



Q/ Does blood pressure screening benefit children?

EVIDENCE-BASED ANSWER

A | SCREENING MAY NOT SHOW BENEFITS in childhood but could pay off for adults. Although major professional organizations recommend measuring blood pressure (BP) at every clinic visit for all children older than 3 years (strength of recommendation [SOR]: C, expert opinion), scant evidence links earlier detection and treatment of childhood hypertension with improved patient-oriented outcomes.

However, detecting childhood hypertension may help identify adults who would benefit from earlier treatment.

Children with elevated BP have a more than 60% chance of being hypertensive as young adults (SOR: B, prospective cohort study). Children with systolic BP above the 95th percentile had a more than 4-fold increase in coronary artery disease as adults compared with children below the 95th percentile (SOR: B, retrospective study).

Identifying hypertension in children is associated with a 15-fold greater likelihood of hypertension in their parents (SOR: B, case series).

Evidence summary

The US Preventive Services Task Force considers screening adults for hypertension a grade A recommendation because it's known to improve patient outcomes through early diagnosis, treatment, and prevention of serious cardiovascular complications.¹

The Fourth Task Force of the National High Blood Pressure Education Program Working Group, endorsed by the American Academy of Pediatrics, states that maintaining a large national database of BP values throughout childhood allows physicians to recognize children and adolescents with elevated BP.² Data indicate that, in this population, the prevalence of prehypertension is 10% and the prevalence of hypertension is 4%.³

The Task Force suggests that detecting and treating childhood hypertension should be important because of increasing childhood obesity, the risk of developing left ventricular hypertrophy, and other intermediate cardiovascular effects in undiagnosed and untreated children. The Task Force acknowledges, how-

ever, that prospective longitudinal outcome studies in untreated children and adolescents are lacking.

Hypertensive children often grow up to be hypertensive adults

A prospective cohort study showed that children with elevated BP had a greater likelihood of adult hypertension than children with normal BP. Investigators followed 2445 children 7 to 18 years of age to determine whether elevated BP in childhood correlated with increased BP in adulthood.

Investigators obtained BP, height, and weight measurements biennially during the children's school years and when they were young adults between 20 and 30 years of age. Twelve to 13 years later, 24% of children with BP above the 90th percentile still had BP above the 90th percentile (relative risk [RR]=2.4; $P<.001$) and 39% had BP above the 80th percentile (RR=1.9; $P<.001$). Ninety-four percent of children with more than 3 normal readings during the study were nor-

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➤ **Screening blood pressure in children has the potential to identify families at increased risk for cardiovascular disease.**

motensive as young adults. Children with one or 2 abnormal readings had a 17% and 24% chance, respectively, of having hypertension as adults ($P<.001$).⁴

High childhood systolic BP may predict CAD in adulthood

A retrospective study evaluated 126 children 10 to 17 years of age who were admitted to the hospital for an elective surgical procedure between 1950 and 1967. Children with documented BP readings at admission were eligible for the study; children with preexisting cardiac and renal disease were excluded. Investigators reassessed patients as adults (age range 42-68 years); the mean follow-up period was 42 years.

Mean BP was 125/80 mm Hg at admission and 133/75 mm Hg at follow-up. Univariate logistic regression analysis showed a significant association between systolic BP in childhood and coronary artery disease at follow-up (odds ratio [OR]=1.052; 95% confidence interval [CI], 1.005-1.101; $P=.027$). Children with systolic BP at or above the 95th percentile had a 4-fold increase in coronary artery disease at follow-up compared with children whose systolic BP was below the 95th percentile (29% vs 7%, $P=.03$). Investigators also found an association between elevated BP in childhood and a diagnosis of hypertension at follow-up ($P=.007$).

Limitations of the study included small sample size, selection bias, changes in the definition of hypertension during the 4 decades since the study began, and limited childhood BP data (a single measurement at admission for surgery).⁵

Parents of hypertensive children are likely to be hypertensive themselves

Screening BP in children has the potential to identify families at increased risk for cardiovascular disease. A case series found a high incidence of hypertension among the parents of children with elevated BP. Investigators measured several risk factors, including BP in 141 children (mean age 10.5 ± 3.4 years) and 108 parents (at least one a biological parent, mean age 38.5 ± 7.5 years). They obtained 2 BP readings 15 to 30 minutes apart.

Parents of children with BPs at or above

the 95th percentile had a 15-fold greater likelihood of hypertension themselves (OR=14.7; 95% CI, 3.02-71.56; $P=.009$, positive predictive value=75%; negative predictive value=81%).⁶ Limitations of the study included small sample size, high prevalence of obesity and black ethnicity in the study population (a population with a greater incidence of hypertension), and only 2 BP measurements in the same day, which isn't diagnostic for hypertension.

Recommendations

The American College of Obstetricians and Gynecologists recommends screening girls for hypertension between 13 and 15 years of age.⁷

The American Academy of Family Physicians concludes that the evidence is insufficient to recommend for or against routine screening for hypertension in children and adolescents to reduce the risk of cardiovascular disease.⁸

The European Society of Hypertension and European Society of Cardiology recommend that children older than 3 years have auscultatory BP measurements at each clinic visit.⁹

JFP

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