

Pediatric Hypertension Epidemiologic Overview

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November 18, 2025 | MDPH Blood Pressure Training

About Me

- Assistant Professor in Division of Preventive and Behavioral Medicine within Department of Population and Quantitative Health Sciences

Behavioral epidemiologist and applied public health researcher who conducts mixed methods research focused on implementing evidenced based interventions to promote prevention of chronic disease in pediatric and adolescent populations

Goals

Increase awareness of the importance of blood pressure in youth



Shift prevention efforts upstream and support life course perspective



Cardiovascular disease prevention

Outline

- American Academy of Pediatrics Clinical Practice Guidelines
 - Definition and diagnostic process
- Prevalence of pediatric hypertension
 - Nationally and locally
- Impact of pediatric hypertension across the life course
- Risk factors for pediatric hypertension
- Management of hypertension in youth
- Resources

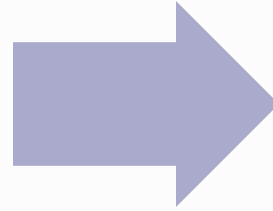
A Shift in Thinking about Pediatric Hypertension

1970s

Task Force Report on High Blood Pressure in Children and Adolescents

- Blood pressure begins to be commonly measured in asymptomatic youth
- Using adult definition of hypertension
- Children must be severely hypertensive to meet this criteria

Pediatric hypertension was thought to be rare, and most cases are secondary



Current 2017

American Academy of Pediatrics Clinical Practice Guidelines for Screening and Management of High Blood Pressure in Children and Adolescents

- Blood pressure screening is recommended at least yearly for all children aged 3 years and older
- Definition is based on age, height, and gender adjusted normative data

Pediatric hypertension is common, and most cases do not have a secondary cause

AAP Blood Pressure Guidelines for Youth

- BP should be measured yearly for kids 3+
- BP should be checked at every health care encounter for kids at increased risk (with obesity, renal disease, aortic arch obstruction or coarctation, or diabetes and on medications that impact BP)
- Diagnosis HTN if a child or adolescent has auscultatory-confirmed BP readings ≥ 95 th percentile on 3 different visits
- Clinicians should provide advice on the DASH diet and recommend moderate to vigorous physical activity at least 3 to 5 days per week (30–60 minutes per session) to help reduce BP

CLINICAL PRACTICE GUIDELINE Guidance for the Clinician in Rendering Pediatric Care

American Academy
of Pediatrics



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Clinical Practice Guideline for Screening and Management of High Blood Pressure in Children and Adolescents

Joseph T. Flynn, MD, MS, FAAP,^a David C. Kaelber, MD, PhD, MPH, FAAP, FACP, FACMI,^b Carissa M. Baker-Smith, MD, MS, MPH, FAAP, FAHA,^c Douglas Blowey, MD,^d Aaron E. Carroll, MD, MS, FAAP,^e Stephen R. Daniels, MD, PhD, FAAP,^f Sarah D. de Ferranti, MD, MPH, FAAP,^g Janis M. Dionne, MD, FRCPC,^h Bonita Falkner, MD,ⁱ Susan K. Flinn, MA,^j Samuel S. Gidding, MD,^k Celeste Goodwin,^l Michael G. Leu, MD, MS, MHS, FAAP,^m Makia E. Powers, MD, MPH, FAAP,ⁿ Corinna Rea, MD, MPH, FAAP,^o Joshua Samuels, MD, MPH, FAAP,^p Madeline Simasek, MD, MSCP, FAAP,^q Vidhu V. Thaker, MD, FAAP,^r Elaine M. Urbina, MD, MS, FAAP,^s SUBCOMMITTEE ON SCREENING AND MANAGEMENT OF HIGH BLOOD PRESSURE IN CHILDREN

Definition of Pediatric Hypertension

Based on distribution of blood pressure levels in large sample of health children

For Children Aged 1–<13 y	For Children Aged ≥13 y
Normal BP: <90th percentile	Normal BP: <120/<80 mm Hg
Elevated BP: ≥90th percentile to <95th percentile or 120/80 mm Hg to <95th percentile (whichever is lower)	Elevated BP: 120/<80 to 129/<80 mm Hg
Stage 1 HTN: ≥95th percentile to <95th percentile + 12 mmHg, or 130/80 to 139/89 mm Hg (whichever is lower)	Stage 1 HTN: 130/80 to 139/89 mm Hg
Stage 2 HTN: ≥95th percentile + 12 mm Hg, or ≥140/90 mm Hg (whichever is lower)	Stage 2 HTN: ≥140/90 mm Hg

Definition of Pediatric Hypertension

Children and Adolescents

- Based on distribution of blood pressure levels in large sample of healthy children

For Children Aged 1–<13 y	For Children Aged ≥13 y
Normal BP: <90th percentile	Normal BP: <120/<80 mm Hg
Elevated BP: ≥90th percentile to <95th percentile or 120/80 mm Hg to <95th percentile (whichever is lower)	Elevated BP: 120/<80 to 129/<80 mm Hg
Stage 1 HTN: ≥95th percentile to <95th percentile + 12 mmHg, or 130/80 to 139/89 mm Hg (whichever is lower)	Stage 1 HTN: 130/80 to 139/89 mm Hg
Stage 2 HTN: ≥95th percentile + 12 mm Hg, or ≥140/90 mm Hg (whichever is lower)	Stage 2 HTN: ≥140/90 mm Hg

Adults

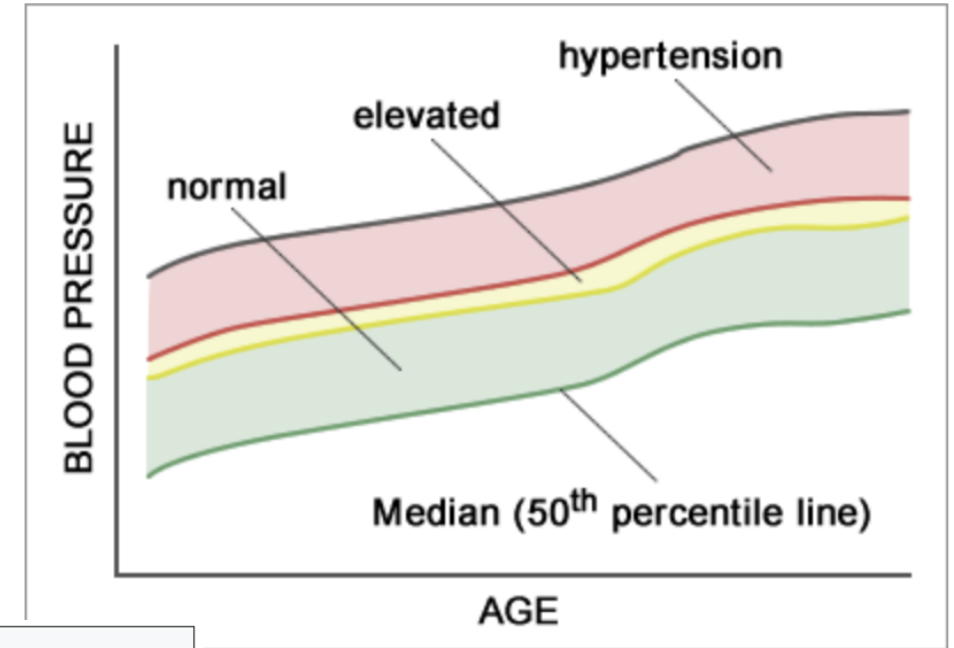
- Based on levels related to adverse outcomes in adulthood (heart attack, stroke, etc.)

