Guidelines for the Management of Hypertension In Nigeria May 1996

(A recommendation for health care providers prepared by the Nigerian Hypertension Society and adopted at the Consensus Meeting sponsored by The Nigerian Heartcare Foundation)

Foreword

It is with great pleasure that I accept to write the foreword to this all-important health manual which deals with the control and management of hypertension.

It is common knowledge that cardiovascular diseases are today the worldôs Public Health principal enemy, because they account for more than six million deaths every year in developing country. Indeed, 25% of all deaths throughout the world are attributable to cardiovascular diseases.

Luckily, however, cardiovascular disease (CVD) is largely preventable and we have the capacity to virtually eliminate this world-wide impending epidemic by applying what we know so far and working together in a spirit of collaboration and partnership. Any attempt to facilitate the control of this dreadful disease must be acknowledged.

It is therefore gratifying to note that the Nigeria Heartcare Foundation took the initiative to challenge our Medical Scientists - from the Federal Ministry of Health, Nigerian Cardiac Society, Nigerian Hypertension Society, Nigerian Medical Association, Medical Colleges, Guild of Medical Directors, pharmacists Societies, National Agency for Food and Drug Administration & Control, to Drug Manufacturers, and others to give a critical look at how hypertension can be controlled and managed in Nigeria and indeed in Sub-saharan African countries.

The Medical experts who prepared the guidelines did not only describe causes and nature of hypertension, by also how to detect, evaluate and manage it.

The experts, representing a wide spectrum of disciplines and experiences related to hypertension control rated hypertension as one of the major risk factors for cardiovascular disease. In preparing the Guidelines they highlighted the reversible major risk factors as smoking, high blood cholesterol, diabetes mellitus, left ventricular hypertrophy as well as the irreversible factors of age and family history. Thus, the Guideline is a useful tool in the hands of health care providers for the detection, evaluation and management of hypertension in Nigerian.

The Guidelines is recommended to all health care providers ï doctors, nurses, pharmacist and all other health workers.

Ihechukwu Madubuike
Honourable Minister of Health

Background

Medical and Public health authorities in several developed countries have made formal recommendations to health care providers for guidance in the management of high blood pressure and related cardiovascular disease [1]

However, in developing counties, especially the sub-Saharan region of Africa, acceptable guidelines are not readily available. It is acknowledged that appropriate treatment for the individual patient must be based on considerations that go beyond blood pressure alone, with some modifications to accommodate local circumstances. In March 1996, the Nigerian Heartcare Foundation at the instance of the Nigerian Hypertension society, sponsored a consensus meeting to develop guidelines for the detection, evaluation and management of hypertension in Nigerian

Hypertension is the commonest non-communicable disease in Nigeria. No fewer than 4.33 million Nigerians aged 15 years and above have elevated blood pressure (systolic Blood Pressure (SBP) of **160 mmHg** or above and / or Diastolic blood Pressure (DBP) of **95 mmHg** or above) or are on anti-hypertensive medication. This estimate is derived from a recent National Survey of Nigerian Adults sponsored by the Federal Ministry of Health (Non communicable Disease Survey 1990-91), and using the 1991 census data. [2]

The prevalence of high blood pressure increase with age, it is slightly greater in women than in men, and in both sexes is greater in urban than in rural communities.[3, 4] its prevalence is higher at both ends of socio-economic ladder than in the middle. Up to the age of 44 years high blood pressure prevalence is greater for men; thereafter the reverse is the case.

The consensus group examined current hypertension guidelines from the United States (US)[5], the United Kingdom (UK)[6] and the World Health Organization/International Society of Hypertension (WHO/ISH) [7] and used them as a guide in preparing this document.
It is hoped that this booklet would serve as a useful guide to Health care practitioners treating hypertensive patients in Nigeria.

Specific recommendations are made for treatment at individual level and practical suggestions are offered in the area of prevention bearing in mind the prevailing socio-economic conditions in the country.

