EGYPTIAN HYPERTENSION SOCIETY
GUIDELINES

MANAGEMENT OF HYPERTENSION IN EGYPT AND DEVELOPING COUNTRIES

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EXECUTIVE SUMMARY

PREPARED BY

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MAGNITUDE OF THE PROBLEM

- Hypertension is a major health problem in Egypt with a prevalence rate of 26.3% among the adult population (≥ 25 years)[1]. Its prevalence increases with aging, approximately 50% of Egyptians above the age of 60 years suffer from hypertension. About seven million Egyptians had high blood pressure in the year 1993.
- Risks of hypertension include cardiovascular complications (heart failure, myocardial infarction, atrial fibrillation, aneurysms, dissection), renal (azotemia) and cerebrovascular (stroke, transient ischemic attacks "TIA", dementia), resulting in disability and premature death. These risks can be reversed by treatment and control of hypertension.
- Hypertension is poorly managed in Egyptians. The rates of awareness, treatment and control are low. Only 8% of hypertensive Egyptians have their blood pressure controlled[1].

NATIONAL GUIDELINES FOR DEVELOPING COUNTRIES

- Hypertension guidelines from rich industrial countries may not be applicable in developing and economically disadvantaged communities.
- Poverty, high illiteracy rate, inadequate health care system with limited access to medical insurance will limit hypertensive patient care to the minimally acceptable level rather than the ideal or optimal western care recommended in international guidelines.
- Racial, genetic, life style and environmental differences between white Caucasian and black, dark or Asian populations will influence the hypertension mechanisms[2], humoral profile[3,4], type and extent of complications[5,6] (renal failure and stroke more common in blacks). Also, response to dietary therapy[7,8] (better with low salt, rich fruit and vegetable diet), and antihypertensive drugs (less control with ACE-inhibitors and beta adrenergic blockers)[9,10] varies.
- Risk factors for hypertension and atherosclerotic cardiovascular disease such as obesity, excess dietary salt intake, diabetes and cigarette smoking are particularly prevalent among Egyptians[11].
- Compared to developed countries, hypertensive population in the developing world include a large proportion of young and middle aged individuals because of the younger mean age[1].

MINIMAL VERSUS OPTIMAL CARE

- Resources more than science dictate the type of care that can be provided. Limited resources and economic factors will influence the level of management.
- Guidelines have to make a compromise between what is possible (minimal care) and what is ideal (optimal care), see tables 1, 2. This will have an impact on evaluation (get the required information with the least expensive methods- relying more on detailed history and physical examination) and on the initiation and type of therapy (stressing dietary therapy, life style, use of less expensive drugs, and initiate therapy at higher thresholds of blood pressure).
- Even a small reduction in blood pressure is worthwhile if absolute targets prove difficult to achieve.

Table 1. Evaluation

	Minimal Care	Optimal Care
Detailed History- Physical Exam.	+++	++
Urine dipstick	+	+
Blood Sugar	±	+
ECG	±	+
Blood tests: urea, creatinine, lipid profile, K	-	+
Optic Fundus	-	±

+++: strongly recommended. +: recommended. - : not done
±: done if facilities are available.

Table 2. Therapy

	Minimal Care	Optimal Care
Duration of blood pressure monitoring before starting drug therapy	Weeks to months	Weeks to months
Life style and diet therapy	+++	++
Threshold BP in low risk group	160/100	160/100
Threshold BP in intermediate risk group	150/90	140/90
Threshold BP in high risk group	140/85	135/85
Drug of first choice	Small dose thiazide	Individualize

DEFINITION AND CLASSIFICATION

- Levels of blood pressure 140 mmHg or more systolic and 90 mmHg or more diastolic represent the cut points for the current definition of hypertension.
- The following WHO/ISH classification of the levels of blood pressure (Table 3) is recommended[12].

