

Update: Hypertonie

WS 42 – Salle 3 – 4 Stravinski

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Hypertension – something is going on again ...

- A brief view on the **2017 US guidelines** for the management of hypertension



- A current case from our hypertension clinic, and ...
- ... what the new **2018 European guidelines** tell us
- ... how the new **2018 European guidelines** have changed my approach to the management of arterial hypertension

November 2017, Anaheim, California:

The 2017 ACC/AHA/AAPA/ABC/ACPM/AGS/APhA/ASH/ASPC/NMA/PCNA Guideline for the Prevention, Detection, Evaluation, and Management of High Blood Pressure in Adults

Clinical Practice Guideline

2017 ACC/AHA/AAPA/ABC/ACPM/AGS/APhA/ASH/ASPC/NMA/PCNA Guideline for the Prevention, Detection, Evaluation, and Management of High Blood Pressure in Adults

A Report of the American College of Cardiology/American Heart Association Task Force on Clinical Practice Guidelines

398 pages

Clinical Practice Guideline: Executive Summary

2017 ACC/AHA/AAPA/ABC/ACPM/AGS/APhA/ASH/ASPC/NMA/PCNA Guideline for the Prevention, Detection, Evaluation, and Management of High Blood Pressure in Adults: Executive Summary

A Report of the American College of Cardiology/American Heart Association Task Force on Clinical Practice Guidelines

350 pages

Systematic Review

Systematic Review for the 2017 ACC/AHA/AAPA/ABC/ACPM/AGS/APhA/ASH/ASPC/NMA/PCNA Guideline for the Prevention, Detection, Evaluation, and Management of High Blood Pressure in Adults

A Report of the American College of Cardiology/American Heart Association Task Force on Clinical Practice Guidelines

140 pages



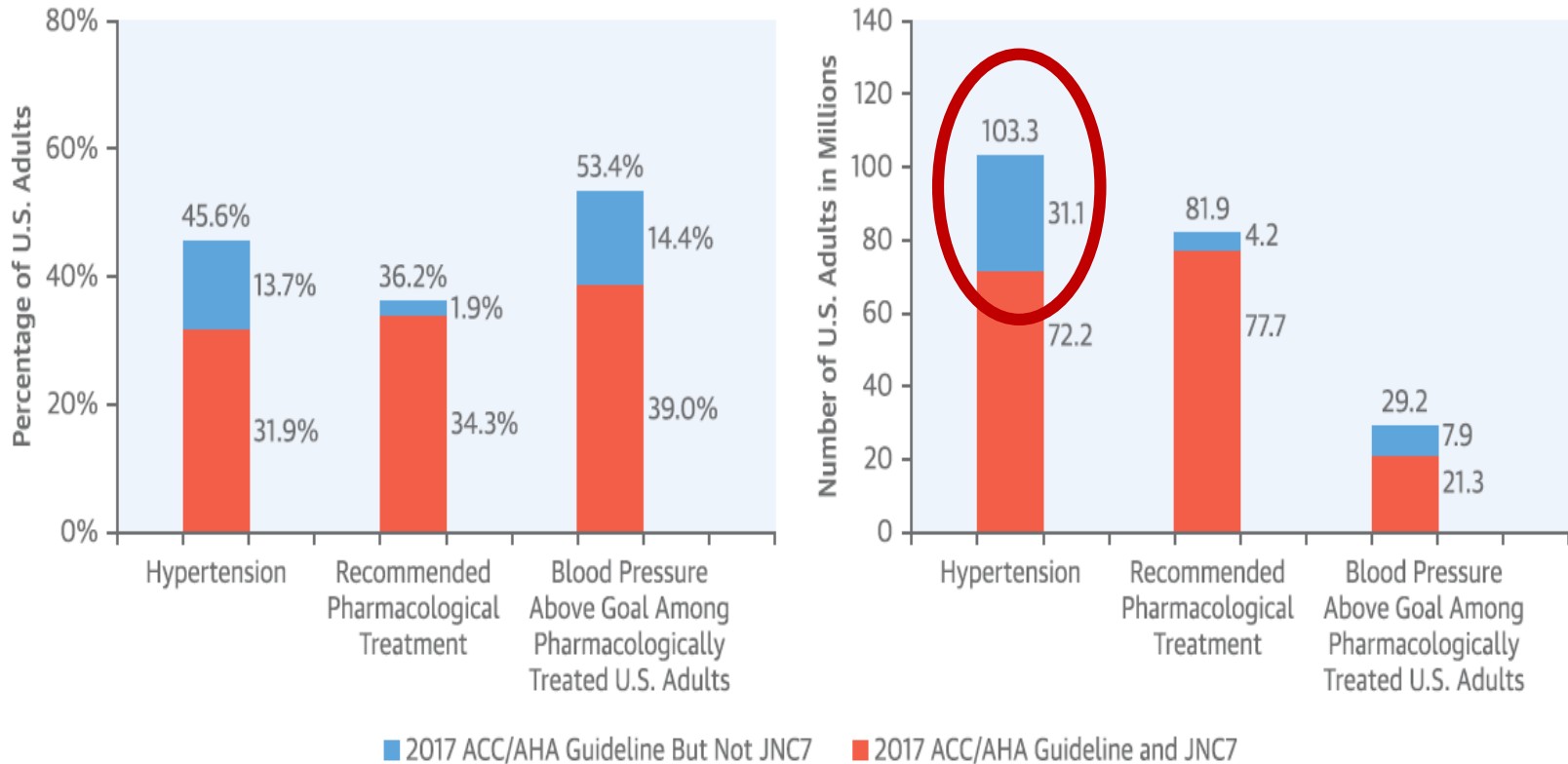
Whelton PK et al., Hypertension, 2017.

New definition/classification of arterial hypertension

BP category	systolic		diastolic
Normal	<120 mmHg	and	<80 mmHg
Elevated	120–129 mmHg	and	<80 mmHg
Hypertension			
Stage 1	130-139 mmHg	or	80-89 mmHg
Stage 2	≥140 mmHg	or	≥90 mmHg

Whelton PK et al., Hypertension, 2017.

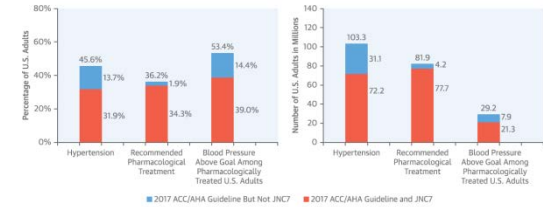
The new definition/classification and the consequences



NHANES 2011 – 2014.

New definition of arterial hypertension

Why was it changed ?



Big Pharma Gets a Big Win From Trump

The president campaigned on stinging criticisms of the pharmaceutical industry and promises to use Medicare to lower drug prices. But none of that materialized in his drug-pricing speech this week.



Donald J. Trump
@realDonaldTrump



Following

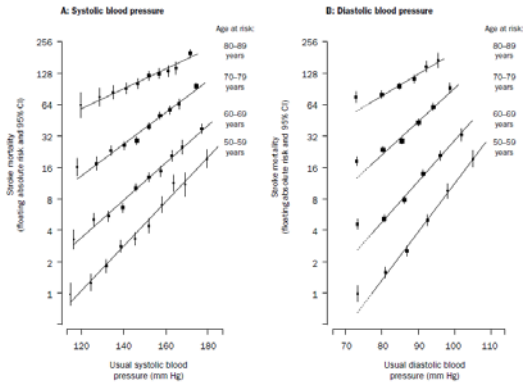
...time for Republicans & Democrats to get together and come up with a healthcare plan that really works - much less expensive & FAR BETTER!

© Donald Trump/Twitter

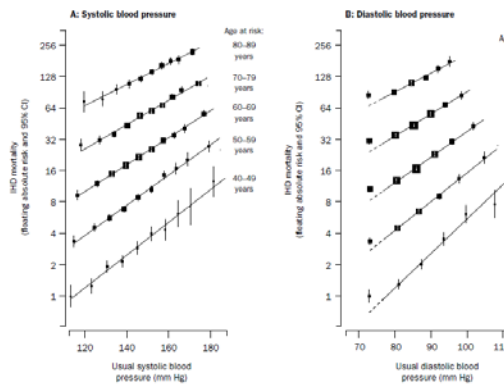


Is the new definition/classification justifiable ?

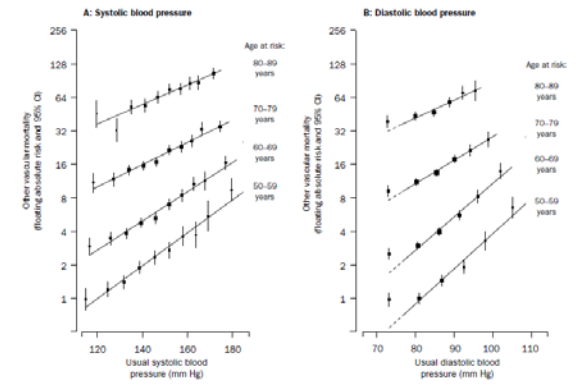
Stroke



Ischemic heart disease



Other vascular disease

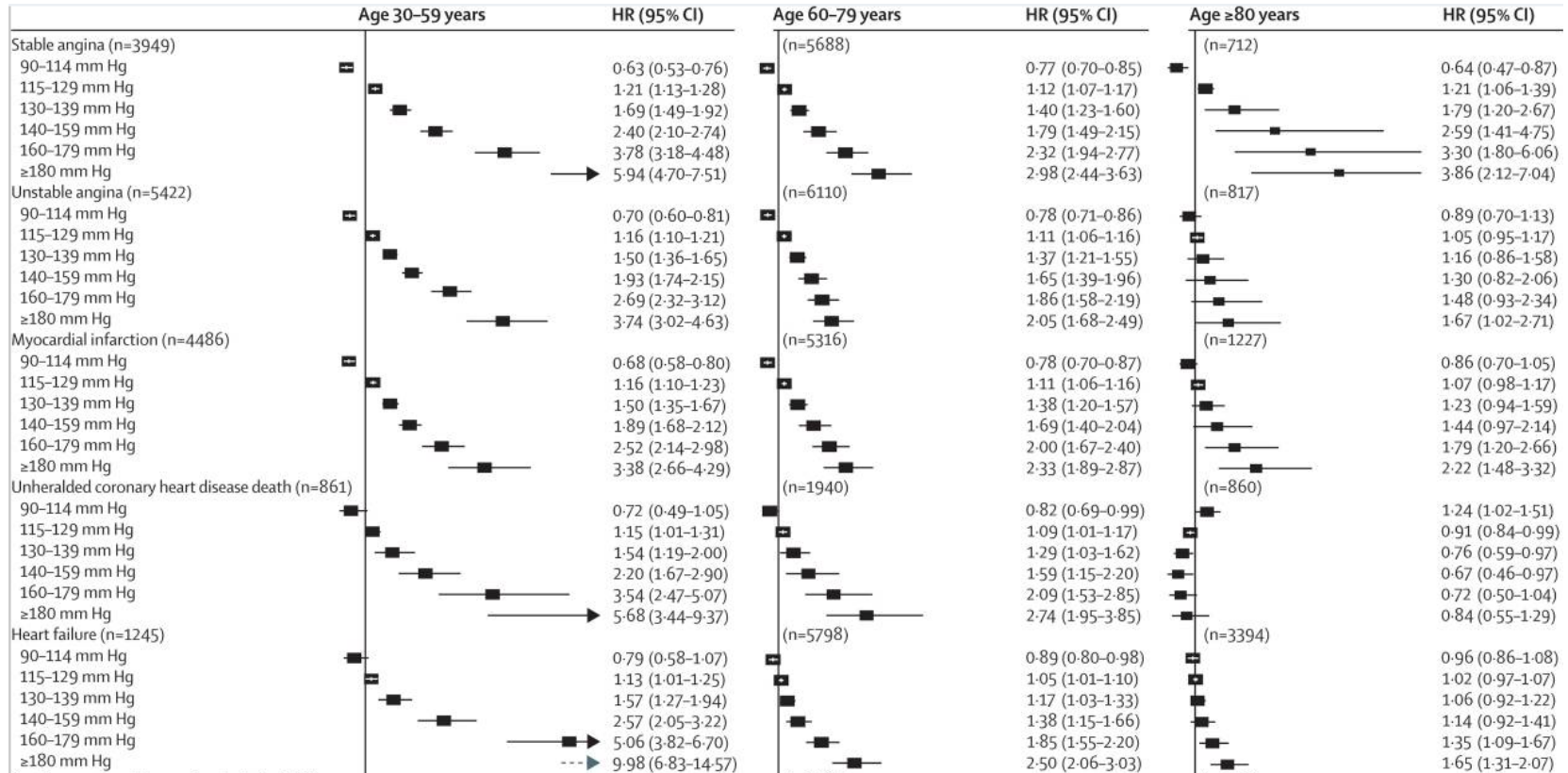


Mortality doubled (x 2) for every 20/10 mmHg BP increase !

