Raising the BP threshold in elderly **Against**

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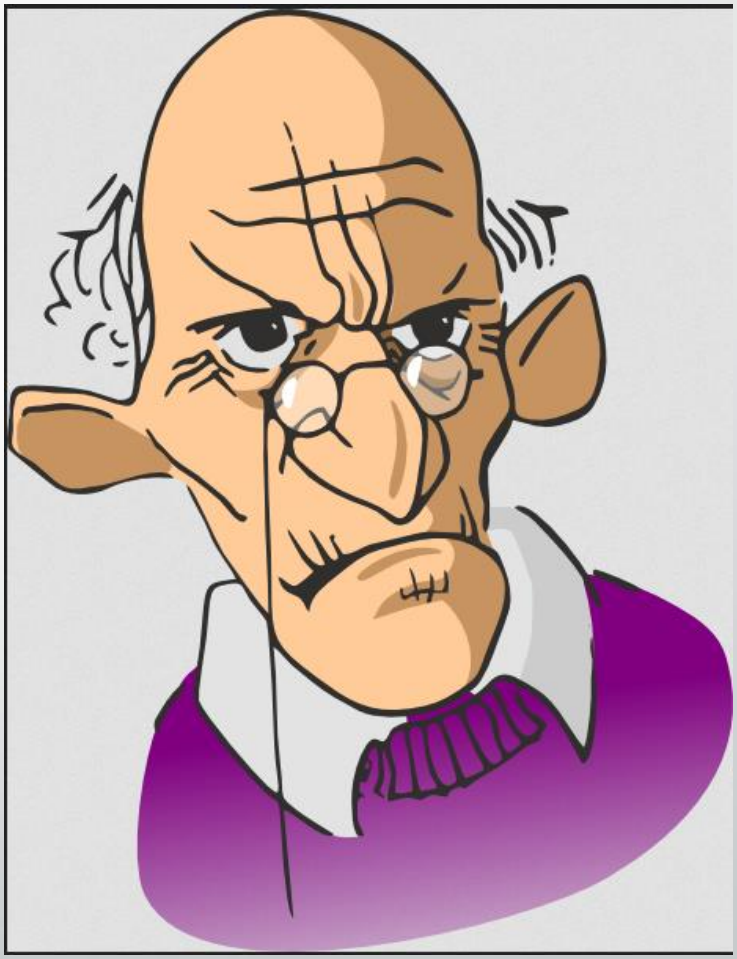
How OLD is OLD?

- Traditional demographic definition of ≥ 65 years
- Medical definition ?????
- Clinically relevant physiological differences between the

  "young old" (65 to 74 yrs),

  "older old"(75 to 84 yrs), "oldest old" (≥85 years of age)



Key concerns in JNC 8: Why 60 yrs ?

Goal < 150/90
for those 60 and older

Strength of recommendation — strong (grade A)

Trial Name (Reference)	N	Age Range (y)	Mean Age (y)
ACCOMPLISH (8)	11,506	≥55	68
ALLHAT (9)	33,357	≥55	67
ANBP 2 (10)	6,083	65–84	72
Coope and Warrender (11)	884	60–79	68
EWPHE (12)	840	≥60	72
HYVET (4)	3,845	80–105	84
INVEST (13)	22,576	≥50	66
LIFE (14)	9,193	55–80	67
MRC (15)	4,396	65–74	70
SHEP (16)	4,736	≥60	72
STONE (17)	1,632	60–79	67
STOP-HTN (18)	1,627	70–84	76
Syst-China (19)	2,394	≥60	67
Syst-Eur (20)	4,695	≥60	70
VALUE (21)	15,245	≥50	67

JNC -8 differ from other guideline in Age limit

	JNC-8	ASH/ISH	AHA/ACC	ESH/ESC	CHEP (Canadian HT Guideline)	Indian Guidelines on Hypertension-III
Published on	18th Dec 2013	19th Dec 2013	21st Nov 2013	14th June, 2013	May 2013	February, 2013
Target BP goal for General Patients	<140/90	<140/90	<140/90	<140/90	<140/90	<140/90
For Elderly people	150/90 (≥60 yrs)	150/90 (≥80 yrs)	Lower targets for the Elderly	Elderly <80 yrs: SBP 150-140 & DBP <90 **Fit** elderly <80 yrs: SBP <140 can be considered Elderly >80 yrs: SBP 150-140 & DBP <90 (provided good physical & mental conditions)	<150/90 (≥80 yrs)	140-145/90

ESC endorse <140 mmHg SBP goal in fit elderly patients

Recommendations	
SBP goal for "most" •Patients at low–moderate CV risk •Patients with diabetes •Consider with previous stroke or TIA •Consider with CHD •Consider with diabetic or non-diabetic CKD	**<140 mmHg**
SBP goal for elderly •Ages <80 years •Initial SBP ≥160 mmHg	**140-150 mmHg**
SBP goal for fit elderly Aged <80 years	**<140 mmHg**
SBP goal for elderly >80 years with SBP •≥160 mmHg	**140-150 mmHg**
DBP goal for "most"	**<90 mmHg**
DB goal for patients with diabetes	**<85 mmHg**

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

J Hypertension 2013;31:1281-1357

Huge difference in reported number of CV events

Trial (Reference)	Participants, *n*	Duration, *y*	Total End Points, *n*	Primary Outcome	Coronary Heart Disease	Composite CVD
<150 mm Hg vs. higher goal						
HYVET (16)*	3845	2.1	Any CVD: 331 Strokes: 120 Deaths: 431	HR: 0.61 *P* = 0.046	HR: 0.72 (95% CI, 0.30–1.70) *P* = 0.45	–
SHEP (15)	4736	4.5	Any CVD: 703 Strokes: 245 Deaths: 455	RR: 0.64 (CI, 0.50–0.82) *P* = 0.0003	RR: 0.73 (CI, 0.57–0.94)	–
<140 mm Hg vs. higher goal						
JATOS (17)	4418	2	CVD or renal event: 172 Deaths: 17	Rate per 1000 PYs: 22.6 vs. 22.7 *P* = 0.99	Rate per 1000 PYs: 6.8 vs. 7.4 *P* = 0.78	Rate per 1000 PYs: 22.6 vs. 22.7 *P* = 0.99
VALISH (18)	3260	2.85	CVD or renal event: 99 Deaths: 54	HR: 0.89 (CI, 0.60–1.31) *P* = 0.383	HR: 1.23 (CI, 0.33–4.56) *P* = 0.761	HR: 0.89 (CI, 0.60–1.31) *P* = 0.383

