

PMID	First Author	Title	Year	Study Type	Prospect/Retrospect	Study	CVD	RF by CQ	Country	Setting	Main Study Objective	N at Baseline (N at Follow-up)	Target Population	Eligibility Criteria	Patient Characteristics	Study Groups	n at Baseline (n at Follow-up) for Study Groups	Total Follow-up Duration	Outcomes Measured	Results	Main Reported Findings by Critical Question
8501577	Gillman MW	Identifying children at high risk for the development of essential hypertension	1993	Cohort	Prospective	East Boston	None	Q8 (RF4)	USA	Community (other)	Evaluate the prediction of adult BP from serial childhood values.	337/ 317	Pediatric/ Young adults	All available participants in the East Boston BP study.	Cohort study of 339 schoolchildren from a single school in east Boston beginning in 1978 with annual F/U until 1981 and then reassembly of 317 of the original cohort in 1989-1990. 177F/ 139M. 315 W; 2 Asian.	N/A	N/A	12 yr	Age Sex HT WT BMI SBP DBP History of HTN dx History of parental HTN dx Medication use Cigarette use Alcohol use * BPs were measured weekly X 3 wks using a standard protocol in 1978, 1979, 1980 & 1981 and then again in 1989-90.	BPs were higher in Ms than Fs, as expected. Nearly half of subjects had at least one parent with HTN. Tracking correlations based on single visit BP measurements ranged from 0.23-0.37, as reported by others. Tracking correlations corrected for within-person variability and adjusted for age/sex/BMI/HR & parental HTN were 0.55(CI=0.45-0.63) for SBP and 0.41 (CI=0.30-0.50) for DBP. Predictive values for ranges of BP at age 10 y are presented.	SBP over several visits in childhood is a modest predictor of adult BP. While there is statistically significant tracking from childhood to adult BP, screening for adult HTN based on childhood BP readings is not highly effective.
14744922	Li S	Childhood blood pressure as a predictor of arterial stiffness in young adults: the Bogalusa heart study	2004	C/S	Retrospective	Bogalusa	Distensibility	Q3 (RF4,5,10) Q5 (RF4,5,10) Q9 (RF4,5,10)	USA	Community (other)	Correlate arterial stiffness assessed by brachial-ankle pulse wave velocity (baPWV) with C-V RFs measured in childhood, adolescence and early adult life.	835	Pediatric/ Young adults	835 young adult Bogalusa subjects who underwent baPWV in 2000-2001 and who had RF data from at least 1 childhood & 1 adult CrS. 76% of subjects had at least 6 sets of RF measurements.	Community-based cohort of B & W children and young adults - originally examined at 5-17 yrs; 52% F, 44% B. For this study, 835 young adults aged 24-44 yrs, 72% W, 44% male with at least 4 RF measurements from childhood to adult life	N/A	N/A	N/A	Age Gender HT WT BMI SBP DBP TC TG HDL LDL Smoking status Brachial/ankle pulse wave velocity (baPWV)	In general, Bs had higher SBPs and HDLs & lower TGs than Ws. Ms vs Fs had higher SBPs, LDL, TGs & lower HDL; WMs & BFs had higher BMI than WFs & BMs respectively. In young adults, baPWV was higher in males than females (p<S** and Bs vs Ws (p=S**)). In univariate regression, childhood SBP, BMI & HDL were significantly correlated with baPWV in young adults. In adulthood, SBP, TGs, BMI, HDL, & LDL were all significantly correlated with baPWV; highest correlation was with SBP (r = 0.471) In MVA, the only independent predictor of baPWV in young adults was SBP in childhood. SBP, HDL-C, TGs and smoking in adulthood were independent correlates of baPWV. In a 3rd model, cumulative burdens of SBP, TGs and smoking X yrs from childhood were independent predictors of baPWV. SBP beginning in childhood is a consistent predictor of arterial stiffness in young adults.	SBP from childhood is a consistent & independent predictor of arterial stiffness assessed by baPWV in young adult life. Race & gender impact arterial stiffness. Higher SBP and TGs plus lower HDL & smoking in adulthood combine to increase arterial stiffness. The cumulative burden of higher SBP & TGs and duration of smoking yrs from childhood independently predicts increased arterial stiffness.
