

TRENDS IN HYPERTENSION TREATMENT GOALS

Controlling Systolic Blood Pressure below 140 mm Hg in Most Hypertensive Patients matches Systolic Blood Pressure Intervention Trial Intensive Treatment: Practical Implications for Patient Care

¹Brent M Egan, ²Jiexiang Li, ³C Shaun Wagner

ABSTRACT

The Systolic Blood Pressure Intervention Trial (SPRINT) investigators concluded that most hypertensive patients would benefit from treating systolic blood pressure (SBP, mm Hg) to a target below 140 benchmark, as intensive treatment (SBP, 121.5) led to 25% fewer cardiovascular endpoints than standard treatment (SBP, 134.6) in high-risk patients. This conclusion reflects at least three assumptions addressed in this report. First, SBP with SPRINT standard was similar to or lower than SBP of treated adults in usual care. Second, SBP with SPRINT intensive treatment was lower than in adults with treated hypertension controlled to <140 with usual care. Third, SPRINTs rigorous blood pressure (BP) measurement methods translate to most care settings. Systolic blood pressure in a representative sample of US adults [National Health and Nutrition Examination Survey ≥18 years with treated hypertension fell from 137.1 in 1999–2002 to 130.1 in 2009–2012 as control to SBP <140 rose from 60 to 72%. Over the time, SBP in treated adults controlled to <140 fell from 123.0 to 120.9 as percentages with SBP <130 rose from 66.1 to 74.7%. The SPRINT BP measurement protocol led to SBP ~3 and ~7 below daytime ambulatory SBP for standard and intensive treatment respectively, whereas usual clinic SBP is ~5 above daytime ambulatory SBP. Thus, SBP 134.6 and 121.5 with SPRINT standard and intensive treatment are comparable to usual clinic SBP of 142.6 and 133.5 respectively. Systolic blood pressure intervention trial Intensive Treatment standard and intensive treatment fall short of SBP with usual care, especially when measurement methodologies are considered. Systolic blood pressure intervention trial supports the current SBP goal <140 based on usual clinic measurement methods.

Keywords: Blood pressure, Cardiovascular disease, Hypertension.

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INTRODUCTION

The systolic blood pressure intervention trial (SPRINT) showed that intensive treatment with a systolic blood pressure (SBP, mm Hg) target <120 rather than <140 with standard treatment reduced the major cardiovascular events to 25% in high-risk patients without diabetes or prior stroke.¹ Systolic blood pressure intervention trial investigators concluded that the results supported a SBP goal below the benchmark of <140 for most adults with hypertension. The conclusion reflects four assumptions. First, SBP with SPRINT standard treatment was at least as low as SBP achieved with usual care. Second, SBP with SPRINT intensive treatment is lower than SBP among treated hypertensive adults with SBP <140 in usual care. Third, SBP with the rigorous measurement methodologies in SPRINT translate to SBP measured in most care settings. Fourth, benefits of better SBP in a subgroup of patients at high risk for cardiovascular events translate to other groups of hypertensive adults.

We previously examined the first two implicit assumptions in SPRINT.² In fact, a representative sample of treated adults with hypertension had lower mean SBP than participants in SPRINT standard treatment. Moreover, SPRINT intensive treatment did not lead to lower SBP than adults in usual care who were treated for hypertension and controlled to SBP <140 mm Hg.

In this report, we examine the first two assumptions in greater depth by analyzing changes in SBP over three time periods as author in a representative sample of US adults to estimate the direction and potential impact of temporal trends in SBP of adults with treated hypertension. We also assess in greater depth, the practical clinical translation of SBP values obtained in SPRINT with a rigorous and time-consuming protocol as compared to SBP measurements in usual care.^{3,4} The fourth assumption is not assessed in this report.

^{1,2}Professor, ³Assistant Professor

¹Department of Biomedical Sciences, School of Medicine Greenville, University of South Carolina; Care Coordination Institute and Greenville Health System, Greenville, South Carolina, USA

²Department of Mathematics, College of Charleston, Charleston South Carolina, USA

³Department of Biomedical Sciences, School of Medicine Greenville University of South Carolina, Greenville, South Carolina, USA

Corresponding Author: Brent M Egan, Professor, Department of Biomedical Sciences, School of Medicine Greenville, University of South Carolina, Greenville, South Carolina, USA, Phone: +18645222260, e-mail: began@ccihealth.org

MATERIALS AND METHODS

The National Health and Nutrition Examination Surveys (NHANESs) assess health and nutritional status of the US civilian noninstitutionalized population. Participants are selected using a multistage, probability sampling design. All adults provided written consent approved by the National Center for Health Statistics.