Ann Intern Med. 2014 Apr 1;160(7):499-503

VALISH was underpowered

concluded in the trial

Target Blood Pressure for Treatment of Isolated Systolic Hypertension in the Elderly

Valsartan in Elderly Isolated Systolic Hypertension Study

Toshio Ogihara, Takao Saruta, Hiromi Rakugi, Hiroaki Matsuoka, Kazuaki Shimamoto, Kazuyuki Shimada, Yutaka Imai, Kenjiro Kikuchi, Sadayoshi Ito, Tanenao Eto, Genjiro Kimura, Tsutomu Imaizumi, Shuichi Takishita, Hirotsugu Ueshima, for the Valsartan in Elderly Isolated Systolic Hypertension Study Group

Why JNC-8 included this trial is a matter of debate!

years. The strict control (1545 patients) and moderate control (1534 patients) groups were well matched (mean age: 76.1 years; mean blood pressure: 169.5/81.5 mm Hg). Median follow-up was 3.07 years. At 3 years, blood pressure reached 136.6/74.8 mm Hg and 142.0/76.5 mm Hg, respectively. The blood pressure difference between the 2 groups was 5.4/1.7 mm Hg. The overall rate of the primary composite end point was 10.6 per 1000 patient-years in the strict control group and 12.0 per 1000 patient-years in the moderate control group (hazard ratio: 0.89; [95% CI: 0.60 to 1.34]; $P=0.38$). In summary, blood pressure targets of <140 mm Hg are safely achievable in relatively healthy patients ≥ 70 years of age with isolated systolic hypertension, although our trial was underpowered to definitively determine whether strict control was superior to less stringent blood pressure targets. (***Hypertension*. 2010;56:196-202.**)

J- Curve:
Does it really exist?

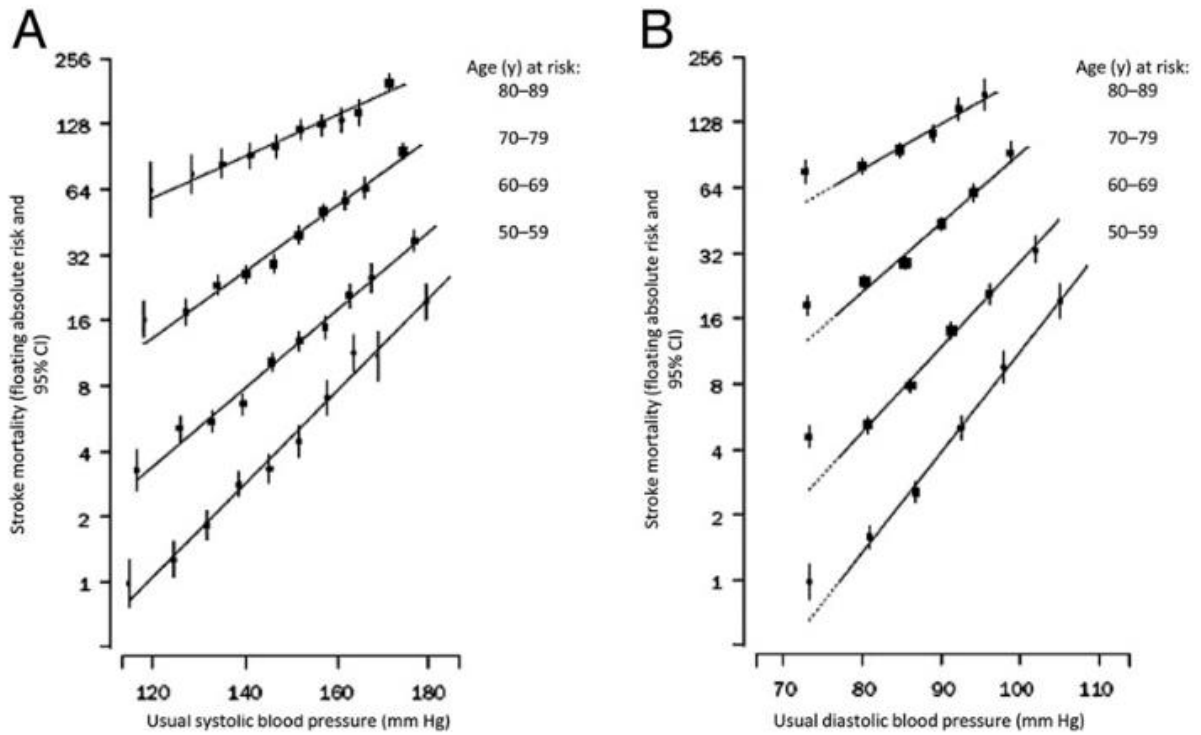
Age-specific relevance of usual blood pressure to vascular mortality: a meta-analysis of individual data for one million adults in 61 prospective studies.

- Throughout middle and old age, usual blood pressure is strongly and directly related to vascular (and overall) mortality, without any evidence of a threshold down to at least 115/75 mm Hg.

