Supplemental Methods

Data Collection and Clinical Covariates

During clinical examination, trained African American interviewers administered standardized questionnaires to assess selected demographic and behavior characteristics: age, sex, education, socioeconomic status, alcohol consumption and, current smoking. Education was measured as the highest level of schooling completed and classified into two categories within this study as "less than high school" or "greater than high school". Current smoking was defined by affirmative responses to the questions "Have you smoked more than 400 cigarettes in your lifetime?" and "Do you now smoke cigarettes?" Daily alcohol consumption was assessed from a validated food frequency questionnaire,[1] and in our study defined as "none": 0 drinks/week, "moderate" consumption: 1-14 and 1-7 alcoholic drinks/week for men and women respectively, and "heavy" consumption: >14 and >7 alcoholic drinks/week for men and women respectively.[2]

Participants were asked to bring any medications taken within 2 weeks prior to the baseline examination to the clinic visit and were transcribed verbatim. Medication coding was performed by a pharmacist using the Medispan dictionary and classified into categories according to the Therapeutic Classification System. Antihypertensive medication use was defined by self-report. Participants were asked to avoid caffeine, eating, heavy physical activity, smoking, and alcohol intake for 12 hours prior to the clinic examination. During the clinical examination, weight and height were measured for each participant. Body mass index was calculated as the weight in kilograms divided by height in meters squared (kg/m^2). Fasting blood samples were collected according to standardized procedures and processed at two central laboratories (University of Mississippi Medical Center and the University of Minnesota).[1] Total and high-density lipoprotein (HDL) cholesterol was quantified by an oxidase method and low-density lipoprotein (LDL) cholesterol was calculated using the Freidewald equation. Estimated glomerular filtration rate (eGFR) was calculated using the Chronic Kidney Disease Epidemiology Collaboration (CKD-EPI) equation.[3] Reduced eGFR was defined as <60 $ml/min/1.73\ m^2$. Urinary albumin to creatinine ratio was calculated. Diabetes was defined as a fasting (≥8 hours) serum glucose ≥126 mg/dL or hemoglobin A1c ≥6.5% or use of insulin or oral hypoglycemic medications within 2 weeks prior to the clinic examination.

Blood Pressure Comparability Study

As the Jackson Heart Study (JHS) began transitioning from using a random-zero sphygmomanometer (RZS) to an Omron HEM-907XL (Omron Healthcare Inc., Lake Forest, Il.), an automatic oscillatory device (AOD), a Blood Pressure Comparability Study was conducted during Visit 2. The purpose of the Blood Pressure Comparability Study was to allow the JHS Coordinating Center (JHS CC) to calibrate the BP measurements of participants with only RZS readings; this includes all participants at clinic exam Visit 1 and part of the cohort at clinic exam Visit 2. Of the 5,301 JHS participants enrolled at Visit 1, 5,280 had RZS readings only. At Visit 2, 1,966 had RZS reading only, 113 had AOD readings only, and 2,115 had both RZS and AOD readings.

Participants who had RZS and AOD readings comprised the Blood Pressure Comparability Study. At Visit 3, 3,814 had AOD readings only.

At Visit 2, two technicians measured each participant's blood pressure (BP) simultaneously with the RZS and AOD using a Y connector and a double-headed stethoscope. Each technician was blinded to the other's readings. The RZS was used to determine the pulse obliteration pressure using the standard RZS equipment. Next, the technician replaced the RZS cuff with the AOD cuff. The AOD was set to manual mode and used to inflate and deflate the BP cuff; the maximum value corresponding to the RZS in use was used to determine the peak inflation value for the AOD. During the deflation period, both technicians listened for the onset of the 1st and 5th Korotkoff phase sounds and recorded the corresponding systolic and diastolic BP. This was repeated twice per participant; thus, participants had a total of four BP readings: two from the RZS and two from the AOD. For analysis purposes, we averaged the two device-specific measurements.