Participants for this analysis included all adults ≥ 18 - years old in NHANES 1999–2012 having at least one valid blood pressure (BP).^{5,6} In addition to a descriptive analysis of all patients, analyses were also conducted on two subsets of patients with hypertension including: (i) Individuals without diabetes mellitus or chronic kidney disease (CKD), since these two groups had a target SBP of <130 according to Joint National Committee (JNC) VI and JNC VII in effect from 1999–2012^{7,8} and (ii) individuals that met SPRINT-like inclusion and exclusion criteria.⁹

As NHANES data do not directly translate to SPRINT inclusion and exclusion criteria,^{2,9} the following approach was used. Adults included in the analysis were ≥ 50 years with hypertension and one or more of the following: (i) History of myocardial infarction or angina, (ii) CKD with estimated glomerular filtration rate 20 to 59 mL/1.73 m²/minute, (iii) 10-year Framingham cardiovascular disease risk score $\geq 15\%$, and (iv) age ≥ 75 years. Exclusion criteria were: (i) <50 years of age, (ii) diabetes mellitus, (iii) history of stroke, (iv) history of heart failure, and (v) SBP ≥ 180 , ≥ 170 on more than two BP medicines, ≥ 160 on more than three BP medicines, ≥ 150 on more than four BP medicines, and (vi) 0 to 1 health care encounters in the previous year (proxy for nonadherence). Data were also analyzed on all adults ≥ 18 years with hypertension.

Blood pressure was measured by trained professionals using sphygmomanometry and appropriately sized arm cuffs in volunteers after 5 minutes seated rest. The first BP was excluded in estimating mean systolic and diastolic values for individuals with more than one value as recommended in NHANES procedure manuals.^{5,6}

Hypertension was defined by: SBP ≥ 140 and/or diastolic BP (DBP) ≥ 90 mm Hg and/or positive response to “Are you currently taking prescribed medication to lower your BP?” Adults with SBP ≥ 130 and who denied treatment for hypertension were not included in the SPRINT-like sample, although some of them would have met SPRINT inclusion criteria.⁹ However, under JNC VII, they were not considered hypertensive and, with the exception of those with diabetes, who were excluded from SPRINT, and those with CKD, did not have an indication for anti-hypertensive therapy.^{7,8}

Treatment of hypertension was defined by the percentage of adults with prevalent hypertension reporting that they were taking prescription medication to lower BP.^{5,6}

Hypertension control was defined as SBP <140 for all adults.

Percentage of treated hypertension controlled was calculated as the number of adults on antihypertensive medications with SBP <140 divided by the number with hypertension.

Diabetes included: (a) Diagnosed diabetes defined by positive response(s) to one or more questions, “Have you ever been told by a doctor that you have diabetes?”, “Are you now taking insulin?”, or “Are you now taking diabetic pills to lower your blood sugar?” and (b) undiagnosed diabetes defined by fasting glucose ≥ 126 mg/dL and/or glycohemoglobin $\geq 6.5\%$.¹⁰

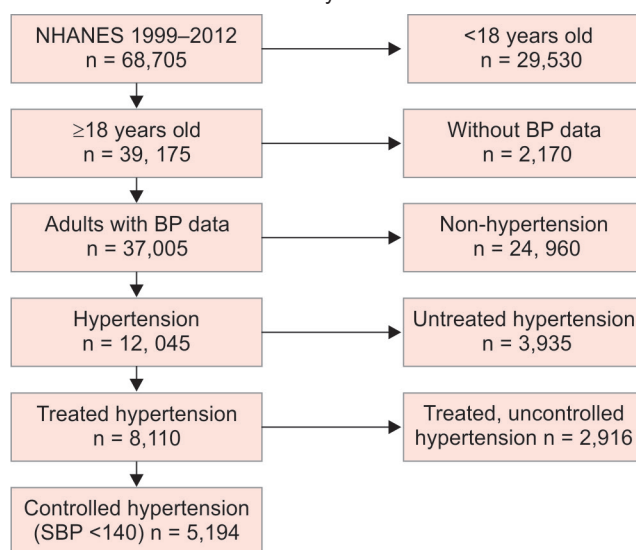
Cardiovascular disease included: (i) Coronary heart disease (CHD) defined as described.¹¹ (ii) stroke was defined by endorsement of “Has a doctor ever told you that you had a stroke?”¹², and (iii) congestive heart failure was defined by affirmative response to “Has a doctor ever told you that you had congestive heart failure?”¹²

