Outline

- Introduction
- Definition
- Epidemiology
- Classification
- Types
- Risk factors
- Management
  - History
  - Physical Examination
  - Investigations
  - Treatment
- Complications
- Prevention.
- Conclusion
- References.

* Hypertension is a global health challenge and its prevalence is increasing rapidly amongst adults in many African countries

* Hypertension and other non-communicable diseases are currently responsible for at least 20% of all deaths in Nigeria.

* Although it rarely causes symptoms on its own, its complications can lead to suffering, avoidable death and financial burdens.

* Hypertension is arguably the most important modifiable risk factor for coronary heart disease and stroke

*Introduction..

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*Introduction

World Health Organization

Hypertension is a silent, invisible killer that rarely causes symptoms. Increasing public awareness is key, as is access to early detection. Raised blood pressure is a serious warning sign that significant lifestyle changes are urgently needed. People need to know why raised blood pressure is dangerous, and how to take steps to control it

Dr Margaret Chan
DG WHO

*Definition

*Systolic blood pressure greater than 140 mm Hg and a diastolic pressure greater than 90 mm Hg based on the average of two or more accurate blood pressure measurements taken during two or more contacts with a health care provider.

JNC 7

*Global Trend

According to CDC , 1 in 3 Americans are hypertensive.

Globally, 1 billion people grapple with the condition

The prevalence rates of hypertension vary around worldwide with the lowest prevalence in rural India (3.4% in men and 6.8% in women) and the highest prevalence in Poland (68.9% in men and 72.5% in women)

* In 2000,972 million people had hypertension with a prevalence rate of 26.4%,333 million developed countries and 639 million in developing countries.

* It is projected that by 2025 a total of 1.54 billion people accounting for 30% of the World population would be hypertensive with 75% of these from the developing countries and regions.

Global Burden of Hypertension

2025 Projection

Year 2000	Year 2025
*__26.4%__ of world adult population had hypertension	• __29.2%__ of world adult population will have hypertension
*Total of __972 million__ adults	• Total of __1.56 billion__ adults __20 %__ in developed nations, __80%__ in developing nations)
*Highest prevalence is in __established market economies__ (eg, North America, Europe)	• Highest prevalence will be in __developing continents__ (eg, Asia, Africa) will account for 75% of world's hypertensive patients

*National Prevalence

* In 2008, among all WHO regions, the prevalence of high blood pressure was highest in the African Region (46%) and lowest in the Region of the Americas (35%).
* From **1990 to 1999**, the pooled prevalence of hypertension was 15.0%; with a significant increase to 22.5% from **2000 to 2009.**
* Adedoyin *et al*. Recorded a prevalence of 30.4% in southwestern Nigeria.[
* Onwubere et al. in 2011 in a study carried out inEzeagu Community, Enugu State found a prevalence rate of 46.4% in a population aged 40- 70 years.

*Classification

	Blood pressure(mmhg)	
Classsification	Systolic	Diastolic
Normal	119 or lower	79 or lower
Prehypertension	120-139	80-89
Stage1 hypertenson	140-159	90-99
Stage2 hypertension	160 0r higher	100 or higher

*Pre Hypertension

* Prehypertension is **not** a disease category rather a designation for individuals at high risk of developing HTN

* Should be firmly and unambiguously advised to practice lifestyle modification

* Prehypertensive Clients are **not** candidates for drug therapy however if co-morbidity exist then, drug therapy is indicated if a trial of lifestyle modification fails to reduce their BP to 130/80 mmHg or less

Renal	Parenchymal diseases, renal cysts(PKD), renal tumors, obstructive uropathy.
Endocrine causes	1º aldosteronism, Cushin syndrome, pheochromocytma, hyper/hypothyroidism, hypercalcemia.
Neurogenic	Acute raised ICP,psychogenic, acute soinal cord section, famillial dysautonomia. Lead poisoning, Gullian- Barre syndrome.
Drugs	Oral contraceptives, adrenal steroids, antidepressants, cyclosporine, nasal decongestants, NSAIDS, MAOI, erythropoetin, cocaine
Pregnancy induced hypertension	
Obstructive Sleep apnoea	
Co-arctation of the aorta	

*Causes of 2º HTN

*Primary HTN:

- *Also known as essential HTN.
- *Accounts for 95% cases of HTN.
- *Gradual in onset
- *Age of onset: 4th decade
- *S/S occur years after onset of HTN.
- *Strong Family history
- *No universally established cause known, risk factors however exist.

