FOCUS ON PAEDIATRIC HYPERTENSION

Why paediatric hypertension can no longer be ignored. A practical global roadmap from the ISH Position Paper

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Hypertension is a well-known risk factor for cardiovascular disease and early mortality in adults. Yet one of the central messages of our recently published International Society of Hypertension (ISH) position paper is clear: **hypertension often begins in childhood.** In our paper, *Practical approach to evaluate and manage hypertension in youth*,[1] colleagues from 12 countries worked together to provide practical, globally adaptable guidance for clinicians caring for children and adolescents. We did not aim to replace existing national guidelines. Instead, we sought to harmonise key principles and offer pragmatic advice that can be implemented across diverse health systems, including in low- and middle-income settings where much of the global burden resides.

The scale and consequences of the problem

Global data suggest sustained hypertension affects approximately 4% of children,[2] with higher rates reported in sub-Saharan Africa and South Asia, although not reflected in global analyses. Prevalence continues to rise, driven by obesity, unhealthy dietary patterns, physical inactivity, adverse childhood experiences, poor sleep, and broader socioecological pressures. Childhood blood pressure tracks strongly into adulthood. Longitudinal data from the International Childhood Cardiovascular Cohorts Consortium show that elevated systolic blood pressure in childhood is directly associated with increased risk of cardiovascular events in mid-life.[3] Children with blood pressure above the 90th percentile have roughly double the risk of fatal or nonfatal adult cardiovascular outcomes.[4] In addition, paediatric hypertension is associated with early target organ injury long before clinical events occur, including left ventricular hypertrophy and vascular changes.[5] The life-course implications are illustrated in **Figure 1** of the paper, which maps the progression from childhood hypertension to adult cardiovascular and kidney disease. The trajectory is importantly, modifiable.