Data analysis: SAS Enterprise Guide 7.1 (Cary, NC) survey procedures were used for within survey analyses and appropriate weights accounting for unequal probabilities of selection, oversampling, and nonresponse. Age-dependent descriptors were age adjusted with weight calculated from NHANES 2009–2012 data. Data are reported as mean and one standard error of the mean. The SD of SBP for all treated adults in each time period was calculated based on guidance in an online resource.¹³

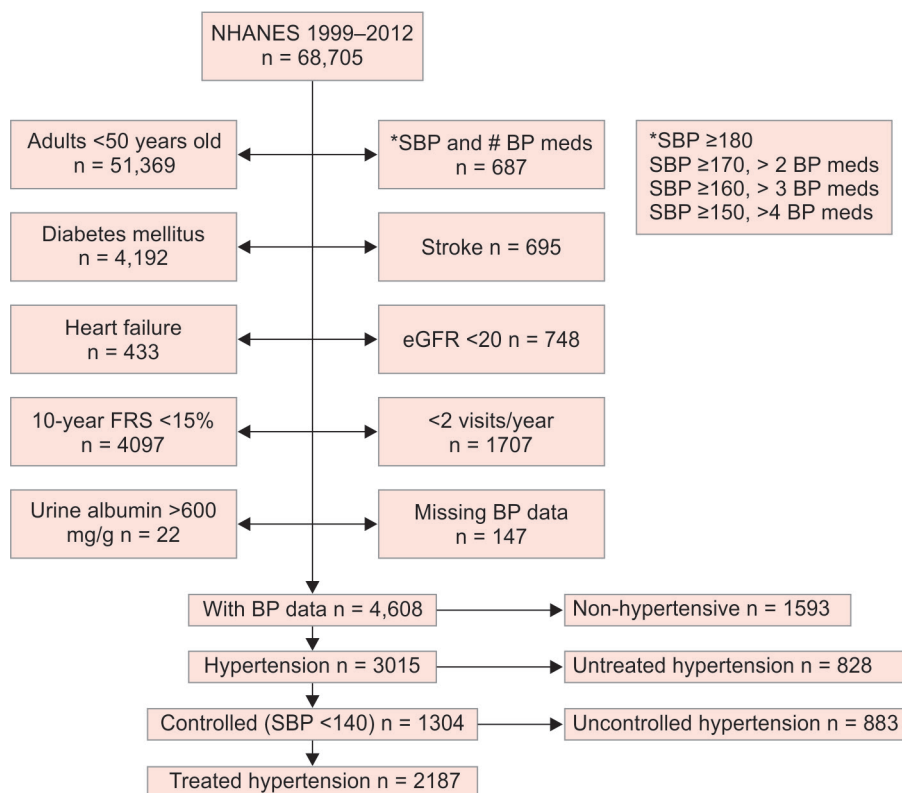
RESULTS

The process for identifying adults with hypertension in NHANES 1999–2012 (Flow Chart 1) and the subset meeting SPRINT-like inclusion criteria (Flow Chart 2) is shown.

Flow Chart 1 : Process for selecting all adults 18 years and older with treated hypertension from NHANES participants; BP: Blood pressure; SBP: Systolic blood pressure; NHANES: National health and nutrition examination survey



Flow Chart 2 : Process for selecting SPRINT-like adults (left side) 50 years and older; (BP: Blood pressure; SBP: Systolic blood pressure; NHANES: National health and nutrition examination survey; FRS: Framingham risk score; eGFR: Estimated glomerul filtration rate)



Selected data for all US adults with treated hypertension, the subset without diabetes or CKD, and the SPRINT-like subset are provided in Table 1. The estimated number of all US adults with treated hypertension, the subset without diabetes or CKD, and the SPRINT-like sample increased from 1999 to 2002. The mean age of US adults with treated hypertension and the subset without diabetes or CKD was lower than in SPRINT-like adults.

