

China hypertension guidelines

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15:00-16:15 18 Oct. 2018, Athens

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- **China hypertension guidelines since 1999**
 - **China nationwide hypertension control initiatives**
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1999	A booklet
2004	Hypertension 2005;134 (Suppl) :2-41
2010	Chin J Cardiol 2011;39(7):579-616. Chin J Hypertens 2011;(8)
2018(9)	



2010 China hypertension guidelines: Diagnosis of hypertension

Classification	SBP (mm Hg)	DBP (mm Hg)
Normal	<120	<80
High normal	120-139	80-89
Hypertension	≥140	≥90
Stage 1 (mild)	140-159	90-99
Stage 2 (moderate)	160-179	100-109
Stage 3 (severe)	≥180	≥110
Isolated systolic hypertension	≥140	<90



2010 China hypertension guidelines: Risk stratification

Blood pressure (mmHg)

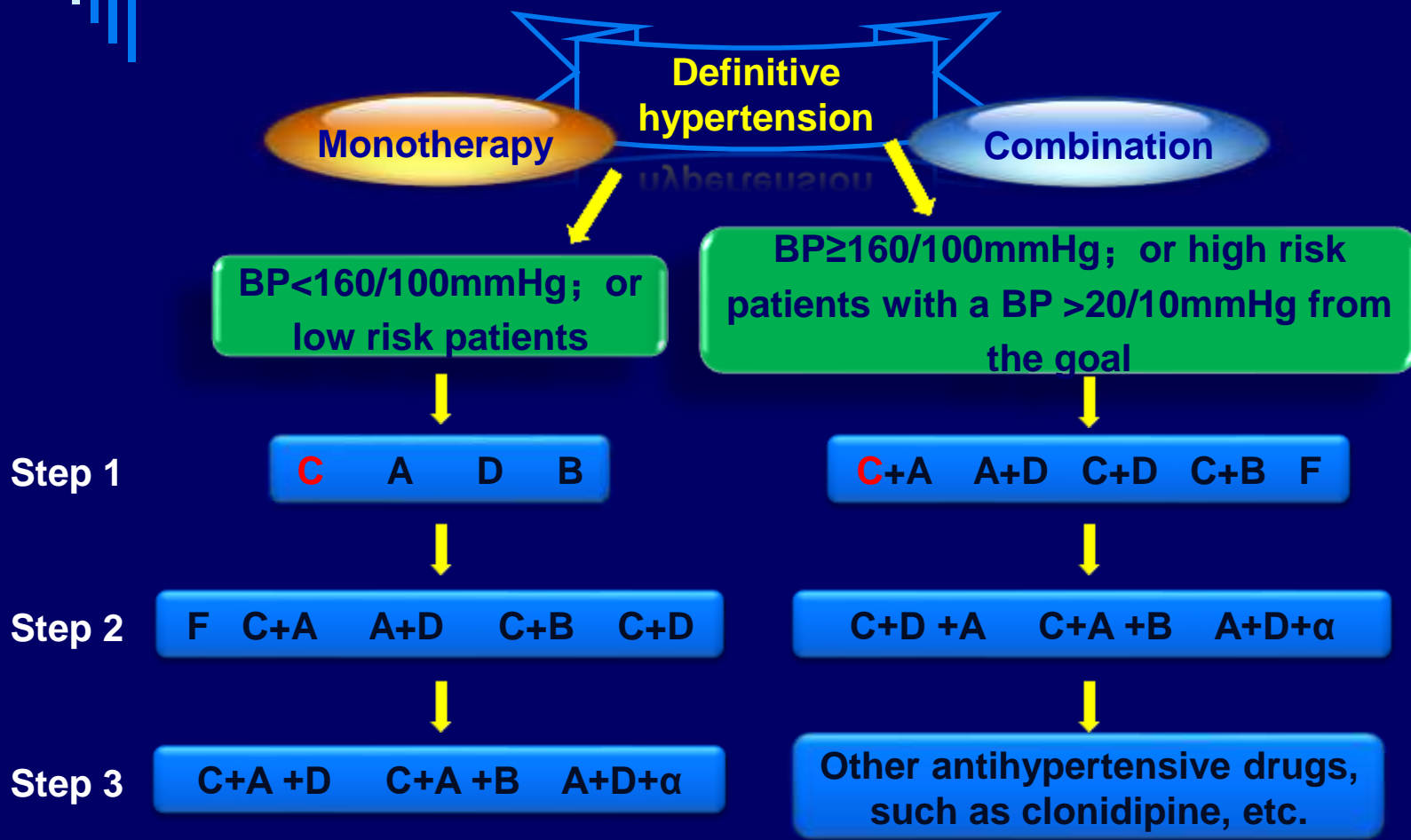
Risk factors and disease conditions	Blood pressure (mmHg)		
	Stage 1 hypertension SBP 140-159 or DBP 90-99	Stage 2 hypertension SBP 160-179 or DBP 100-109	Stage 3 hypertension SBP \geq 180 or DBP \geq 110
No	Low	Medium	High
1-2 risk factors	Medium	Medium	Very high
\geq 3 risk factors or target organ damage	High	High	Very high
Clinical complications and diabetes	Very high	Very high	Very high



2010 China hypertension guidelines: Target blood pressure

Patients	Target systolic/diastolic BP (mm Hg)
General	140/90
Elderly (≥ 65 years)	150/90
Renal disease or diabetes	130/80
Stroke	140/90
CHD	130/80 (diastolic not < 60)