High Blood Pressure and Factors Linked to it

Hypertension is an abnormal state of circulatory function which in the long term, can lead to organ damage and severe morbidity. It is accepted that individual blood pressure levels are influenced by genetic and non-genetic factors. [8] The important non-genetic factors are:

(i) Diet (e.g. levels of sodium, potassium and fat consumption of food)

(ii) Alcohol consumption

(iii) Lack of physical exercise

(iv) Psychosocial

(v) Socio-economic

(vi) Behavioural

Classification of Blood Pressure

The following classification of blood pressure in the adult Nigerian (age > 15 years) is proposed for the purpose of these guidelines.

CLASSIFICATION OF BLOOD PRESSURE (AGE > 15 YEARS)

CATEGORY	SYSTOLIC (MM Hg)	DIASTOLIC (mm Hg)
NORMAL	<140	<90
BORDERLINE	140 ï 159	90 ï 94
HYPERTENSION		
STAGE 1 (MILD)	170 ï 186	95 ï 104
STATE 2 (MODERATE)	170 ï 186	105 ï 119
STAGE 3 (SEVERE)	= OR ≥ 190	= OR ≥ 120

Hypertension in adults (age 15 years and above) is thus defined as a persistently elevated systolic blood pressure of /or more than 160 mm Hg and/ or diastolic pressure equal to or more than 95 mm Hg.

Detection

Hypertension control begins with detection and requires continued surveillance. Health care professional are strongly advised to measure blood pressure at each patient visit.

Measurement: Hypertension should not be diagnosed on the basis of a single measurement. Initial elevated reading should be confirmed on at least two subsequent visits during one to several weeks (unless SBP is 190 mm Hg or greater and/or DBP is 120 mm Hg or greater) when immediate treatment is mandatory.

Blood pressure should be measured in such a manner that values obtained are representative of patientsô usual levels. [9] The following technique is recommended:

The patient should be seated with arm bared, supported, and at heart level. He should not have smoked or ingested caffeine within 30 minutes of the measurement.

Measurement should begin after at least 5 minutes of rest.

The appropriate cuff size must be used to ensure an accurate measurement. The bladder should nearly or completely encircle the upper arm.

Measurement should be taken with a mercury sphygmomanometer, or a recently calibrated aneroid manometer or electronic device, with the arm at heart base level.

Both SBP and DBP as well as pulse rate should be recorded. The disappearance of Korotkoffôs sound (phase v) should be used for the diastolic reading.

Two or more readings separated by an interval of two minutes should be averaged. It the first two reading differ by more than 10 mm Hg, additional readings should be obtained.

The blood pressure and pulse rate should also be taken in the standing position with the arm held horizontally at the level of the base of the heart.

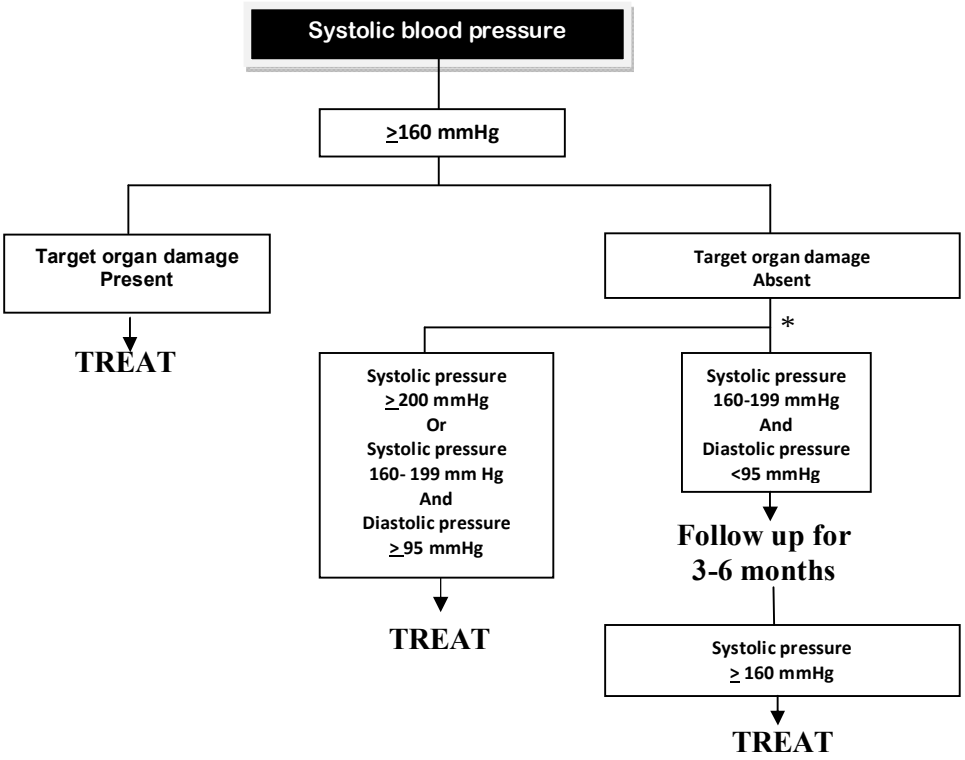
Patients should be adequately educated on the meaning of their blood pressure reading and advised on the need for periodic remeasurement.