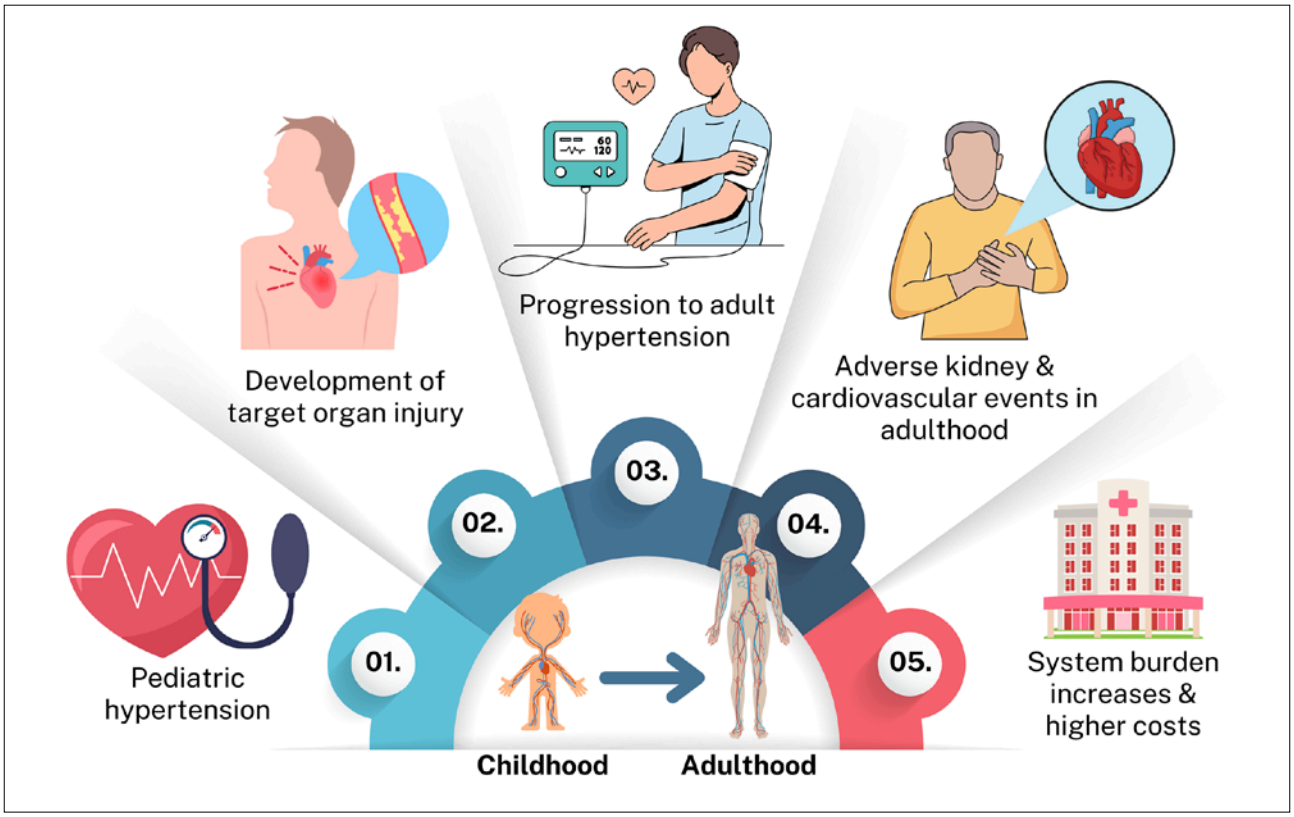
Getting the diagnosis right

Accurate blood pressure measurement is fundamental.[6] In children, diagnostic thresholds are percentile-based and differ slightly across regions. This complexity contributes to under-recognition.

We emphasise several practical points:

- Use devices that have been validated specifically in children
- Select the correct cuff size based on measured mid-upper arm circumference
- Ensure appropriate technique patient positioning, and repeated measurements
- Confirm elevated values across multiple visits

Figure 1. Long-term clinical consequences of paediatric hypertension across the life course.



Out-of-office measurement, i.e., ambulatory blood pressure monitoring (ABPM) is particularly valuable in children, as it detects white-coat hypertension, masked hypertension, and nocturnal hypertension.[7] Masked hypertension especially carries cardiovascular risk comparable to sustained hypertension, and may otherwise be missed without ABPM. Although ABPM availability varies globally, its use should be prioritised where feasible. Home blood pressure measurement is an additional approach to out-of-office measurement, although further research is needed regarding validity and interpretation.

Evaluating the child in front of you

Unlike in adults, secondary hypertension remains relatively common in younger children, with renal causes predominating.[8] A sequential, targeted evaluation is recommended. Not every child requires extensive testing, but further work-up should be considered in:

- Children younger than 6 years
- Stage 2 hypertension without obesity
- Severe or symptomatic hypertension
- Presence of target organ injury
- Suspicion of syndromic or endocrine causes

Assessment of target organ injury is essential for risk stratification and treatment decisions.[9] Echocardiography to evaluate left ventricular mass and basic renal evaluation (urinalysis and estimated GFR) are key components.

Lifestyle is the cornerstone

Lifestyle modification remains the foundation of management and often the most powerful intervention.

Core recommendations include:

- Reducing sodium intake (approximately 2000 mg/day in adolescents)
- Shifting toward minimally processed foods
- Limiting sugar-sweetened beverages
- Encouraging ≥60 minutes of moderate-to-vigorous physical activity daily
- Limiting recreational screen time to <2 hours/day
- Promoting age-appropriate sleep
- Addressing stress and psychosocial wellbeing

These interventions must be culturally sensitive and socioeconomically realistic. Family engagement is critical. Children rarely control their food or activity environments. Motivational interviewing, caregiver modelling, and school-based programmes can significantly enhance adherence.

When medication is needed

Pharmacotherapy should not be delayed when clearly indicated. Current guidelines recommend initiating medication in youth with:

- Persistent hypertension despite 6-12 months of lifestyle intervention
- Stage 2 hypertension
- Symptomatic hypertension
- Hypertension associated with diabetes, chronic kidney disease, or established target organ injury

As in adults, ACE inhibitors, angiotensin receptor blockers, long-acting calcium channel blockers, or thiazide diuretics are all acceptable first-line medication options. Evidence suggests similar blood pressure-lowering efficacy across major drug classes in children.[10] Combination preparations have not been studied systematically in children but may be appropriate in selected patients. Treatment targets vary slightly between guidelines, but generally aim for below the 90th percentile in younger children and <130/80 mmHg in adolescents.