Prospectives Studies Collaboration, Lancet, 2002.

BP and cardiovascular risk

Example: systolic BP



vs. reference SBP = 115 mmHg

Rapsomaniki et al., Lancet, 2014.

New values for treatment initiation, new targets



Initiation of antihypertensive treatment Clinical situation	systolic	diastolic
Secondary prevention, patients with known cardiovascular disease	130	80
Primary prevention, 10-year ASCVD risk \geq 10%	130	80
Primary prevention, 10-year ASCVD risk $<$ 10%	140	90



Treatment targets Clinical situation	systolic	diastolic
Known cardiovascular disease, 10-year ASCVD risk \geq 10%	<130	<80
No additional marker for increased cardiovascular risk	<130	<80



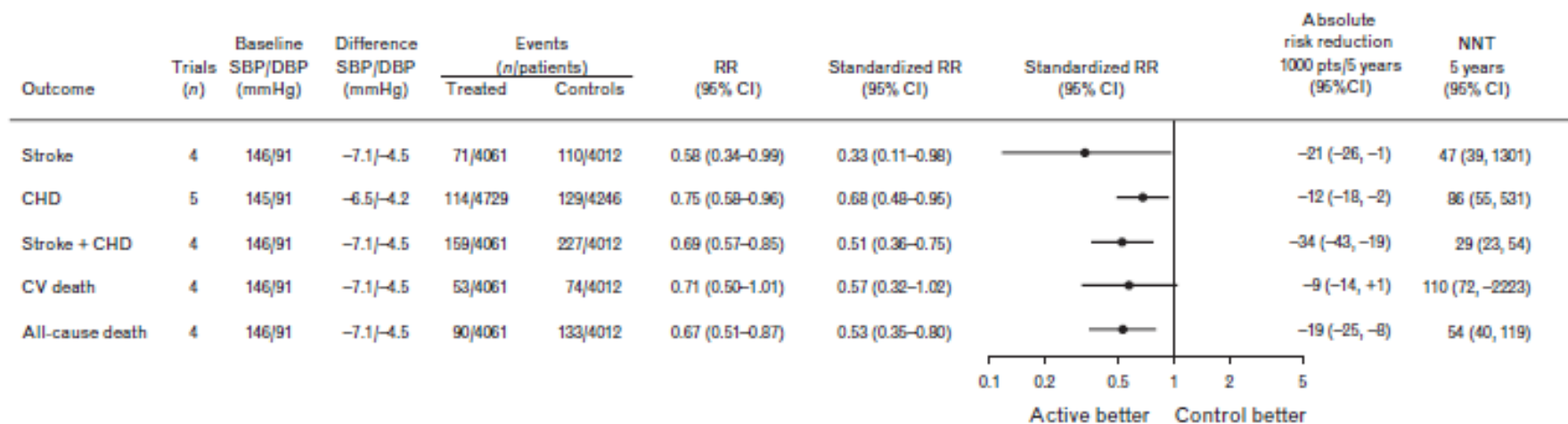
Estimation of 10-year atherosclerotic cardiovascular disease (ASCVD):

<http://tools.acc.org/ASCVD-Risk-Estimator/>

Whelton PK et al., Hypertension, 2017.

Are lower target values justified ?

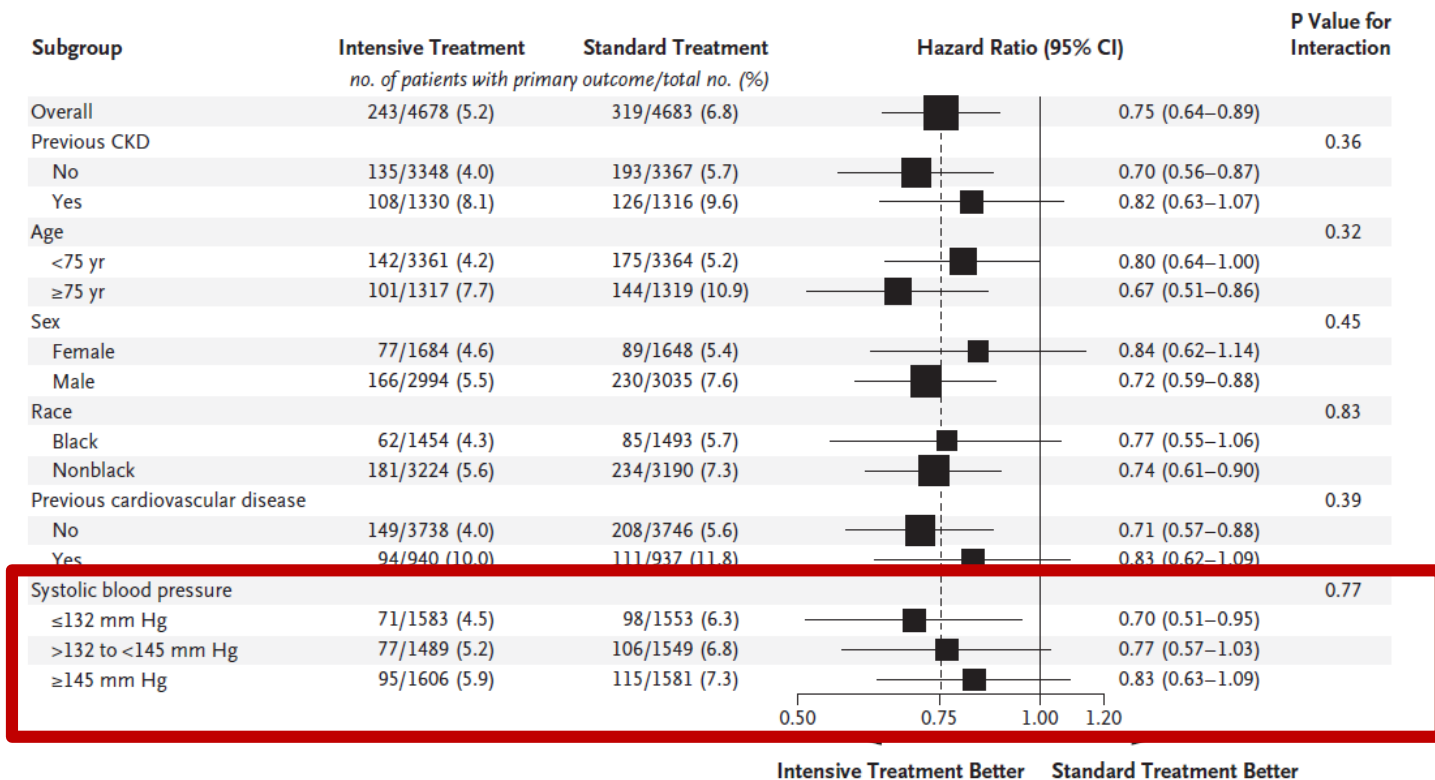
Blutdrucksenkung bei Stage 1 Hypertonie und niedrigem/mässigem Risiko



Thomopoulos C et al., J Hypertens, 2014.

Are lower target values justified ?

Protective effect in all BP subgroups in the SPRINT trial



Wright JR et al., New Engl J Med, 2015.

But: how much does SPRINT really tell us?

Landmark NIH study shows intensive blood pressure management may save lives

Embargoed for Release: September 11, 2015, 10:30 AM EDT

Lower blood pressure target greatly reduces cardiovascular complications and deaths in older adults

More intensive management of high blood pressure, below a commonly recommended blood pressure target, significantly reduces rates of cardiovascular disease, and lowers risk of death in a group of adults 50 years and older with high blood pressure. This is according to the initial results of a landmark clinical trial sponsored by the National Institutes of Health called SPRINT, which compared intensive treatment (systolic target BP <120 mmHg) versus standard treatment (systolic target BP <140 mmHg). The study found that intensive treatment significantly reduced the risk of cardiovascular death, stroke, and heart failure compared with standard treatment.

Intensive treatment: Systolic target BP <120 mmHg

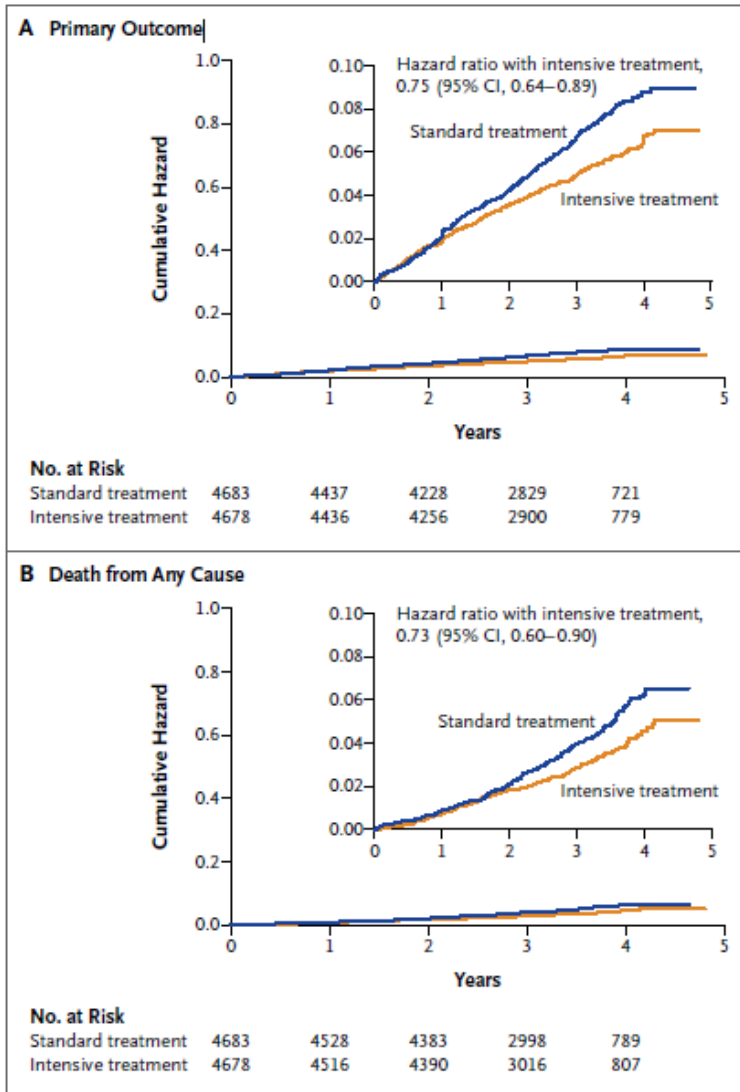
Standard treatment: Systolic target BP <140 mmHg

"This study provides potentially lifesaving information that will be useful to health care providers as they consider the best treatment options for some of their patients, particularly those over the age of 50," said Gary H. Gibbons, M.D., director of the National Heart, Lung, and Blood Institute (NHLBI), the primary sponsor of SPRINT. "We are delighted to have achieved this important milestone in the study in advance of the expected closure date for the SPRINT trial and look forward to quickly communicating the results to help inform patient care and the future development of evidence-based clinical guidelines."

