CLINICAL GUIDELINE FOR THE MANAGEMENT OF HYPERTENSION AT DISTRICT LEVEL

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INTRODUCTION

• High prevalence world-wide
• Global health burden (developed and developing countries)
• Major contributor to cardio-vascular disease (CVD)
• 10% of direct health costs (R5 billion spent on CVD in South Africa 1991)
ROLE OF DISTRICT HEALTH SYSTEM (PHC)

• Primary prevention
  - Education and awareness
  - Improving family cohesion
  - Decreasing stress
  - Lifestyle modification

• Screening
  - Population at risk
  - Patients with risk factors
  - Electively or patient request
ROLE OF DISTRICT HEALTH SYSTEM (PHC) cont’d

- Modification of help-seeking behaviour
- Secondary and tertiary prevention
  - Sustained monitoring and cost-effective management
  - Lifestyle modification
  - Network utilization and optimization – prompt 2 – way referrals and communication
DRUGS

• Diuretics
• ACE Inhibitors
• Calcium Channel Blockers
• Vasodilators
# JNC 7 CLASSIFICATION OF BLOOD PRESSURE FOR ADULTS 18 AND OLDER

<table>
<thead>
<tr>
<th>BP Classification</th>
<th>Systolic BP (mmHg)*</th>
<th>Diastolic BP (mmHg)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Normal</td>
<td>&lt;120</td>
<td>And &lt;80</td>
</tr>
<tr>
<td>Prehypertension</td>
<td>120-139</td>
<td>Or 80-89</td>
</tr>
<tr>
<td>Stage 1 Hypertension</td>
<td>140-159</td>
<td>Or 90-99</td>
</tr>
<tr>
<td>Grade 2 Hypertension</td>
<td>≥160</td>
<td>Or ≥100</td>
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</table>

*When a patient’s systolic and diastolic BP’s fall into different categories, the higher category should apply. * In SSA the age under consideration is 15 years and above. JNC 7 report. JAMA 2003; 289: 2560-2571
WHEN MEASURING BP IN YOUR OFFICE

- Allow the patient to sit quietly for several minutes
- Use a validated device (calibr. 2 yrly)
- No smoking, caffeine or food in last 30 min
- Take at least two measurements spaced by 1-2 mins
- Use a standard bladder (12-13 cm W x 35 cm C), but a larger one for big arms
- Have the cuff at the heart level
- Deflate the cuff slowly (2mmHg/s)
- Measure BP also in standing position (1 min) in elderly patients and diabetic patients
WHEN MEASURING BP IN YOUR OFFICE cont’d

- Record SBP (phase I) and DBP (phase V) both arms. If discrep. – higher reading
- 2 readings 1 min apart at 1 sitting
- 3 separate occasions (2 months)
- Note – mercury environmental hazard
### CARDIOVASCULAR RISK FACTORS AND TARGET ORGAN DAMAGE

<table>
<thead>
<tr>
<th>Major risk factors</th>
<th>Target organ damage</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Age</strong> (&gt;55 years for men; &gt; 65 years for women)</td>
<td>Heart</td>
</tr>
<tr>
<td><strong>Family history of premature CVD</strong> (men &lt;55 years or women &lt; 65 years)</td>
<td>Left ventricular hypertrophy</td>
</tr>
<tr>
<td>Hypertension</td>
<td>Heart failure</td>
</tr>
<tr>
<td>Smoking</td>
<td>Angina or prior myocardial infarction</td>
</tr>
<tr>
<td><strong>Obesity (BMI * 25 kg/m2)</strong></td>
<td>Prior coronary revascularization</td>
</tr>
<tr>
<td><strong>Abdominal circumference * 102 cm (men), * 88 cm (women)</strong></td>
<td>Brain</td>
</tr>
<tr>
<td>Physical inactivity</td>
<td>Stroke or transient ischemic attack</td>
</tr>
<tr>
<td>Diabetes mellitus</td>
<td>Chronic kidney disease</td>
</tr>
<tr>
<td>Dyslipidemia</td>
<td>Peripheral artery disease</td>
</tr>
<tr>
<td>Proteinuria, microalbuminuria</td>
<td>Retinopathy</td>
</tr>
<tr>
<td><strong>Metabolic syndrome</strong> (New emerging risk factors)</td>
<td></td>
</tr>
</tbody>
</table>

*J Hypertension 2003; 21: 1011-1053*
MX OBJECTIVES/RX GOALS

- To achieve BP <140 mmHg and <90 mmHg in those with uncomplicated hypertension
- To achieve target BP of <130 mmHg and < 80 mmHg in those with established CVD (coronary heart disease or cerebrovascular disease) or diabetes or chronic renal disease
- To manage identified risk factors, TOD.
- To institute appropriate patient education.
PATIENT EDUCATION STRATEGY

• The patients must be educated on the entire concept of hypertension especially with regard to the significance of symptoms in a majority of cases, and the possible complications if not appropriately treated.

