohol intake (recommend <21 units per week in males and <14 units per week in females).
- Participation in regular physical activity and improvement of overall level of fitness. (Centres of Disease Control and Prevention and the American College of Sports Medicine recommend an accumulation of 30 minutes of moderate intensity physical activity at least 5 days per week. This could include activities such as brisk walking, mowing the lawn, climbing flights of stairs etc).

Raised blood pressure is one of the overall risk factors in vascular diseases. The presence of other risk factors such as smoking, dyslipidaemias and diabetes mellitus will have a multiplicative effect on total risk. When blood pressure level is assessed it should be placed in context with other existing risk factors. Assessment of overall risk can be determined using, for example, the Dundee risk assessment score.

- Key areas for attention
- Obesity
- Excess alcohol consumption
- Physical inactivity
- Reducing saturated fat and salt and increasing potassium intake.

Action required**Lead responsibility**

- | | |
|--|---|
| - Ensure a co-ordinated information base through regional surveys. | Department of Health and Social Services |
| - Develop public awareness programmes on blood pressure. | Health Promotion Agency |
| - Undertake health promotion in Primary Care. | Board Facilitators and Primary Care Teams |
| - Develop resource material to support the programme. | Health Promotion Agency |

OBJECTIVE - TO RAISE PROFESSIONAL AWARENESS ABOUT BLOOD PRESSURE CONTROL AND GAIN CONSENSUS ON MANAGEMENT

Professional Awareness

It is important that all professional health care staff are aware of the importance of the control of blood pressure. Consensus on the management of raised blood pressure, both non-pharmacological and pharmacological is required.

It is essential that the publication of the CREST guidelines is followed up with both regionally and locally provided training initiatives involving professional training bodies. The British Hypertension Society Guidelines on the measurement of blood pressure and management of hypertension should be used as the main resource in taking this initiative forward. The recommendations of the Task Force of the European Society of Cardiology, European Atherosclerosis Society and European Society of Hypertension are also very helpful.

Key areas for attention

- Ensuring professional awareness.
- Ensuring all those involved have up-to-date knowledge and appropriate skills.
- Ensuring consistency in approach.

Action required

Lead responsibility

- | | |
|---|--|
| • Disseminate BHS Management Guidelines. | CREST |
| • Identify the educational needs of professional staff. | Professional Training Bodies |
| – Develop undergraduate and postgraduate training initiatives. | Academic Institutions and Professional Training Bodies |
| – Undertake clinical audit of 'blood pressure management' against the guidelines. | Professional Staff |

OBJECTIVE - TO ENSURE THAT STAFF ARE PROPERLY TRAINED TO MEASURE BLOOD PRESSURE ACCURATELY AND ADEQUATELY USING APPROPRIATE AND PROPERLY SERVICED EQUIPMENT

Blood Pressure Measurement

Health care staff should be properly trained to measure blood pressure accurately and adequately using appropriate equipment which must be regularly serviced to avoid inaccurate measurements.

The guidelines produced by the British Hypertension Society on the measurement of blood pressure should be followed. They provide information relating to the instruments, cuff size and technique and give advice on how many measurements to take and how to assess thresholds for institution of therapy.

Where possible equipment to measure blood pressure should be purchased through a central purchasing facility which recognises these guidelines.

Key areas for attention

- Ensuring the purchase, use and maintenance of standard equipment.
- Ensuring a standard approach to measurement techniques.
-
-

Action required	Lead responsibility
- Adopt and encourage use of BHS Measurement Guidelines.	Commissioners/Trusts
- Develop education programmes for staff.	Professional Training Bodies
- Co-ordinate purchasing, servicing and standardisation arrangements for equipment.	Central Services Agency/Trusts/Primary Care Teams
- Undertake clinical audit against BHS Measurement Guidelines.	Professional Staff

OBJECTIVE - TO DETECT, INVESTIGATE AND TREAT RAISED LEVELS OF BLOOD PRESSURE SAFELY, EFFECTIVELY AND EFFICIENTLY

Screening

Each person between the ages of 16 and 80 years should have his or her blood pressure measured and recorded every five years. Although there is as yet no scientifically proven optimal screening interval blood pressure measurement at least every five years is generally regarded as good practice. It is also in keeping with the General Practice Health Promotion bandings.