High blood pressure, or hypertension, is a leading risk factor for heart disease, stroke, kidney failure, and other health problems. An estimated 1 in 3 people in the United States

NIH Press Release, September 2015.

Some remarks concerning SPRINT



Primary Outcome
(MI, ACS, Stroke, HF, CV Death)

-25%

Death
(all cause)

-27%

Death
(cardiovascular cause)

-43%

Heart failure

-38%

SPRINT Research Group, New Engl J Med, 2015.

BP measurement in SPRINT

SPRINT «Manual of Procedures»:

“During the 5 minute rest period, participants should be resting and should not be completing questionnaires or speaking with study staff. The staff member should leave the room during this 5 minute rest period. The following script can be used at this time.

“In SPRINT, study staff were trained to program an Omron 907XL (Omron Healthcare Inc, Lake Forest, IL) to wait 5 minutes and then record 3 readings at 1-minute intervals. After the device was activated, research staff left the examining room, with the patient then being alone during the 5

SPRINT is the first outcome trial ever to utilize un-attended automated office BP – a BP method previously not validated against cardiovascular endpoints

“With their agreement, leave the room and return in 5 minutes. Push the button on the machine and wait for the output. Record the systolic and diastolic blood pressure and pulse readings obtained at each of the three readings.”

<http://cardiobrief.org/2016/09/06/sprint-more-controversy-and-confusion-about-landmark-trial/>

Myers MG et al., Hypertension, 2016

«Unattended blood pressure measurement» in SPRINT

Comparison to conventional office BP measurements

	All patients	Untreated	Treated
Number of patients	422	174	248
Number of males	202	88	114
Number of females	220	86	134
Mean age (\pm SD)	58.6 (14.1)	52.9 (14.6)	62.6 (12.3)
Excess alcohol use	27	11	16
Cigarette smoker	56	16	40
Diabetes mellitus	50	3	47
Initial office systolic BP	155.1 (18.7)*	153.6 (17.3)*	156.2 (19.5)*
Initial office diastolic BP	90.2 (12.7)*	93.3 (11.1)*	88.0 (13.3)*
Automated office systolic BP	140.5 (19.8)	138.4 (18.9)	142.0 (20.3)
Automated office diastolic BP	83.1 (11.2)**	85.1 (9.9)	81.7 (11.8)
Awake ambulatory systolic BP	139.4 (13.4)	138.6 (12.6)	139.9 (10.8)
Awake ambulatory diastolic BP	80.7 (10.6)	83.6 (9.5)	81.7 (11.8)

Δ OBPM - aOBPM:

14.6 / 7.1 mmHg *

Δ OBPM - AABPM:

15.7 / 9.5 mmHg *

BP, blood pressure.

*Denotes $P < 0.001$ versus automated office BP and awake ambulatory BP.

**Denotes $P < 0.002$ versus awake ambulatory BP.

Systolic BP (SPRINT)

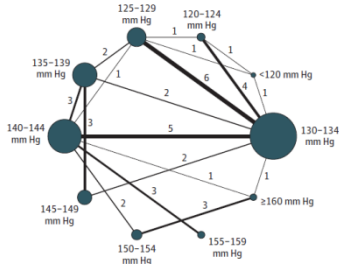
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Systolic BP 125-135 mmHg (conventional BPM)

Bakris G, Circulation, 2016; Armstrong D et al., Blood Press Monit, 2015.

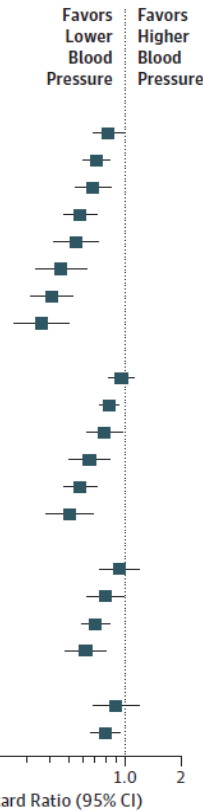
Is lower really better ?

A look at the most recent meta-analysis



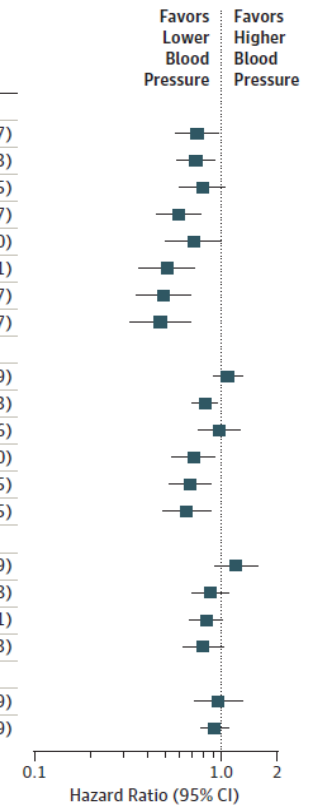
Cardiovascular disease

Mean Achieved Systolic Blood Pressure, mm Hg	Hazard Ratio (95% CI)
Reduction to 120-124	
120-124 vs 125-129	0.82 (0.67-0.97)
120-124 vs 130-134	0.71 (0.60-0.83)
120-124 vs 135-139	0.68 (0.55-0.85)
120-124 vs 140-144	0.58 (0.48-0.72)
120-124 vs 145-149	0.55 (0.42-0.72)
120-124 vs 150-154	0.46 (0.34-0.63)
120-124 vs 155-159	0.41 (0.32-0.54)
120-124 vs ≥ 160	0.36 (0.26-0.51)
Reduction to 130-134	
130-134 vs 135-139	0.96 (0.83-1.14)
130-134 vs 140-144	0.83 (0.74-0.94)
130-134 vs 145-149	0.78 (0.63-0.98)
130-134 vs 150-154	0.65 (0.51-0.85)
130-134 vs 155-159	0.58 (0.48-0.72)
130-134 vs ≥ 160	0.51 (0.39-0.69)
Reduction to 140-144	
140-144 vs 145-149	0.94 (0.74-1.20)
140-144 vs 150-154	0.79 (0.63-0.99)
140-144 vs 155-159	0.70 (0.60-0.84)
140-144 vs ≥ 160	0.62 (0.48-0.80)
Reduction to 150-154	
150-154 vs 155-159	0.90 (0.68-1.19)
150-154 vs ≥ 160	0.79 (0.66-0.94)



All-cause mortality

Mean Achieved Systolic Blood Pressure, mm Hg	Hazard Ratio (95% CI)
Reduction to 120-124	
120-124 vs 125-129	0.74 (0.57-0.97)
120-124 vs 130-134	0.73 (0.58-0.93)
120-124 vs 135-139	0.79 (0.59-1.05)
120-124 vs 140-144	0.59 (0.45-0.77)
120-124 vs 145-149	0.71 (0.50-1.00)
120-124 vs 150-154	0.51 (0.36-0.71)
120-124 vs 155-159	0.49 (0.34-0.67)
120-124 vs ≥ 160	0.47 (0.32-0.67)
Reduction to 130-134	
130-134 vs 135-139	1.08 (0.90-1.29)
130-134 vs 140-144	0.82 (0.68-0.93)
130-134 vs 145-149	0.97 (0.75-1.26)
130-134 vs 150-154	0.71 (0.53-0.90)
130-134 vs 155-159	0.68 (0.51-0.85)
130-134 vs ≥ 160	0.68 (0.47-0.85)
Reduction to 140-144	
140-144 vs 145-149	1.20 (0.93-1.59)
140-144 vs 150-154	0.87 (0.69-1.08)
140-144 vs 155-159	0.83 (0.67-1.01)
140-144 vs ≥ 160	0.80 (0.62-1.03)
Reduction to 150-154	
150-154 vs 155-159	0.96 (0.71-1.29)
150-154 vs ≥ 160	0.92 (0.77-1.09)



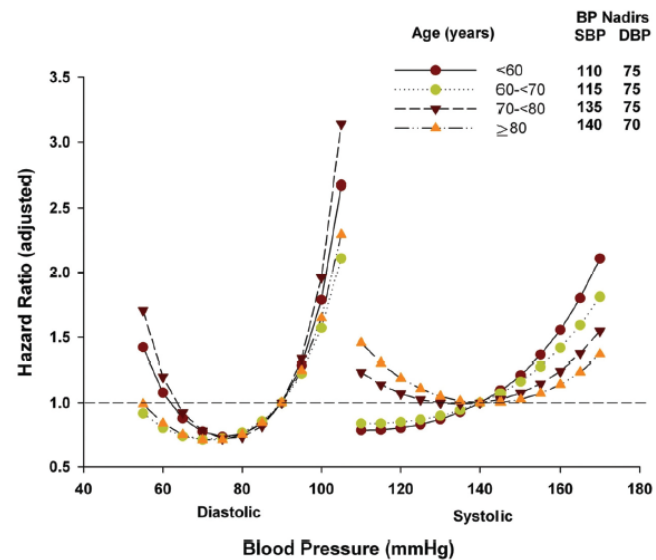
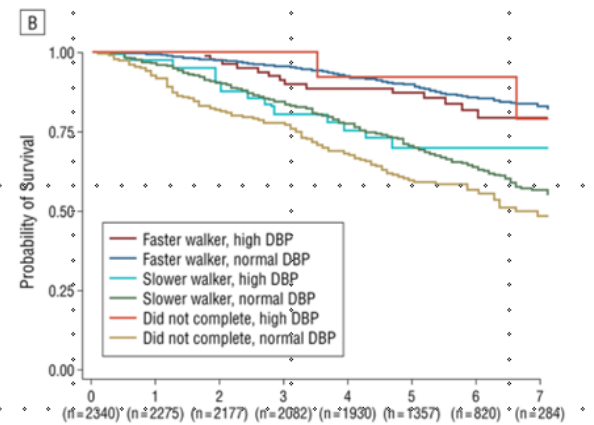
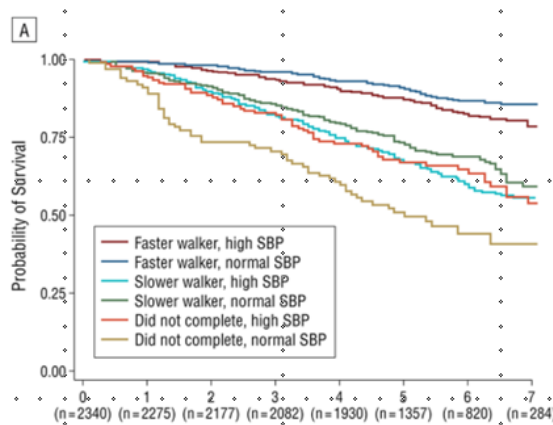
Similar trend after exclusion of SPRINT data !

Bundy JD et al., JAMA Cardiol, 2017.

Is this correct for all patient groups?