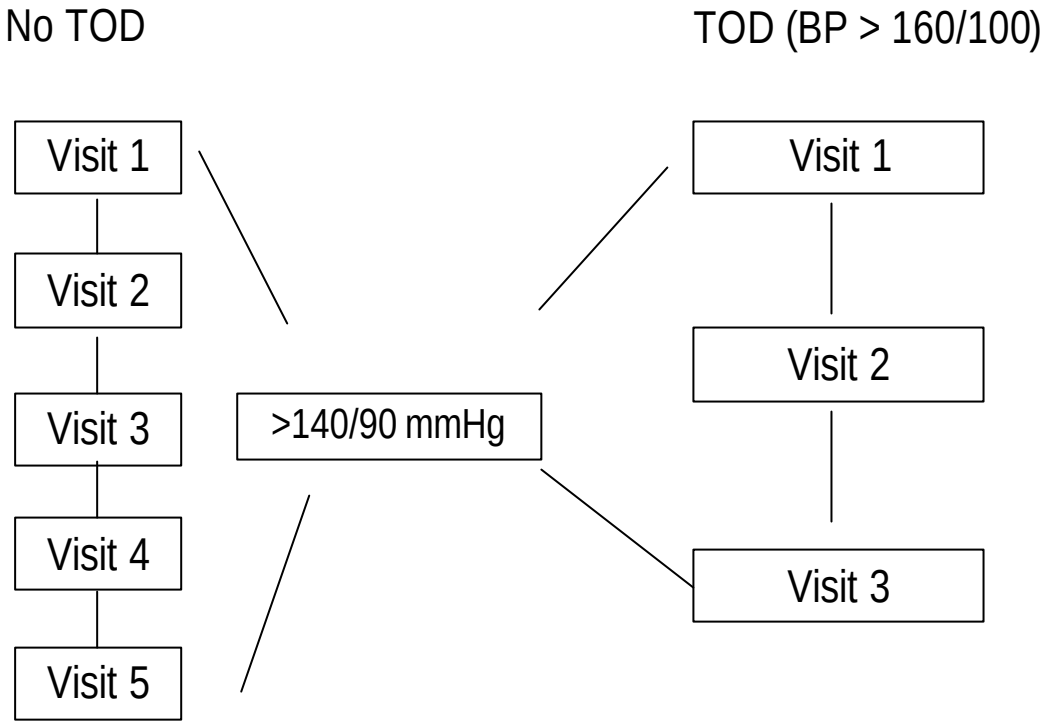
Table 3

Category	Systolic	Diastolic
Optimal	<120	< 80
Normal	<130	<85
High-normal	130-139	85-89
Grade 1 (Mild Hypertension)	140-159	9099
Subgroup Borderline	140-149	90-99
Grade 2 (Moderate Hypertension)	160-179	100-109
Grade 3 (Severe Hypertension)	≥ 180	≥ 110
Isolated Systolic Hypertension	≥ 140	<90

DIAGNOSIS OF HYPERTENSION

- Persistent elevation of systolic blood pressure above 140 mmHg and/or diastolic blood pressure above 90 mmHg on at least five repeated blood pressure measurements in five office visits over a period varying from days to months is required to make a diagnosis of hypertension. The frequency of visits and period of blood pressure monitoring will be dictated by the severity of hypertension and cardiovascular risk profile. Three visits are enough if the blood pressure is persistently above 160/100 mmHg or if target organ damage is present.
- Failure to measure blood pressure accurately using a standardized technique and failure to realize the variable nature of blood pressure and office induced hypertension (white coat effect) will missclassify individuals.
- Levels of blood pressure measured at home or during daytime ambulatory recording should be less than 135/85 mmHg.