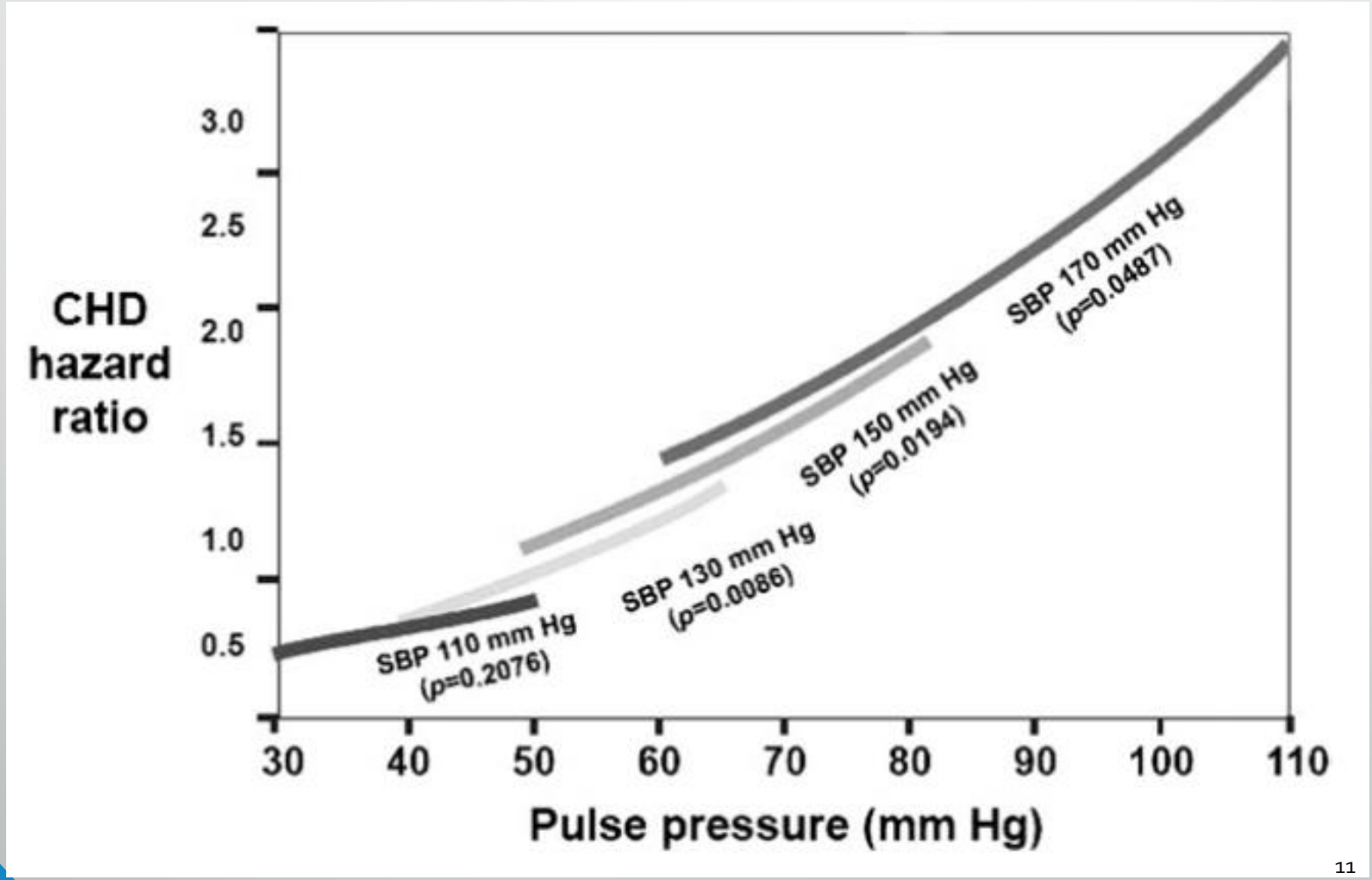
Lancet. 2002 Dec 14;360(9349):1903-13.

Absolute Risk of Stroke Mortality in Relation to Blood Pressure

JACC Vol. 57, No. 20, 2011
May 17, 2011:000–00



Joint Influences of Systolic Blood Pressure and Pulse Pressure on Coronary Heart Disease