Elderly patients, frail patients

Recommendations for Treatment of Hypertension in Older Persons		
References that support recommendations are summarized in Online Data Supplement 54.		
COR	LOE	Recommendations
I	A	1. Treatment of hypertension with a SBP treatment goal of less than 130 mm Hg is recommended for noninstitutionalized ambulatory community-dwelling adults (≥65 years of age) with an average SBP of 130 mm Hg or higher. ^{510,511}
IIa	C-E0	2. For older adults (≥65 years of age) with hypertension and a high burden of comorbidity and limited life expectancy, clinical judgment, patient preference, and a team-based approach to assess risk/benefit is reasonable for decisions regarding intensity of BP lowering and choice of antihypertensive drugs.



No guidance for the management of arterial hypertension in elderly, frail patients provided!

Same as for all other guidelines!

Odden et al., Arch Int Med, 2012; Denardo et al., Am J Med, 2010.

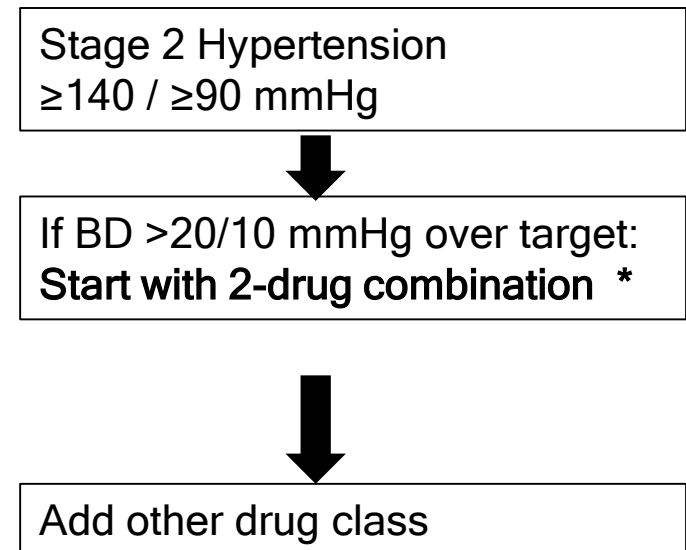
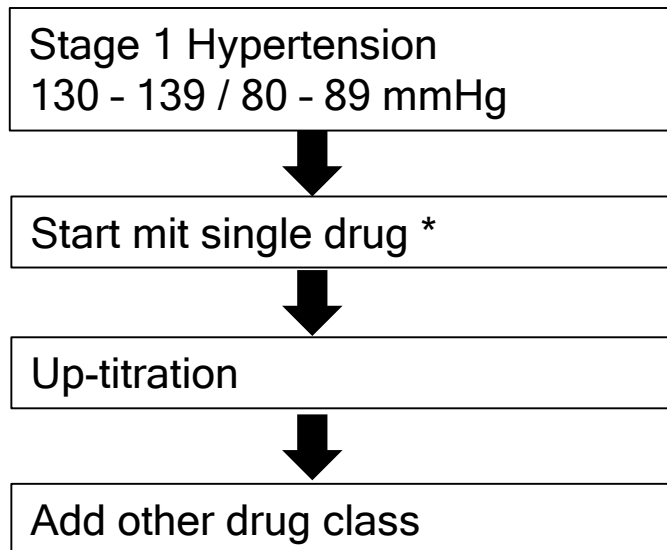
Which medication, when, and how much ?

First-line-therapies *

Diuretics

Ca-antagonists

ACEI/sartans

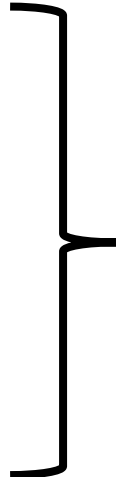


Whelton et al., Hypertension, 2017.

Summary:

The hypertension world after the publication of the new American guidelines recommend

- A new, more aggressive definition/classification of hypertension
- New, more aggressive cut-offs for treatment initiation
- New, more aggressive target values
- Initiation of treatment with two drugs
- More precise BP measurement
- Atherosclerotic risk guides treatment decisions in all BP stages



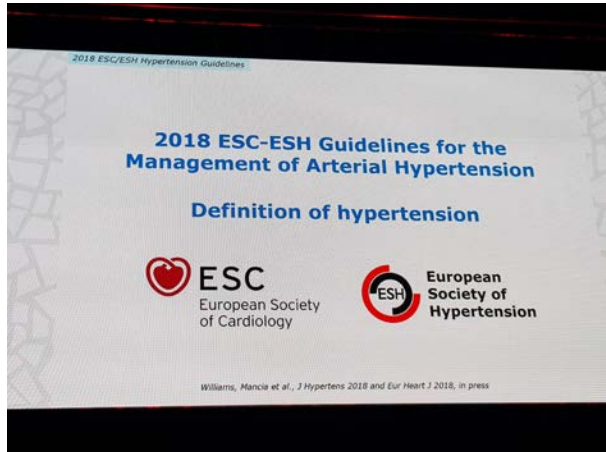
Triggered a very emotional discussion on the sense and nonsense of the new guidelines

Do we have to approach hypertension in a different way ?

Whelton PK et al., Hypertension, 2017.

Juni 2018, ESH Barcelona

August 2018, ESC Munich



2018 ESC/ESH Guidelines for the management of arterial hypertension

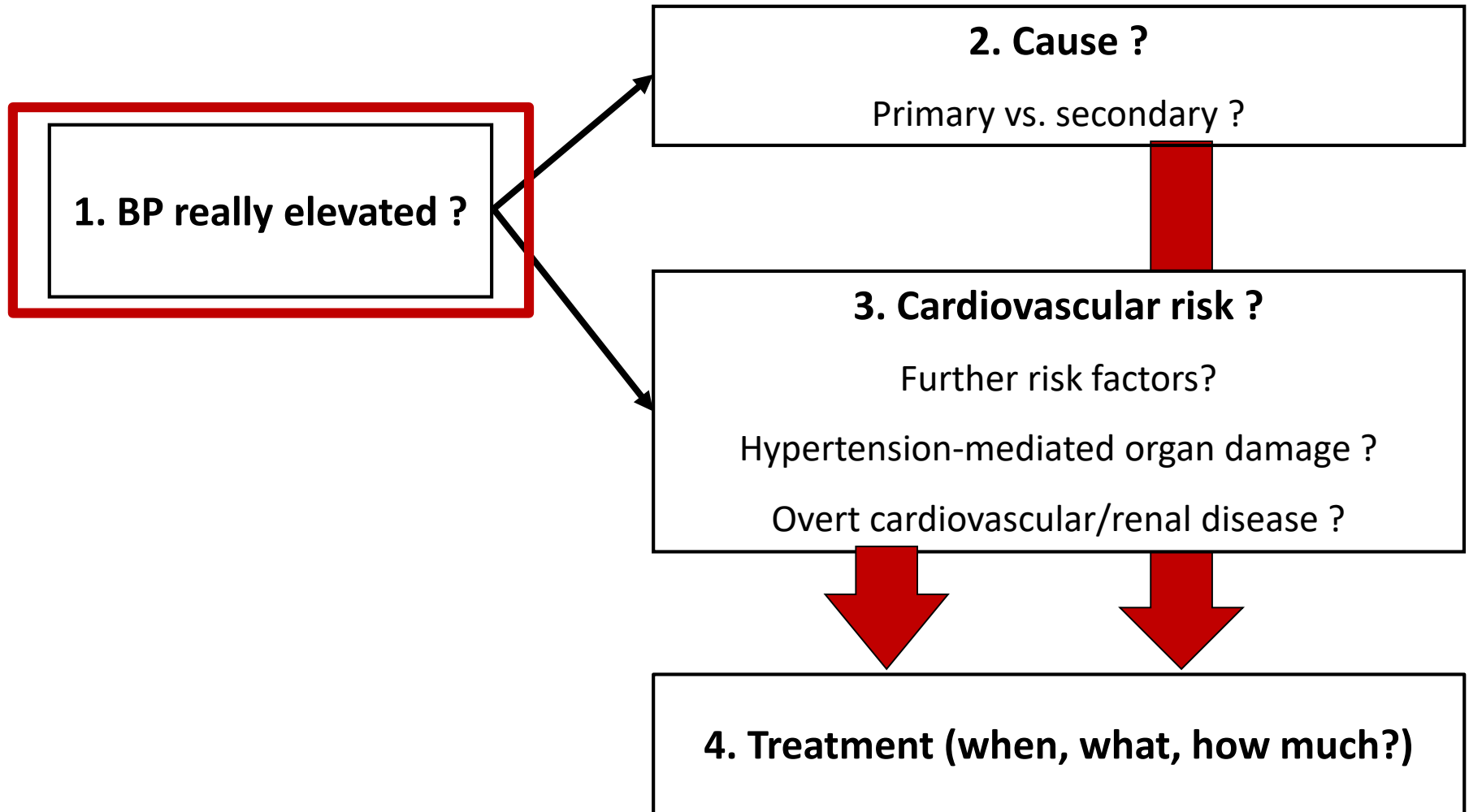
The Task Force for the management of arterial hypertension of the European Society of Cardiology (ESC) and the European Society of Hypertension (ESH)

Williams B. et al., Eur Heart J, 2018.

Mr T., *1973 – a patient from our hypertension clinic

- Repetitive home BP measurements in the range of 150-160/100-105 mmHg since January 2018
- Feels well, no difficulties exercising, fitness training 3x/week
- Pre-ex. cond.: Meulengracht's disease
Dyslipidemia (Hypercholesterolemia, Hypertriglyceridemia)
Neuropathia vestibularis
- Family history: unremarkable
- Social history: married, 2 children (3 and 1 year old);
Physician working at a pharmaceutical company, huge time pressure
- Medication: none

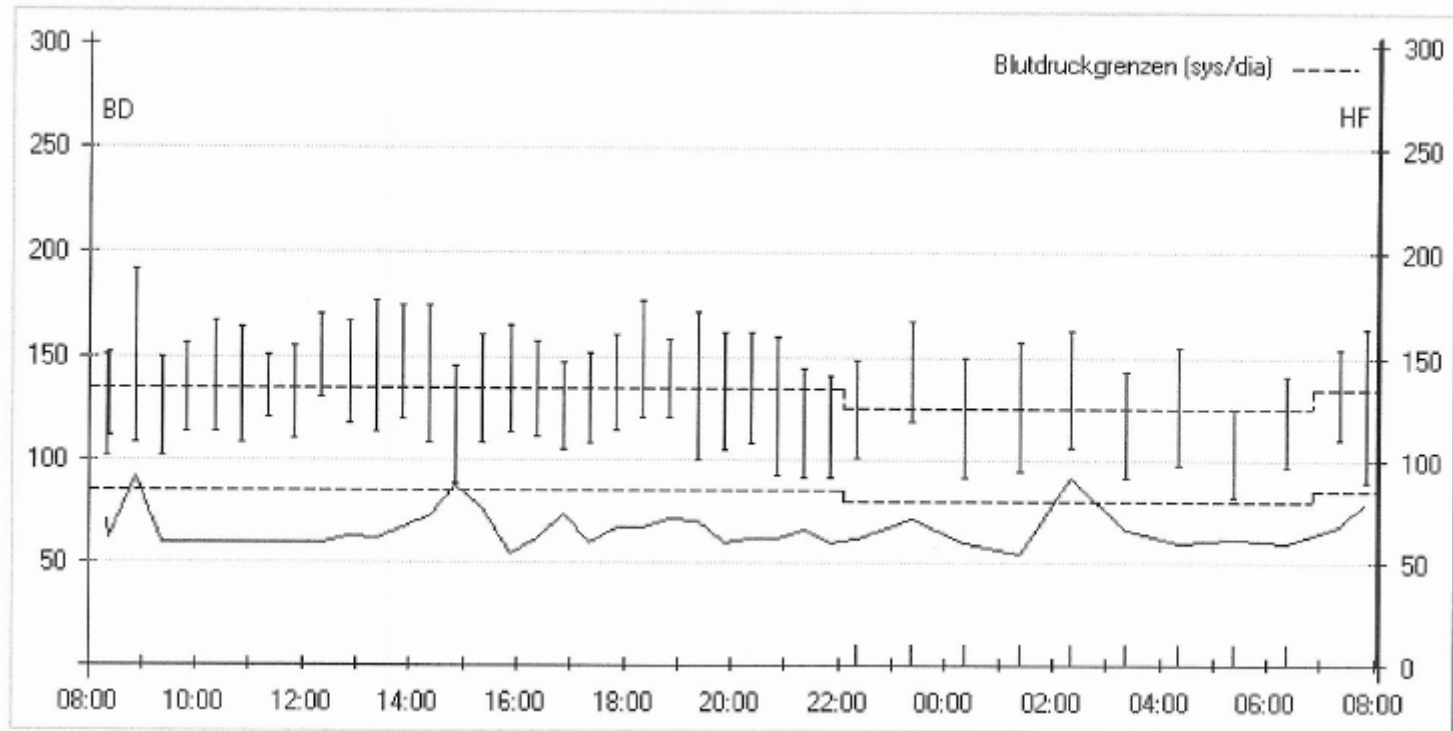
Newly detected high BP: what should be considered ?