Confirmation and Follow-Up

Repeated blood pressure measurement will determine whether initial elevations persist and require close observation, prompt attention, or whether they have returned to normal and need only periodic re-measurement. Initial blood pressure reading that are markedly elevated (i.e. a DBP = /$\geq$ 120 mmHg or a SBP = /$\geq$190 mm HG) or are associated with evidence of target organ damage require immediate drug therapy. The timing of subsequent reading should be based on the initial blood pressure as well as previous diagnosis and treatment of CVD and risk factors. The procedure of dealing with lower levels of hypertension is presented in the flow chart on pages 6 & 7.

NIGERIAN CONSENSUS ON THE MANAGEMENT OF HYPERTENSION

GOAL: Therapeutic – to reduce the systolic Blood pressure to below 140mmHg

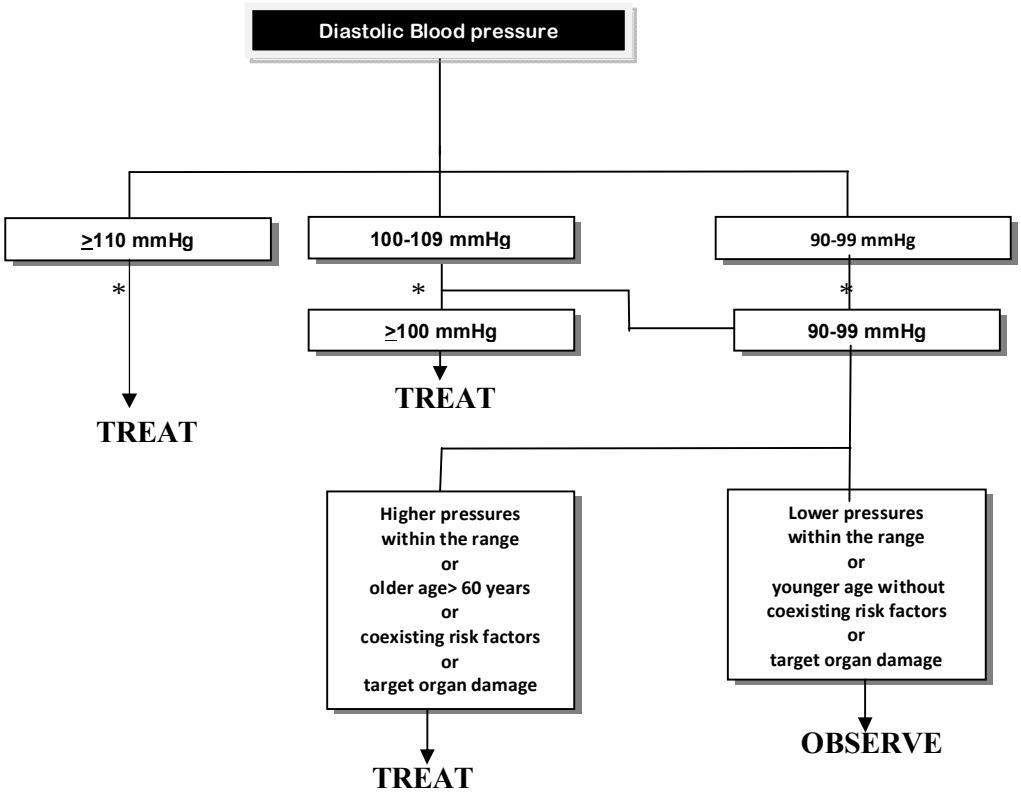


All patients are given non-pharmacological measures

*** Repeat measurement three times on at least two different occasions**

NIGERIAN CONSENSUS ON THE MANAGEMENT OF HYPERTENSION

GOAL: Therapeutic- To reduce the Diastolic Blood Pressure to below 90mmHg



All patients are given non-pharmacological measures

*** Repeat measurements three times on at least two different occasions**

Medical History

A medical history should include the following:

* Family history of high blood pressure, coronary heart (CHD) stroke, cardiovascular disease (CVD), diabetes mellitus and dyslipidaemia.