ACCF/AHA 2011 Expert Consensus Document on Hypertension in the Elderly

JACC Vol. 57, No. 20, 2011
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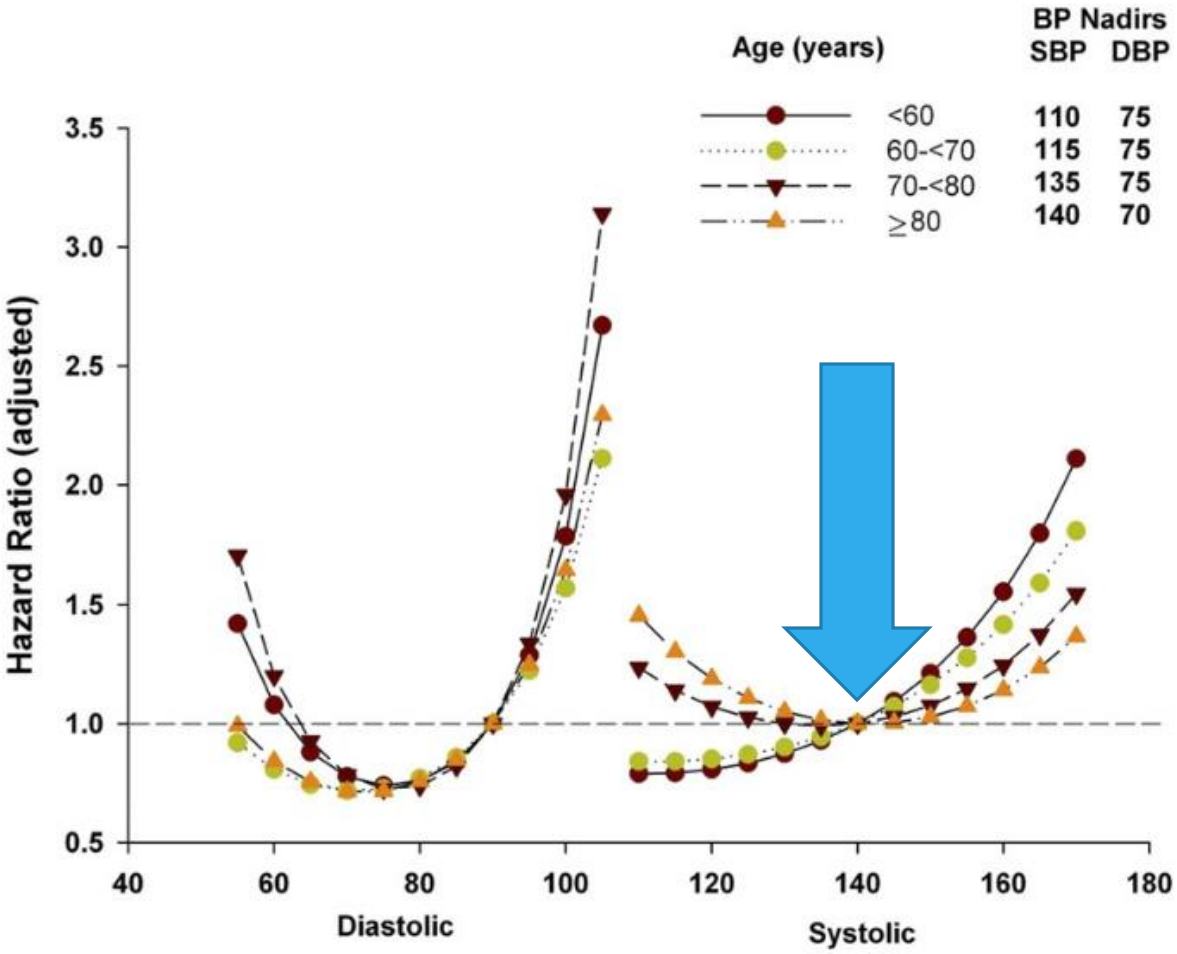
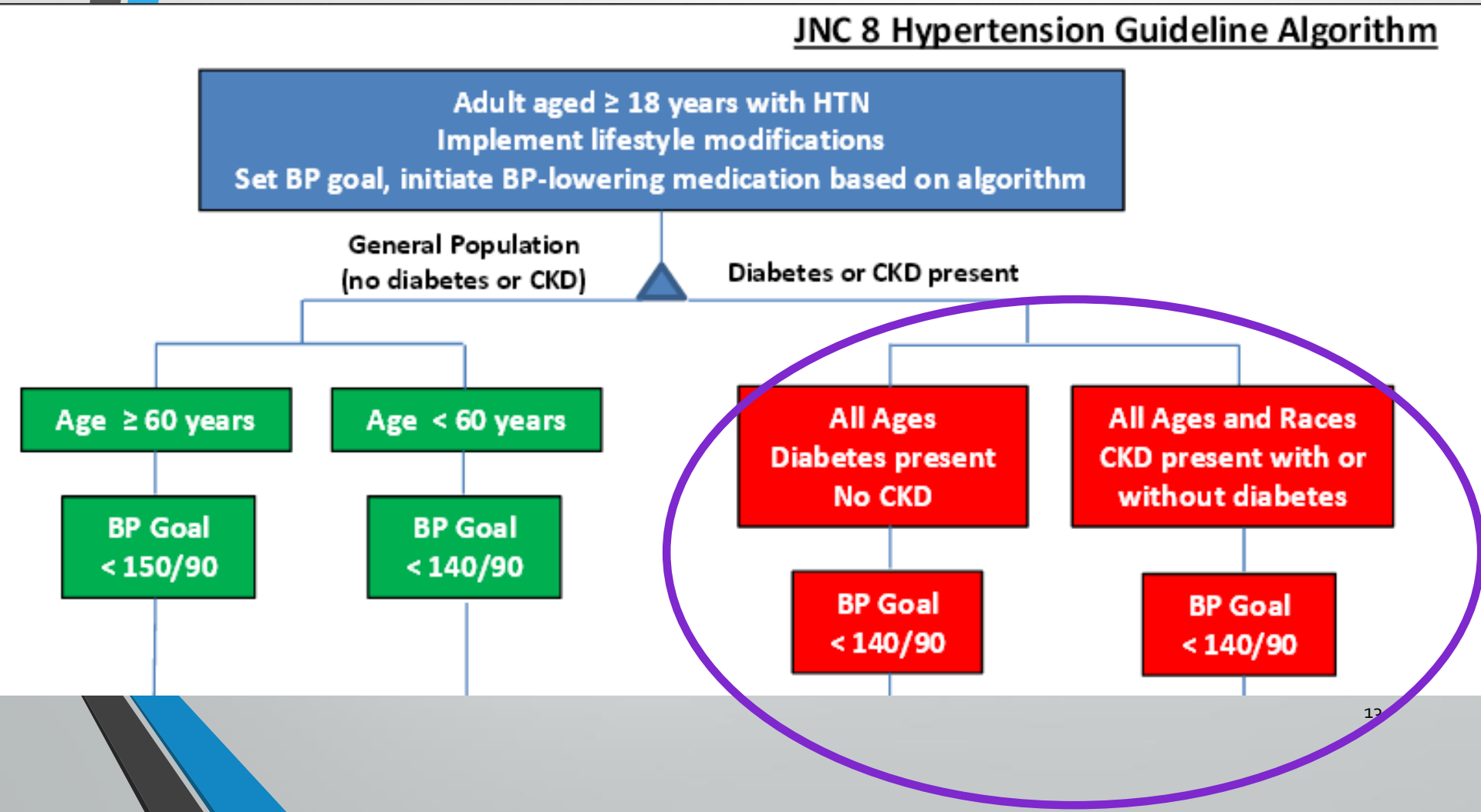
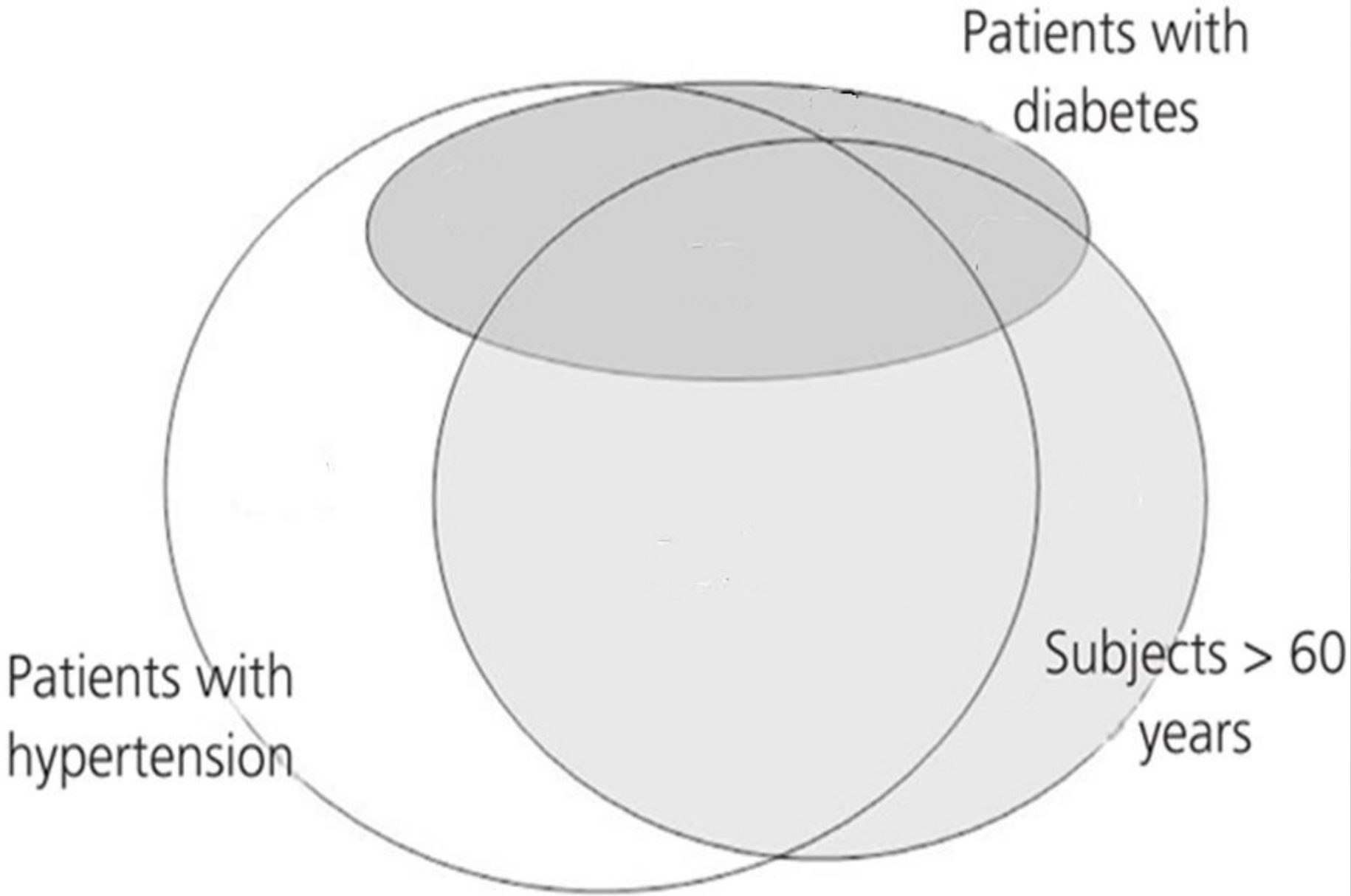
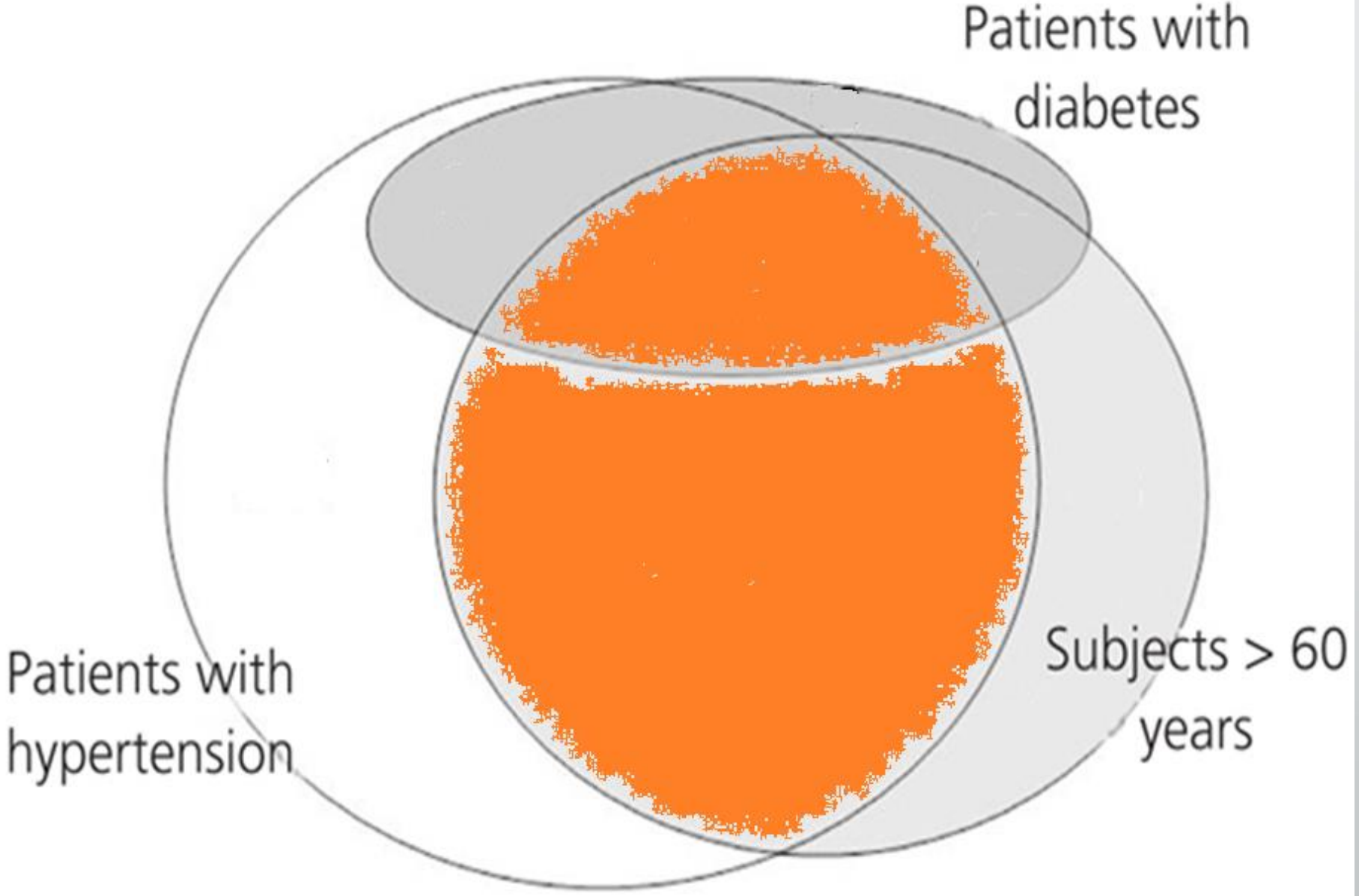


