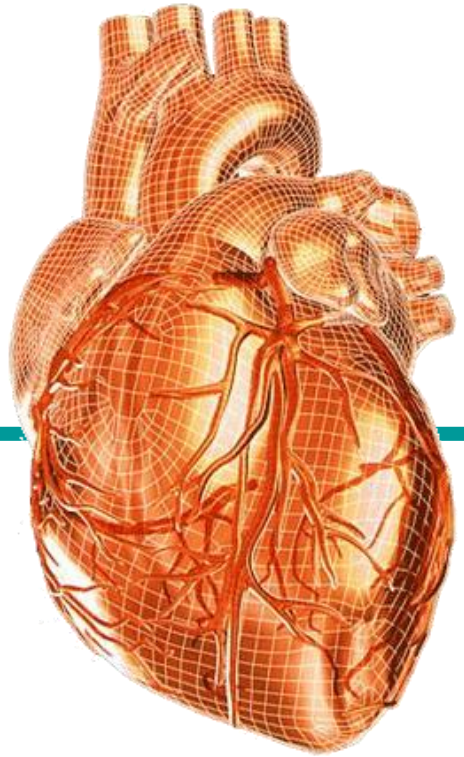

# *Feeling the pressure? Managing Hypertension in 2016*

ACC Latin America Conference 2016

MEXICO CITY
OCTOBER 7 – 8, 2016

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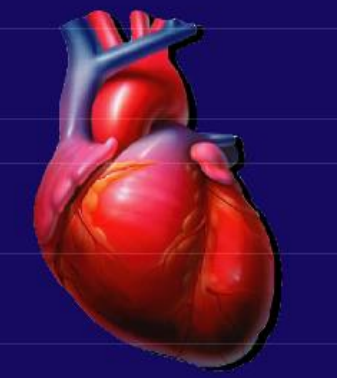
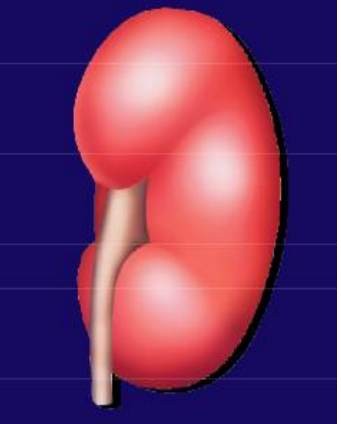

# Disclosure of Potential Conflicts of Interest

| Categories of potential conflict of interest | Company (period from 2002 to 2016) |
|---|---|
| Sponsoring of transport and/or hotel accommodations in Congresses | **LIBBS, AstraZeneca, MSD, Servier,** |
| Sponsored in clinical trials and/or in basic research funded by pharmaceutical companies | **Bayer** |
| Speaker in meetings sponsored by pharmaceutical companies | **LIBBS, Novartis, MSD, BMS, Pfizer, Servier** |
| Participate in normative committees of scientific trials sponsored by pharmaceutical companies | **Bayer** |
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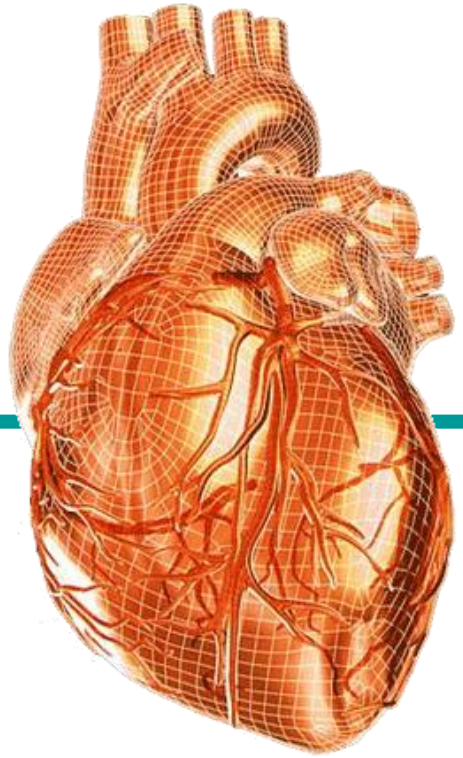


Should new hypertension goals apply to all?

# Current Context of Hypertension

# Multivariable-Adjusted Hazard Ratios for 24-Hour Systolic and Diastolic BP According to Age Groups

| | | <50 years (n=3761) | | | ≥50 years (n=4580) | | |
|---|---|---|---|---|---|---|---|
| End Point | | n | Diastolic Pressure | Systolic Pressure | n | Diastolic Pressure | Systolic Pressure |
| Mortality | | | | | | | |
| Total | A | 64 | 1.38 (1.08–1.77)† | 1.20 (0.86–1.66) | 863 | 1.17 (1.10–1.25)‡ | 1.21 (1.14–1.29)‡ |
| | FA | | 2.05 (1.26–3.33)† | 0.56 (0.30–1.05) | | 1.03 (0.94–1.13) | 1.19 (1.08–1.30)‡ |
| Cardiovascular | A | 16 | 2.34 (1.61–3.39)‡ | 2.23 (1.32–3.78)† | 340 | 1.31 (1.18–1.44)‡ | 1.47 (1.35–1.61)‡ |
| | FA | | 4.07 (1.60–10.4)† | 0.44 (0.13–1.56) | | 0.96 (0.85–1.10) | 1.51 (1.34–1.70)‡ |
| Noncardiovascular | A | 46 | 1.13 (0.83–1.55) | 0.93 (0.61–1.42) | 502 | 1.06 (0.97–1.16) | 1.03 (0.94–1.12) |
| | FA | | 1.73 (0.96–3.12) | 0.53 (0.25–1.13) | | 1.09 (0.95–1.25) | 0.96 (0.84–1.10) |
| Fatal plus nonfatal events | | | | | | | |
| All cardiovascular | A | 47 | 1.65 (1.27–2.14)‡ | 1.68 (1.19–2.36)† | 697 | 1.36 (1.27–1.46)‡ | 1.44 (1.35–1.53)‡ |
| | FA | | 1.74 (1.03–2.93)* | 0.92 (0.47–1.81) | | 1.06 (0.97–1.17) | 1.39 (1.27–1.51)‡ |
| Cardiac | A | 37 | 1.53 (1.12–2.08)† | 1.52 (1.01–2.27)* | 440 | 1.26 (1.16–1.38)‡ | 1.37 (1.26–1.48)‡ |
| | FA | | 1.67 (0.92–3.03) | 0.88 (0.40–1.90) | | 1.01 (0.90–1.14) | 1.36 (1.22–1.52)‡ |
| Coronary | A | 28 | 1.63 (1.16–2.30)† | 1.67 (1.07–2.62)* | 320 | 1.25 (1.13–1.38)‡ | 1.35 (1.23–1.48)‡ |
| | FA | | 1.73 (0.87–3.45) | 0.92 (0.37–2.24) | | 1.01 (0.88–1.15) | 1.35 (1.18–1.53)‡ |
| Stroke | A | 7 | 2.31 (1.25–4.27)† | 2.43 (1.12–5.26)* | 249 | 1.61 (1.43–1.81)‡ | 1.65 (1.49–1.83)‡ |
| | FA | | 2.24 (0.62–8.20) | 1.04 (0.21–5.26) | | 1.14 (0.97–1.34) | 1.52 (1.32–1.76)‡ |

Li Y *et al*. *Circulation* 2014; 130(6):466-74

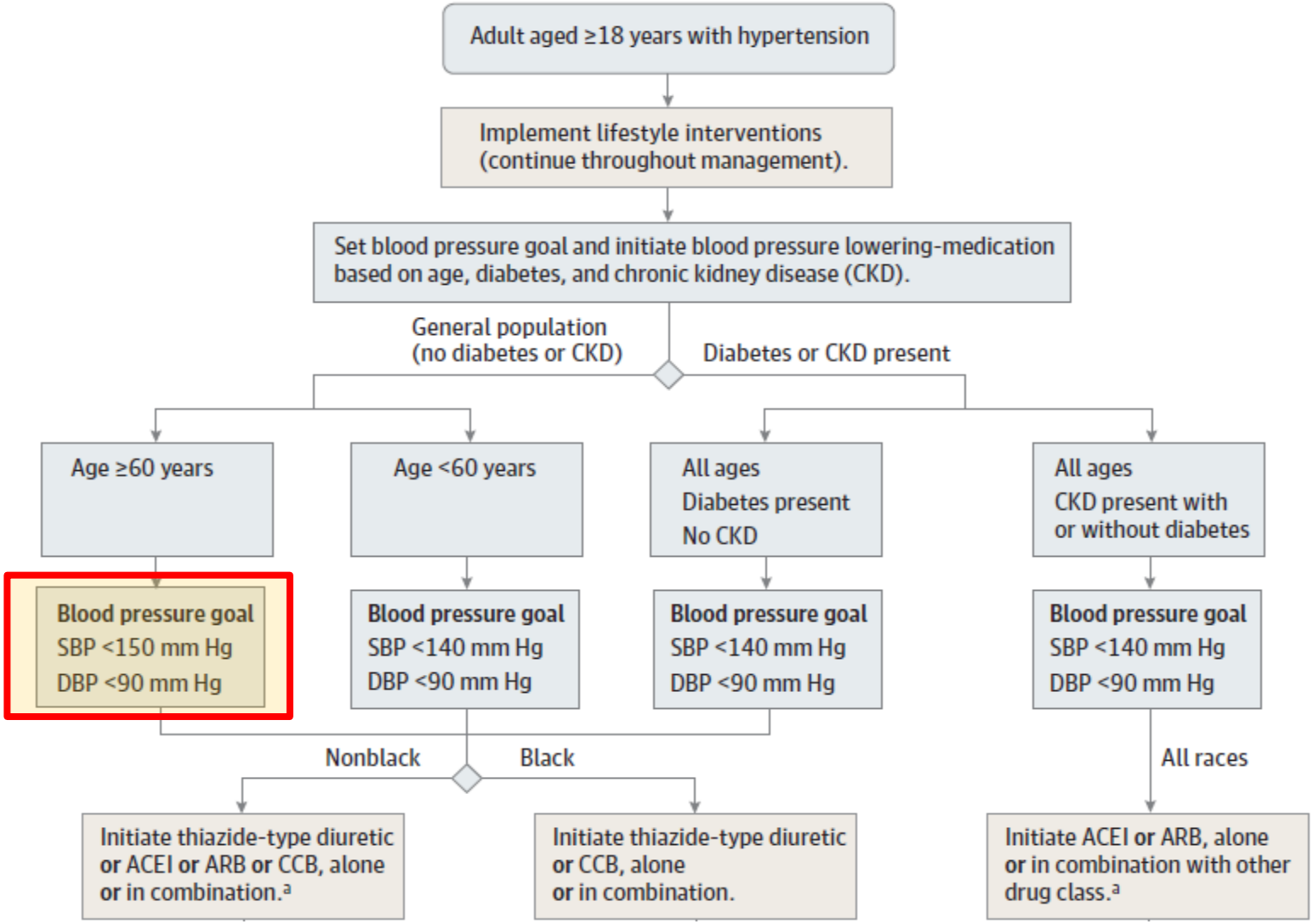
# Ambulatory Hypertension Subtypes and 24-Hour Systolic and Diastolic Blood Pressure as Distinct Outcome Predictors in 8341 Untreated People Recruited From 12 Populations

Yan Li, MD, PhD; Fang-Fei Wei, MD; Lutgarde Thijs, MSc; José Boggia, MD, PhD; Kei Asayama, MD, PhD; Tine W. Hansen, MD, PhD; Masahiro Kikuya, MD, PhD; Kristina Björklund-Bodegård, MD, PhD; Takayoshi Ohkubo, MD, PhD; Jørgen Jeppesen, MD; Yu-Mei Gu, MD; Christian Torp-Pedersen, MD, PhD; Eamon Dolan, MD, PhD; Yan-Ping Liu, MD; Tatiana Kuznetsova, MD, PhD; Katarzyna Stolarz-Skrzypek, MD, PhD; Valérie Tikhonoff, MD, PhD; Sofia Malyutina, MD, PhD; Edoardo Casiglia, MD, PhD; Yuri Nikitin, MD, PhD; Lars Lind, MD, PhD; Edgardo Sandoya, MD, PhD; Kalina Kawecka-Jaszcz, MD, PhD; Luis Mena, MD; Gladys E. Maestre, MD, PhD; Jan Filipovský, MD, PhD; Yutaka Imai, MD, PhD; Eoin O'Brien, MD, PhD; Ji-Guang Wang, MD, PhD; Jan A. Staessen, MD, PhD; on behalf of the International Database on Ambulatory blood pressure in relation to Cardiovascular Outcomes (IDACO) Investigators

- **The risks conferred by DBP24 and SBP24 are age dependent.**
- **DBP24 and isolated diastolic hypertension drive coronary complications below age 50**
- **Above age of 50yo SBP24-h and isolated systolic, and mixed hypertension are the predominant risk factors.**

# Hypertension Guidelines - JNC-8

Figure. 2014 Hypertension Guideline Management Algorithm




JAMA 2014;311(5):507-20

# 2013 ESH/ESC Hypertension Guidelines

## Blood pressure goals in hypertensive patients

| Recommendations | Class [a] | Level [b] | Ref. [c] |
|---|---|---|---|
| A SBP goal <140 mmHg: | | | |
| a) is recommended in patients at low–moderate CV risk; | I | B | 266, 269,270 |
| b) is recommended in patients with diabetes; | I | A | 270, 275, 276 |
| c) should be considered in patients with previous stroke or TIA; | IIa | B | 296, 297 |
| d) should be considered in patients with CHD; | IIa | B | 141, 265 |
| e) should be considered in patients with diabetic or non-diabetic CKD. | IIa | B | 312, 313 |
| In elderly hypertensives less than 80 years old with SBP ≥160 mmHg there is solid evidence to recommend reducing SBP to between 150 and 140 mmHg. | I | A | 265 |
| In fit elderly patients less than 80 years old SBP values <140 mmHg may be considered, whereas in the fragile elderly population SBP goals should be adapted to individual tolerability. | IIb | C | - |
| In individuals older than 80 years and with initial SBP ≥160 mmHg, it is recommended to reduce SBP to between 150 and 140 mmHg provided they are in good physical and mental conditions. | I | B | 287 |
| A DBP target of <90 mmHg is always recommended, except in patients with diabetes, in whom values <85 mmHg are recommended. It should nevertheless be considered that DBP values between 80 and 85 mmHg are safe and well tolerated. | I | A | 269, 290, 293 |

CHD = coronary heart disease; CKD = chronic kidney disease; CV = cardiovascular; DBP = diastolic blood pressure; SBP = systolic blood pressure; TIA = transient ischaemic attack.