*Secondary HTN:

- *Less common cause of HTN (5%).
- *Dramatic in onset
- *Age of onset: 1st- 2nd / 5th -6th decades
- *S/S occur at the start of HTN
- *F.H: May/may not be present.
- *Secondary to other potentially rectifiable cause.

*Types

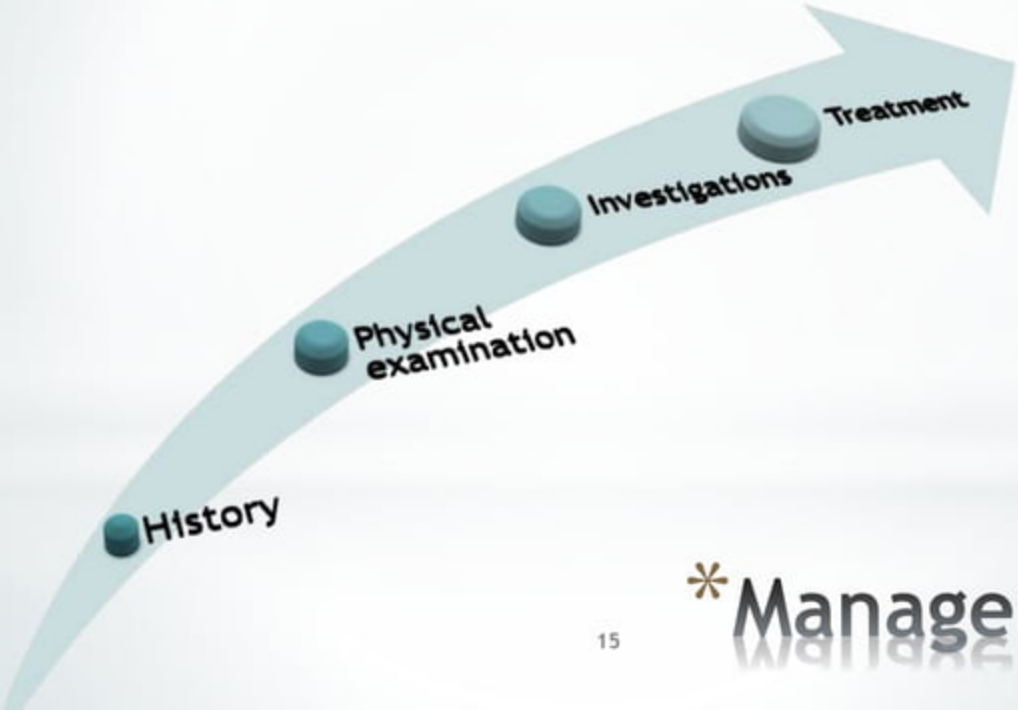
Non-modifiable Risk

* Alcohol
* Cigarette smoking
* Diabetes mellitus
* Elevated serum lipids
* Excess dietary sodium
* Obesity (BMI > 30)
* Sedentary lifestyle
* Socioeconomic status
* Stress

Modifiable Risk

* Age (> 55 for men; > 65 for women
* Gender
* Family history
* Ethnicity (African Americans)

*Risk factors for Primary HTN



*Management

* Onset: at age < 20 yrs or > 40 sudden onset (thrombus or cholesterol embolism).
* Episodic, headache and chest pain/palpitation.
* Nosebleeds - Difficulty in breathing
* Tinnitus (ringing or buzzing in the ears)
* Blurred Vision
* History of snoring and daytime sleepiness (sleep disorders)
* **Positive family history of HTN**
* Personal habits (cardiac risk factors): nutrition, smoking, alcohol, exercise, drugs (Prescribed / recreational)
* Co-morbidities : Diabetes, AGN, CGN, Hyperthyroidism

