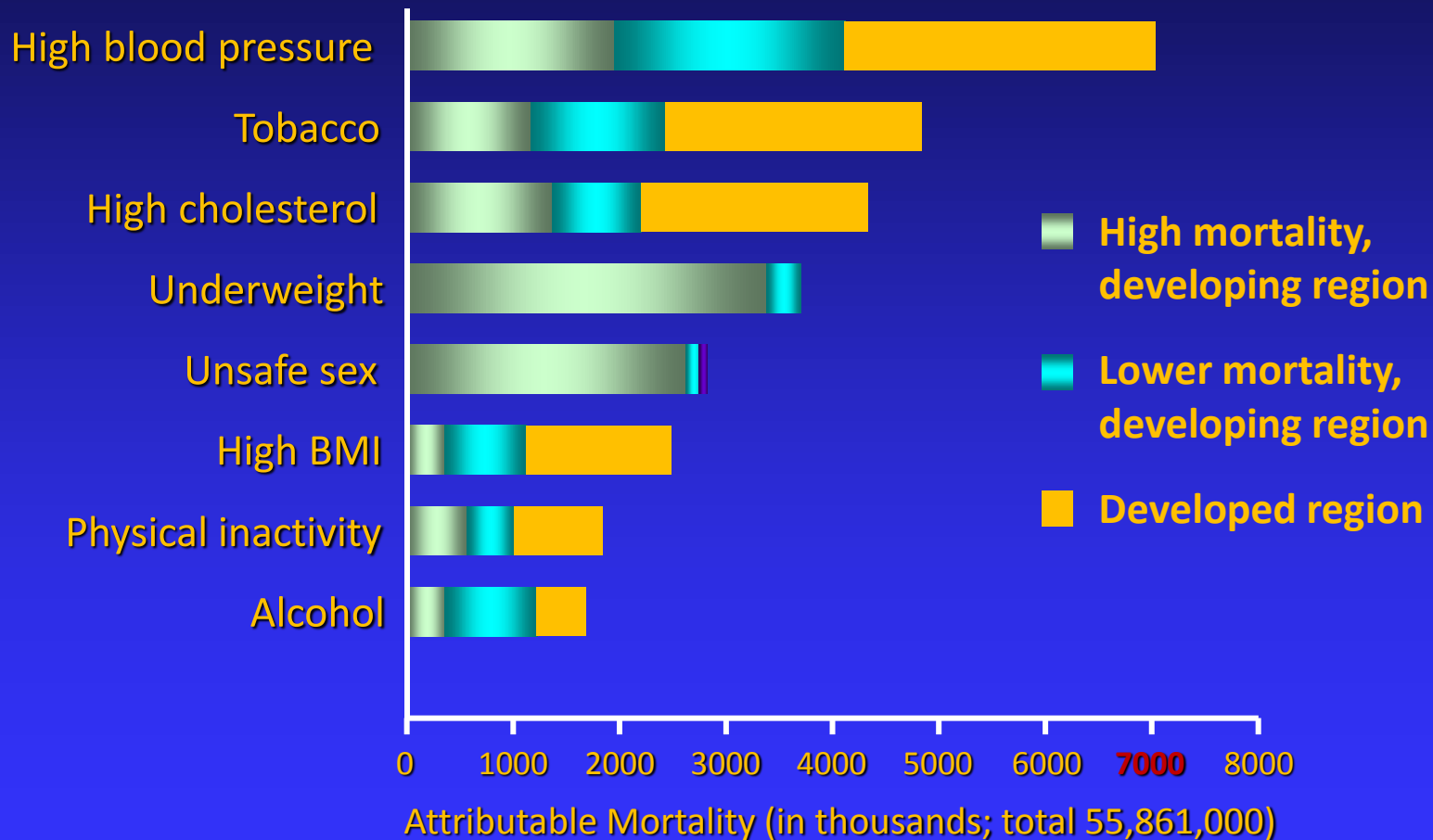


**2017 Updates for 2015 TSOC/THS  
Hypertension Guideline**

**Hao-Min Cheng, M.D., PhD.**

Director, Center for Evidence-based  
Medicine, Taipei Veterans General Hospital

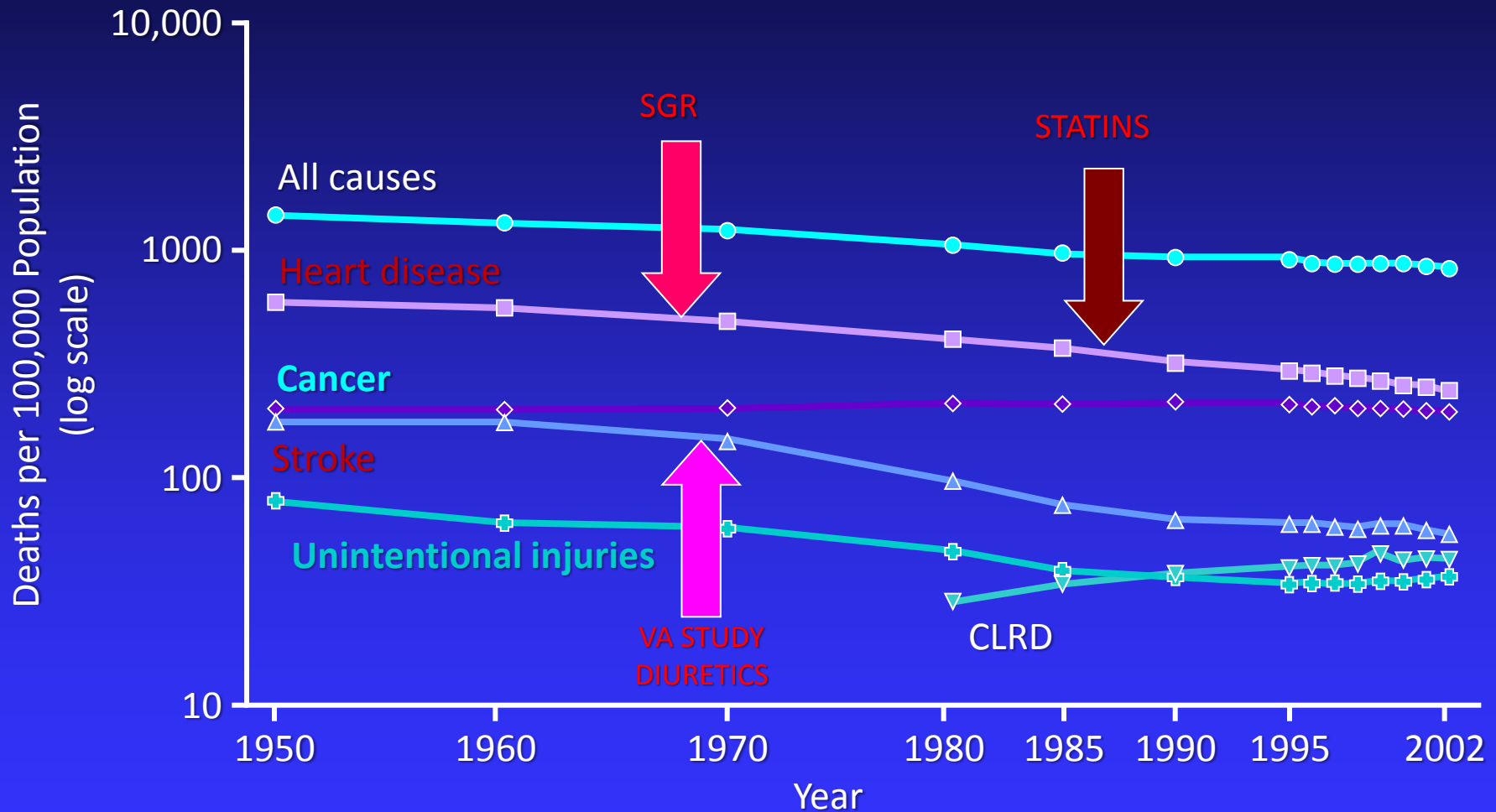
# Global Disease Burden



BMI = body mass index.

Adapted with permission from Ezzati M, et al. *Lancet*. 2002;360:1347-1360.

# Death rate of different diseases in United States



CLRD=chronic lower respiratory diseases.

Centers for Disease Control and Prevention. Available at: <http://www.cdc.gov/nchs/data/hus/hus05.pdf>. Accessed July 4, 2006.



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- Summary of 2015 Hypertension Treatment Guideline
  - Diagnosis algorithm
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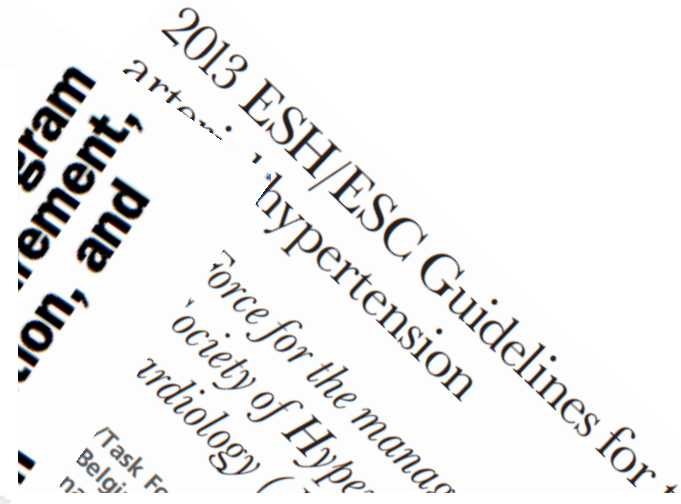
An Effective Approach to High Blood Pressure Control

A Science Advisory From the American Heart Association, the American College of Cardiology, and the Centers for Disease Control and Prevention

Alan S. Go, MD; MaryAnn Bauman, MD; Sallyann M. Coleman King, MD, MSc;

Gregg C. Fonarow, MD, FAHA, FACC; Willie Lawrence, MD, FAHA, FACC;

Kim A. Williams, MD, FAHA, FACC; Eduardo Sanchez, MD



Clinical Practice Guidelines for the Management of Hypertension in the Community  
Statement by the American Society of Hypertension and the International Society of Hypertension

Michael A. Weber<sup>a</sup>, Ernesto L. Schiffrin<sup>b</sup>, William B. White<sup>c</sup>, Samuel Mann<sup>d</sup>, Lars H. Lindholm<sup>e</sup>, John G. Kenerson<sup>f</sup>, John M. Flack<sup>g</sup>, Barry L. Carter<sup>h</sup>, Barry J. Materson<sup>i</sup>, C. Venkata S. Ram<sup>j</sup>, Debbie L. Cohen<sup>k</sup>, Jean-Claude Cadet<sup>l</sup>, Roger R. Jean-Charles<sup>m</sup>, Sandra Taler<sup>n</sup>, David Kountz<sup>o</sup>, Raymond Townsend<sup>p</sup>, John Chalmers<sup>q</sup>, Agustin J. Ramirez<sup>r</sup>, George L. Bakris<sup>s</sup>, Jiguang Wang<sup>t</sup>, Aletta E. Schutte<sup>u</sup>, John D. Bisognano<sup>v</sup>, Rhian M. Touyz<sup>w</sup>, Dominic Sica<sup>x</sup>, and Stephen B. Harrap<sup>y</sup>



Hypertension

JOURNAL OF THE AMERICAN HEART ASSOCIATION

**The 2013 Recommendations for the Management of High Blood Pressure in Adults**  
**Strength of the Panel Members Appointed**  
**Joint National Committee (JNC 8)**

# Worldwide Guidelines of HTN



Figure 2 Geographical distribution of CPGs worldwide

# History of TSOC Guideline

## Guideline

### 2010 Guidelines of the Taiwan Society of Cardiology for the Management of Hypertension

*Chern-En Chiang,<sup>1</sup> Tzung-Dau Wang,<sup>2</sup> Yi-Heng Li,<sup>3</sup> Tsung-Hsien Lin,<sup>4</sup> Kuo-Liong Chien,<sup>5</sup> Hung-I Yeh,<sup>6</sup>*

*Kou-G*

### 2015 Guidelines of the Taiwan Society of Cardiology and the Taiwan Hypertension Society for the Management of Hypertension



*Chern-En Chiang<sup>a,\*</sup>, Tzung-Dau Wang<sup>b</sup>, Kwo-Chang Ueng<sup>c</sup>, Tsung-Hsien Lin<sup>d</sup>, Hung-I Yeh<sup>e</sup>, Chung-Yin Chen<sup>f</sup>, Yih-Jer Wu<sup>e</sup>, Wei-Chuan Tsai<sup>g</sup>, Ting-Hsing Chao<sup>g</sup>, Chen-Huan Chen<sup>h,i,j,k</sup>,*

*Pao-Hsi*

*Kang-I*

### The 2017 Focused Update of the Guidelines of the Taiwan Society of Cardiology (TSOC) and the Taiwan Hypertension Society (THS) for the Management of Hypertension

*Chern-En Chiang,<sup>1</sup> Tzung-Dau Wang,<sup>2</sup> Tsung-Hsien Lin,<sup>3</sup> Hung-I Yeh,<sup>4</sup> Ping-Yen Liu,<sup>5</sup> Hao-Min Cheng,<sup>6</sup> Ting-Hsing Chao,<sup>7</sup> Chen-Huan Chen,<sup>8</sup> Kou-Gi Shyu,<sup>9</sup> Kwo-Chang Ueng,<sup>10</sup> Chung-Yin Chen,<sup>11</sup> Pao-Hsien Chu,<sup>12</sup> Shih-Hsien Sung,<sup>13</sup> Kang-Ling Wang,<sup>14</sup> Yi-Heng Li,<sup>7</sup> Kuo-Yang Wang,<sup>15</sup> Fu-Tien Chiang,<sup>16</sup> Wen-Ter Lai,<sup>3,17</sup> Jyh-Hong Chen,<sup>18</sup> Wen-Jone Chen,<sup>2,19</sup> San-Jou Yeh,<sup>20</sup> Ming-Fong Chen,<sup>21</sup> Shing-Jong Lin<sup>22</sup> and Jiunn-Lee Lin<sup>2</sup>*

*Acta Cardiol Sin 2017;33:213 - 225*



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Available online at [www.sciencedirect.com](http://www.sciencedirect.com)

**ScienceDirect**

Journal of the Chinese Medical Association 78 (2015) 1–47



[www.jcma-online.com](http://www.jcma-online.com)

Guidelines

## 2015 Guidelines of the Taiwan Society of Cardiology and the Taiwan Hypertension Society for the Management of Hypertension



Chern-En Chiang<sup>a,\*</sup>, Tzung-Dau Wang<sup>b</sup>, Kwo-Chang Ueng<sup>c</sup>, Tsung-Hsien Lin<sup>d</sup>, Hung-I Yeh<sup>e</sup>,  
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Pao-Hsien Chu<sup>l</sup>, Chia-Lun Chao<sup>m</sup>, Ping-Yen Liu<sup>g</sup>, Shih-Hsien Sung<sup>n</sup>, Hao-Min Cheng<sup>h,i,j,k</sup>,  
Kang-Ling Wang<sup>a</sup>, Yi-Heng Li<sup>g</sup>, Fu-Tien Chiang<sup>o,p</sup>, Jyh-Hong Chen<sup>g</sup>, Wen-Jone Chen<sup>o,q</sup>,  
San-Jou Yeh<sup>r</sup>, Shing-Jong Lin<sup>i,j,s</sup>

# 2015 TSOC/THS Guideline for Hypertension (2<sup>nd</sup> Edition)

**Dec, 2014**





# Outline



- Summary of 2015 Hypertension Treatment Guideline
  - Diagnosis algorithm
  - Life style modification
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  - Adjustment algorithm
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- Cost-effectiveness Study of Antihypertensive agents



# Blood Pressure Measurement



Correct methods for office blood pressure measurement.

## Before measurement

Timing	
1 hour	Avoiding coffee, food, smoking, decongestants
30 minutes	Avoiding exercise
5 minutes	Sitting calmly
Preparation	Emptying bladder and bowel, and removing all clothing that covers the location of cuff placement
Environment	Calm and warm place
During measurement	
Body position	Seated, back supported, legs uncrossed, feet flat on floor, and relaxed
Arm	Supported, using the arm with higher value
Cuff	at heart level, using appropriate sized one
Measurement	Taking two measurement, spaced 1-2 minutes apart, and additional measurement if needed
	Measuring heart rate by pulse palpation (at least 30 seconds) after the second measurement
	For patients with atrial fibrillation, measuring blood pressure manually, using direct auscultation over the brachial artery
	When suspecting orthostatic hypotension, measuring blood pressure 1 and 3 minutes after assumption of standing position
After measurement	
Blood pressure readings	Averaging, but not rounding them
	Recording

Definition and classification of hypertension by office blood pressure measurement.

Staging	Systolic BP (mmHg)	Diastolic BP (mmHg)
Normal	<120	and <80
Prehypertension	120-139	or 80-89
Stage 1 hypertension	140-159	or 90-99
Stage 2 hypertension	160-179	or 100-109
Stage 3 hypertension	≥180	or ≥110
Isolated systolic hypertension	≥140	and <90

Systolic BP ≥130 mmHg or diastolic BP ≥80 mmHg are considered high blood pressures in special patient groups (coronary heart disease, diabetes, and proteinuric chronic kidney disease), and also in patients who receive antithrombotics for stroke prevention. (Modified from Chiang et al.<sup>9</sup> with permission).

Definition of hypertension by HBPM and ABPM.

Category	Systolic blood pressure (mmHg)	Diastolic blood pressure (mmHg)
HBPM	≥135	or ≥85
ABPM	≥130	or ≥80
Daytime	≥135	or ≥85
Nighttime	≥120	or ≥70

ABPM: ambulatory blood pressure monitoring; HBPM: home blood pressure monitoring (Modified from Chiang et al.<sup>9</sup> with permission).