Blood Pressure Categories



BLOOD PRESSURE CATEGORY	SYSTOLIC mm Hg (upper number)		DIASTOLIC mm Hg (lower number)
NORMAL	LESS THAN 120	and	LESS THAN 80
ELEVATED	120 – 129	and	LESS THAN 80
HIGH BLOOD PRESSURE (HYPERTENSION) STAGE 1	130 – 139	or	80 – 89
HIGH BLOOD PRESSURE (HYPERTENSION) STAGE 2	140 OR HIGHER	or	90 OR HIGHER
HYPERTENSIVE CRISIS (consult your doctor immediately)	HIGHER THAN 180	and/or	HIGHER THAN 120

Blood Pressure Tables



BP Levels for Boys by Age and Height Percentile

Age (y)	BP Percentile	SBP (mm Hg)							DBP (mm Hg)						
		Height Percentile or Measured Height							Height Percentile or Measured Height						
		5%	10%	25%	50%	75%	90%	95%	5%	10%	25%	50%	75%	90%	95%
5	Height (in)	41.1	41.8	43.0	44.3	45.5	46.7	47.4	41.1	41.8	43.0	44.3	45.5	46.7	47.4
	Height (cm)	104.4	106.2	109.1	112.4	115.7	118.6	120.3	104.4	106.2	109.1	112.4	115.7	118.6	120.3
	50th	91	92	93	94	95	96	96	51	51	52	53	54	55	55
	90th	103	104	105	106	107	108	108	63	64	65	65	66	67	67
	95th	107	108	109	109	110	111	112	66	67	68	69	70	70	71
	95th + 12 mm Hg	119	120	121	121	122	123	124	78	79	80	81	82	82	83

Simplified Values for Further Evaluation

Screening BP Values Requiring Further Evaluation

Age, y	BP, mm Hg			
	Boys		Girls	
	Systolic	DBP	Systolic	DBP
1	98	52	98	54
2	100	55	101	58
3	101	58	102	60
4	102	60	103	62
5	103	63	104	64
6	105	66	105	67
7	106	68	106	68
8	107	69	107	69
9	107	70	108	71
10	108	72	109	72
11	110	74	111	74
12	113	75	114	75
≥13	120	80	120	80

Measurement Best Practices

- Seated
 - Child seated in a quiet room for 3–5 min before measurement, with the back supported and feet uncrossed on the floor
- Right Arm
 - BP should be measured in the right arm (for consistency, for comparison with standard tables, and to avoid a falsely low in the case of coarctation of the aorta)
 - Arm should be at heart level, supported, and uncovered above the cuff
 - Child and observer should not speak while the measurement is being taken
- Cuff Size
 - The correct cuff size should be used
 - The bladder length should be 80%–100% of the circumference of the arm, and the width should be at least 40%

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Measurement Best Practices

- Measurement
 - Bell of the stethoscope should be placed over the brachial artery in the antecubital fossa, and the lower end of the cuff should be 2–3 cm above the antecubital fossa.
 - The cuff should be inflated to 20–30 mm Hg above the point at which the radial pulse disappears.
 - Overinflation should be avoided.
 - The cuff should be deflated at a rate of 2–3 mm Hg per second.
 - The first (phase I Korotkoff) and last (phase V Korotkoff) audible sounds should be taken as SBP and DBP. If the Korotkoff sounds are heard to 0 mm Hg, the point at which the sound is muffled (phase IV Korotkoff) should be taken as the DBP, or the measurement repeated with less pressure applied over the brachial artery.
 - The measurement should be read to the nearest 2 mm Hg.

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EQIPP

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Available on [PediaLink](#)

Blood Pressure Measurement in Children

Watchable by westboroughk12.org.

BLOOD PRESSURE MEASUREMENT IN CHILDREN (correct technique)



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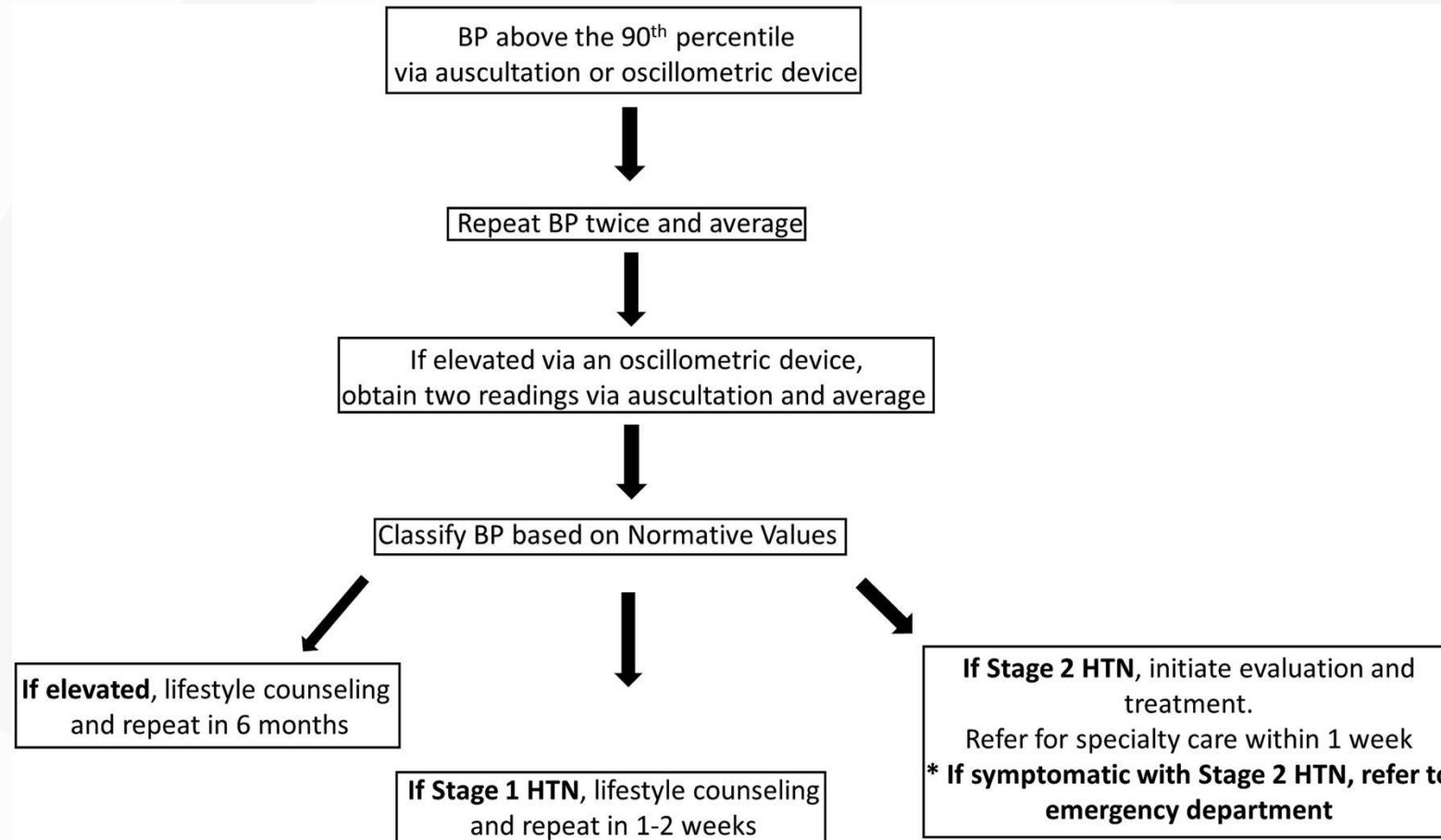
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https://www.youtube.com/watch?v=bYcCkiXJA_Q

AAP Blood Pressure Guidelines for Youth



AAP Blood Pressure Guidelines for Youth

Screening

Follow-up
(2 additional screenings)

Diagnosis

How Common is Hypertension in Youth?



~1 in every 25 youth in the US has hypertension

~1 in every 10 kids with overweight/obesity has hypertension

~13-18% of youth in the US have elevated blood pressure

Child Characteristics and Prevalence

National Data 2018 (NHANES)

Prevalence increases with increasing BMI

Characteristic	Elevated blood pressure			Hypertensive blood pressure		
	Prevalence, % (95% CI)	Crude Prevalence Difference (95% CI)	Prevalence Difference Adjusted for Overweight/Obesity, % (95% CI)	Prevalence, % (95% CI)	Crude Prevalence Difference (95% CI)	Prevalence Difference Adjusted for Overweight/Obesity, % (95% CI)
BMI percentile^c						
Healthy weight, <85	4.9 (4.1 to 5.9)	Reference	NA	2.2 (1.7 to 2.8)	Reference	NA
Overweight, ≥85 to <95	9.2 (7.1 to 12.0)	4.3 (1.8 to 6.8)		4.1 (2.7 to 6.1)	1.9 (0.3 to 3.5)	
Obesity, ≥95	12.7 (10.7 to 15.1)	7.8 (5.7 to 9.9)		8.6 (6.9 to 10.9)	6.4 (4.3 to 8.6)	