Diagnosis of Hypertension



BLOOD PRESSURE MEASUREMENT

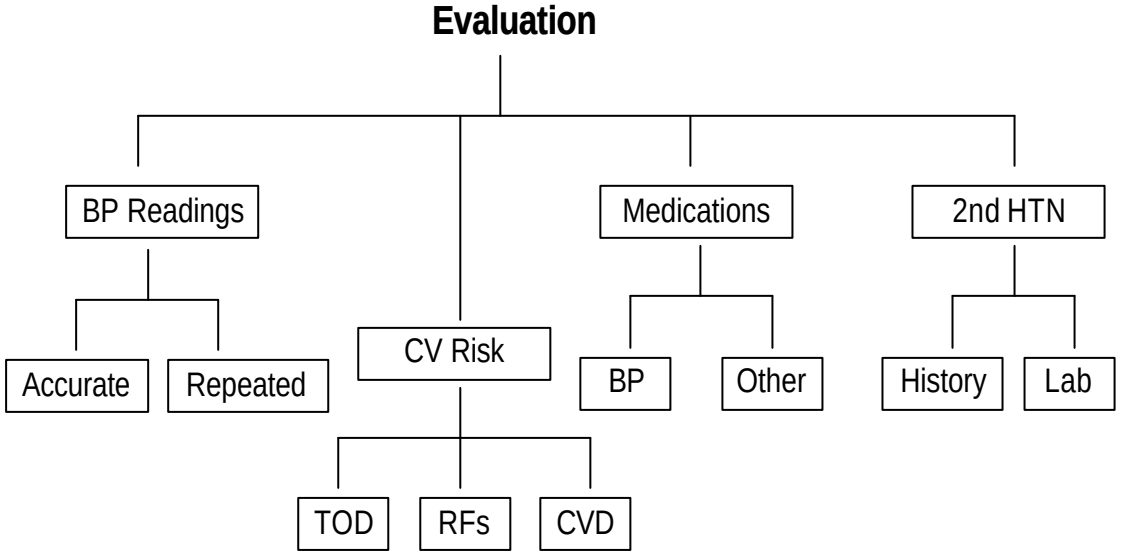
- Use a calibrated, well maintained machine (mercury or aneroid).
- Examination done in a quiet room after five minutes rest in a relaxed position avoiding talking, full bladder and withholding for two hours tobacco, eating and coffee.
- Use the appropriate cuff size, following a standardized measurement technique[13], record the blood pressure to the nearest 2 mmHg for at least two measurements, take the lower reading.
- Use phase V (disappearance of sounds) for diastolic blood pressure.

BP Measurement

Environment	Patient	Technique
Noise	Rest	Machine
Temperature	Talking	Cuff size
	Bladder	Cuff position
	Food and coffee	Cuff inflation
	Arm position	Cuff deflation
		Auscultator: K.S.

EVALUATION

- Assess cardiovascular risk and target organ damage (TOD) through a careful and detailed history and physical examination with a detailed questioning about current medication. Body weight should be checked in each office visit.
- Urine dipstick analysis should be done in all patients and if possible blood sugar, and a standard 12 lead ECG.
- If blood testing facilities are available examine blood for creatinine, urea, potassium, total cholesterol, HDL and LDL cholesterol and triglycerides.
- Echocardiography is not a part of the routine evaluation.
- An underlying cause (secondary hypertension) is suspected when hypertension is difficult to control (in spite of triple drug therapy), or if it is severe and of sudden onset particularly in a young subject or above the age of 60 years or if there is rapid deterioration in kidney function. Referral to specialized facilities is needed in these conditions.



RISK CATEGORIZATION

- Prognosis in hypertensive patients is highly variable depending largely on factors other than blood pressure such as sex, age, other risk factors, TOD, or history of cardiovascular disease[14]. Cardiovascular risk can vary more than 10 fold at a given blood pressure level[15].
- Hypertensive patients can be categorized according to their risk profile (adopted from JNC VI)[16]:
  Group A (low risk): no TOD, no other risk factors and no associated cardiovascular disease.
  Group B (intermediate risk): one or more additional risk factors but not diabetes or TOD (table 4).
  Group C (high risk): diabetes, TOD and/or associated cardiovascular disease (Table 5).

Table 4. Cardiovascular Risk Factors

- Male gender.
- Age > 65 years.
- Current cigarette smoking.
- Diabetes.
- Total S- Cholesterol >240 mg/dl or HDL-C<40 mg/dl, LDL-C >160 mg/dl
- Positive family history: atherosclerotic cardiovascular disease in first degree relative before the age of 40 in males and 50 in females.