Once exploratory data analysis began, the JHS CC discovered a large amount of noise in the data; **Supplemental Figure 1** below shows the observed noise for systolic BP and diastolic BP, respectively.

The level of noise observed in the JHS data is not unexpected and has been shown elsewhere in the literature.[4-6] However, due to such noise, the JHS CC decided to investigate several calibration methods beyond normal ordinary least squared (OLS) regression. The following 5 methods were explored:

1. **Ignoring the change.** This method completely ignores that the JHS changed blood pressure machines. If an AOD measure is present at clinic exam Visit 2, its value is used. Otherwise, the RZS measure is used.
2. **Ordinary least squares.** This method predicts a participant's AOD measure by creating a prediction equation using ordinary OLS regression, where the participant's RZS measure is the only predictor.
3. **Deming regression.** Considered the gold standard for calibration techniques, this method is similar to OLS but is an errors-in-variables regression model that accounts for error both in the dependent and independent variables.
4. **Adjustment via average difference.** Rather than adjust using a prediction equation, this method adjusts all participants by the observed average difference between the AOD and the RZS.
5. **Modeling the difference between AOD and RZS as a function of RZS.** This method utilizes the difference between AOD and RZS measurements as the outcome and the participant's RZS measure as the predictor; that is, this models the difference between machines as a function of the participant's RZS measure. Rather than normal OLS methods, this prediction model is created using robust regression.[7]

Several example models were compared across the different calibration methods. In particular, the JHS CC examined the resulting regression coefficients and standard errors; results across calibration methods were similar. Based on the shape of the data, the JHS CC felt most comfortable calibrating the data using a function of the RZS measurement. Thus, the JHS CC recommended that JHS researchers use the calibration equation created by method 5 (modeling the difference between AOD and

RZS as a function of RZS). The following equations resulted from method 5 and were used to predict SBP and DBP for the current study:

$$SBP_{AOD} = SBP_{RZS} + 11.0 - 0.1 * SBP_{RZS}$$

$$DBP_{AOD} = DBP_{RZS} + 10.3 - 0.2 * DBP_{RZS}$$

Supplemental References

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6. Stang A, Moebus S, Mohlenkamp S, Dragano N, Schmermund A, Beck EM, Siegrist J, Erbel R, Jockel KH and Heinz Nixdorf Recall Study Investigative G. Algorithms for converting random-zero to automated oscillometric blood pressure values, and vice versa. *Am J Epidemiol*. 2006;164:85-94.
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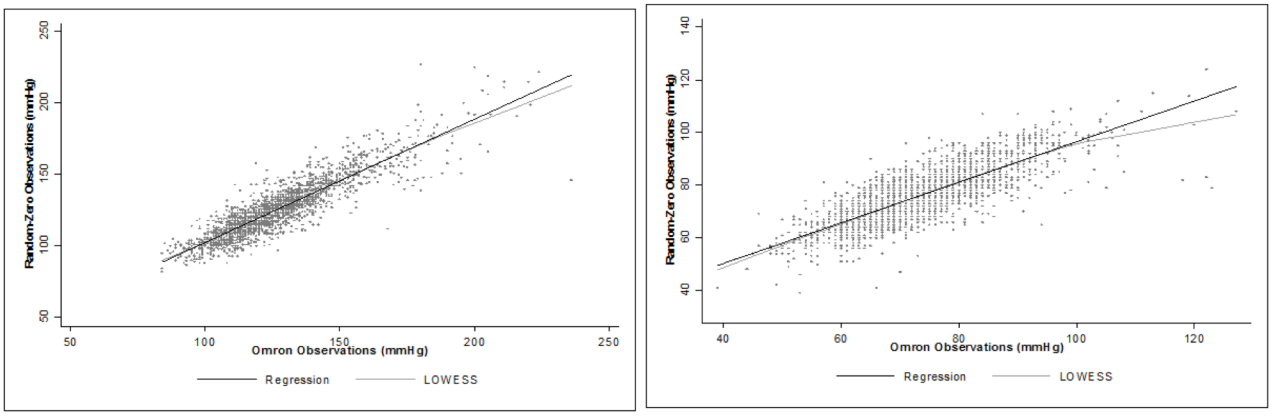
Supplemental Table 1. Characteristics of the Jackson Heart Study participants included in the analytical sample, the sample who underwent ABPM but were excluded from the analysis, and non-ABPM sample.