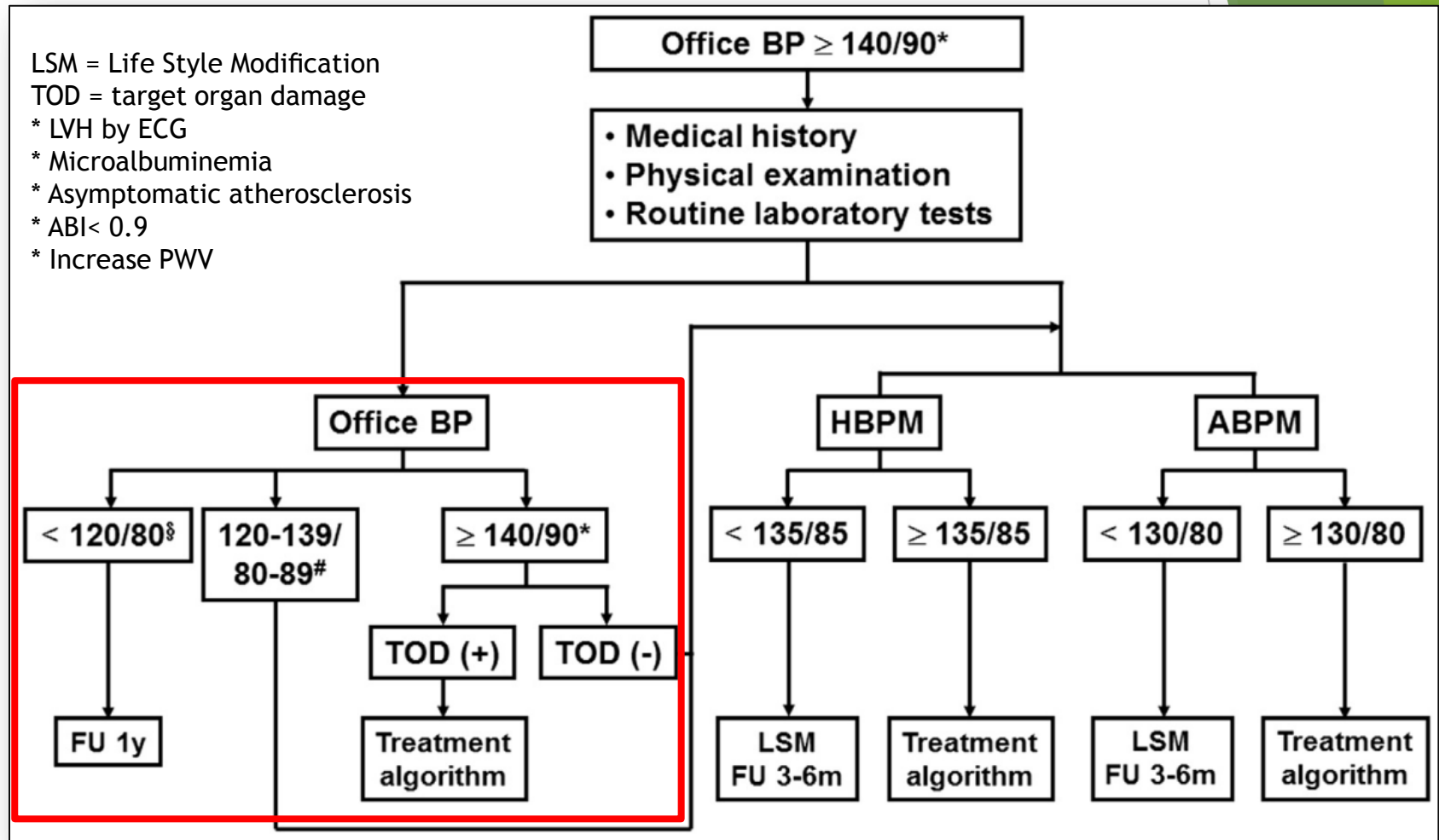


# In addition to Office BP



	Advantages	Disadvantages
<b>HBPM</b>	<ul style="list-style-type: none"><li>✓ Stronger predictor of CV events than office BP</li><li>✓ Provides a larger number of BP readings</li><li>✓ <b>Can be repeated more frequently than ABPM</b></li><li>✓ Identifies white-coat &amp; masked hypertension</li><li>✓ Evaluates the efficacy of antihypertensive at different times of the day and night, except sleep</li><li>✓ High acceptance by patients</li><li>✓ Relatively low cost</li></ul>	<ul style="list-style-type: none"><li>✓ Necessity for patient training (simple for automated devices)</li><li>✓ Possible use of un-validated devices</li><li>✓ Lack of night time recordings</li></ul>
<b>ABPM</b>	<ul style="list-style-type: none"><li>✓ Much stronger predictor of CV events than office BP</li><li>✓ Provides larger number of BP readings</li><li>✓ Identifies white-coat &amp; masked hypertension</li><li>✓ Disclose nocturnal hypertension and dipping patterns</li><li>✓ <b>Provides averaged daytime, night-time and 24-hour values</b></li><li>✓ <b>Assess BP variability over 24 hours</b></li><li>✓ <b>Evaluates the 24-hour efficacy of antihypertensive drugs</b></li></ul>	<ul style="list-style-type: none"><li>✓ Cost (reimbursement issue)</li><li>✓ Limited availability in private practice</li><li>✓ Discomfort in patients</li><li>✓ Repeated measurement not likely in short term</li></ul>

# Diagnosis Algorithm





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# Life Style Modification Recommendation



Life style modification for managing hypertension (S-ABCDE).

Changes	Recommendation	Expected benefits in SBP reduction	COR	LOE
<u>S</u> odium restriction	2.0–4.0 gm/day	2.5 mmHg/1 gm sodium reduction	I	B
<u>A</u> lcohol limitation	Men: <30 gm/day ethanol Women: <20 gm/day ethanol	2–4 mmHg	I	B
<u>B</u> ody weight reduction	BMI: 22.5–25.0	1 mmHg/per 1 kg reduction	I	B
<u>C</u> igarette smoking cessation	Complete abstinence	No independent effect	I	C
<u>D</u> iet adaptation	<b>DASH</b> diet: rich in fruits and vegetables (8–10 servings/day), rich in low-fat dairy products (2–3 servings/day), and reduced in saturated fat and cholesterol	10–12 mmHg	I	A
<u>E</u> xercise adoption	Aerobic, at least 40 minutes/day, and at least 3-4 days/week	3–7 mmHg	I	A

BMI: body mass index; COR: class of recommendation; DASH: Dietary Approaches to Stop Hypertension; LOE: level of evidence; SBP: systolic blood pressure (Modified from Chiang et al.<sup>9</sup> with permission).



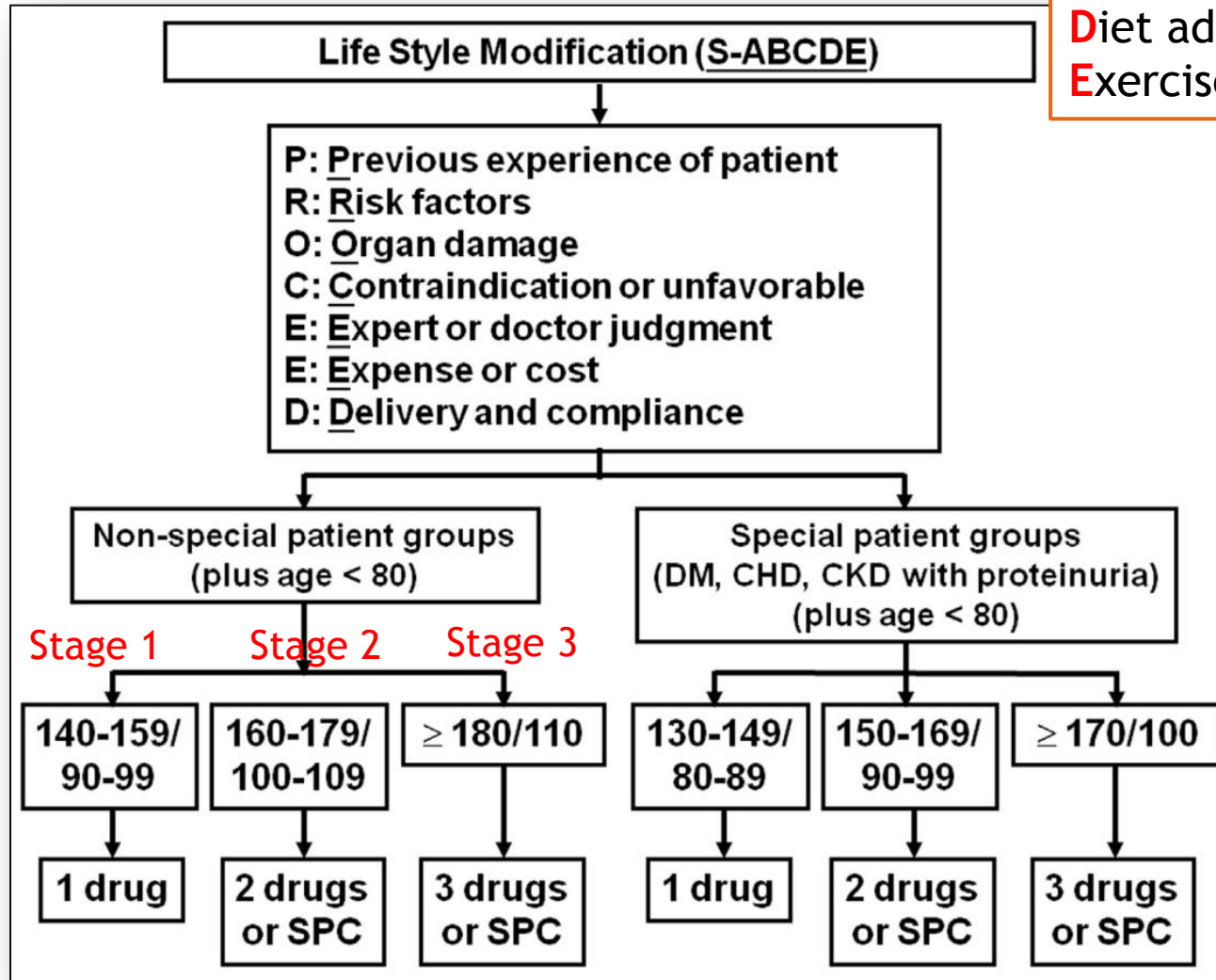
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# Treatment Algorithm

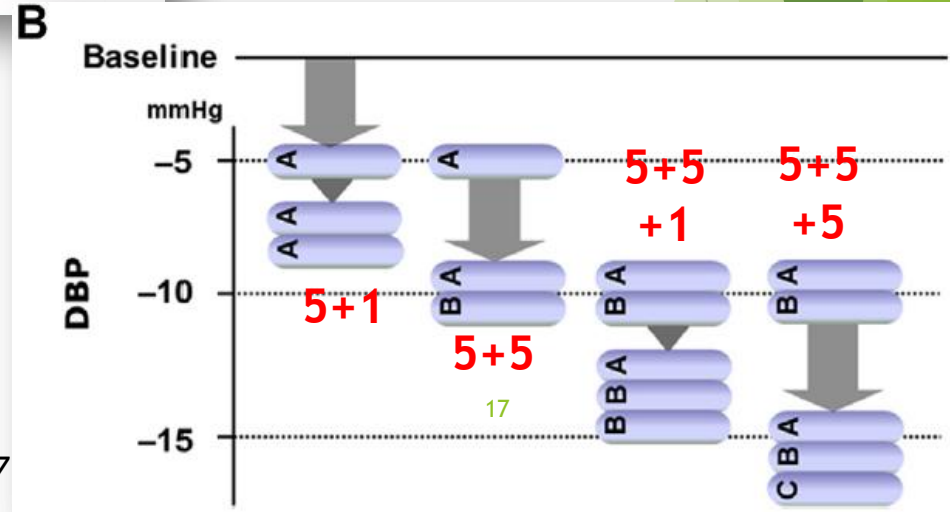
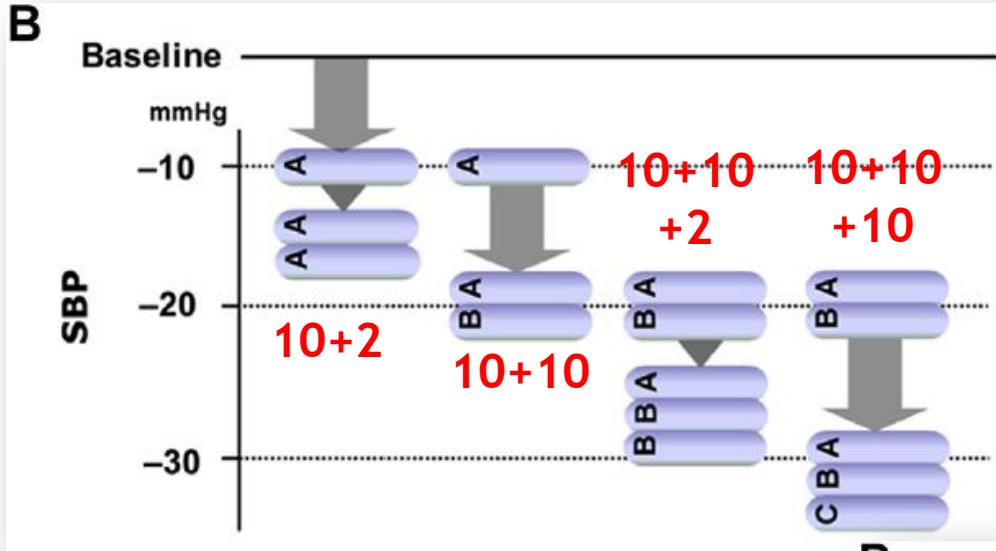
**S**odium restriction  
**A**lcohol limitation  
**B**ody weight reduction  
**C**igarette smoking cessation  
**D**iet adaptation  
**E**xercise adoption



SPC  
Single-Pill Combination



# Rule of 10 & Rule of 5





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# Adjustment Algorithm

▶ When BP does not reach goal

▶ **AT GOALS**

▶ Adherence

▶ Timing of administration

▶ Greater doses

▶ Other classes of drugs

▶ Alternative combination or SPC

▶ LSM + Laboratory tests



# Recommended Drugs



## Recommended drugs.

Clinical conditions	Drugs
Target organ damage	
<u>Left ventricular hypertrophy</u>	<u>ARB</u>
<u>Microalbuminuria</u>	<u>ACEI, ARB</u>
Asymptomatic atherosclerosis	CCB
Clinical events	
<u>History of myocardial infarction</u>	<u>BB, ACEI, ARB</u>
Coronary Heart Disease	BB, ACEI, ARB, CCB (long-acting)
Heart failure	Thiazide diuretic, loop diuretic, BB, ACEI, ARB, MRA
Stroke	ACEI, ARB, Thiazide diuretic, CCB,
Chronic kidney disease	ACEI, ARB, loop diuretic
Peripheral artery disease	CCB
<u>Diabetes mellitus</u>	<u>ACEI, ARB, DRI</u>
Associated conditions	
Isolated systolic hypertension	Thiazide diuretic, CCB, ARB
Metabolic syndrome	ACEI, ARB
Benign prostate hypertrophy	Alpha-blocker

ACEI: angiotensin converting enzyme inhibitor; ARB: angiotensin receptor blocker; BB: beta blocker; CCB: calcium channel blocker; DRI: direct renin inhibitor; MRA: mineralocorticoid receptor antagonist. (Modified from Chiang et al.<sup>9</sup> with permission).

## Contraindications or unfavorable conditions.

	Contraindications	Unfavorable conditions
Thiazide diuretics		Gout, hypokalemia, hyponatremia, metabolic syndrome, pregnancy
BB	Bronchial asthma, sick sinus syndrome, 2 <sup>nd</sup> and 3 <sup>rd</sup> degree AV block	Peripheral artery disease, Metabolic syndrome
CCB (non-DHP)	Sick sinus syndrome, 2 <sup>nd</sup> and 3 <sup>rd</sup> degree AV block	Systolic heart failure
ACEI	Bilateral renal artery stenosis, pregnancy, angioedema	Hyperkalemia
ARB	Bilateral renal artery stenosis, pregnancy	Hyperkalemia
DRI	Bilateral renal artery stenosis, pregnancy	Hyperkalemia
MRA	Hyperkalemia	
Alpha-blocker		Systolic heart failure

ACEI: angiotensin converting enzyme inhibitor; ARB: angiotensin receptor blocker; BB: beta blocker; CCB: calcium channel blocker; DHP: dihydropyridine; DRI: direct renin inhibitor; MRA: Mineralocorticoid receptor antagonist (Modified from Chiang et al.<sup>9</sup> with permission).



Contents lists available at ScienceDirect

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Journal homepage: <http://www.jfma-online.com>



### Guideline

# 2010 Guidelines of the Taiwan Society of Cardiology for the Management of Hypertension

Chern-En Chiang,<sup>1</sup> Tzung-Dau Wang,<sup>2</sup> Yi-Heng Li,<sup>3</sup> Tsung-Hsien Lin,<sup>4</sup> Kuo-Liong Chien,<sup>5</sup> Hung-I Yeh,<sup>6</sup>  
Kou-Gi Shyu,<sup>7</sup> Wei-Chuen Tsai,<sup>3</sup> Ting-Hsing Chao,<sup>8</sup> Juey-Jen Hwang,<sup>2</sup> Fu-Tien Chiang,<sup>9</sup> Jyh-Hong Chen<sup>3\*</sup>

“The main benefits of antihypertensive agents are derived from **lowering of BP *per se***, and are generally independent of the drugs being used, except that certain associated cardiovascular conditions might favor certain classes of drugs.”