*History

Item	
General appearance	Look for signs of metabolic syndrome (overweight, truncal obesity), skin chances (striae in cushing syndrome)
Fundoscopy	Retinal changes reflect severity of HTN.
Examination of the neck.	Assess for thyroid enlargement, carotid bruits
Cardiopulmonary Examination	Take blood pressure .Gallops may indicate heart failure,
Neurological Examination	Look for evidence of previous stroke, evaluate cognition
Peripheral Pulses	Reduced leg pulses can indicate coarctation of the aorta or systemic atherosclerosis. Thickened brachial artery is indicative of artherosclerosis.

*Physical Examination..

INITIAL INVESTIGATIONS

1. Urine for: Protein, blood, glucose
2. FBC
3. FBS
4. Serum electrolyte urea and Creatinine
5. ECG
6. Serum - Total cholesterol, HDL, LDL, Triglycerides
7. X-ray chest P/A view

ADDITIONAL INVESTIGATIONS

1. Ambulatory BP recording
2. Renal ultrasonography
3. Renal angiography
4. 24 hours urine assay for creatinine meta morphines and catacholamines or plasma catacolamines if pheochromocytoma suspected.
5. Plasma renin activity & aldesterone

*Investigations

* Non- Pharmacological
* Pharmacological

* Management

Goals of Treatment

- Treating SBP and DBP to targets that are <140/90 mmHg
- Patients with diabetes or renal disease, the BP goal is <130/80 mmHg
- The primary focus should be on attaining the SBP goal.
- To reduce cardiovascular and renal morbidity and mortality

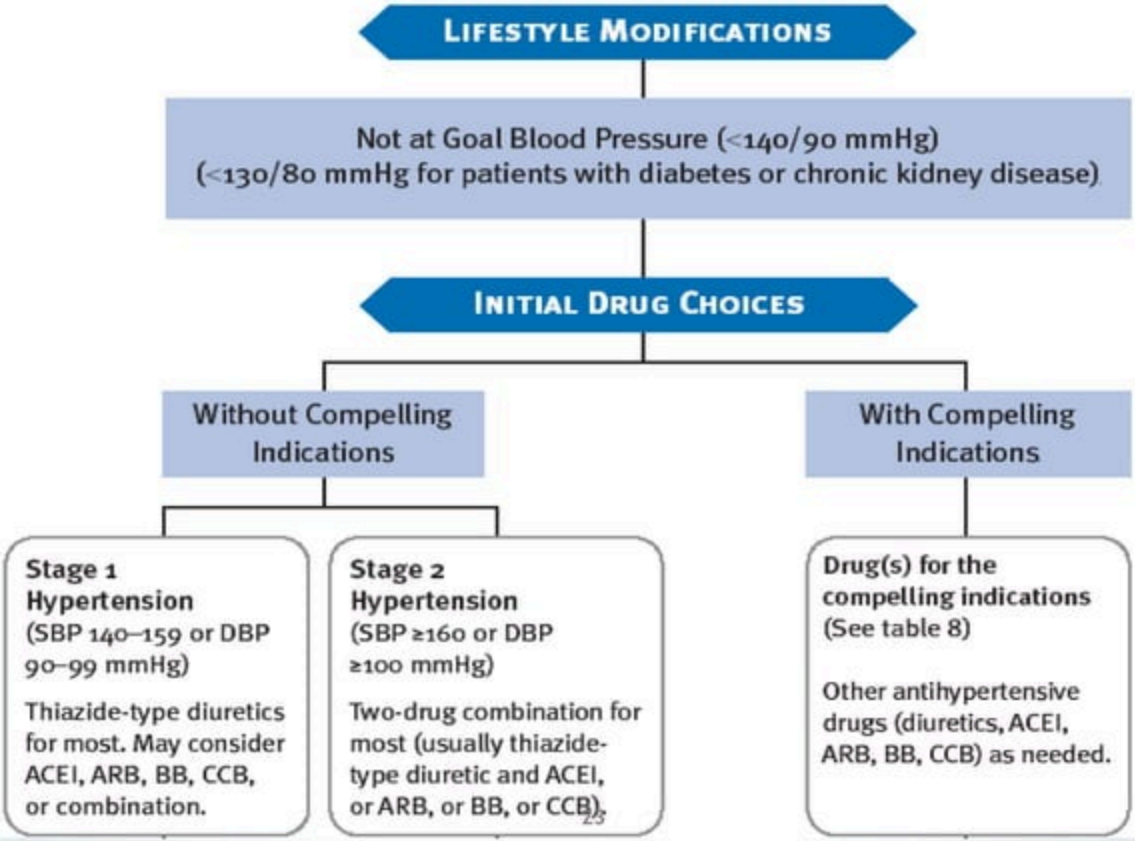
* Reductions in **stroke** incidence, averaging 35–40 percent
* Reductions in **MI**, averaging 20–25 percent
* Reductions in **HF**, averaging >50 percent.