In all treated adults with hypertension, mean SBP declined 7 from 137.1 [standard deviation (SD) 22.1 mm Hg] in 1999–2002 to 130.1 (SD 19.3 mm Hg) during 2009–2012 as control to SBP <140 rose from 60.0 to 72.2%. In treated

adults without diabetes or CKD, i.e., the subset with JNC 7 goal SBP <130, SBP declined 6.6 from 136.1 to 129.5 as SBP control to <140 rose from 61.6 to 74.1%. Among SPRINT-like adults, mean SBP declined 7.2 from 140.2 to 133.0 over the same time periods, and control to SBP <140 rose from 51.5 to 66.2%. Systolic blood pressure was lower and control to <140 higher in all adults and the subset without diabetes or CKD than the SPRINT-like subset.

The majority of all adults with treated hypertension and the subset without diabetes or CKD was female across time periods, whereas females comprised <50% of treated SPRINT-like adults in the latter two time

Table 1: Selected characteristics of three groups of US adults with treated hypertension in three NHANES time periods

Time period	1999–2002	2003–2008	2009–2012	1999–2002	2003–2008	2009–2012	1999–2002	2003–2008	2009–2012
Group variable	All adults ≥18 years with treated hypertension			Adults ≥18 years with treated hypertension excluding diabetes and CKD			All SPRINT-like adults ≥50 years with treated hypertension		
Sample, N	1,785	3,443	2,882	1,033	1,883	1,526	562	941	684
Population, N	33,314,241	45,268,606	52,070,137	21,408,731	27,705,881	30,960,851	9,794,240	12,423,360	12,870,162
Age, years	61.8 ± 0.2	61.5 ± 0.1	61.8 ± 0.1	59.4 ± 0.2	59.3 ± 0.2	59.6 ± 0.2	67.8 ± 0.3	68.0 ± 0.2	68.1 ± 0.2
Female, %	58.7 ± 1.5	55.3 ± 1.0	55.2 ± 1.1	58.3 ± 1.6	53.4 ± 1.5	54.6 ± 1.7	52.1 ± 2.2	46.2 ± 2.4	43.5 ± 1.8
White, %	75.4 ± 2.0	76.2 ± 2.1	72.3 ± 2.7	76.5 ± 2.1	78.4 ± 2.1	75.9 ± 2.7	83.4 ± 2.2	84.8 ± 1.8	84.0 ± 1.9
Black, %	13.8 ± 1.9	13.9 ± 1.6	14.6 ± 1.9	12.7 ± 1.9	13.1 ± 1.7	13.4 ± 1.9	7.9 ± 1.5	8.7 ± 1.3	7.8 ± 1.1
Hispanic, %	7.3 ± 1.5	5.8 ± 0.9	8.1 ± 1.6	6.9 ± 1.4	4.9 ± 0.8	6.4 ± 1.3	5.2 ± 1.5	3.8 ± 0.7	5.0 ± 1.3
SBP, mmHg	137.1 ± 0.6	132.4 ± 0.4	130.1 ± 0.5	136.1 ± 0.7	130.5 ± 0.5	129.5 ± 0.7	140.2 ± 0.9	134.4 ± 0.6	133.0 ± 0.9
SBP <140, %	60.0 ± 1.4	69.4 ± 1.1	72.2 ± 1.0	61.6 ± 1.8	72.6 ± 1.4	74.1 ± 1.4	51.5 ± 2.6	62.8 ± 1.9	66.2 ± 2.5

Data are presented as mean and one standard error. NHANES data for 1999–2002 and 2003–2008 are age-adjusted to the US 2010 population; CKD: Chronic kidney disease; NHANES: National health and nutrition examination survey; SPRINT: Systolic blood pressure intervention trial

Table 2: Characteristics of all and SPRINT-like US adults with treated and controlled hypertension in three NHANES time periods