* Known duration and levels of elevated blood pressure.

* History of weight gain, leisure time, physical activities and cigarette smoking or other tobacco use.

* Dietary assessment, including salt intake, alcohol use and intake of high cholesterol foods and saturated fats.

* Results and side effects of previous antihypertensive therapy.

* Symptoms suggesting secondary hypertension.

* Psychosocial and environment factors (e.g. family situation, employment status, working conditions and literacy level) that may influence blood pressure control.

Clinicians should obtain a history of all prescribed and over- the-counter medications. Some medication can raise blood pressure and/ or interfere with the effectiveness of antihypertensive dugs. These dugs include, but are not limited to; **oral contraceptives steroids, nonsteroidal anti-inflammatory drugs, nasal decongestants and other common cold remedies, appetite suppressants, cyclosporine, erythropoietin, tricyclic antidepressants and monoamine oxidase inhibitors.**

Physical Examination

The initial physical examination should include the following:

Two or more blood pressure measurement separated by a two-minute interval, with the patient either supine or seated, and after standing for at least 2 minutes.

Verification in the contra lateral arm (if values are different, the higher value should be used).

Measurement of height and weight

Fundoscopic examination (with pupil dilatation if necessary) for arteriolar narrowing, anteriovenous nipping, haemorrhages, exudates or papilloedema.

Examination of the neck for carotid bruit, distended veins, or an enlarged thyroid gland

Examination of the heart for increased size, precordial heave, clicks, murmurs, arrhythmias, and third (S3) and fourth (S4) heart sounds.

Examination of the abdomen for bruit, enlarged kidney masses and abnormal aortic pulsation

Examination of the extremities for diminished or absent peripheral arterial pulsation, bruits and oedema.

Laboratory Tests and Diagnostic Procedures

Following a resting electrocardiogram (ECG), minimal laboratory tests should be performed routine before therapy is initiated: urinalysis, serum urea, potassium and sodium.

For selected cases, other tests that should be performed include: complete blood cell count, fasting blood glucose, serum creatinine, calcium, uric acid, cholesterol (total and high density lipoprotein) and triglycerides, urinary microalbumin, urinary sodium, plasma renin and echocardiography. [10, 11, 12]

Treatment

Goal

The goal of treating patients with hypertension is to prevent morbidity and mortality associated with high blood pressure. This should be accomplished by achieving and maintaining SBP below 140mm Hg and DBP below 90 mm Hg, while concurrently controlling other modifiable cardiovascular risk factors. Further reduction to levels of 130/85 mm Hg may be pursued, with due regard for cardiovascular function, especially in the elderly. How far the DBP should be reduced below 85 mm Hg unclear.

Life-style modification

Life-style modification previously referred to as non-pharmacologic therapy includes weight reduction, increase physical activity, moderation of dietary sodium and alcohol intake. These are used as definitive or adjunctive therapy for hypertension. [13-16]
Physicians should actively encourage their patients to adopt these life-style habits. They are effective in lowering the blood pressure of many people who follow them, and they can also reduce other risk factors for premature CVD. Their capacity to reduce morbidity or mortality in those with elevated blood pressure has not been conclusively documented. However, because of their ability to improve the cardiovascular risk profile, life-style modification interventions, properly used, offer multiple benefits at little cost and with minimal risk. [17]
Even when not adequate in themselves to control hypertension, they may reduce the number and doses of antihypertensive medications needed to achieve good control.