15837946	Cruickshank JK	Origins of the "black/white" difference in blood pressure: roles of birth weight, postnatal growth, early blood pressure, and adolescent body size: the Bogalusa heart study	2005	Cohort	Prospective	Bogalusa	None	Q5 (RF4,8) Q6 (RF4,8) Q7 (RF4,8)	USA	Community (other)	Evaluate birth, childhood and adolescent anthropometrics and BP in a bi-racial cohort	185	Pediatric/ Young adults	185 B & W children with BP & anthropometric data from birth to adolescence were evaluated in this study.	Community-based cohort of B & W children and young adults - originally examined at 5-17 yrs; 52% F, 44% B. For this study, evaluation of 185 B & W children with BP & anthropometric data from birth to adolescence; 48 B and 47 W boys; 41 B and 49 W girls.	N/A	N/A	15-17 yrs	SBP DBP Birth wt Sex Ethnic group BMI Difference between birth wt & wt at age 4 Difference between ht @ 6 mos & ht @ 4 y Difference between wt & ht @ 4 y and wt & ht @ 15 y	Birth weights were a mean of 442 and 282 gms lower in B Ms and BFs respectively of Ws (p<.001). BPs were 3.4/1.9 & 1.7/0.6 mmHg higher in adolescent Bs vs Ws despite a mean ht difference of -4 cm & wt difference of -3 kg in BMs vs WMs; there was no size difference between B & W Fs. In the subset of 102 children who had annual BPs, BP tended to track by quartiles as recorded at 2 y of age into adolescence. In MVA, Bwt accounted for the ethnic difference in BP. In MVA, BP was independently predicted by (in decreasing impact order) birth wt, adolescent ht, adolescent BMI and BP at 4-5 yrs (all p=S**); and inversely by change in wt from birth to 4-5 yrs (p=S**)	Ethnic differences in BP which emerge in adolescence can be explained by birth weight and by early weight gain & growth in ht, followed by current stature.
16330678	Kivimaki M	Early socioeconomic position and blood pressure in childhood and adulthood: the Cardiovascular Risk in Young Finns Study	2006	Cohort	Prospective	Young Finns	None	Q5 (RF4) Q8 (RF4)	Finland	Community (other)	Evaluate the impact of childhood SES and adult BP	3596/2270	Pediatric/ Young adults	All participants in the C-V Risk in Young Finns study who had baseline & F/U measurement of SBP and at least one measure of parental SES available.	5-center Finnish cohort enrolled at 3-18 yr of age in 1980 and followed with serial RF evaluation over time. At 24-39 yr of age, group underwent re-evaluation of C-V RFs.	N/A	N/A	21 yrs	Parent occupation in 1980 Household income in 1980 Participant occupation in 2001 Educational level Birth weight Breastfed in 1983 BMI in 2001 Smoking status in 2001 Alcohol consumption in 2001 SBP in 2001 Age Sex	Lower parental SES was associated with higher BP in childhood, adolescence (p<0.01) and adulthood (p<0.0001) with mean age- and sex-adjusted SBP differences between highest and lowest SES groups varying between 2.9 and 4.3 mmHg. Adulthood SES was not associated with SBP. Correlation was attenuated by adjustment for childhood BP and BMI but not by inclusion of birth weight, breastfeeding, smoking or alcohol consumption.	Early SES circumstances are independently predictive of adult BP after accounting for fetal, infant & adulthood influences. Socially patterned exposures may have an enduring influence on BP.