Screening is most likely to occur at general practice level through opportunistic screening and health checks. Co-operation and collaboration between General Practice, voluntary agencies, occupational health departments and others involved in measuring blood pressure should be encouraged. However, the group recommends that ideally all measurements, but certainly any that are raised, are channelled through the family doctor and action taken where indicated.

Where possible blood pressure should be measured in the context of total health care to allow assessment of all relevant risk factors.

Key areas for attention

- Making screening more accessible.
- Developing co-ordinated approaches.
- Ensuring best practice is followed.
- Developing a multi-professional approach.

Action required

Lead responsibility

- | | |
|--|------------------------------------|
| - Develop training sessions on screening for Practice teams. | Primary Care Advisors/facilitators |
| - Ensure communication links from occupational health service (OHS) to primary care. | OHS / Primary Care Teams |
| - Encourage delegation of screening to appropriately skilled practice staff. | Primary Care Teams |

Management

The British Hypertension Society guidelines for the Management of Raised Blood Pressure make recommendations on blood pressure thresholds for intervention, on non-pharmacological and pharmacological treatments, and on treatment goals ([Appendix 3](#)). These should be followed. All patients with raised blood pressure should have a routine work-up (see EHSSB summary). The British Hypertension Society recommends the use of non-pharmacological measures in all hypertensives and suggests that drug treatment of mild hypertension is only indicated in men and women under 80 years whose diastolic blood pressure averages 100mm Hg or more over three to four months. Patients with a diastolic blood pressure of 90-99mm Hg over this period should not usually be treated unless there is evidence of target organ damage but should be carefully followed up at intervals of three to six months. Those with a systolic blood pressure of 160mm Hg or more after repeated measurements should be treated regardless of age. **All blood pressure levels for intervention should be considered in the light of other existing risk factors.**

Those suspected of having secondary hypertension should be referred for specialist advice. Indications for referral are: accelerated (malignant) hypertension, suspected secondary cause of elevation, elevated blood pressure that is proving resistant to therapy and patients with multiple cardiovascular risk factors.

Key areas for attention

- Following BHS recommended guidelines.
- Developing a routine work-up for patients.
- Ensuring consistency in approach.

Action required

Lead responsibility

- | | |
|---|---|
| - Adopt use of BHS Management Guidelines. | Commissioners/Trusts. /Health Professionals |
| - Undertake clinical audit against BHS Guidelines. | Professional Staff |
| - Agree shared care approach and ensure good communication between hospital and GP. | Trusts/Primary Care Teams |

BASELINE DATA

There is currently a limited amount of information on blood pressure levels in the Northern Ireland population. Through the GP health promotion bandings information is available on the proportion of the population who have had their blood pressure measured in the last 5 years. Unfortunately details of the actual blood pressure measurements are not available at aggregate level. The group recommends that information on blood pressure should be fed into a system which allows Regional and Board assessment of population blood pressure levels.

Some data is available from the Change of Heart Baseline Survey and other MONICA surveys. Building on this work, which goes back to 1983/84, should be encouraged so that changes over time can be monitored. The proposed DHSS "Health and Social Wellbeing" Survey should provide extremely useful information on blood pressure levels and also data on risk factor prevalence. The group strongly recommends that the methodology used in the survey should be compatible with the MONICA studies so that meaningful comparisons can be made.

MONITORING AND EVALUATION OF THE PROGRAMME

The long term goal of this Blood Pressure Control Programme is to diminish the community burden of mortality and morbidity associated with stroke and heart attacks. Achievement of this goal can be monitored by observing changes over time in incidence of and mortality from these conditions. However, as changes in these indicators will not be seen for some years it is essential that the contribution made by the different components, eg reduction in risk factor prevalence, percentage screened, detected, treated and controlled are monitored. Ways of monitoring changes in these components through initiatives like the Health and Social Wellbeing Survey need to be explored.

WAY FORWARD

The Blood Pressure Strategy produced by the EHSSB has been accepted by the other three Health Boards and by the CREST Working Group on Blood Pressure. A number of key objectives (page 5) for implementation of a Blood Pressure Control Programme are identified from the EHSSB Strategy. Key areas for attention and action required have been listed for each objective together with identification of where lead responsibility for each task rests.