Child Characteristics and Prevalence

Prevalence increases with age and is higher in males

Characteristic	Elevated blood pressure			Hypertensive blood pressure		
	Prevalence, % (95% CI)	Crude Prevalence Difference (95% CI)	Prevalence Difference Adjusted for Overweight/Obesity, % (95% CI)	Prevalence, % (95% CI)	Crude Prevalence Difference (95% CI)	Prevalence Difference Adjusted for Overweight/Obesity, % (95% CI)
Age, y						
8–9	5.9 (4.4 to 8.0)	Reference	Reference	6.0 (4.6 to 8.0)	Reference	Reference
10–12	4.3 (3.2 to 6.0)	(–3.6 to 0.5)	–1.7 (–3.6 to 0.3)	4.0 (3.0 to 5.3)	–2.1 (–4.1 to 0.02)	–1.5 (–3.6 to 0.7)
13–15	7.0 (5.6 to 8.8)	(–1.2 to 3.4)	0.7 (–1.5 to 2.8)	2.0 (1.4 to 2.8)	–4.1 (–5.9 to –2.3)	–3.8 (–5.6 to –2.0)
16–17	12.8 (10.4 to 15.8)	(3.7 to 10.2)	6.3 (3.2 to 9.4)	4.5 (3.2 to 6.3)	–1.6 (–3.9 to 0.8)	–1.4 (–3.6 to 0.7)
Sex						
Female	4.9 (3.9 to 6.1)	Reference	Reference	3.0 (2.2 to 4.1)	Reference	Reference
Male	9.6 (8.1 to 11.2)	4.6 (2.8 to 6.5)	4.6 (2.7 to 6.4)	4.7 (3.7 to 5.9)	1.7 (0.2 to 3.2)	1.3 (–0.2 to 2.8)

Child Characteristics and Prevalence

Prevalence is higher in non-Latino Black and Mexican American children

Characteristic	Elevated blood pressure			Hypertensive blood pressure		
	Prevalence, % (95% CI)	Crude Prevalence Difference (95% CI)	Prevalence Difference Adjusted for Overweight/Obesity, % (95% CI)	Prevalence, % (95% CI)	Crude Prevalence Difference (95% CI)	Prevalence Difference Adjusted for Overweight/Obesity, % (95% CI)
Race/ethnicity						
Non-Latino White	6.3 (5.1 to 7.9)	Reference	Reference	3.2 (2.4 to 4.3)	Reference	Reference
Non-Latino Black	10.4 (8.8 to 12.1)	4.0 (2.1 to 5.9)	4.0 (2.2 to 5.8)	4.4 (3.3 to 5.8)	1.2 (−0.3 to 2.7)	0.5 (−0.8 to 1.9)
Mexican American	8.4 (6.8 to 10.5)	2.1 (−0.1 to 4.3)	1.6 (−0.5 to 3.7)	5.2 (3.9 to 6.8)	2.0 (0.1 to 3.9)	1.3 (−0.4 to 2.9)
Other Latino ^d	8.0 (6.0 to 10.6)	1.7 (−0.9 to 4.3)	1.7 (−0.7 to 4.1)	3.9 (2.4 to 6.2)	0.7 (−1.2 to 2.6)	0.3 (−1.5 to 2.0)
Non-Latino Asian ^d	4.6 (2.9 to 7.4)	−1.7 (−4.5 to 1.0)	−0.2 (−2.8 to 2.5)	4.3 (2.8 to 6.4)	1.1 (−0.7 to 2.9)	1.5 (−0.2 to 3.1)
Other ^{d,e}	6.7 (4.2 to 10.7)	0.4 (−2.9 to 3.7)	0.2 (−2.7 to 3.1)	5.5 (3.5 to 8.6)	2.3 (−0.4 to 5.1)	1.9 (−0.6 to 4.4)

Child Characteristics and Prevalence

Prevalence is higher in children from families with lower education/income

Characteristic	Elevated blood pressure			Hypertensive blood pressure		
	Prevalence, % (95% CI)	Crude Prevalence Difference (95% CI)	Prevalence Difference Adjusted for Overweight/Obesity, % (95% CI)	Prevalence, % (95% CI)	Crude Prevalence Difference (95% CI)	Prevalence Difference Adjusted for Overweight/Obesity, % (95% CI)
Family education						
≥College graduate	5.4 (4.0 to 7.4)	Reference	Reference	3.9 (2.7 to 5.5)	Reference	Reference
High school diploma/GED/some college	8.0 (6.8 to 9.4)	2.5 (0.6 to 4.5)	1.6 (−0.3 to 3.5)	3.8 (3.0 to 4.9)	−0.02 (−1.7 to 1.7)	−0.7 (−2.4 to 0.9)
8.0 (6.5 to 9.9)2.6 (0.4 to 4.8)2.1 (0.0 to 4.3)3.8 (2.8 to 5.2)−0.06 (−1.8 to 1.7)−0.5 (−2.3 to 1.3)						
Family income^f						
High	5.8 (4.2 to 7.9)	Reference	Reference	3.1 (2.1 to 4.5)	Reference	Reference
Medium	7.8 (6.5 to 9.2)	2.0 (−0.3 to 4.2)	1.3 (−1.1 to 3.6)	4.0 (3.1 to 5.2)	0.9 (−0.7 to 2.6)	0.4 (−0.9 to 1.7)
Low	8.4 (7.3 to 9.6)	2.6 (1.4 to 4.0)	1.4 (−0.4 to 3.2)	4.6 (3.6 to 5.8)	1.4 (−0.2 to 3.0)	0.6 (−0.8 to 2.1)

Local Context



228 children in obesity prevention program based in Worcester Public Schools

~30% had BP measurements that in elevated or hypertensive range

<5 parents reported child has history of high blood pressure

Primary vs. Secondary HTN

Primary

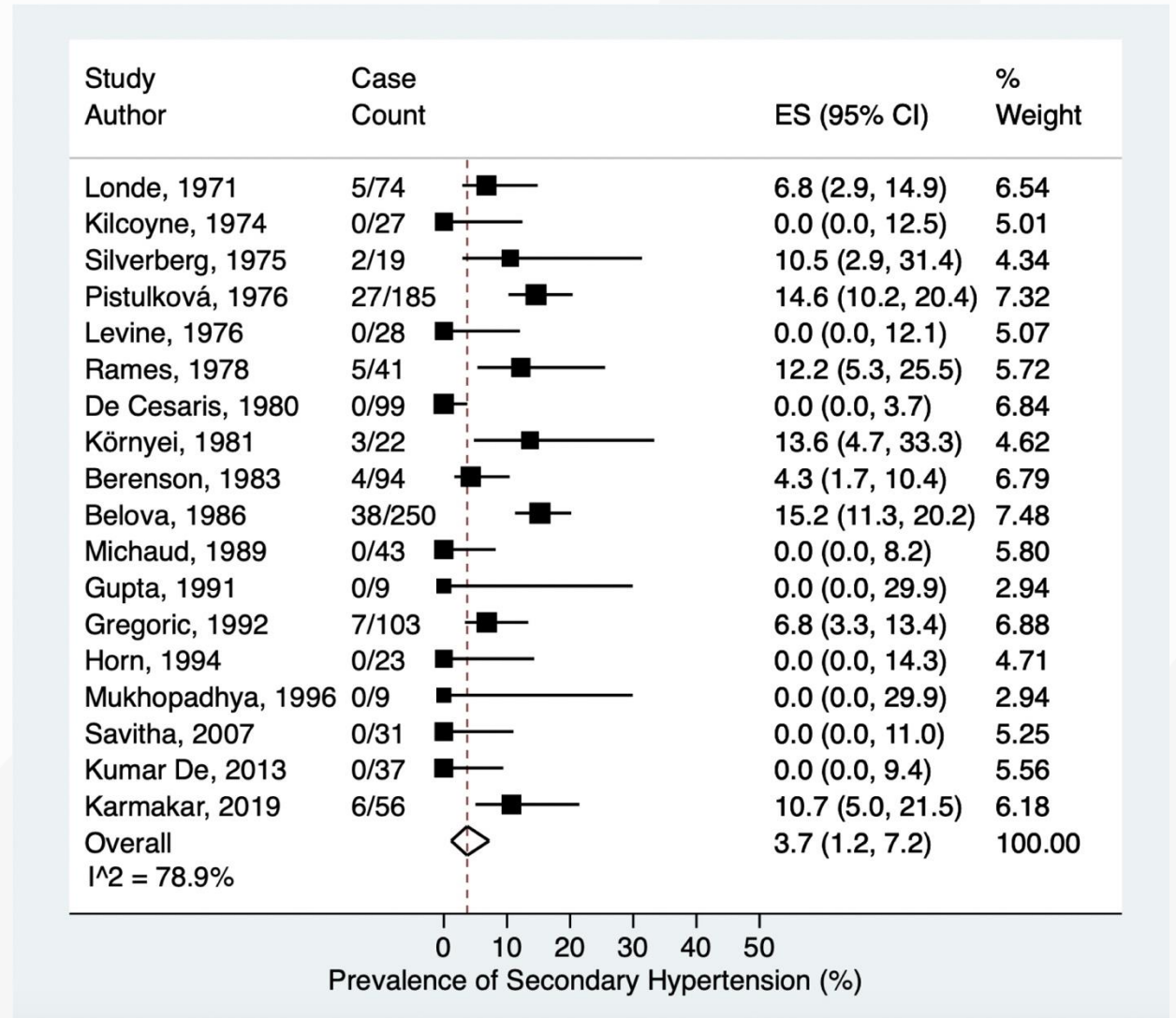
- Predominant type of HTN
- Typically seen in children 6+ years old, often seen with overweight/obesity and with family history of HTN