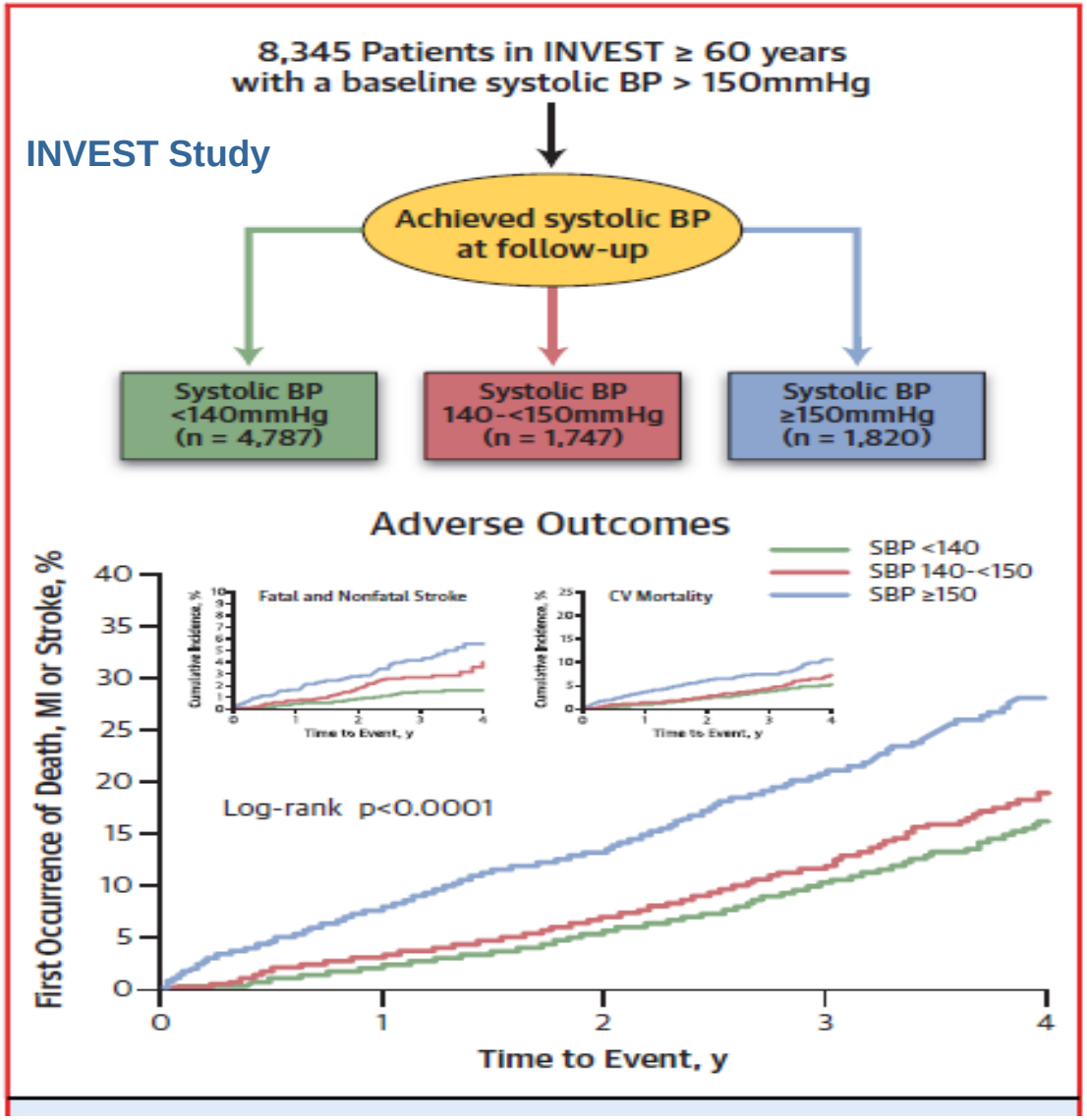
[a]Class of recommendation.

[b]Level of evidence.

[c]Reference(s) supporting recommendation(s).

*Eur Heart J* 2013; 34(28):2159-219

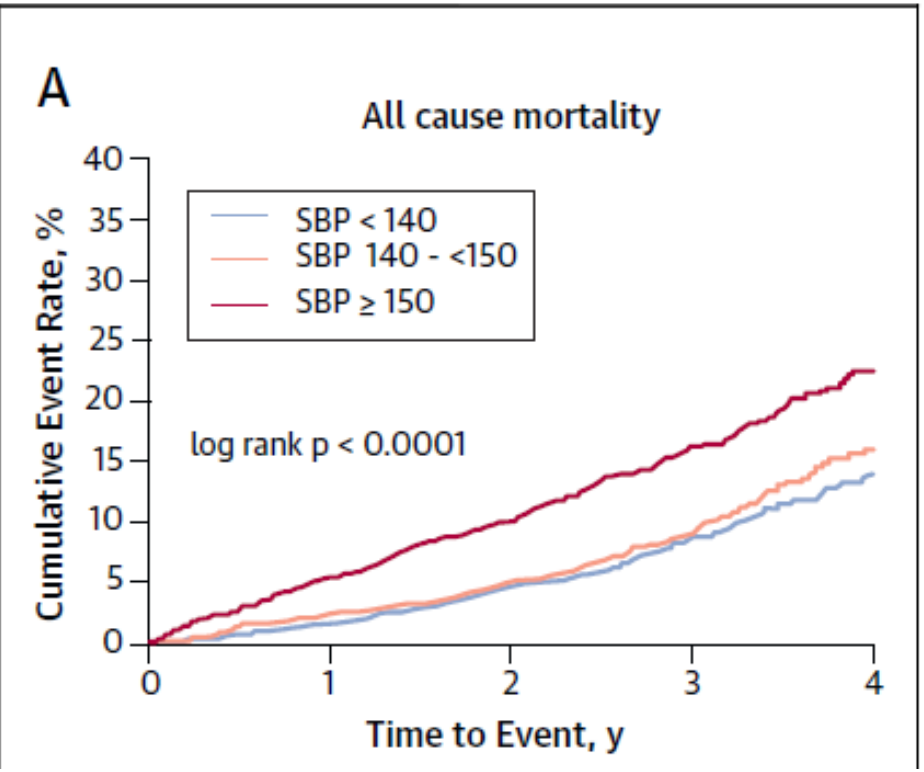
# Hypertension: Risk of CV Events According to Systolic BP in Patients ≥ 60 Years

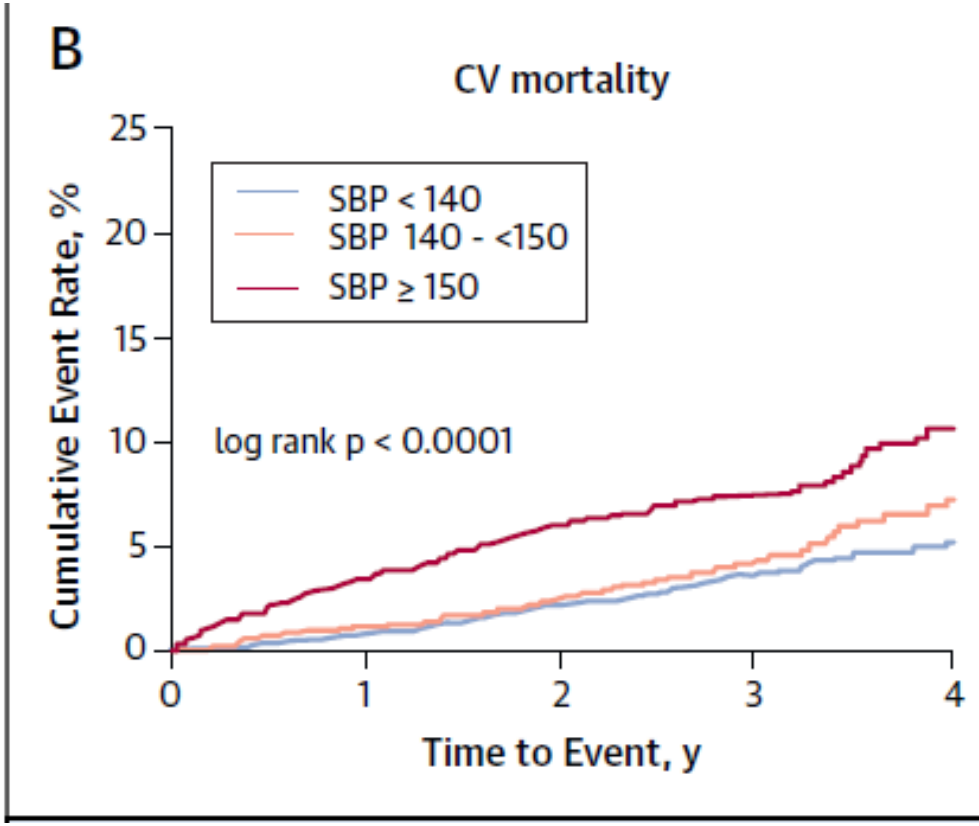



Bangalore S, *et al. JACC* 2014;64(8): 784-93

# Hypertension: Risk of CV Events According to Systolic BP in Patients ≥ 60 Years

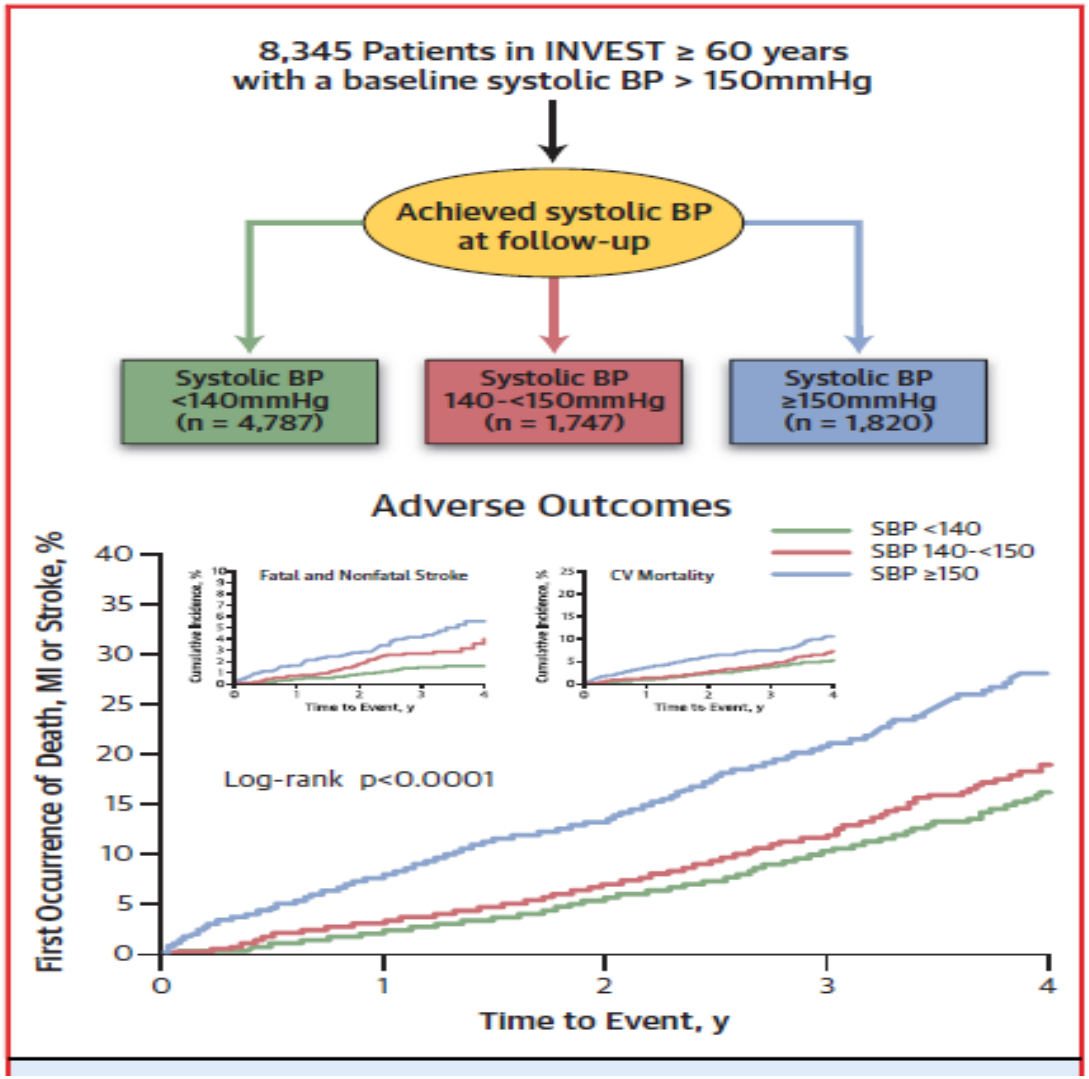
## INVEST Study




Bangalore S, *et al. JACC* 2014;64(8): 784-93

# INVEST Study: Risk of CV Events According to Systolic BP in Patients ≥ 60 Years

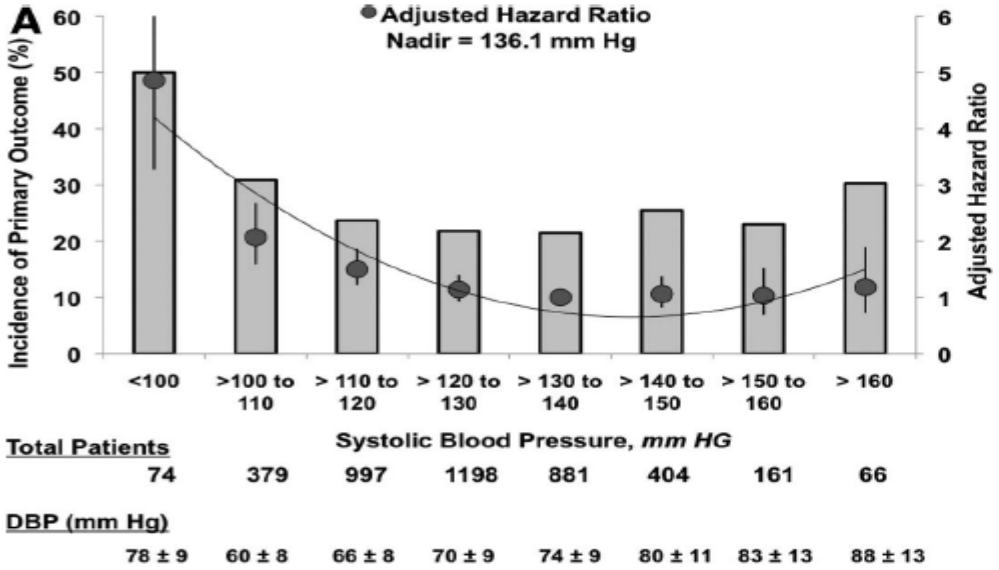


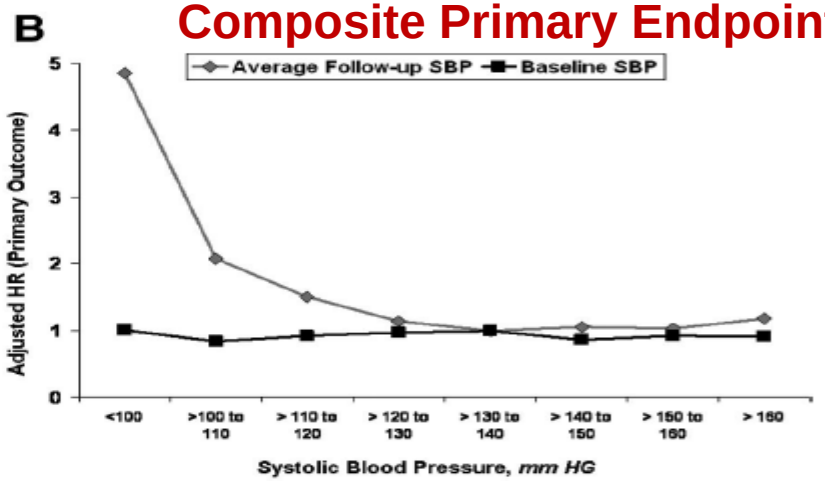

"In ***hypertensive patients with CAD*** who are **≥ 60 years** of age, achieving a BP target of 140 to <150 mmHg as recommended by the JNC-8 panel was associated with less benefit than the previously recommended target of <140 mmHg."