Given the burden of mortality and morbidity caused by raised blood pressure in Northern Ireland CREST recommends that this programme for Blood Pressure Control is given priority by the Health and Social Services Executive, the Health and Social Services Boards and Trusts and by professional staff working in primary care and health promotion. CREST is most encouraged that tackling the problem of raised blood pressure in Northern Ireland was highlighted in the Department's Regional Strategy 1992-1997.

In order to help initiate work and focus attention on this Blood Pressure Control Programme the Working Group recommends that consideration should be given to appointing a facilitator for a period of 2-3 years. Such a person should have a primary care background with relevant experience and expertise. The appointee would have a regional co-ordination role working with the Health and Personal Social Services Boards and Trusts as well as with individual primary care teams. The Committee also felt that initially it might be useful to establish a small implementation group to guide and oversee the successful introduction of the programme.

APPENDIX 2 - EHSSB BLOOD PRESSURE STRATEGY - SUMMARY

As part of its response to the high incidence of vascular mortality and morbidity in its area, the EHSSB has produced the enclosed strategy for elevated blood pressure. It attempts to ensure a high rate of detection of cases of elevated blood pressure and provides guidelines for efficient and effective diagnosis and management of patients with raised blood pressure.

This document looks at the scope of the problem, offers guidelines for the management of elevated blood pressure and proposes an action plan for the implementation and evaluation of the strategy.

Detailed guidelines are enclosed but the following statements and flow diagrams summarise the suggested guidelines.

- **FOLLOW BRITISH HYPERTENSION SOCIETY GUIDELINES FOR MEASUREMENT OF BLOOD PRESSURE**

In particular use appropriate size of cuff, record phase V (sounds disappear) as diastolic and measure to nearest 2mm Hg.

- **PERFORM SIMPLE SCREENING EARLY**

All patients require a careful history and examination with appropriate blood and urine tests. Specialised radiology should be performed as appropriate.

- **CLASSIFY EXTENT OF ELEVATION**

MILD - DBP 90-109mm Hg

SEVERE - Diastolic BP (DBP) > 110mm Hg.

- **SEVERE RISES IN BLOOD PRESSURE SHOULD WARRANT EARLY INTERVENTION**

- **MILDLY ELEVATED BLOOD PRESSURE NEEDS CAREFUL EVALUATION OVER SOME MONTHS BEFORE A DECISION ON THERAPY, USUALLY LIFELONG, IS MADE**

- **FOR MILDLY ELEVATED BLOOD PRESSURE**

Observe monthly for 3 months and then intervene as shown

- **FOR SEVERELY ELEVATED BLOOD PRESSURE**

Repeated measurements over 1-2 weeks, appropriate investigations and then treatment.

- **SUSTAINED ELEVATED SYSTOLIC BLOOD PRESSURE (> 160mm Hg) IS TO BE REGARDED SERIOUSLY AND, CONTRARY TO PREVIOUS OPINION, SHOULD BE TREATED**
- **TREATMENT OF ELDERLY PATIENTS (UP TO 80 YEARS) WITH ELEVATED BLOOD PRESSURE, USING THE ABOVE GUIDELINES, IS WORTHWHILE AND REDUCES MORBIDITY AND MORTALITY**

These patients can often be treated with low dose diuretics.

- **INSTITUTE DRUG THERAPY AS PER FLOW DIAGRAM (see later)**
- **OPINION REMAINS DIVIDED ON WHICH DRUGS ARE FIRST-LINE AGENTS**

See BHS Guidelines regarding appropriate agents and combinations.

- **BP CONTROL ON THERAPY**

It remains an issue of much concern that about 50% of treated patients do not achieve acceptable blood pressure control.

50% at least will need more than one agent and this should be recognised and acted upon rapidly.

- **REFERRAL TO SPECIALIST BP CENTRES**

Indications are: accelerated (malignant) hypertension, suspected secondary cause of elevation, elevated blood pressure that is difficult to treat and patients with multiple cardiovascular risk factors.

LIFESTYLE MODIFICATIONS FOR EVERY CLIENT WHO HAS ELEVATED BLOOD PRESSURE WITH A VIEW TO LOWERING OF BLOOD PRESSURE AND/OR REDUCING CARDIOVASCULAR DISEASE

- Reduce energy intake to achieve target body weight.
- Limit animal fat intake.
- Eat plenty of fresh fruit and vegetables.
- Take regular aerobic exercise.
- Avoid excessive alcohol.
- Limit salt intake.
- Stop smoking.