Time period	1999–2002	2003–2008	2009–2012	1999–2002	2003–2008	2009–2012
	<i>All adults ≥18 years with treated hypertension and SBP <140</i>			<i>All SPRINT-like adults ≥50 years with treated hypertension and SBP <140</i>		
Group						
Sample, N	966	2249	1979	285	584	435
Population, N	19,982,027	31,393,888	37,583,372	5,043,458	7,804,226	8,519,127
Age, year	60.5 ± 0.2	60.3 ± 0.2	60.6 ± 0.1	67.5 ± 0.3	67.9 ± 0.2	67.7 ± 0.3
Female, %	53.1 ± 1.9	52.7 ± 1.3	54.7 ± 1.5	38.6 ± 3.6	36.9 ± 3.0	37.0 ± 2.4
White, %	77.7 ± 2.1	77.7 ± 1.9	73.6 ± 2.6	86.1 ± 1.9	85.6 ± 1.9	85.9 ± 1.9
Black, %	12.4 ± 1.8	13.1 ± 1.5	13.8 ± 1.7	7.7 ± 1.5	8.1 ± 1.3	7.0 ± 1.0
Hispanic, %	6.7 ± 1.3	5.6 ± 0.9	7.3 ± 1.5	4.3 ± 1.5	3.7 ± 0.8	4.3 ± 1.2
SBP, mm Hg	123.0 ± 0.4	121.9 ± 0.3	120.9 ± 0.3	125.8 ± 0.8	124.1 ± 0.6	123.3 ± 1.0
SBP <135, %	85.5 ± 1.0	85.6 ± 0.8	89.8 ± 0.7	76.3 ± 3.2	79.1 ± 2.0	88.3 ± 1.6
SBP <130, %	66.1 ± 1.5	69.2 ± 1.3	74.7 ± 1.1	53.3 ± 3.6	61.5 ± 2.9	68.3 ± 3.2
SBP <125, %	49.7 ± 1.8	54.6 ± 1.3	57.9 ± 1.4	37.8 ± 3.4	45.3 ± 2.6	47.8 ± 3.9
SBP <120, %	33.2 ± 1.9	39.2 ± 1.2	41.4 ± 1.0	25.5 ± 3.4	32.3 ± 2.2	30.4 ± 2.8

Data are age-adjusted to 2010 and presented as mean and one standard error; Cont: Controlled; Rx: Treated; Rx&Cont/Rx: Percent of treated patients controlled to SBP <140 mm Hg; SBP: Systolic blood pressure; SPRINT: Systolic blood pressure intervention trial

periods. While the majority of all adults with treated hypertension, including the subset without diabetes or CKD, were white in the three NHANES time periods, the white majority was larger among the SPRINT-like subset.

Data for all adults and the SPRINT-like subset with treated hypertension controlled to SBP <140 (Table 2). Mean SBP values were slightly lower, rather than higher, in adults ≥18 years when excluding individuals with diabetes and CKD who had a SBP goal <130. Thus, analyses of adults with controlled hypertension focused on all adults and the SPRINT-like subset. As expected, among adults with SBP <140, the SPRINT-like subset was older, less likely to be female, and more likely to be white. Mean SBP values fell 2.1 over the time among all adults (123.0–120.9) with treated and controlled hypertension and 2.5 (125.8–123.3) in SPRINT-like adults. Percentages with hypertension controlled to various SBP target ranging from <120 to <135 rose with time and were higher in all than SPRINT-like adults.

The distribution of SBP in all treated adults and the two subsets with controlled (SBP <140) and uncontrolled hypertension are shown in Graphs 1A to F. The graphic highlights that a substantial majority of adults with SBP <140 has SBP <130 and that a substantial minority have SBP <120. The graphic also highlights the declining categorical and cumulative percentages of adults with SBP ≥140 and especially the subsets with SBP ≥160 and ≥180 mmHg.

