

## What is “hypertension” after all? Raymond R. Townsend, MD University of Pennsylvania

Many years ago, one of the Framingham architects William Kannel stated that it is not “hypertension” that kills, but blood pressure. Even a cursory glance at how we classify blood pressure utilizing the seven Joint National Committee Reports reveals that hypertension is a diagnosis in continual evolution. In recent months that evolution looks to be continuing as momentum builds toward a definition that downplays the role of the actual blood pressure numbers *per se* and emphasizes instead the place of blood pressure in the assessment of global cardiovascular (CV) risk. This makes some intuitive sense, but it also overturns much of the current order of things. Imagine two patients waiting to see you for a follow-up visit on a given afternoon. Both are 60 year old women. One has a family history of long-lived relatives, a good cholesterol panel, an enviable body mass index and a “touch” of systolic hypertension with pretreatment values of 150/80 mm Hg which were easily managed with a small dose of HCTZ. In the next room is a 60 year old woman with the same pretreatment blood pressure, but she also has the typical trappings of metabolic syndrome and an impressive family history for premature cardiovascular disease. Although both have hypertension, the hypertensions are not created equal and the ultimate risk profile in the second case is worse than in the first case. Much like **Prehypertension** was designed to raise our awareness of incipient “hypertension”, the new thinking is to place a patient’s blood pressure in the perspective of its role in the total risk profile. Its much akin to saying that hypertension is a risk factor, not the risk factor for cardiovascular disease.

So what will the new definition of hypertension look like? To quote the working group: “Hypertension is a progressive cardiovascular syndrome arising from complex and interrelated etiologies. Early markers of the syndrome are often present before blood pressure elevation is observed; therefore, hypertension cannot be classified solely by discrete blood pressure thresholds. Progression is strongly associated with functional and structural cardiac and vascular abnormalities that damage the heart, kidneys, brain, vasculature, and other organs, and lead to premature morbidity and death. The four categories currently used to classify hypertension in JNC 7 are normal, prehypertension, and stages 1 and 2 hypertension. We propose instead to classify patients as either normal or hypertensive, as determined by their cardiovascular risk profile. The progression of hypertension—from early to progressive to advanced—may be best represented as stages 1, 2, and 3 hypertension. Each stage of hypertension is described by BP patterns and the presence or absence of cardiovascular risk factors, early markers of hypertensive [cardiovascular disease] CVD, and target organ damage.” {1}. The characteristics and categories of the new staging for hypertension are in the Table, the goal being to find those at higher CV risk and concentrate efforts, particularly drug treatment, on that group.

CLASSIFICATION	NORMAL	STAGE 1 HYPERTENSION	STAGE 2 HYPERTENSION	STAGE 3 HYPERTENSION
Descriptive category (BP pattern and CVD status)	Normal BP or rare BP elevations AND No identifiable CVD**	Occasional or intermittent BP elevations OR Risk factors or markers suggesting early CVD**	Sustained BP elevations OR Evidence of progressive CVD**	Marked and sustained BP elevations OR Evidence of advanced CVD**
Cardiovascular risk factors (see Table II)	None	≥1 risk factor present	Multiple risk factors present	Multiple risk factors present
Early disease markers (see Table III)	None	0–1	≥2	≥2 present with evidence of CVD
Target organ disease (see Table IV)	None	None	Early signs present	Overtly present with or without CVD events

\*This paradigm expands on the Seventh Report of the Joint National Committee on Prevention, Detection, Evaluation, and Treatment of High Blood Pressure (JNC 7) definition and classification of hypertension by classifying individuals by blood pressure (BP) level or cardiovascular status; however, priority is given to cardiovascular status; \*\*cardiovascular disease (CVD) designation is determined by the constellation of risk factors, early disease markers, and target organ disease as listed in Tables II–IV. BP categories are shown in the Figure.

Source: Journal of Clinical Hypertension September 2005 {1}

Four bits of recent experience tend to underscore the potential for success of such an approach:

- ❖ The HOPE trial treated those at high CV risk with an ACE inhibitor (half of which were not conventionally “hypertensive” by numbers) with proven CV benefit compared with placebo {2}
- ❖ The PROGRESS study demonstrated that a cocktail of ACE inhibitor and diuretic used in the prevention of another stroke in those with a prior stroke had significant benefit in those with or without hypertension by conventional BP numbers compared with placebo {3}
- ❖ The CAMELOT study enrolled those with intravenous ultrasound (IVUS) documented coronary disease whose average blood pressure was 129 mm Hg systolic showing benefit in at least one arm (the Calcium Channel Blocker) in terms of disease progression {4}
- ❖ And lastly, the recent TROPHY trial demonstrated that those with “incipient” hypertension (entry blood pressures 130-139 / 85-89 mm Hg) experienced a substantial and statistically significant reduction in the likelihood of developing hypertension when treated with an ARB for two years {5}

So what does this mean for clinical practice? For starters it does offer a risk-based approach to stratifying individuals with any level of blood pressure who by epidemiology criteria do have a reasonable likelihood of experiencing a future CV event. As currently promulgated it would eliminate the JNC 7 prehypertensive and reclassify people as either stage 1 hypertension or normal.

By defining hypertension in such a way, it forces us to consider that the data we generate from this common office procedure is *part* of a complex cardiovascular disorder. As such the real issue, cardiovascular disease (estimated only partially by the BP levels) assumes the ultimate goal in the prescribing approach. Such a strategy may pave the way for further research and clinical investigations aimed at detecting and treating CV disease at an earlier phase. Problems implementing such a strategy become evident when you

look carefully at the Table and the links to other Tables as a necessity to supply additional data. Given that only 1 out of 3 hypertensives using the conventional 140/90 mm Hg criteria are adequately treated, the requirement to more thoroughly characterize the hypertensive patient by a relatively exhaustive evaluation for global cardiovascular risk will be a difficult task. Existing data on multiple risk factor treatment (for example concurrent hypertension and dyslipidemia control) at a dismal 9% level are sobering evidence our “silo” thinking {6}. Thus, coming to grips with recommendations like those of the Hypertension Working Group will require a considerable rethinking of the way we currently do things.

## **References**

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