* Benefits of Treatment

Initiation of therapy

* Having assessed the patient and determined the overall risk profile, management of hypertension should proceed as follows:
* In low risk patients, it is suggested to institute life style modifications and observe BP for a period of 2-3 months, before deciding whether to initiate drug therapy.
* In medium risk patients, institute life style modifications and initiate drug therapy after 2-4 weeks, in case BP remains above 140/90.
* In high and very high-risk groups, initiate immediate drug treatment for hypertension and other risk factors in addition to instituting life-style modification

Figure 1. Algorithm for treatment of hypertension



*Lifestyle modifications

Modification	Recommendation	Approximate SBP Reduction (Range)†
Weight reduction	Maintain normal body weight (body mass index 18.5–24.9 kg/m²).	5–20 mmHg/10kg[92,93]
Adopt DASH eating plan	Consume a diet rich in fruits, vegetables, and lowfat dairy products with a reduced content of saturated and total fat.	8–14 mmHg[94,95]
Dietary sodium reduction	Reduce dietary sodium intake to no more than 100 mmol per day (2.4 g sodium or 6 g sodium chloride).	2–8 mmHg[94-96]
Physical activity	Engage in regular aerobic physical activity such as brisk walking (at least 30 min per day, most days of the week).	4–9 mmHg[97-98]
Moderation of alcohol consumption	Limit consumption to no more than 2 drinks (e.g., 24 oz beer, 10 oz wine, or 3 oz 80-proof whiskey) per day in most men, and to no more than 1 drink per day in women and lighter weight persons.	2–4 mmHg[99]

* Pharmacological Tx of hypertension

Table 1. Classification and management of blood pressure for adults*

BP Classification	SBP* mmHg	DBP* mmHg	Lifestyle Modification	Initial drug therapy	
				Without Compelling Indication	With Compelling Indications (See Table 8)
Normal	<120	and <80	Encourage	No antihypertensive drug indicated.	Drug(s) for compelling indications.‡
Prehypertension	120–139	or 80–89	Yes		
Stage 1 Hypertension	140–159	or 90–99	Yes	Thiazide-type diuretics for most. May consider ACEI, ARB, BB, CCB, or combination.	Drug(s) for the compelling indications.‡ Other antihypertensive drugs (diuretics, ACEI, ARB, BB, CCB) as needed.
Stage 2 Hypertension	≥160	or ≥100	Yes	Two-drug combination for most† (usually thiazide-type diuretic and ACEI or ARB or BB or CCB).	

DBP, diastolic blood pressure; SBP, systolic blood pressure.

Drug abbreviations: ACEI, angiotensin converting enzyme inhibitor; ARB, angiotensin receptor blocker; BB, beta-blocker; CCB, calcium channel blocker.

* Treatment determined by highest BP category.

† Initial combined therapy should be used cautiously in those at risk for orthostatic hypotension.

‡ Treat patients with chronic kidney disease or diabetes to BP goal of <130/80 mmHg.