	Analytic sample	**Excluded from analytic sample***	**Non-ABPM sample**
	n=1,016	n=132	n=4,158
Demographic Characteristics			
Age, years	59.2 ± 10.9	58.4 ± 12.5	54.3 ± 13.1
Female sex, %	68.2%	68.9%	62.2%
Education < high school, %	19.0%	26.5%	20.5%
Clinical Characteristics			
Body mass index, kg/m^2	31.1 ± 6.4	32.9 ± 6.5	31.9 ± 7.4
Diabetes, %	24.5%	29.0%	21.0%
LDL cholesterol, mg/dL	125.8 ± 35.7	126.5 ± 36.8	126.9 ± 36.8
HDL cholesterol, mg/dL	54.0 ± 15.0	52.9 ± 15.3	51.2 ± 14.5
Estimated glomerular filtration rate < 60 ml/min/1.73 m^2, %	7.3%	12.1%	8.0%
Albumin to creatinine ratio ≥ 30 mg/g, %	10.6%	12.9%	13.2%
Health Behaviors			
Alcohol use, %			
Non-drinker	63.2%	59.8%	57.3%
Moderate drinker	34.4%	35.6%	39.1%
Heavy drinker	2.4%	4.5%	3.7%
Current Smoking, %	10.2%	17.7%	13.8%
Clinic blood pressure, mmHg			
Systolic	127.6 ± 15.9	128.5 ± 14.6	127.4 ± 17.2
Diastolic	74.4 ± 8.5	74.4 ± 8.3	76.1 ± 8.8
Antihypertensive medication use, %	56.6%	64.2%	47.5%

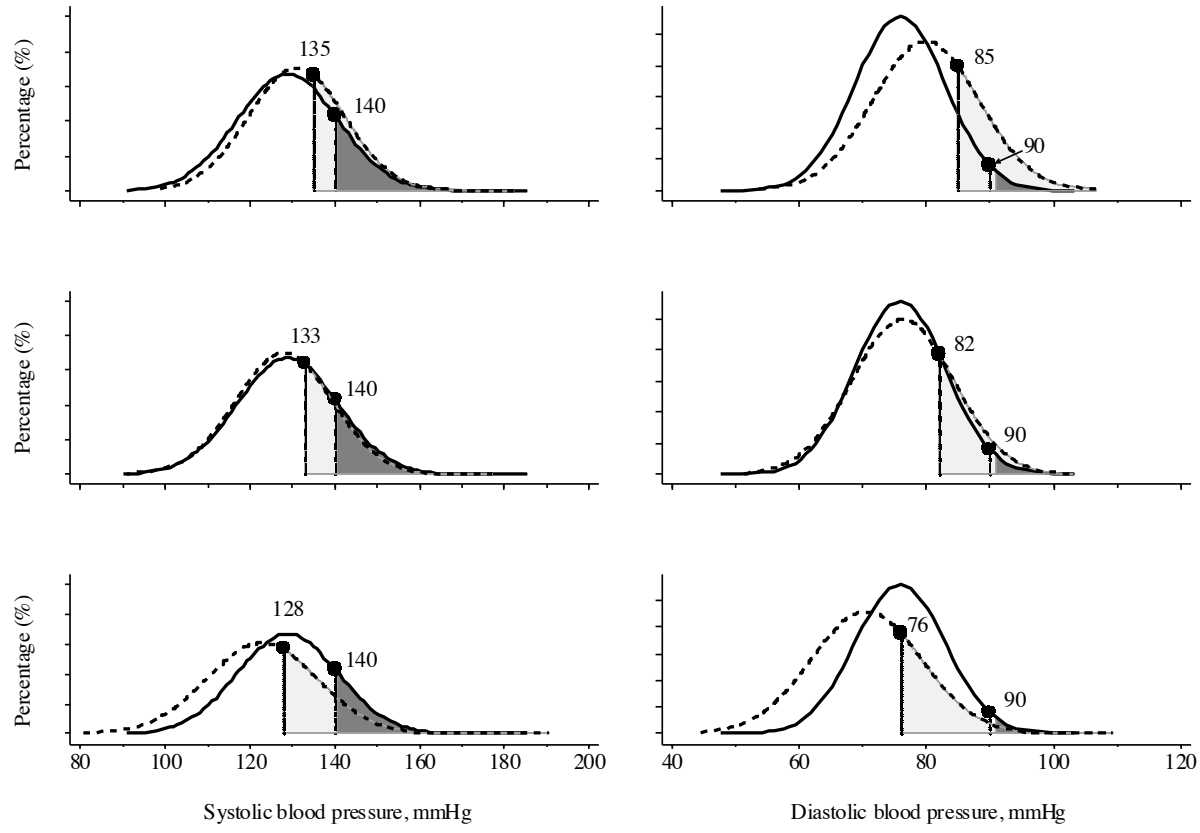
Characteristics for the analytic sample weighted to the 2010 US Census distribution of age and sex for African American adults are reported in Table 1.
Numbers in the table are percentages or mean ± standard deviation.
ABPM: ambulatory blood pressure monitoring.
HDL: high-density lipoprotein cholesterol.
LDL: low-density lipoprotein cholesterol.
*These participants underwent ABPM and either did not meet the IDACO criteria (n=102; see Methods section for a description of these criteria) or had missing data on clinic BP or antihypertensive medication use (n=30).