Secondary

- Less common
- Causes:
 - Renal or Renovascular (most prominent)
 - Cardiac/Aortic Coarctation
 - Endocrine
 - Environmental Exposures
 - Neurofibromatosis
 - Medication Related (oral contraceptives, corticosteroids, nervous system stimulants)
 - Monogenic

Secondary HTN

- About 3.7% of newly diagnosed hypertension is secondary (from school and primary care settings)
- 77-97% of secondary hypertension- intrinsic kidney disease or renovascular disease



Why Youth Blood Pressure Matters

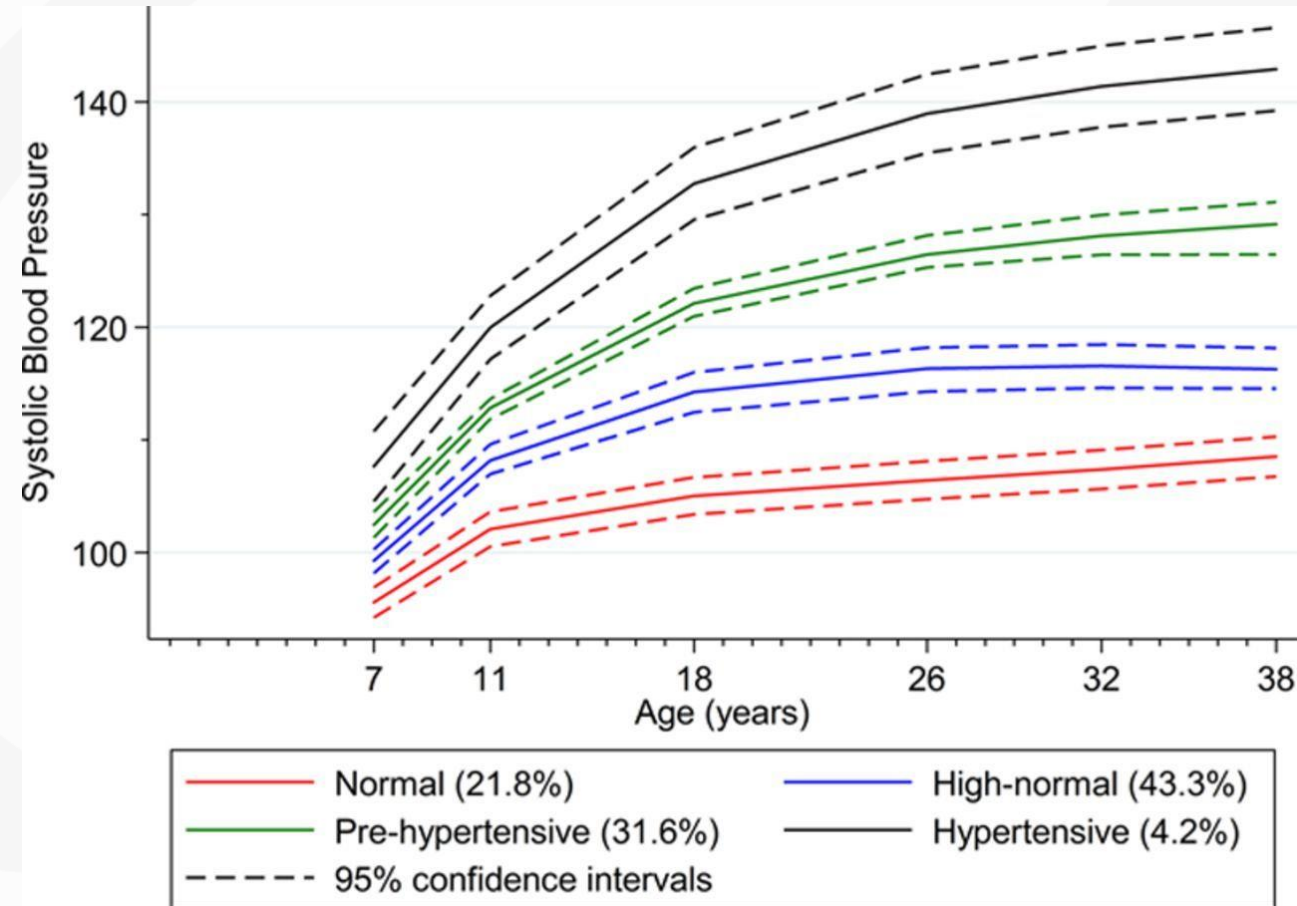


Risk in Youth



Risk in Adulthood

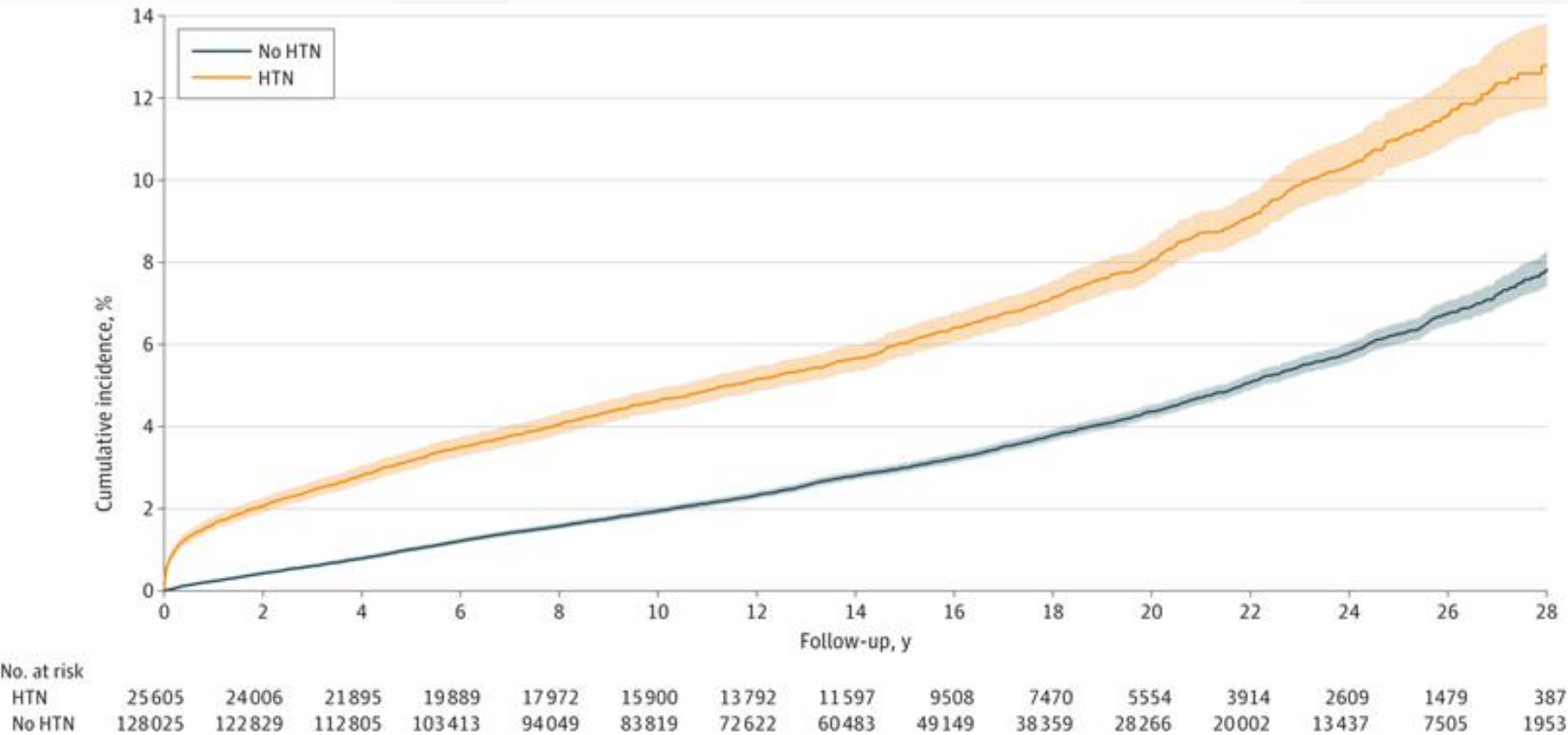
Why Youth Blood Pressure Matters



Theodore RF, Broadbent J, Nagin D, et al. Childhood to Early-Midlife Systolic Blood Pressure Trajectories. *Hypertension*. 2015;66(6):1108-1115. doi:10.1161/HYPERTENSIONAHA.115.05831