Table 10. Oral antihypertensive drugs*

Class	Drug (Trade Name)	Usual Dose Range in mg/Day	Usual Daily Frequency*
Thiazide diuretics	chlorothiazide (Diuril)	125–500	1–2
	chlorthalidone (generic)	12.5–25	1
	hydrochlorothiazide (Microzide, HydroDIURIL†)	12.5–50	1
	polythiazide (Renese)	2–4	1
	indapamide (Lozol†)	1.25–2.5	1
	metolazone (Mykrox)	0.5–1.0	1
	metolazone (Zaroxolyn)	2.5–5	1
Loop diuretics	bumetanide (Bumex†)	0.5–2	2
	furosemide (Lasix†)	20–80	2
	torsemide (Demadex†)	2.5–10	1
Potassium-sparing diuretics	amiloride (Midamor†)	5–10	1–2
	triamterene (Dyrenium)	50–100	1–2
Aldosterone receptor blockers	eplerenone (Inspra)	50–100	1
	spironolactone (Aldactone†)	25–50	1
BBs	atenolol (Tenormin†)	25–100	1
	betaxolol (Kerlone†)	5–20	1
	bisoprolol (Zebeta†)	2.5–10	1
	metoprolol (Lopressor†)	50–100	1–2
	metoprolol extended release (Toprol XL)	50–100	1
	nadolol (Corgard†)	40–120	1
	propranolol (Inderal†)	40–160	2
	propranolol long-acting (Inderal LA†)	60–180	1
	timolol (Blocadren†)	20–40	2
BBs with intrinsic sympathomimetic activity	acebutolol (Sectral†)	200–800	2
	penbutolol (Levatol)	10–40	1
	pindolol (generic)	10–40	2

Table 10. Oral antihypertensive drugs* (continued)

Class	Drug (Trade Name)	Usual Dose Range in mg/Day	Usual Daily Frequency*
Combined alpha- and BBs	carvedilol (Coreg)	12.5–50	2
	labetalol (Normodyne, Trandate†)	200–800	2
ACEIs	benazepril (Lotensin†)	10–40	1
	captopril (Capoten†)	25–100	2
	enalapril (Vasotec†)	5–40	1–2
	fosinopril (Monopril)	10–40	1
	lisinopril (Prinivil, Zestril†)	10–40	1
	moexipril (Univasc)	7.5–30	1
	perindopril (Aceon)	4–8	1
	quinapril (Accupril)	10–80	1
	ramipril (Altace)	2.5–20	1
	trandolapril (Mavik)	1–4	1
Angiotensin II antagonists	candesartan (Atacand)	8–32	1
	eprosartan (Teveten)	400–800	1–2
	irbesartan (Avapro)	150–300	1
	losartan (Cozaar)	25–100	1–2
	olmesartan (Benicar)	20–40	1
	telmisartan (Micardis)	20–80	1
	valsartan (Diovan)	80–320	1–2

* Primodal prevention
* Primary Prevention
* Secondary Prevention
* Tertiary Prevention.
* Quartinary Prevention

*Prevention

*THE RATIONALE

1. **Importance**: Hypertension is a very prevalent condition that contributes to significant adverse health outcomes, including premature death, heart attack, renal insufficiency, and stroke.

2. **Detection:** The USPSTF found good evidence that blood pressure measurement can identify adults at increased risk of cardiovascular disease from high blood pressure.

3. **Benefits of detection and early treatment:** The USPSTF found good evidence that treatment of high blood pressure in adults substantially decreases the incidence of cardiovascular events

*Screening for HTN

1. **Patient population**: This recommendation applies to adults without known hypertension.
2. **Screening tests:** Office measurement of blood pressure is most commonly performed with a sphygmomanometer. Diagnosis is only after two or more elevated readings are obtained on at least two visits over a period of one to several weeks.
3. **Assessment of risk**: The actual level of blood pressure elevation should not be the only factor in determining treatment. When making treatment decisions, physicians should consider the patient's overall cardiovascular risk profile, including smoking, diabetes, abnormal blood lipid values, age, sex, sedentary lifestyle, and obesity.
4. **Screening interval**: The JNC 7 recommends screening every two years in persons with blood pressure less than 120/80 mm Hg, and every year in persons with systolic blood pressure of 120 to 139 mm Hg or diastolic blood pressure of 80 to 90 mm Hg.