• Patients should be encouraged to keep records of their own BP readings done on them in the hospital or from home checks (self or otherwise). They should not panic in case of markedly elevated readings but should report to their doctor for action.

• Emphasis should be placed on life style modifications and the need for life long treatment.

• Drug information should be provided to the patient in reasonable detail.
LIFESTYLE MODIFICATION

- Weight reduction if BMI is $\geq 25\text{kg/m}^2$
- Limit salt intake to no more than one teaspoon (5 gram) per day
- Limit alcohol intake to not more than two standard drinks per day for men and not more than one standard drink for women
- Abstain from tobacco use
- Promote a ‘balanced’ diet. This includes a diet
  - low in saturated fats (animal fats and some vegetables oils) and sugar. Oils consumed for cooking should be low in saturated fats (hence avoid coconut oil, butter and lard and limit palm oil)
  - high in fibers, unrefined carbohydrates, fruits and vegetables; avoid preserved foods because of their high salt content;
  - including low-fat dairy products
  - fish
- Take regular aerobic exercise for 30 - 60 minutes on most days of the week (eg brisk walking)
### Choice of Drug: Compelling and Possible Indications

<table>
<thead>
<tr>
<th>Compelling Indications</th>
<th>Drugs</th>
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<tbody>
<tr>
<td>Diabetes Mellitus (types 1 &amp; 2) with proteinuria</td>
<td>ACE-I</td>
</tr>
<tr>
<td>Elderly with isolated systolic hypertension</td>
<td>Thiazide diuretic - long acting CCB</td>
</tr>
<tr>
<td>Angina</td>
<td>β-Blocker or CCB (heart rate limiting)</td>
</tr>
<tr>
<td>Post myocardial infarct or CAD</td>
<td>β-Blocker, ACE-I</td>
</tr>
<tr>
<td>LVH</td>
<td>Thiazide diuretic and ACE-I, CCB</td>
</tr>
<tr>
<td>CCF</td>
<td>ACE-I, β-Blocker, thiazide diuretic and/or loop diuretic for volume overload.</td>
</tr>
<tr>
<td>Stroke</td>
<td>Thiazide diuretic, ACE-I, CCB</td>
</tr>
<tr>
<td>Pre-existing stroke</td>
<td>Thiazide diuretic, ACE-I</td>
</tr>
<tr>
<td>Pregnancy</td>
<td>Methyldopa, CCB</td>
</tr>
<tr>
<td>Prostatism</td>
<td>α-Blocker (Not used as monotherapy for hypertension)</td>
</tr>
<tr>
<td>Chronic renal disease</td>
<td>ACE-I combined with thiazide diuretic, loop diuretic</td>
</tr>
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</table>
COMBINATION THERAPY

- **Disadvantage:** unnecessary exposure to additional drug.

- **Advantages:** (1) effectiveness can be increased due to different mechanisms of action; (2) tolerance can be increased due to less side effects; (3) adherence can be increased due to the use of fixed low-dose combinations within a single tablet.

- The following two-drug combinations have been found to be effective and well tolerated: thiazide diuretic and β-Blocker; thiazide diuretic and ACE-I; CCB (dihydropyridine) and β-blocker; CCB and ACE-I; CCB and thiazide diuretic;
Hypertensive emergencies are situations that require urgent management of BP to prevent or limit TOD. These patients may be treated on an outpatient basis but preferably require hospitalization for supervised and gradual reduction of BP.