# 2015 Hypertension Guideline of TSOC/THS BP Targets



Categories	Targets (mmHg)	COR	LOE
Low to moderate risk	<140/90	IIa	B
<b>Secondary prevention</b>			
<b>CHD</b>	<b>&lt;130/80</b>	<b>I</b>	<b>B</b>
History of stroke	<140/90	I	B
<b>Diabetes</b>	<b>&lt;130/80</b>	<b>I</b>	<b>A</b>
CKD	<140/90	I	A
<b>CKD + proteinuria</b>	<b>&lt;130/80</b>	<b>IIb</b>	<b>C</b>
Very elderly (age>80)	<150/90	IIa	B
<b>Patients receiving antithrombotic therapy</b>	<b>&lt;130/80</b>	<b>I</b>	<b>B</b>



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# SPRINT Trials

Nov, 2015



# SPTINT Trial



- ▶ Funded by NIH (National Institute of Health)
- ▶ Randomized, controlled, open-label
- ▶ Two groups:
  - ▶ Standard group, SBP <140 mm-Hg
  - ▶ Intensive group, SBP<120 mm-Hg

# SPRINT Trial



The NEW ENGLAND  
JOURNAL of MEDICINE

ESTABLISHED IN 1812

NOVEMBER 26, 2015

VOL. 373 NO. 22

A Randomized Trial of Intensive versus  
Standard Blood-Pressure Control

The SPRINT Research Group\*

## ► Inclusion criteria ( 4 specific groups)

1. Clinical or subclinical CV disease other than stroke
2. Chronic kidney disease (CKD)  
eGFR 20~60 ml/min/1.73m<sup>2</sup>
3. A 10-year risk of CV disease greater than 15% (Framingham risk score)
4. Age of 75 years or older

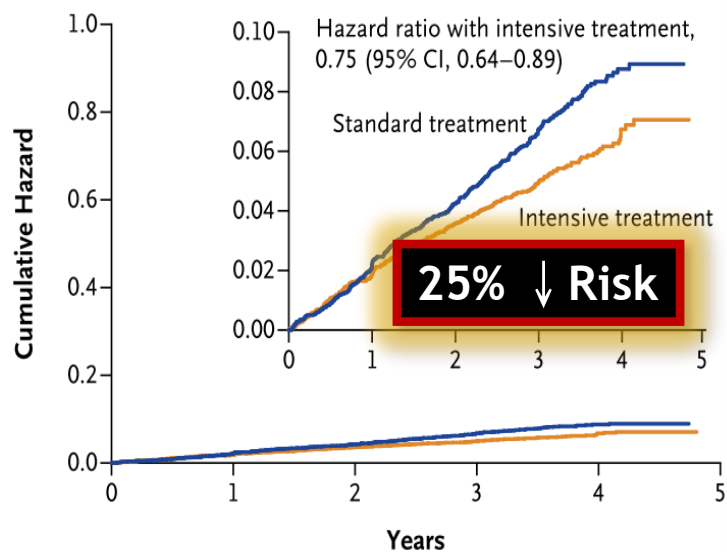
# SPRINT Trial



- ▶ Method of BP measurement:
  - ▶ Office BP
  - ▶ Automated measurement system
  - ▶ Mean of three BP measurements
  - ▶ Sit for 5 minutes in the quiet rest environment

# Outcome

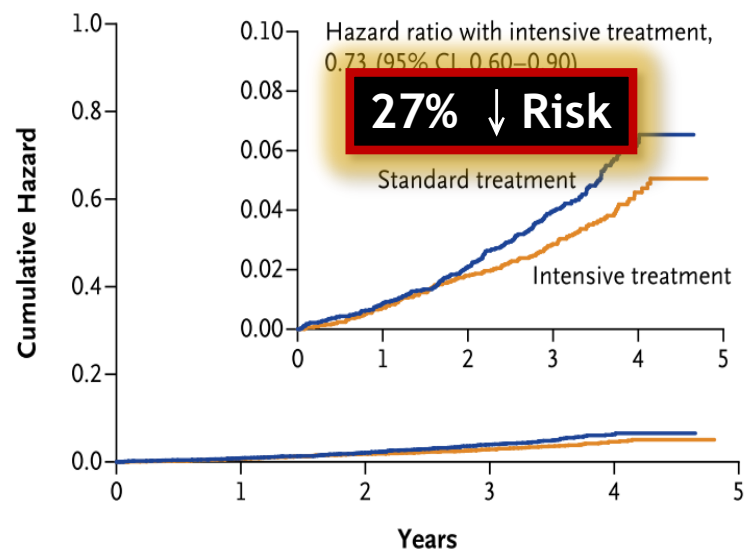
**A Primary Outcome**



**No. at Risk**

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

**B Death from Any Cause**

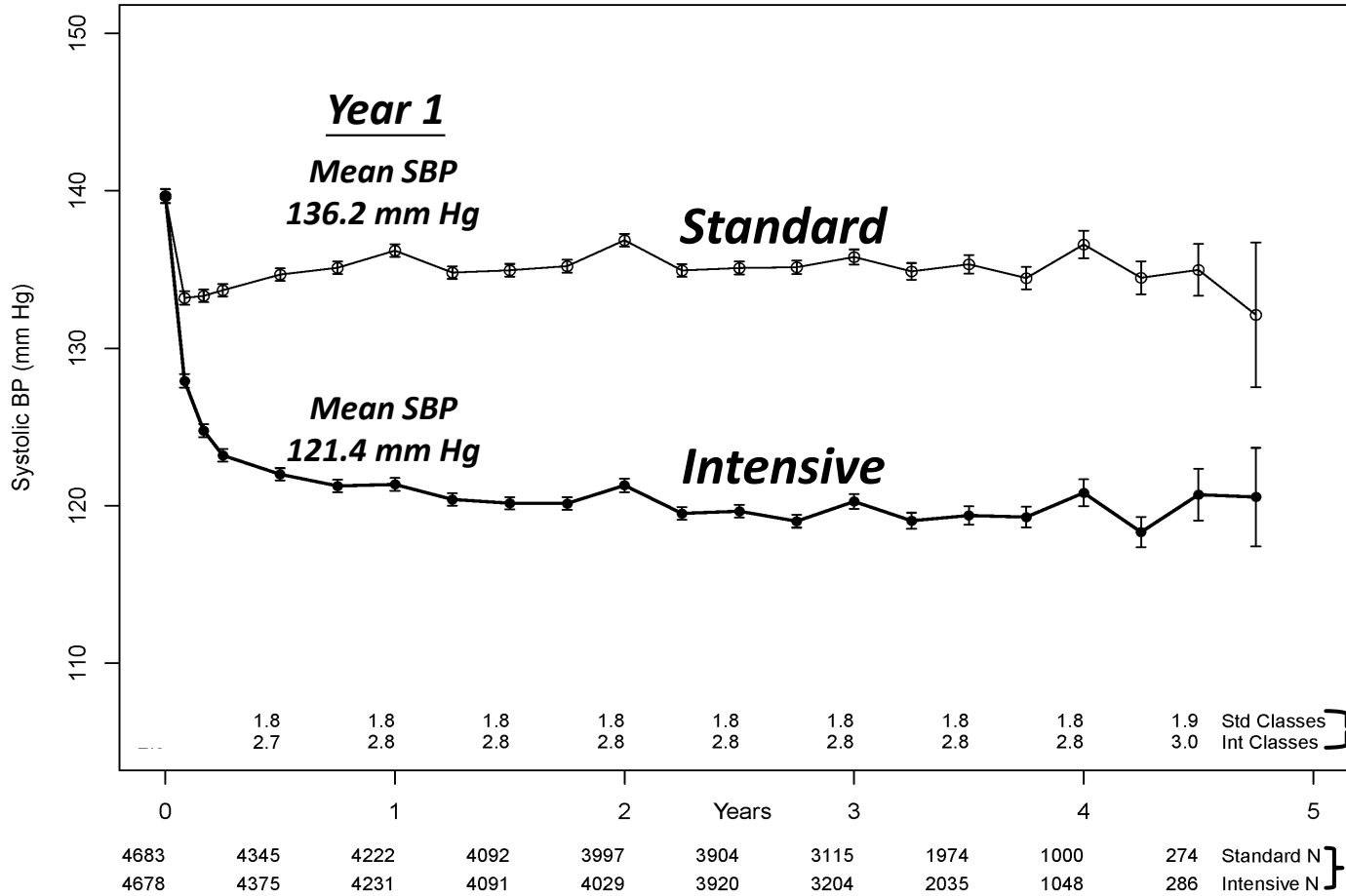


**No. at Risk**

Standard treatment	4683	4528	4383	2998	789
Intensive treatment	4678	4516	4390	3016	807



# Systolic BP During Follow-up



**Average SBP (During Follow-up)**

**Standard: 134.6 mm Hg**

**Intensive: 121.5 mm Hg**

**Average number of antihypertensive medications**

**Number of participants**

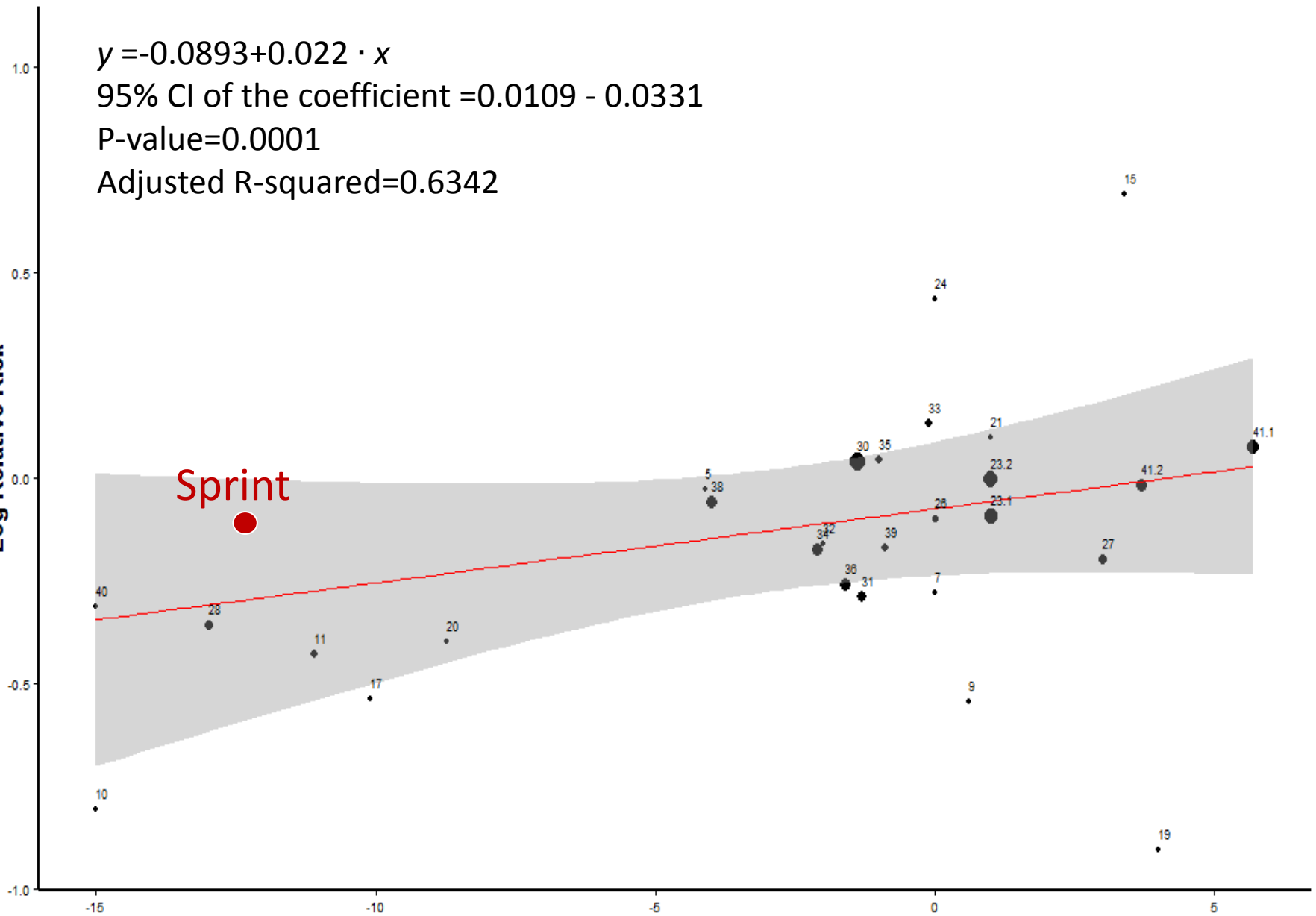
# SPRINT Primary Outcome and its Components

## Event Rates and Hazard Ratios

	<i>Intensive</i>		<i>Standard</i>		<i>HR (95% CI)</i>	<i>P value</i>
	<i>No. of Events</i>	<i>Rate, %/year</i>	<i>No. of Events</i>	<i>Rate, %/year</i>		
<b>Primary Outcome</b>	<b>243</b>	<b>1.65</b>	<b>319</b>	<b>2.19</b>	<b>0.75 (0.64, 0.89)</b>	<b>&lt;0.001</b>
<i>All MI</i>	<b>97</b>	<b>0.65</b>	<b>116</b>	<b>0.78</b>	<b>0.83 (0.64, 1.09)</b>	<b>0.19</b>
<i>Non-MI ACS</i>	<b>40</b>	<b>0.27</b>	<b>40</b>	<b>0.27</b>	<b>1.00 (0.64, 1.55)</b>	<b>0.99</b>
<i>All Stroke</i>	<b>62</b>	<b>0.41</b>	<b>70</b>	<b>0.47</b>	<b>0.89 (0.63, 1.25)</b>	<b>0.50</b>
<b>All HF</b>	<b>62</b>	<b>0.41</b>	<b>100</b>	<b>0.67</b>	<b>0.62 (0.45, 0.84)</b>	<b>0.002</b>
<b>CVD Death</b>	<b>37</b>	<b>0.25</b>	<b>65</b>	<b>0.43</b>	<b>0.57 (0.38, 0.85)</b>	<b>0.005</b>

$y = -0.0893 + 0.022 \cdot x$   
95% CI of the coefficient = 0.0109 - 0.0331  
P-value = 0.0001  
Adjusted R-squared = 0.6342

Log Relative Risk



Difference of final achieved SBP between treated and control groups (mmHg)



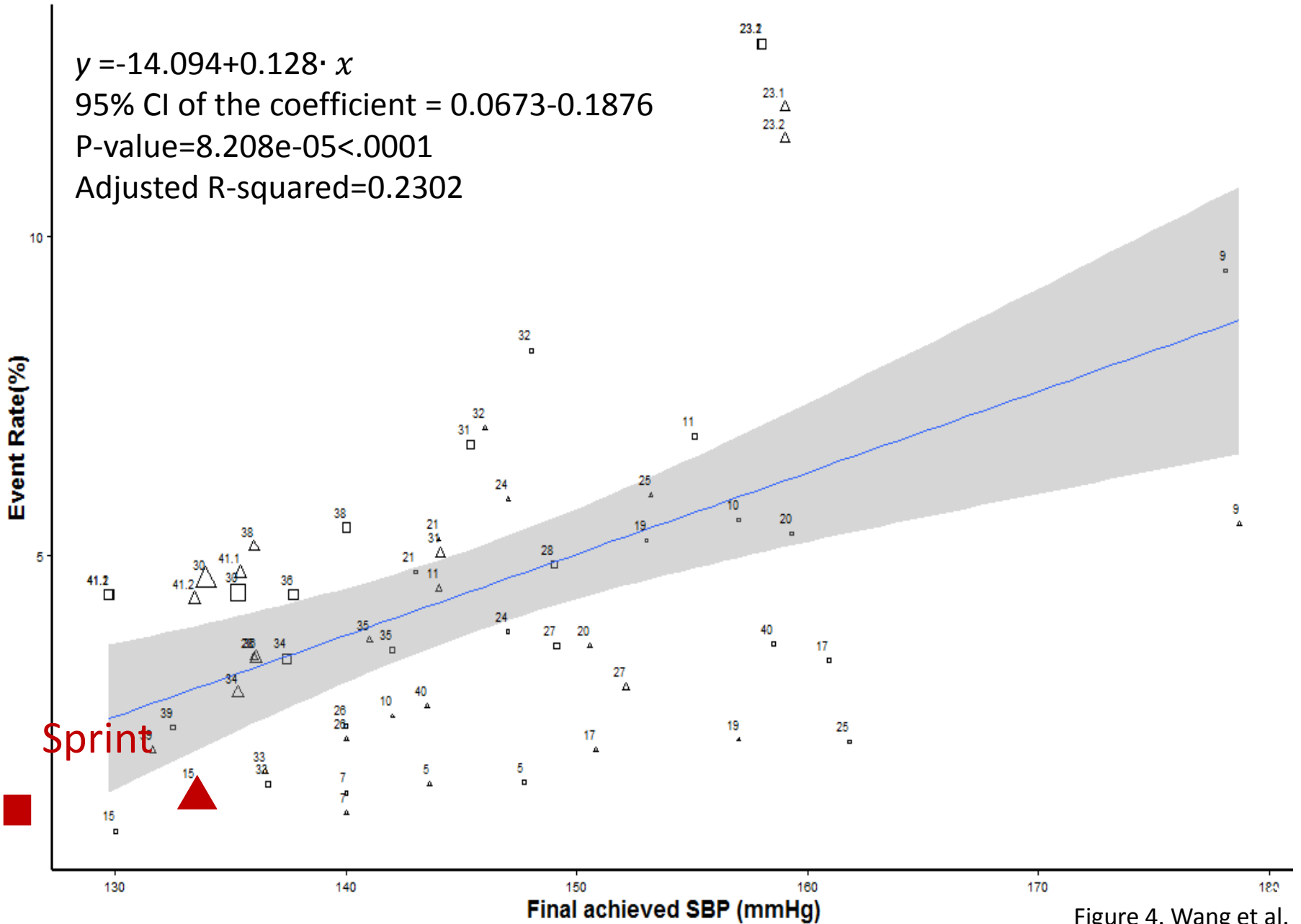
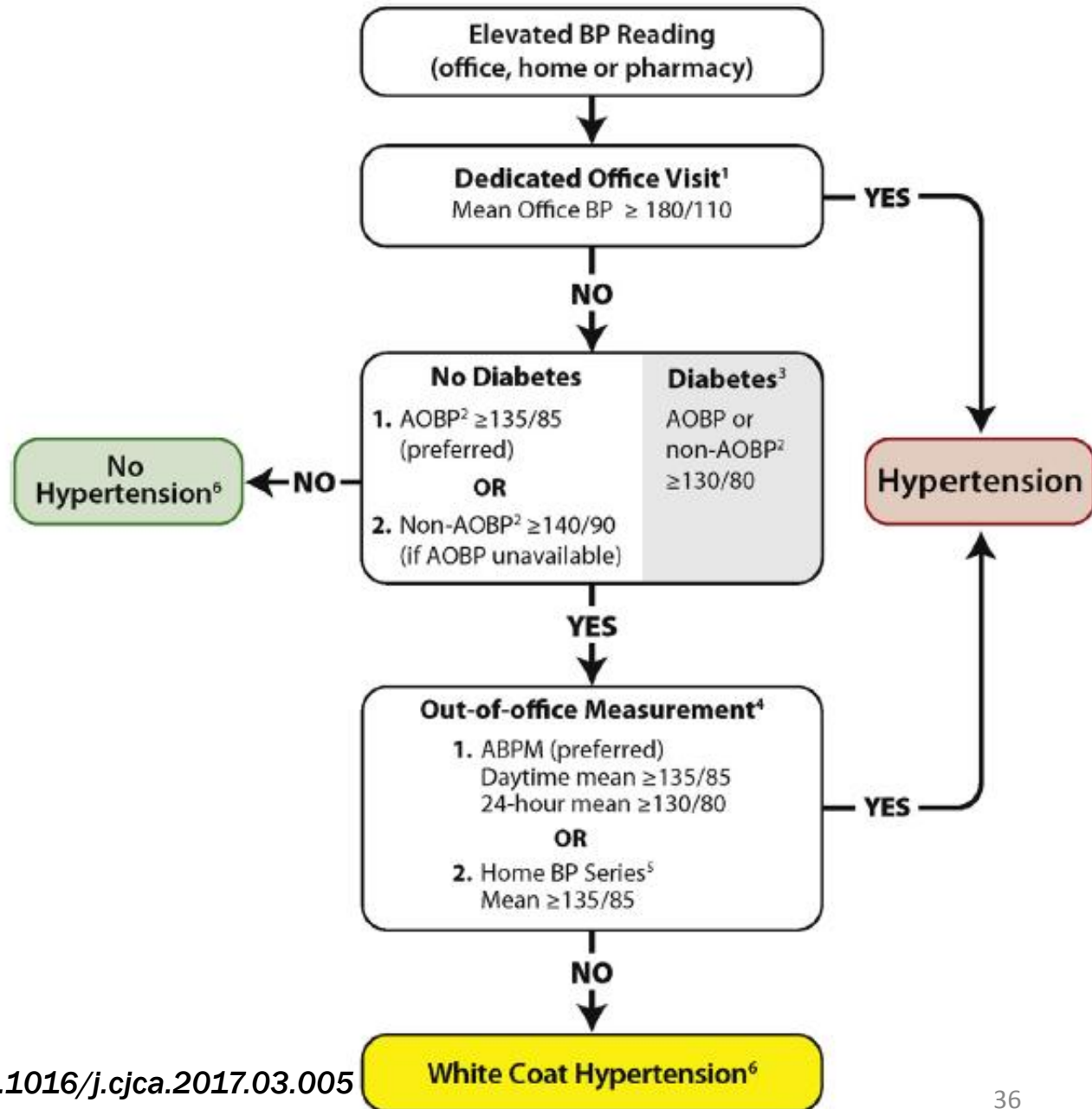


Figure 4. Wang et al.