Life-style modification is particularly helpful in the large proportion of hypertensive patients who have additional risk factors for premature CVD, especially dyslipidaemia and diabetes. [18]

Tobacco Avoidance

Although unrelated to hypertension, cigarette smoking is a major CVD risk factor, and avoidance of tobacco is essential. Everyone, especially hypertensive patients, should be strongly advised not to smoke. Repetitive counseling should be provided. Those who continue to smoke may not receive the full degree of protection against CVD from antihypertensive therapy. [19, 20] The nicotine patch or nicotine chewing gum, in conjunction with patient counseling, may assist the clinician in promoting smoking cessation. Smoking cessation information is available from the Nigerian Cancer Society and the Federal Ministry of Health and Social Services.

Weight Reduction

Excess body weight is closely correlated with increased blood pressure. The deposition of excess fat in the upper part of the body (truncal or abdominal), as evidenced by an increase

waist-to-hip ratio above 0.85 in women and 0.95 in men, has also been correlated with hypertension, dyslipidaemia, diabetes and increased coronary heart disease mortality. [21, 22]

Weight reduction reduces blood pressure in a large proportion of hypertensive individuals who are more than 10% above ideal weight. [23] A reduction in blood pressure usually occurs early during a weight loss programme, often with as small as weight loss as 4kg. Weight reduction in overweight hypertensive patients enhances the blood pressure-lowering effect of concurrent antihypertensive agents, and can significantly reduce concomitant cardiovascular risk factors.

Principles of Drug Management

The 1993 report of the Joint National Committee (JNC) on the Detection, Evaluation and Treatment of High Blood Pressure was accepted as generally applicable to Nigeria with some modifications. Escalating drug costs with the reality that most hypertensive patients in Nigerian are poor, was partly responsible for convening this consensus. In the first instance, drug management choices should be made for each individual patient as a whole in his or her social setting.

Consideration in cost-effective drug management include the cut-off points for intervention, treatment goals, number of initial and repeat investigations, number of visits, the level of personnel engaged in the management of the patients, the cost to patients attending clinics, the actual price of the drug, cost of investigation to monitor side-effects, cost of side-effects themselves, quality of life and the number of disease endpoints prevented. Health care workers must have adequate knowledge of the various anti-hypertensive drugs and their side-effects if patients are to derive the most benefit from their management.

Based on this consideration, the drugs of first choice are **thiazide diuretics**
e.g. Bendrofluazide 1.25 ï 5mg daily, or hydrochlorothiazide 12.5 ï 50mg daily in almost all patients with hypertension. If there are addition problems such as diabetes, hyperlipidaemia, gout or left ventricular hypertrophy, then the drug approach should be modified. Glucose intolerance and hyperlipidaemia may develop even on low-dose diuretics. Ideally, baseline and annual fasting and 2-hour postprandial blood glucose should be measured. As a minimum, a random blood sugar or urine dipstick for glucose should be carried out at first visit and annually.

Alternative drugs are required if diuretics do not work or if they cause side-effects. The choice of the second type or alternative drugs should be determined by factors such as cost effectiveness, and each patientôs social setting and clinical picture. The addition of a second drug may be required it the response is inadequate. The second or alternative drug may be Reserpine (in a dose of 0.05-0.2 / day), a vasodilator, a beta-blocker, an alpha-blocker, a calcium channel blocker or an angiotensin converting enzyme (ACE) inhibitor. Economic circumstance will determine the choice. If response is still inadequate on a combination of three drugs, referral to a specialized center is indicated.

Beta-blockers and ACE inhibitors are often not effective as monotherapy in black populations, but in combination with diuretics. [24] Calcium channel blocker may be more effective as monotherapy in these communities. [25]

The aim of therapy is to achieve and maintain the target blood pressure with minimal, if any, adverse effects. Target blood pressure is linked to drug initiation thresholds: in patients with hypertension (blood pressure equal to or above 160 mmHg systolic and /or 95 mmHg diastolic) the goal is to reduce the blood pressure to 140/90 mm Hg or below.

In the elderly it is prudent to lower blood pressure gradually.

COMBINATION OF DRUGS

If a single drug has been ineffective it is reasonable to substitute a different drug. If a single drug has been partly effective it may be preferable to add a small dose of a second drug rather than increase the dose of the first.

For reasons of convenience, cost and increased patient compliance, preparations that combine two drugs in a single tablet or capsule may be appropriate for many hypertensive patients once the need and dose for the constituent drugs have been established. Non-drug measures should be continued in order to minimize the required number and doses of drugs and to control other risk factors.