THE ROUTINE WORK-UP OF THE PATIENT WITH ELEVATED BLOOD PRESSURE

Initial investigations should be aimed at screening for obvious secondary causes or markers for cardiovascular disease. These should consist of:

1. Full history and physical examination
2. Routine clinic urinalysis
 - - blood
 - - protein
 - - glucose
3. Blood for
 - serum creatinine and urea
 - serum potassium

(without forearm exercise - spun in laboratory on the same day to avoid haemolysis)

4. Consider estimation of urinary catecholamines.

These should not be performed routinely but are indicated if any symptoms or signs of pheochromocytoma or other pointers towards the disease are present.

5. Consider referral to BP specialist for assessment and radiological investigation
 - if history of renal disease now or in the past
 - abnormal renal signs on examination or on urinalysis.

6. Secondary Hypertension

If any of the above leads to suspicion of secondary hypertension then appropriate referral should be made for further diagnostic assessment and therapy at an early stage.

7. If blood pressure elevation is severe or refractory to therapy more detailed investigation is indicated.
8. Consider other cardiovascular risk factors.

9. It should be recognised that good and early control of blood pressure in renal patients is one of the most effective ways of reducing the long-term effects of ischaemic heart disease and renal failure. The same is probably true of diabetes.

Finally, the EHSSB wish to make screening more accessible and available to the public and recommends opportunistic screening and follow-up in primary care, hospital and work place settings. Prevention, detection and effective management of blood pressure abnormalities are vital health promotion objectives. There will be continuing education in elevated blood pressure for health care staff and specialised hospital clinics will continue to be available for the management of treatment-resistant patients and those with secondary causes. Elevated blood pressure in patients with other medical conditions should be taken very seriously (see point 9 above).

ELEVATED BLOOD PRESSURE IN OLDER PEOPLE

In absolute terms high blood pressure is a much greater risk for cardiovascular events in older than in younger people ⁽¹⁾. Both systolic and diastolic blood pressure predict the occurrence of cardiovascular disease although statistical analysis suggests that in older people systolic pressure is more closely related to cardiovascular risk ⁽²⁾. For example elderly subjects with isolated systolic hypertension in the Framingham study had 2-5 times the cardiovascular mortality of the general population ⁽³⁾. While the risks have always been apparent, there is now abundant evidence of the benefits of treatment of high blood pressure, including isolated systolic hypertension, in older people ^(4,5,6,7,8.) These benefits are seen at least until 80 years, and the available evidence for isolated systolic hypertension suggests treatment benefits at all ages ⁽⁸⁾. These benefits include reductions in total stroke of 25%-47%, fatal stroke of approximately 70% and all cardiovascular events by between 17% and 40%. A few trials did show reductions in cardiac events. Treatment of isolated systolic hypertension resulted in significant reduction of 36% in all strokes and 27% in all cardiac events, which included a significant reduction of 33% in non-fatal myocardial infarction.

There is difficulty converting these results into clinical practice. There has been a persistent reluctance to treat hypertension in older patients, possibly contributed to by traditional teaching. The lack of trial evidence has been cited, together with the fear that treatment may do more harm than good. Elderly patients do present special problems in treatment: drug interactions, compliance and an increased risk of adverse events. However results from the trials have strongly reinforced that treatment benefits outweigh risk. **There Are No Longer Any Doubts That Sustained Elevated Blood Pressure In Elderly People Should Be Treated.**

ELEVATED BLOOD PRESSURE IN PATIENTS WITH OTHER MEDICAL CONDITIONS

The cost effectiveness of treating elevated blood pressure in older patients should be considered. The greatest benefits of any treatment are to be seen where the risk is highest. In older people cardiovascular risk is high, and benefits of anti-hypertensive treatment are realised within a short time span. The main benefit is a consistent and significant reduction in stroke. The high cost of treating stroke means that the treatment of hypertension becomes a very cost-effective process in those at high risk. It should be recognised that good and early control of blood pressure in renal patients is one of the most effective ways of reducing the long-term effects of ischaemic heart disease and renal failure. The same is probably true of diabetes.