2010 China hypertension guidelines: Choice of antihypertensive drugs



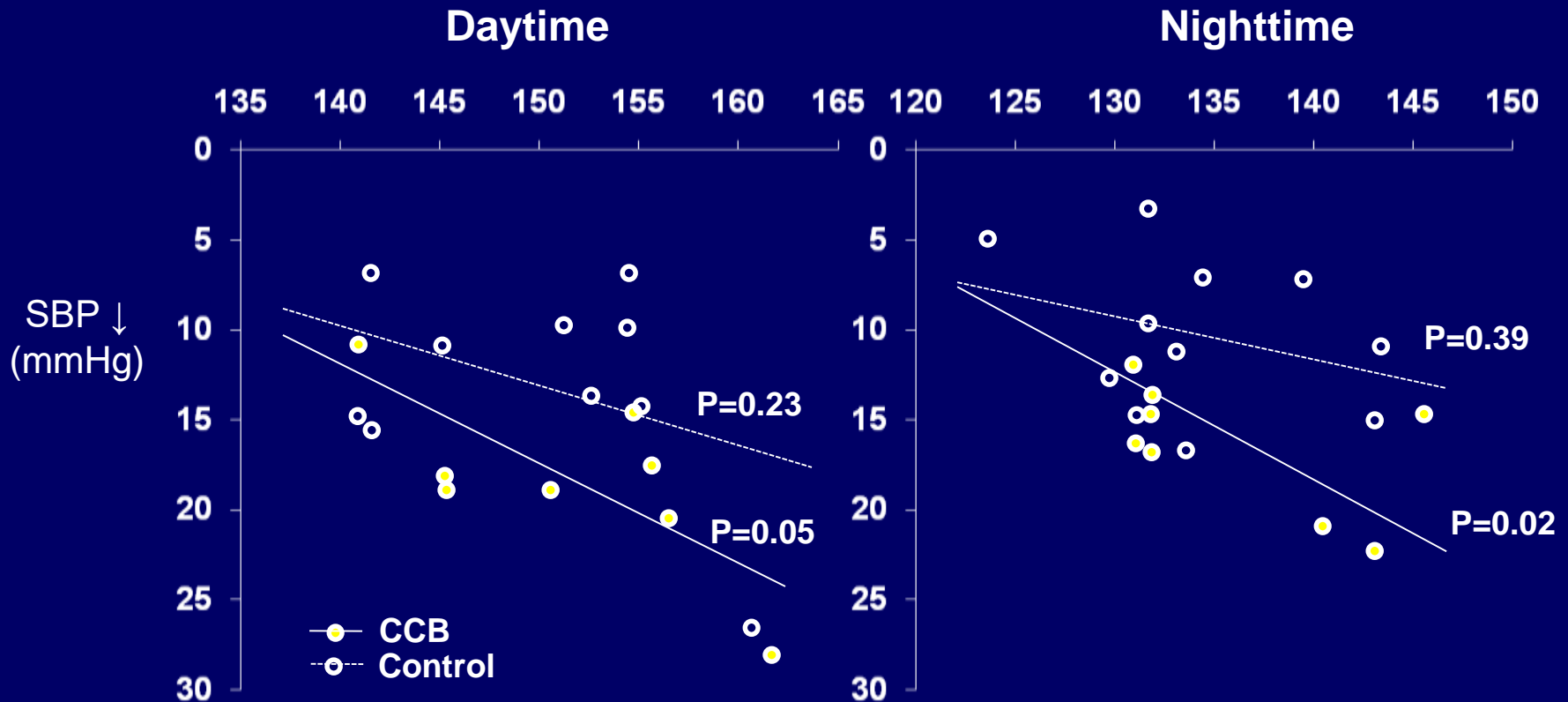
A: ACEI or ARB; B: β-blockers; C: Dihydropyridine CCBs; D: Thiazides; α: α-blockers; F: Fixed dose combination



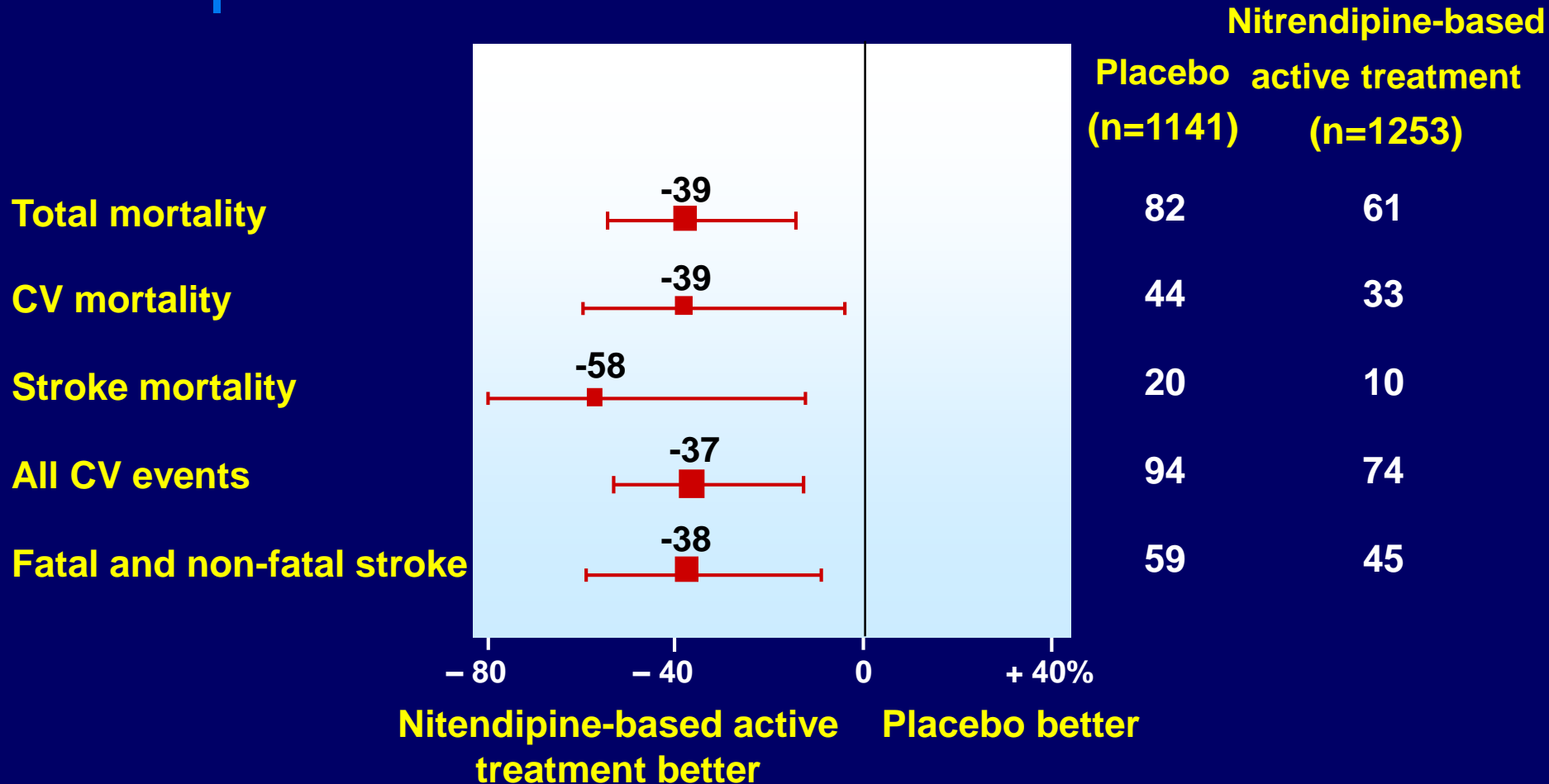
2010 China hypertension guidelines: Combination therapy