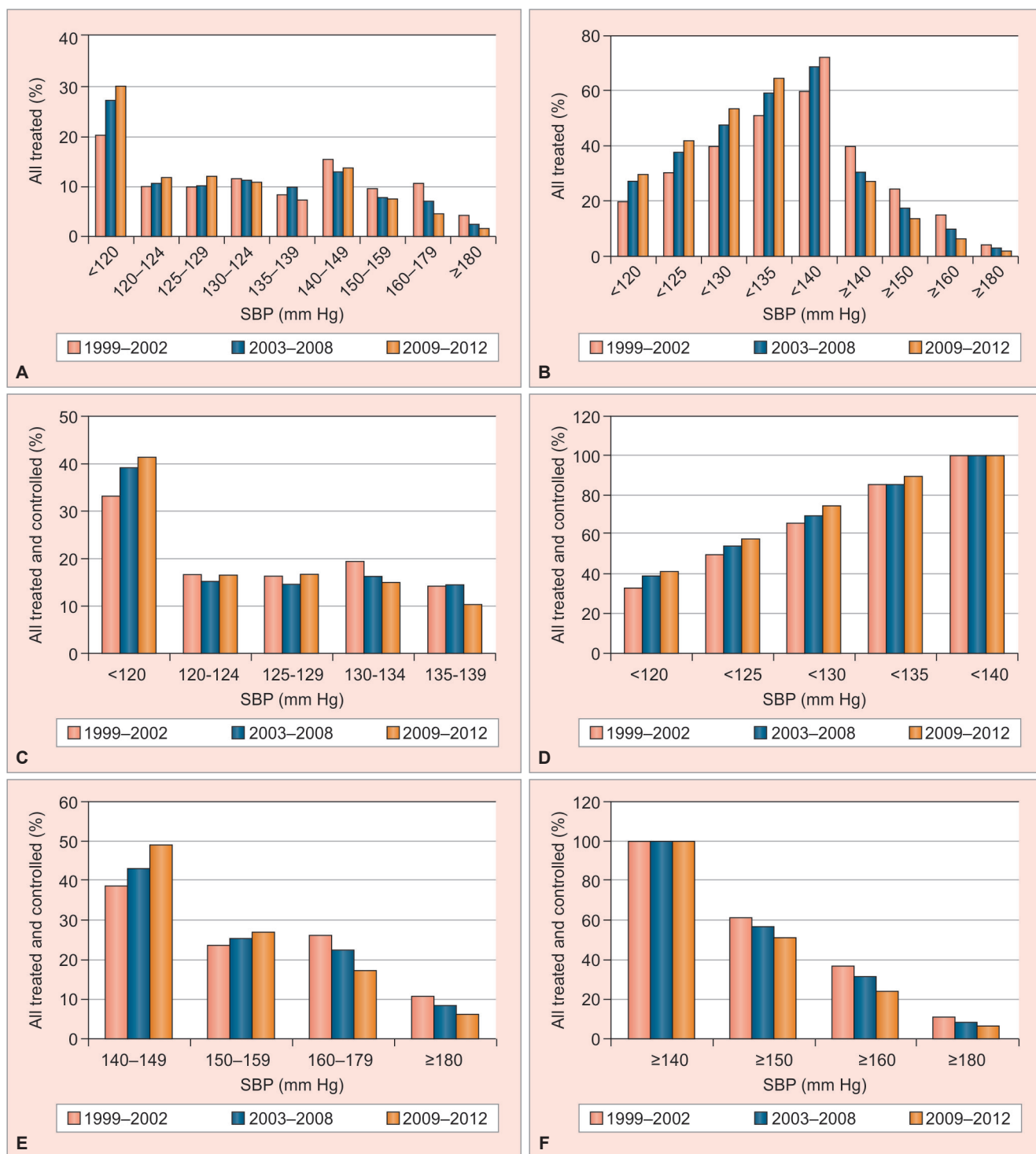
DISCUSSION

Systolic blood pressure intervention trial is a landmark study, which could support changes in hypertension guidelines leading to a SBP target substantially below the target of <140 for most patients as proposed by SPRINT authors.¹ We previously evaluated two critical

assumptions in SPRINT that could lead to a lower SBP requiring more intensive treatment for millions of hypertensive adults.² One implicit assumption was that SPRINT participants randomized to standard treatment attained SBP comparable to or lower than US adults with treated hypertension. In this report, we find that treated hypertensive adults in the US attained lower mean SBP than SPRINT standard treatment participants in both 2003–2008 and 2009–2012 (Table 1). Moreover, as the percentage of US adults with hypertension treated and controlled has increased from 60% 1999–2002 to 72.2% in 2009–2012, mean SBP of all treated adults has fallen progressively from 137.1 to 130.1. Our previous estimates suggested that the mean SBP in all treated hypertensive adults would approach values attained with SPRINT intensive treatment if SBP were controlled to <140 in 88% of them,² the implied US Healthy People 2020 target.

It could be argued that US adults with hypertension and diabetes or CKD were treated to a SBP goal <130,^{7,8} which, in turn, contributed to the lower mean SBP for all adults with treated hypertension than in SPRINT standard treatment. To address this possibility, adults with diabetes or CKD were removed from all treated hypertensives and the analysis repeated. In fact, SBP fell after excluding these two groups with a lower treatment goal (Table 1).