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APPENDIX 3 - MANAGEMENT GUIDELINES IN ESSENTIAL HYPERTENSION: HIGHLIGHTS OF THE REPORT BY THE SECOND WORKING PARTY OF THE BRITISH HYPERTENSION SOCIETY (BHS)

Background

1970s

Large studies initiated to determine value of treatment in mild hypertension.

1988

WHO/ISH joint conference produce guidelines for the management of mild hypertension⁽¹⁾.

1988

Recommendations of the Joint National Committee on Detection, Evaluation and Treatment of High Blood Pressure in the United States. Updating previous guidelines and broadening step-care approach. Emphasis on control of risk factors for cardiovascular disease and the cost of pharmacological intervention.

1989

The BHS set up the First Working Party, to determine whether firm advice on the treatment of mild hypertension could be given based on their analysis of the available intervention trials. Advice published⁽²⁾.

1992

BHS set up the Second Working Party, to consider issues relating to the current management of hypertension - in particular, in the light of trials in elderly patients and evidence that drug treatment reduces coronary events in addition to preventing strokes. Recommendations published⁽³⁾.

RECOMMENDATIONS

Summary

- Use non-pharmacological measures in all hypertensives.
- In addition initiate treatment in patients (under 80) with diastolic BP (DBP) ≥ 100 mm Hg or between 90 and 99mm Hg, with target organ damage.
- Treat elderly patients with systolic BP (SBP) ≥ 160 mm Hg and/or DBP ≥ 90 mm Hg.
- Currently recommend either diuretic or beta-blocker as first-line therapy. However, where these are contraindicated, ineffective, or when side effects occur, or in selected conditions, there may be a role for newer agents, as first-line. These agents include ACE inhibitors, calcium channel blockers and alpha blockers.

BP MEASUREMENT

Follow BHS guidelines⁴.

- Patient seated.
- Using conventional mercury manometer with an appropriate bladder size.
- Diastolic reading taken at disappearance of sound (phase V).
- Record to nearest 2mm Hg.
- \geq two BP measures at each visit.
- \geq four separate visits to determine BP thresholds.
- In mild hypertensives and older patients with isolated systolic hypertension, but no target organ damage, take BP measurements over 3-6 months.
- In severe hypertensives, take BP measurements more often.
- Standing BP measurements important for elderly and diabetic hypertensives in whom orthostatic hypotension is common.

NON-PHARMACOLOGICAL MEASURES

Offered to all hypertensives and to people with strong family history of hypertension. *“Non-pharmacological measures play an important part in any blood pressure control programme”.*

In MILD hypertensives can reduce BP by 10.5/8.2mm Hg vs. 18.2/12.8mm Hg reductions with drugs⁽⁵⁾. There is, therefore, the potential to avoid the need for drugs by the use of non-pharmacological measures.

In more SEVERE hypertensives can reduce need for high-dose and/or multiple drug regimens.