Preferred	Acceptable	Not recommended
D-CCB+ARB	Thiazide+ β -blocker	ACEI+ β -blocker
D-CCB+ACEI	A-blocker+ β -blocker	ARB+ β -blocker
ARB+thiazide	D-CCB+K ⁺ sparing diuretic	ACEI+ARB
ACEI+thiazide	Thiazide+ K ⁺ sparing diuretic	Centrally acting agent+ β -blocker
D-CCB+thiazide		
D-CCB+ β -blocker		

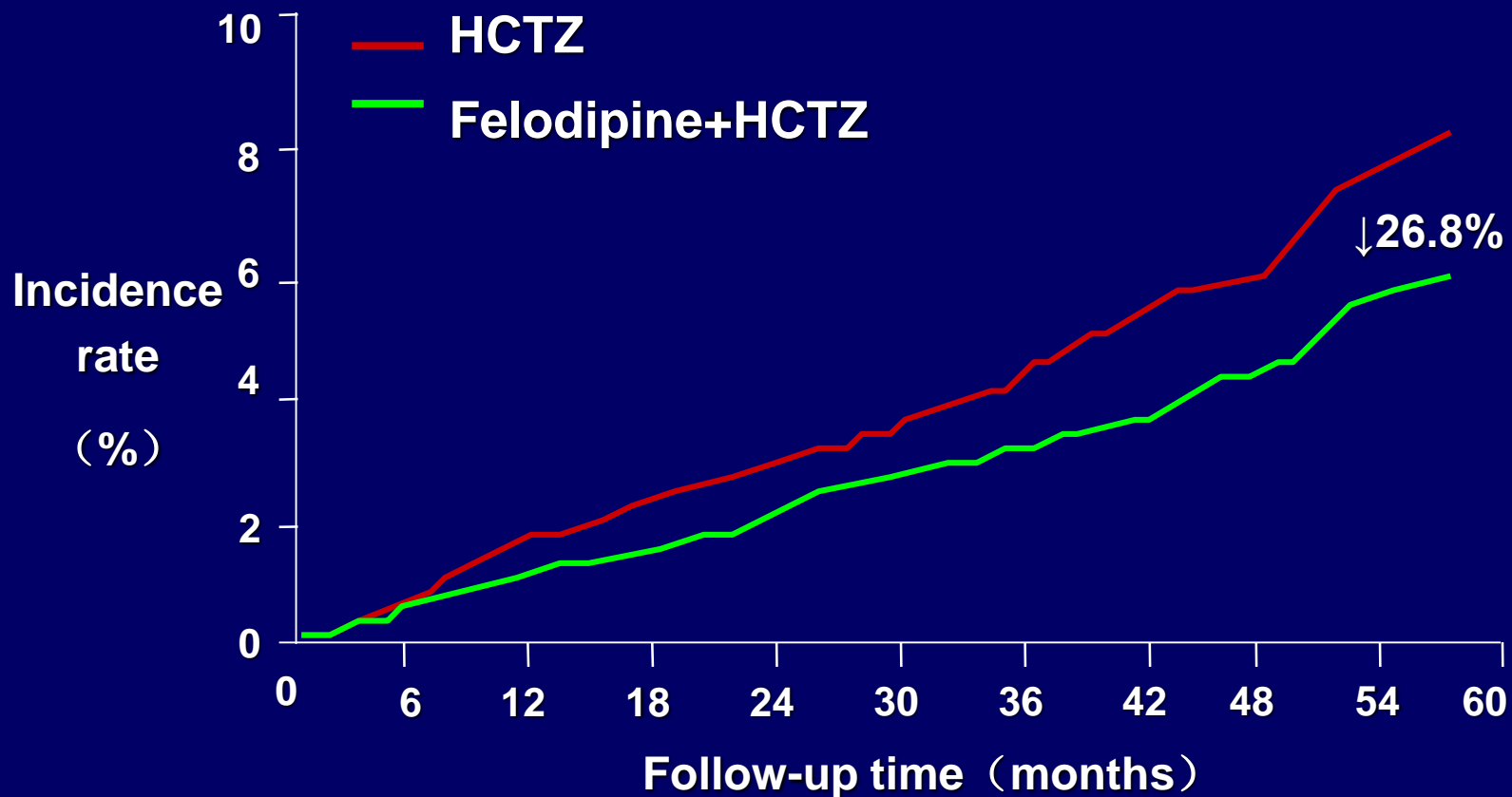
Meta-analysis of ABP lowering trials: CCB vs. other classes of drugs