The higher SBP with SPRINT standard treatment than usual care likely reflects the specific SBP goal and protocol for attaining it. Rather than a SBP goal of <140 consistent with most guidelines, the SPRINT standard-treatment SBP goal was 135 to 139.⁹ Unlike the hypertension guidelines, the SPRINT protocol specified reducing antihypertensive medication on any single visit when SBP was <130 and on consecutive visits when SBP was <135.⁹



Graphs 1A to F : Percentages of all US adults with treated hypertension (top), treated and controlled hypertension (SBP <140, middle), and treated and uncontrolled hypertension (SBP ≥140, bottom). Panels on the left side show the percentages of treated hypertensives in each SBP band, whereas panels on the right display cumulative percentages above or below each of the SBP cut-points shown; SBP: Systolic blood pressure]

A second key SPRINT assumption is that intensive treatment with target SBP <120 leads to a lower SBP than in treated hypertensives with SBP <140. If this assumption is not correct, then the rationale for lowering the SBP target to <120 or <130 for treated adults with hypertension is weakened. As reported, 72.2% of all US adults with treated hypertension were controlled to a

SBP <140 in 2009–2012,² and their mean SBP was 120.9, which is comparable to 121.4 after 1 year of SPRINT intensive treatment.¹ Furthermore, the current report indicates that mean SBP of treated hypertensive patients controlled to <140 is also declining over time (Table 2 and Graphs 1A to F) and could fall further as control to SBP <140 improves. The percentages of adults with SBP <120

and <130 has also risen over time as SBP control to <140 has improved. In 2009–2012, nearly three of four adults with treated hypertension and SBP <140 also had SBP <130 (Table 2).

A third key SPRINT assumption is that SBP obtained with rigorous measurement methodologies translate to usual care or that SPRINT measurement methods can be adopted by most primary care settings. Systolic blood pressure intervention trial used automated office BP (AOBP) measurements, in which a series of measurements were obtained with the patient alone in the exam room (unattended) using an accurate, automated device and averaged.^{3,4,9} Systolic blood pressure intervention trial added 5 minutes of rest before the AOBP measurement³ with the additional time requirement likely limiting broad adoption. Moreover, mean AOBP without rest correlates well with daytime ambulatory BP values,¹⁴ whereas AOBP with 5 minutes leads to mean values below ambulatory daytime readings.^{3,15,16} More specifically, in the SPRINT ambulatory BP study, daytime ambulatory SBP was ~7 higher than clinic SBP with intensive treatment and ~3 than SPRINT standard treatment. Daytime ambulatory SBP is typically ~5 lower than usual clinic SBP.⁸

Of importance, SPRINT results indicate that SBP values well below 140 in adults with treated and controlled hypertension reduce fatal and nonfatal cardiovascular events with a moderate increase in adverse events, e.g., hypotension, syncope, hyponatremia, hypokalemia, and acute kidney injury.¹ Thus, clinicians should be encouraged to continue and not reduce antihypertensive therapy for adults controlled to these lower values who are tolerating therapy. The benefits of good SBP control in SPRINT extended to adults >75 years where the benefits of SBP <140 were less certain.^{17,18} The current discussion against lowering the SBP target below the current <140 based on SPRINT is not intended to detract from these key contributions.

The reason SBP values well below 140 are required to obtain high control rates in a group of adults with treated hypertension reflect the substantial within and between individual variability in this important biological variables.² Unless the variability in BP declines, mean values well below the SBP target will be required both to control a single individual on most visits as well as most individuals at any time point. For example, in a normal distribution ~84% of individuals are included in the area up to 1 SD above the mean.¹⁹ Assuming a normal SBP distribution and an interindividual SD of SBP is 16, then a mean SBP of 123 to 124 in treated hypertensive adults is required to control 84% of them to SBP <140.