LIFESTYLE MODIFICATIONS

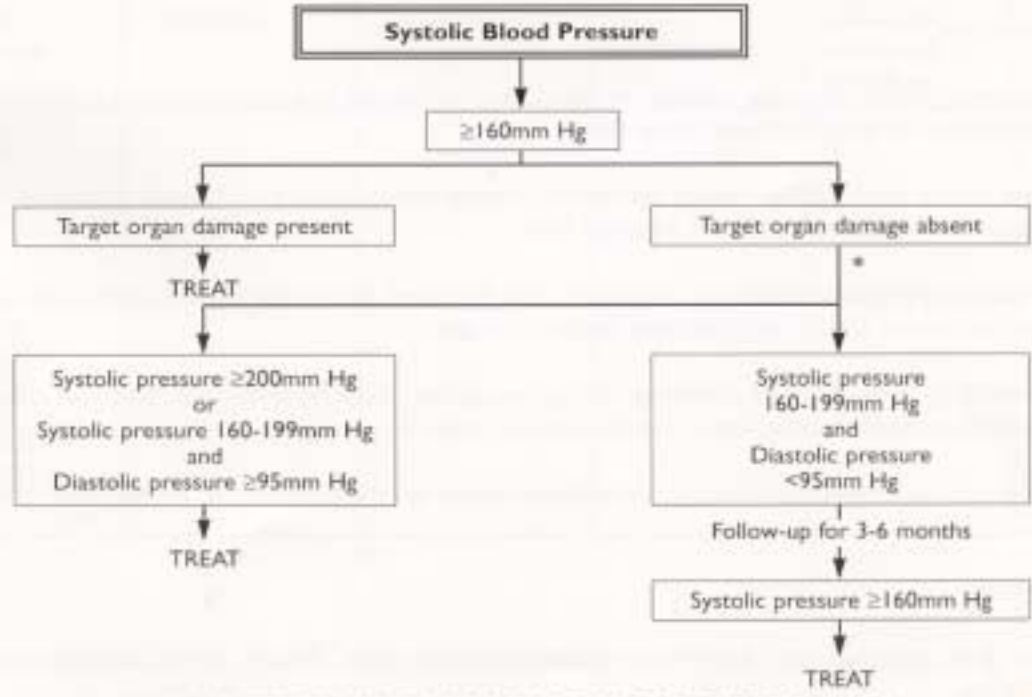
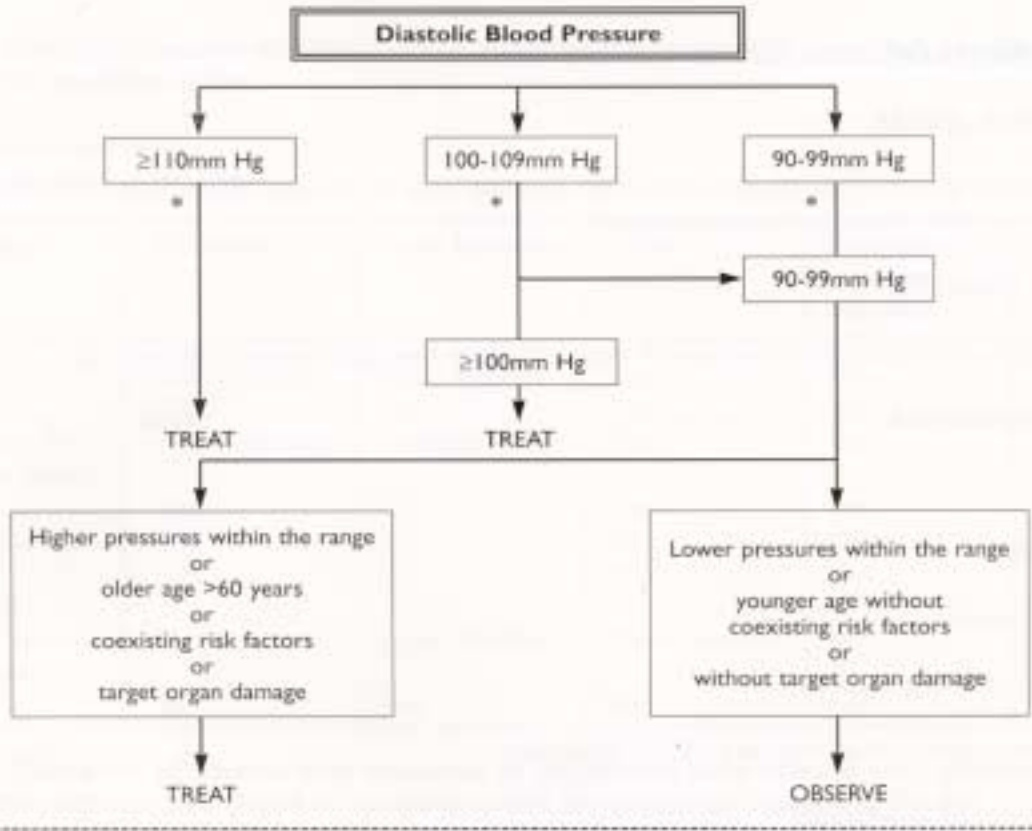
BP Lowering

- Reduce energy intake to achieve target body weight.
- Avoid excessive alcohol intake.
- Reduce salt intake
- Take regular exercise

Cardiovascular Disease Prevention

As for BP lowering, plus

- Limit animal fat intake.
- Eat plenty of fruit and vegetables
- Stop smoking



ALL PATIENTS GIVEN NON-PHARMACOLOGICAL ADVICE
*REPEATED MEASUREMENTS

PHARMACOLOGICAL INTERVENTION

Treatment goals

“It remains an issue of much concern that around half of treated hypertensive patients do not achieve acceptable blood pressure control”.