16332648	Steffen LM	Associations of plant food, dairy product, and meat intakes with 15 yr incidence of elevated blood pressure in young black and white adults: the Coronary Artery Risk Development in Young Adults (CARDIA) Study	2005	Cohort	Prospective	CARDIA	None	Q6 (RF4,9) Q13 (RF4,9)	USA	Community (other)	Evaluate associations between diet intake at baseline at 18-30 y of age and 7 yrs later with BP @ F/U 15 yrs later.	5115/ 4304	Pediatric/ Young adults	All participants in the CARDIA study who had baseline and 7 y diet evaluation and subsequent F/U to 15 yrs later.	Population-based, prospective observational study with participants recruited from 4 metropolitan areas (Birmingham, Ala; Chicago, Ill; Minneapolis, Minn; & Oakland, Calif) in 1985-1986 at 18-30 yrs of age (44.9% black, 53.9% women) & followed up >= 15 yrs later in 2000-2001 @ 33-45 yrs of age.	N/A	N/A	15 yrs	Age Race Sex Education Activity SBP DBP Fam hx of parental MI before age 60 BMI Smoking status TC TG HDL LDL Fasting glucose (FG) Diet history at 0 and y7. Elevated BP (EBP) defined as SBP>=130 mmHg, DBP >=85 mmHg or use of antihypertensive meds.	Over the 15 y F/U, 23.2% of subjects developed incident EBP, 13.7% with HTN & 9.4% with high normal BPs. 64% of those with EBP were B. EBP incidence varied from 12% in white women to 33% in black men. After adjustment for age/baseline age/ race/sex /center /calories & education, Fs & Ws consumed more plant foods /d than did Ms & Bs. Plant food intake was inversely asst'd with 15 y cumulated incidence of EBP after adjustment for age/race/sex /center/ calories/C-V RFs. Intake of whole grain, fruit & nuts was inversely associated with EBP (p for trend=S) Consumption of red & processed meats was (+) associated with 15 y cumulated incidence of EBP. Dairy intake was not related to BP. (+) dose response relations for EBP were observed across increasing amounts of red meat & processed food intake.	High plant food intake and low consumption of red & processed meats are associated with lower incidence of high BP on 15 y follow-up.
16446400	Matthews KA	Blood pressure reactivity to psychological stress and coronary calcification in the Coronary Artery Risk Development in Young Adults Study	2006	Cohort	Prospective	CARDIA	Coronary Ca	Q3 (RF4) Q9 (RF4)	USA	Community (other)	To compare BP response to video game & star tracing task to extent of CAC assessed 13 yrs later.	1	Pediatric/ Young adults	All 4202 participants in a C-V reactivity protocol performed in y 2 of the CARDIA study who subsequently underwent CAC testing 13 yrs later.	Population-based, prospective observational study with participants recruited from 4 metropolitan areas (Birmingham, Ala; Chicago, Ill, Minneapolis, Minn; & Oakland, Calif) in 1987-1988 at 20-35 yrs of age (44.9% black, 53.9% women) & followed up 13 yrs later in 2000-2001 @ 33-45 yrs of age.	N/A	N/A	13 yrs	SBP DBP Fam hx of parental MI before age 60 BMI Smoking status TC TG HDL LDL BP response to video BP response to tracing task Fasting glucose (FG) Coronary calcium score (CaC)	Overall, 9.3% of subjects had CAC present; 4.7% had scores > 20. Those with CaC were older (p=S**), W (p=S**), M (p=S**), more likely to smoke (p=S**) & to have a (+) fam hx of MI (p=S**). At yr 2, (+) CaC vs no CaC had lower HDL (p=S**) & higher BMI (p=S**), TGs (p=S**) and LDL (p=S**). In MVA, each 10 mmHg increase in BP during video game was asst'd with 24% increased odds of having CAC at F/U (unadjusted OR=1.24, CI=1.06-1.46, p=S*). After adjustment for age, race, sex, education, smoking, fam hx, BMI & BP, change in BP predicted CaC (OR=1.31, CI=1.08-1.58, S*). After adjustment for interim hypertension or MetS, association was unchanged. No association with BP change during star tracing.	SBP reactivity to a video game at 20-33 yrs of age predicted the presence of CaC 13 yrs later. Presence of CaC was associated with the presence of multiple C-V RFs including (in descending order of OR), smoking, (+) fam hx, male sex. SBP change with video, baseline SBP, hx of smoking, alcohol intake & atherogenic lipid values.

