Introduction

The 7th Report of the Joint National Committee on Prevention, Detection, Evaluation, and Treatment of High Blood Pressure (JNC 7) like the previous 6 reports, is an important document for physicians all over the world. This essay is restricted to comments on few of the areas and readers are requested to refer to the original guidelines for details.

With approximately 90 million hypertensives in India, this is a vital document to prevent the epidemic of hypertension and to control its consequences.

The key messages of the JNC 7 are:

1. The report stresses on the incremental risk of cardiovascular disease (CVD), which begins at much lower levels (115/75mmHg) of systolic blood pressure (SBP).
2. It is more meaningful to label persons at blood pressure (BP) level of SBP 120-139 or diastolic blood pressure (DBP) levels of 80-89 mmHg as “prehypertensive” than “High Normal”.
3. While stage 1 hypertension of JNC-6 is retained, stage 2 and 3 are named stage 2 for ease of management.
4. In persons older than 50 years, SBP > 140 mmHg is a much more important risk factor for cardiovascular disease than DBP.
5. A much greater importance has been given to the use of thiazide-type diuretics as the preferred first line therapy than it was being done in the past.
6. The importance of using more than one class of drugs earlier than was the case hitherto has been highlighted. The new recommendations says that whenever BP is more than 20/10 mmHg above the goal BP, use of 2 classes of drugs should be considered and one of these should be a thiazide-type diuretic.
7. The importance of interaction with and motivation of the patient on prevention of hypertension and reducing its cardiovascular events has been stressed.

Blood Pressure classification

Based upon the epidemiology and observational data, the JNC 7 has revised the classification of blood pressure for adults. In this context, it is critical to measure the blood pressure carefully on two or more
occasions after the initial screening, for making the diagnosis of hypertension and to assign the patient to appropriate treatment category and follow-up.

A new category of “prehypertension” has been introduced in the JNC 7 report. The new category with BP levels at SBP 120-139 and or DBP 80-89 mmHg, has created considerable stir among the medical community. All of a sudden, individuals previously normotensive have been designated as having prehypertension.

Prehypertension Stage
Apart from being at twice the risk of developing hypertension, compared to persons with normotension, the total morbidity, mortality and economic loss caused by cardiovascular events amongst high normal blood pressure (prehypertension) population far exceeds that caused by hypertensive population.

Therefore, one can understand the importance of renaming, “High Normal stage” as “prehypertensive stage”, as the word high normal does not stress upon its importance and urgency of management. The new name suggests that it is urgent and mandatory for the persons so diagnosed particularly if they have one or more other risk factors to invest time and effort to implement lifestyle changes now, to avoid or at least substantially reduce the risks of cardiovascular events.

However, the resources required to meet the challenge of prehypertension are phenomenal. In a country like India with limited resources, whether the new definition would result in any practical benefits to the community as a whole is not too difficult to predict. One only hopes, that the new definition would not lead to more anxiety-related problems, particularly if blood pressure is not measured as per accepted guidelines.

Magnitude of Problem
India’s population is estimated at 1060 million, with approximately 60% adults above 18 years age (636 million), sixty percent of total adult population (382 million) are rural inhabitants whereas forty percent (254 million) live in urban areas. At a very conservative estimate of hypertension prevalence at 20% in urban and 10% in rural population, we have 89 million hypertensives in India. Also, as per JNC 7 classification, we have another 180 million prehypertensives.

Importance of Systolic Blood Pressure
The debate whether it is the systolic blood pressure (SBP) which is more important as a cardiovascular risk factor or the diastolic blood pressure (DBP) has been ongoing for decades. In the seventies and eighties all major therapeutic trials, without exception had DBP as the evaluation criteria, as DBP

