Childhood High Blood Pressure: A New Emphasis

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The national effort to detect and control high blood pressure has spanned all age barriers. The reporting of the Task Force on Blood Pressure Control in Children of the National High Blood Pressure Education Program (National Heart, Lung, and Blood Institute, NIH) has further sharpened the focus on high blood pressure. With the interest, both professional and public, have come many questions for the practicing pediatrician.

- How do we define high blood pressure according to age?
- Is the procedure for measuring blood pressure in children acceptable for accurate results?
- Should all children be screened for high blood pressure? If so, at what age, by whom, and in what setting?
- Is there sufficient knowledge to approach only target populations?
- If a child is found with high blood pressure, to what extent should diagnostic studies be done? Is most childhood high blood pressure secondary?
- What is the obligation to other members of the family?
- What medications should be used?
- What are the long-term effects of the medication?
- What is the place of other forms of therapy?
- How can you attain adherence to a therapeutic contract?
- What are the cost-benefit ratios of treating patients for many years?
- What are the psychologic implications of the need for lifelong medical treatment?
- What advice can be given to the parents of a child with high blood pressure in regard to their health? In regard to the other children in the family?
- What advice should be given to the patients themselves?

This issue of PEDIATRIC ANNALS intends to expand on the findings of the Task Force on continued
Blood Pressure Control in Children, the mechanisms of blood pressure control, background information on childhood high blood pressure, differential diagnosis of high blood pressure, current therapy for hypertension, treatment of hypertensive crisis, and finally the government’s efforts in the field of childhood high blood pressure.

What is the role of the primary physician in coping with this problem? What, indeed, is the role of the pediatrician? The concentration of pediatric practice is to a large extent on promotion of growth and development, on prevention of disease and disability, and on illnesses that are acute and of brief duration. As a rule, those in child care lack experience with chronic illness and with the effects of chronic care and surveillance on the patient, the family, society, and the medical profession in general and physicians individually.

As the definition of high blood pressure in children becomes more generally accepted, another issue remains. The pediatrician who has not dealt with chronic disease must learn to be more comfortable with a high reading on the manometer and the implications of the diagnosis. With the vast majority of medicine being practiced outside the university medical centers, it seems that only by cooperation with the nonuniversity physician can the true magnitude of the problem of high blood pressure be defined and the longitudinal efficacy of treatment of a nonselected population be ascertained. At first glance, this public health role may seem foreign to the practicing pediatrician, yet the need for studies of epidemiology, prevention, and long-term results is evident. It is not unlike the pediatrician’s addressing other problems, such as immunization for infectious disease, proper nutrition, control of rheumatic fever, or detection and treatment of tuberculosis.

By virtue of the unique position of the pediatrician in the health-care delivery system, we should be able to attain a more accurate determination of the incidence of primary or idiopathic high blood pressure in children. This is an area in which we are just beginning to realize the incidence. With the perspective that can be readily gained from the family history, the child at risk can be more easily identified. When the identification of the high-risk child is combined with the routine health examination, which should include a blood pressure reading after three years of age, two things can be accomplished. First, broadly speaking, incidence can be determined and, in the narrow sense, the patient can be identified earlier and started on treatment and education. Since, as stated above, this is a relatively uncharted sea, the pediatrician incurs another responsibility. Knowledge must remain current in an area where little interest existed previously. With the efforts now being made, we can expect a great proliferation of information in this area, and great dedication will be needed for us to remain current. The pediatrician must be responsible for the appropriateness of the diagnostic workup. The younger child with the higher pressure will more likely have secondary high blood pressure. This is less true of the adolescent. Dr. Lieberman’s presentation in this issue suggests the current approach to the differentiation of primary from secondary high blood pressure.

Blood pressure levels, obtained on at least three separate occasions, that are above the 95th percentile for age would indicate the need for further study and long-term surveillance. Pressure should be recorded once a year, plotted on graphs, and compared with
new norms that have been developed. It is necessary to observe the pattern. If sustained pressure is above the 95th percentile and the examination and laboratory studies are normal and if the persistent diastolic pressure is less than 90 mm. Hg in children from three to 12 years of age or less than 95 mm. Hg for those 13 to 18, counseling, surveillance, and annual re-evaluation should be done. The adolescent patient may require treatment if counseling, salt restriction, and repeated examination do not bring about a lower value. Counseling and surveillance for the patient and family include:

- Periodic blood pressure determinations.
- Advice regarding weight reduction if appropriate.
- Avoidance of salt abuse.
- Encouragement of physical activity.
- Encouragement to discontinue or not begin tobacco use.
- Examination for other cardiovascular disease risk factors — e.g., serum lipids, glucose, etc.
- Advice regarding use of medications — e.g., sympathomimetics, birth control pills, steroids, etc.

For those three to 12 years of age with diastolic pressure greater than 90 mm. Hg or those over 12 with diastolic pressure greater than 95 mm. Hg, further investigation and treatment are indicated as well as counseling and surveillance. For those identified as having high blood pressure, examination of parents and siblings becomes mandatory.

Having identified the child at risk or the one having high blood pressure, the pediatrician must now instruct the patient and the family concerning the implications of the findings, treatment, chronicity, and the need for surveillance. Emphasis must be placed on surveillance and adherence to a therapeutic contract over a prolonged period. For the pediatrician this means dealing with various members of the family as well as the patient, who may already be experiencing the normal problems of adjustment. The need for a multiprofessional team approach seems to be as appropriate for children as it has been for adults.