JNC 8 Algorithm




Patients with diabetes
Patients with hypertension
Subjects > 60 years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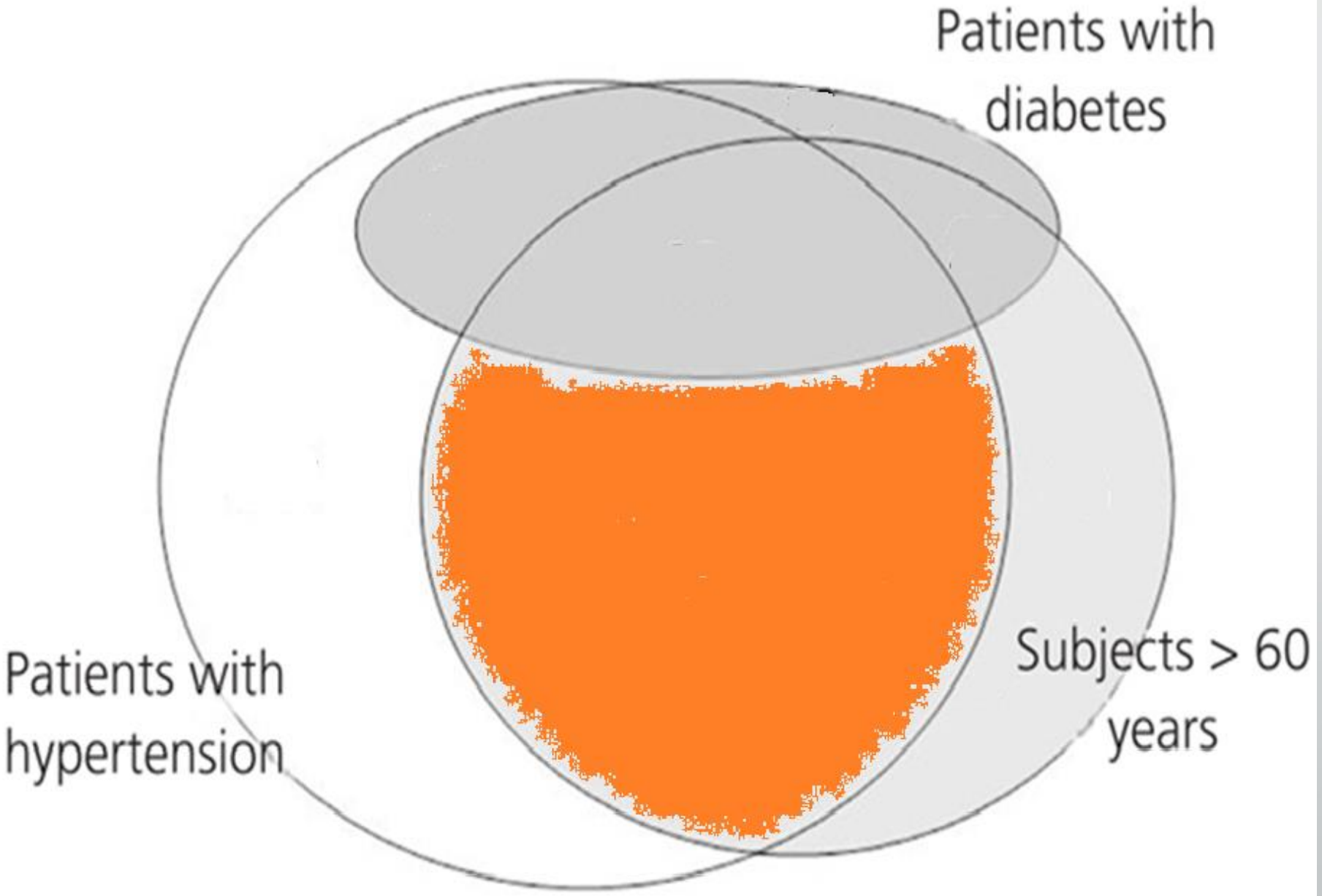
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Patients with hypertension
Subjects > 60 years

ACCF/AHA Expert Consensus Document

ACCF/AHA 2011 Expert Consensus Document on Hypertension in the Elderly

A Report of the American College of Cardiology Foundation Task Force on Clinical Expert Consensus Documents

Patient Type	Goal BP (mm Hg)	
Left ventricular dysfunction	<120/80	~ 30%
Diabetes mellitus	<130/80	~ 15%
Chronic renal disease	<130/80	~ 0.5%
CAD or CAD risk equivalents *	<130/80	~ 5 – 10 %
Carotid artery disease	<130/80	~ 30%
Peripheral arterial disease	<130/80	~ 8 - 38%
Abdominal aortic aneurysm	<130/80	~ 5%
High-risk (10-y FRS ≥10%)	<130/80	

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Framingham Coronary Heart Disease Risk Score ☆

Estimates risk of heart attack in 10 years.

Age	70	years
Sex	Female / **Male**	
Smoker	**No** / Yes	
Total cholesterol	4	mmol/L ⇋
HDL cholesterol	2	mmol/L ⇋
Systolic BP	142	mm Hg
Blood pressure being treated with medicines	No / **Yes**	

12.3 %

10-year risk of MI or death.

ESH/ ESC Guidelines for the management of arterial hypertension - 2013

Recommendations	Class	LoE
An SBP goal of <140 mmHg:		
a) is recommended in patients at low-moderate cardiovascular risk	I	B
b) is recommended in patients with diabetes	I	A
c) should be considered in patients with previous stroke or transient ischaemic attack	IIa	B
d) should be considered in patients with coronary heart disease	IIa	B
e) should be considered in patients with diabetic or non-diabetic chronic kidney disease	IIa	B

Are there any evidence support for lower SBP targets in elderly?

SPRINT Research Question

Examine effect of more intensive high blood pressure treatment than is currently recommended