Syst-China: Fatal and non-fatal endpoints



FEVER: Fatal and nonfatal stroke

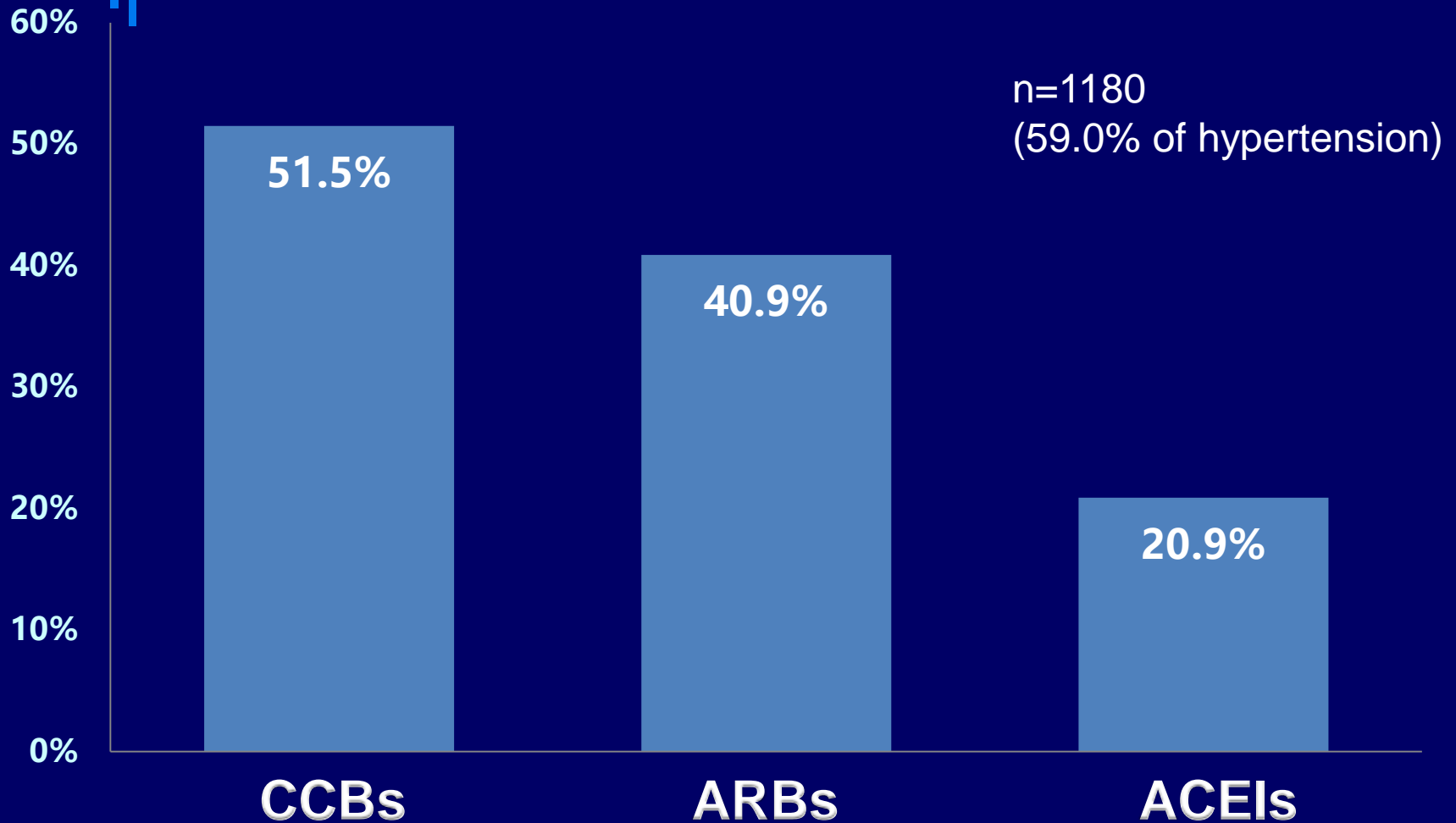




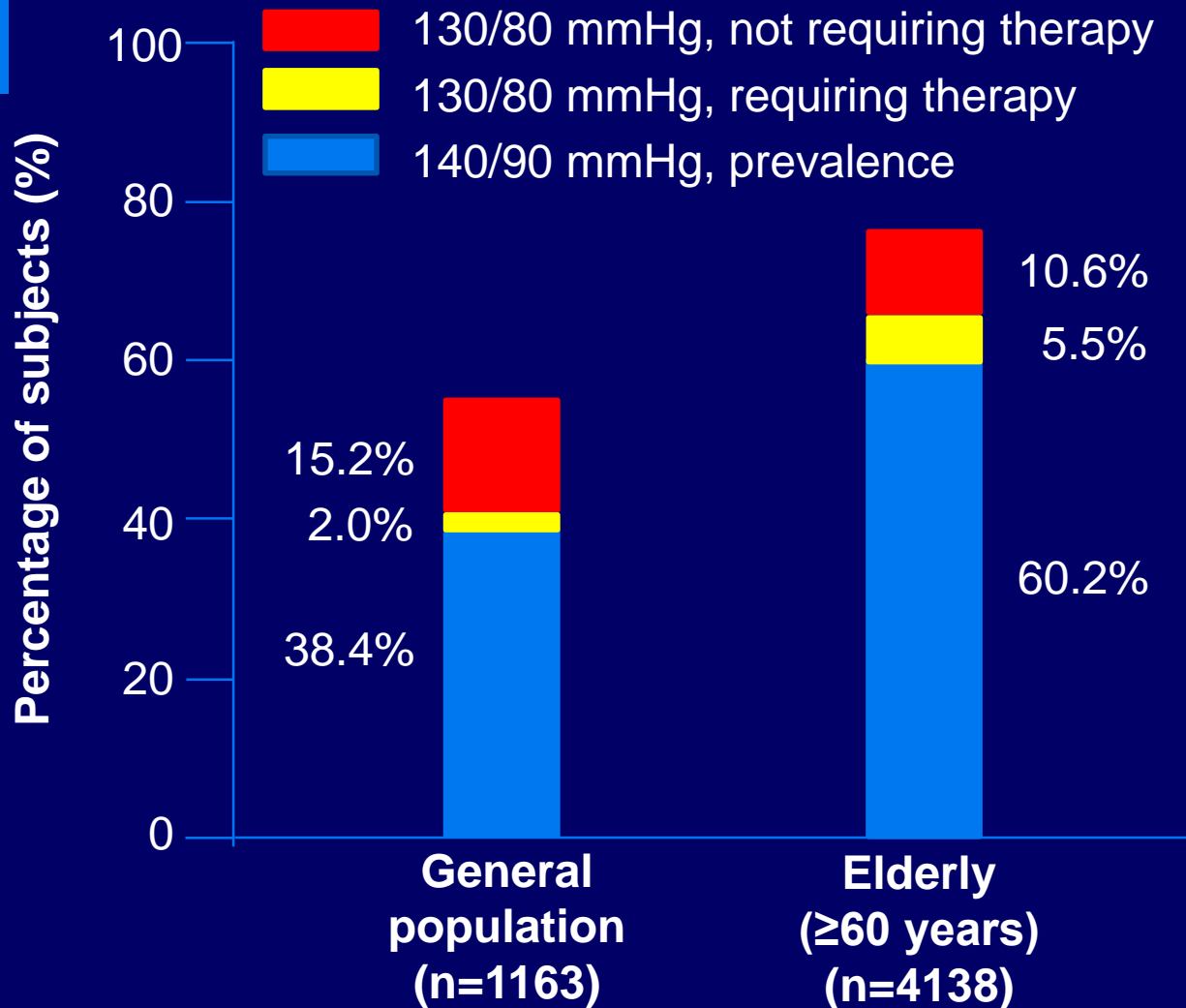
2010 China Hypertension Guidelines: Choice of drugs in diabetes mellitus

Guideline	First choice	Concomitant use	Conditional use
Chinese Hypertension League	ACEIs or ARBs	CCBs or low dose thiazide or β -blockers	β -blockers not in hypoglycemia

ATTEND: Use of antihypertensive drugs in diabetes in endocrinology



Prevalence of hypertension according to 140/90 or 130/80 mmHg





Awareness, treatment and control rates of hypertension in China

	Prevalence	Number of patients	Awareness	Treated	Controlled
1991 (>15 y)	11.3%	94 million	26.6%	45.5% (12.1%)	23.1% (2.8%)
2002 (≥18 y)	18.8%	160 million	30.2%	81.8% (24.7%)	25.0% (6.1%)
2015 (≥18 y)	27.9%	244.5 million	46.9%	86.8% (40.7%)	37.6% (15.3%)

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- **China hypertension guidelines since 1999**
 - **China nationwide hypertension control initiatives**
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China Nationwide Hypertension Control Initiatives

- **May Measurement Month in China**
- **A Web-based and WeChat Linked Blood Pressure Measurement System**
- **Web-based Programming and Interpretation of Ambulatory Blood Pressure Monitoring**
- **Primary Aldosteronism Screen in Resistant Hypertension**

- **Outside the hospital**

- Measure & aware

- **Inside the hospital**

- Treat & control



May Measurement Month 2017

May Measurement Month 2017: an analysis of blood pressure screening results worldwide