All physicians dealing with high blood pressure must be aware of the problems of labeling. It creates a problem with employment and increases rates for health and life insurance as well as concerns for marriage and childbearing. The child may be made vulnerable by the necessity of giving him a label. Parents may deny or reject, smother or overprotect the child. There will be questions of responsibility and guilt. The physician must be prepared to handle these questions, either personally or through a member of the health team. It points up the need for education of the patient and the family and, in the larger scope, the need for education of society to the fact that this is a controllable entity.

With the massive screening programs that have been carried on across the country, no discussion would be complete without mentioning our thoughts on the role of practicing pediatricians in this scheme. We strongly support the stance taken by the Task Force in not recommending mass screening for children and adolescents. This is based on the psychologic damage that could result from falsely labeling an adolescent as having high blood pressure and the poor cost-effectiveness ratio that would pertain because of the low incidence of fixed high blood pressure in this age group. In addition to primary-care physician offices, maternal and child health programs, early periodic screening detection and treatment programs, and school health pro-
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IMPORTANT INFORMATION: This is a Schedule V substance by Federal law; diphenoxylate HCl is chemically related to methadone. In case of overdose or individual hypersensitivity, reactions similar to those after meperidine or morphine overdose may occur; treatment is similar to that for meperidine or morphine intoxication (prolonged and careful observation, ventilation, and monitoring). Respiratory depression may occur in spite of an initial response to Narcan® (naltrexone HCl) or may be evidenced as soon as 20 hours after ingestion. LOMOTIL IS NOT AN INNOCUOUS DRUG AND DOSAGE RECOMMENDATIONS SHOULD BE STRICTLY ADHERED TO ESPECIALLY IN CHILDREN. THIS MEDICATION SHOULD BE KEPT OUT OF REACH OF CHILDREN.

Indications: Lomotil is effective as adjunctive therapy in the management of the symptoms of diarrhea.

Contraindications: In children less than 2 years, due to the decreased safety margin in younger age groups, patients who are already known to be sensitive to diphenoxylate HCl or atropine, and in diabetics associated with pseudomembranous enterocolitis occurring during, or up to several weeks following, treatment with antibiotics such as clindamycin (Cleocin®) or tetracycline (Lincocin®). Warnings: Use with special caution in young children, because of variable response, and with extreme caution in patients with cirrhosis and other advanced hepatic disease or abnormal liver function tests, because of possible hepatic coma. Diphenoxylate HCl may potentiate the action of barbiturates, tranquilizers and alcohol. In theory, the concurrent use with monoamine oxidase inhibitors could precipitate hypertensive crisis. In the event of dehydration or electrolyte imbalance, withhold Lomotil until corrective therapy has been instituted. Usage in pregnancy: Weigh the potential benefits against possible risks before using during pregnancy, lactation, or in women of childbearing age. Diphenoxylate HCl and atropine are secreted in the breast milk of nursing mothers.

Precautions: Addiction, dependence, tolerance. Addiction may be possible at high doses of diphenoxylate HCl. Tolerance and dependence may develop in patients with chronic diarrhea who are treated with Lomotil for extended periods, even after the symptoms of diarrhea have disappeared. Withdrawal symptoms may occur if abrupt discontinuation of therapy occurs. In patients with inflammatory bowel disease, Lomotil should be used with caution. In children, since signs of atropinism may occur even with the recommended dosage. Use with care in patients with acute ulcerative colitis and diverticulitis. If abdominal distention or other symptoms develop. Adverse reactions: Atropine-like effects include dryness of skin and mucous membranes, flushing, hyperthermia, tachycardia, and urinary retention. Other side effects with Lomotil include nausea, sedation, vomiting, swelling of the gums, abdominal discomfort, respiratory depression, numbness of the extremities, headache, dizziness, depression, malaise, drowsiness, coma, lethargy, anorexia, restlessness, euphoria, pruritus, angioneurotic edema, gastric ulcer, pancreatitis, and toxic megacolon. Dosage and administration: Lomotil is contraindicated in children less than 2 years old. Use only Lomotil liquid for children 2 to 12 years old. For ages 2 to 5 years, 4 ml (2 mg) 1 to 5 times daily; 5 to 8 years, 4 ml (2 mg) 1 to 5 times daily; 8 to 12 years, 4 ml (2 mg) 1 to 5 times daily; adults, 2 tablets (5 mg) 1 to 2 times daily. Dosage for children under 5 years of age should be reduced to 75% of the recommended adult dosage. Maintenance dosage may be as low as one fourth of the initial dosage. Make downward dosage adjustment as soon as initial symptoms are controlled. Overdose: Keep the medication out of the reach of children since accidental overdose may cause severe, even fatal, respiratory depression. Signs of overdose include flushing, hyperthermia, tachycardia, lethargy or coma, hypotonic reflexes, hypotension, pinpoint pupils and respiratory depression which may occur 12 to 30 hours after overdose. Evacuate stomach by lavage, establish a parenteral airway and, when necessary, assist respiratory mechanically. A narcotic antagonist may be used in severe respiratory depression. Observation should extend over at least 48 hours.

Dosage forms: Tablets: 2.5 mg of diphenoxylate HCl with 0.025 mg of atropine sulfate. Liquid: 2.5 mg/mL of diphenoxylate HCl and 0.025 mg of atropine sulfate per 5 mL. A plastic dropper calibrated in increments of 1 mL (total capacity, 2 mL) accompanies each 2-oz. bottle of Lomotil liquid.

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