

# Despite tests, high blood pressure hard to recognize in children

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A Johns Hopkins Children's Center study of 2,500 patient records suggests that medical staff fails to check a child's blood pressure a fifth of the time, and is not recognizing what constitutes an abnormal reading in those whose blood pressure they do check.

Researchers at Hopkins Children's say the consequences are that pediatricians and nurses may be missing the development of [hypertension](#) and its serious consequences, even when they do take blood pressure measurements.

The American Academy of Pediatrics' (AAP) guidelines call for regular blood pressure checks in [children](#) 3 years and older to screen for elevated blood pressure, and say elevated blood pressure on three consecutive medical visits qualifies as hypertension. Even a single episode of [high blood pressure](#) can indicate hypertension and should trigger repeat measurements during the visit and subsequent doctor visits, the AAP says.

The problem is that measuring a child's blood pressure is far more complicated than it is in adults and requires interpreting each individual measure against a reference table for age, gender and height, says lead investigator Tammy Brady, M.D., M.H.S., a nephrologist at Hopkins Children's.

The researchers analyzed 2,500 records of visits to the pediatrician's office. Medical staff did not check blood pressure in 500 of the cases.

Elevated blood pressure scores were recorded in 726 cases of the 2,000 measurements taken, but the implications went unrecognized and unremarked upon in 87 percent of them, the study found.

The findings, to be published in June's Pediatrics and appearing online May 3, underscore the need for better recognition and aggressive monitoring of all children to prevent both the short-term and long-term complications of hypertension, the investigators say.

The study found that medical staff was more likely to miss elevated blood pressures in children of normal weight and in those without a family history of cardiovascular disease. The same was true for those children whose blood pressure was at or below 120/80, a score considered ideal in adults, but one that may portend trouble in a child, depending on height, gender and age.

Blood pressure parameters in adults are clearly defined, but the complicated arithmetic involved in children's blood pressure may be one of the greatest barriers to recognizing a child's elevated pressure, the investigators say.

Brady says more education and automated systems that alert the medical staff if a child's blood pressure is out of range can help. Hopkins Children's is currently testing one such alert system and will soon publish data on its effectiveness.

Hypertension, defined as persistently elevated blood pressure, can cause kidney, eye and heart damage, but while some complications take years and decades to develop, certain ones evolve quickly, the researchers say. A dangerous thickening of the heart muscle called left-ventricular hypertrophy can develop in a matter of months in children with untreated hypertension, but is reversible with early treatment.

Because high blood pressure rarely causes symptoms, medical staff may overlook a child who has no traditional risk factors, such as obesity or family history, the researchers say. Half of the children in the study with elevated blood pressure were normal weight.

"Nurses and doctors may be so falsely reassured by a child's lack of symptoms and risk factors that they either miss milder elevations or may chalk them up to measurement error and never follow up on them," Brady says.

In the study, covering children ages 3 to 20 visiting a primary care pediatric clinic at Johns Hopkins, high blood pressure was discovered in six percent of healthy-weight children and in 20 percent of overweight and obese children. Even though medical staff was more attentive to elevated blood pressure among overweight and obese children, high blood pressure was still missed in four out five of them. Children with scores below 120/80 were nearly eight times more likely to have their high blood pressure missed than children with blood pressure above 120/80. Children without a family history of cardiovascular disease were twice as likely to have their high blood pressure unrecognized as those with family history.

Provided by Johns Hopkins Medical Institutions

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