# Canadian Guidelines 2016: Diagnostic process



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Chern-En Chiang,<sup>1</sup> Tzung-Dau Wang,<sup>2</sup> Tsung-Hsien Lin,<sup>3</sup> Hung-I Yeh,<sup>4</sup> Ping-Yen Liu,<sup>5</sup> Hao-Min Cheng,<sup>6</sup> Ting-Hsing Chao,<sup>7</sup> Chen-Huan Chen,<sup>8</sup> Kou-Gi Shyu,<sup>9</sup> Kwo-Chang Ueng,<sup>10</sup> Chung-Yin Chen,<sup>11</sup> Pao-Hsien Chu,<sup>12</sup> Shih-Hsien Sung,<sup>13</sup> Kang-Ling Wang,<sup>14</sup> Yi-Heng Li,<sup>7</sup> Kuo-Yang Wang,<sup>15</sup> Fu-Tien Chiang,<sup>16</sup> Wen-Ter Lai,<sup>3,17</sup> Jyh-Hong Chen,<sup>18</sup> Wen-Jone Chen,<sup>2,19</sup> San-Jou Yeh,<sup>20</sup> Ming-Fong Chen,<sup>21</sup> Shing-Jong Lin<sup>22</sup> and Jiunn-Lee Lin<sup>2</sup>

2017 Focused Updates of  
TSOC/THS Hypertension Guideline



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# Automated Office Blood Pressure *AOBP*

- ▶ Reduce White-coat hypertension or white-coat effect

Four essential elements (*EMAU*)

- ▶ E: Electronic and automated device
- ▶ M: Multiple readings (1min, intervals)
- ▶ A: Averaged mean
- ▶ U: Unattended and undisturbed spaces

# Unattended automatic office BP

- BPs in SPRINT were measured with patients seated in a quiet room without talking and taken as an average of 3 measurements with an automated device (Omron Healthcare, Lake Forest, IL) that was preset to wait 5 minutes before measurements.

Trial	Device	Status of Observation	References
ACCORD	Model 907, Omron Healthcare, Lake Forest, IL	Attended	The ACCORD Study Group <sup>2</sup>
SPS3	Colin BP-8800C, Press Mate, Meena Medical Inc, Bedford, TX	Attended	The SPS3 Study Group <sup>3</sup>
SPRINT	Model 907, Omron Healthcare, Lake Forest, IL	Unattended	The SPRINT Research Group <sup>7</sup>
HOT	Visomat OZ, D2 International, Hestia Pharma GmbH, Germany	Attended	Hansson et al <sup>9</sup>
TROPHY	HEM-705CP, Omron Healthcare, Lake Forest, IL	Attended	Julius et al <sup>19</sup>
ONTARGET	HEM-757, Omron Corporation, Tokyo, Japan	Attended	Verdecchia et al <sup>20</sup>
TRANSCEND	HEM-757, Omron Corporation, Tokyo, Japan	Attended	Verdecchia et al <sup>20</sup>

## 2017 Focused Update of TSOE/THS HTN Guideline

**A two-pathway approach:** Office BP or uAOBP

		Traditional Target	COR/LOE	New Target	COR/LOE
Primary Prevention		<140/90	I/B	<140/90	I/B
Secondary prevention	DM	<130/80	I/B	<130/80	I/B
	CHD	<130/80	I/B	<120/NA <sup>AOBP</sup>	I/B
	Stroke	<140/90	I/A	<140/90	I/A
	CKD	<140/90	I/A	<120/NA <sup>AOBP</sup>	I/B
	CKD + Proteinuria	<130/80	IIb/C		
<b>Elderly (≥75 y/o)</b>		<b>&lt;140/90</b>	<b>I/B</b>	<120/NA <sup>AOBP</sup>	I/B
P't with Anti-thrombotic for Stroke prevention		<130/80	I/B	<130/80	I/B

\* NA, not available



# Outline



- Summary of 2015 Hypertension Treatment Guideline
  - Diagnosis algorithm
  - Life style modification
  - Treatment algorithm
  - Adjustment algorithm
- 2017 updates of TSOC/TSH Hypertension Guideline
  - Unattended automatic office BP monitoring
  - Changes of treatment target and supporting evidence
- 2017 ACC/AHA Hypertension Guideline
- Consensus document of ComeAsia discussion group



# **Evidence Supporting the Guideline Amendment**



# General Population 2015

## Recommendation



- For patients <80 years of age and without diabetes, CHD, and proteinuric CKD, BP targets are <140/90 mmHg. (COR IIa, LOE B)
- For patients with an age 80 years, irrespectively of other clinical conditions, BP targets are <150/90 mmHg. (COR IIa, LOE B)

## The Trial:

International, multi-centre, randomised double-blind placebo controlled

### Inclusion Criteria:

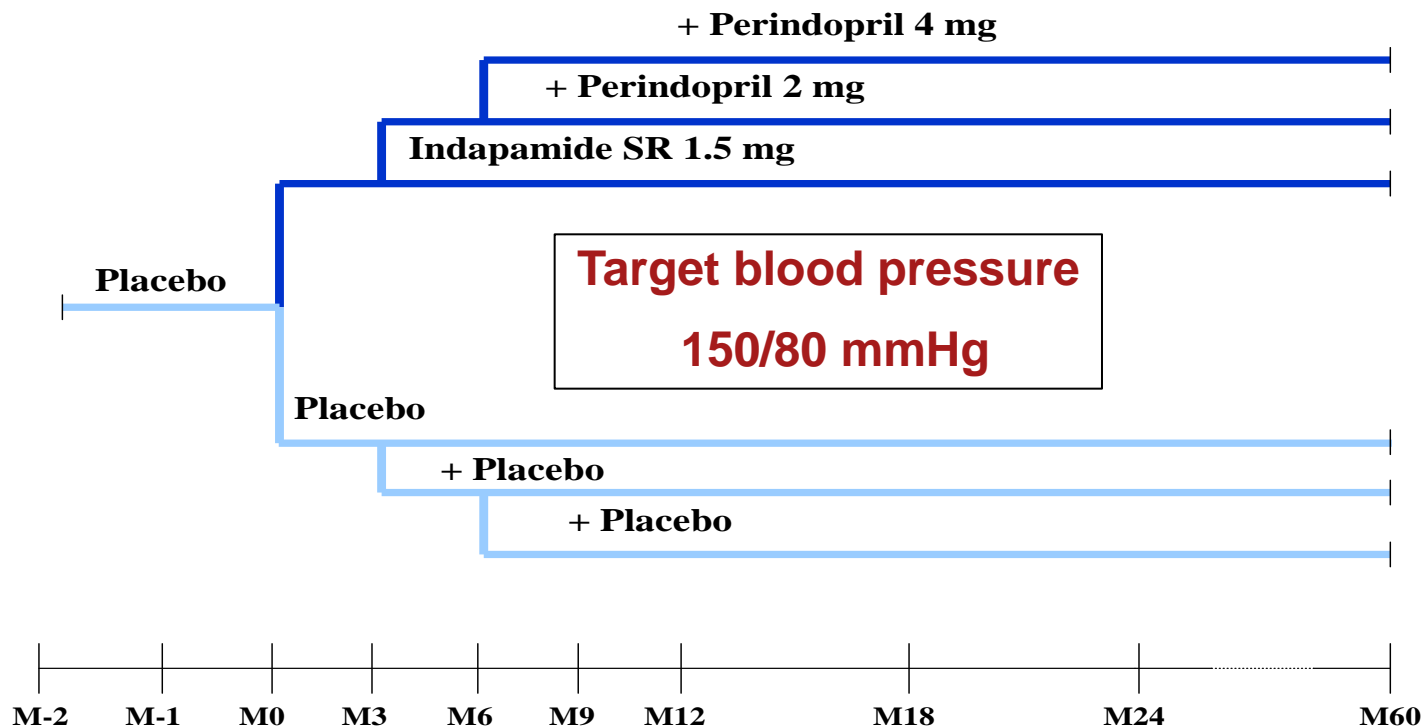
Aged 80 or more,  
Systolic BP; 160 -199mmHg  
+ diastolic BP; <110 mmHg,  
Informed consent

### Exclusion Criteria:

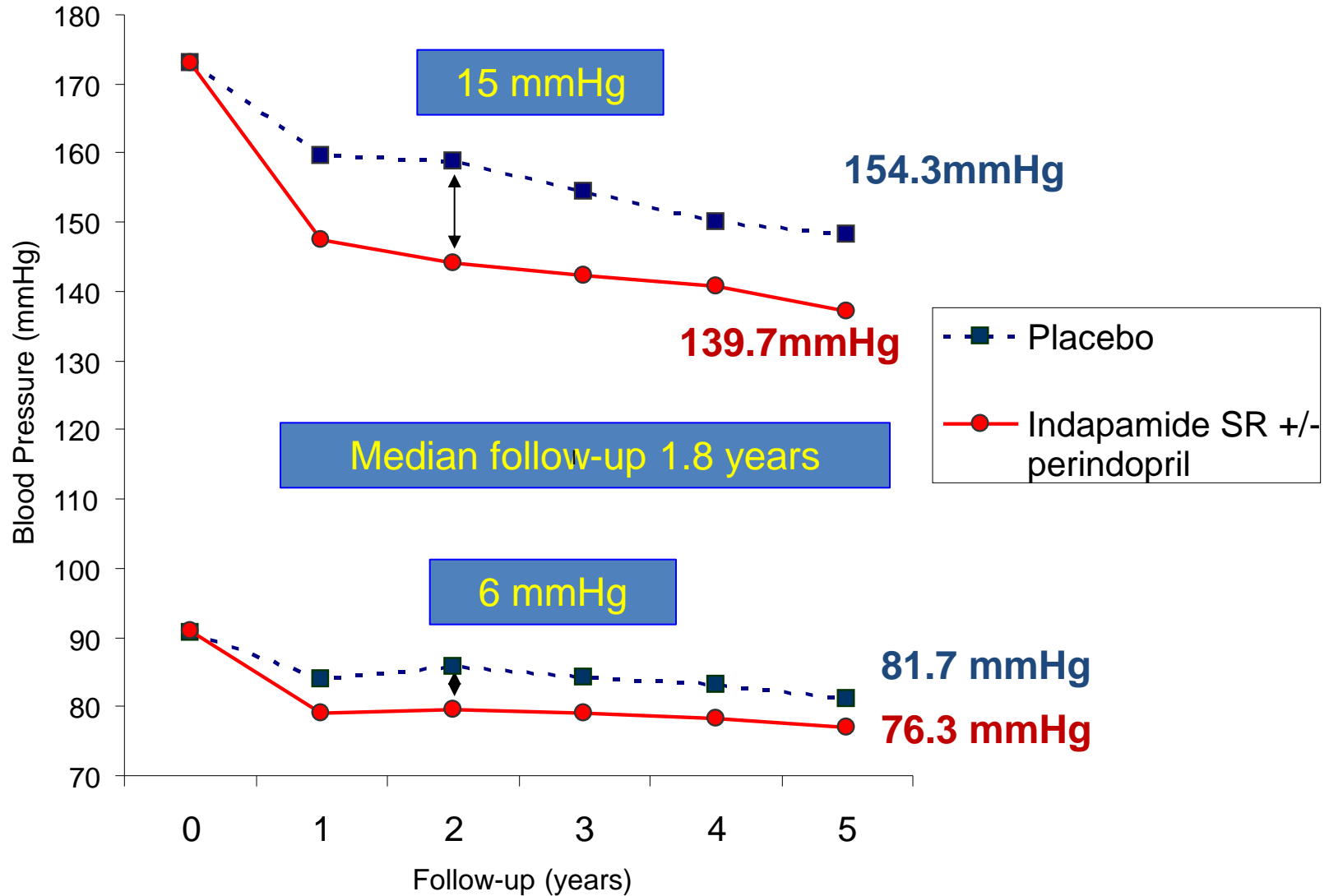
Standing SBP < 140mmHg  
Stroke in last 6 months  
Dementia  
Need daily nursing care

### Primary Endpoint:

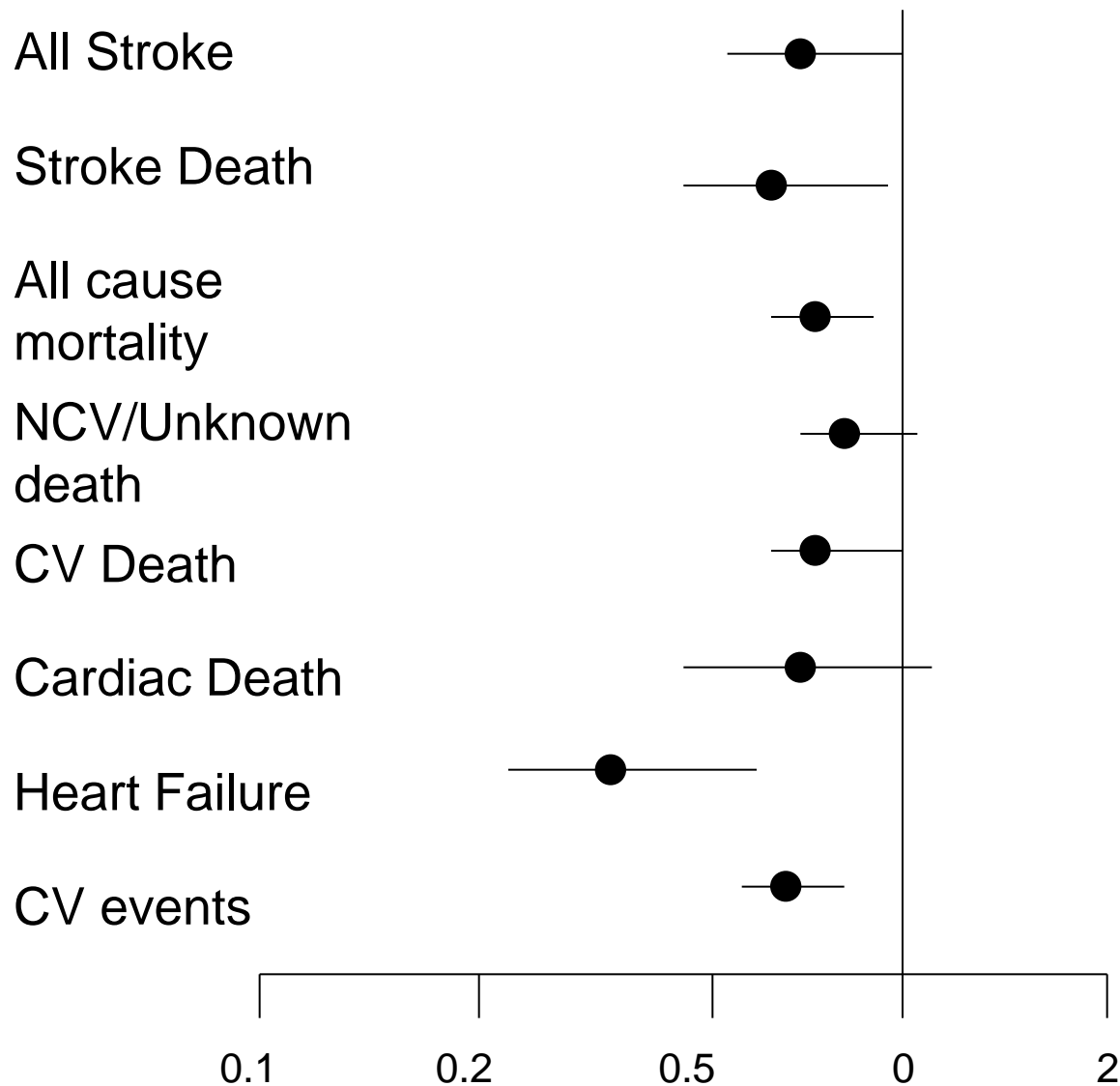
All strokes (fatal and non-fatal)



# Blood pressure separation



# ITT – Summary



HR	95% CI
0.70	(0.49, 1.01)
0.61	(0.38, 0.99)
0.79	(0.65, 0.95)
0.81	(0.62, 1.06)
0.77	(0.60, 1.01)
0.71	(0.42, 1.19)
0.36	(0.22, 0.58)
0.66	(0.53, 0.82)

# SPRINT-Senior(>75y/o)

Table 3. Incidence of Cardiovascular, Renal, and Mortality Outcomes by Treatment Group