- In most situations, high BP should be managed very carefully and slowly in the hospital.
- The aim is generally to achieve a progressive BP lowering to a DBP of 100 mmHg over 48 – 72 hours.
DRUGS IN HYPERTENSIVE URGENCIES AND EMERGENCIES

- ACE inhibitors, using initial low doses. Check serum electrolytes for possible severe hyponatraemia or hyperkalaemia prior to drug use

- Beta-blockers

- Diuretics. This may also potentiate the effects of the other classes mentioned above

- NB: CCB if ACE – Inhibitors not tolerated
COMMON SITUATIONS IN HYPERTENSIVE EMERGENCY

- Hypertensive encephalopathy
- Cerebro-vascular accident (CVA, stroke); CVA and stroke require a more prudent approach for the first ten days. After stabilization, the blood pressure should be progressively decreased.
- Hypertensive heart failure presenting with acute left ventricular failure with severe pulmonary oedema
- Malignant hypertension
- Dissecting aneurysm of the aorta
- Eclampsia and pre-eclampsia
- Unstable angina/myocardial infarction
HYPERTENSION IN CHILDREN AND ADOLESCENTS

- There is evidence of increasing prevalence of hypertension in children and adolescents. The main cause of hypertension in children relates to the epidemic of overweight world wide.
- Refer to Regional Hospital.
### Other risk factors and disease history

<table>
<thead>
<tr>
<th>Other risk factors and disease history</th>
<th>Normal SBP 120-129 or DBP 80-84 mmHg</th>
<th>High normal SBP 130-139 or DBP 85-89 mmHg</th>
<th>Stage 1 Mild Hypertension SBP 140-159 or DBP 90-99 mmHg</th>
<th>Stage 2 Moderate Hypertension SBP 160-179 or DBP 100-109 mmHg</th>
<th>Stage 3 Severe Hypertension SBP &gt; 180 or DBP &gt; 110 mmHg</th>
</tr>
</thead>
<tbody>
<tr>
<td>No other major risk factors</td>
<td>Average risk</td>
<td>Average risk</td>
<td>Low added risk</td>
<td>Moderate added risk</td>
<td>High added risk</td>
</tr>
<tr>
<td>1-2 major risk factors</td>
<td>Low added risk</td>
<td>Low added risk</td>
<td>Moderate added risk</td>
<td>Moderate added risk</td>
<td>Very high added risk</td>
</tr>
<tr>
<td>≥3 major risk factors or target organ damage or diabetes mellitus</td>
<td>Moderate added risk</td>
<td>High added risk</td>
<td>High added risk</td>
<td>High added risk</td>
<td>Very high added risk</td>
</tr>
<tr>
<td>Associated clinical conditions</td>
<td>Very high added risk</td>
<td>Very high added risk</td>
<td>Very high added risk</td>
<td>Very high added risk</td>
<td>Very high added risk</td>
</tr>
</tbody>
</table>

### Determine Risk

#### Low Added Risk
- Monitor BP & other risk factors for 6 - 12 months
  - SBP < 140
  - DBP < 80

#### Moderate Added Risk
- Monitor BP & other risk factors for 3 - 6 months
  - SBP < 140
  - DBP < 80

#### High/Very High Added Risk
- Monitor BP & other risk factors
  - SBP > 140
  - DBP < 80

### Lifestyle Modification as Appropriate

- Angina.
- Prior myocardial infarction.
- Heart failure.
- Left ventricular hypertrophy (confirmed by ECG).
- Stroke: secondary prevention.
- ACE-I plus or diuretics.
- Diabetes type 1 or without evidence of microalbuminuria.
- Chronic kidney disease.
- Isolated systolic hypertension.
BP > 140/90 mmHg on lifestyle modification

STEP 1: INITIAL DRUG CHOICE
- Start with low dose of a long acting drug
- Titrate dose at 2 monthly intervals

STEP 2: DRUG THERAPY
- If not at goal BP after 2 months, OR if troublesome side effects
  - Add low dose diuretic or 1 of the following
    - Beta-blocker
    - ACEI
    - Long acting calcium channel blocker
    - Fixed dose combination

STEP 3: DRUG THERAPY
- If not at goal BP after 2 months
  - Add another drug from step 2 above or
    - Hydralazine or
    - Alpha-blocker

REFER – if not at goal BP After 2 months

UNCOMPROMICATED HYPERTENSION
Low dose thiazide diuretic
12.5mg hydrochlorothiazide

COMPELLING INDICATION FOR SPECIFIC CLASS EXISTS
- Diabetes mellitus with proteinuria: ACEI
- Evidence of CHD/Stroke/PVD/OR diabetes OR 1 major risk factor: ACEI
- Heart failure - diuretics and ACEI
- Isolated systolic hypertension – thiazide / long acting calcium channel blocker
- Myocardial infarction - beta-blockers / ACEI
- Pregnancy - methyldopa
ACKNOWLEDGEMENT

SOUTH AFRICAN HYPERTENSION SOCIETY