Mr T., *1973 – Follow-up

- **BP at 1. visit: 180/110 mmHg**
- Physical examination without particularities
- Diagnostic evaluation is started together with an immediate antihypertensive therapy with Lercanidipine 20 mg
- **BP at 2. visit (+ 2 weeks): 143/100 mmHg**

Herr T., *1973 – Ambulatory BP measurement

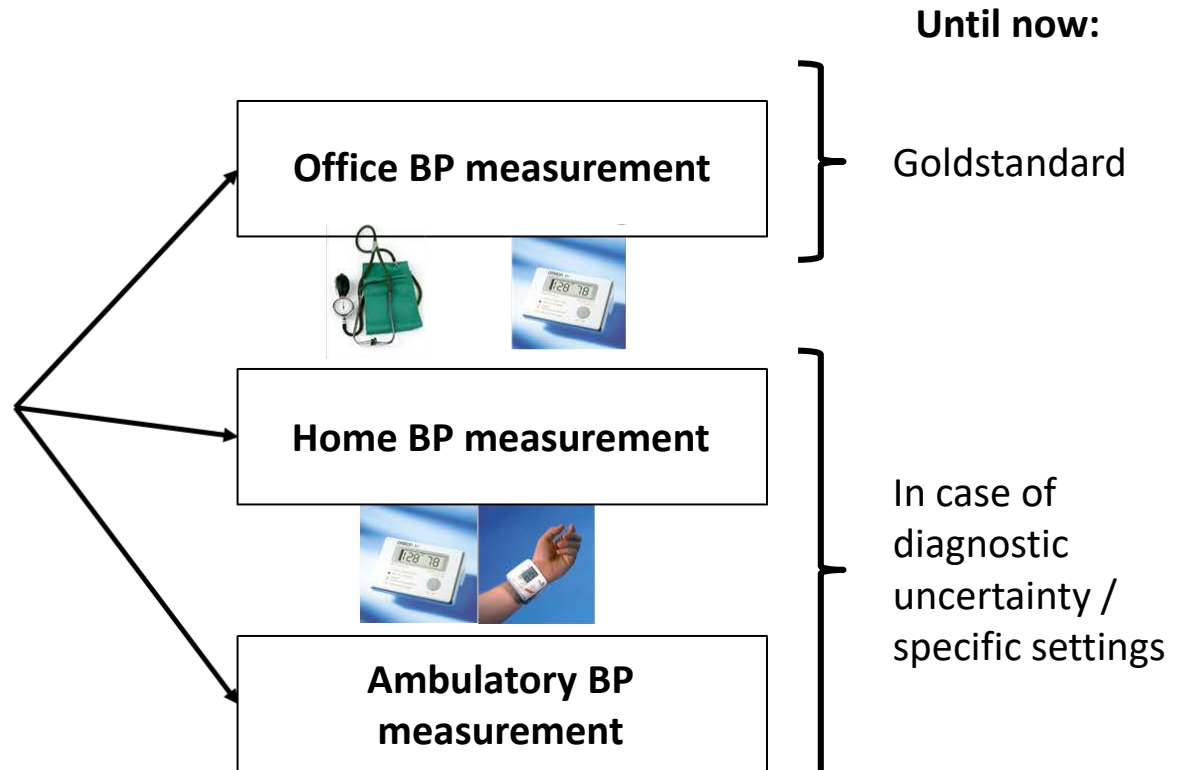


Average 24h: 158 / 106 mmHg
Day/awake: 161 / 109 mmHg
Night/sleeping: 150 / 98 mmHg

- **Arterial hypertension ? Confirmed !**

BP measurement – what's new in the guidelines ?

Meetings	+20.2	+15.0
Work	+16.0	+13.0
Walking	+12.0	+5.5
Dressing	+11.5	+9.7
Telephone	+9.5	+7.2
Eating	+8.8	+9.6
Talking	+6.7	+6.7
Desk work	+5.9	+5.3
Reading	+1.9	+2.2
Business (at home)	+1.6	+3.2
Television	+0.3	+1.1
Relaxing	0	0
Sleeping	-10.0	-7.6



Clinical indications for HBPM or ABPM	Specific indications for ABPM
<ul style="list-style-type: none"> -Suspicion of white-coat hypertension -Grade I hypertension in the office -High office BP in individuals without asymptomatic organ damage and at low total CV risk -Suspicion of masked hypertension -High normal BP in the office -Normal office BP in individuals with asymptomatic organ damage or at high total CV risk -Identification of white-coat effect in hypertensive patients -Considerable variability of office BP over the same or different visits -Autonomic, postural, post-prandial, siesta- and drug-induced hypotension -Elevated office BP or suspected pre-eclampsia in pregnant women -Identification of true and false resistant hypertension 	<ul style="list-style-type: none"> • Marked discordance between office BP and home BP • Assessment of dipping status • Suspicion of nocturnal hypertension or absence of dipping, such as in patients with sleep apnoea, CKD, or diabetes • Assessment of BP variability

How do I get reliable results?

Office BP measurement



When ?

- at each visit

How ?

- validated BP monitor, correct cuff size
- quiet environment, 5 minutes at rest
- no smoking, no coffee 30 minutes prior to measurement
- no alcohol 24 h prior to measurement

How often ?



- 3 measurements/visit
(Interval 1-2', until difference <10 mmHg)
- at first visit: Measurement on both sides and supine !

Depending on BP level!



Williams B. et al., Eur Heart J, 2018.

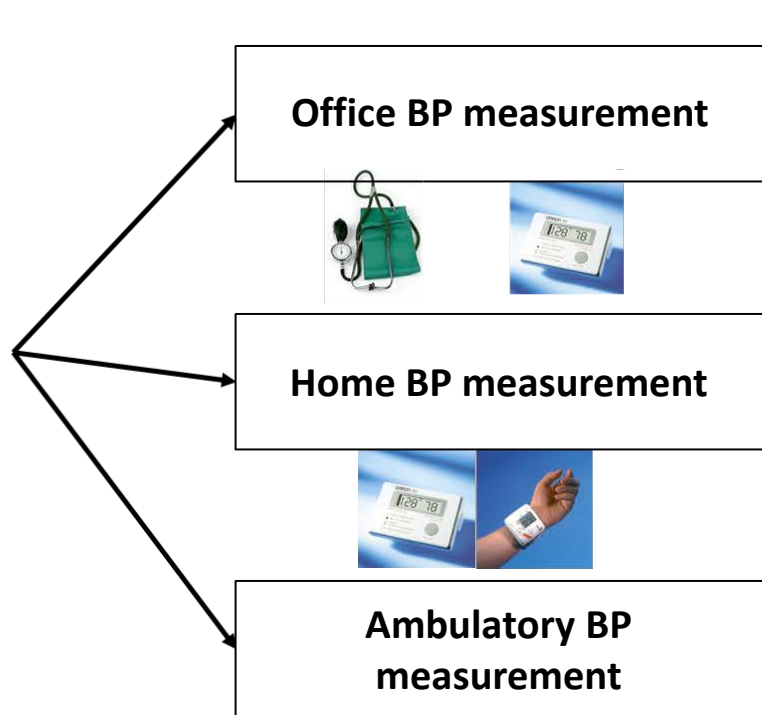
«New» European BP limits

							
Category	Systolic		Diastolic	Category	Systolic		diastolic
Optimal	< 120	and	< 80	Normal	<120	and	<80
Normal	120 – 129	and/or	80 – 84	Elevated	120-129	and	<80
High-normal	130 – 139	and/or	85 – 89	Stage 1	130-139	or	80-89
Grade 1	140 – 159	and/or	90 – 99	Stage 2	≥140	or	≥90
Grade 2	160 – 179	and/or	100 – 109				
Grade 3	≥ 180	and/or	≥ 110				
Isolated systolic hypertension	≥ 140	and	< 90				

Williams B. et al., Eur Heart J, 2018.

BP measurement – what's new in the guidelines ?

Meetings	+20.2	+15.0
Work	+16.0	+13.0
Walking	+12.0	+5.5
Dressing	+11.5	+9.7
Telephone	+9.5	+7.2
Eating	+8.8	+9.6
Talking	+6.7	+6.7
Desk work	+5.9	+5.3
Reading	+1.9	+2.2
Business (at home)	+1.6	+3.2
Television	+0.3	+1.1
Relaxing	0	0
Sleeping	-10.0	-7.6



New:

Diagnosis can be based on all three modalities !!

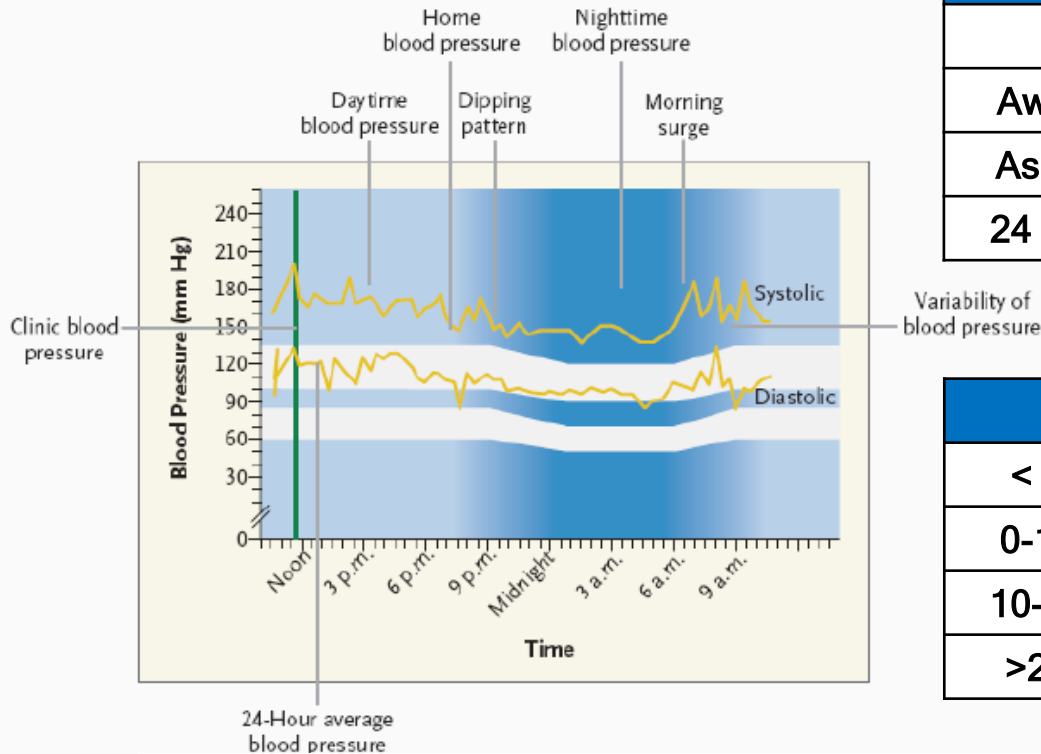


- Conditions in which white-coat hypertension is more common, e.g.
 - Grade I hypertension on office BP measurement
 - Marked office BP elevation without HMOD
- Conditions in which masked hypertension is more common, e.g.
 - High-normal BP
 - Normal office BP in individuals with HMOD or at high total CV risk
- Postural and postprandial hypotension in untreated and treated patients
- Evaluation of resistant hypertension
- Evaluation of BP control, especially in treated higher-risk patients
- Exaggerated BP response to exercise
- When there is considerable variability in the office BP
- Evaluating symptoms consistent with hypotension during treatment
- Specific indications for ABPM rather than HBPM:
 - Assessment of nocturnal BP values and dipping status (e.g. suspicion of nocturnal hypertension, such as in sleep apnea, CKD, diabetes, endocrine hypertension, or autonomic dysfunction)

Williams B. et al., Eur Heart J, 2018.