Table 5. Target Organ Damage

- Left ventricular hypertrophy: clinical, ECG, or echo.
- Heart failure: clinical manifestations.
- Coronary disease: angina, myocardial infarction, history of CABG or PCI.
- Renal disease: serum creatinine >1.8 mg/dl, proteinuria.
- Cerebrovascular disease: stroke, TIA, dementia.
- Peripheral arterial disease.
- Abdominal aortic aneurysm.
- More than grade 1 optic fundus retinopathy.

LIFE STYLE MODIFICATION- DIET THERAPY

- Recommended in all hypertensive patients and should be the initial therapeutic approach in mild hypertension.
- Limit calorie intake in overweight individuals (BMI > 25 kg/m^2) aiming at a weight reduction of 5 Kg.
- Limit salt (sodium chloride) intake to less than 6 gm/day.
- Encourage fruits and vegetables consumption 6-8 portions/day.
- Limit intake of total and saturated fats, encourage fish and nuts and fat free dairy products.
- Increase physical activity by taking regular exercise e.g. 30 minutes brisk walk/day.
- Combined diet, exercise and weight control may limit the need to drug therapy, allow step down or even discontinuation[17].
- Limit alcohol intake and stop cigarette smoking.

INITIATION AND MONITORING OF DRUG THERAPY

- Unless there is an emergency or blood pressure > 210/120 mmHg, no drug treatment should be instituted during the first two office visits so as to rule out the presence of "white coat" hypertension.
- Duration of blood pressure monitoring before initiating drug therapy varies depending upon blood pressure level, risk profile and response to life style modification.
- Threshold for antihypertensive drug treatment is 160/100 mmHg in low risk group, 140-150/90-95 mmHg for intermediate risk group and 135-140/80-85 mmHg in high risk group. The previous blood pressure cut points are the average of blood pressure readings taken on three separate office visits at least one weak apart.
- Start with a small dose of thiazide diuretics in all patients with mild to moderate hypertension unless they are contraindicated or there are specific indications for other agents.

- In absence of adequate blood pressure response (fall in systolic blood pressure by 10 mmHg and diastolic blood pressure by 5 mmHg) after one to two months of drug therapy add another drug from a different pharmacologic group or use single dose combination.
- Treatment and follow-up should continue indefinitely.
- Recheck blood pressure at one to two monthly intervals until blood pressure remains at target level for two consecutive visits then recheck at 3 to 6 month intervals depending upon the risk profile.
- Antihypertensive drugs require a period of up to two months to achieve their maximal hypotensive effect[18]. Do not change drugs at short intervals.

Drug Initiation

Risk Category	BP Monitoring	BP Threshold
A	6-12 month	160/100 mmHg
B	3-6 month	140/90-150/90 mmHg
C	1-3 month	140/85-135/85 mmHg

HYPERTENSION ASSOCIATED WITH TARGET ORGAN DAMAGE

- Treatment should be more aggressive in this group aiming at a target blood pressure less than 135/85 mmHg and initiated after a shorter monitoring period (two to four weeks).
- Drugs of first choice depend upon TOD:
  - Renal disease: ACE-inhibitors or angiotensin receptor blockers (ARBs)± thiazide diuretics (loop diuretic if serum creatinine is above 2.5 mg/dl).
  - Cerebrovascular disease: reduce the blood pressure after the acute phase of stroke by thiazide diuretic, and if necessary ACE- inhibitors, ARBs or Ca antagonist. Urgent blood pressure lowering is recommended in cerebral infarction if blood pressure is 220/120 mmHg or greater (180/105 mmHg in patients with cerebral hemorrhage). Do not lower mean blood pressure by more than 20% in the first two hours, then toward 160/100 mmHg within the next six hours.
  - Coronary disease: beta adrenergic blockers, ACE-inhibitors and if necessary Calcium antagonists.
  - Heart failure: ACE-inhibitors + thiazide diuretics.