Randomized Controlled Trial Target Systolic BP

Intensive Treatment Goal SBP < 120 mm Hg

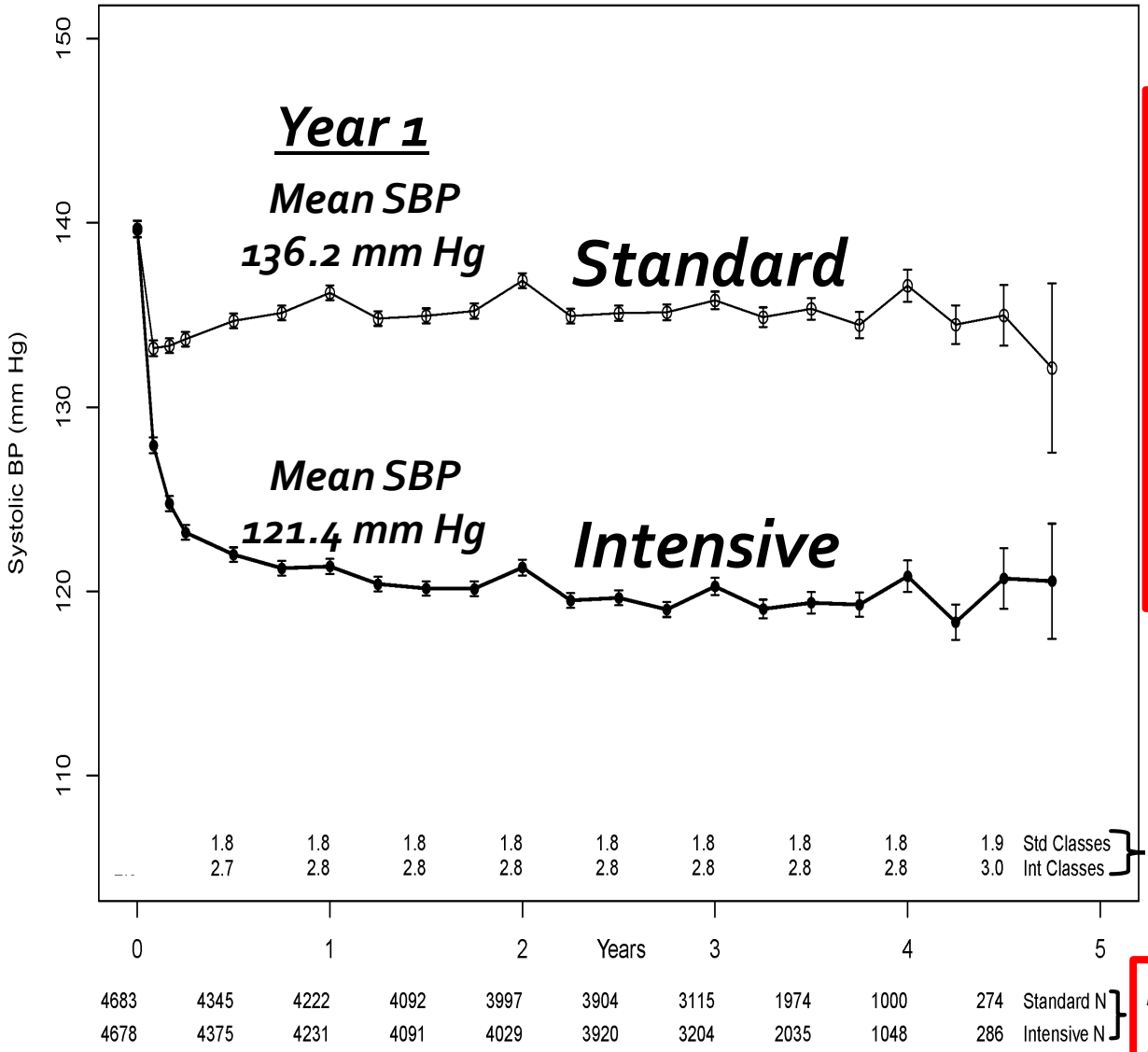
Standard Treatment Goal SBP < 140 mm Hg

SPRINT design details available at:

- *ClinicalTrials.gov (NCT01206062)*
- *Ambrosius WT et al. Clin. Trials. 2014;11:532-546.*

SPRINT
Systolic Blood Pressure Intervention Trial

Systolic BP During Follow-up



Average SBP
(During Follow-up)

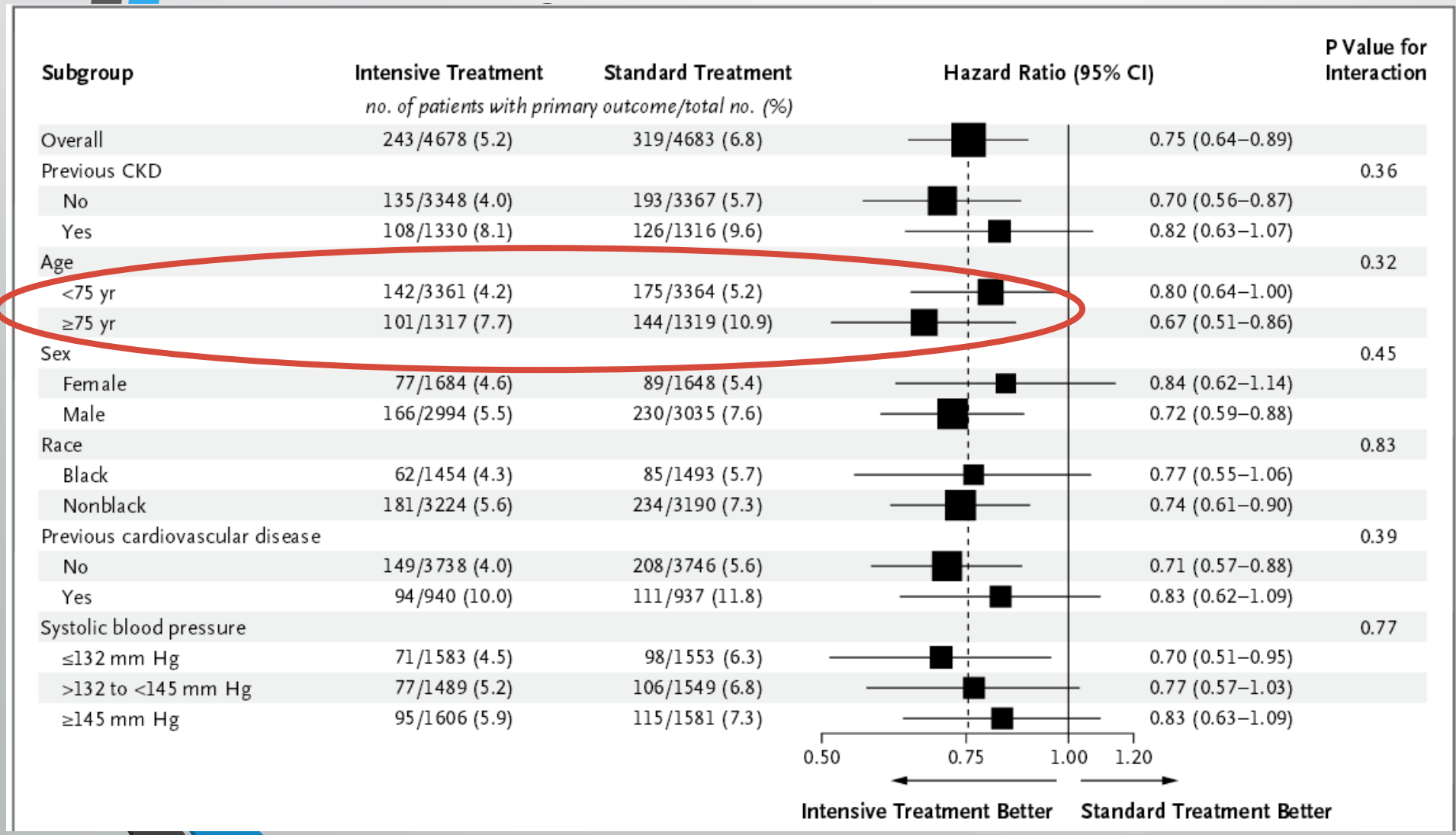
Standard: 134.6 mm Hg

Intensive: 121.5 mm Hg

Average number of antihypertensi

Number of participants

SPRINT
Systolic Blood Pressure Intervention Trial


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)
0.50
0.75
1.00
1.20
Intensive Treatment Better
Standard Treatment Better