FOLLOW UP OF THERAPY

During the stabilization period of treatment, patientôs needs to be seen at regular intervals until the blood pressure levels are satisfactorily controlled. The main task of doctors during follow-up is to ensure that target systolic and diastolic blood pressure are reached and maintained and that other risk factors are controlled. Gradual and careful lowering of the blood pressure will minimize side effects and complications, and will improve compliance. Sometimes telling a patient that he or she has hypertension (ólabelingô) may be followed by anxiety or mood changes. Additional support, e.g. reassurance about prognosis, emphasis on the ability to lead normal active live and explanation of any new symptoms that may appear is therefore particularly important. Self-measurement of blood pressure may be helpful to ensure compliance.

After stabilization of blood pressure, follow-up visits at 3-6 month intervals may be adequate. During each visit the blood pressure should be measured, side effect monitored, and non-pharmacological measures, particularly cessation of smoking, control of serum cholesterol and obesity, should be reinforced. Drug therapy should be adjusted accordingly. As a rule antihypertensive therapy should be maintained indefinitely. Cessation of therapy in patients who have been correctly diagnosed as hypertensive is usually followed sooner or later-by return of blood pressure to pretreatment levels. Nevertheless, after prolonged blood pressure control it may be possible top attempt a careful progressive reduction in the dose or number of drugs used, especially in patients strictly observing non-drug treatment.

Depending on the drugs used, appropriate laboratory investigations should be performed at regular intervals.

Management of Hypertension

Emphasize that treatment is life-long.

A. **NON-DRUG**

LIFE-STYLE MODIFICATION

DIET	-	SALT REDUCTION
	-	CALORIES REDUCTION UNTIL IDEAL BMI
EXERCISE	-	REGULAR AND MODERATE
SMOKING	-	STOP
ALCOHOL	-	REDUCTION OF INTAKE

HEALTH EDUCATION

DETECTION
EVALUATION
REFERRAL

B. **IDEAL DRUG MANAGEMENT**
(Modified Stepped-care approach is considered best for our present economy). Start with one drug and add, or change to others as needed.

(STEP) DRUGS RECOMMENDED

(1) DIURETICS: Thiazides (Low does) e.g.

Bendrofluazide 1.25 ï 5mg daily orally
A fixed-dose combination of hydrochlorothiazide and a potassium-sparing diuretic is a widely used alternative to plain thiazides

(**2**) **RESERPINE** 0.05 ï 0.2mg daily orally

(**2a**) Two fixed dose combinations, one containing reserpine and a diuretic and the other containing an additional ergot derivative are widely used e.g. (i) reserpine + hydrochlorothiazide or (ii) reserpine + clopamide + dihydroergocristine. Definitive clinical trials are still needed to determine which of these should be preferred, but they are both effective.

(3) ALPHA-RECEPTOR BLOCKER: Prazosin 1-5mg orally. It is usually given combined with a diuretic. A common presentation in Nigeria prazosin 0.5mg/ polythiazide 0.25mg.

(4) BETA-RECEPTOR BLOCKERS: Alone or in a two three drug combination with a diuretic and/or calcium-channel blocker.

A. Propranolol 40mg daily in 1-2 doses daily.

B. Atenolol 25-100mg daily in 1-2 doses daily
Atenolol has the advantage of being more consistently effective, but it is more expensive.

(**5**) **CALCIUM ANTAGONISTS:** Alone or in two or three drug combination with a diuretic and/or beta blocker.

Amlodipine 2.5-20mg daily usually in one dose.

Isradipine 2.5-15mg in 1-3 divided doses daily

(**6**) **ACE INHIBITORS**: Usually in combination with a diuretic

Captopril 25-100mg daily in 1-4 divided doses.

Enalapril 5-40mg daily usually in one dose.

Lisinopril 5mg daily

(**7**) **SPECIAL SITUATIONS:** (Children, Pregnancy, Resistant Primary or Secondary Hypertension)

CENTRALLY ACTING SYMPATHETIC NERVOUS SYSTEM MODIFIERS: Methyldopa 250-2000mg daily in 1-4 divided doses (Avoid large doses because of adverse reaction on the liver, useful in pregnancy).