Thomas Beaney, Aletta E Schutte, Maciej Tomaszewski, Cono Ariti, Louise M Burrell, Rafael R Castillo, Fadi J Charchar, Albertino Damasceno, Ruan Kruger, Daniel T Lackland, Peter M Nilsson, Dorairaj Prabhakaran, Agustin J Ramirez, Markus P Schlaich, Jiguang Wang, Michael A Weber, Neil R Poulter, on behalf of the MMM Investigators

Lancet Glob Health 2018

Published Online
May 16, 2018
[http://dx.doi.org/10.1016/S2214-109X\(18\)30259-6](http://dx.doi.org/10.1016/S2214-109X(18)30259-6)

Imperial College London, London, UK (T Beaney MRC N R Poulter FMed Sci); South Africa Medical Research Council, North-West University, Potchefstroom, South Africa (A E Schutte PhD); Division of Cardiovascular Sciences, University of Manchester, Manchester, UK (M Tomaszewski MD); Cardiac Research Centre, University of Manchester, Centre for Medical Education, Heath Park, Cardiff, UK (C Ariti MSc); Department of Medicine, University of

Summary

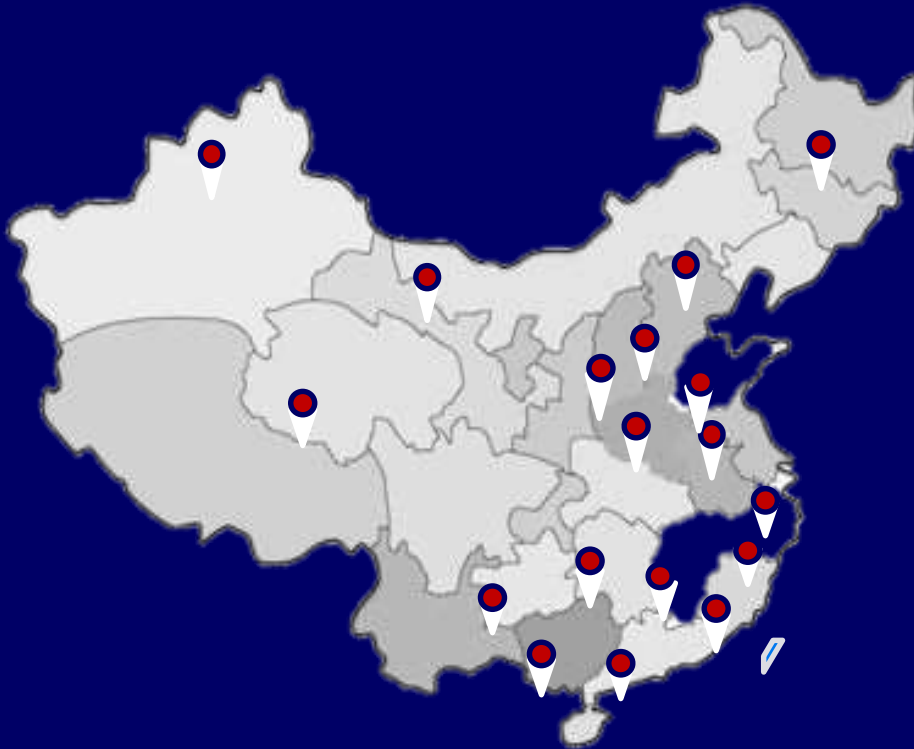
Background Increased blood pressure is the biggest contributor to the global burden of disease and mortality. Data suggest that less than half of the population with hypertension is aware of it. May Measurement Month was initiated to raise awareness of the importance of blood pressure and as a pragmatic interim solution to the shortfall in screening programmes.

Methods This cross-sectional survey included volunteer adults (≥ 18 years) who ideally had not had their blood pressures measured in the past year. Each participant had their blood pressure measured three times and received a questionnaire about demographic, lifestyle, and environmental factors. The primary objective was to raise awareness of blood pressure, measured by number of countries involved, number of people screened, and number of people who have untreated or inadequately treated hypertension (defined as systolic blood pressure ≥ 140 mm Hg or diastolic blood pressure ≥ 90 mm Hg, or both, or on the basis of receiving antihypertensive medication). Multiple imputation was used to estimate the mean of the second and third blood pressure readings if these were not recorded. Measures of association were analysed using linear mixed models.

Findings Data were collected from 1 201 570 individuals in 80 countries. After imputation, of the 1 128 635 individuals for whom a mean of the second and third readings was available, 393 924 (34.9%) individuals had hypertension. 153 905 (17.3%) of 888 616 individuals who were not receiving antihypertensive treatment were hypertensive, and