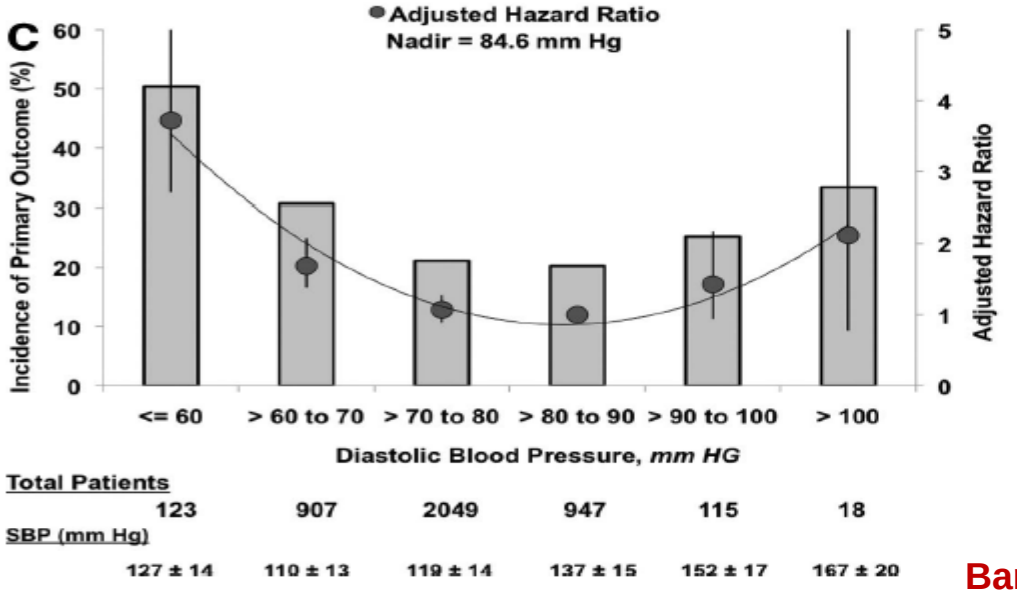
Bangalore S, *et al. JACC* 2014;64(8): 784-93

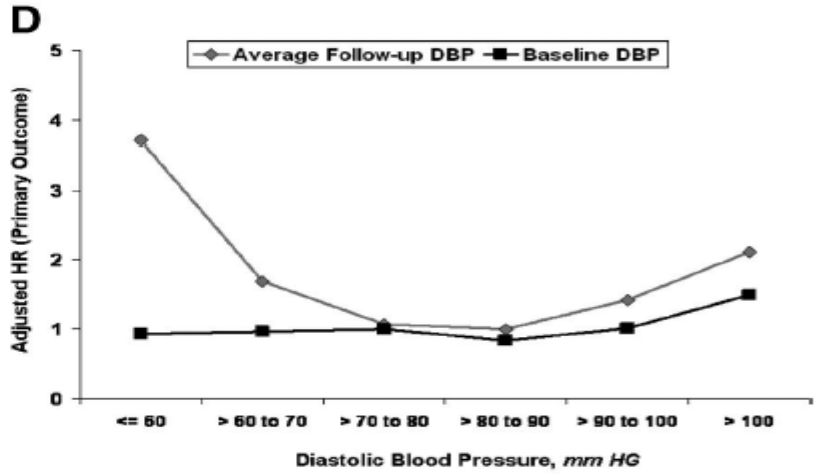
# J- or U-Shaped Curve Association Between BP and the Risk of Future CV Events After ACS

**PROVE IT-TIMI 22 Trial**
**Composite Primary Endpoint**

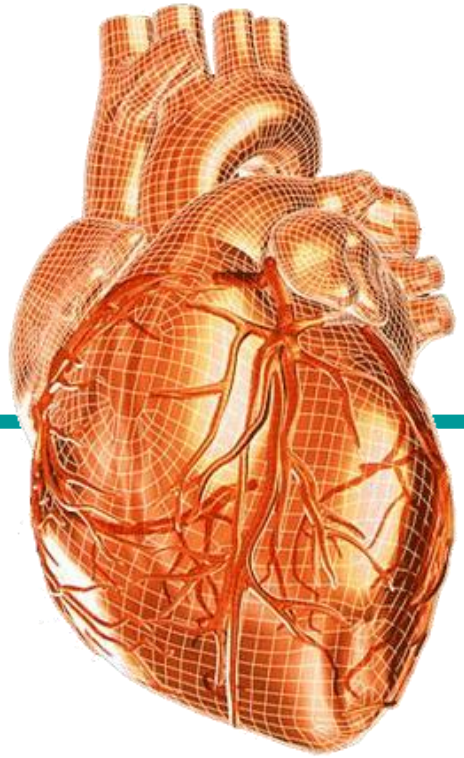



Bangalore S, *et al. Circulation* 2010;122(21):2142-51

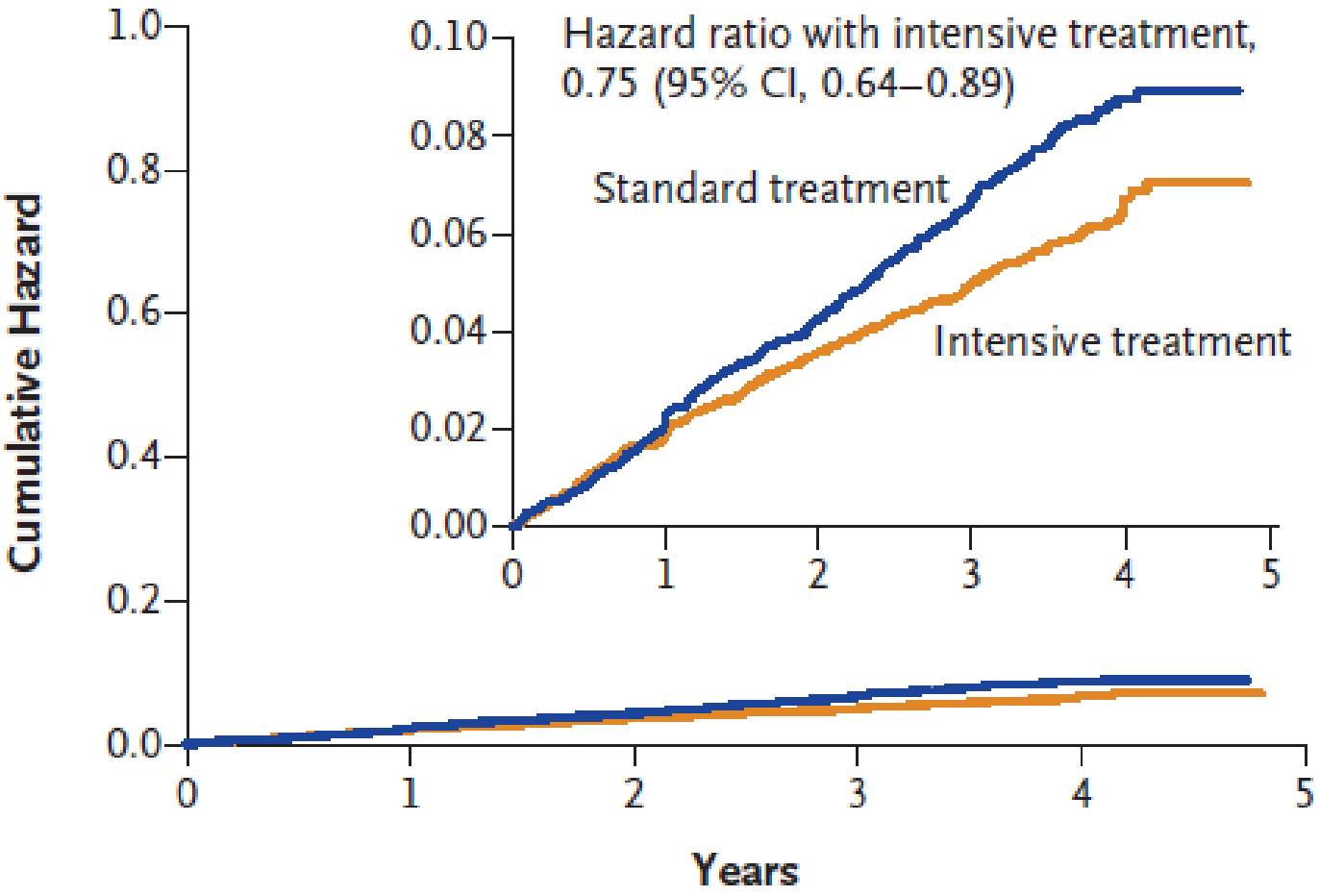


# *Feeling the pressure? Managing Hypertension in 2016*

## Should new hypertension goals apply to all?

# SPRINT A Randomized Trial of Intensive *versus* Standard Blood Pressure Control

## A Primary Outcome

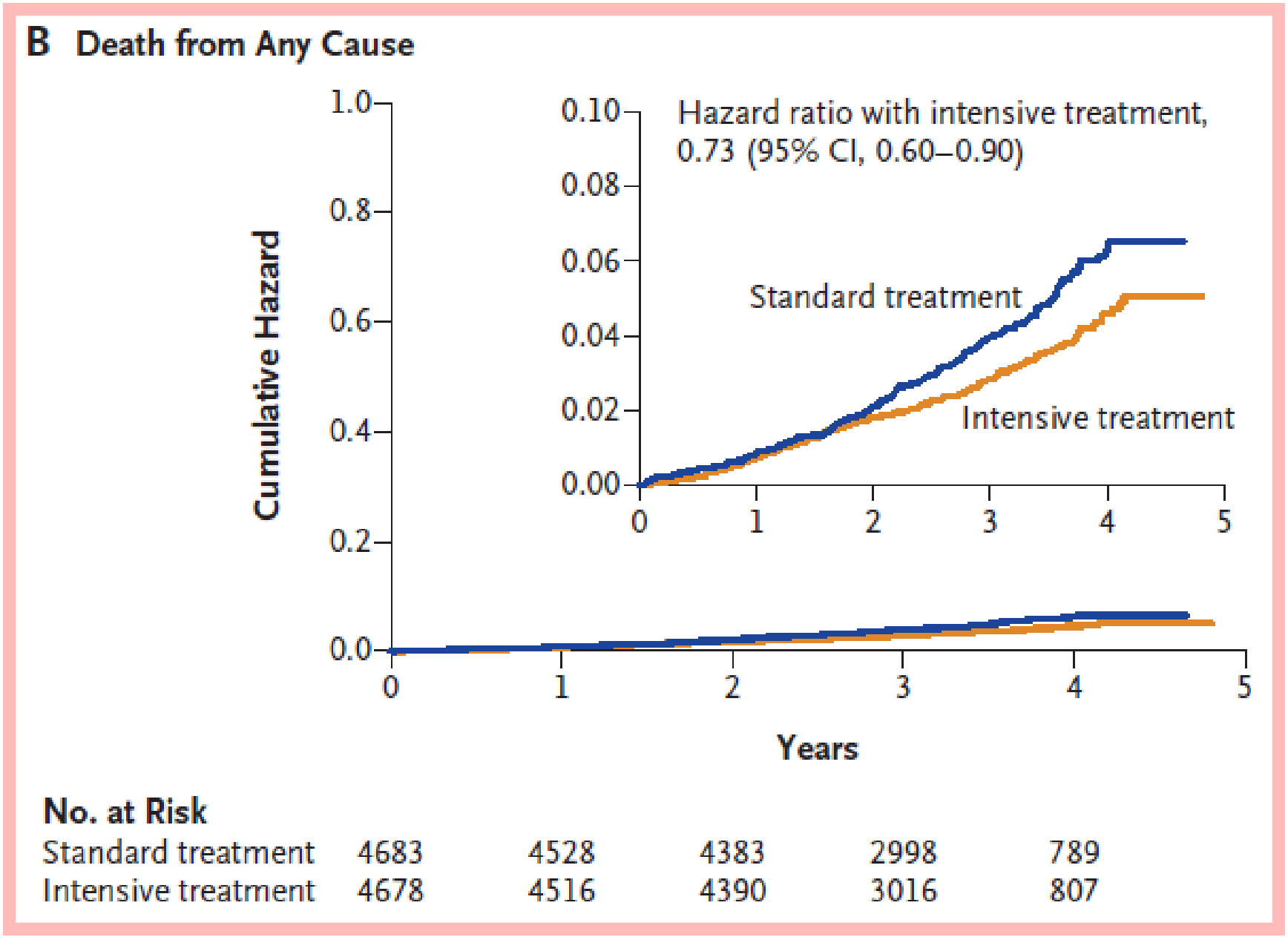



**No. at Risk**

| | | | | | |
|---|---|---|---|---|---|
| Standard treatment | 4683 | 4437 | 4228 | 2829 | 721 |
| Intensive treatment | 4678 | 4436 | 4256 | 2900 | 779 |

SPRINT Research Group, Wright JT Jr, *et al*. *N Engl J Med* 2015;373(22):2103-16.

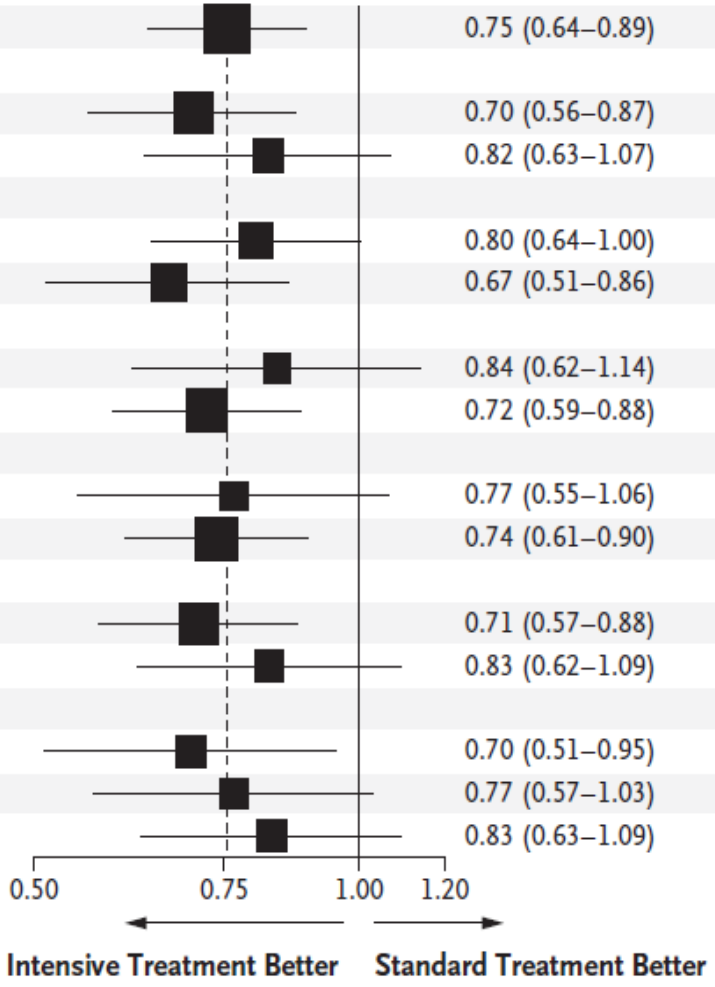
# SPRINT A Randomized Trial of Intensive *versus* Standard Blood Pressure Control




SPRINT Research Group, Wright JT Jr, *et al*. *N Engl J Med* 2015;373(22):2103-16.

# Forest Plot - Primary Outcome According to Subgroups

| Subgroup | Intensive Treatment | Standard Treatment | Hazard Ratio (95% CI) | P Value for Interaction |
|---|---|---|---|---|
| | *no. of patients with primary outcome/total no. (%)* | | | |
| Overall | 243/4678 (5.2) | 319/4683 (6.8) | 0.75 (0.64–0.89) | |
| Previous CKD | | | | 0.36 |
| No | 135/3348 (4.0) | 193/3367 (5.7) | 0.70 (0.56–0.87) | |
| Yes | 108/1330 (8.1) | 126/1316 (9.6) | 0.82 (0.63–1.07) | |
| Age | | | | 0.32 |
| <75 yr | 142/3361 (4.2) | 175/3364 (5.2) | 0.80 (0.64–1.00) | |
| ≥75 yr | 101/1317 (7.7) | 144/1319 (10.9) | 0.67 (0.51–0.86) | |
| Sex | | | | 0.45 |
| Female | 77/1684 (4.6) | 89/1648 (5.4) | 0.84 (0.62–1.14) | |
| Male | 166/2994 (5.5) | 230/3035 (7.6) | 0.72 (0.59–0.88) | |
| Race | | | | 0.83 |
| Black | 62/1454 (4.3) | 85/1493 (5.7) | 0.77 (0.55–1.06) | |
| Nonblack | 181/3224 (5.6) | 234/3190 (7.3) | 0.74 (0.61–0.90) | |
| Previous cardiovascular disease | | | | 0.39 |
| No | 149/3738 (4.0) | 208/3746 (5.6) | 0.71 (0.57–0.88) | |
| Yes | 94/940 (10.0) | 111/937 (11.8) | 0.83 (0.62–1.09) | |
| Systolic blood pressure | | | | 0.77 |
| ≤132 mm Hg | 71/1583 (4.5) | 98/1553 (6.3) | 0.70 (0.51–0.95) | |
| >132 to <145 mm Hg | 77/1489 (5.2) | 106/1549 (6.8) | 0.77 (0.57–1.03) | |
| ≥145 mm Hg | 95/1606 (5.9) | 115/1581 (7.3) | 0.83 (0.63–1.09) | |

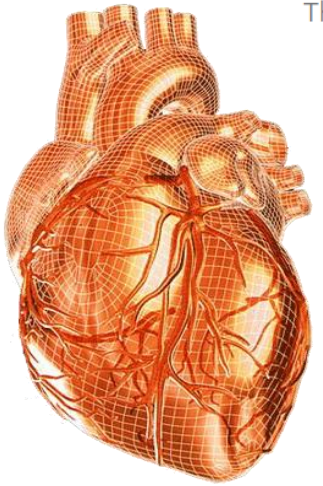



SPRINT Research Group, Wright JT Jr, *et al*. *N Engl J Med* 2015;373(22):2103-16.