VASODILATOR: Hydralazine 25 -200mg daily orally in up to 4 divided doses ï useful in resistant hypertension.

DRUGS FOR HYPERTENSIVE CRISES & EMERGENCIES

Drug	**Dose**	**Onset of Action**
HYDRALAZINE	10 - 40mg im 10 - 20mg iv bolus iv infusion 20 - 40mg In 500ml of 5% dextrose over 4-6 hrs.	20 - 30min 10min
METHYLDOPA	250-500mg iv infusion over 10 min.	30 min
DIAZOXIDE	1 - 3mg/kg in 30sec as iv bolus	1-2 min
NB:	All infusions for antihypertensive in 5% dextrose in water.	

Primary Prevention of High Blood Pressure

Primary prevention of hypertension can be accomplished by application of interventions to the general population (population-based strategy) with the objectives of achieving a downward shift in the distribution of blood pressure. This approach can be complemented by special attempts to lower blood pressure among those who are most likely to develop hypertension (targeted strategy). The latter includes persons with Borderline Hypertension, a family history of hypertension, and one or more of the several life style factors that are important contributors to age-related increases in blood pressure. These life style factors include a high salt intake, an excessive consumption of calories, physical inactivity, excessive alcohol consumption, and low intake of potassium. They form the basis for intervention strategies that have shown promise in the prevention of high blood pressure.[26]

The evidence is less convincing for stress management and for supplementation with calcium, magnesium, fish oils, or fiber and for alteration in micronutrient consumption. In many instances, however, the data are insufficient to make a final judgment on the potential role of these factors in the primary prevention of hypertension.

Intervention programmes conducted in community-based and practice-based settings indicate that the desired life-style changes are potentially feasible. Achievement of the intervention goals has, however, been constrained by a number of social barriers, including lack of satisfactory food substitutes and absence of a national campaign to foster adoption of the population based and targeted intervention strategies necessary to prevent high blood pressure.

National Education Programme

A National High Blood Pressure Education Programme is well positioned to provide leadership for such campaigns. Goals of the campaigns should include promotion of foods that are low in salt and calories and high in potassium. It should also include moderation in alcohol consumption and promotion of physical activity. To attain these goals, public education to underscore the importance of lifestyle factors in the development of hypertension, as well as enhanced education and support of health care providers to encourage and facilitate their active participation, will be necessary. Objectives for national change in the prevalence of factors that increase the publicôs risk of developing high blood pressure should be established, since they do not yet exist.

Finally, additional attention needs to be focused on research question related to the prevention of high blood pressure. Primary prevention of hypertension is challenging, and the potential for benefit makes it an important national goal for the next decade and beyond.

Community Programme for Blood Pressure Control

Community screening activities are important for population subgroups at especially high risk for developing CVD, and with limited access to medical care. Community programmes may be an important strategy for primary prevention of hypertension, for monitoring the progress and promoting compliance by hypertensive persons already receiving therapy.

Ideally, community programmes are encouraged to include as many of the following at their resources will allow:

1. Detection, education and referral for other cardiovascular risk factors.

2. Multiple strategies to improve compliance with treatment, including public, patient, and professional education activities incorporating culturally sensitive approaches as well as environmental supports, such as informative food labelling, heart-healthy menus in restaurants, and safe trails for walking and cycling.[27]

3. Multiple centers to reach all segments of the population, including all health care setting, schools, worksites, churches, mosques, community centers, supermarkets, and pharmacies.

4. Extensive use of media promotion in conjunction with these activities.[28 ï 30]

Multiple targets, including individuals and groups with increased cardiovascular risk factors as well as those with ñnormalò risk factors levels who need education and support to continue to practice prevention behaviours, such as weight control, exercise, and good nutrition.

In the absence of resources for comprehensive efforts, community programmes are encourage to being modest activities with expansion to more comprehensive programmes when they involve both clinicians and other health care providers. This coordination occurs only if clinicians are aware of and support the community programmes. Advisory boards or community high blood pressure councils can facilitate cooperation among professional agencies, local health department, voluntary health agencies, hospitals, industries, and other interested groups. These boards or councils can help identify community problems, resources, priorities, solutions to problems, and method of evaluating programme effectiveness.[31] Such community involvement fosters a sense of commitment and acceptance of responsibility for the communityôs health problems and their solutions.