*Clinical considerations

* Themed: HEALTHY HEART BEAT/HEALTHY BLOOD PRESSURE
* OBJECTIVES
  * Raise awareness of the causes and consequence of HTN
  * Provide information on how to prevent HTN and related complications.
  * Encourage self care to prevent HTN
  * Make blood pressure checks affordable for all.
  * Incite national and local authority to create a healthy environment for healthy behaviour

* World health day 2013

How public health stakeholders can tackle hypertension

World Health Organization

* Initiative To Address Hypertension

There are six important components of any country

1 | an integrated primary care programme
2 | the cost of implementing the programme
3 | basic diagnostics and medicines
4 | reduction of risk factors in the population
5 | workplace-based wellness programmes
6 | monitoring of progress.

* Integrated programmes must be established at the primary care level for control of hypertension. In most countries this is the weakest level of the health system.

*Treatment should be targeted particularly at people at medium or high risk of developing heart attack, stroke or kidney damage.

The features of an integrated primary care programme

1. Cost of implementing an integrated primary care programme

* The cumulative cost of implementing an integrated primary care programme to prevent heart attack, stroke and kidney failure, using blood pressure as an entry point that address cardiovascular disease and cervical cancer in all low- and middle-income countries is estimated to be US$ 9.4 billion a year

* Availability of basic technologies to manage people with hypertension .

* Availability and appropriate use of essential medicines to prevent complications in people with moderate to high cardiovascular risk .

* The links between different levels of the health system so that people can be managed appropriately based on heir level of risk.

* **2. A WHO costing tool to estimate the cost of establishing such a programme in any country**

* The cost of implementing such a programme is low, at less than US$ 1 per head in low-income countries, less than US$ 1.50 per head in lower middle-income countries and US$ 2.50 in up- per middle-income countries

* Most cardiovascular disease in the population occurs in people with an average risk level, because they constitute the largest proportion of the population.

* The population-based approach is thus based on the observation that effective reduction of cardiovascular disease rates in the population usually calls for community-wide changes in unhealthy behaviors or reduction in mean risk factor levels.

4 . Reduction of risk factors in the population

* Population-wide approaches to reduce high blood pressure are similar to those that address other major non communicable diseases.
* They require public policies to reduce the exposure of the whole population to risk factors such as an unhealthy diet, physical inactivity, harmful use of alcohol and tobacco use , with a special focus on children, adolescents and youth.

* WHO considers work place health programmes to be one of the most cost-effective

* Workplace wellness programmes should focus on promoting worker health through the reduction of individual risk-related behaviours, e.g. tobacco use, unhealthy diet, harmful use of alcohol, physical inactivity and other health risk behaviors

*

5 Workplace wellness programmes and high blood pressure control

6. Monitoring the impact of action to tackle hypertension

* National surveillance health information systems must be strengthened to monitor the impact of action to prevent and control hypertension and other risk factors of non communicable diseases.

* Monitoring systems must collect reliable information on risk factors and their determinants, non communicable disease mortality and illness. This data is critical for policy and programme development. However, some countries still lack surveillance data for hypertension and other risk factors

1. Health Promotion for the General Population
2. Disease Prevention for the High Risk groups.

Community Based Interventions, Workplace Interventions , Disease Prevention for the High Risk, Setting up special clinics , Harnessing the Private Sector and Specific interventions at the tertiary level to enhance capacity to respond to the needs of NCD

*Strategies

* Awareness generated on HEALTHY LIFE STYLES.
* Decrease in the incidence of Non -Communicable Diseases particularly, Diabetes, Cardiovascular Diseases,cancer and Stroke.
*

* Expected outcomes

* The following **non pharmacologic therapies** are associated with reductions in blood pressure:
  * Reduction of dietary sodium intake
  * Potassium supplementation
  * Increased physical activity and weight loss
  * Stress management
  * Reduction of alcohol intake
* **Pharmacological Therapy**

* **Other Recommendations**
  * Adults with hypertension should be **screened for diabetes.**
  * Adults should be **screened for hyperlipidemia** (depending on age, sex, risk factors) and smoking.
  * Physicians should discuss **aspirin chemoprophylaxis** with patients at increased risk of cardiovascular disease.