Why Youth Blood Pressure Matters

Cumulative Probability of Major Adverse Cardiac Events Among Children Diagnosed with Hypertension vs Controls Without Hypertension



Why Youth Blood Pressure Matters

ARTICLES | OCTOBER 14 2024

Predictors in Youth of Adult Cardiovascular Events

- Elevated BP associated with 45% increased risk of CVD events in adulthood
- BMI in overweight range associated with 96% increased risk of CVD events in adulthood
- BMI in obese range associated with 173% increase in risk of CVD events in adulthood
- Smoking, high total cholesterol, triglycerides, LDL and HDL also associated with increased risk

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Risk Factors for Hypertension in Youth

Overweight/Obesity

Diet

Physical Activity

Sleep

Stress

Family History

Importance of Addressing Risk Factors

15-year study of 5,115 young adults (18-30 years)

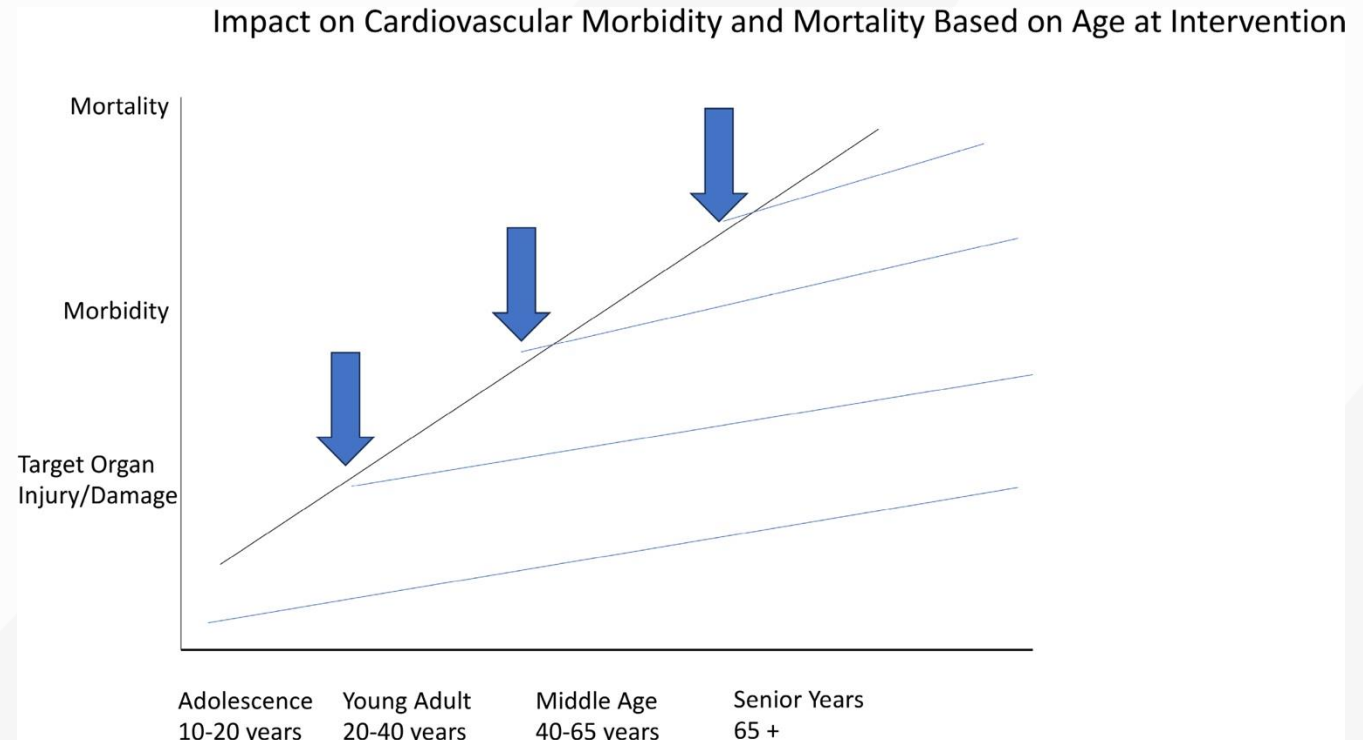
- Young adult levels of modifiable risk factors predict the odds of developing heart disease in middle age as well as or better than levels of risk factors measured in middle age
- earlier risk assessment and efforts to encourage young adults to achieve and maintain optimal levels are needed



Importance of Addressing Risk Factors

SHIP AHOY Study

- Used echocardiography to investigate cardiac changes in youth ages 11-18
- BP in youth is associated with left atrial size and function



Management of Hypertension in Youth

Weight
management

Low sodium diet
(DASH)

Physical activity

Reduce
stress/improve
sleep

Antihypertensives

Lifestyle Change Interventions

DASH Eating Plan

The Benefits: Lowers blood pressure & LDL “bad” cholesterol.



Eat This



Limit This

 Vegetables	 Fatty meats
 Fruits	
 Whole grains	 Full-fat dairy
 Fat-free or low-fat dairy	
 Fish	 Sugar sweetened beverages
 Poultry	
 Beans	 Sweets
 Nuts & seeds	
 Vegetable oils	 Sodium intake

www.nhlbi.nih.gov/DASH

HOW MUCH SALT DOES YOUR CHILD EAT?

How much sodium do kids eat on average?

- Kids 6-10: 2,903 mg of sodium
- Kids 11-13: 3,194 mg of sodium
- Kids 14-18: 3,672 mg of sodium
- Recommended daily value for sodium intake = 1,500 mg