	Intensive Treatment		Standard Treatment		HR (95% CI) <sup>b</sup>	P Value
	No. With Outcome Events (n = 1317) <sup>a</sup>	% (95% CI) With Outcome Events/y	No. With Outcome Events (n = 1319) <sup>a</sup>	% (95% CI) With Outcome Events/y		
All participants						
Cardiovascular disease primary outcome				3.85 (3.28-4.53)	0.66 (0.51-0.85)	.001
Myocardial infarction (MI)	37	0.92 (0.67-1.27)	53	1.34 (1.02-1.75)	0.69 (0.45-1.05)	.09
ACS not resulting in MI <sup>d</sup>	17	0.42 (0.26-0.68)	17	0.42 (0.26-0.68)	1.03 (0.52-2.04)	.94
Stroke <sup>d</sup>	25	0.62 (0.42-0.91)	33	0.83 (0.59-1.16)	0.72 (0.43-1.21)	.22
Heart failure <sup>d</sup>	35	0.86 (0.62-1.20)	55	1.39 (1.06-1.81)	0.62 (0.40-0.95)	.03
Cardiovascular disease death <sup>d</sup>	18	0.44 (0.28-0.70)	29	0.72 (0.50-1.03)	0.60 (0.33-1.09)	.09
Nonfatal MI	37	0.92 (0.67-1.27)	53	1.34 (1.02-1.75)	0.69 (0.45-1.05)	.09
Nonfatal stroke	25	0.62 (0.42-0.91)	33	0.83 (0.59-1.16)	0.68 (0.40-1.15)	.15
Nonfatal heart failure	35	0.86 (0.62-1.20)	55	1.39 (1.06-1.81)	0.63 (0.40-0.96)	.03
All-cause mortality				3.63 (2.17-3.18)	0.67 (0.49-0.91)	.009
Primary outcome plus all-cause mortality				4.31 (4.63-6.09)	0.68 (0.54-0.84)	<.001
CKD						
Primary CKD outcome <sup>e</sup>					1.68 (0.49-6.59)	.42
Incident albuminuria <sup>f</sup>					0.96 (0.53-1.75)	.90
Non-CKD						
Secondary CKD outcome <sup>g</sup>						
Incident albuminuria <sup>f</sup>						

Primary outcome: HR 0.66

Heart failure: HR 0.62

All-cause mortality: HR 0.67

Not influence renal outcome in CKD

Deteriorated renal function in subjects without CKD

# SPRINT Elderly (>75y/o)

Table 4. Incidence of Cardiovascular and Mortality Outcomes by Frailty Status and Gait Speed

		Intensive Treatment		Standard Treatment		HR (95%CI) <sup>a</sup>	P Value	P Value for Interaction		
		No./Total With Outcome Events	% (95% CI) With Outcome Events/y	No./Total With Outcome Events	% (95% CI) With Outcome Events/y					
<b>Frailty</b>	Primary outcome <sup>c</sup>	Fit	4/159	0.80 (0.30-2.12)	10/190	1.72 (0.93-3.20)	0.47 (0.13-1.39) <sup>d</sup>	.20	.84	
		Less fit	48/711	2.23 (1.68-2.97)	77/745	3.51 (2.81-4.39)	0.63 (0.43-0.91)	.01		
		Frail	50/440	3.90 (2.96-5.15)	61/375	5.80 (4.52-7.46)	0.68 (0.45-1.01)	.06		
	All-cause mortality	Fit	5/159	0.98 (0.41-2.36)	6/190	1.01 (0.45-2.24)	0.95 (0.27-3.15) <sup>d</sup>	.93	.52	
		Less fit	26/711	1.16 (0.79-1.71)	52/745	2.24 (1.71-2.95)	0.48 (0.29-0.78)	.003		
		Frail	40/440	2.95 (2.17-4.03)	49/375	4.28 (3.24-5.67)	0.64 (0.41-1.01)	.05		
	Primary outcome plus all-cause mortality <sup>c</sup>	Fit	8/159	1.59 (0.80-3.19)	13/190	2.24 (1.30-3.86)	0.71 (0.28-1.69) <sup>d</sup>	.45	.88	
		Less fit	65/711	3.01 (2.36-3.84)	108/745	4.90 (4.05-5.91)	0.60 (0.44-0.83)	.002		
		Frail	69/440	5.37 (4.24-6.80)	84/375	7.95 (6.42-9.85)	0.67 (0.48-0.95)	.02		
<b>Gait Speed</b>	≥0.8 m/s	59/880	2.22 (1.72-2.87)	86/893	3.24 (2.63-4.01)	0.67 (0.47-0.94)	.02	.85		
	Primary outcome <sup>c</sup>	Speed <0.8 m/s	34/371	3.15 (2.25-4.41)	54/369	5.22 (4.00-6.81)	0.63 (0.40-0.99)		.05	
		Missing	9/66	4.40 (2.29-8.46)	8/57	5.13 (2.57-10.27)	0.86 (0.33-2.29) <sup>d</sup>		.75	
		Speed ≥0.8 m/s	40/880	1.45 (1.07-1.98)	60/893	2.16 (1.67-2.78)	0.65 (0.43-0.98)		.04	
	All-cause mortality	Speed <0.8 m/s	29/371	2.56 (1.78-3.68)	40/369	3.57 (2.62-4.86)	0.75 (0.44-1.26)		.28	.68
		Missing	4/66	1.85 (0.69-4.93)	7/57	4.19 (2.00-8.80)	0.44 (0.12-1.47) <sup>d</sup>		.20	
		Speed ≥0.8 m/s	82/880	3.08 (2.48-3.83)	119/893	4.48 (3.74-5.36)	0.67 (0.50-0.89)		.006	
	Primary outcome plus all-cause mortality <sup>c</sup>	Speed <0.8 m/s	51/371	4.70 (3.57-6.18)	73/369	7.00 (5.56-8.80)	0.60 (0.45-1.01)		.06	.81
		Missing	11/66	5.37 (2.97-9.70)	13/57	8.30 (4.82-14.30)	0.67 (0.48-0.95)		.02	
Speed ≥0.8 m/s		82/880	3.08 (2.48-3.83)	119/893	4.48 (3.74-5.36)	0.67 (0.50-0.89)	.006			

**HR 0.47-0.71**

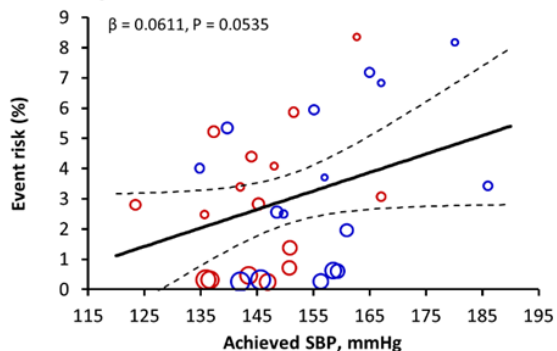
**Frailty**

**Gait Speed**

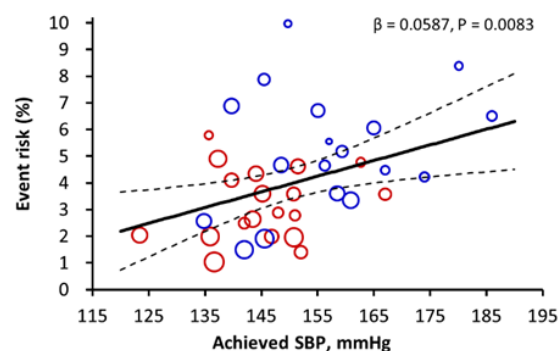
**HR 0.44-0.75**

# Meta-regression analysis

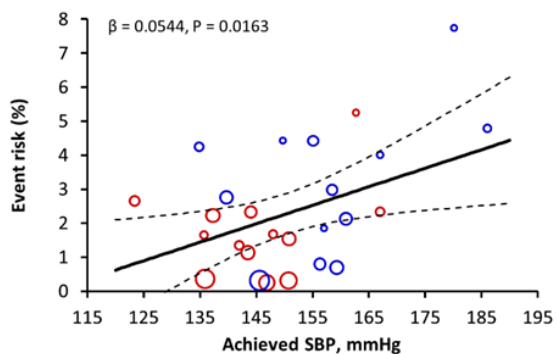
### Coronary heart disease



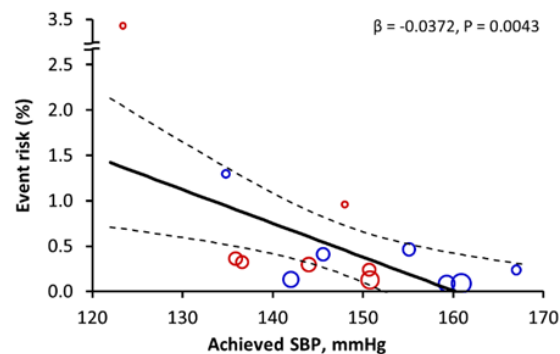
### Stroke



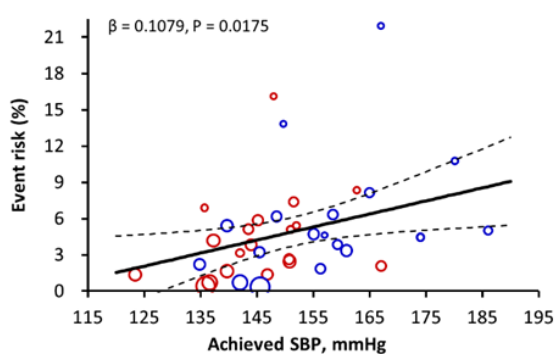
### Heart failure



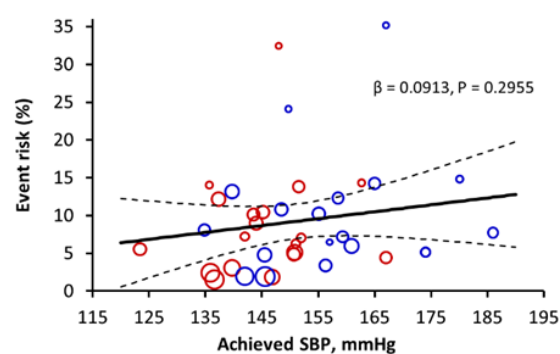
### Renal failure



### Cardiovascular death



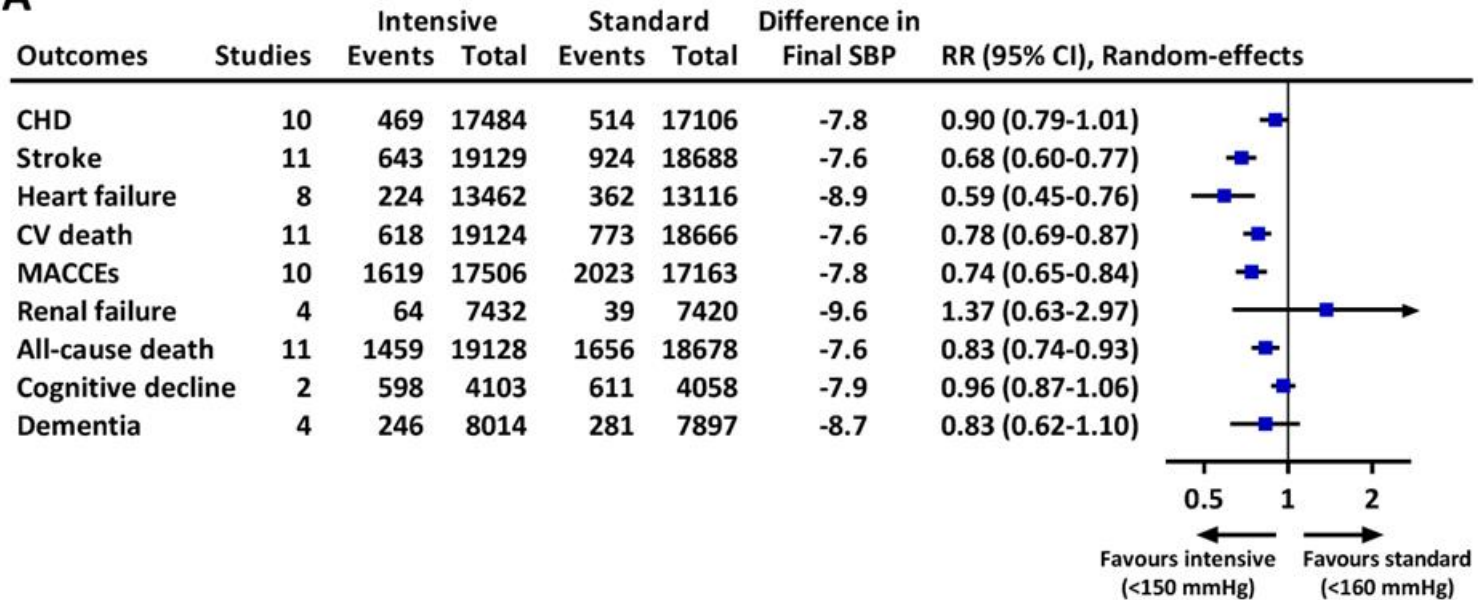
### All-cause death



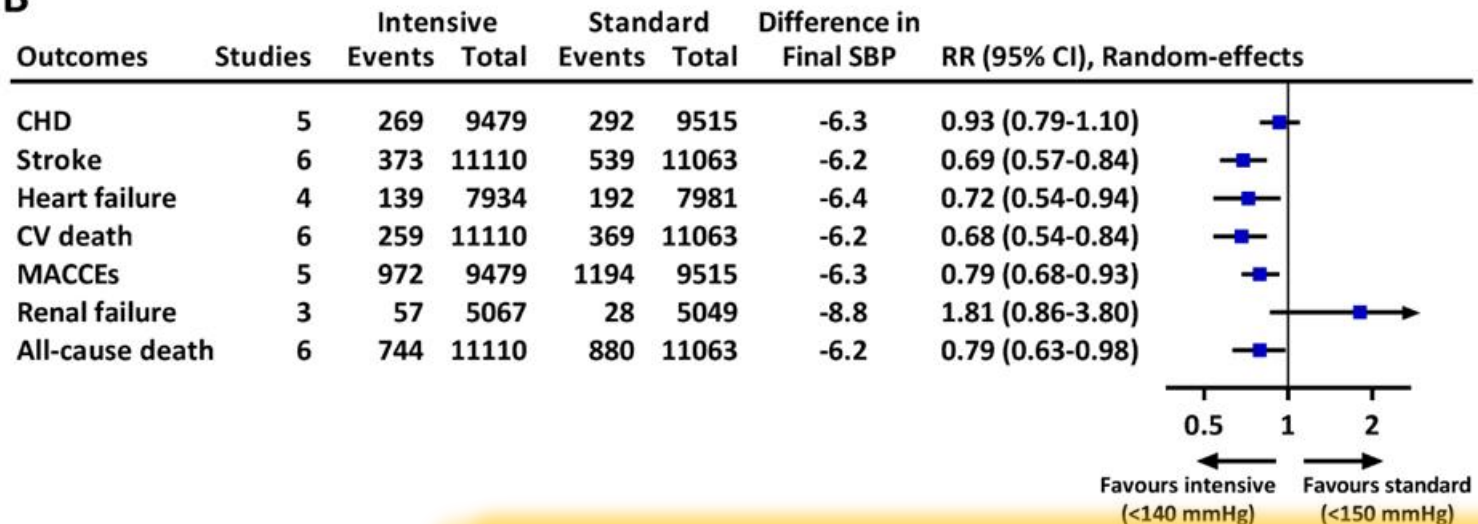


# Effect of blood pressure lowering on outcome incidence

**A**



**B**

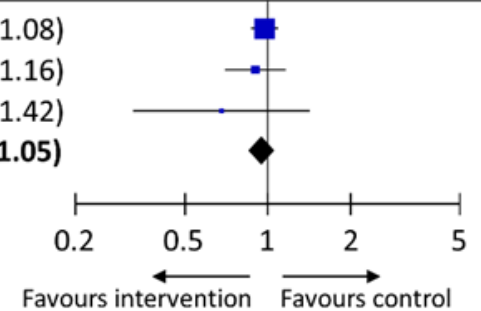


# Effect of antihypertensive treatment on cognitive decline

## A. Cognitive decline

Trials	Intervention		Control		Weight	Risk Ratio (95% CI), M-H, Fixed-effects
	Events	Total	Events	Total		
HYVET-COG, 2008	485	1687	486	1649	77.5%	0.98 (0.88, 1.08)
SCOPE, 2003	113	2416	125	2409	19.7%	0.90 (0.70, 1.16)
SHEP, 2001	12	1368	17	1317	2.7%	0.68 (0.33, 1.42)
<b>Overall</b>	<b>610</b>	<b>5471</b>	<b>628</b>	<b>5375</b>	<b>100.0%</b>	<b>0.95 (0.86, 1.05)</b>

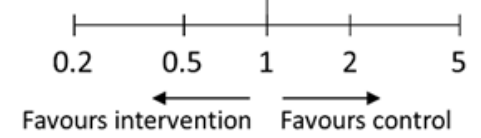
Heterogeneity:  $\text{Chi}^2 = 1.19$ ,  $\text{df} = 2$  ( $P = 0.55$ );  $I^2 = 0\%$   
 Test for overall effect:  $Z = 0.98$  ( $P = 0.33$ )