ORIGINAL ARTICLE

# A Randomized Trial of Intensive versus Standard Blood-Pressure Control

The SPRINT Research Group*



## Supplementary Appendix

This appendix has been provided by the authors to give readers additional information about their work.

Supplement to: The SPRINT Research Group. A randomized trial of intensive versus standard blood-pressure control. N Engl J Med 2015;373:2103-16. DOI: 10.1056/NEJMoa1511939

**A RANDOMIZED TRIAL OF INTENSIVE VERSUS STANDARD BLOOD PRESSURE CONTROL**

**SUPPLEMENTARY APPENDIX**

**SPRINT Research Group, Wright JT Jr, *et al*. *N Engl J Med* 2015;373(22):2103-16. Supplementary Appendix.**

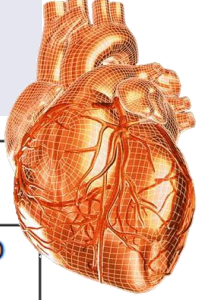
**Table of Contents**

**Table 3. Serious Adverse Events, Conditions of Interest, and Monitored Clinical Events.**

| Variable | Intensive Treatment (N = 4678) | Standard Treatment (N = 4683) | Hazard Ratio | P Value |
|---|---|---|---|---|
| | *no. of patients (%)* | | | |
| Serious adverse event* | 1793 (38.3) | 1736 (37.1) | 1.04 | 0.25 |
| Conditions of interest | | | | |
| Serious adverse event only | | | | |
| Hypotension | 110 (2.4) | 66 (1.4) | 1.67 | 0.001 |
| Syncope | 107 (2.3) | 80 (1.7) | 1.33 | 0.05 |
| Bradycardia | 87 (1.9) | 73 (1.6) | 1.19 | 0.28 |
| Electrolyte abnormality | 144 (3.1) | 107 (2.3) | 1.35 | 0.02 |
| Injurious fall† | 105 (2.2) | 110 (2.3) | 0.95 | 0.71 |
| Acute kidney injury or acute renal failure‡ | 193 (4.1) | 117 (2.5) | 1.66 | <0.001 |
| Emergency department visit or serious adverse event | | | | |
| Hypotension | 158 (3.4) | 93 (2.0) | 1.70 | <0.001 |
| Syncope | 163 (3.5) | 113 (2.4) | 1.44 | 0.003 |
| Bradycardia | 104 (2.2) | 83 (1.8) | 1.25 | 0.13 |
| Electrolyte abnormality | 177 (3.8) | 129 (2.8) | 1.38 | 0.006 |
| Injurious fall† | 334 (7.1) | 332 (7.1) | 1.00 | 0.97 |
| Acute kidney injury or acute renal failure‡ | 204 (4.4) | 120 (2.6) | 1.71 | <0.001 |
| Monitored clinical events | | | | |
| Adverse laboratory measure§ | | | | |
| Serum sodium <130 mmol/liter | 180 (3.8) | 100 (2.1) | 1.76 | <0.001 |
| Serum sodium >150 mmol/liter | 6 (0.1) | 0 | | 0.02 |
| Serum potassium <3.0 mmol/liter | 114 (2.4) | 74 (1.6) | 1.50 | 0.006 |
| Serum potassium >5.5 mmol/liter | 176 (3.8) | 171 (3.7) | 1.00 | 0.97 |
| Orthostatic hypotension¶ | | | | |
| Alone | 777 (16.6) | 857 (18.3) | 0.88 | 0.01 |
| With dizziness | 62 (1.3) | 71 (1.5) | 0.85 | 0.35 |

SPRINT Research Group, Wright JT Jr, *et al*. *N Engl J Med* 2015;373(22):2103-16.

Table S5. Serious Adverse Events and Conditions of Interest Classified as Possibly or Definitely Related to the Intervention.



| | Intensive (N=4678) | Standard (N=4683) | |
|---|---|---|---|
| | no. of patients (%) | no. of patients (%) | Hazard Ratio (P Value) |
| Serious Adverse Events[1] | 220 (4.7) | 118 (2.5) | 1.88 (<0.001) |
| | | | |
| Conditions of Interest | | | |
| SAE Only | | | |
| Hypotension | 83 (1.8) | 37 (0.8) | 2.52 (<0.001) |
| Syncope | 64 (1.4) | 28 (0.6) | 2.15 (0.006) |
| Bradycardia | 34 (0.7) | 24 (0.5) | 1.28 (0.44) |
| Electrolyte abnormality | 69 (1.5) | 48 (1.0) | 1.58 (0.05) |
| Injurious fall[2] | 19 (0.4) | 13 (0.3) | 1.99 (0.21) |
| Acute Kidney Injury or Acute Renal Failure[3] | 88 (1.9) | 34 (0.7) | 3.14 (<0.001) |
| | | | |
| ER Visit or SAE | | | |
| Hypotension | 125 (2.7) | 58 (1.2) | 2.24 (<0.001) |
| Syncope | 94 (2.0) | 44 (0.9) | 2.13 (0.005) |
| Bradycardia | 51 (1.1) | 29 (0.6) | 1.68 (0.05) |
| Electrolyte abnormality | 93 (2.0) | 62 (1.3) | 1.61 (0.02) |
| Injurious fall[2] | 36 (0.8) | 23 (0.5) | 2.22 (0.05) |
| Acute Kidney Injury or Acute Renal Failure[3] | 96 (2.1) | 36 (0.8) | 3.13 (<0.001) |

1. Defined as an event that was fatal or life threatening, resulting in significant or persistent disability, requiring or prolonging a hospitalization.
2. An Injurious fall was defined as a fall that resulted in **evaluation in an emergency department** or resulted in **hospitalization**.

**SPRINT Research Group, Wright JT Jr, *et al*. *N Engl J Med* 2015;373(22):2103-16.**
**Supplementary Appendix.**

# SPRINT

## A Randomized Trial of Intensive *versus* Standard Blood Pressure Control

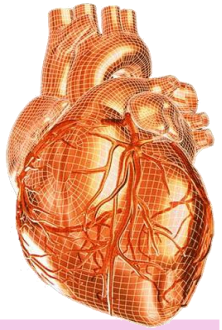


Table S2. Utilization of Antihypertensive Medication Classes at Most Recent Visit

| | *Intensive (N=4678)* | *Standard (N=4683)* |
|---|---|---|
| Number of agents | | |
| Average | 2.7 (1.2) | 1.8 (1.1) |
| 0 | 125 (2.7) | 530 (11.3) |
| 1 | 493 (10.5) | 1455 (31.1) |
| 2 | 1429 (30.5) | 1559 (33.3) |
| 3 | 1486 (31.8) | 807 (17.2) |
| 4+ | 1137 (24.3) | 323 (6.9) |

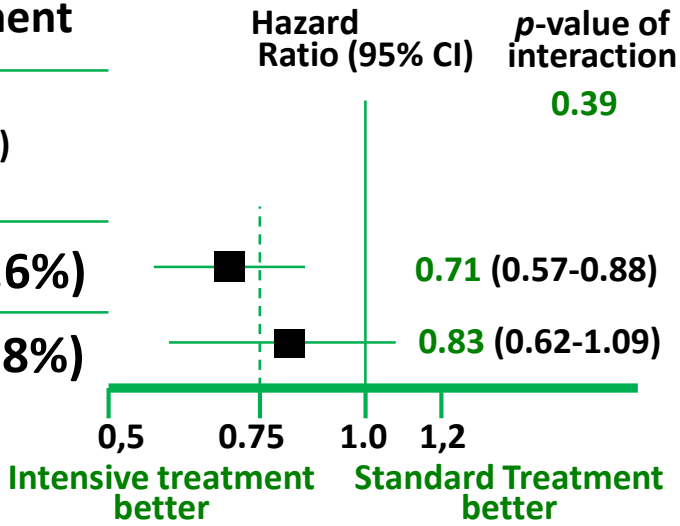
SPRINT Research Group, Wright JT Jr, *et al*. *N Engl J Med* 2015;373(22):2103-16.
Supplementary Appendix.

## SPRINT Study - Demographic Characteristics

| | Intensive treatment (*n*= 4678) | Standard Treatment (*n*= 4683) |
|---|---|---|
| Presence of Cardiovascular Disease - Nº (%) | 940 (20.1) | 937 (20.0) |
| Clinical | 776 (16.7) | 783 (16.7) |
| Subclinical | 247 (5.3) | 246 (5.3) |

## SPRINT Study - Primary Endpoint in Patients with and without Previous CV Disease

| Previous Cardiovascular Disease | Intensive treatment | Standard Treatment |
|---|---|---|
| | # de patients with primary endpoint / (%) | |
| No | 149/3738 (4.0%) | 208/3746 (5.6%) |
| Yes | 94/940 (10.0%) | 111/937 (11.8%) |




Incidence of Primary Endpoint in SPRINT Study with and without Previous CV Disease
Based on SPRINT Research Group. **Wright *et al. N Engl J Med* 2015;373(22):2103-16.**

Original Investigation

# Intensive vs Standard Blood Pressure Control and Cardiovascular Disease Outcomes in Adults Aged ≥75 Years A Randomized Clinical Trial

Jeff D. Williamson, MD, MHS; Mark A. Supiano, MD; William B. Applegate, MD, MPH; Dan R. Berlowitz, MD; Ruth C. Campbell, MD, MSPH; Glenn M. Chertow, MD; Larry J. Fine, MD; William E. Haley, MD; Amret T. Hawfield, MD; Joachim H. Ix, MD, MAS; Dalane W. Kitzman, MD; John B. Kostis, MD; Marie A. Krousel-Wood, MD; Lenore J. Launer, PhD; Suzanne Oparil, MD; Carlos J. Rodriguez, MD, MPH; Christianne L. Roumie, MD, MPH; Ronald I. Shorr, MD, MS; Kaycee M. Sink, MD, MAS; Virginia G. Wadley, PhD; Paul K. Whelton, MD; Jeffrey Whittle, MD; Nancy F. Woolard; Jackson T. Wright Jr, MD, PhD; Nicholas M. Pajewski, PhD; for the SPRINT Research Group

## Serious Adverse Events

Detailed information regarding SAEs appears in eTable 3 and eTable 4 in Supplement 2. Data on SAEs in participants older than 75 years have been previously reported (Table S6[13]). In the intensive treatment group, SAEs occurred in 637 participants (48.4%) compared with 637 participants (48.3%) in the standard treatment group (HR, 0.99 [95% CI, 0.89-1.11]; $P = .90$). The absolute rate of SAEs was higher but was not statistically significantly different in the intensive treatment group for hypotension (2.4% vs 1.4% in the standard treatment group; HR, 1.71 [95% CI, 0.97-3.09]), syncope (3.0% vs 2.4%, respectively; HR, 1.23 [95% CI, 0.76-2.00]), electrolyte abnormalities (4.0% vs 2.7%; HR, 1.51 [95% CI, 0.99-2.33]), and acute kidney injury or renal failure (5.5% vs 4.0%; HR, 1.41 [95% CI, 0.98-2.04]). However, the absolute rate of injurious falls was lower but was not statistically significantly different in the intensive treatment group (4.9% vs 5.5% in the standard treatment group; HR, 0.91 [95% CI, 0.65-1.29]).

**SPRINT Research Group**
**Williamson JD, *et al*. *JAMA* 2016;315(24):2673-82.**

# SPRINT - Serious adverse events, conditions of interest, and monitored clinical measures by treatment group in SPRINT participants 75 years or older

| | Intensive-treatment | | Standard-treatment | | | |
|---|---|---|---|---|---|---|
| | N | N with event (%) | N | N with event (%) | HR (95% CI) | p-value |
| **Serious Adverse Events**[1] | 1,317 | 637 (48.4) | 1,319 | 637 (48.3) | 0.99 (0.89, 1.11) | 0.895 |
| By Frailty Status | | | | | | |
| Fit | 159 | 50 (31.4) | 190 | 66 (34.7) | 0.84 (0.53, 1.31) | 0.439 |
| Less Fit | 711 | 333 (46.8) | 745 | 341 (45.8) | 0.97 (0.83, 1.14) | 0.714 |
| Frail | 440 | 251 (57.0) | 375 | 227 (60.5) | 1.02 (0.84, 1.24) | 0.844 |
| By Gait Speed | | | | | | |
| ≥0.8 m/s | 880 | 419 (47.6) | 893 | 412 (46.1) | 1.03 (0.89, 1.18) | 0.716 |
| <0.8 m/s | 371 | 187 (50.4) | 369 | 195 (52.8) | 1.00 (0.80, 1.25) | 0.988 |
| Missing | 66 | 31 (47.0) | 57 | 30 (52.6) | 0.79 (0.42, 1.50) | 0.469 |
| **Individual Conditions of Interest (ER Visit or SAE)** | | | | | | |
| Hypotension | 1,317 | 44 (3.3) | 1,319 | 27 (2.0) | 1.66 (1.03, 2.73) | 0.039 |
| Syncope | 1,317 | 57 (4.3) | 1,319 | 43 (3.3) | 1.28 (0.85, 1.92) | 0.240 |
| Bradycardia | 1,317 | 47 (3.6) | 1,319 | 44 (3.3) | 1.01 (0.67, 1.54) | 0.961 |
| Electrolyte Abnormality | 1,317 | 60 (4.6) | 1,319 | 43 (3.3) | 1.44 (0.97, 2.16) | 0.067 |
| Injurious Fall[3] | 1,317 | 153 (11.6) | 1,319 | 186 (14.1) | 0.80 (0.64, 0.99) | 0.040 |
| Acute Kidney Injury or Acute Renal Failure[4] | 1,317 | 73 (5.5) | 1,319 | 55 (4.2) | 1.39 (0.97, 1.99) | 0.072 |
| **Monitored Clinical Events** | | | | | | |
| Laboratory Measures[5] | | | | | | |
| Sodium<130 mmol/L | 1,317 | 69 (5.2) | 1,319 | 45 (3.4) | 1.56 (1.07, 2.30) | 0.02 |
| Sodium>150 mmol/L | 1,317 | 1 (0.1) | 1,319 | 0 (0.0) | - | - |
| Potassium<3 mmol/L | 1,317 | 17 (1.3) | 1,319 | 11 (0.8) | 1.50 (0.69, 3.37) | 0.303 |
| Potassium>5.5 mmol/L | 1,317 | 69 (5.2) | 1,319 | 65 (4.9) | 1.01 (0.71, 1.42) | 0.972 |
| Signs and Symptoms | | | | | | |
| Orthostatic hypotension[6] | 1,317 | 277 (21.0) | 1,319 | 288 (21.8) | 0.90 (0.76, 1.07) | 0.241 |
| Orthostatic hypotension with dizziness | 1,317 | 25 (1.9) | 1,319 | 17 (1.3) | 1.44 (0.77, 2.73) | 0.252 |

SPRINT Research Group, Williamson JD, *et al*. *JAMA* 2016;315(24):2673-82. Supplement 2

Annals of Internal Medicine

## Let's Not SPRINT to Judgment About New Blood Pressure Goals

Eduardo Ortiz, MD, MPH, and Paul A. James, MD

Ortiz E, James PA. *Ann Intern Med* 2016 May;164(10):692-3

SPRINT (Systolic Blood Pressure Intervention Trial), a randomized controlled trial that compared aggressive treatment less than 120 m in patients a stopped early months before men (64%) with ties that increa with diabetes target, the tria the primary c duction sound crease in even or an absolute

On the bas for 1000 persc goal less than mm Hg, an av sons will be ha efits or harms benefit or be worthwhile to ing 3 drugs ev duce their risk ever, after lea benefit is only harm, their e diminish.