How do I get reliable results?

Ambulatory BP measurement



Blood Pressure Value (mmHg)			
	«Optimal»	Normal	Abnormal
Awake	< 130/80	< 135/85	≥ 135/85
Asleep	< 115/65	< 120/70	≥ 120/70
24 hour	< 125/75	< 130/80	≥ 130/80

Dipping Pattern	
< 0%	Inverse/reverse Dipping
0-10%	Non-Dipping
10-20%	Dipping
>20%	Extreme/Super Dipping

Quality criteria

Wake/Sleep Phase	≥ 14 / ≥ 7 measurements
SBP / DBP / PP	70-250 / 40-150 / 20-150 mmHg

Analysis not usable

≥ 30% missing values, missing values >2 consecutive hours, irregular activity-/rest phases, sleep phase < 6 h, > 12 h

2013 ESH/ESC Guidelines for the management of arterial hypertension, J Hypertens, 2013.

How do I get reliable results ?

Home/Self BP measurement

Setting ?

- seated, relaxed position
- at least 5 minutes at rest
- arm on firm support
- cuff at heart level
- measurement at arm with higher BP



How often ?

- at least 2x in the morning, 2x in the evening
- at least for 7 days

Reference value ? <135 / 85 mmHg

Documentation

- log book
- electronic memory (!)

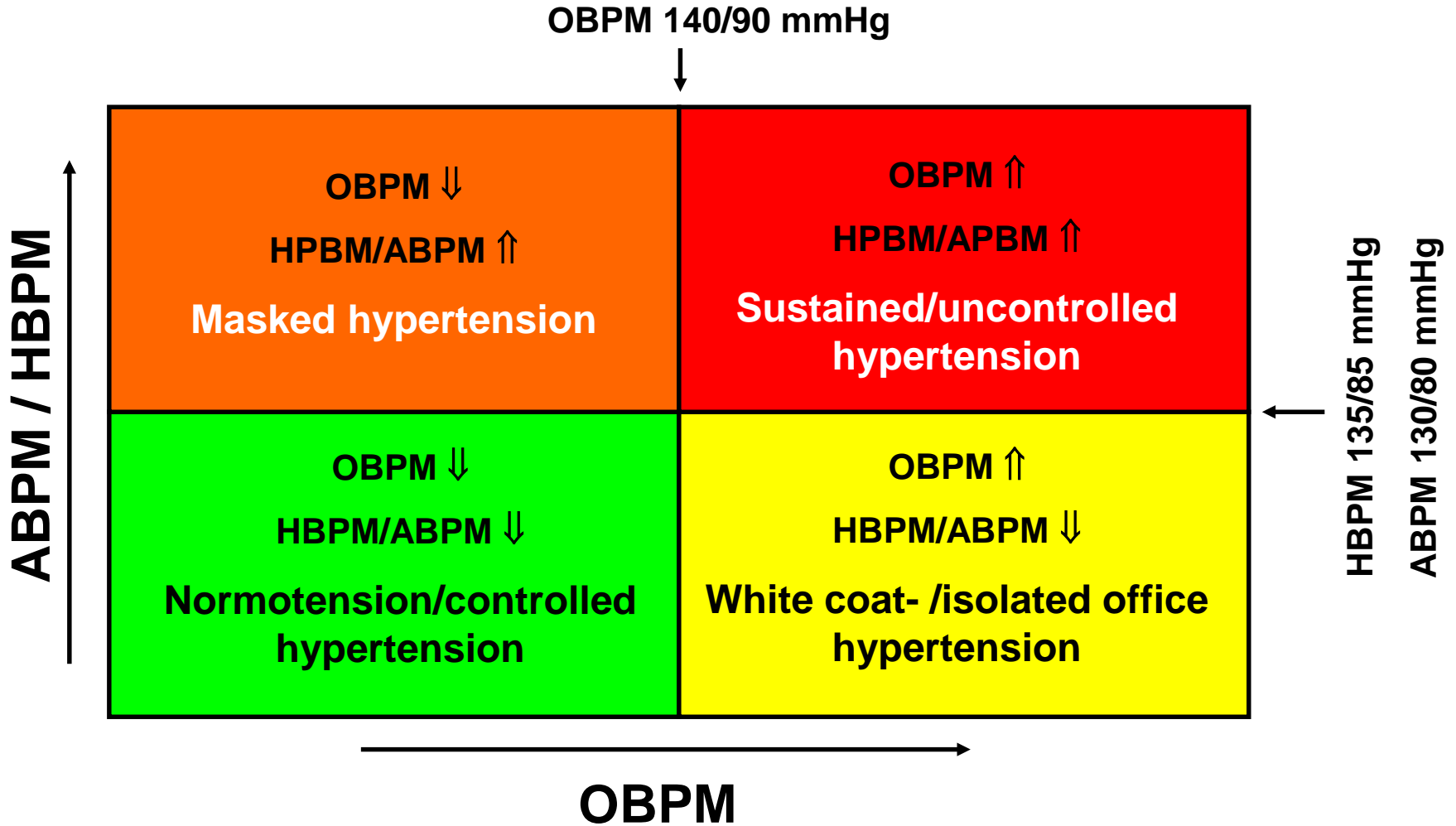


Important !

- Training for physicians, nurses and patients

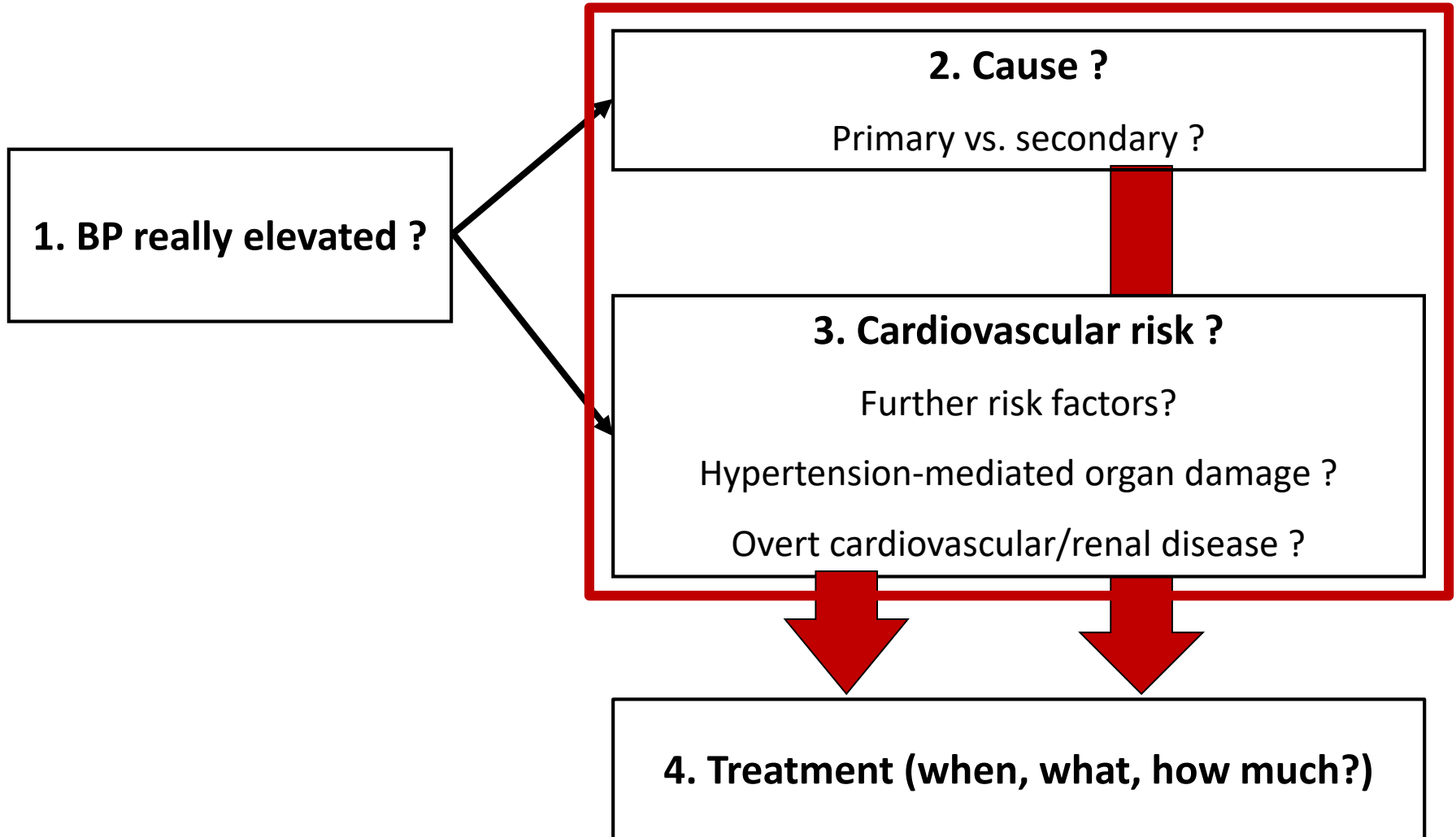
Comprehensive diagnosis of arterial hypertension

ABPM / HBPM are needed



Parati et al. , ESH Hypertension Newsletter 2009; 10: No. 12R

Newly detected high BP: what should be considered ?



Mr T., *1973

What do you want to know ?

- Laboratory values ?
- Urinalysis ?
- ECG ?
- Echocardiography ?
- Other exams ?

