I

In childhood, blood pressure (BP) levels are significantly lower than in adults. Thus, children rarely have the BP levels that in adults are predictive of future complications. No childhood population has been followed longitudinally to see the relationship of early childhood BP levels to the development of coronary heart disease, renal disease, or stroke in adult life. There is also little information that relates to the efficacy of lowering the BP of children except in those with extreme hypertension. Therefore, the predictive significance of children's BP measurements at present must be extrapolated from information that is less direct.

The importance of recognizing and treating hypertension in adults resulted in a consideration of the significance of BP measurement in children by a Task Force on Blood Pressure Control in Children, appointed by the National Heart, Lung, and Blood Institute.1 The Task Force was charged with providing guidelines for practicing physicians and health care providers involved in school health and other community programs for children.

Normal BP values in children in relation to age, maturation indices, race, and sex have been published by numerous authors.2-10 Each has established a BP reference in a different manner: some with subjects seated, some recumbent, some under basal conditions, some under more anxious conditions, some in mixed racial groups, some in blacks, some in whites, some utilizing mercury sphygmomanometers, and some by using automated devices. It is therefore difficult to assess whether children's BPs vary in different geographic areas and to establish the reference BP levels for physicians investigating whether an individual child's BP is high. There is general agreement that height and weight, in addition to age, should be included in evaluating a child's BP level.

In this issue of Hypertension, Gutgesell et al.11 present BP data derived from groups of children and emphasize the difficulty of comparisons with other

Commentary

Where Are Children's Blood Pressures Headed?

SIDNEY BLUMENTHAL, M.D., NEW YORK, NEW YORK AND RONALD M. LAUER, M.D., IOWA CITY, IOWA

Presented as a commentary by the peer reviewers of the preceding article: Gutgesell M, Terrell G, Labarthe D. Pediatric Blood Pressure: Ethnic Comparisons in a Primary Care Center. Address for reprints: Ronald M. Lauer, M.D., Department of Pediatrics, University of Iowa Hospital, Iowa City, Iowa 52242.
studies. The authors present BP levels of black, Spanish-surname, and white children obtained in a primary care center in Houston, Texas. They found these pressures to be significantly lower than those presented by the Task Force, which were obtained in the schools of Rochester, Minnesota; Muscatine, Iowa; and in a clinic in Miami, Florida. This difference perhaps resulted from the difference in method of BP measurement: the children in the Houston clinic were seated for 30 minutes to 2 hours before being measured, while children in the schools of Muscatine, Iowa and Rochester, Minnesota had been standing in line before being seated for measurement. The Task Force realized that the levels they presented were obtained under somewhat anxious conditions and that most children, after rest, would have lower pressures. However, it was their opinion that pressures obtained under these circumstances more closely resembled many situations in clinical practice in an ambulatory setting than so-called “basal” pressure, i.e., children seated for 1/2 to 2 hours before measurement.

The Task Force suggested an arbitrary strategy for clinical action, in which children whose BPs were greater than the 95th percentile for age would be asked to return on at least two more occasions to have their pressures measured under quiet conditions. Only those with pressures persistently above the 95th percentile were recommended for further investigation.

For a physician to recognize children with BP levels greater than their peers, it is necessary to use a reference group for comparison and, most important, to measure the BP in these children in the same fashion as was used in the reference population. If the Task Force recommendations of utilizing a standard that is relatively high and repeated measurements of BP are taken, only a small number of children will be found to have persistently high pressures. Thus, few will be subjected to laboratory investigations. This is appropriate because only a very small number of children with secondary hypertension exist in the school age population.13, 14

What is the outlook for children whose BPs are persistently higher than their peers after rest? Are they a group who are destined for adult hypertension? Studies of BP tracking may prove this to be the case. However, in adults, elevated casual systolic or diastolic BPs are predictive of future coronary heart disease. Some studies of adults indicate those with pressures persistently above the 95th percentile were recommended for further investigation. Whether control of obesity and restriction of salt intake for children can have a salutary effect upon their future health is an open question. Since these measures are not harmful and have proved to be effective in adults with hypertension, the Task Force has recommended them for children whose BPs are suspect.

Major questions exist about the unanticipated consequences of prolonged drug administration in the developing human. Although a high incidence of serious adverse reactions has not been reported, neither has there been an adequate longitudinal evaluation of children receiving antihypertensive agents. It is not unreasonable to anticipate that drugs that influence adrenergic reactivity in the peripheral nervous system may also affect the central nervous system if they pass the blood-brain barrier and may potentially modify cognitive as well as behavioral development. Further, compounds that modify the electrolyte status and fluid composition of the body could conceivably exert long-term influence on the somatic growth of a variety of systems, as has been demonstrated in experimental models. It is for these reasons that the Task Force recommended drug therapy only for children with fixed high diastolic BP.

References
15. Levy RI, White PD, Stroud WD: Transient hypertension. The relative prognostic importance of various systolic and diastolic levels. JAMA 128: 1059, 1945
Where are children's blood pressures headed?
S Blumenthal and R M Lauer

*Hypertension*. 1981;3:46-47
doi: 10.1161/01.HYP.3.1.46

*Hypertension* is published by the American Heart Association, 7272 Greenville Avenue, Dallas, TX 75231
Copyright © 1981 American Heart Association, Inc. All rights reserved.
Print ISSN: 0194-911X. Online ISSN: 1524-4563

The online version of this article, along with updated information and services, is located on the
World Wide Web at:
http://hyper.ahajournals.org/content/3/1/46.citation

Permissions: Requests for permissions to reproduce figures, tables, or portions of articles originally published in
*Hypertension* can be obtained via RightsLink, a service of the Copyright Clearance Center, not the Editorial
Office. Once the online version of the published article for which permission is being requested is located, click
Request Permissions in the middle column of the Web page under Services. Further information about this
process is available in the Permissions and Rights Question and Answer document.

Reprints: Information about reprints can be found online at:
http://www.lww.com/reprints

Subscriptions: Information about subscribing to *Hypertension* is online at:
http://hyper.ahajournals.org//subscriptions/