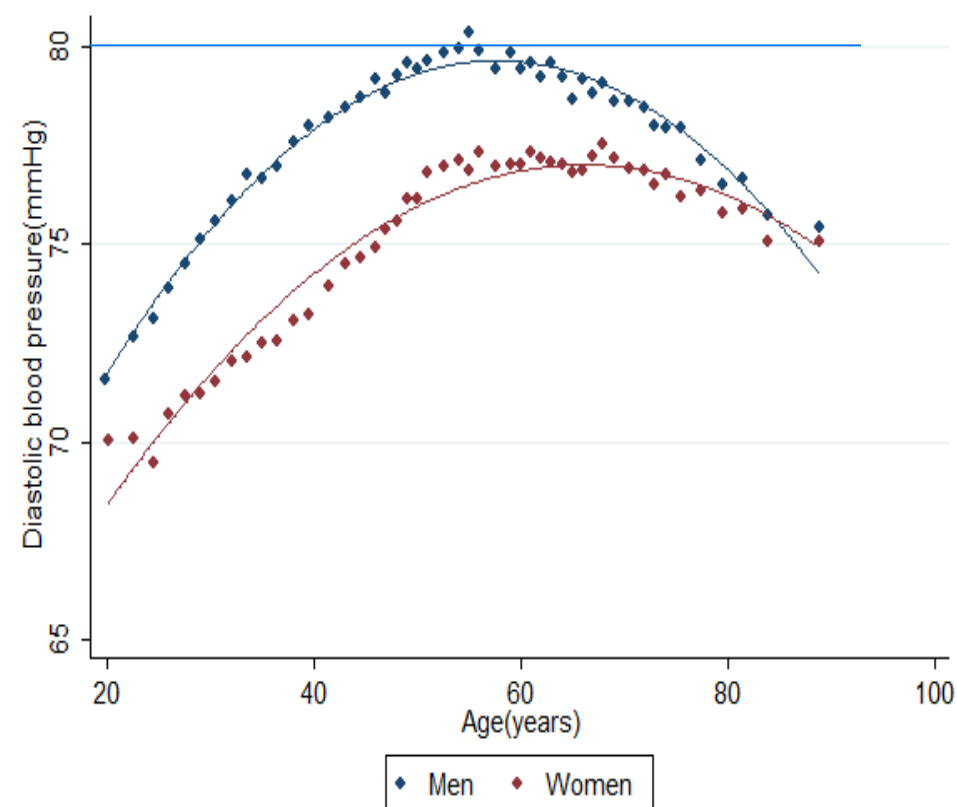
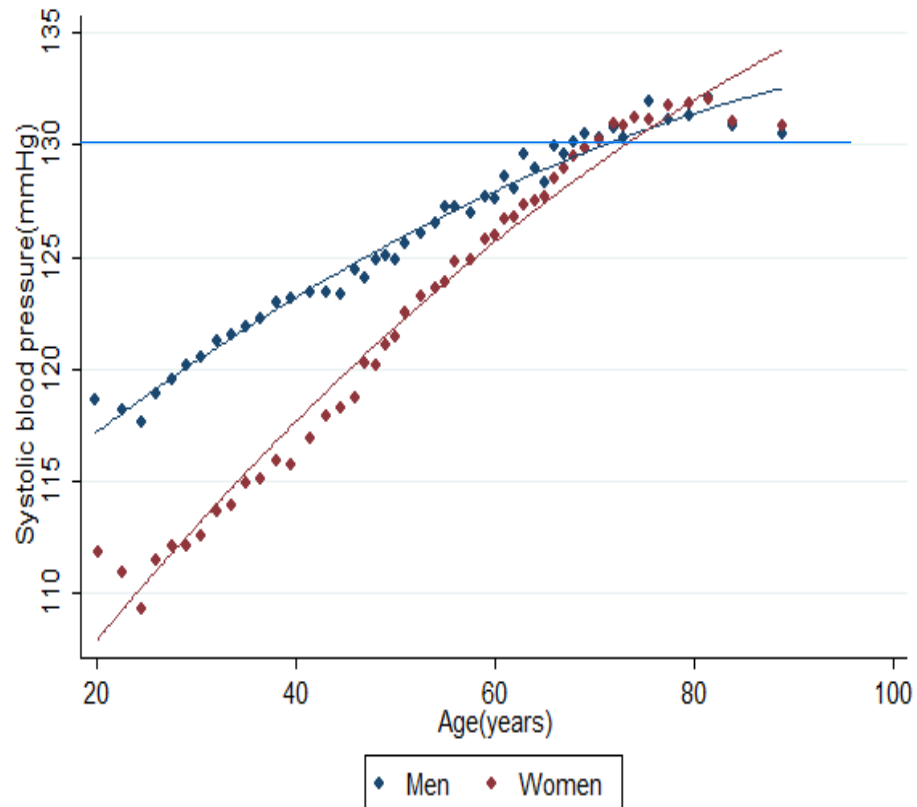


MMM China 2018: Participation



- From May 17 to July 30
- 18 provinces
- 367 sites
- 340,000 people

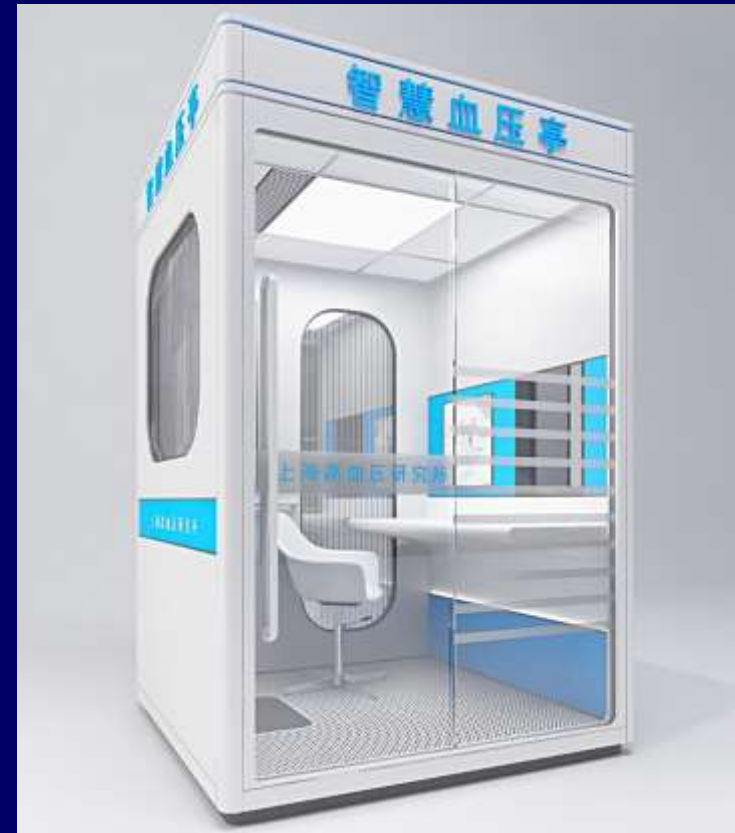
MMM China 2018: BP by age and sex (n=280,737)



MMM China: Devices



**ZhiZhong Automated BP Measurement System,
ZhiZhong Technology, Shanghai, China**



**iBP Measurement System,
HeSi Technology, Shanghai, China**

Web-based SHUOYUN ABPM analysis system

www.shuoyun.com.cn



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无锡市人民医院 动态血压监测报告

上海市高血压研究所支持



专家-查看报告 (加强版)

页码: 1/2

电话: 021-64370045 传真: 021-64333548 e-mail地址: wsmmyy@renmyy.com 报告ID: 000201305170365

受检者姓名: 王心刚 性别: 男 年龄: 30岁 检查日期: 2013-08-06 联系电话: 13865895475 报告打印日期: 2013-08-10
本次为: 住院检查 测量袖带大小: 成人标准 测量部位: 左臂 工作是否倒班: 否 有无午睡: 有
服用降压药时间: 一天2次 (8:30, 19:30)

ABPM统计摘要:

	白天清醒时段 (6:00-21:00)			夜间睡眠时段 (1:00-6:00)			起床后清醒时段 (6:00-8:00)			24小时			
	收缩压 (mmHg)	舒张压 (mmHg)	脉率 (b/min)	收缩压 (mmHg)	舒张压 (mmHg)	脉率 (b/min)	收缩压 (mmHg)	舒张压 (mmHg)	脉率 (b/min)	收缩压 (mmHg)	舒张压 (mmHg)	脉率 (b/min)	
有效读数个数 (%)	51(94%)			11(92%)			9(100%)			72(95%)			
均值	133	80	73	141	71	72	132	79	74	135	78	73	
标准差	24	17	10	25	21	7	22	22	10	24	18	10	
最大值	179	109	89	165	109	85	160	109	89	179	109	89	
中位数	132	84	72	148	59	69	140	86	70	136	81	72	
最小值	90	51	60	94	51	64	94	51	63	90	51	60	
变异系数 (%)	18	21	13	18	30	10	36	28	14	18	22	13	
血压总评												-18	9
夜间血压下降率 (%)												-6反弓型	11勺型