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16880344	Juonala M	Elevated blood pressure in adolescent boys predicts endothelial dysfunction: the cardiovascular risk in young Finns study	2006	Cohort	Prospective	Young Finns	FMD	Q3 (RF4)	Finland	Community (other)	Evaluate whether SBP in childhood predicts endothelial-dependent dilation in young adult life	3596/2265	Pediatric/Young adults	All participants in the C-V Risk in Young Finns study who had baseline & F/U measurement of SBP and brachial artery U/S studies in 2001.	5-center Finnish cohort enrolled at 3-18 yr of age in 1980 and followed with serial RF evaluation over time. At 24-39 yr of age, group underwent evaluation of FMD.	N/A	N/A	21 yr	Age Gender HT WT BMI Waist circumference (WC) SBP DBP TC TG HDL LDL ApoA1 ApoB Fasting glucose (FG) Fasting insulin (INS) HOMA Metabolic syndrome (NCEP definition) Smoking status CRP Physical activity Diet Carotid IMT (cIMT) Carotid diameter Carotid compliance (CAC) Brachial flow mediated dilation (FMD) Brachial artery diameter	In males, top quartile SBP in adolescence (12-18 yr of age) was inversely related to FMD evaluated at 24-39 yr of age (p<S**), independent of brachial diameter and other childhood and adult RFs. BP quartiles in adolescence were associated with DBP & BMI in childhood & adulthood, and LDL & TGs in childhood. The association between adolescent BP & adult FMD was independent of brachial artery diameter & other childhood or adulthood RFs Childhood SBP (3-9 yr of age) did not correlate with adult FMD in men or women. Combining several childhood/adolescent BPs to create a "BP load" variable and comparison of those with consistently high SBP did not change results. In adulthood, in 24-39 y old subjects, SBP correlated inversely with FMD(=0.09;p=S**). Subjects with SBP >140 mmHg had decreased FMD (7.1+/-4.1% vs 8.0+/-4.4%,n=2022; p=S). By MVA with adolescent & adult SBP in the model, only adolescent SBP persisted as significant(p=S).	Adolescent BP in males predicts flow-mediated brachial arterial dilation in adult life measured 21 yrs later, independent of all other RFs. SBP measured in adolescence in males was a stronger correlate for endothelial function than SBP in adulthood.
17142523	Gidding SS	Higher Self-reported Physical Activity Is Associated With Lower Systolic Blood Pressure: The Dietary Intervention Study in Childhood (DISC)	2006	Cohort (RCT F/U)	Prospective	DISC	None	Q6,8,10,11(RF4, RF5, RF8, RF11)	USA	Clinical	Assess physical activity patterns in boys and girls longitudinally from late childhood through puberty and determine the association of level of physical activity on BP, LDL-C, and BMI	663 (623)	Pediatric/Young adults	For males: 8 1/2 - 10 5/6 yr at baseline For females: 7 5/6 - 10 1/12 yr at baseline Baseline LDL levels between the 80th and 98th percentiles for age and gender based on the Lipid Research Clinics data set Exclusions: Major illnesses Taking lipid-lowering medications Blood pressure level of >125/80 mmHg Weight for height either <5th or >90th percentile on the basis of data from the Bogalusa Heart Study	Gender: Male: 55% Female: 45% Mean Age: Male: 9.7 yr Female: 9.0 yr	Group 1: Males Group 2: Female	Group 1: 362 (346) Group 2: 301 (283)	3 yr	SBP DBP LDL-C BMI Self-reported physical activity (MET score)	Using general estimating equations, a 100 unit increase in MET score was associated with a 1.15 mmHg decline in SBP(p=S*). A trend towards a lower BMI was observed in relation to time spent in intense activity (p=.0643). There was a trend towards a 1.28 mg/dl lower LDL-C level with a similar change in activity but this was not significant (p=.1014)	Lower SBP was associated with high self-reported physical activity levels over a 3 y interval in children going through puberty. This is especially striking as BPs normally rise during this time period. Similar trends were seen for LDL-C and BMI but these were not significant. Higher levels of physical activity have the potential to counteract age-related increases in CV RFs.