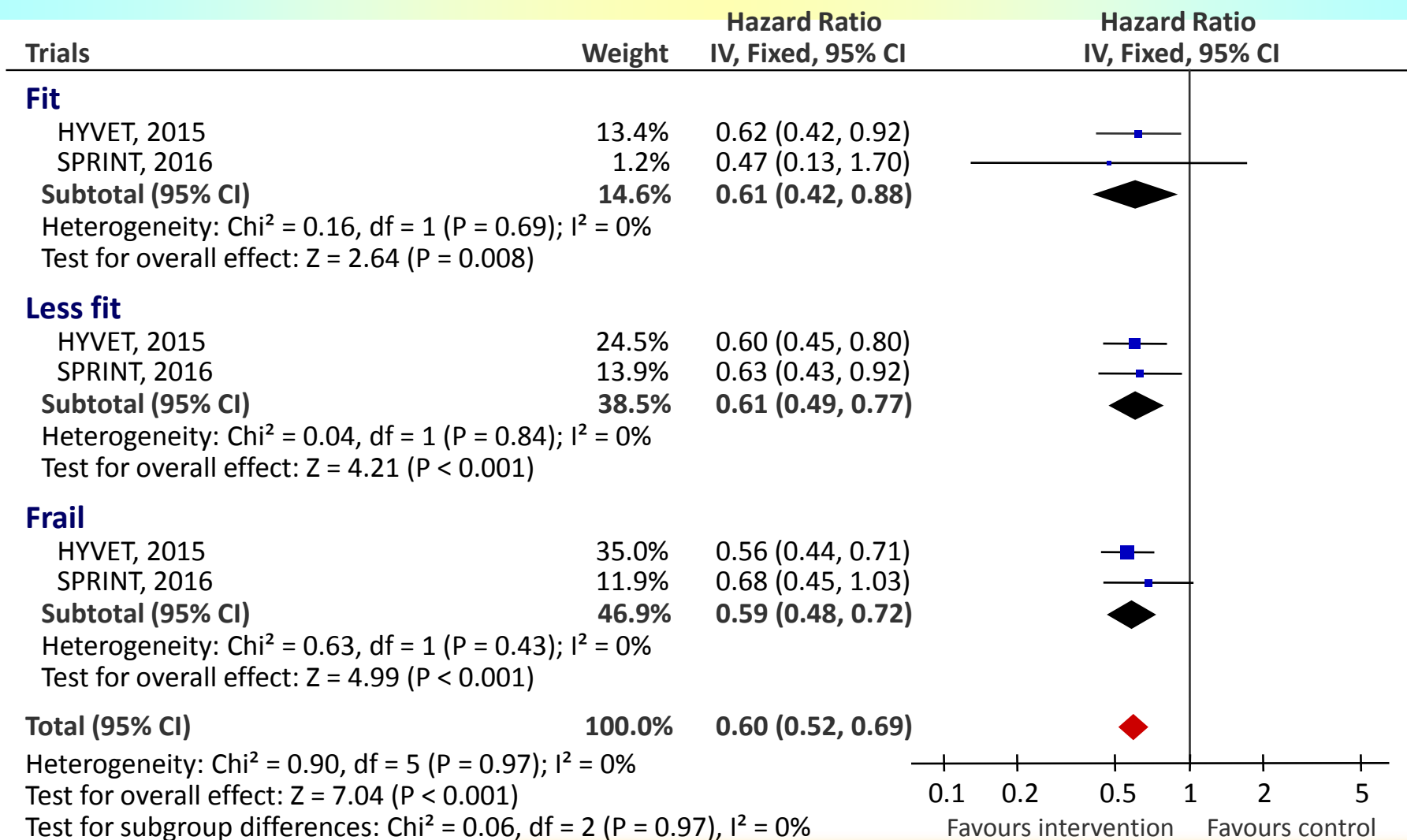
## B. Dementia

Trials	Intervention		Control		Weight	Risk Ratio (95% CI), M-H, Random-effects
	Events	Total	Events	Total		
HYVET-COG, 2008	126	1687	137	1649	34.2%	0.90 (0.71, 1.13)
SCOPE, 2003	62	2477	57	2460	26.1%	1.08 (0.76, 1.54)
SHEP, 1991	37	2365	44	2371	21.8%	0.84 (0.55, 1.30)
Syst-Eur, 2002	21	1485	43	1417	17.9%	0.47 (0.28, 0.78)
<b>Overall</b>	<b>246</b>	<b>8014</b>	<b>281</b>	<b>7897</b>	<b>100.0%</b>	<b>0.83 (0.62, 1.10)</b>

Heterogeneity:  $\text{Tau}^2 = 0.05$ ;  $\text{Chi}^2 = 7.13$ ,  $\text{df} = 3$  ( $P = 0.07$ );  $I^2 = 58\%$   
 Test for overall effect:  $Z = 1.32$  ( $P = 0.19$ )



# Effect of antihypertensive treatment on cardiovascular events, stratified by frailty status



# General Population 2017

## Recommendation

- For patients < 75 years of age and without diabetes CHD, and CKD, BP targets with traditional office BP measurement are < 140/90 mmHg. (COR I, LOE B)
- For elderly patients with an age > 75 years, the AOBP target for SBP is < 120 mmHg. (COR I, LOE B)
- For elderly patients with an age > 75 years, BP targets, using traditional BP measurement, are < 140/90 mmHg. (COR I, LOE B)



# Outline



- Summary of 2015 Hypertension Treatment Guideline
  - Diagnosis algorithm
  - Life style modification
  - Treatment algorithm
  - Adjustment algorithm
- 2017 updates of TSOC/TSH Hypertension Guideline
  - Unattended automatic office BP monitoring
  - Changes of treatment target and supporting evidence
- 2017 ACC/AHA Hypertension Guideline
- Consensus document of ComeAsia discussion group



## Categories of BP in Adults\*



BP Category	SBP		DBP
<b>Normal</b>	<120 mm Hg	and	<80 mm Hg
<b>Elevated</b>	120–129 mm Hg	and	<80 mm Hg
<b>Hypertension</b>			
Stage 1	130–139 mm Hg	or	80–89 mm Hg
Stage 2	≥140 mm Hg	or	≥90 mm Hg

\*Individuals with SBP and DBP in 2 categories should be designated to the higher BP category.

BP indicates blood pressure (based on an average of ≥2 careful readings obtained on ≥2 occasions, as detailed in DBP, diastolic blood pressure; and SBP systolic blood pressure.

## Prevalence of Hypertension Based on 2 SBP/DBP Thresholds\*†

	SBP/DBP $\geq$ 130/80 mm Hg or Self-Reported Antihypertensive Medication†		SBP/DBP $\geq$ 140/90 mm Hg or Self-Reported Antihypertensive Medication‡	
<b>Overall, crude</b>	46%		32%	
	Men (n=4717)	Women (n=4906)	Men (n=4717)	Women (n=4906)
<b>Overall, age-sex adjusted</b>	48%	43%	31%	32%
<b>Age group, y</b>				
<b>20–44</b>	30%	19%	11%	10%
<b>45–54</b>	50%	44%	33%	27%
<b>55–64</b>	70%	63%	53%	52%
<b>65–74</b>	77%	75%	64%	63%
<b>75+</b>	79%	85%	71%	78%
<b>Race-ethnicity §</b>				
<b>Non-Hispanic White</b>	47%	41%	31%	30%
<b>Non-Hispanic Black</b>	59%	56%	42%	46%
<b>Non-Hispanic Asian</b>	45%	36%	29%	27%
<b>Hispanic</b>	44%	42%	27%	32%

The prevalence estimates have been rounded to the nearest full percentage.

\*130/80 and 140/90 mm Hg in 9623 participants ( $\geq$ 20 years of age) in NHANES 2011–2014.

†BP cutpoints for definition of hypertension in the present guideline.

‡BP cutpoints for definition of hypertension in JNC 7.

§ Adjusted to the 2010 age-sex distribution of the U.S. adult population.

BP indicates blood pressure; DBP, diastolic blood pressure; NHANES, National Health and Nutrition Examination Survey; and SBP, systolic blood pressure.



## Corresponding Values of SBP/DBP for Clinic, HBPM, Daytime ABPM, Nighttime ABPM, and 24-Hour ABPM Measurements |



Clinic	HBPM	Daytime ABPM	Nighttime ABPM	24-Hour ABPM
120/80	120/80	120/80	100/65	115/75
130/80	130/80	130/80	110/65	125/75
140/90	135/85	135/85	120/70	130/80
160/100	145/90	145/90	140/85	145/90

ABPM indicates ambulatory blood pressure monitoring; BP, blood pressure; DBP diastolic blood pressure; HBPM, home blood pressure monitoring; and SBP, systolic blood pressure.





## Best Proven Nonpharmacological Interventions for Prevention and Treatment of Hypertension\*



	Nonpharmacological Intervention	Dose	Approximate Impact on SBP	
			Hypertension	Normotension
Weight loss	Weight/body fat	Best goal is ideal body weight, but aim for at least a 1-kg reduction in body weight for most adults who are overweight. Expect about 1 mm Hg for every 1-kg reduction in body weight.	-5 mm Hg	-2/3 mm Hg
Healthy diet	DASH dietary pattern	Consume a diet rich in fruits, vegetables, whole grains, and low-fat dairy products, with reduced content of saturated and total fat.	-11 mm Hg	-3 mm Hg
Reduced intake of dietary sodium	Dietary sodium	Optimal goal is <1500 mg/d, but aim for at least a 1000-mg/d reduction in most adults.	-5/6 mm Hg	-2/3 mm Hg
Enhanced intake of dietary potassium	Dietary potassium	Aim for 3500–5000 mg/d, preferably by consumption of a diet rich in potassium.	-4/5 mm Hg	-2 mm Hg

\*Type, dose, and expected impact on BP in adults with a normal BP and with hypertension. DASH indicates Dietary Approaches to Stop Hypertension; and SBP, systolic blood pressure. Resources: Your Guide to Lowering Your Blood Pressure With DASH—How Do I Make the DASH? Available at: <https://www.nhlbi.nih.gov/health/resources/heart/hbp-dash-how-to>. Top 10 Dash Diet Tips. Available at: [http://dashdiet.org/dash\\_diet\\_tips.asp](http://dashdiet.org/dash_diet_tips.asp)



## Best Proven Nonpharmacological Interventions for Prevention and Treatment of Hypertension\* (cont.)



	Nonpharmacological Intervention	Dose	Approximate Impact on SBP	
			Hypertension	Normotension
Physical activity	Aerobic	<ul style="list-style-type: none"> <li>● 90–150 min/wk</li> <li>● 65%–75% heart rate reserve</li> </ul>	-5/8 mm Hg	-2/4 mm Hg
	Dynamic resistance	<ul style="list-style-type: none"> <li>● 90–150 min/wk</li> <li>● 50%–80% 1 rep maximum</li> <li>● 6 exercises, 3 sets/exercise, 10 repetitions/set</li> </ul>	-4 mm Hg	-2 mm Hg
	Isometric resistance	<ul style="list-style-type: none"> <li>● 4 × 2 min (hand grip), 1 min rest between exercises, 30%–40% maximum voluntary contraction, 3 sessions/wk</li> <li>● 8–10 wk</li> </ul>	-5 mm Hg	-4 mm Hg
Moderation in alcohol intake	Alcohol consumption	In individuals who drink alcohol, reduce alcohol <sup>†</sup> to: <ul style="list-style-type: none"> <li>● Men: ≤2 drinks daily</li> <li>● Women: ≤1 drink daily</li> </ul>	-4 mm Hg	-3 mm

\*Type, dose, and expected impact on BP in adults with a normal BP and with hypertension.

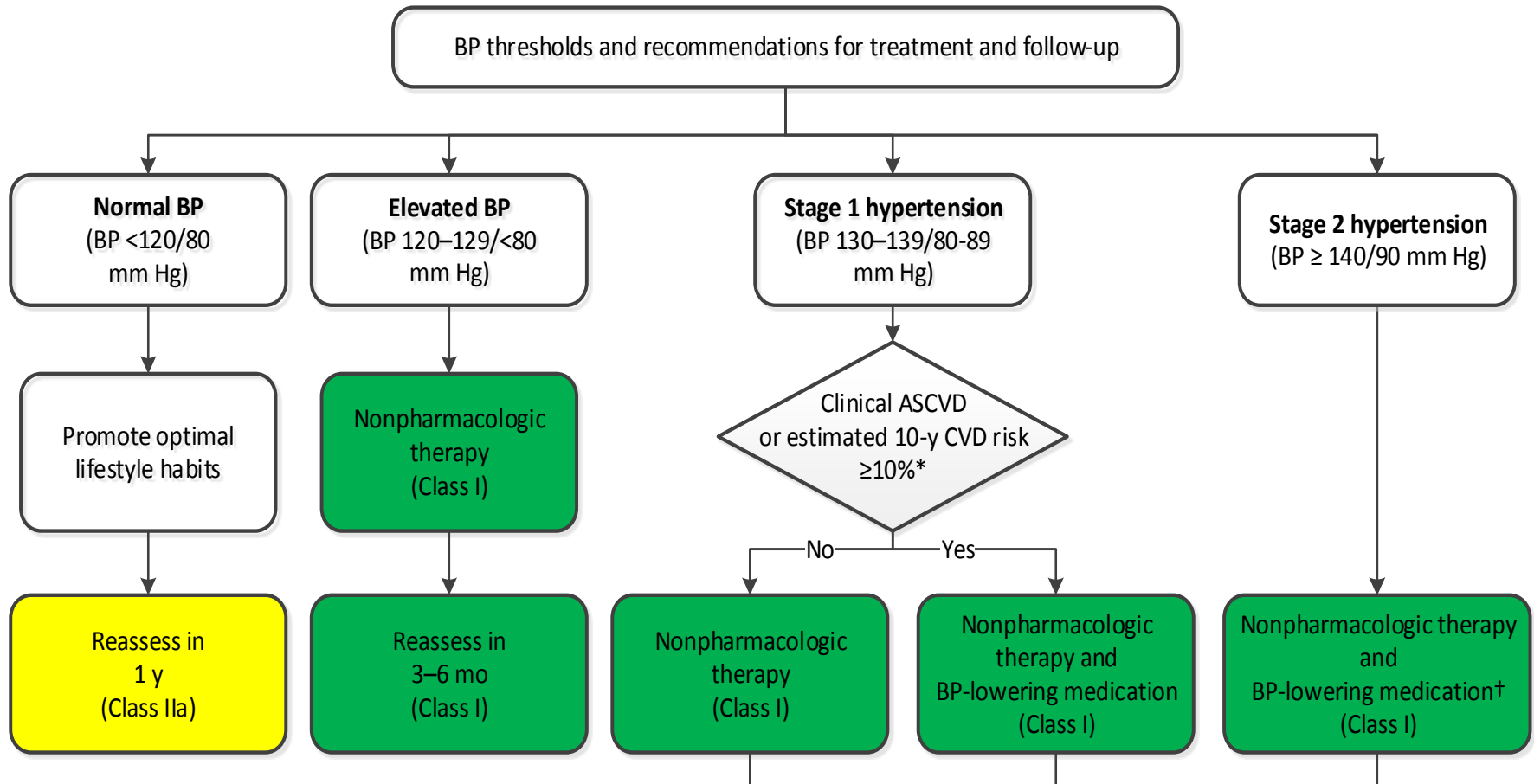
†In the United States, one “standard” drink contains roughly 14 g of pure alcohol, which is typically found in 12 oz of regular beer (usually about 5% alcohol), 5 oz of wine (usually about 12% alcohol), and 1.5 oz of distilled spirits (usually about 40% alcohol).

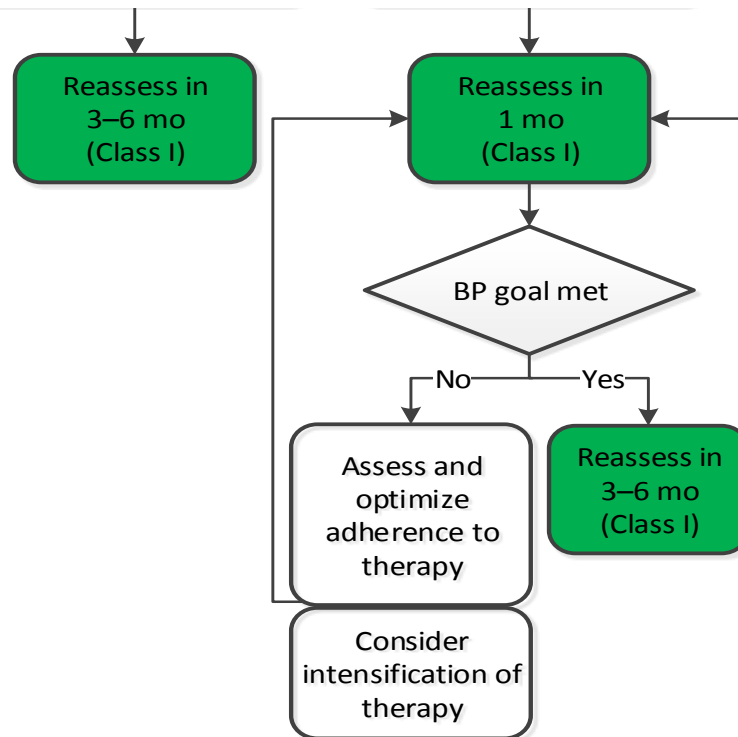


# Blood Pressure (BP) Thresholds and Recommendations for Treatment and Follow-Up (continued on next slide)



BP thresholds and recommendations for treatment and follow-up





Colors correspond to Class of Recommendation in Table 1.

\*Using the ACC/AHA Pooled Cohort Equations. Note that patients with DM or CKD are automatically placed in the high-risk category. For initiation of RAS inhibitor or diuretic therapy, assess blood tests for electrolytes and renal function 2 to 4 weeks after initiating therapy.

†Consider initiation of pharmacological therapy for stage 2 hypertension with 2 antihypertensive agents of different classes. Patients with stage 2 hypertension and BP  $\geq 160/100$  mm Hg should be promptly treated, carefully monitored, and subject to upward medication dose adjustment as necessary to control BP. Reassessment includes BP measurement, detection of orthostatic hypotension in selected patients (e.g., older or with postural symptoms), identification of white coat hypertension or a white coat effect, documentation of adherence, monitoring of the response to therapy, reinforcement of the importance of adherence, reinforcement of the importance of treatment, and assistance with treatment to achieve BP target.



## BP Thresholds for and Goals of Pharmacological Therapy in Patients With Hypertension According to Clinical Conditions



Clinical Condition(s)	BP Threshold, mm Hg	BP Goal, mm Hg
<b>General</b>		
Clinical CVD or 10-year ASCVD risk $\geq 10\%$	$\geq 130/80$	$< 130/80$
No clinical CVD and 10-year ASCVD risk $< 10\%$	$\geq 140/90$	$< 130/80$
Older persons ( $\geq 65$ years of age; noninstitutionalized, ambulatory, community-living adults)	$\geq 130$ (SBP)	$< 130$ (SBP)
<b>Specific comorbidities</b>		
Diabetes mellitus	$\geq 130/80$	$< 130/80$
Chronic kidney disease	$\geq 130/80$	$< 130/80$
Chronic kidney disease after renal transplantation	$\geq 130/80$	$< 130/80$
Heart failure	$\geq 130/80$	$< 130/80$
Stable ischemic heart disease	$\geq 130/80$	$< 130/80$
Secondary stroke prevention	$\geq 140/90$	$< 130/80$
Secondary stroke prevention (lacunar)	$\geq 130/80$	$< 130/80$
Peripheral arterial disease	$\geq 130/80$	$< 130/80$

ASCVD indicates atherosclerotic cardiovascular disease; BP, blood pressure; CVD, cardiovascular disease; and SBP, systolic blood pressure.



# Secondary Stroke Prevention



COR	LOE	Recommendations for Treatment of Hypertension for Secondary Stroke Prevention
I	A	Adults with previously treated hypertension who experience a stroke or transient ischemic attack (TIA) should be restarted on antihypertensive treatment after the first few days of the index event to reduce the risk of recurrent stroke and other vascular events.
I	A	For adults who experience a stroke or TIA, treatment with a <b>thiazide diuretic, ACE inhibitor, or ARB, or combination</b> treatment consisting of a thiazide diuretic plus ACE inhibitor, is useful.*
I	B-R	Adults not previously treated for hypertension who experience a stroke or TIA and have an established BP of 140/90 mm Hg or higher should be prescribed antihypertensive treatment a few days after the index event to reduce the risk of recurrent stroke and other vascular events.