Supplemental Figures and Figure Legends

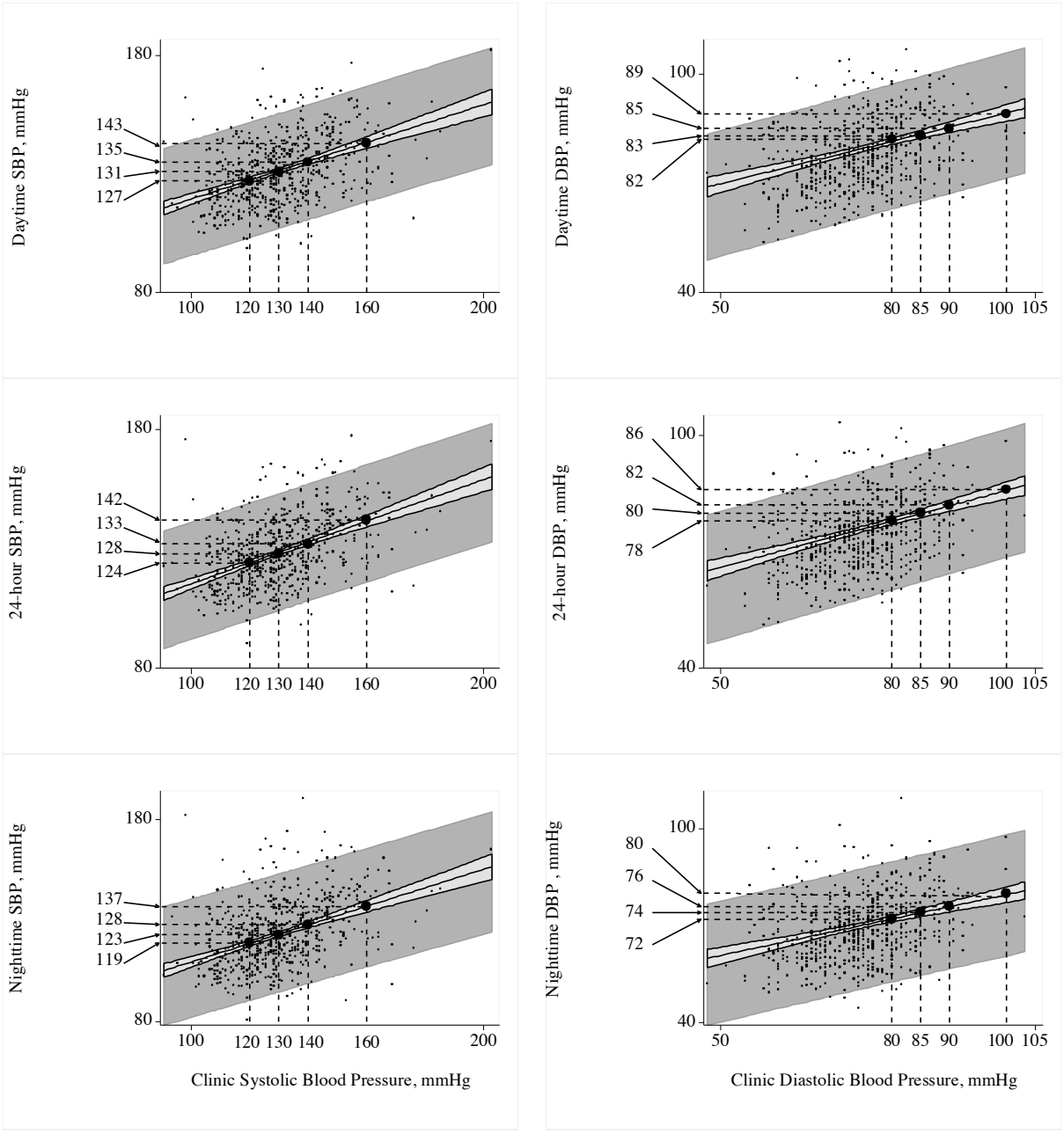
Supplemental Figure 1. Comparisons of random-zero sphygmomanometer and autonomic oscillatory device (Omron HEM-907XL) measurements for systolic blood pressure (left panel) and diastolic blood pressure (right panel).



Supplemental Figure 2. Daytime, 24-hour, and nighttime blood pressure thresholds corresponding to a clinic systolic blood pressure/diastolic blood pressure threshold of 140/90 mmHg determined using the regression-derived approach in participants taking antihypertensive medication. Dash line represents the distribution of ambulatory blood pressure. Solid line represents the distribution of clinic blood pressure. Light gray shaded regions indicate the participants with daytime, 24-hour, and nighttime blood pressure at or above the thresholds corresponding to clinic systolic blood pressure/diastolic blood pressure of 140/90 mmHg. Dark gray shaded regions indicate the participants with clinic systolic blood pressure/diastolic blood pressure at or above the thresholds of 140/90 mmHg.



Supplemental Figure 3. Daytime, 24-hour, and nighttime blood pressure thresholds corresponding to a clinic systolic blood pressure/diastolic blood pressure threshold of 120/80 mmHg, 130/85 mmHg, 140/90 mmHg, and 160/100 mmHg determined using the regression-derived approach in participants taking antihypertensive medication. Light gray area represents 95% confidence interval bands. Dark gray area represents 95% prediction bands. DBP: diastolic blood pressure; SBP: systolic blood pressure.



Supplemental Figure 4. Daytime, 24-hour, and nighttime blood pressure thresholds estimated among participants taking antihypertensive medication compared to published recommendations of blood pressure thresholds for ambulatory hypertension: daytime systolic blood pressure/diastolic blood pressure ≥ 135/85 mmHg, 24-hour systolic blood pressure/diastolic blood pressure ≥ 130/80 mmHg, and nighttime systolic blood pressure/diastolic blood pressure ≥ 120/70 mmHg. Blue lines represent recommended systolic blood pressure and diastolic blood pressure thresholds. DBP: diastolic blood pressure; SBP: systolic blood pressure.