HYPERTENSION IN SPECIAL GROUPS

- Elderly: start with small dose of thiazide diuretic and add calcuim antagonist or ARB if necessary. Check blood pressure always in the supine and standing positions. Be aware of the marked fluctuations in blood pressure, the auscultatory gap when measuring blood pressure and the frequent comorbid conditions.
- Diabetes mellitus: initiate drug therapy within days after confirming the diagnosis of hypertension aiming at a target blood pressure of less than 140/85 mmHg, and even at lower levels in presence of proteinuria. Start with ACE-inhibitors and add thiazide diuretic, calcium antagonist, beta blockers or ARBs if necessary. In presence of protenuria ARBs may replace ACE-inhibitors as initial therapy.

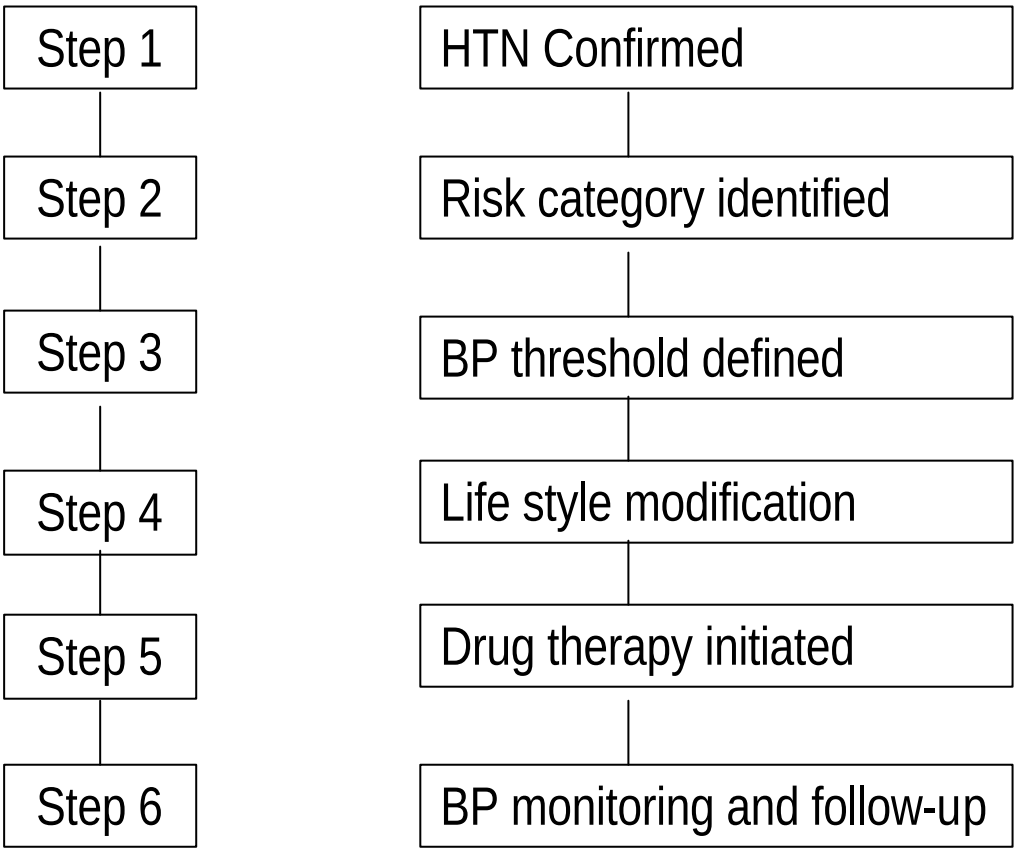
COMPLIANCE

- Non compliance is probably the major cause of failure to control hypertension.
- Measures to improve compliance include patient education, use of less expensive medications, single daily dosage, fixed dose drug combination, continuous monitoring by spouse, nurse or doctor and home blood pressure self measurement.

IMPLEMENTATION STRATEGIES

- Adoption by government agencies of the guidelines as the standard of care to be followed by physicians.
- Increase physician awareness: printed material, seminars, meetings.
- Educational sessions with local opinion leaders nationwide.
- Reminder system and audit with feedback if available.

Management



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