*Cont'd

* 1. Patient Based
* 2.Physician Based
* 3. Societal Based

* Impediments & Solutions to effective control of HTN

IMPEDIMENTS	INTERVENTION
Attitudes about hypertension	Education at the community and individual level concerning consequences of hypertension
Medication Side Effects	Use of medications with fewer side effects.
Medication cost & Availability	Use of diuretics and other generically available medication
Medication Adherence	Less frequent dosing of medications, combination medications Methods to increase ease of medication renewal (i.e, telephone or computer-linked)

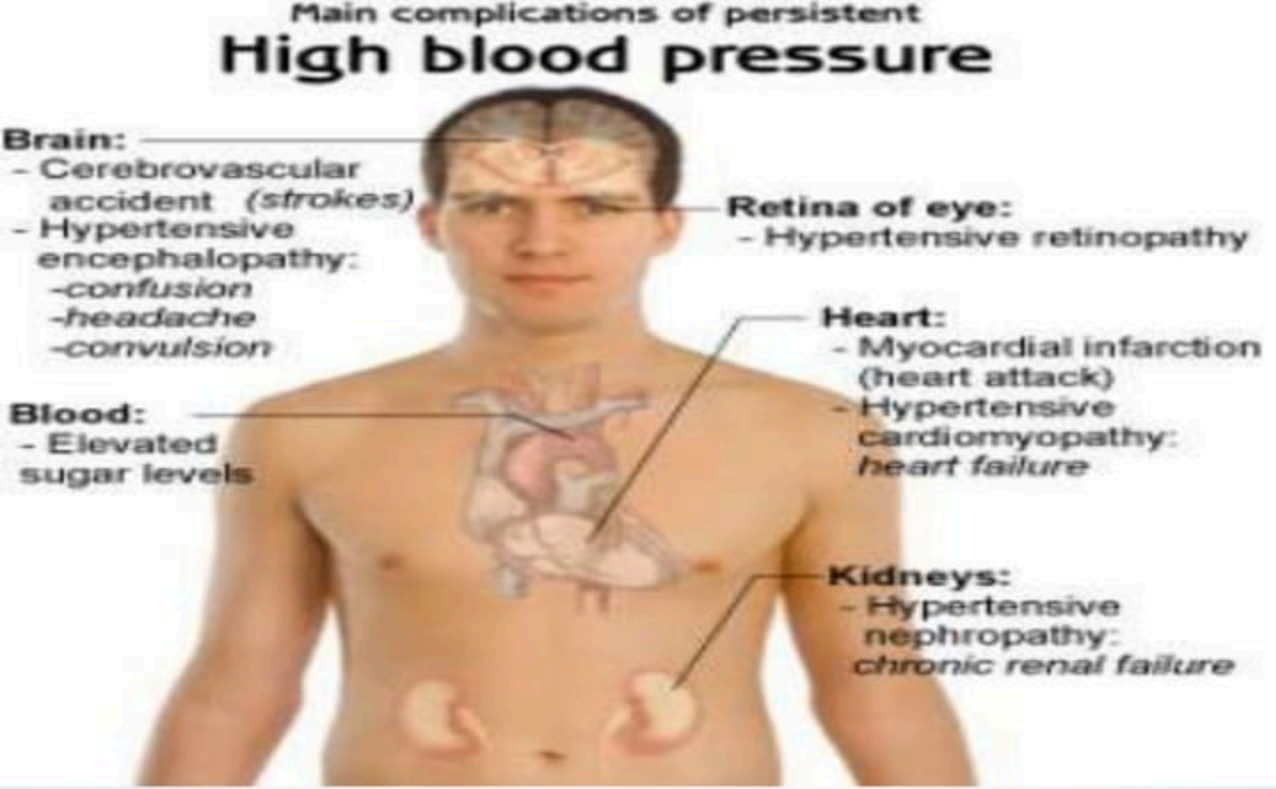
*Patient Based Barriers

IMPEDIMENTS	INTERVENTION
Knowledge	Conferences, academic detailing, computer-based algorithms, publication of clinical trials
Access	Use of physician extenders, group visits, work site care, expansion of health coverage
Awareness	Computer based reminders
Motivation	Incentives for health providers and managers

