

Randall Children's Hospital

Co-Management and Referral Guidelines

Evaluation of Hypertension in Children

Randall Children's Nephrology

Phone: 503-413-3926

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Introduction

- The prevalence of pediatric hypertension has increased over the past two decades.
- Childhood hypertension can lead to early onset cardiovascular disease.
- Risk factors for hypertension include: overweight/obesity, minority race/ethnicity, prematurity, dyslipidemia, type 1 or type 2 diabetes mellitus, sleep apnea, parental hypertension.
- Ambulatory Blood Pressure Monitoring (ABPM) is a portable automated blood pressure (BP) device that can measure a child's BP for 18–24 hours and thus provide more BP measurements.

Diagnosis of hypertension in children is based on the child's BP in the context of age, gender and height.

See links to online BP tables at the end of this document.

- Normal Blood Pressure (BP) = Systolic BP (SBP) **and** Diastolic BP (DBP) < 90th percentile
- Prehypertension = SBP and/or DBP ≥ 90th to < 95th percentile
- Hypertension = SBP and/or DBP ≥ 95th percentile
 - Stage 1 Hypertension = SBP and/or DBP ≥ 95th to < 99th percentile + 5 mmHg
 - Stage 2 Hypertension = SBP and/or DBP ≥ 99th percentile + 5 mmHg

Evaluation and Management

Initial Evaluation

- Healthy children ≥ 3 years — BP should be taken in upper extremity at each health care visit.^{1,2}
- Children with a chronic illness should have BP taken in upper extremity at each health care visit regardless of age.^{1,2}

¹ For elevated BPs taken with automated device → recheck with a manual BP cuff.

² Correct BP cuff size = cuff bladder (inflatable portion) wraps 100 percent around the circumference of the arm (err on using larger BP cuff if the size is borderline).

- Concerning exam findings: overweight/obesity, tachycardia, gallop, crackles, diaphoresis, flushing, papilledema, acanthosis nigricans, thyroid enlargement, truncal obesity, abdominal bruit

Initial Management

- Normal BP → educate family on heart healthy lifestyle
- Prehypertension → discuss therapeutic lifestyle changes, then recheck BP every six months
- Stage 1 Hypertension → repeat manual BP on three visits, and if BPs are still elevated:
 1. Refer to Randall Children's Nephrology for ABPM study, evaluation and management;OR
 2. Initiate evaluation for target-organ damage: CBC, basic metabolic panel, TSH, free T4, urinalysis, fasting glucose, fasting lipid panel, eye exam, echocardiogram (looking for coarctation or left ventricular hypertrophy), renal ultrasound + renal doppler study.
Discuss therapeutic lifestyle changes and refer to Randall Children's Nephrology.
- Stage 2 Hypertension → refer to Randall Children's Nephrology for complete evaluation.

(continued)



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When to refer

- Stage 1 Hypertension on three BP measurements
- Stage 2 Hypertension
- Patients presenting with acute onset of headaches, visual changes and/or mental status changes → please refer to ER and/or contact on-call pediatric nephrologist.

Referral process

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For urgent referrals, call Legacy One Call Consult & Transfer: 1-800-500-9111 to speak with the on-call pediatric nephrologist.

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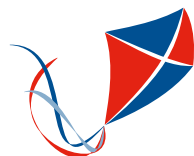
Sharon Su, M.D.

Additional Resources

1. NIH Blood Pressure Tables for Children and Adolescents:
http://www.nhlbi.nih.gov/guidelines/hypertension/child_tbl.htm
2. NIH Pocket Guide to Blood Pressure Measurement in Children:
https://www.nhlbi.nih.gov/health/public/heart/hbp/bp_child_pocket/bp_child_pocket.pdf
3. Baylor College of Medicine Age-based Pediatric Blood Pressure Reference Charts:
<https://www.bcm.edu/bodycomplab/Flashapps/BPVAgeChartpage.html>
4. The Fourth Report on the Diagnosis, Evaluation and Treatment of High Blood Pressure in Children and Adolescents:
http://www.nhlbi.nih.gov/health/prof/heart/hbp/hbp_ped.pdf
5. UpToDate® Blood pressure percentiles for boys (2 to 17 years):
<http://www.uptodate.com/contents/calculator-blood-pressure-percentiles-for-boys-2-to-17-years>
6. UpToDate® Blood pressure percentiles for girls (2 to 17 years):
<http://www.uptodate.com/contents/calculator-blood-pressure-percentiles-for-girls-2-to-17-years>
7. UpToDate® Blood pressure measurement:
http://www.uptodate.com/contents/image?imageKey=PEDS/64977&topicKey=PEDS%2F6087&source=outline_link&search=hypertension+in+children+bp+cuff
8. UpToDate® Determining appropriate blood pressure cuff size in children:
http://www.uptodate.com/contents/image?imageKey=PEDS/73414&topicKey=PEDS%2F6087&source=outline_link&search=hypertension+in+children+bp+cuff
9. Flynn JT. Neonatal Hypertension. *Pediatr Nephrol.* 2000 Apr. 14(4):332–41.
10. Tips from Pediatrician: How to Measure Blood Pressure in Children:
https://www.youtube.com/watch?v=VBKTG_toBiw
11. Taking a Child's Blood Pressure:
<https://www.youtube.com/watch?v=H1YrHuYH34M>
12. How to Take Blood Pressure: Tips for Taking Blood Pressure:
<https://www.youtube.com/watch?v=tB8nISCEs8>

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Find this and other co-management/referral guidelines online at: www.legacyhealth.org/randallguidelines



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