SPRINT wa clinical outcon of only 2.2%). significant diff to differences clinically signif incorporated their design. T study participa the treatment Such preferen ment and exp prognosis with groups, including information that an ave of persons receiving more intensive tr years will not benefit.

However, the small decrease in ever part of the story. Media coverage of SPR the National Institutes of Health's pres cused exclusively on the benefits of inten while ignoring harms (2, 3). Serious events occurred more frequently in the treated group, with an increase from 2.5 These harms, which were classified by in possibly or definitely related to the int cluded significant increases in hypotension, syncope, electrolyte abnormalities, and acute kidney injury or

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Priority Updates from the Research Literature from the Family Physicians Inquiries Network

*J Fam Pract* 2016 May; 65(5): 342–344.

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Department of Family Medicine, Univers North Carolina, C Hill

# "Go low" or say "No" to aggressive systolic BP goals?

The SPRINT trial demonstrated the benefits—and risks—of reaching a systolic target <120 mm Hg in non-diabetic patients at high risk for CV events. Here's who might benefit.

ORIGINAL RESEARCH

American Heart Association | American Stroke Association

*J Am Heart Assoc* 2016 Jul 12;5(7). pii: e003547. doi: 10.1161/JAHA.116.003547.

## Prevalence of Eligibility Criteria for the Systolic Blood Pressure Intervention Trial in US Adults Among Excluded Groups: Age <50 Years, Diabetes Mellitus, or a History of Stroke

Adam P. Bress, PharmD, MS; Rikki M. Tanner, PhD, MPH; Rachel Hess, MD, MS; Samuel S. Gidding, MD; Lisandro D. Colantonio, MD, MS; Daichi Shimbo, MD; Paul Muntner, PhD

Original Investigation

# Intensive vs Standard Blood Pressure Control and Cardiovascular Disease Outcomes in Adults Aged ≥75 Years
## A Randomized Clinical Trial

Jeff D. Williamson, MD, MHS; Mark A. Supiano, MD; William B. Applegate, MD, MPH; Dan R. Berlowitz, MD; Ruth C. Campbell, MD, MSPH; Glenn M. Chertow, MD; Larry J. Fine, MD; William E. Haley, MD; Amret T. Hawfield, MD; Joachim H. Ix, MD, MAS; Dalane W. Kitzman, MD; John B. Kostis, MD; Marie A. Krousel-Wood, MD; Lenore J. Launer, PhD; Suzanne Oparil, MD; Carlos J. Rodriguez, MD, MPH; Christianne L. Roumie, MD, MPH; Ronald I. Shorr, MD, MS; Kaycee M. Sink, MD, MAS; Virginia G. Wadley, PhD; Paul K. Whelton, MD; Jeffrey Whittle, MD; Nancy F. Woolard; Jackson T. Wright Jr, MD, PhD; Nicholas M. Pajewski, PhD; for the SPRINT Research Group

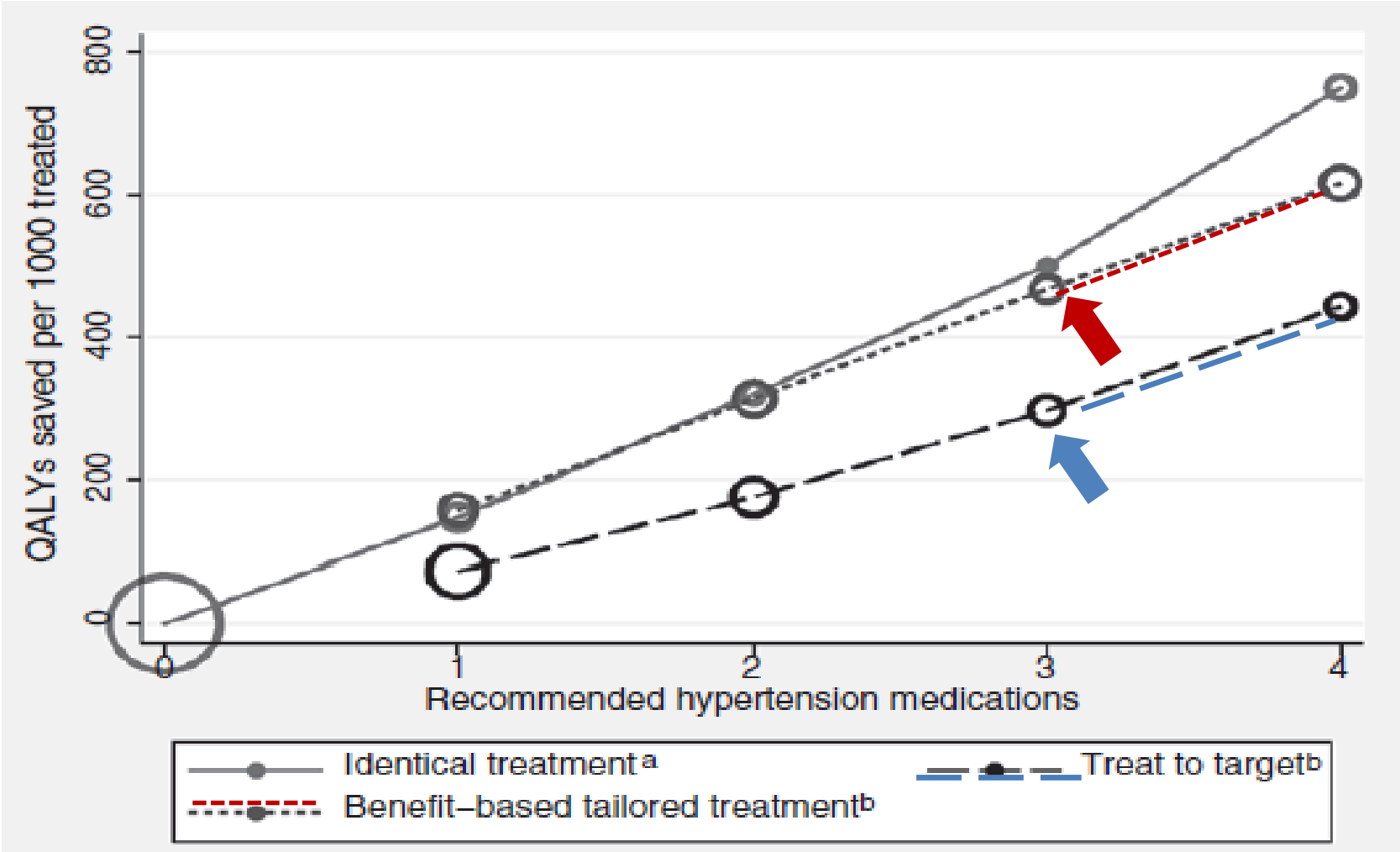
of SPRINT data may be helpful to better define the burden, costs, and benefits of intensive BP control. However, the present results have substantial implications for the future of intensive BP therapy in older adults because of this condition's high prevalence, the high absolute risk for cardiovascular disease complications from elevated BP, and the devastating consequences of such events on the independent function of older people.[3,29,33,34]

34. Sussman J, Vijan S, Hayward R. Using benefit-based tailored treatment to improve the use of antihypertensive medications. *Circulation*. 2013;128(21):2309-2317.

**SPRINT Research Group**
**Williamson JD, *et al*. *JAMA* 2016;315(24):2673-82.**

# Hypertension
# Benefit-based Tailored Treatment

**Benefit-based Tailored Treatment (BTT) *versus* Treat to Target Strategy**




**Sussman J, *et al*. *Circulation* 2014; 128: 2309-17**

# Hypertension
# Benefit-based Tailored Treatment

**Better results**

Preventive Cardiology

## Using Benefit-Based Tailored Treatment to Improve the Use of Antihypertensive Medications

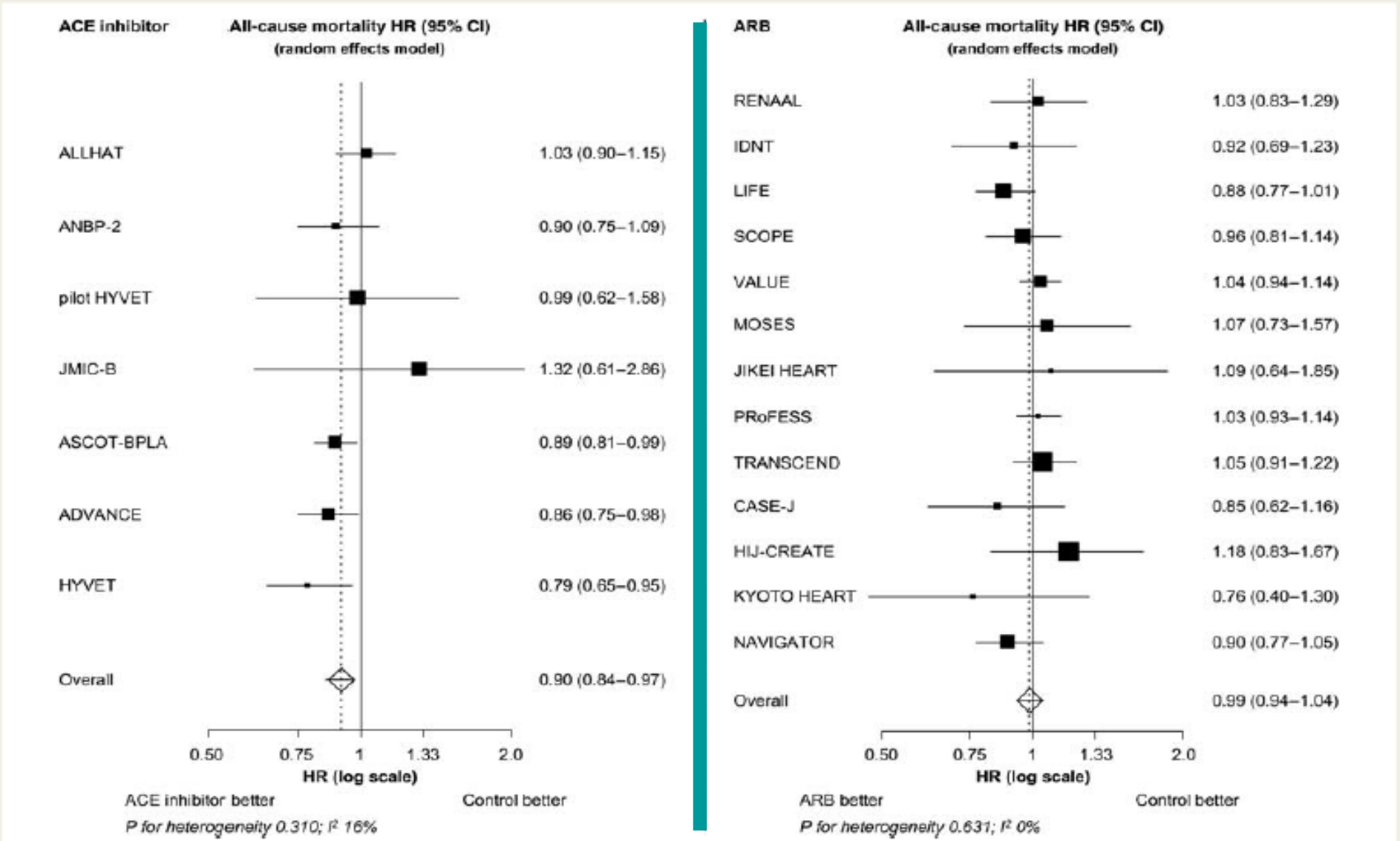
Jeremy Sussman, MD, MS; Sandeep Vijan, MD, MS; Rod Hayward, MD

In summary, the results of the present study suggest that CVD events can be prevented more effectively with a more comprehensive accounting for all available factors that contribute to net patient benefit, such as other clinical risk factors and polypharmacy, rather than by chiefly basing decisions on whether the observed BP level is above or below a prespecified BP target. The next wave of clinical treatment strategies may be more efficient, effective, and transparent, with a full assessment of risk and benefit and the use of BTT.

**Sussman J, *et al*. *Circulation* 2014; 128: 2309-17**

# Angiotensin-converting enzyme inhibitors reduce mortality in hypertension: a meta-analysis of randomized clinical trials of renin–angiotensin–aldosterone system inhibitors involving 158 998 patients

# All-Cause Mortality



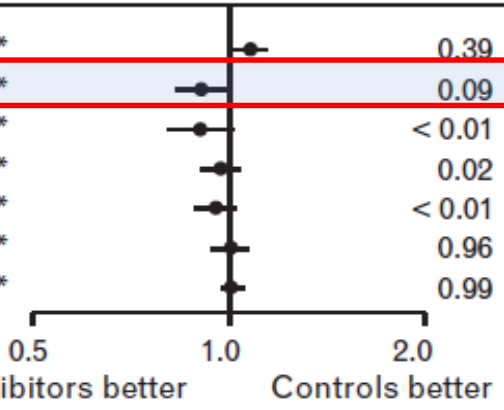

van Vark *et al. Eur Heart J*. 2012;33:2088-97

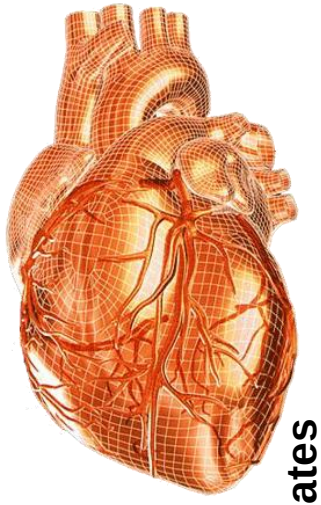
# Effects of blood pressure-lowering on outcome incidence in hypertension: 5. Head-to-head comparisons of various classes of antihypertensive drugs – overview and meta-analyses

Costas Thomopoulos[a], Gianfranco Parati[b], and Alberto Zanchetti[c]