Mr T., *1973 – Laboratory 1

Leucocytes	6.5	(3.9 - 10.2)	U-Stix	unauffällig
Hemoglobin	150	(135 - 172)		
Thrombocytes	235	(150 - 370)	U-Albumin	<3 (<20)

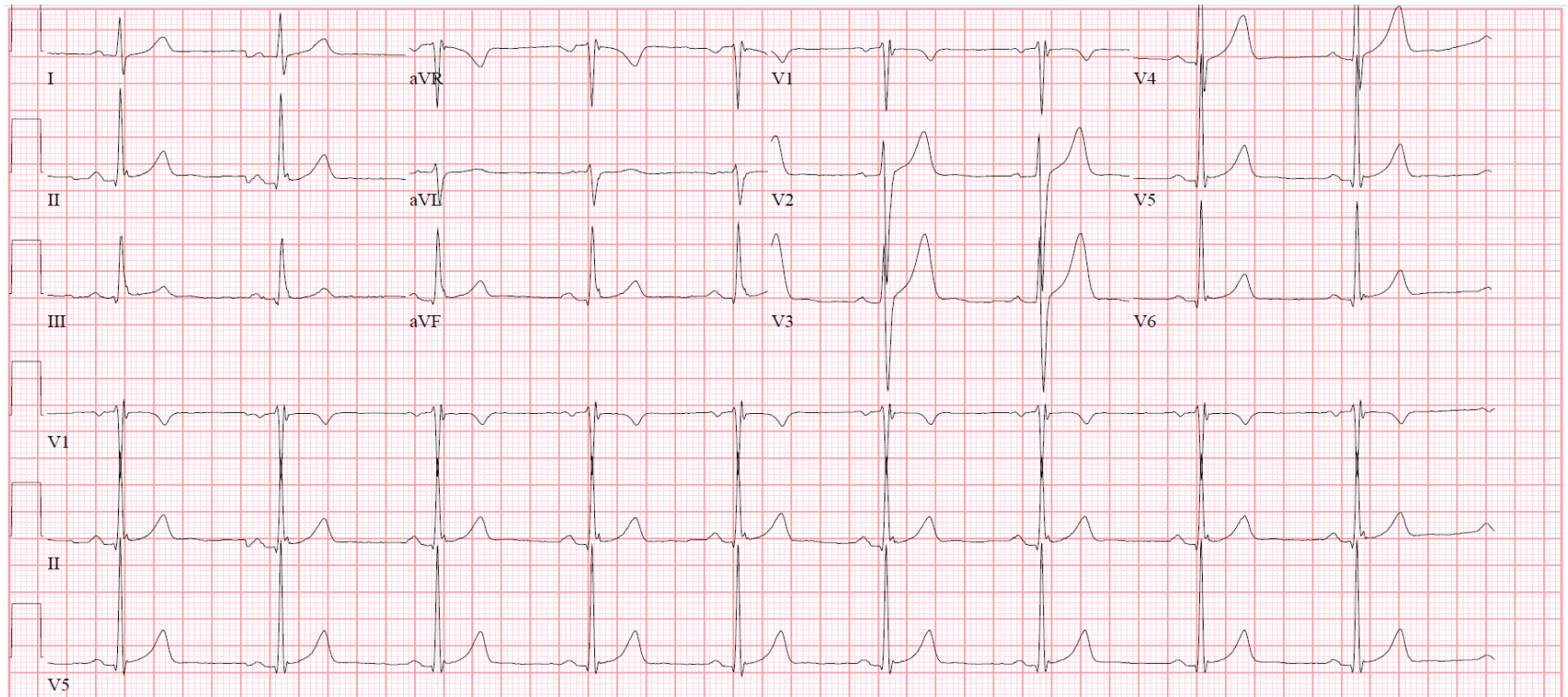
Cell count w/o particularities

Sodium	139	(136 - 145)	TSH	2.96	(0.27 - 4.20)
Potassium	4.0	(3.5 - 5.1)			
Calcium	2.38	(2.10 - 2.60)	Fasting glucose	5.4	(3.6 - 5.6)
			HbA1c	5.1	(4.4 - 6.0)
Creatinine	86	(59 - 104)	Cholesterol	6.2	(<5.0)
Urea	5.0	(2.7 - 6.8)	HDL	1.1	(>1.0)
ASAT	30	(<41)	LDL	3.9	(<3.0)
ALAT	34	(<41)	TG	2.5	(<2.0)
GGT	116	(40 - 130)			
AP	41	<60)			
Bilirubin total	25.4	(<20.0)			

Mr T., *1973 – Laboratory 2

• Aldosterone	455.0	(recumbent: 32.4 – 653.7)
• Renin	1.8	(1.7 – 23.9)
• Aldosterone/Renin	252.8	(<52.6: normotone und essentielle Hypertoniker)
• Metanephrine, free	120	(73 – 430)
• Normetanephrine, free	<82	(107 – 1347)
• Methoxytyramine, free	<86	(<171)

Herr T., *1973 – ECG



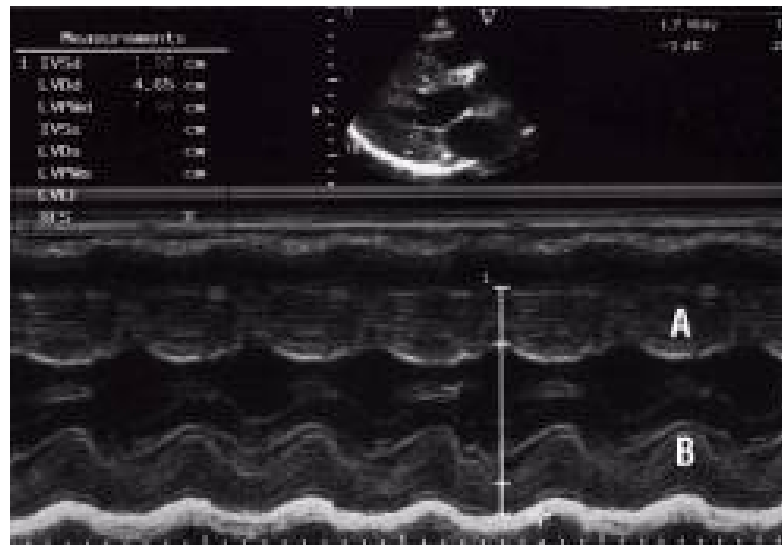
LVH indices:

SR 56/min
 Indifference- steep type
 PQ 170 ms, QRS 100 ms, QT 420 ms

Sokolow-Lyon-Index:	$S_{V1/V2} + R_{V5/V6} \geq 35 \text{ mm}$ $R_I + S_{III} > 25 \text{ mm}$	or	38 mm
Cornell-Product:	$(R_{aVL} + S_{V3} + 6 \text{ (women)}) \times \text{QRS-duration}$ $\geq 2440 \text{ mmxms}$		1800 mVxms
	$R_{aVL} > 11 \text{ mm}$		1 mm

Mr T., *1973 – Echocardiography




Ejection Fraction	80%
LV mass index	91 g/m ² (M: <115 g/m ² , F: <95 g/m ²)
Relative wall thickness	0.4 (<0.43)
E/A ratio	0.7
E/e' ratio	5.9



2. Causes of hypertension ?

Primary/essential vs. secondary hypertension

Secondary hypertension should be considered in case of

- **difficult to control / therapy-refractory hypertension**
-  **very high BP**
-  **sudden BP increase**
- **young hypertensives** („Early Onset Hypertension“ – FH+ for CVI)
- **clinical signs/symptoms of endocrine hypertension**
- **(unexplained) hypokaliemia**
- **incidentaloma**
- **1° relatives with hyperaldosteronism**
-  ***high grade of suspicion («gut feeling»)***

2. Causes of hypertension ?

Most frequent causes of secondary hypertension

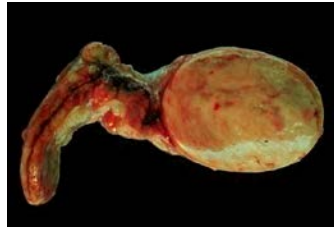
Age	% secondary hypertension	Most frequent causes
0 – 12	70 – 85	<ul style="list-style-type: none">• Renoparenchymal disease• Coarctation
12 – 18	10 – 15	<ul style="list-style-type: none">• Renoparenchymal disease• Coarctation
19 – 39	5	<ul style="list-style-type: none">• Hypo-/Hyperthyroidism• Fibromuscular dysplasia• Renoparenchymal disease
40 – 64	8 – 12	<ul style="list-style-type: none">• Hyperaldosteronism• Hypo-/Hyperthyroidism• Obstructive sleep apnea syndrome• Cushing's disease• Pheochromocytoma
≥ 65	17	<ul style="list-style-type: none">• Atherosclerotic renal artery stenosis• Renal failure• Hypothyroidism

Viera et al., Am Fam Phys, 2010

Endocrine hypertension

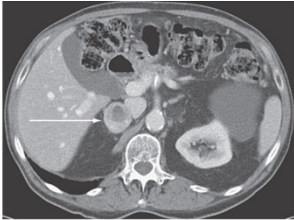
Screening

Primary hyperaldosteronism (1-10%)



→ Ratio Aldosterone/Renin

Pheochromocytoma (<0.2%)



→ Free Metanephrines (Plasma)

→ Catecholamines (24h-Urin)

Cushing's disease

→ Cortisol (24h-urin collection)

Acromegaly

Hypo-/hyperthyroidism

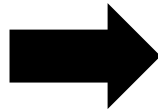
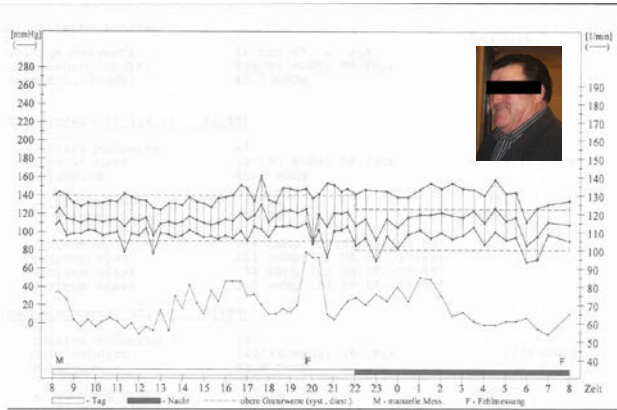
Primary hyperparathyroidism

→ IGF-1

→ TSH

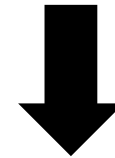
→ Ca, Albumine (corr.)

OSAS Screening

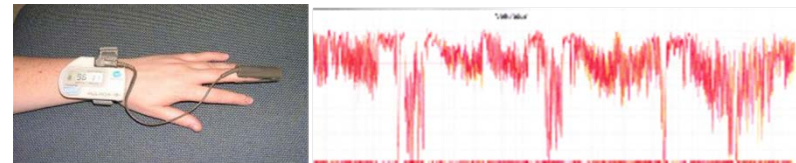


Situation	Chance of dozing			
Sitting and reading	0	1	2	3
Watching TV	0	1	2	3
Sitting inactive in a public place (e.g. movie theatre or a meeting)	0	1	2	3
As a passenger in a car for an hour without a break	0	1	2	3
Lying down to rest in the afternoon when circumstances permit	0	1	2	3
Sitting and talking to someone	0	1	2	3
Sitting quietly after lunch	0	1	2	3
Sitting quietly after lunch	0	1	2	3

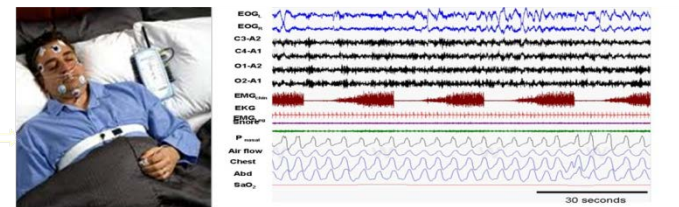
«0» – never, «3» – always; ≥ 11 points: OSAS very likely



- Prevalence: ~ 5%
- Collar size > 43cm correlated with OSAS*
- BMI > 30 in 50% of patients
- Prevalence higher in patients with known CV disease (60%)
- RF for hypertension (independent from body weight), diastolische HF, CV disease



Pulsoxymetrie



Polysomnographie

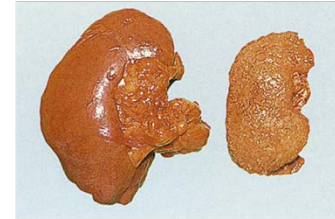
Baguet et al., ESH Scientific Newsletter, 2011.