ABPM血压数据:

序号	日期	时间	收缩压	舒张压	脉率	序号	日期	时间	收缩压	舒张压	脉率	序号	日期	时间	收缩压	舒张压	脉率
1	8/5	14:00	175	55	86	28	8/5	20:45	179	80	86	55	8/6	7:30	160	51	79
2	8/5	14:15	126	71	80	29	8/5	21:00	136	99	68	56	8/6	7:45	109	86	87
3	8/5	14:30	144	96	79	30	8/5	21:15	118	90	67	57	8/6	8:00	113	60	64
4	8/5	14:45	152	107	64	31	8/5	21:30	149	67	63	58	8/6	8:15	110	72	86
5	8/5	15:00	160	82	83	32	8/5	21:45	154	92	66	59	8/6	8:30	94	54	87
6	8/5	15:15	149	96	77	33	8/5	22:00	167	62	85	60	8/6	8:45	100	84	85
7	8/5	15:30	174	102	62	34	8/5	22:30	92	92	78	61	8/6	9:00	155	92	62
8	8/5	15:45	96	87	64	35	8/5	23:00	109	90	89	62	8/6	9:15	121	63	62
9	8/5	16:00	123	89	62	36	8/5	23:30	113	60	86	63	8/6	9:30	157	62	67
10	8/5	16:15	150	87	72	37	8/6	0:00	153	100	66	64	8/6	9:45	96	103	81
11	8/5	16:30	124	56	82	38	8/6	0:30	137	64	63	65	8/6	10:00	124	90	68
12	8/5	16:45	141	52	73	39	8/6	1:00	156	59	72	66	8/6	10:15	179	87	60
13	8/5	17:00	172	65	64	40	8/6	1:30	142	88	64	67	8/6	10:30	124	92	61
14	8/5	17:15	90	107	82	41	8/6	2:00	150	54	69	68	8/6	10:45	146	108	85
15	8/5	17:30	130	65	64	42	8/6	2:30	100	56	65	69	8/6	11:00	121	55	68
16	8/5	17:45	133	72	60	43	8/6	3:00	145	81	85	70	8/6	11:15	108	71	70
17	8/5	18:00	124	87	86	44	8/6	3:30	162	54	65	71	8/6	11:30	112	81	77
18	8/5	18:15	102	85	87	45	8/6	4:00	122	51	74	72	8/6	11:45	118	51	73
19	8/5	18:30	131	93	83	46	8/6	4:30	165	103	67	73	8/6	12:00	162	84	87
20	8/5	18:45	153	85	86	47	8/6	5:00	148	74	83	74	8/6	12:15	125	89	72
21	8/5	19:00	102	65	61	48	8/6	5:30	164	51	67	75	8/6	12:30	115	75	73
22	8/5	19:15	165	74	87	49	8/6	6:00	94	109	78	76	8/6	12:45	152	86	65
23	8/5	19:30	134	70	69	50	8/6	6:15	139	97	64	77	8/6	13:00	130	104	85
24	8/5	19:45	136	74	66	51	8/6	6:30	141	93	89	78	8/6	13:15	167	98	61
25	8/5	20:00	172	69	82	52	8/6	6:45	146	66	68	79	8/6	13:30	156	63	81
26	8/5	20:15	122	51	87	53	8/6	7:00	140	98	70	80	8/6	13:45	101	96	63
27	8/5	20:30	115	54	78	54	8/6	7:15	147	51	63	81	8/6	14:00	167	103	60

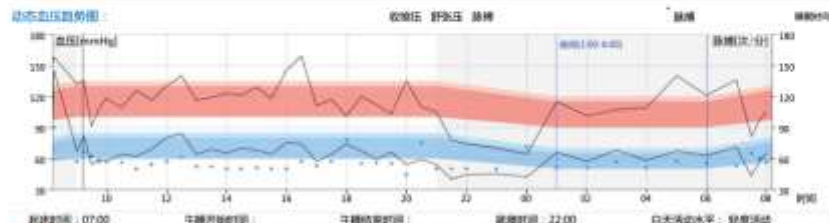
专家评估和建议:

24小时: 收缩压升高, 舒张压正常 (135/78 mmHg) ;
 白天清醒时段: 收缩压与舒张压均正常 (133/80 mmHg) ;
 夜间睡眠时段: 收缩压与舒张压均升高 (141/71 mmHg) ;
 起床后清醒时段: 收缩压与舒张压均正常 (132/79 mmHg) ;
 血压昼夜: 收缩压昼夜节律消失, 舒张压昼夜节律正常。

送给医生: 姜洪新 签名日期: 2013-08-06 专家: 姜洪新 签名日期: 2013-08-09 医师确认: _____ 日期: _____

动态血压测量报告

受检者姓名: 刘秀莲 性别: 女 年龄: 72 检查日期: 2014-05-02 数据上传日期: 2014-05-03 本次为: 门诊检查
测量袖带大小: 成人标准 有无午睡: 无 测量部位: 左臂 工作是否倒班: 否 服用降压药时间: 无



ABPM统计摘要:

	白天表			白天清醒时段(07:00-22:00)			夜间睡眠时段(22:00-07:00)			晨峰时段(07:00-09:00)			24小时			
	收缩压 (mmHg)	舒张压 (mmHg)	脉率 (b/min)	收缩压 (mmHg)	舒张压 (mmHg)	脉率 (b/min)	收缩压 (mmHg)	舒张压 (mmHg)	脉率 (b/min)	收缩压 (mmHg)	舒张压 (mmHg)	脉率 (b/min)	收缩压 (mmHg)	舒张压 (mmHg)	脉率 (b/min)	
有效读数个数百分比	3(60%)			32(97%)			4(80%)			40(94%)						
均值	147	100	72	123	84	58	103	58	58	105	58	58	123	82	58	
标准差	13	41	17	19	10	7	25	10	7	23	12	5	21	10	7	
最大值	158	145	90	159	84	78	140	68	71	136	71	65	159	84	78	
中位数	151	87	69	116	64	55	108	60	54	101	61	58	116	64	55	
最小值	132	67	57	74	40	44	64	42	50	81	43	53	64	40	44	
血压总评	67	33	6	0	0	25	0	0	0	0	0	0	8	0	0	
夜间血压下降率												10%勺型	7%勺型			
血压总评												-25	-6			
变异系数 (%)	0.09	0.41	0.23	0.17	0.16	0.13	0.25	0.17	0.12	0.22	0.21	0.09	0.18	0.17	0.13	
AAI指数												0.58	0.64	0.52	0.59	
晨峰可能性												晨峰可能性“中度”				