## Head-to-Head Comparisons of Various Antihypertensive Classes

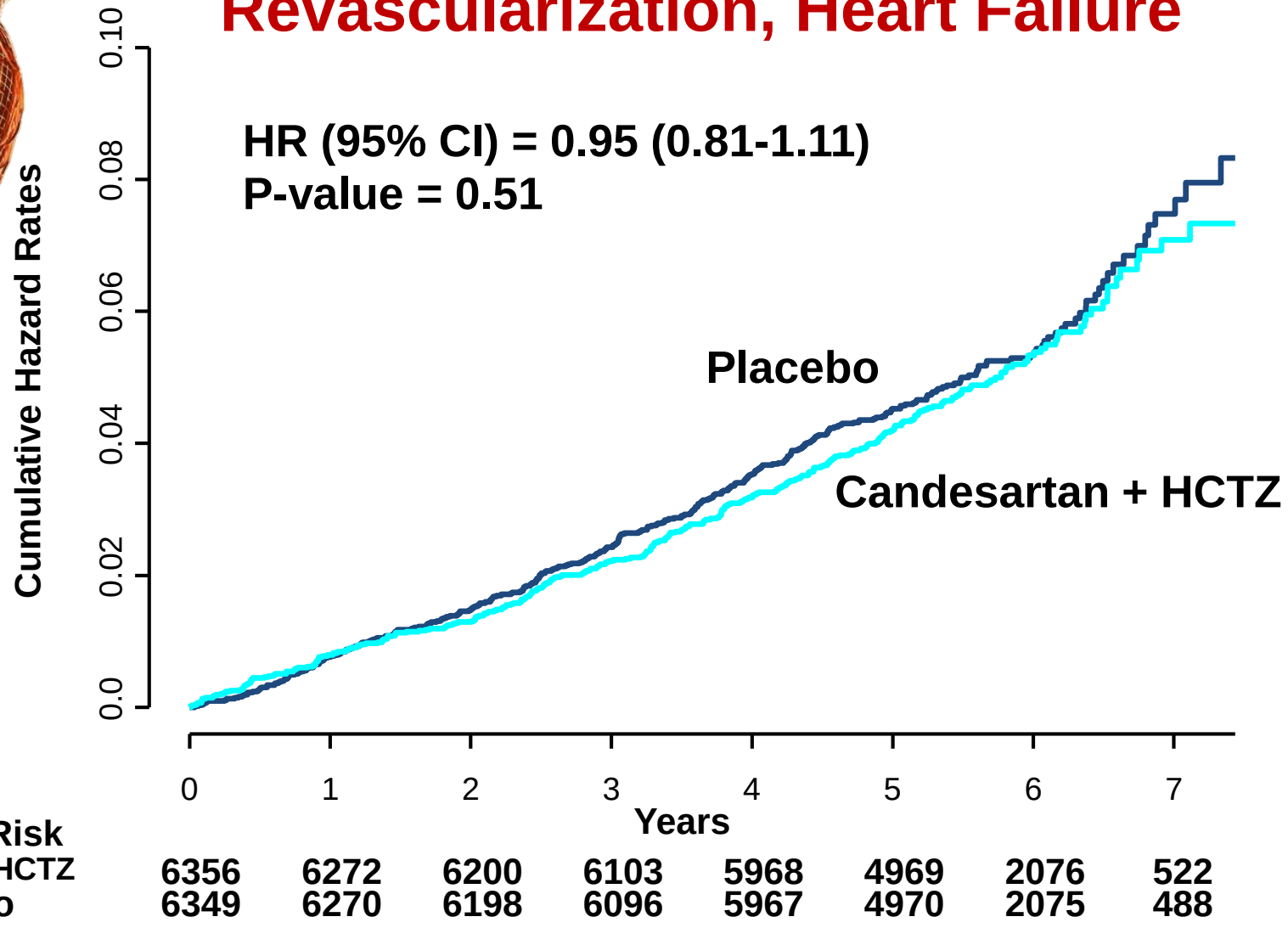
| Outcome | Trials (n) | Events (n/patients) | | Difference SBP/DBP (mmHg) | RR (95% CI) | RR (95% CI) | P (Heterogen) |
|---|---|---|---|---|---|---|---|
| | | ACE-Inhibitors | Controls | | (a) ACE-Inhibitors vs Angiotensin Receptor Blockers | | |
| Storke | 3 | 413/8886 | 377/8842 | 1.01/0.61 | 1.09 (0.95–1.25) | | 0.95 |
| CHD | 3 | 423/8886 | 453/8842 | 1.01/0.61 | 0.93 (0.82–1.06) | | 0.72 |
| HF | 3 | 364/8886 | 406/8842 | 1.01/0.61 | 0.89 (0.78–1.02) | | 0.90 |
| Stroke + CHD | 3 | 836/8886 | 830/8842 | 1.01/0.61 | 1.00 (0.91–1.10) | | 0.70 |
| Stroke + CHD + HF | 3 | 1200/8886 | 1236/8842 | 1.01/0.61 | 0.97 (0.90–1.04) | | 0.60 |
| CV Death | 2 | 605/8706 | 601/8662 | 1.03/0.63 | 1.00 (0.90–1.12) | | 0.59 |
| All-cause Death | 2 | 1020/8706 | 995/8662 | 1.03/0.63 | 1.02 (0.94–1.11) | | 0.82 |
| | | | | | (b) ACE Inhibitors vs All Other Drug Classes | | |
| Stroke | 20 | 1468/32381 | 2203/49740 | 1.55/0.65 | 1.08 (1.02–1.14)* | | 0.39 |
| CHD | 20 | 1696/32360 | 3325/49741 | 1.55/0.65 | 0.91 (0.83–0.99)* | | 0.09 |
| HF | 15 | 1299/31118 | 2522/48484 | 1.56/0.66 | 0.89 (0.80–1.01)* | | < 0.01 |
| Stroke + CHD | 20 | 3171/32583 | 5538/49956 | 1.55/0.65 | 0.98 (0.91–1.04)* | | 0.02 |
| Stroke + CHD + HF | 14 | 4417/31019 | 7991/48397 | 1.57/0.67 | 0.95 (0.89–1.02)* | | < 0.01 |
| CV Death | 21 | 1693/32619 | 2894/50190 | 1.50/0.63 | 1.01 (0.95–1.06)* | | 0.96 |
| All-cause Death | 21 | 3267/32507 | 5768/50078 | 1.54/0.65 | 1.01 (0.98–1.04)* | | 0.99 |





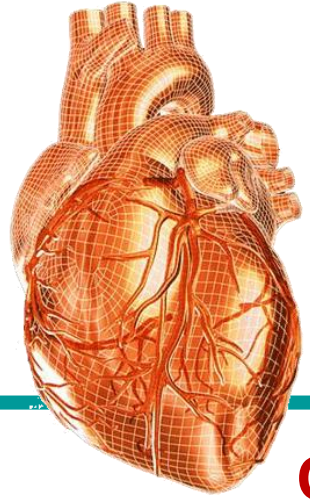
# HOPE 3

## CV Death, MI, Stroke, Cardiac Arrest, Revascularization, Heart Failure




| No. at Risk | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Cand + HCTZ | 6356 | 6272 | 6200 | 6103 | 5968 | 4969 | 2076 | 522 |
| Placebo | 6349 | 6270 | 6198 | 6096 | 5967 | 4970 | 2075 | 488 |

*Lonn et al. N Engl J Med* 2016;374(21):2009-20.

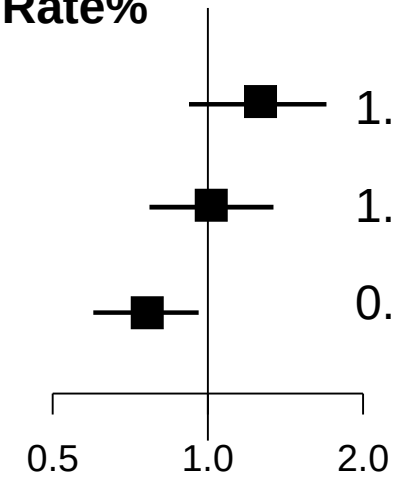


# HOPE 3

## Prespecified subgroups by tertiles of SBP

### CV Death, MI, Stroke, Cardiac Arrest, Revasc, HF

| Cutoffs | SBP Mean | Diff | Placebo Event Rate% | HR (95% CI) | P Trend |
|---|---|---|---|---|---|
| ≤131.5 | 122 | 6.1 | 3.5 | 1.25 (0.92-1.70) | 0.009 |
| 131.6-143.5 | 138 | 5.6 | 4.6 | 1.02 (0.77-1.34) | |
| >143.5 mmHg | 154 | 5.8 | 7.5 | 0.76 (0.60-0.96) | |

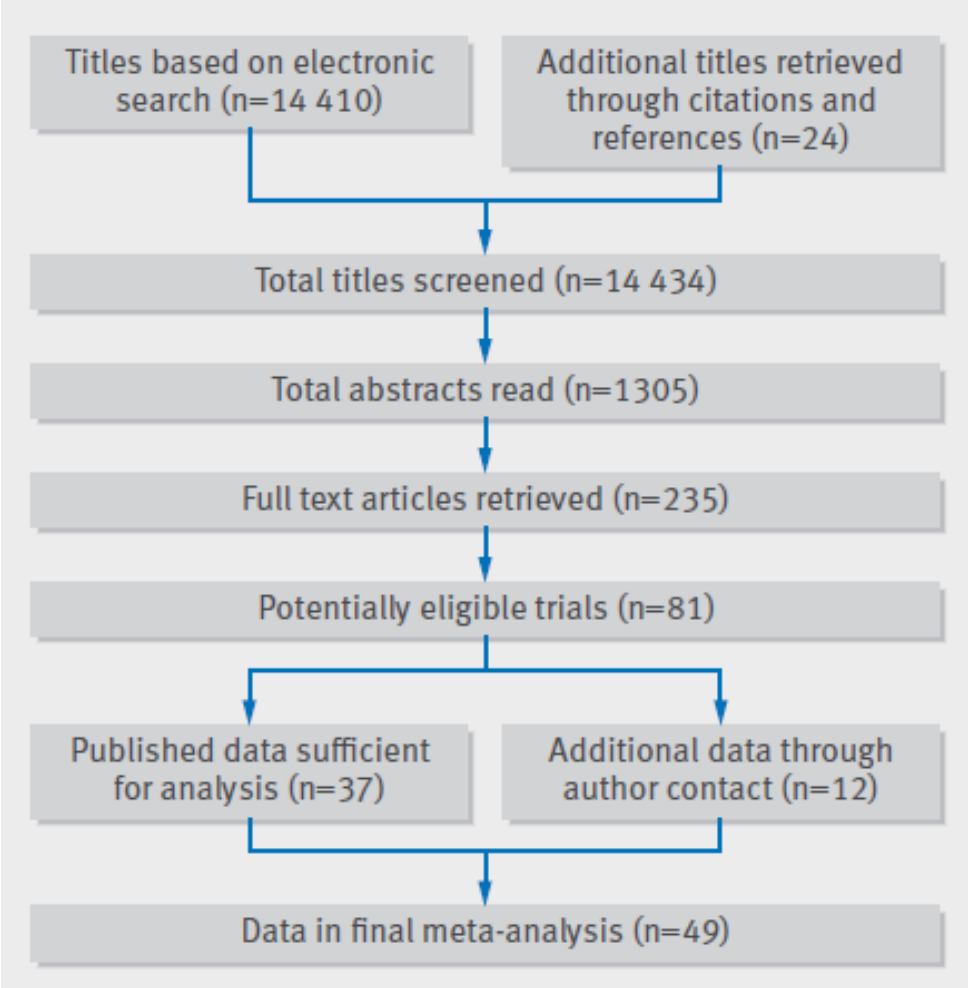



Candesartan + HCTZ Better  Placebo Better

*Lonn et al. N Engl J Med* 2016;374(21):2009-20.

# Effect of antihypertensive treatment at different blood pressure levels in patients with diabetes mellitus: systematic review and meta-analyses

Mattias Brunström, Bo Carlberg




Brunstrom and Carlberg. *BMJ* 2016;352:i717. doi: 10.1136/bmj.i717

# Effect of antihypertensive treatment at different blood pressure levels in patients with diabetes mellitus: systematic review and meta-analyses

**Table 1 | Characteristics of included studies**

| Study ID | No of participants | Comorbidities | Intervention group | Control group | Baseline SBP/DBP (mm Hg) | Mean in-treatment difference SBP/DBP (mm Hg) |
|---|---|---|---|---|---|---|
| ABCD-2V[20] | 129 | 6% with previous cardiovascular disease | DBP <75 mm Hg, using valsartan | DBP 80-90 mm Hg using placebo | 126/84.7 | 6/5 |
| ABCD-H[21] | 470 | 53% with previous cardiovascular disease, 60% with retinopathy | DBP <75 mm Hg | DBP <90 mm Hg | 155/98 | 6/8 |
| ABCD-N[22] | 480 | 29% with previous cardiovascular disease, 50% with retinopathy | 10 mmHg DBP reduction | Placebo | 136.4/84.4 | 9/6 |
| ACCORD[23] | 4733 | 34% with previous cardiovascular disease | SBP <120 mm Hg | SBP <140 mm Hg | 139.2/75.95 | 14.2/6.1 |
| ACTION[24, 25] | 1113 | Stable angina in all patients, 51% with myocardial infarction | Nefidipine 60 mg | Placebo | 141/80 | 6/3 |
| ADVANCE[26, 27] | 11 140 | 32% with previous cardiovascular disease | Perindopril 4 mg and indapamide 1.25 mg | Placebo | 145/81 | 5.6/2.2 |
| ALTITUDE[28] | 8561 | Chronic kidney disease in all patients, 42% with cardiovascular disease | Aliskiren 300 mg | Placebo | 137.3/74.2 | 1.3/0.6 |
| ATLANTIS[29] | 140 | Microalbuminuria in all patients, no data on cardiovascular disease | Ramipril 1.25 mg or 5.0 mg | Placebo | 132.9/76.9 | 6/3.5 |
| BENEDICT[30] | 1204 | No data on previous cardiovascular disease | Trandolapril 2 mg, verapamil 240 mg, or combination treatment 2/180 mg | Placebo | 150.8/87.5 | 2.3/2 |
| BENEDICT-B[31] | 281 | Microalbuminuria in all patients, no data on cardiovascular disease | Verapamil 180 mg and trandolapril 2 mg | Trandolapril 2 mg | 150/86.7 | 0.8/0.7 |
| CAMELOT[32] | 364 | Coronary artery disease in all patients | Amlodipine 10 mg or enalapril 20 mg | Placebo | 133/77.4 | 4.2/1.8 |
| DEMAND[33] | 380 | Microalbuminuria in all patients, no data on cardiovascular disease | Manidipine 10 mg+delapril 30 mg or delapril alone | Placebo | 147.9/87.3 | 1.4/1.9 |
| DIABHYCAR [34] | 4912 | Microalbuminuria in all patients, 24% with cardiovascular disease | Ramipril 1.25 mg | Placebo | 145.4/82.3 | 1.3/0.7 |
| DIRECT-P2[35] | 1905 | Retinopathy in all patients, 6% with cardiovascular disease | Candesartan 16 mg | Placebo | 132.9/78 | 3.3/1.3 |
| EWPHE[36] | 111 | 64% with previous cardiovascular disease | Hydrochlorothiazide 25 mg and triamterene 50 mg | Placebo | 186.8/101.2 | 16.1/5.3 |
| FEVER[37] | 1241 | 42% with previous cardiovascular disease | Felodipine 5 mg | Placebo | 155.3/90.2 | 4.6/1.8 |
| Fogari –02[38] | 309 | Microalbuminuria in all patients, no cardiovascular disease | Amlodipine 5-10 mg and fosinopril 15-30 mg | Amlodipine 5-15 mg or fosinopril 10-30 mg | 160.4/99.3 | 9.0/4.6 |
| HDFP[39] | 1079 | 8% with previous cardiovascular disease | DBP <90 mm Hg or 10 mm Hg DBP reduction by diuretic | Referred care | 158.7/101.1 | 10/6 |
| HOT[40] | 1501 | 3% with previous cardiovascular disease | DBP <80 mm Hg | DBP <85 or DBP <90 mm Hg | 174.1/105.3 | 3.4/2.9 |
| HSCS[41] | 162 | Previous stroke/transient ischaemic attack in all patients | Deserpidine 0.5 mg and methyclo-thiazide 5-10 mg | Placebo | 167/100 | 25/12.3 |
| IDNT[42] | 1715 | Diabetic nephropathy in all patients, 29% with cardiovascular disease | Irbesartan 300 mg or amlodipine 10 mg | Placebo | 159/87 | 3.5/3 |
| IRMA 2[43] | 590 | Microalbuminuria in all patients, 27% with cardiovascular disease | Irbesartan 150 mg or 300 mg | Placebo | 153/90.3 | 2/0 |
| JATOS[44] | 327 | 7% with previous cardiovascular disease | SBP <140 mm Hg | SBP 140-160 mm Hg | 172.3/87.3 | 5.6/0.9 |
| Laffel –95[45] | 143 | Microalbuminuria in all patients, no cardiovascular disease | Captopril 50 mg | Placebo | 120.8/78.5 | 7/6 |
| Lewis –93[46] | 409 | Diabetic nephropathy in all patients, no cardiovascular disease | Captopril 75 mg | Placebo | 138.5/85.5 | 1.5/2.5 |
| MERIT-HF[47] | 985 | Heart failure NYHA II-IV in all patients | Metoprolol CR/XL 200 mg | Placebo | 132/78 | No data |
| MICRO-HOPE[48] | 3577 | 69% with previous cardiovascular disease | Ramipril 10 mg | Placebo | 142/79.7 | 3.8/0.9 |
| ORIENT[49] | 577 | Diabetic nephropathy in all patients, 16% with cardiovascular disease | Olmesartan 10-40 mg | Placebo | 138.8/76.2 | 3.8/1.4 |