17525085	Mzayek F	The association of birth weight with developmental trends in blood pressure from childhood through mid-adulthood: the Bogalusa Heart study	2007	Cohort	Retrospective	Bogalusa	None	Q5 (RF4)	USA	Don't know/NR	Investigate the association between birth weight and progression of blood pressure through early adulthood, comparing that relation between African Americans and Whites	2,275 (NR)	Pediatric/Young Adult	Bogalusa participants examined 2 or more times Exclusions: Congenital heart disease, severe renal disease, type 1 diabetes mellitus, and failing to fast at time of examination	Community-based cohort of B & W children and young adults - original group examined at 5-17 yrs; 52% F, 35% B. In 1982; serial cross-sectional studies performed from 1970 to present. For this study: White: Male: 660 Female: 775 African American: Male: 362 Female: 465	N/A	N/A	N/A	SBP DBP	Birth weight was inversely associated with SBP and DBP (p<0.01) for every 1-kg increase in birth weight. SBP dropped by 1.9 mmHg (95% CI: -2.6, -1.3) and DBP by 0.7 mmHg (95% CI: -1.2, -0.2) The interaction of birth weight with ethnicity was not significant for any outcome Birth weight was inversely associated with later blood pressure. The strength of that association did not differ between African Americans and Whites	Q 8: Birth wt was inversely associated with SBP and DBP. Q5: The interaction of birth weight with ethnicity was not significant for any outcome. The strength of the inverse association between birth weight and blood pressure did not differ between African Americans and Whites
17846287	Din-Dzietham R	High Blood Pressure Trends in Children and Adolescents in National Surveys, 1963 to 2002	2007	CrS	Retrospective	NHANES	None	Q5 (RF4) Q6 (RF4, RF8)	US	Clinical	Assess high blood pressure (HBP) secular trends in children and adolescents enrolled in national surveys and determine whether the HBP trend reversed its course with the rise in obesity	29176 (N/A)	Pediatric/Young adults	8-17 yr Non-Hispanic white/Non-Hispanic black/Mexican American Exclusions: Children with congenital kidney or heart diseases Pregnant girls	8-17 yr Non-Hispanic white: 59% Non-Hispanic black: 21% Mexican American: 20%	Group 1: 1963-1970 respondents Group 2: 1971-1975 respondents Group 3: 1976-1980 respondents Group 4: 1982-1984 respondents Group 5: 1988-1994 respondents Group 6: 1999-2002 respondents	Group 1: 11,339 Group 2: 3,416 Group 3: 2,985 Group 4: 2,771 Group 5: 4,183 Group 6: 4,482	39 yr	SBP DBP BMI Waist circumference(WC) Sex	Age-adjusted HBP prevalence tended to decrease between 1963 & 1998 to 1994 and to increase thereafter. In 1999 - 2002, the age-adjusted prevalences for HBP were 4.2% (SE 0.7%), 3.3%(SE 0.6%) and 4.6% (SE .6%) for blacks(B), whites(W) and Mexican-Americans(M-A). Between 1998 & 2002, pre-HTN & HTN increased by 2.3(p=S**) and 1(p=NS) percentage points. Obesity increased monotonically beginning in the earliest survey (1963 - 1970) for Bs and Ws. The increase in BP/pre-HTN/HTN lagged 10 yrs behind the increase in obesity. Increasing BMI and WC both increased the likelihood of HBP with greater impact for WC than BMI. Obesity rise had the greatest BP impact among Bs and M-As.	Age-adjusted prevalence in HTN & pre-HTN has increased over the last decade after a downward trend previously. Increasing BMI and WC both increased the likelihood of HBP with greater impact for WC than BMI. The increase in BP/pre-HTN/HTN lagged 10 yrs behind the increase in obesity. Obesity rise had the greatest BP impact among Bs and M-As.
18676538	Faulkner B	Blood Pressure Variability and Classification of Prehypertension and Hypertension in Adolescence	2008	Cohort	Retrospective	National Childhood Blood Pressure Database	None	Q5 (RF4) Q6 (RF4, RF8) Q7 (RF4)	US	Clinical	Examine the persistence of BP classifications of prehypertension and hypertension at 2 year follow-up	8,533 (8,533)	Pediatric/Young adults	13-15 yr	White: 39% Black: 51% Hispanic: 10%	Group 1: Males Group 2: Females	Group 1: 4,147 (4,147) Group 2: 4,386 (4,386)	4 yr	SBP DBP BMI BP classification	Among subjects classified as having prehypertension at first evaluation, 14% of Ms and 12% of Fs were classified as having HTN at 2 y follow-up. Prehypertension persisted in 50% of Ms and 24% of Fs. Conversion from prehypertension to HTN among Ms of 14% was significantly greater than conversion to HTN from normal BP(5%)(p=S**); this was also true for Fs (p=S) Among subjects classified as having hypertension at first evaluation, 31% of Ms and 26% of Fs were classified as having HTN at 2 y follow-up. 47% of Ms and 26% of Fs had BPs in the prehypertension range at follow-up. Among subjects classified as having hypertension at first evaluation, 83% of Ms and 54% of Fs were classified as having HTN or pre-HTN at 4 y follow-up. In MVA, initial BMI and change in BMI were significant predictors of SBP z-score change (each, p=S**). In Fs, age was also a significant predictor. There were no significant ethnicity effects in Ms or Fs.	Children with prehypertension have significant risk for progression to HTN within 2 to 4 y follow-up. Both overweight and excessive wt gain contribute to this progression. There were no significant ethnicity effects in Ms or Fs.