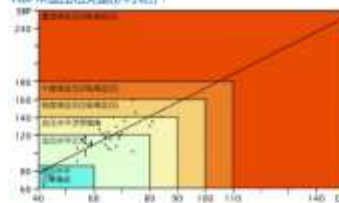
ABPM统计摘要: 记录的时间段: 2014.05.02/08:12 - 2014.05.03/08:00; 有效读数=40; 排除读数=1 (2%)

收缩压最大值: 159mmHg(05/02 16:30); 收缩压最小值: 64mmHg(05/03 00:01)

舒张压最大值: 84mmHg(05/02 12:30); 舒张压最小值: 40mmHg(05/02 21:30)

平均心率: 55次/分

ABPM血压相关图(24小时):



测量数据总数: 40

$SBP=1.59 \times DBP+13.77$

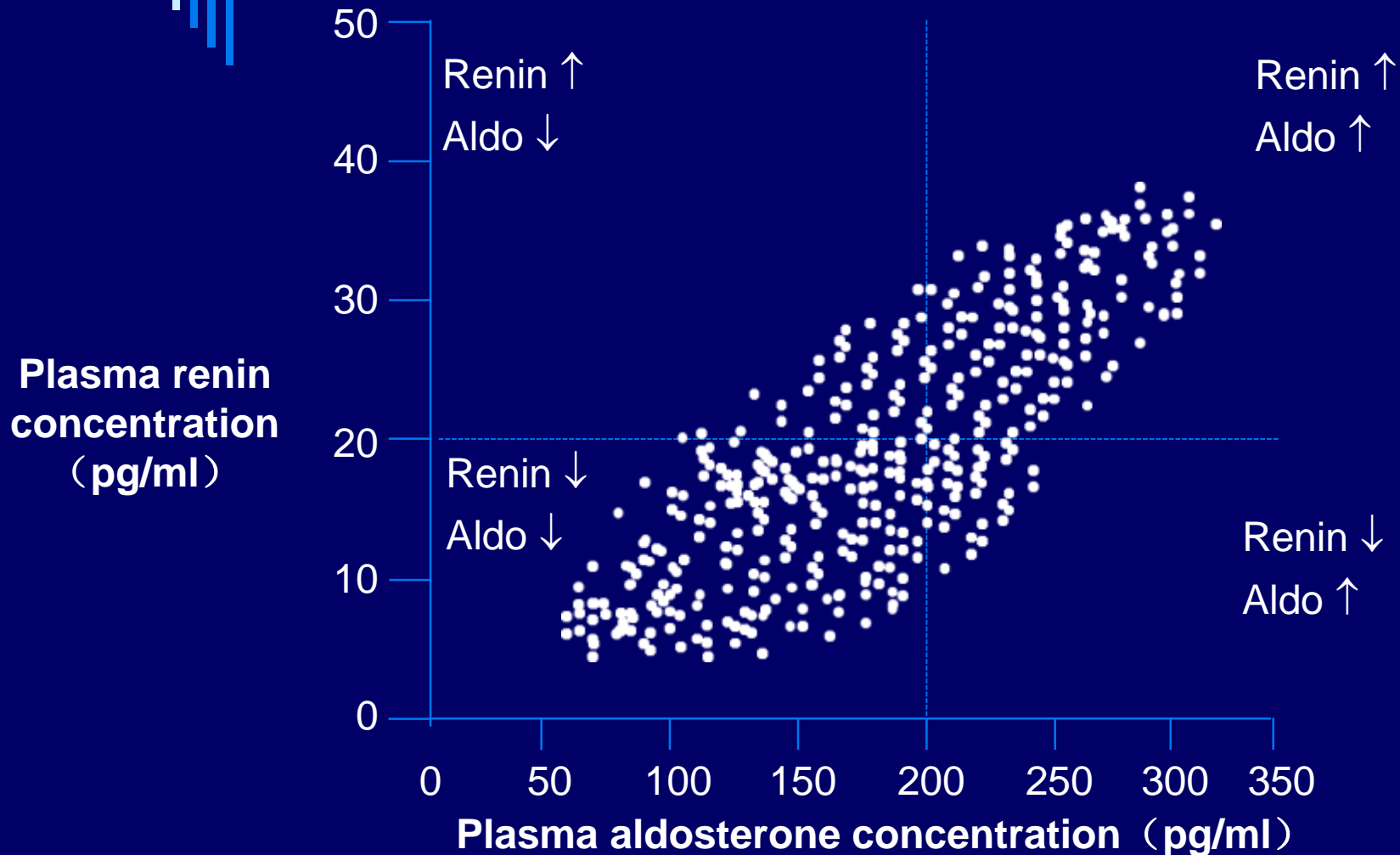
SBP和DBP的相关性: $r=0.8$, SBP和DBP呈高度线性正相关性

ABPM血压数据:

序号	日期	时间	收缩压	舒张压	平均收缩压	脉率	序号	日期	时间	收缩压	舒张压	平均收缩压	脉率
1	05/02	08:12	153	87	108	69	23	05/02	18:00	101	74	83	78
2	05/02	08:15	138	145	149	80	24	05/02	18:30	120	67	85	55
3	05/02	09:01	132	67	89	57	25	05/02	19:00	112	59	77	56
4	05/02	09:15	135	81	89	66	26	05/02	19:30	103	66	78	55
5	05/02	09:30	91	54	66	62	27	05/02	20:00	135	54	81	44
6	05/02	09:45	108	59	75	57	28	05/02	20:30	110	59	76	75
7	05/02	10:00	118	57	77	57	29	05/02	21:00	105	54	71	50
8	05/02	10:30	109	64	79	56	30	05/02	21:30	78	40	53	50

A China Nationwide Registry
“ABPM On-target in 10,000 Patients Initiative”

ChemiLuminescence for measurement of plasma renin and aldosterone





ChinaPAPS: China Registry of Primary Aldosteronism in Hypertension

- **Design:** Prospective observational
- **Subjects:** Target > 30000 cases
- **Timeline:** September 2018
- **Data collection:** Demographics, clinical manifestations, diagnosis, treatment, clinical outcomes

-
- **In the past two decades, three China hypertension guidelines have been published in the Chinese literature. Updating is being undertaken, and probably will be published in the near future, hopefully with a full or abridged English version.**
 - **Implementing is even more difficult than writing guidelines. Several nationwide initiatives in China are ongoing. and hopefully will increase the control rate of hypertension by 2030 to 50% or higher by treating >70% of hypertensive patients and to the goal of <140/90 mm Hg in >70% of those treated.**
-

Thank you very much !