**Brunstrom and Carlberg. *BMJ* 2016;352:i717. doi: 10.1136/bmj.i717**

# Effect of antihypertensive treatment at different blood pressure levels in patients with diabetes mellitus: systematic review and meta-analyses

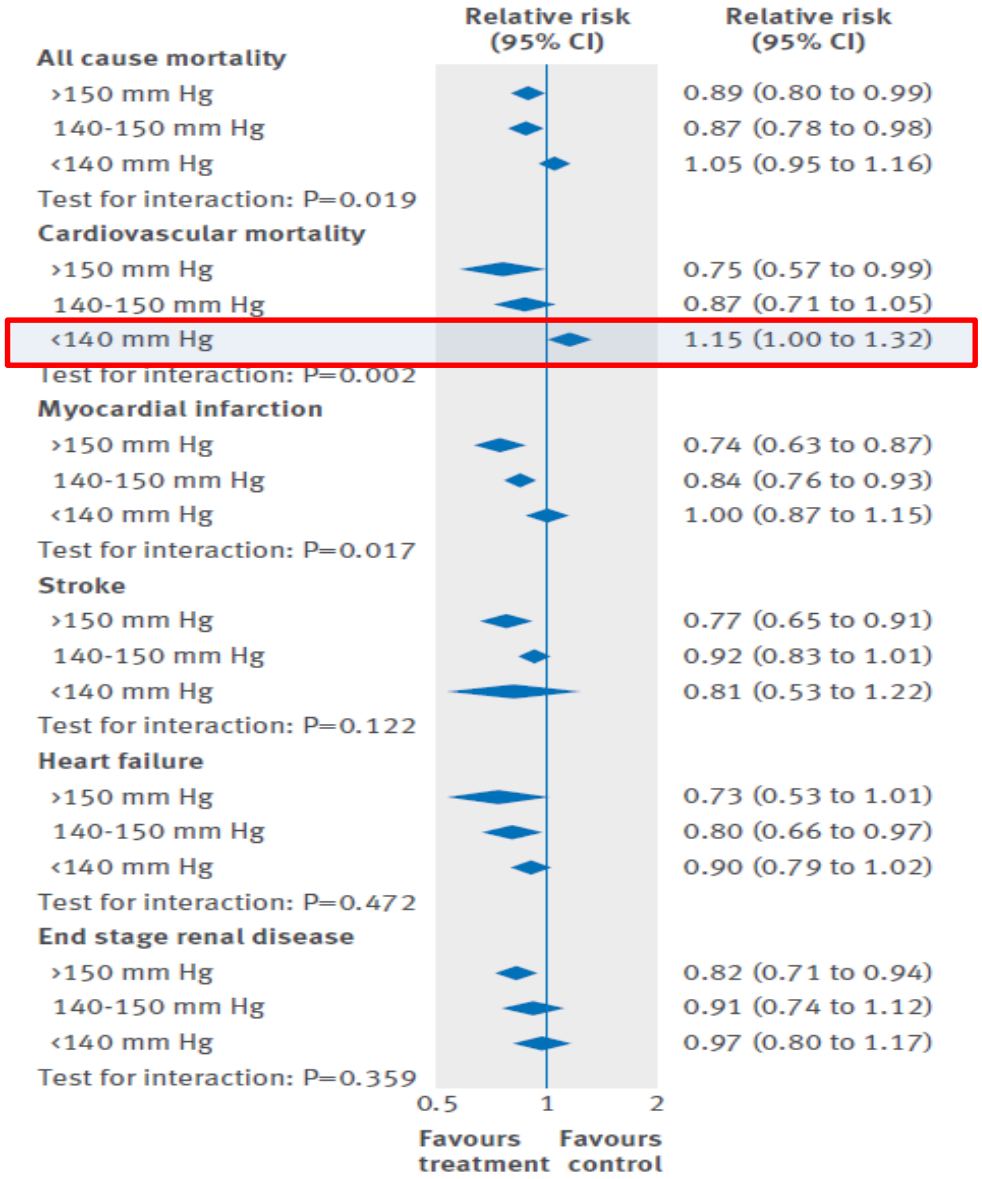
| | | | | | | |
|---|---|---|---|---|---|---|
| PEACE[50] | 1386 | Stable coronary artery disease in all patients | Trandolapril 4 mg | Placebo | 135.3/76.6 | 1.5/0.9 |
| PERSUADE[51] | 1502 | Stable coronary artery disease in all patients | Perindopril 8 mg | Placebo | 140.1/81.6 | 4.6/1.8 |
| PHARAO[52] | 135 | No data on previous cardiovascular disease | Ramipril 5 mg | Placebo | 135.5/84.1 | 1.5/0 |
| PROFESS[53] | 5743 | Previous ischaemic stroke/transient ischaemic attack in all patients | Telmisartan 80 mg | Placebo | 144.2/83.8 | 4/2 |
| PROGRESS[54] | 761 | Previous stroke/transient ischaemic attack in all patients | Perindopril 4 mg with or without indapamide | Placebo | 149.5/84.5 | 9.5/4.6 |
| RASS[55] | 285 | No previous cardiovascular disease | Losartan 100 mg or enalapril 20 mg | Placebo | 120.1/70.6 | 3/2 |
| RENAAL[56,57] | 1513 | Diabetic nephropathy in all patients, 20% with cardiovascular disease | Losartan 50-100 mg | Placebo | 152.5/82.0 | 2.3/0.7 |
| ROADMAP[58] | 4447 | 33% with previous cardiovascular disease | Olmesartan 40 mg | Placebo | 136.5/80.5 | 3.1/1.9 |
| Ravid –98[59] | 194 | No previous cardiovascular disease | Enalapril 10 mg | Placebo | 130/80 | No data |
| SAVE[60] | 496 | Previous myocardial infarction and ejection fraction <40% in all patients | Captopril 75-150 mg | Placebo | 117.8/70.4 | No data |
| SCOPE[61] | 597 | 8% with previous cardiovascular disease | Candesartan 8-16 mg | Placebo | 166/90 | 5.1/1.2 |
| SHEP[62] | 583 | No data on previous cardiovascular disease | SBP <160 mm Hg or ≥20 mm Hg SBP reduction | Placebo | 170.2/75.8 | 10/2 |
| SOLVD[63] | 1310 | Heart failure and ejection fraction <35% in all patients | Enalapril 20 mg | Placebo | 124.9/76.8 | No data |
| SPS3[64] | 1106 | Previous lacunar infarction in all patients | SBP <130 mm Hg | SBP 130-149 mm Hg | 143/78.5 | 11/5 |
| STOP[65] | 142 | No data on previous cardiovascular disease | Atenolol 50 mg or metoprolol 100 mg or pindolol 5 mg or hydrochloro-thiazide 25 mg+amiloride 2.5 mg | Placebo | 195.3/100.8 | 18.2/8.5 |
| Syst-Eur[66] | 492 | 30% with previous cardiovascular disease | Nitrendipine 10-40 mg with or without enalapril with or without hydrochlorothiazide | Placebo | 175.3/84.5 | 8.6/3.9 |
| TRACE[67] | 237 | Previous myocardial infarction and ejection fraction <35% in all patients | Trandolapril 4 mg | Placebo | 126/76.5 | No data |
| UKPDS[68,69] | 1148 | 6% with previous cardiovascular disease | Blood pressure <150/85 mm Hg | Blood pressure <180/105 (200/105) mm Hg | 159.3/94 | 10/5 |
| VA-NEPHRON[70] | 1448 | Diabetic nephropathy in all patients, 23% with cardiovascular disease | Losartan 100 mg+lisinopril 10-40 mg | Losartan 100 mg | 137.0/72.7 | 1.5/1 |
| VAL-HEFT[71] | 1276 | Heart failure NYHA II-IV in all patients | Valsartan 320 mg | Placebo | 125.6/74.8 | No data |
| VALISH[72] | 399 | No data on previous cardiovascular disease | SBP <140 mm Hg | SBP 140-150 mm Hg | 168.0/80.7 | 3.7/0.9 |

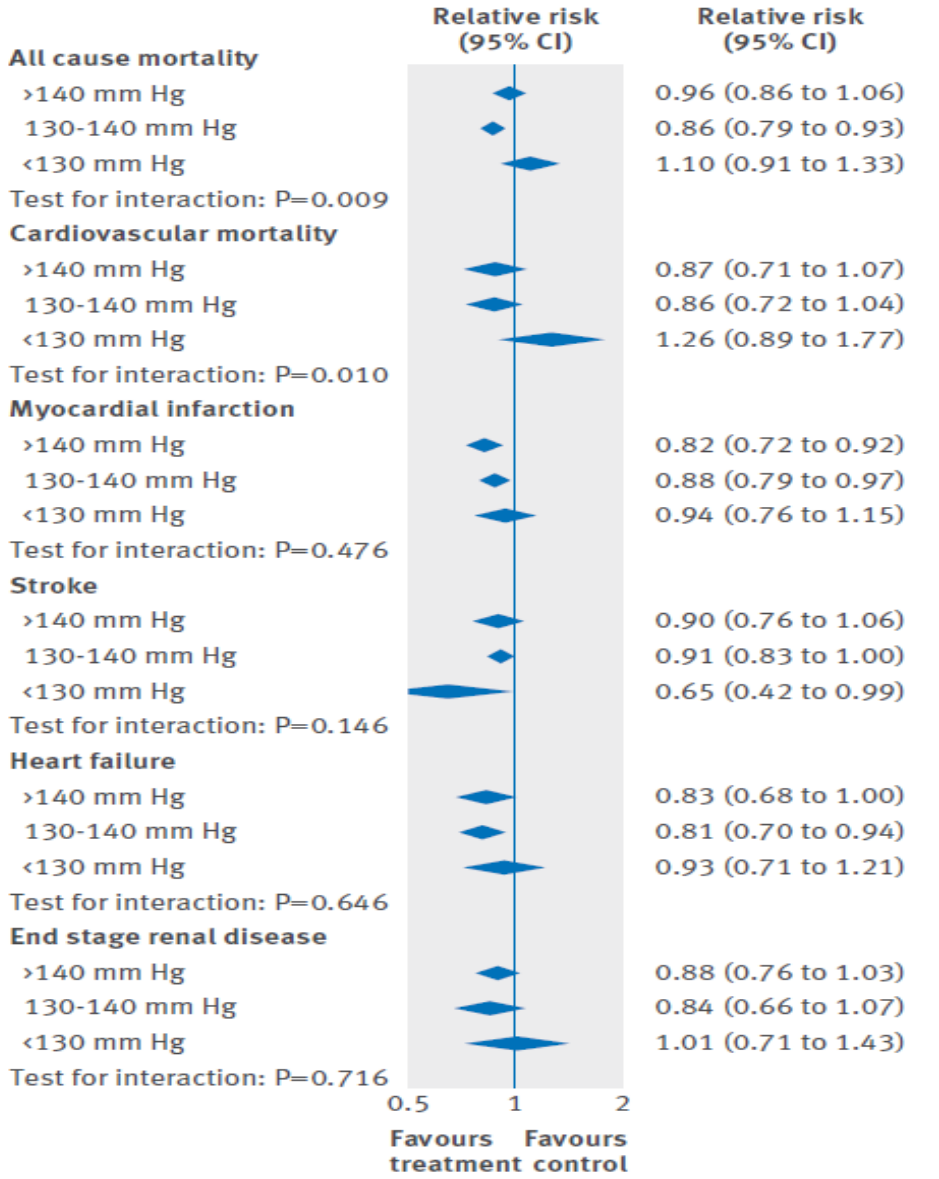
DBP=diastolic blood pressure; SBP=systolic blood pressure; NYHA=New York Heart Association function class.

Brunstrom and Carlberg. *BMJ* 2016;352:i717. doi: 10.1136/bmj.i717

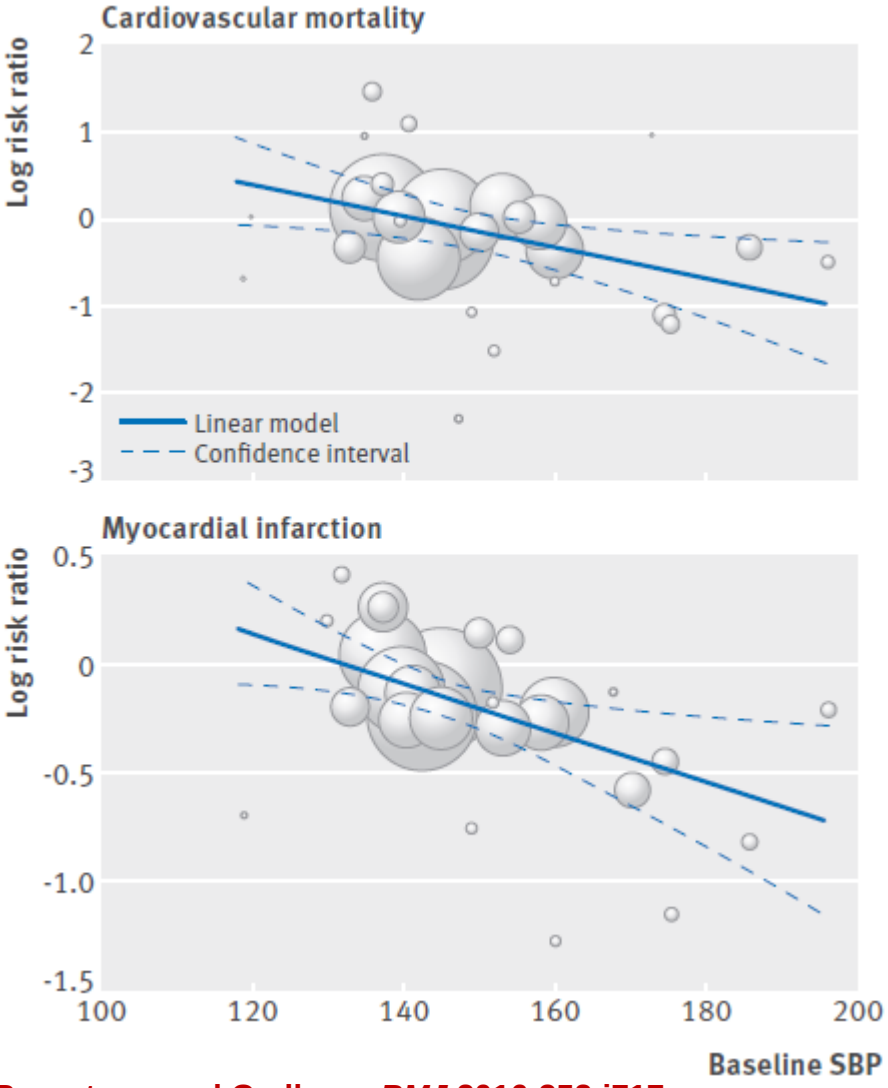
# Effect of antihypertensive treatment at different blood pressure levels in patients with diabetes mellitus: systematic review and meta-analyses

Brunstrom and Carlberg. *BMJ* 2016;352:i717. doi: 10.1136/bmj.i717



# Effect of antihypertensive treatment at different blood pressure levels in patients with diabetes mellitus: systematic review and meta-analyses




| Outcome | Relative risk (95% CI) | P value |
|---|---|---|
| Mortality | 1.04 (0.98 to 1.10) | 0.151 |
| Cardiovascular mortality | 1.15 (1.03 to 1.29) | 0.015 |
| Myocardial infarction | 1.12 (1.03 to 1.22) | 0.011 |
| Stroke | 1.07 (0.98 to 1.18) | 0.137 |
| Heart failure | 1.05 (0.93 to 1.20) | 0.401 |
| End stage renal disease | 1.05 (0.90 to 1.22) | 0.496 |

Fig 4 | Results from metaregression analyses of treatment effect in relation to baseline systolic blood pressure (SBP). Relative risk is expressed as change in treatment effect for each 10 mm Hg lower baseline SBP. See table for results of all outcomes (those with significant results also presented as graphs). Each circle represents one trial and the size of each circle represents the weight given to the trial in metaregression

In patients with DM and a SBP > 140 mmHg, antihypertensive treatment is associated with a ↓ risk of mortality and CV disease.