Lifestyle Change Interventions

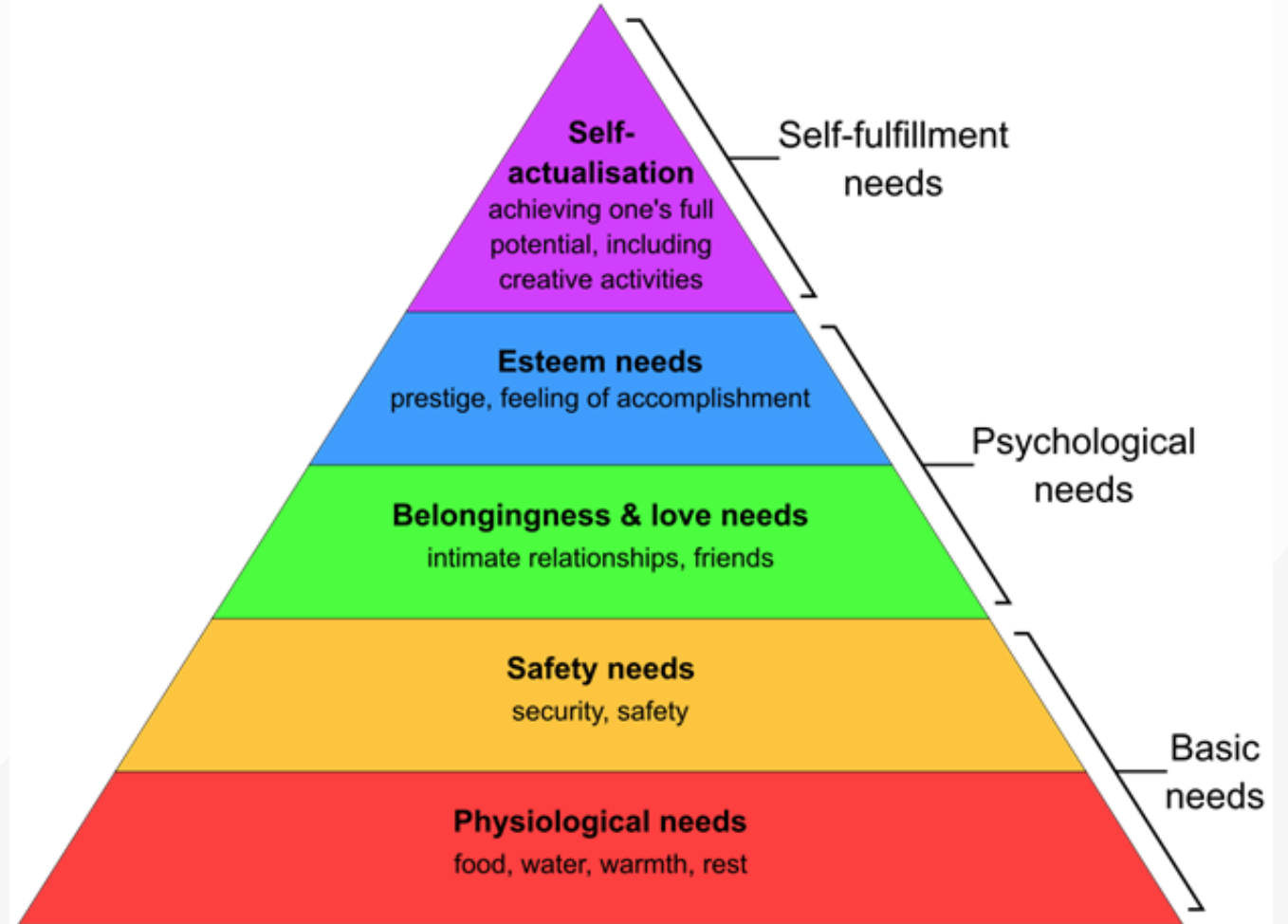
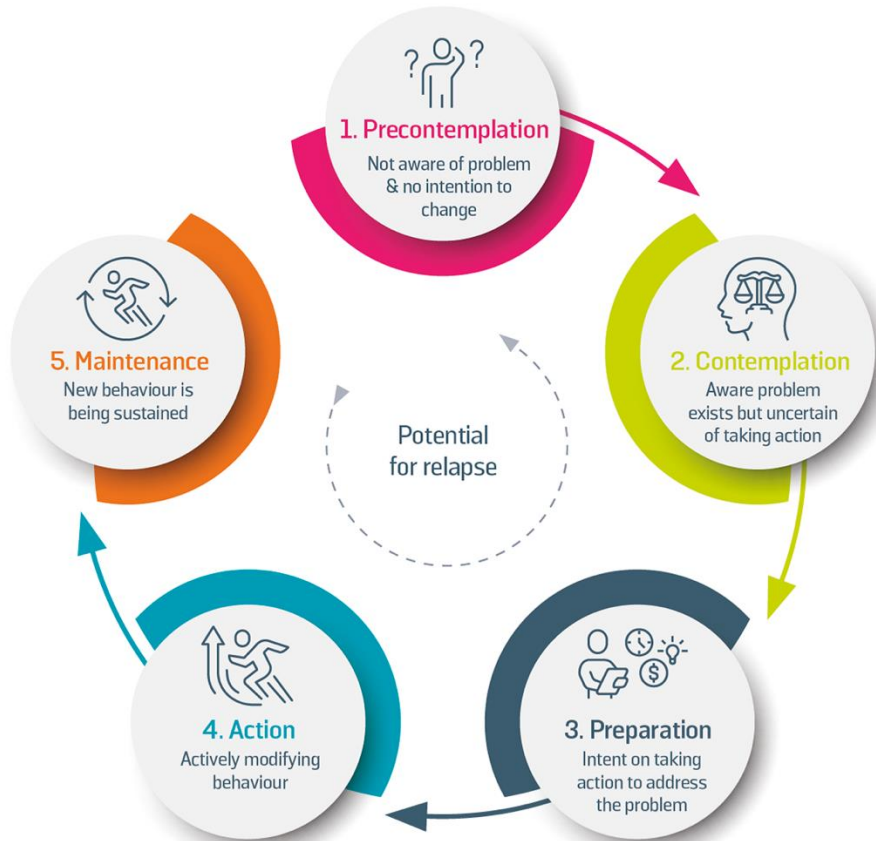


Lifestyle Change Interventions

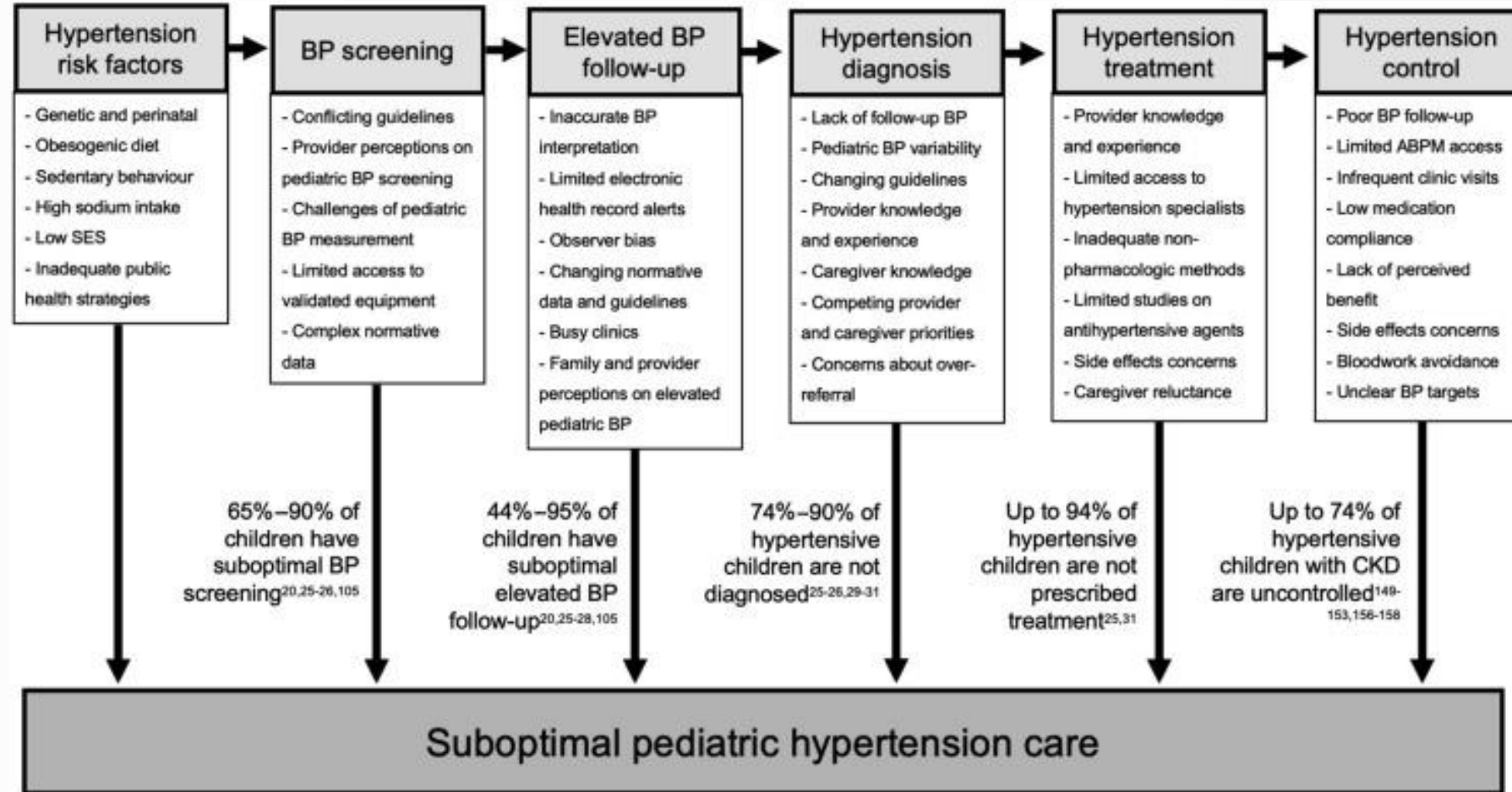
- Focus on the whole family
- Use motivational interviewing (ask open ended questions, affirm, reflect, summarize)
- Be aware of stages of change and hierarchy of needs

Lifestyle Change Interventions

Stages of Change Diagram



Need for Improvement in Care



Local Context



UMass Memorial Health



Screening: 89% of children had guideline adherent screening in 2018 however only **57%** of children with obesity

Follow-up: only **18%** of children received guideline adherent follow-up after a high blood pressure screening elevated or hypertensive range



Goulding M, Ryan G, Frisard C, et al. Disparities in Receipt of Guideline-adherent Blood Pressure Screening: An Observational Examination of Electronic Health Record Data from a Massachusetts Healthcare System. *The Journal of Pediatrics*. 2023;261. doi:[10.1016/j.jpeds.2023.113592](https://doi.org/10.1016/j.jpeds.2023.113592)

Goulding M, Ryan G, Frisard C, et al. Pediatric High Blood Pressure Follow-Up Guideline Adherence in a Massachusetts Health Care System. *Academic Pediatrics*. Published online July 23, 2023. doi:[10.1016/j.acap.2023.07.006](https://doi.org/10.1016/j.acap.2023.07.006)

Local Context Provider Perspectives



UMass Memorial Health



Children's Medical Center
UMass Memorial Health
UMASS MEMORIAL MEDICAL CENTER



UMass Chan
MEDICAL SCHOOL

"I think it is getting bigger with the increasing rates of obesity. I think we're seeing a lot more hypertension"

"I have them come for a blood pressure follow-up, I mean, really, whenever is convenient for them. Most of them don't come, unfortunately"

"Having, more access to lifestyle supports is helpful...I think that's really hard to accomplish in a 30-minute physical when you're, also focusing on a lot of other things."