<table>
<thead>
<tr>
<th>JNC 7 Blood Pressure Category</th>
<th>JNC 6 Blood Pressure Category</th>
<th>SBP (mmHg)</th>
<th>And/or</th>
<th>DBP (mmHg)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Normal</td>
<td>Optimal</td>
<td>&lt; 120</td>
<td>And</td>
<td>&lt; 80</td>
</tr>
<tr>
<td>Prehypertension</td>
<td></td>
<td>120-139</td>
<td>or</td>
<td>80-89</td>
</tr>
<tr>
<td>—</td>
<td>Normal</td>
<td>&lt; 130</td>
<td>And</td>
<td>&lt; 85</td>
</tr>
<tr>
<td>—</td>
<td>High-Normal</td>
<td>130-139</td>
<td>or</td>
<td>85-89</td>
</tr>
<tr>
<td>Hypertension</td>
<td>Hypertension</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Stage 1</td>
<td>Stage 1</td>
<td>140-159</td>
<td>or</td>
<td>90-99</td>
</tr>
<tr>
<td>Stage 2</td>
<td></td>
<td>≥ 160</td>
<td>or</td>
<td>≥ 100</td>
</tr>
<tr>
<td>—</td>
<td>Stage 2</td>
<td>160-179</td>
<td>or</td>
<td>100-109</td>
</tr>
<tr>
<td>—</td>
<td>Stage 3</td>
<td>≥ 180</td>
<td>or</td>
<td>≥ 110</td>
</tr>
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</table>
was then thought to confer a greater risk for cardiovascular events than elevated SBP. Claims of risk reduction in these trials were made because the DBP was lowered following treatment. The fact that simultaneously SBP was also substantially reduced was ignored. The total neglect of the role of SBP resulted in classification systems and treatment recommendations that placed much greater emphasis on the treatment of DBP while ignoring the importance of SBP. In 1993, JNC 5, for the first time included in the guidelines the importance of SBP. Now, a large body of epidemiologic data indicates that SBP is far more important than DBP as a determinant of CVD risk, except in younger age groups.

Epidemiologically, systolic hypertension is the most common form of hypertension and far easier to measure correctly. The National Health and Nutrition Examination Survey (NHANES) study has also shown that ISH (SBP >140 mmHg with DBP <90 mmHg) was present in 65% of all hypertensives > 60 years age in both males and females.

Recent data from Framingham has further reinforced the prognostic significance of raised SBP. The value of SBP in risk prediction has also been convincingly shown in 12 year data from 3,16,000 men screened from MRFIT.

Studies like SHEP on isolated systolic hypertension have further confirmed that lowering raised SBP has a strong effect on risk reduction of stroke, fatal and non-fatal myocardial infarction and several other cardiovascular end points.

The statement about the importance of SBP in JNC 7, ie “in persons older than 50 years, SBP >140 mmHg is a much more important risk factor for CVD than diastolic blood pressure” is particularly important for a large country like India with limited health programme resources. Systolic blood pressure is not only reliable but much easier to record than DBP. It can be easily measured by non-medical persons during large B.P surveys as well as for individual patient management. There is also a widespread and fixed belief that 100 + the age of a person is an acceptable level of SBP which needs a change. Now it is up to various medical associations, media and other similar bodies to root out this myth from the minds of 5,00,000 or more primary care physicians in India.

Therapeutic Benefits of Hypertension Treatment
There is now no doubt whatsoever that persistent hypertension (of any degree) causes premature morbidity and mortality. Successful treatment of hypertension yields enormous therapeutic benefits in protection against CVD, chronic kidney disease (CKD) and stroke. In order to get maximum health benefits both the SBP and DBP levels must be normalized. When necessary and if possible, in selected patients, ambulatory blood pressure measurements (ABPM) and self-measurement of blood pressure may be utilized.

Treatment Guidelines
The principal goal of antihypertensive therapy is to prevent, arrest or reverse target organ damage (TOD) in patients with hypertension. This objective then requires achieving the goal or target blood pressure level - slowly but surely. Lifestyle modifications should be recommended for all patients with hypertension irrespective of antihypertensive drug therapy (Table 2)

Pharmacological Treatment
As for pharmacological treatment of hypertension, JNC 7 has given a broad mandate to the medical community to exercise clinical judgement in the selection of initial drug therapy. As in the previous JNC reports, diuretics are recommended for initial therapy in most patients with uncomplicated hypertension.
Thiazide-type Diuretics

Thiazide-type diuretics as well as β-blockers have always been recommended as a first step therapy unless there was a contraindication to their use or another class of drug was specifically indicated.

In the new guidelines, the recommendation for thiazide-type diuretics is more forceful and delinked from β-blockers. This recommendation was indeed expected after the publication of ALLHAT results. There is other evidence supporting the efficacy of diuretics in large randomised trials. JNC 7 recommends diuretics as the first drug of choice if no compelling indication for other drugs is present. The new guidelines also state that diuretics should form a part of the combination if two drugs are being used to treat hypertension. At low doses they have negligible and non-serious side effects. However for tropical countries like India one has to use care and caution, particularly in summer months about very strict salt restrictions so as not to produce excessive hyponatremia. Thiazide-type diuretics are the cheapest antihypertensive drugs and their use should substantially increase compliance particularly where cost is a consideration.