\*Wang WT, You LK, Chiang CE, Sung SH, Chuang SY, Cheng HM and Chen CH. Comparative Effectiveness of Blood Pressure-lowering Drugs in Patients who have Already Suffered From Stroke: Traditional and Bayesian Network Meta-analysis of Randomized Trials. *Medicine (Baltimore)*. 2016;95:e3302.



# Outline



- Summary of 2015 Hypertension Treatment Guideline
  - Diagnosis algorithm
  - Life style modification
  - Treatment algorithm
  - Adjustment algorithm
- 2017 updates of TSOC/TSH Hypertension Guideline
  - Unattended automatic office BP monitoring
  - Changes of treatment target and supporting evidence
- 2017 ACC/AHA Hypertension Guideline
- Consensus document of ComeAsia discussion group



Morning Hypertension Discussion Group

# Characteristics On the Management of Hypertension in Asia



## Brief Review

### Consensus Document on Improving Hypertension Management in Asian Patients, Taking Into Account Asian Characteristics

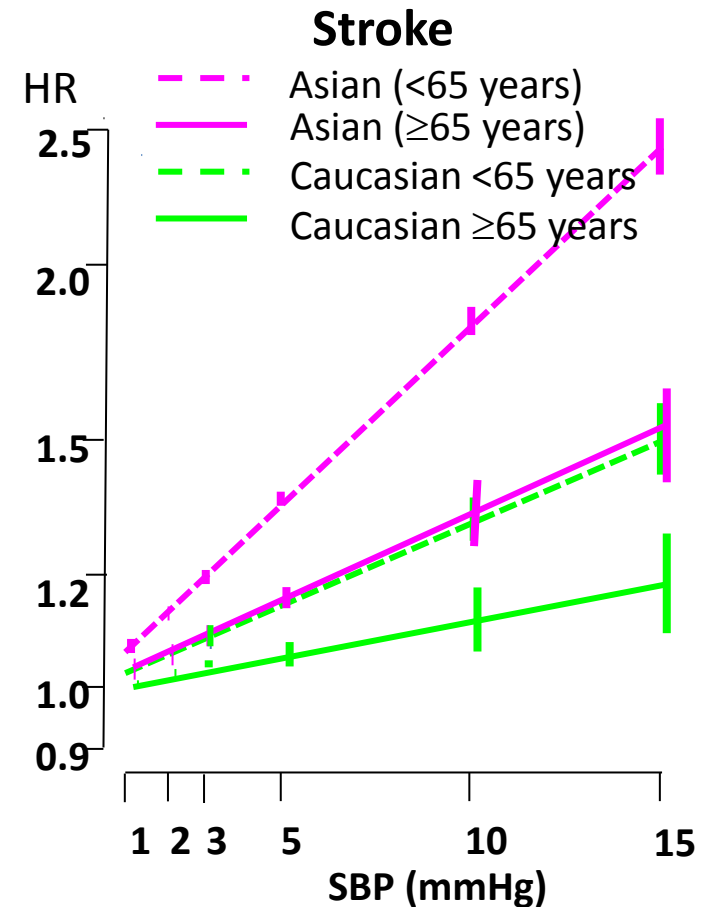
Kazuomi Kario, Chen-Huan Chen, Sungha Park, Chang-Gyu Park, Satoshi Hoshide,  
Hao-Min Cheng, Qi-Fang Huang, Ji-Guang Wang

Kario K, Chen CH, Park S, et al. **Consensus Document on Improving Hypertension Management in Asian Patients, Taking Into Account Asian Characteristics.** *Hypertension*. 2018;71(3):375-382.



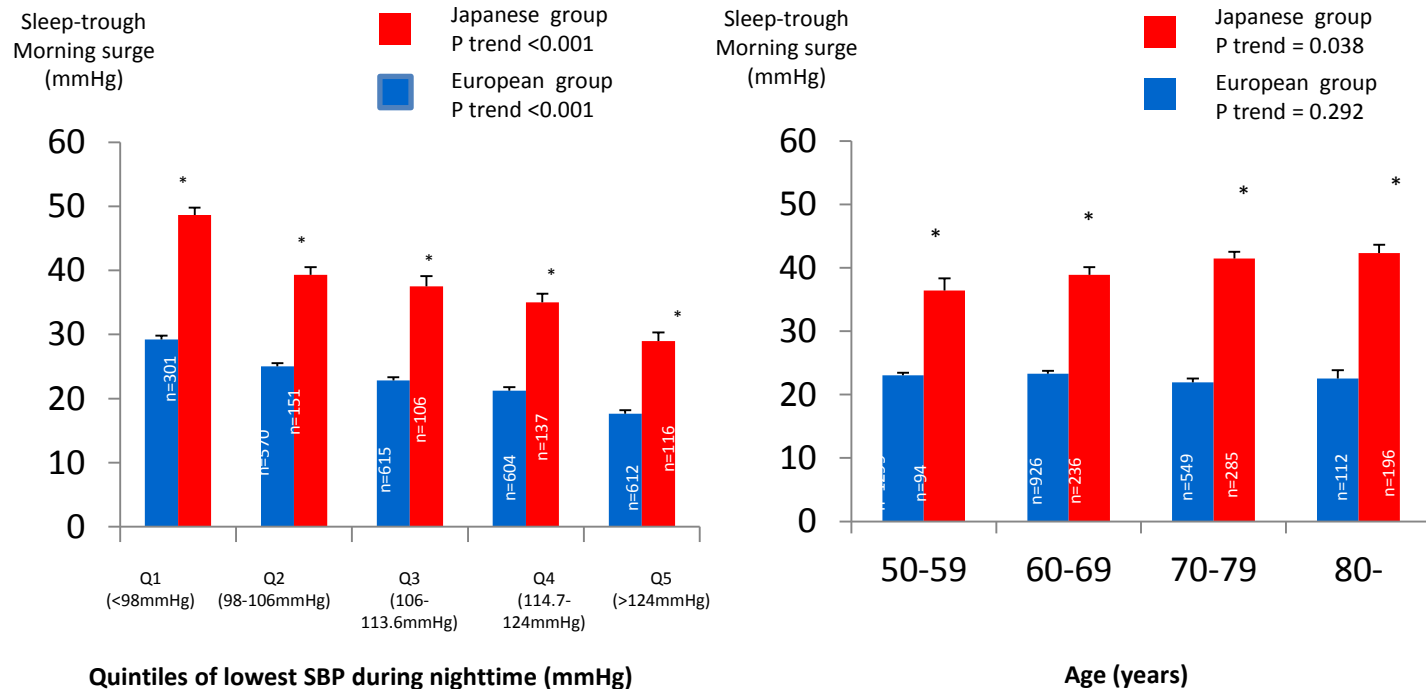
# Blood pressure control throughout 24-hour is important in Asian population.

- In Asian population, stroke incidence is more common than coronary artery disease.
- The contribution of blood pressure level for stroke incidence in Asian population is stronger than that of Western population.

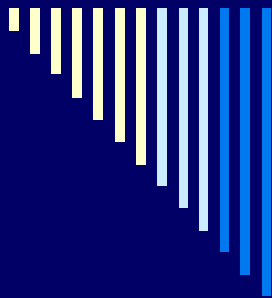


# Asian population may have unique profiles of ABPM compared with Western

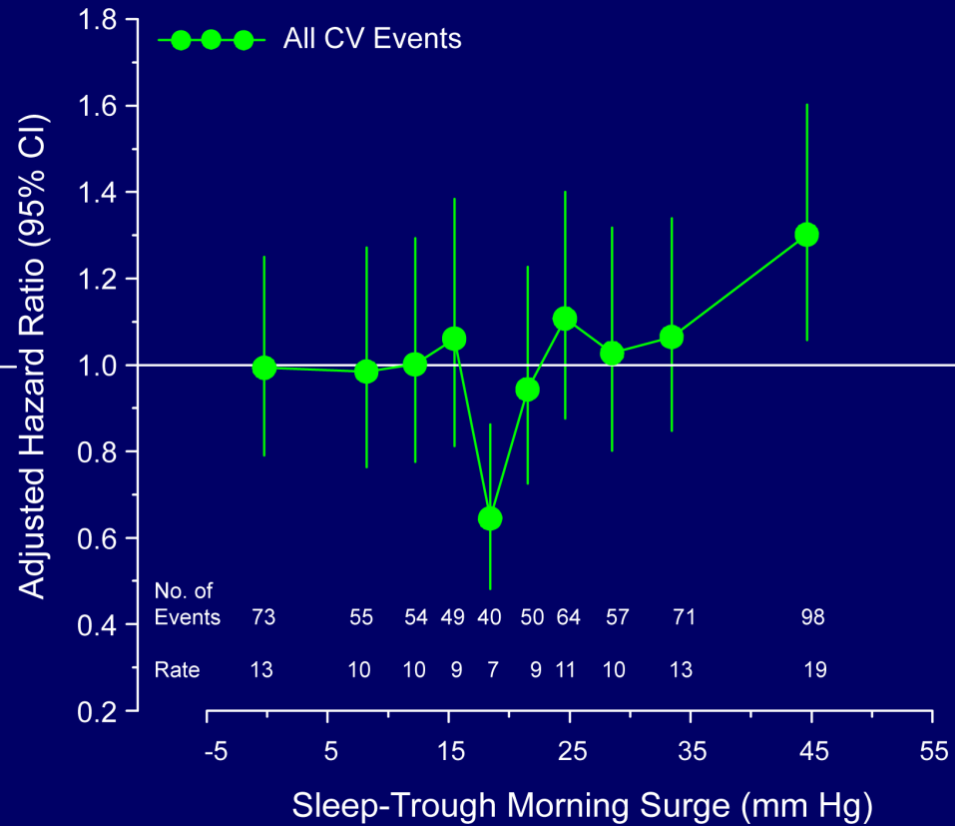
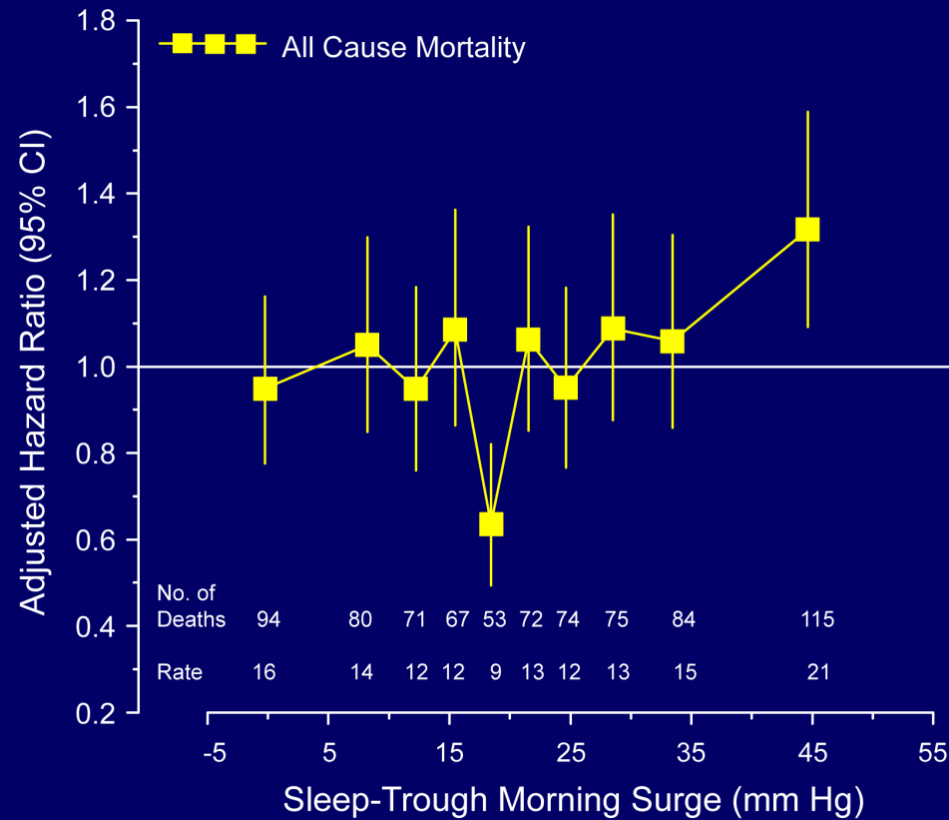
- Morning BP surge in Japanese people was significantly higher than that in Europeans independent of age, 24-hour BP and lowest nocturnal BP.



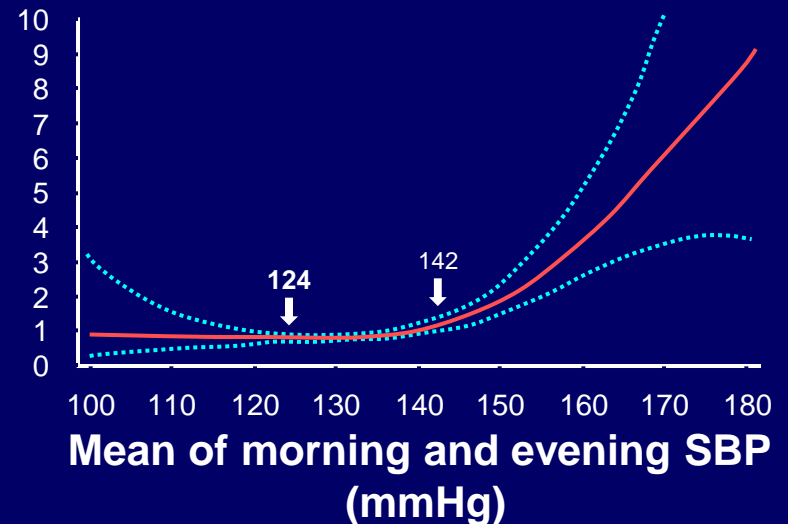
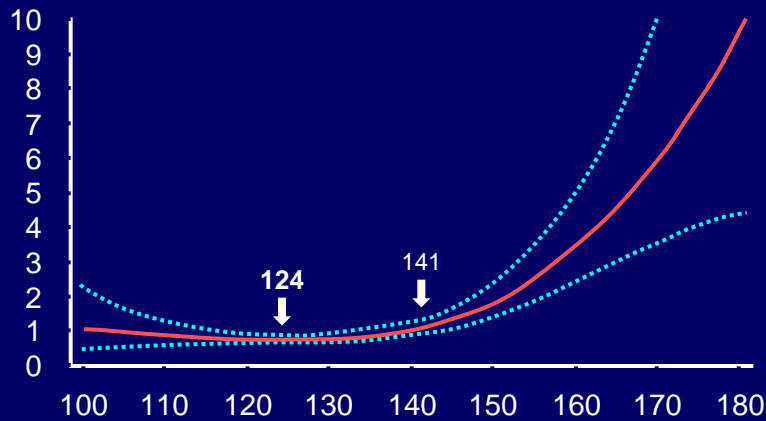
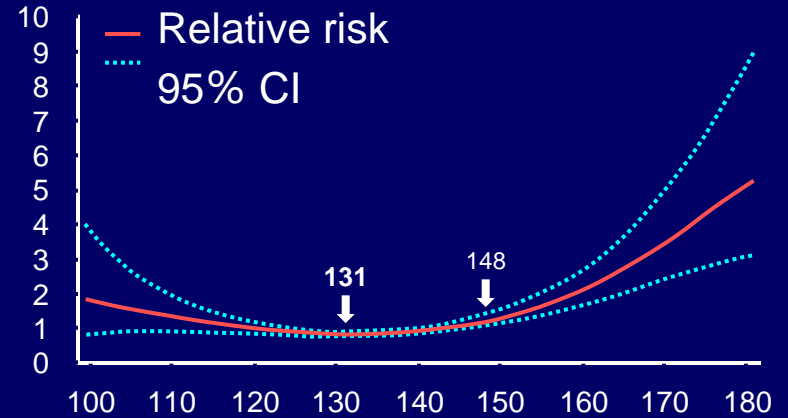
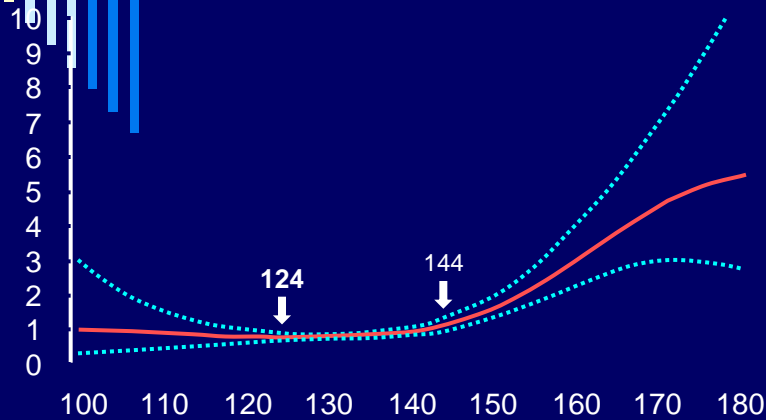
Values are expressed as means  $\pm$  s.e.m. \* -  $p < 0.001$  vs. European group in the same category



# IDACO: Predictive value of morning BP surge



# Morning and evening BP and CV risk



# 1. The prevalence of CKD is higher in hypertensive patients than in general population in Asia.



Prevalence of CKD		
	General adult population	Hypertensive patients
China	10.8%	18.9%
Japan	13%	≈ 20%
Korea	8.2%	19.6%
Taiwan	11.9%	25.9%