"I am very skeptical and suspicious of that reading, um, because 98% of the time, it is just an inaccurate reading"

The Role of Community Based Nurses

“I’ll say that we could either have them come back to the office you know in a few months or get, um, the school nurse to check it. Because I figure that the school – you know they’ll be at school, and so hopefully they won’t be as anxious. And I would say probably most of the time people choose having the school nurse recheck it. “

“I offer that they could go to the pharmacy, um, and check it there, or the school nurse sometimes can check it and send over the rec – the documentation”

“...kids are in school, and so if possible I’ll ask the school nurse to do some readings as well so we got some readings outside the office”

The Role of School Nurses?

4.10 School Measurement and the Role of School-Based Health Professionals

There is limited evidence to support school-based measurement of children's BP.^{8,232} Observational studies demonstrate that school measurements can be reliable²³³ and that longitudinal follow-up is feasible.^{8,232,234} Available data do not distinguish between the efficacy of school-based screening programs in which measurements are obtained by trained clinical personnel (not a school nurse) versus measurements obtained by the school nurse. Because of insufficient evidence and a lack of established protocols, the routine use of school-based measurements to diagnose HTN cannot be recommended. However, school-based BP measurement can be a useful tool to identify children who require formal evaluation as well as a helpful adjunct in the monitoring of diagnosed HTN. Note: School-based health clinics are considered part of systems of pediatric primary care, and these comments would not apply to them.

Should School Nurses Measure Blood Pressure?

J. E. Kelsall¹ and A. R. Watson²

¹*Child Health Unit, General Hospital, Nottingham;* ²*Paediatric Unit, City Hospital, Nottingham*

The inclusion of blood pressure measurements in the routine health appraisal of junior school children was acceptable to children and staff and did not create undue anxiety. Of 677 children only 9 (1.33%) required follow up, 2 being referred to hospital out patients. With appropriate support school nurses should be encouraged to measure blood pressure.

Lois Price Spratten

Nurse-Role Dimensions of a School-Based Hypertension Screening, Education, and Follow-Up Program

INTRODUCTION

The National Task Force on Blood Pressure Control in Children¹ has identified school settings as an appropriate location for implementing hypertension screening, education and follow-up programs. Their recommendation is supported by numerous researchers who conducted studies in school settings of hypertension in children and adolescents during the 1970s.^{2-14,15} These and other studies have demonstrated that school settings are particularly effective with respect to their educational and preventive health value to students, staff, and to a limited number of families in the community.⁴ When combined with regular school services preventive health programs can be offered to large numbers of students at a modest or low cost. In addition, case-detection and long term follow-up can be provided to students who are identified as having a high normal level of blood pressure. Through screening and follow-up programs school nurses can monitor students long term.

Little attention has focused on the link between the introduction of hypertension detection programs and the on-going health education programs in schools. Particularly, the role of the school nurses appears to be a neglected one in hypertension studies which have been reported. While the use of school settings has increased in the past decade, the roles of school nurses in such studies have not been carefully delineated. The study reported here focuses on how the school nurses' roles were expanded by participating in various aspects of the education and follow-up portions of the research. Particularly interesting are the benefits the study gained

from the school nurses' involvement as well as the strong emphasis on education and preventive health. Cooperation was required among many individuals and organizations in the communities served by participating schools.

PROBLEM

Hypertension (high blood pressure) is a common cardiovascular disorder which may affect the heart and blood vessels in the entire body. During the early stages the disease is usually without symptoms. For this reason blood pressure tests must be performed in order to determine if the disease is present. Hypertension is associated with such serious consequences as the increased risk of illness and death.¹⁶⁻¹⁸ Thus, early detection through hypertension screening programs and prompt treatment of those found with elevated blood pressure are important aspects of preventive treatment. Long term monitoring and follow-up of affected individuals represent additional features of prevention which should be offered.

Comprehensive preventive health services, research and teaching through hypertension screening, education and follow-up, can be provided in the school setting. Because the primary mission of the school is to formally instruct students, research studies which include a significant health education component can be integrated into program offerings in an effective manner. However, to achieve this outcome, cooperation

*The author wishes to acknowledge the contributions of three school nurses to the success of this research. They are: Ms. Mary Miller, Helen Stewart, and Yae Yoshikawa.

Survey of School Nurses

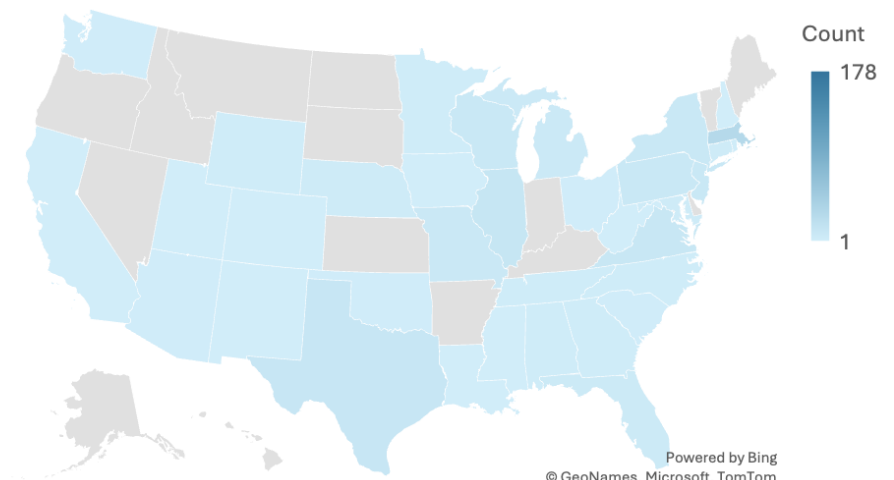
School Nurse Respondents N=195

Demographic	N (%)
Gender (n=158)	
Female	98.1%
Education (n=155)	
Masters	31.61%
Bachelors	58.06%
Associates	9.68%
Certificates (n=158)	
DESE	12.82%
Nationally Certified School Nurse	13.85%
Race (n=155)	
White	92.26%
Black	2.58%
Multiracial	3.23 %
Ethnicity (n=155)	
Hispanic	3.2%
Years practicing as school nurse (n=158)	13.09 (SD14.62)

Schools Represented

Demographic	N (%)
Size (n=186)	
0-250 Students	20 (10.75%)
251-1,000 Students	129 (69.35%)
Over 1,000 Students	37 (19.89%)
School Type (n=182)	
Private	16 (8.79%)
Public	166 (91.21%)
School Level (n=186)	
Elementary	57 (30.65%)
Secondary	51 (27.42%)
Mixed	78 (41.94%)
School Health Center (n=184)	9 (4.89%)