The problem in India is that low dose (12.5 mg hydrochlorthiazide or chlorthalidone) thiazide-type diuretics are not widely available, whereas newer A-II receptor blockers (ARBs), newer ACE inhibitors (ACEIs) and expensive calcium channel blockers (CCBs) are marketed and widely promoted by numerous companies. The message about the usefulness and safety of thiazide diuretics need to be conveyed to the level of primary health care physicians.

Other Drug Classes

In a significant departure from the previous JNC reports, the JNC-7 states that although diuretics are preferred, “may consider ACEIs, ARBs, BBs, or a combination”. The decision to put all classes of drugs in the possible first choice category puts the onus on the treating physician to use his/her experience and clinical acumen to select the drug of first choice, in addition to the thiazide-type diuretics. JNC 7 also highlights the role of certain classes of drugs for various compelling indications (Table 3).

Use of More Than One Drug Class

The rates of achieving goal blood pressure are currently disappointingly low the world over. In India, with a fee for service regime, the rates are even lower because of cost of medications, medical fees, cost of investigations, infrequency of follow-up and almost non-existing system of home monitoring of blood pressure.
Another reason for achieving low rates of goal blood pressure is persistence with a single class of drug for too long, while the patient is lost to follow-up. Failure to achieve goal blood pressure is particularly common in the case of SBP.

Most patients with hypertension need two or more antihypertensive medications to achieve goal blood pressure. ALLHAT\(^\text{16}\) have clearly shown that more than two thirds of the patients require two or more drugs to bring their BP to target level. The problem perhaps lies with the multifactorial nature of hypertension as suppression of one factor is counteracted by another physiological mechanism. Addition of a second drug from a different class should be initiated when a single drug in adequate doses fails to achieve goal blood pressure.

JNC-7 has endorsed the use of combination therapy in stage 2 patients as a direct approach. The new guidelines recommend that if blood pressure is more than 20/10 mmHg above goal blood pressure (<140/90 mmHg or <130/80 mmHg in diabetic and in CKD patients) then one should consider even initiating therapy with two drugs, one of which should be a thiazide-type diuretic. In order to take care of cost, confusion and compliance the use of fixed-dose combinations should be considered.

Fixed-dose combinations offer the advantage of ease of administration ensuring better compliance, reduced dose of each component resulting in less side effects and additive or synergistic effects of the components resulting in better control of hypertension without the interference of compensatory mechanisms.

In India most patients will not visit the hospital or their physician for optimization of monotherapy or complain of too many drugs or doses. A fixed-dose pill to control hypertension seems to be a better option.

**Conclusion**

Finally, while the new guidelines like the previous ones keep updating our knowledge, the problem in the Indian scenario is that this new knowledge is not passed on for action to the primary care physicians at the grassroot level. Two years after the 6th JNC guidelines were published, I was asked to speak on the subject of JNC 6 guidelines at a CME organized for 200 primary care physicians. Before starting, I asked the audience that those who had read or heard of the JNC 6 guidelines should raise their hands—only 3 hands went up.

Therefore, apart from the problem of cost and compliance we need a lot of effort and resources to educate the primary care physicians.

Finally, JNC 7 also highlights the fact that in spite of our increasing knowledge about hypertension,

<table>
<thead>
<tr>
<th>High-risk conditions with compelling indication*</th>
<th>Diuretic</th>
<th>B-blocker</th>
<th>ACE inhibitor</th>
<th>ARB</th>
<th>CCB</th>
<th>Aldosterone antagonist</th>
</tr>
</thead>
<tbody>
<tr>
<td>Heart failure</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
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<tr>
<td>Post myocardial infarction</td>
<td></td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td></td>
<td>✓</td>
</tr>
<tr>
<td>High coronary disease risk</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td></td>
<td>✓</td>
</tr>
<tr>
<td>Diabetes</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Chronic kidney disease</td>
<td></td>
<td></td>
<td></td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Recurrent stroke prevention</td>
<td></td>
<td></td>
<td></td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
</tbody>
</table>

* Compelling indications for antihypertensive drugs are based on benefits from outcome studies or existing clinical guidelines: the compelling indication is managed in parallel with the blood pressure.
the healthcare systems all over the world have failed to translate knowledge about hypertension into action.

Hypertension awareness has not changed in the last 10 years, treatment rates have increased only slightly, while the control rates remain stagnant at around 30%. Failure on the part of healthcare system continues to add every year to the burden of hypertensive morbidity and mortality. There is no doubt that the knowledge is there, there are systems in place to transfer this knowledge throughout the world but what seems to be lacking is the physicians time, empathy trust, motivation and the will to succeed.

References