**In patients with DM and a SBP < 140mmHg, however, antihypertensive treatment is associated with an ↑ risk of cardiovascular death.**

Brunstrom and Carlberg. *BMJ* 2016;352:i717. doi: 10.1136/bmj.i717

COMMENTARY
Franz H. Messerli, MD
Sripal Bangalore, MD, MHA

THE AMERICAN JOURNAL of MEDICINE®

# Should We SPRINT Toward New Blood Pressure Goals or Let the Dust Settle?

**Table** Blood Pressure Goals Then and Now

| Blood Pressure Goals | Hypertension | Hypertension with Diabetes |
|---|---|---|
| Previous* | <140/90 mm Hg | <130/80 mm Hg |
| Now† | <120/? mm Hg | >140/90 mm Hg |

*Recent (2013) on-treatment blood pressure goals of most national and international hypertension guidelines.
†Based on treatment blood pressure goals from references 1 and 4.

*Am J Med* 2016;129(8):769-70.

"Regardless of whether your patient has hypertension with or without diabetes, we should remember a simple but inescapable truth in medicine:
**patients are genetically, physiologically, metabolically, pathologically, psychologically, and culturally different**.
Accordingly there never will be only one way to diagnose and treat many medical disorders, including hypertension.
To lower blood pressure of **all hypertensive patients uniformly to 120 mm Hg clearly has to be considered absurd**, regardless of the SPRINT results.
**Equally absurd would it be to maintain blood pressure levels above 140/90 mm Hg in all diabetic patients**. We can only hope that despite (or even because of) SPRINT, physicians will continue to treat patients and not blood pressure numbers alone.

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# Diastolic Blood Pressure, Subclinical Myocardial Damage, and Cardiac Events

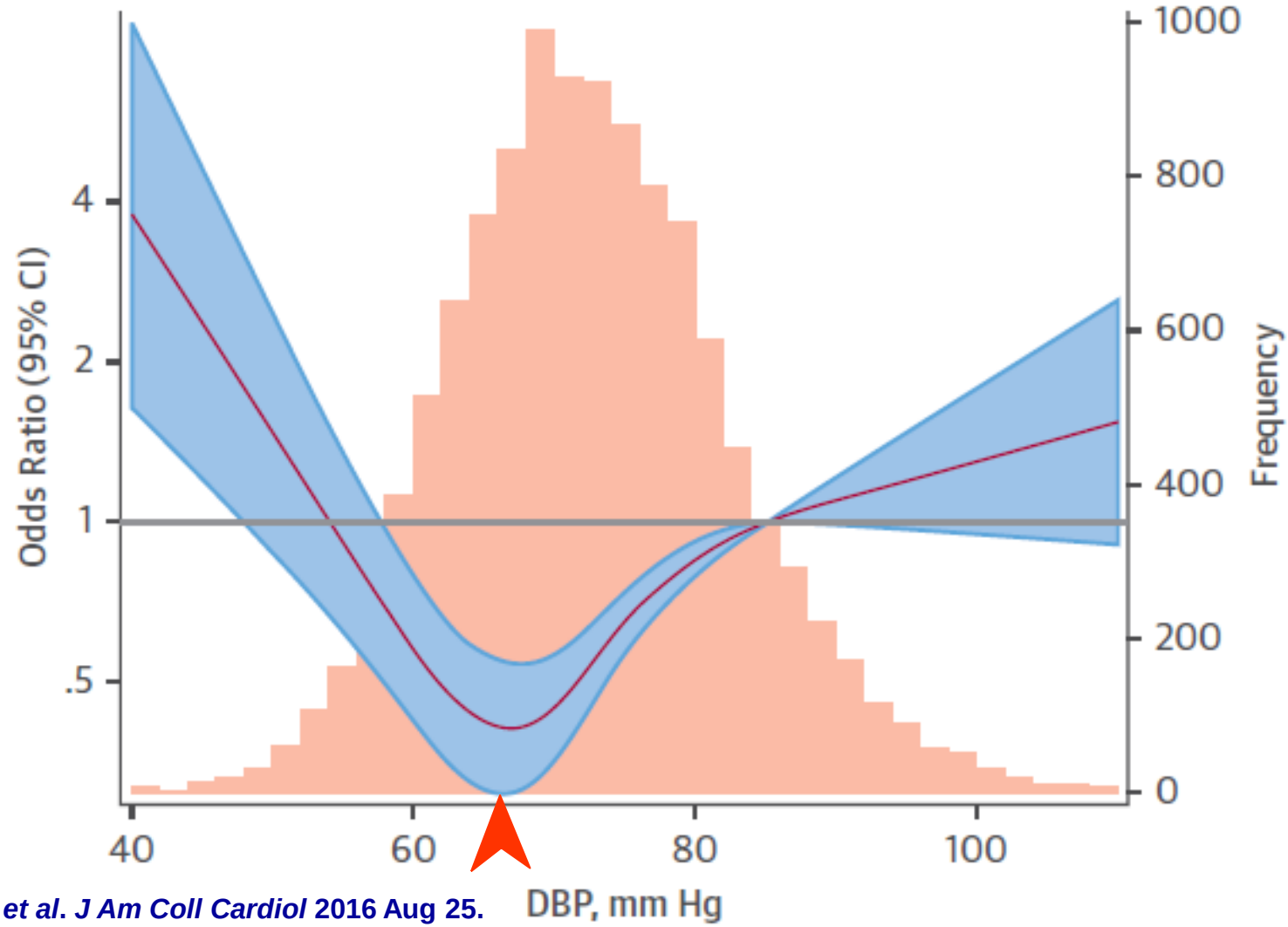
## Implications for Blood Pressure Control

John W. McEvoy, MB, BCh, BAO, MHS,[a,b] Yuan Chen, MS,[a] Andreea Rawlings, PhD,[a] Ron C. Hoogeveen, PhD,[c] Christie M. Ballantyne, MD,[c] Roger S. Blumenthal, MD,[b] Josef Coresh, MD, PhD,[a] Elizabeth Selvin, MPH, PhD[a]

- **11,565 adults from the ARIC (*Atherosclerosis Risk In Communities*) cohort**
- **Patients analyzed for:**
  - ✓ **Associations between DBP and hs-cTnT**
  - ✓ **Prospective associations between DBP and events**

# Linear Inverse Relationship Between DBP and hs-cTnT When DBP < 65 mmHg

**FIGURE 1** Relationship Between DBP and Elevated hs-cTnT



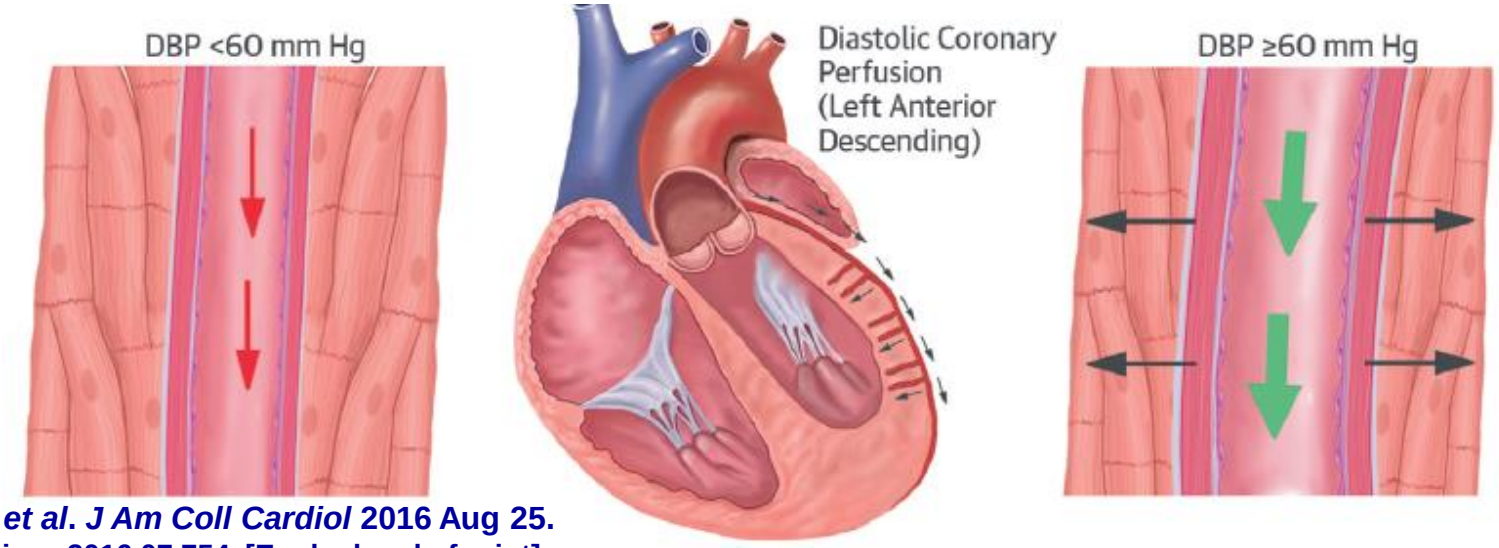

McEvoy JW, *et al*. *J Am Coll Cardiol* 2016 Aug 25.
doi: 10.1016/j.jacc.2016.07.754. [Epub ahead of print]

# Association Between Low DBP and CHD

**TABLE 3** CHD, Stroke, or Mortality Events

**Significant values in bold**
*Cox Model adjustment for variables

| | CHD | | | Stroke | | | Mortality | | |
|---|---|---|---|---|---|---|---|---|---|
| Visit 2 DBP | n/N | HR* (95% CI) | p Value | n/N | HR* (95% CI) | p Value | n/N | HR* (95% CI) | p Value |
| <60 mm Hg | 165/1,087 | **1.49 (1.20-1.85)** | **<0.001** | 56/1,084 | 1.13 (0.79-1.61) | 0.52 | 345/1,087 | **1.32 (1.13-1.55)** | **<0.001** |
| 60-69 mm Hg | 547/3,728 | **1.23 (1.05-1.44)** | **0.01** | 197/3,722 | 1.03 (0.80-1.32) | 0.83 | 1,017/3,727 | 1.10 (0.98-1.23) | 0.12 |
| 70-79 mm Hg | 752/4,247 | **1.20 (1.05-1.37)** | **0.01** | 271/4,234 | 1.07 (0.86-1.32) | 0.55 | 1,142/4,247 | 0.99 (0.89-1.10) | 0.89 |
| 80-89 mm Hg | 350/1,902 | 1.00 (reference) | – | 143/1,894 | 1.00 (reference) | – | 597/1,902 | 1.00 (reference) | – |
| 90-99 mm Hg | 104/487 | 0.93 (0.74-1.16) | 0.52 | 53/484 | 1.20 (0.87-1.66) | 0.27 | 189/487 | 1.01 (0.85-1.19) | 0.92 |
| ≥100 mm Hg | 25/112 | 0.76 (0.50-1.17) | 0.21 | 19/112 | 1.50 (0.90-2.50) | 0.12 | 49/112 | 1.03 (0.76-1.40) | 0.84 |

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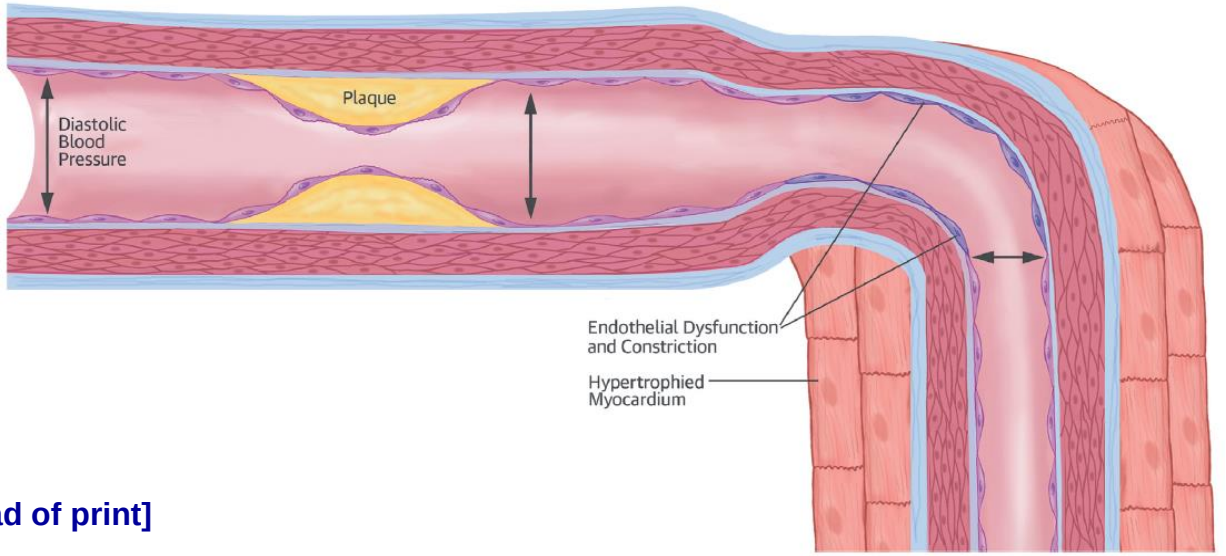
EDITORIAL COMMENT

# Troponin and the J-Curve of Diastolic Blood Pressure

## When Lower Is Not Better*

Deepak L. Bhatt, MD, MPH

FIGURE 1 Factors Potentially Modulating Optimal BP Target for Pharmacotherapy




**Bhatt D. *J Am Coll Cardiol*. 2016 Aug 25.**
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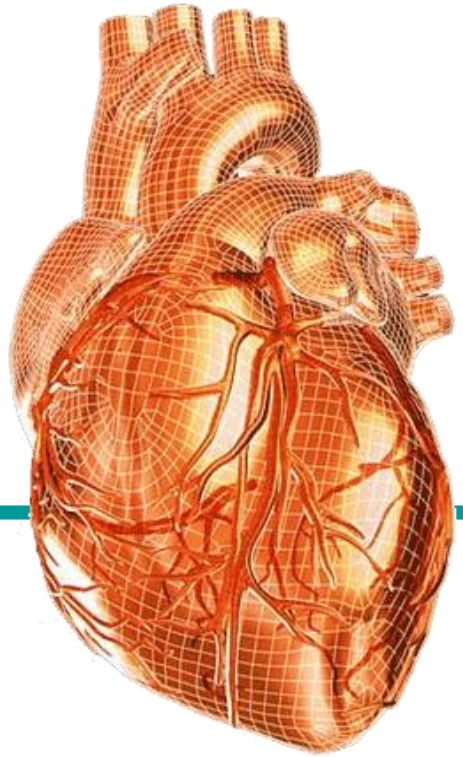

# *Feeling the pressure? Managing Hypertension in 2016*

## Conclusions:

- Hypertension is a highly prevalent disease and CV risk factor
- Target systolic blood pressure still under discussion

| Blood Pressure Goals | Hypertension | Hypertension with Diabetes |
|---|---|---|
| Previous* | <140/90 mm Hg | <130/80 mm Hg |
| Now† | <120/? mm Hg | >140/90 mm Hg |

- Physicians should continue to treat patients and not blood pressure numbers alone (BTT)
- Individualized treatment of hypertension: should it be considered from the point of preventing CV diseases?