A global call to act earlier

Paediatric hypertension has historically been under-recognised and inconsistently managed. Meanwhile, the global burden of cardiovascular disease continues to grow. If we are serious about prevention, we must begin earlier in the life course. This ISH position paper provides practical, globally relevant guidance to help clinicians identify, evaluate, and manage hypertension in youth. The opportunity before us is substantial: with early detection and timely intervention we can alter the cardiovascular trajectory of an entire generation.

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References:

1. Flynn JT, Kruger R, Brady TM, et al. Practical approach to evaluate and manage hypertension in youth: an International Society of Hypertension position paper. J Hypertens. 2026;44:000–000. doi: 10.1097/HJH.0000000000004238. Epub ahead of print. PMID: 41674374

2. Ruan X, Zhu A, Wang T, Sun M, Chen K, Luo M, Li Z, Zou Q, Chen Y, Peng Y, Qin J. Global Prevalence of Hypertension in Children and Adolescents Younger Than 19 Years: A Systematic Review and Meta-Analysis. JAMA Pediatr. 2025; 179(9):987-999.

3. Juhola J, Magnussen CG, Berenson GS, Venn A, Burns TL, Sabin MA, Srinivasan SR, Daniels SR, Davis PH, Chen W, Kähönen M, Taittonen L, Urbina E, Viikari JSA, Dwyer T, Raitakari OT, Juonala M. Combined effects of child and adult elevated blood pressure on subclinical atherosclerosis: the International Childhood Cardiovascular Cohort Consortium. Circulation. 2013; 128(3):217-24.

4. Jacobs DR Jr, Woo JG, Sinaiko AR, Daniels SR, Ikonen J, Juonala M, Kartiosuo N, Lehtimäki T, Magnussen CG, Viikari JSA, Zhang N, Bazzano LA, Burns TL, Prineas RJ, Steinberger J, Urbina EM, Venn AJ, Raitakari OT, Dwyer T. Childhood Cardiovascular Risk Factors and Adult Cardiovascular Events. N Engl J Med. 2022; 386(20):1877-1888.

5. Flynn JT, Kaelber DC, Baker-Smith CM, Blowey D, Carroll AE, Daniels SR, de Ferranti SD, Dionne JM, Falkner B, Flinn SK, Gidding SS, Goodwin C, Leu MG, Powers ME, Rea C, Samuels J, Simasek M, Thaker VV, Urbina EM; SUBCOMMITTEE ON SCREENING AND MANAGEMENT OF HIGH BLOOD PRESSURE IN CHILDREN. Clinical Practice Guideline for Screening and Management of High Blood Pressure in Children and Adolescents. Pediatrics. 2017;140(3):e20171904.

6. Lurbe E, Agabiti-Rosei E, Cruickshank JK, Dominiczak A, Erdine S, Hirth A, Invitti C, Litwin M, Mancia G, Pall D, Rascher W, Redon J, Schaefer F, Seeman T, Sinha M, Stabouli S, Webb NJ, Wühl E, Zanchetti A. 2016 European Society of Hypertension guidelines for the management of high blood pressure in children and adolescents. J Hypertens. 2016; 34(10):1887-920.

7. Stergiou GS, Bountzona I, Alamara C, Vazeou A, Kollias A, Ntineri A. Reproducibility of Office and Out-of-Office Blood Pressure Measurements in Children: Implications for Clinical Practice and Research. Hypertension. 2021 ;77(3):993-1000.

8. Banati P, Vedechkina M, Krishna A, Santos RJ, Banerjee A, Baltag V. WHO's global roadmap to tackle adolescent hypertension. Lancet Child Adolesc Health 2025; 9:367–368.

9. Robinson CH, Chanchlani R. High blood pressure in children and adolescents: current perspectives and strategies to improve future kidney and cardiovascular health. Kidney Int Rep 2022; 7:954–970.

10. Simonetti GD, Rizzi M, Donadini R, Bianchetti MG. Effects of antihypertensive drugs on blood pressure and proteinuria in childhood. J Hypertens 2007; 25:2370–2376.