School Nurse Respondents by State



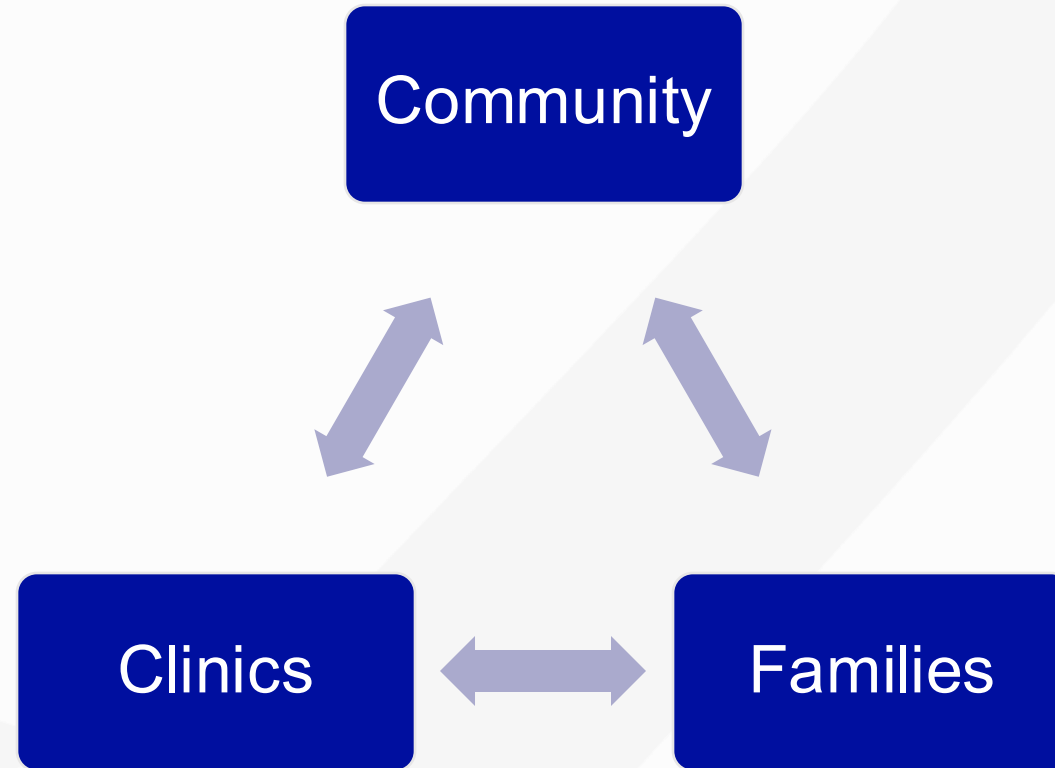
Survey of School Nurses

- BP measurement in school is common, 73% sometimes or often measure BP and 25% do so seldomly
 - usually part of vital assessment/in response to specific symptoms
- Majority (82%) want to do more for cardiovascular health but still most (68%) report a belief that HTN doesn't impact their student population
- Only 19% report they have enough time to complete necessary tasks

The Role of Public Health Nurses?

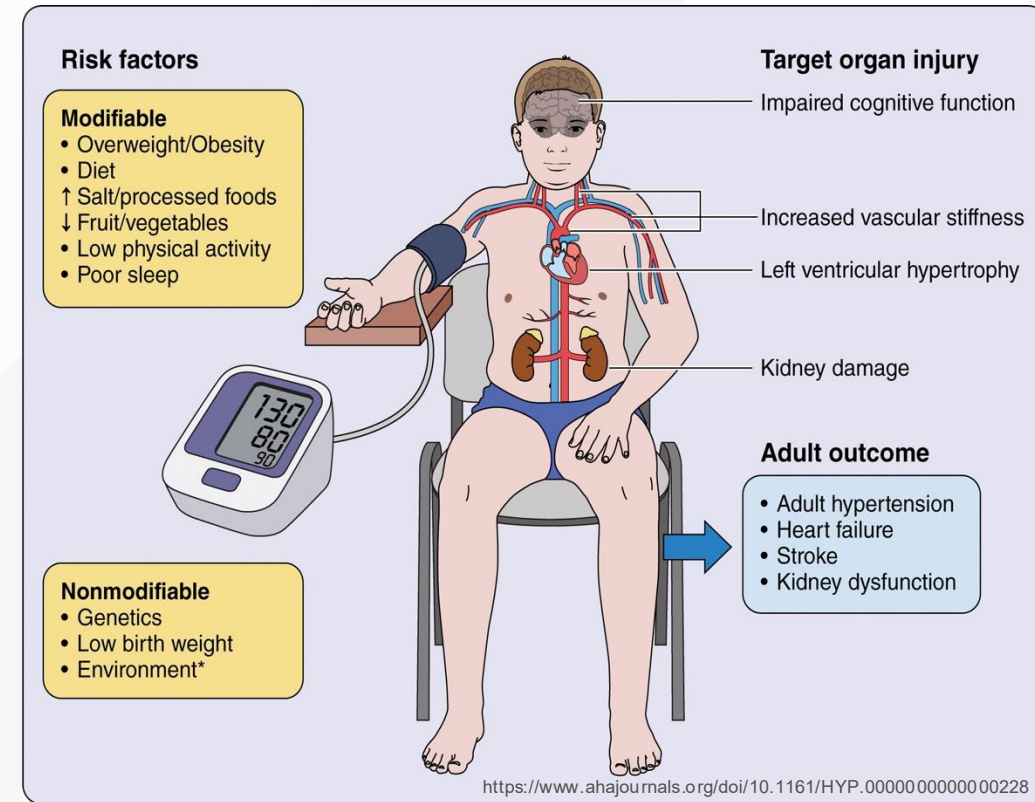
- Survey coming soon!

Community-Clinical Linkages to Improve Pediatric Hypertension Care



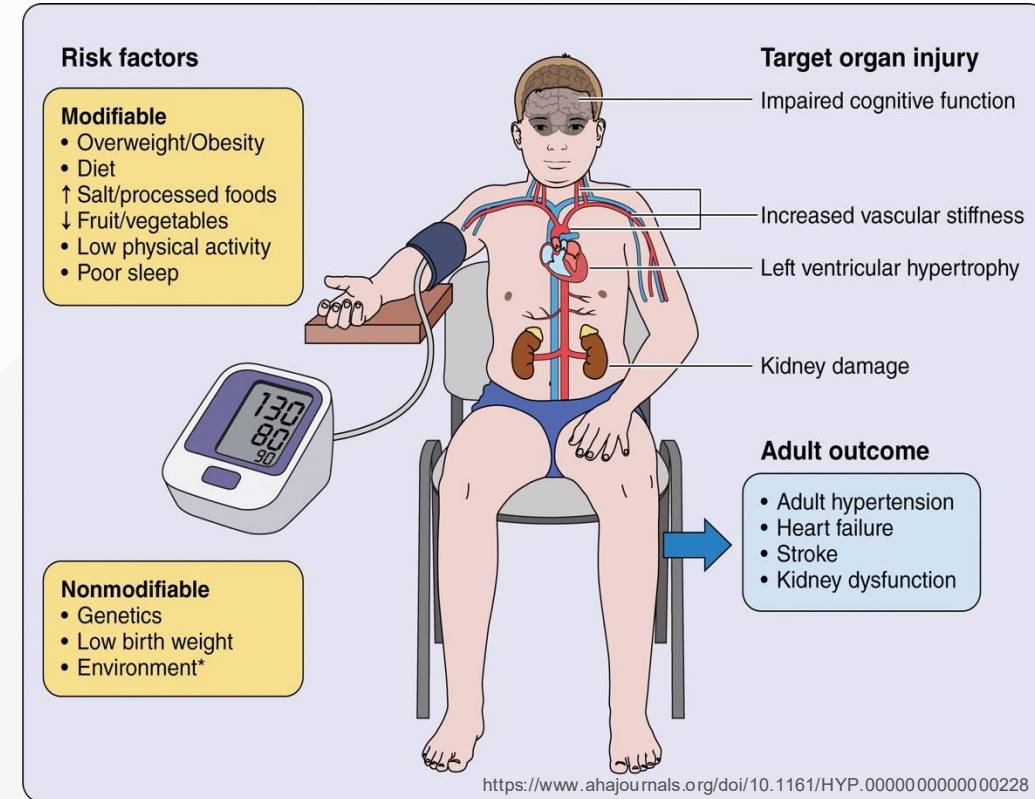
Pediatric Hypertension Resources

- **Pediatric Blood Pressure Measurement Technique**
 - https://www.youtube.com/watch?v=bYcCkiXJA_Q
- **AHA Summary**
 - <https://www.heart.org/en/health-topics/high-blood-pressure/know-your-risk-factors-for-high-blood-pressure/high-blood-pressure-in-children>
- **AAP Guidelines**
 - <https://publications.aap.org/pediatrics/article/140/3/e20171904/38358/Clinical-Practice-Guideline-for-Screening-and>
- **Percentile Calculators**
 - <https://www.mdcalc.com/calc/4052/aap-pediatric-hypertension-guidelines>
 - <https://www.bcm.edu/bodycomplab/BPappZjs/BPvAgeAPPz.html>



Pediatric Hypertension Resources

- Children's Hospital Association Overview
 - <https://www.childrens.com/health-wellness/high-blood-pressure-and-kids>
- MetroWest Shared Public Health Services Infographic
 - <https://mwsphs.org/heart-health-month>
- Heart Healthy Resources
 - <https://www.hopkinsmedicine.org/johns-hopkins-childrens-center/what-we-treat/specialties/nephrology/obesity-hypertension-clinic/healthy-heart-lifestyle-guide>



Questions?

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