*Physician Based Barriers

IMPEDIMENTS	INTERVENTION
Awareness	Public education campaigns Community-screening programs
	Work-based programs
Access to care	Expansion of health coverage (private and government financed)

*Societal Based barriers



*Complications

Reference Card From the

Seventh Report of the Joint National Committee on Prevention, Detection, Evaluation, and Treatment of High Blood Pressure (JNC 7)

EVALUATION

Classification of Blood Pressure (BP)*

Category	SBP mm Hg		DBP mm Hg
Normal	<120	and	<80
Prehypertension	120–139	or	80–89
Hypertension, Stage 1	140–159	or	90–99
Hypertension, Stage 2	≥160	or	≥100

* See *Blood Pressure Measurement Technique* (reverse side)

Key: SBP = systolic blood pressure DBP = diastolic blood pressure

Diagnostic Workup of Hypertension

- Assess risk factors and comorbidities.
- Reveal identifiable causes of hypertension.
- Assess presence of target organ damage.
- Conduct history and physical examination.
- Obtain laboratory tests: urinalysis, blood glucose, hematocrit and lipid panel, serum potassium, creatinine, and calcium. Optional: urinary albumin/creatinine ratio.
- Obtain electrocardiogram.

Assess for Major Cardiovascular Disease (CVD) Risk Factors

- Hypertension
- Obesity (body mass index ≥30 kg/m²)
- Dyslipidemia
- Diabetes mellitus
- Cigarette smoking
- Physical inactivity
- Microalbuminuria, estimated glomerular filtration rate <60 mL/min
- Age (>55 for men, >65 for women)
- Family history of premature CVD (men age <55, women age <65)

Assess for Identifiable Causes of Hypertension

- Sleep apnea
- Drug induced/related
- Chronic kidney disease
- Primary aldosteronism
- Renovascular disease
- Cushing's syndrome or steroid therapy
- Pheochromocytoma
- Coarctation of aorta
- Thyroid/parathyroid disease

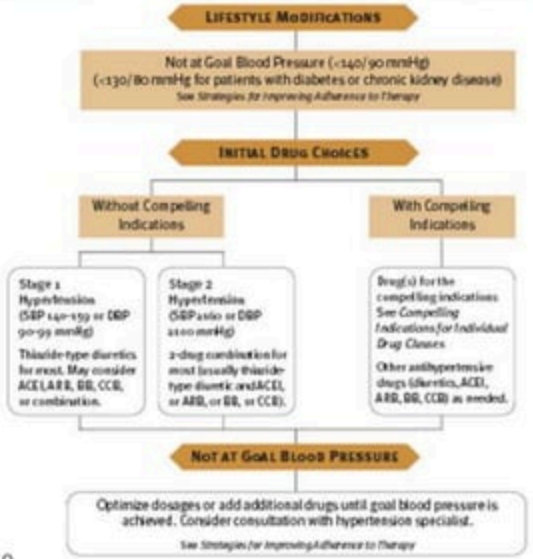
U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES
National Institutes of Health
National Heart, Lung, and Blood Institute

TREATMENT

Principles of Hypertension Treatment

- Treat to BP <140/90 mmHg or BP <130/80 mmHg in patients with diabetes or chronic kidney disease.
- Majority of patients will require two medications to reach goal.

Algorithm for Treatment of Hypertension



*Conclusion

* *"We stand at a critical crossroads in history when our actions – or inaction – can shape the future of life on Earth as we know it……..*

This is a global challenge, one requiring global cooperation among all sectors of society. In the coming year, my hope is that governments, working with the business community, civic organizations, foundations, academic and faith based groups, will continue to work with the United Nations to help forge a more sustainable path to the future. Working together, we can bring hope and opportunity to all. The future is truly in our hands."

-UN Secretary-General, Ban Ki moon

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STOP
HYPERTENSION