FEVER (Felodipine Event Reduction) trial

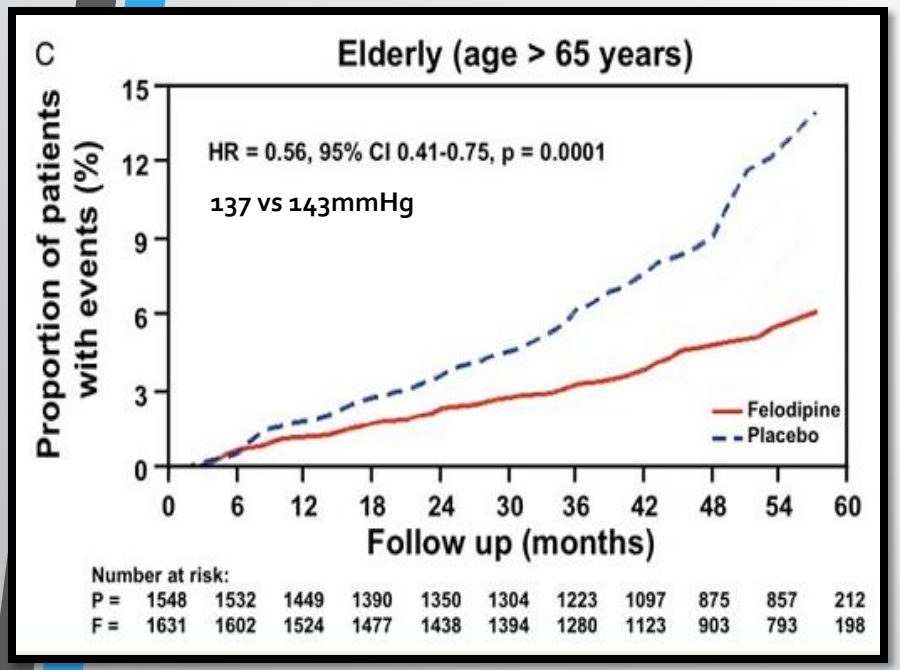
- **9711 Chinese** hypertensives 50 to 79 yr old; mean age,62 years)

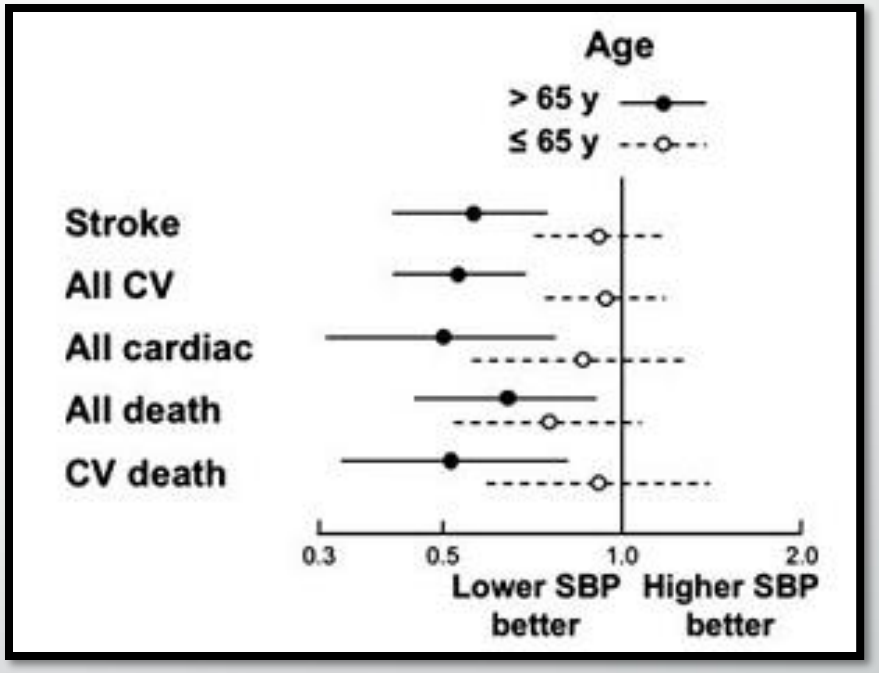
- Results
  - All cardiovascular events were reduced by 27% (P < 0.001),
  - Death by any cause by 31% (p = 0.006),
  - Coronary events by 32% (P = 0.024),
  - Heart failure by 30% (P = 0.239),

FEVER supports <140mm Hg goal for elderly

J Hypertens. 2005;23: 2157-72.

FEVER trial: subgroup analysis: age >65 yrs





Significantly reduced stroke, cardiovascular events, cardiac events, and all death by 40–50% in elderly patients(>65yrs)

European Heart Journal (2011) 32, 1500–1508

Trials suggests a goal SBP <140mm Hg may be more appropriate for ages 60-80

FEVER trial - n= 9711

SPS3 trial - n= 3020

Will Raising Recommended Systolic BP Threshold Yield More Strokes?

- 1706 individuals **at least 60 years old** without a history of stroke, diabetes, or chronic kidney disease at baseline.
- They were observed for a median of **13 years.**
- Systolic blood pressure between 140 and 149 mm Hg was **particularly associated with a higher risk for stroke** among Hispanic and non-Hispanic black participants, and among women vs men.

International Stroke Conference (ISC) 2015. Abstract 79. **Presented February 11, 2015**.

SPS3 trial
(Secondary Prevention of Small Subcortical Strokes)

- Targeting a systolic BP of< 130 mm Hg,
- N= 3020 hypertensives
- Mean age, 63 years
- Results
  - **Markedly reduces hemorrhagic strokes by nearly 50% (P<0.01)**

Lancet. 2013;382:507-15.

<140 mm Hg for all: Simplify implementation

Thank you