Zhang L, et al. Lancet, 2012, 379:815-22

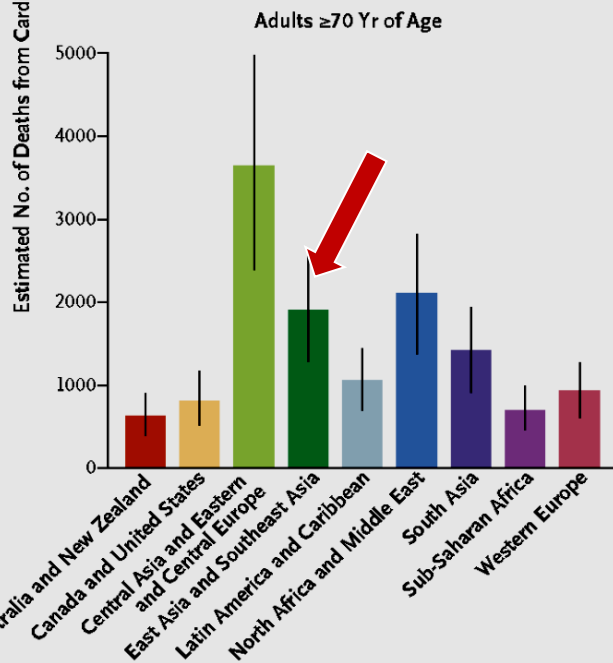
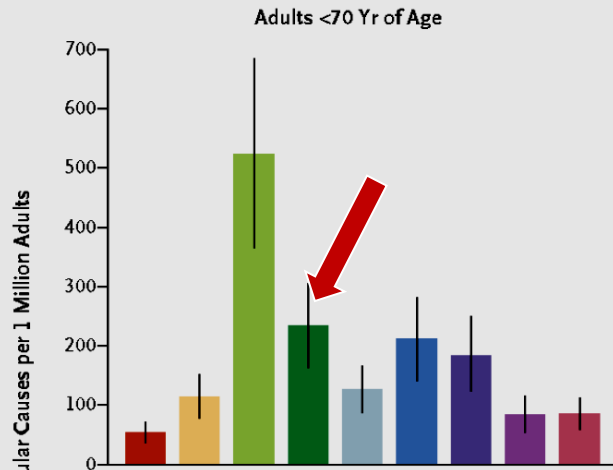
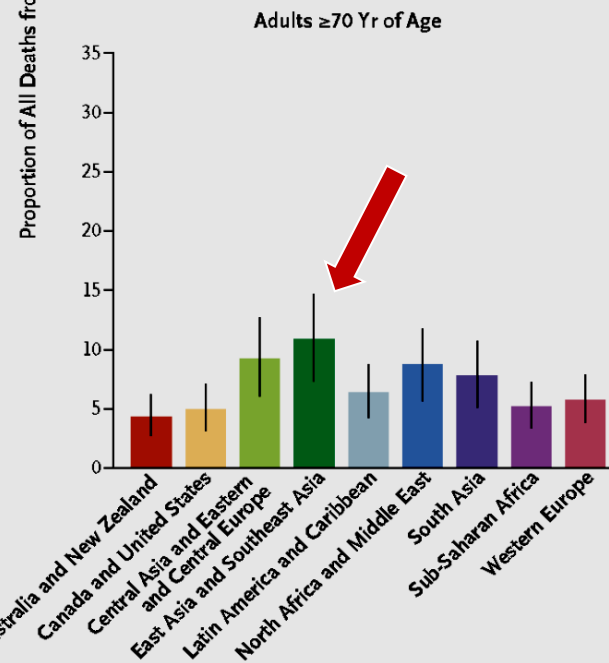
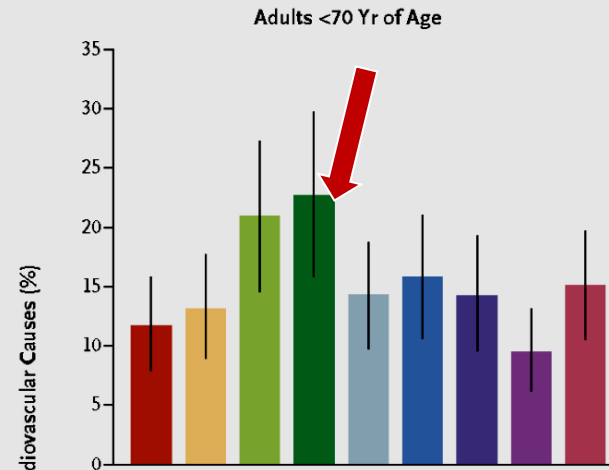
Imai E, et al. Clin Exp Nephrol, 2009, 13:621-30

Park JI, et al. J Korean Med Sci, 2016, 31:915-23

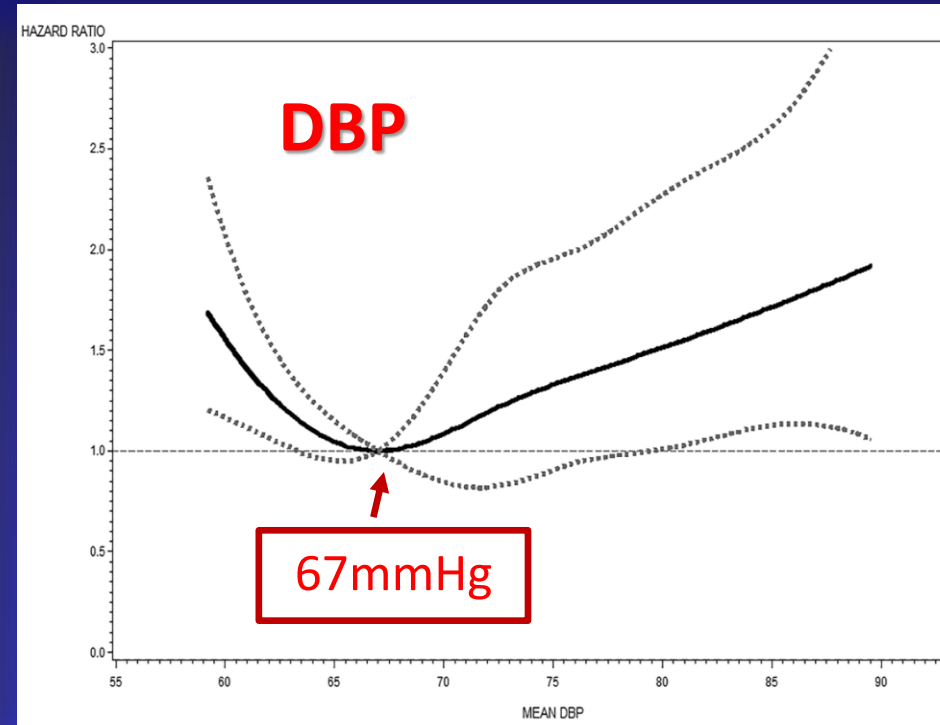
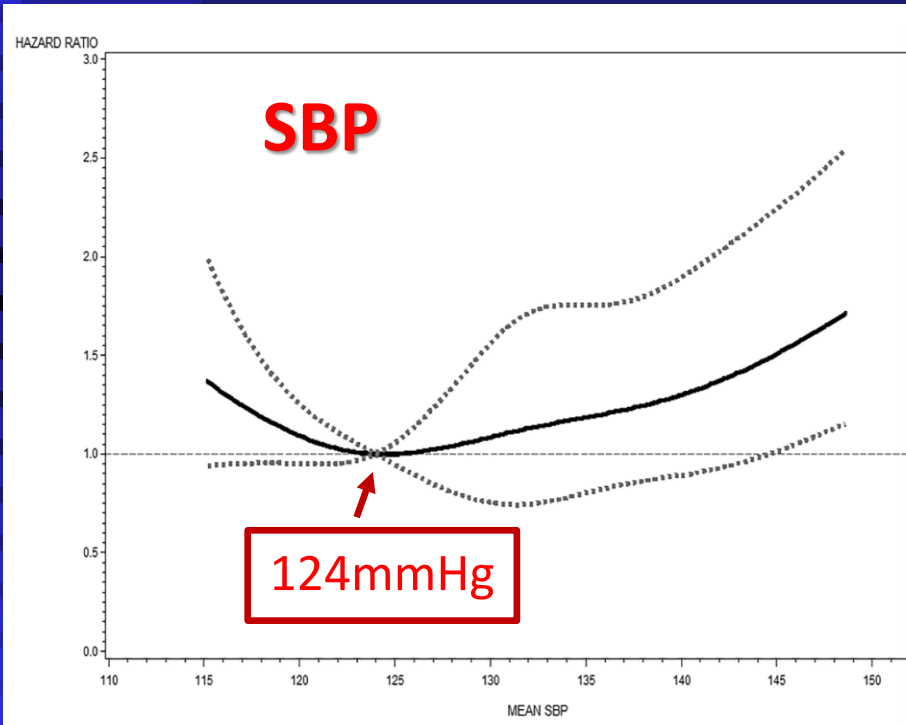
Wen CP, et al. Lancet, 2008, 371: 2173–82

# Top 15 countries for age-, gender adjusted stroke mortality rate

Ranking	Country	Stroke Mortality Rate per 100 000 (as % of Total Mortality Rate)	Ischemic Heart Disease Mortality Rate per 100 000 (as % of Total Mortality Rate)	Total All-Cause Mortality Rate per 100 000	Stroke Mortality in Excess of Ischemic Heart Disease Mortality (as % of Total Mortality)
1	Kiribati	143 (14.0)	13 (1.2)	1027	12.7
2	China	157 (19.9)	63 (8.0)	786	11.9
3	Maldives*	207 (16.2)	66 (5.2)	1278	11.0
4	Saint Kitts and Nevis	218 (23.9)	124 (13.5)	913	10.4
5	Republic of Korea	97 (17.0)	40 (7.1)	569	9.9
6	Mongolia	186 (16.0)	93 (8.0)	1162	8.0
7	Macedonia	164 (19.4)	108 (12.8)	846	6.7
8	Thailand	99 (11.9)	44 (5.3)	832	6.6
9	Haiti	158 (9.8)	58 (3.6)	1611	6.2
10	Portugal	91 (16.9)	61 (11.4)	537	5.5
11	Saint Lucia	80 (12.2)	48 (7.3)	657	4.9
12	Suriname	150 (15.2)	119 (12.1)	990	3.1
13	Japan	42 (11.7)	32 (8.9)	362	2.8
14	Bosnia and Herzegovina	135 (18.2)	114 (15.5)	738	2.7
15	Sao Tome and Principe*	141 (10.1)	107 (7.6)	1394	2.5

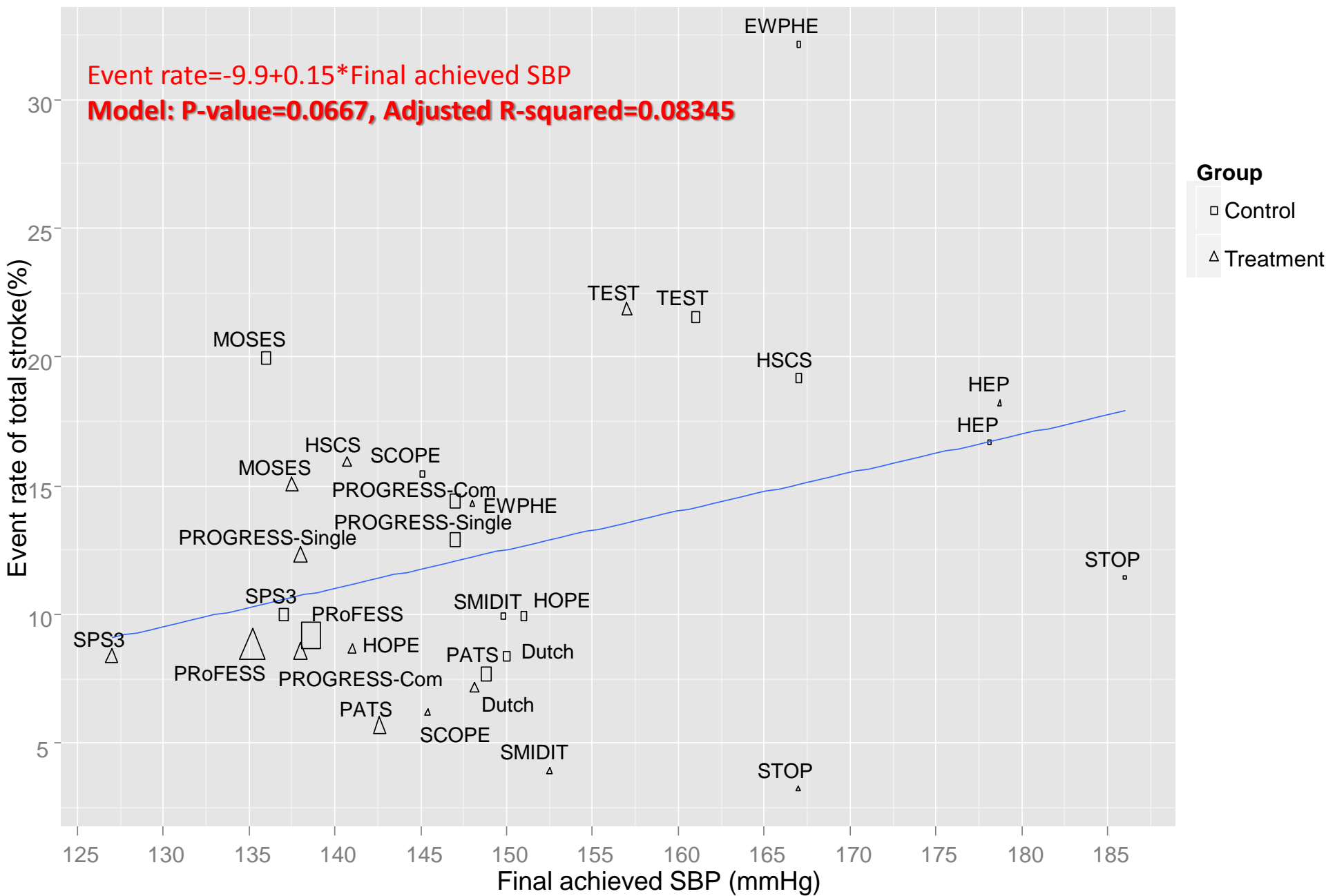
**A****B**

# Achieved BP with the best outcome in SPS3



*Hypertension. 2016;67:63-69.*



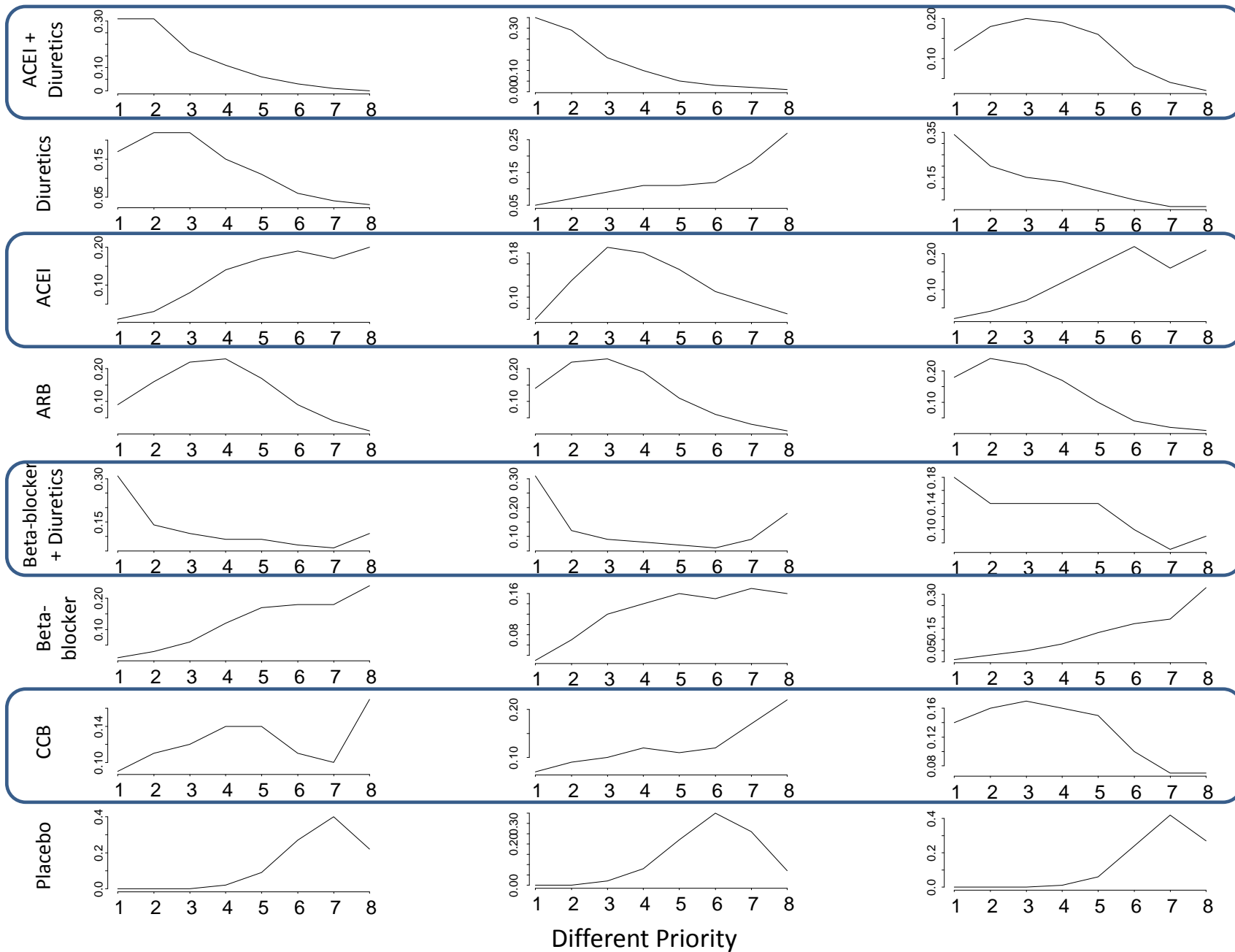


Ranking Probability at different priority

A. Recurrent Stroke

B. CHD

C. MACCE



Different Priority

# Clinical trial in Asia

- ***Blood pressure lowering per se is more important than class of antihypertensive drugs to prevent cardiovascular events from Asian clinical trials.***
- ***Post SPRINT, more strict BP control may be much needed especially in Asian countries.***
- ***Based on the HOMEST study and HOMED BP study, the achieved home BP during antihypertensive treatment is a better predictor than office BP, suggesting that lower home BP the better cardiovascular prognosis until <125 mmHg.***

# Clinical trial in Asia

- ***A long-acting CCB is effective for lowering office, home morning, and 24-hr ambulatory BPs, with reducing exaggerated BP variability.***
- ***ARB is also effective for lowering office and home morning BPs used as both the monotherapy and combination therapy with CCB, and diuretics.***
- ***Even within the same class, CCBs and RAS inhibitors have different effects on lowering 24-hr BP. These differences may be enhanced in the salt-sensitive Asian population with higher salt intake.***
- ***Low dose of diuretics on the top of RAS inhibitors + CCB is effective to reduce BP.***



# Take Home Message

## (2017 TSOC/THS Update Guideline)



- Traditional office BP is a standard method for BP measurement
- AOBP is a good method for office blood pressure, which reduce white-coat effect
- According to SPRINT Trial, the SBP target of CHD/CKD/Elderly is 120mm-Hg(AOBP)
- Based on the present body of evidence, guideline recommendation for elderly hypertensives should be revised
- 2017 ACC/AHA Hypertension guideline suggested a lower BP goal and treatment threshold
- Special considerations should be given for the management of Asian hypertensives

Thanks for Your Attention!  
[hmcheng@vghtpe.gov.tw](mailto:hmcheng@vghtpe.gov.tw)



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