There are potential risks of using SPRINT to revise clinical guidelines and health care quality metrics aimed at SBP targets lower than <140. First, hypertensive patients treated to SBP <140 already attain mean SBP values

comparable to SPRINT intensive treatment. Lowering the SBP target could lead to mean systolic BP below SPRINT. A precedence for this concern is documented in the hypertension optimal treatment (HOT) study,²⁰ which found that a DBP goal hypertension <80 mm Hg reduced cardiovascular events ~50% vs a goal <90 mm Hg in adults with diabetes and hypertension. Mean DBP achieved in HOT participants with diabetes and hypertension was 81 mm Hg and not <80. Guideline writers cited HOT when setting a DBP <80 mm Hg for adults with diabetes and hypertension.^{21,22} Health care quality metrics were developed and implemented to score physicians and health systems on their success at controlling DBP to <80 mm Hg in adults with diabetes, which likely contributed to achieved DBP well below <80 mm Hg.²³

The potential risk is that an analogous sequence of events occurs with SBP goals <120 and lead to mean SBP values in treated hypertensive adults below the mean associated with benefit with SPRINT intensive treatment. While SBP values may be beneficial, evidence-based studies can lead to guideline recommendations that exceed the evidence with potential downside risk. For example, aggressive SBP targets in SPRINT and action to control cardiovascular risk in diabetes (ACCORD) were associated with more adverse events than occurred with standard treatment with benefits on aggregate cardiovascular outcomes in SPRINT and fewer strokes in ACCORD.^{1,24}

While our reports focused on changes of SBP and control to <140 over time, changes in SBP distribution among adults with uncontrolled SBP ≥140 are also noteworthy. In fact, BP distribution in adults with uncontrolled SBP ≥140 has also shifted toward lower values with a progressively smaller proportion having SBP of 160 to 179 and ≥180 (Graphs 1A to F). Cardiovascular events double with each 20 mm Hg increase in SBP above 115.⁸ Intervention studies in isolated systolic hypertension showed large benefits of lowering SBP ~10 even though mean values remained >140.¹⁸ The downward shift of SBP among adults with treated, uncontrolled hypertension is likely contributing to fewer cardiovascular events.

Several limitations of our report are noteworthy. In NHANES, BP was measured by trained observers, which are most likely higher than would have been obtained with the SPRINT measurement protocol. If NHANES used SPRINT methods, discussed earlier, then mean SBP values in NHANES would likely have been lower and percentages controlled at various levels of SBP greater. Second, our NHANES analysis did not include untreated hypertensives as SPRINT was a treatment study. Third, our primary analysis included all adults with treated hypertension, although SPRINT excluded adults with diabetes.^{1,9} One could postulate that including all treated participants with diabetes and CKD, who had a SBP target

<130 during the 1999–2012 time period of the analysis,^{7,8} led to lower SBP. In fact, excluding these two groups resulted led to a lower treated SBP. Fourth, the SPRINT intensive treatment group included a small percentage of individuals with SBP ≥ 140 , whereas our comparison group of treated and controlled hypertensive adults excluded individuals with SBP ≥ 140 , which would have contributed to lower mean SBP among NHANES participants. On the contrary, SPRINT excluded all patients with SBP ≥ 180 and patients with SBP as low as ≥ 150 depending upon the number of antihypertensive medications.⁹ If individuals with severe and treatment resistant hypertension had been excluded from our NHANES analysis, then reported SBP values would have been lower. Finally, while we attempted to select adults in NHANES matching SPRINT inclusion-exclusion criteria, NHANES data do not permit precise matching for all exclusion criteria, e.g., ejection fraction.⁹

In summary, in the US, SBP from 1999 to 2012 has been falling in all treated hypertensive adults and in the subset controlled to SBP <140. The SBP distribution among individuals with SBP ≥ 140 has also been shifting favorably to lower levels. Since 2003, SBP in all treated hypertensive adults in the US have been lower than SBP values achieved with SPRINT standard treatment. These differences in favor of usual care in the US population are probably even greater if SPRINT BP measurement methods were used in NHANES. Adults with treated hypertension and SBP <140 are already achieving mean values similar to SPRINT intensive treatment and most have SBP <130. Moreover, given measurement different, mean SBP with SPRINT standard treatment likely corresponds to a usual clinic SBP of 142.6, whereas SPRINT intensive treatment SBP corresponds to a usual clinic SBP of ~ 133.5 . Importantly, SPRINT documents that SBP <140, and for some SPRINT participants considerably less than 140, are beneficial for improving overall cardiovascular outcomes, including patients ≥ 75 years.

Disclosures

During the previous 3 years, Dr Egan received grants from the CDC, Medtronic, NIH, and Quintiles and honoraria as a consultant to AstraZeneca, Medtronic, Merck, Novartis, the University of Iowa, and Valencia and royalties from UpToDate. Dr Li has nothing to disclose.

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