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Delegates at the National Consensus Meeting on Hypertension March 1996 and Nigerian Hypertension Society Meeting May 1996

Prof. O.O. Akinkugbe, Nigerian Hypertension Society, Prof. A.F.B. Mabadeje Nigerian Hypertension Society, Dr. F.C. Adi, Nigerian Hypertension Society, Prof. L.A Salako Nigerian Institute of Medical Research, Dr. K.K Akinroye Nigerian Heartcare Foundation, Dr. Gabi Williams, Nigerian Heartcare Foundation, Dr. (Mrs.) E.A Abebe, Federal Ministry of Health (Non-Communicable Diseases Unit), Prof. A.C Ikeme, Nigerian Hypertension Society, Dr. V.O Uzodike, Nigerian Cardiac Society, Prof A.A Akinsola Nigerian Renal Association, Prof. T.O Johnson, Lagos University Teaching Hospital, Dr. A.K Oyekan, Nigerian Guild of Medical Directors, Dr. (Mrs.) M.O.O. Ibidapo West Africa College of Physicians, Dr. F. Mobolaji-Lawal, Paediatrics Association of Nigeria. Dr. Ifeoma Egbuonu, Paediatrics Association of Nigeria, Dr. Frank Okupa, Association of General Medical Practitioners, Dr. Leke Kehinde, Association of General Medical Practitioners, Dr. Femi Adelowo, Ogun State University Teaching Hospital, Mrs. S.O Aiyegbusi, National Agency for Food and Drug Administration and Control, Mrs. G.O Omotosho, Lagos University Teaching Hospital, Dr. E.L. Bamgboye, Gbagada General Hospital, Dr. S. Kadiri, University College Hospital, Ibadan,Dr. B L Salako, University College Hospital, Ibadan, Dr. S.O Ajayi, University College Hospital, Ibadan, Dr. A.O Isah, University of Benin Teaching Hospital, Dr. J.O Ohaju-Obodo, University of Benin Teaching Hospital, Dr. J.O Awobusuyi, Gbagada Hospital, V.O. Aina Gbagada General Hospital, Mrs. C.F Sholola Gbagada General Hospital, Mrs. K.O Sunmonu, Gbagada General Hospital, Mrs. Opafemi, Gbagada General Hospital, Mrs. Tayo, Gbagada General Hospital, Dr. A. O Senbanjo, Julisam Clinic, Lagos. Dr. E. U Onifade Lagos University Teaching Dr. J. N Ajuluchukwu, Lagos University teaching Hospital, Dr. A.C Mbakwen, Lagos University Teaching Hospital, Dr. F.O Alli, Lagos University Teaching Hospital, Dr. M. O Mabayoje Lagos University Teaching Hospital, Dr. C.O. Amira, Lagos University Teaching Hospital, Mrs. A.O Delalu, Lagos University Teaching Hospital, Mrs. A.O Oginni, Lagos University Teaching Hospital, Dr. B.J.C Onwubere, University of Nigeria Teaching Hospital, Dr. E.O Okoro, University of Ilorin Teaching Hospital, Dr. E.A Nwankwo, University of Maiduguri Teaching Hospital, Dr. Adedayo Doherty, General Hospital, Isolo, Mrs. B.M Adebiyi, Pharmaceutical Society of Nigeria, Mr. Lere Baale, Pfizer Products Plc., Mr. Remi Adeseun, Swissco Nigeria Ltd, Mr. Ade Popoola, Reals Pharmaceuticals Limited (Zeneca), Mr. A. Adesoye, Reals Pharmaceuticals Limited (Zeneca), Mr. Enyiome Amos-Esonwure, Reals Pharmaceuticals Limited (Zeneca), Dr. I.A Olukoga, Glaxo Wellcome Nigeria Limited, Mr. V. Onugha, Glaxo Wellcome Nigeria Limited, Mr. Ben Akinleye, Roche Nig. Ltd. Mr. A.D. Abalaka, Roche Nig Ltd., Mr. Ike Onyechi Association of General Practice Pharmacist, Dr. T. Sofoluwe, University of Lagos.

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