DBP - to < 90mm Hg

SBP - no firm recommendations can be made (prudent to reduce to < 160mm Hg)

Drug treatment

First-line

- Diuretics
- Beta-blockers

Alternative first-line (Table 1)*

- Angiotensin converting enzyme (ACE) inhibitors
- Calcium channel blockers
- Alpha-blockers

“Newer classes of drugs may be equally or even more effective in lowering blood pressure but have not been evaluated in long-term outcome trials...”

Policy for the use of alternatives when diuretics or beta-blockers are NOT contraindicated - Second BHS Working Party remains divided in their view.

Once the results of ongoing trials are reported, the Working Party will review these new agents and may accept the use of these alternatives as first choice.

“...all [members of Second BHS Working Party] recognise their [alternative first-line drugs] role in selected conditions such as diabetes, asthma, heart failure, and gout...”

*When diuretics or beta-blockers are contraindicated or ineffective, or when side-effects occur (Table 2).

Economics

If clinical factors determining choice are equal, consider cost, which varies widely with different classes of drugs.

Table 1 - Checklist on use of hypotensive drugs in patients with a second condition (Drugs not listed in ranking order)

NO - not recommended

YES - recommended for use

Coexisting	Diuretic	Beta-blocker	ACE inhibitor	Calcium channel blocker	Alpha-blocker
Diabetes	Care needed	Care needed	Yes	Yes	Yes
Gout	No	Yes	Yes	Yes	Yes
Dyslipidaemia	Controversial	Controversial	Yes	Yes	Yes
Ischaemic heart disease	Yes	Yes	Yes	Yes	Yes
Heart failure	Yes	No	Yes	Care needed	Yes
Asthma	Yes	No	Yes	Yes	Yes
Peripheral vascular disease	Yes	Care needed	Care needed	Yes	Yes
Renal artery stenosis	Yes	Yes	No	Yes	Yes

Table 2 - 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).

Common side effects	Diuretic	Beta-blocker	ACE inhibitor	Calcium channel blocker	Alpha-blocker
Headache	-	-	-	+	-
Flushing	-	-	-	+	-
Dyspnoea	-	+	-	-	-
Lethargy	-	+	-	-	-
Impotence	+	+	-	-	-
Cough	-	-	+	-	-
Gout	+	-	-	-	-
Oedema	-	-	-	+	-
Postural hypotension	+	-	-	-	+
Cold hands and feet	-	+	-	-	-

First-line dosing

Start with lowest recommended dose.

IF INEFFECTIVE, but well tolerated - increase dose

IF PARTIALLY EFFECTIVE (expect in $\leq 50\%$ of cases) change drug, or add drug from another pharmacological class based on:

- possibility of complementary action
- possibility of counteracting reflex action of the first drug
- avoidance of side effects associated with higher dose of single agent

Logical Combinations

Diuretic +	β - blocker ACE inhibitor
β - blocker +	diuretic calcium channel blocker (dihydropyridine) α -blocker
ACE inhibitor +	calcium channel blocker

OLDER PEOPLE

Benefits of blood pressure lowering in the older hypertensive patient have been confirmed in six trials. See SHEP⁽⁶⁾ and MRC⁽⁷⁾ for details.

60-80 years

Treat if BP ≥ 160 mm Hg systolic or ≥ 90 mm Hg diastolic

> 80 years

Stay on existing treatment - little evidence for benefit from initiating treatment

Isolated- systolic hypertension

Treat if SBP > 160 mm Hg/DBP < 90 mm Hg, although further trial data are awaited

Follow-up

- When BP stabilised by management, monitor every three months
- Could reduce dose or stop treatment and maintain non-pharmacological measures.

When to reduce or stop treatment?

While more evidence is collected, the Second BHS Working Party recommends:

- DBP < 80mm Hg (due to concern that over-aggressive reduction of DBP may increase coronary events)
- SBP well-controlled

Observe regularly for one year with non-pharmacological recommendations adhered to, re-treat if BP rises again.

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This information is adapted from the report of the Second Working Party of the BHS, first published in the British Medical Journal.

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