Renal causes

Renoparenchymal disease

Prevalence of arterial hypertension in chronic kidney disease

- Focal glomerulosclerosis 75-85%
- Membranoproliferative GN 60-70%
- Mesangioproliferative GN 30-40%
- Minimal change Disease 10-15%
- Polycystic kidney disease 55-65%
- Diabetic nephropathy 65-75%
- Membranous kidney disease 35-45%
- IgA nephritis 20-30%
- Interstitial nephritis 15-25%



Renovascular disease



3. Estimation of cardiovascular risk ?

Euro-SCORE – low-risk countries

43 years, male, non-smoker

BP 180/110 mmHg

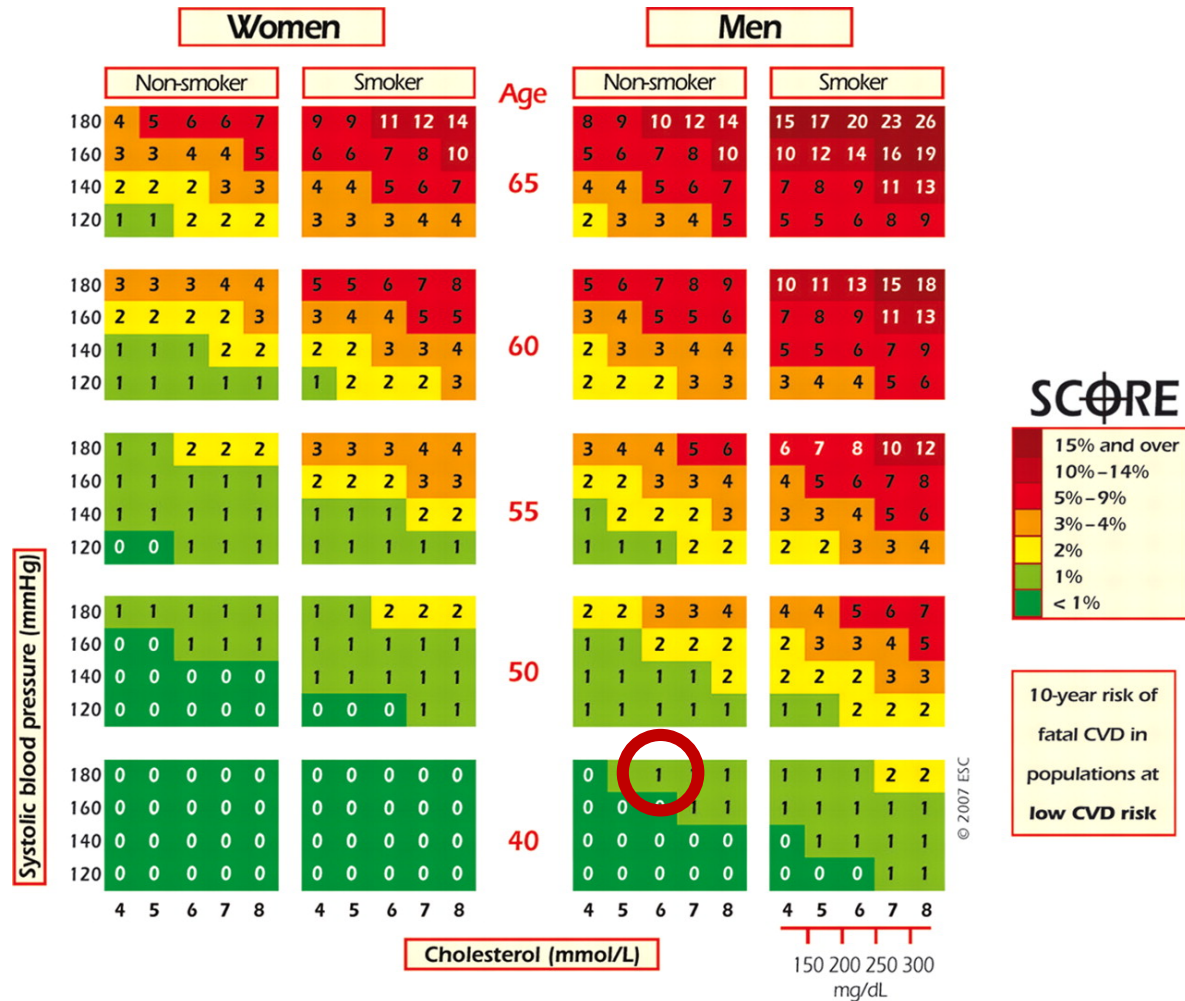
TC 6.2 mmol/l

LDL 3.9 mmol/l

HDL 1.1 mmol/l

TG 2.5 mmol/l

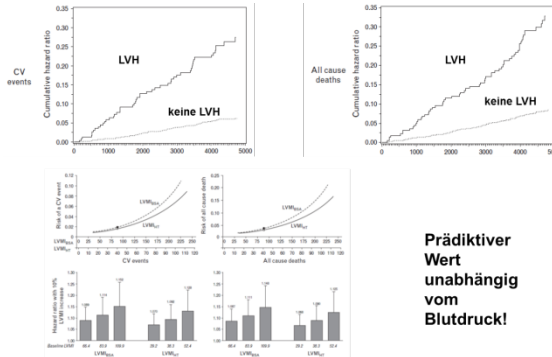
Glucose 5.4 mmol/l



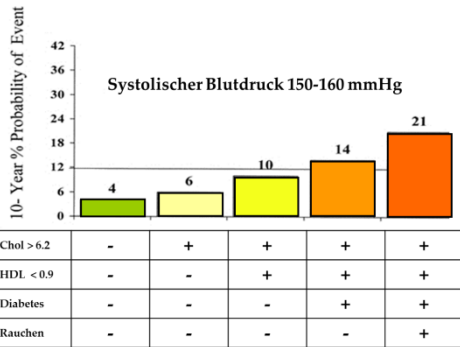
Graham et al., Eur Heart J, 2007

Determinants of cardiovascular risk

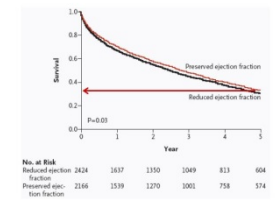
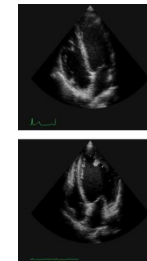
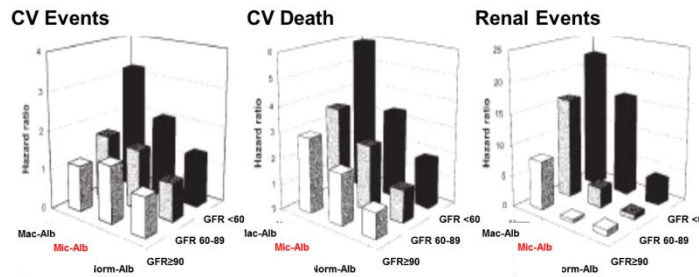
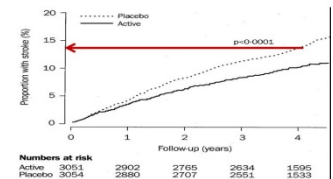
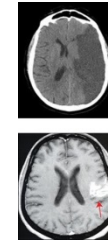
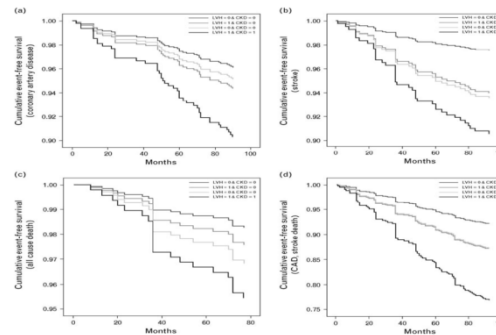
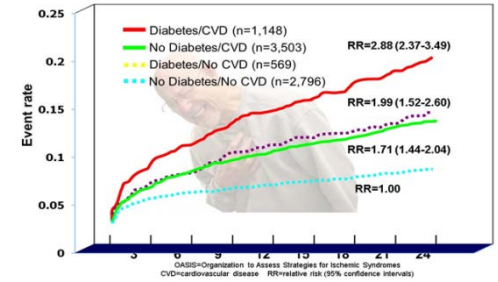
Hypertension-mediated organ damage



Cumulation of risk factors



Clinically apparent cardiovascular/renal disease



Cardiovascular risk stratification

2013 ESH/ESC Guidelines

	Hochnormal	Grad 1	Grad 2	Grad 3
	SBP 130-139 oder DBP 85-89	SBP 140-159 oder DBP 90-99	SBP 160-179 oder DBP 100-109	SBP \geq 180 oder DBP \geq 110
Keine weiteren RF		Niedriges Risiko	Moderates Risiko	Hohes Risiko
1-2 RF	Niedriges Risiko	Moderates Risiko	Moderates bis hohes Risiko	Hohes Risiko
\geq 3 RF	Niedriges bis moderates Risiko	Moderates bis hohes Risiko	Hohes Risiko	Hohes Risiko
EOD, CKD stage 3, oder DM	Moderates bis hohes Risiko	Hohes Risiko	Hohes Risiko	Hohes bis sehr hohes Risiko
Symptomatische CV Erkrankung, CKD \geq 4	Sehr hohes Risiko	Sehr hohes Risiko	Sehr hohes Risiko	Sehr hohes Risiko

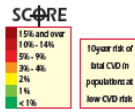


Mancia G et al. 2013 ESH/ESC Guidelines for the management of arterial hypertension, J Hypertens, 2013.
D'Agostino RB et al., Framingham Heart Study, Circulation, 2008.

3. Estimation of cardiovascular risk

New (simplified ?) approach

Basis



Age

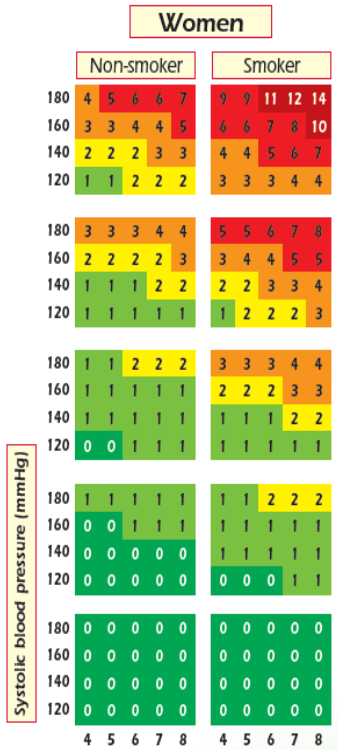
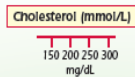
65

60

55

50

40



Risk modifiers

Demographic characteristics and laboratory parameters
Sex ^a (men >women)
Age ^a
Smoking (current or past history) ^a
Total cholesterol ^b and HDL-C
Uric acid
Diabetes ^a
Overweight or obesity
Family history of premature CVD (men aged <55 years and women aged <65 years)
Family or parental history of early-onset hypertension
Early-onset menopause
Sedentary lifestyle
Psychosocial and socioeconomic factors
Heart rate (resting values >80 beats/min)
Asymptomatic HMOD
Arterial stiffening: Pulse pressure (in older people) ≥60 mmHg Carotid-femoral PWV >10 m/s
ECG LVH (Sokolow-Lyon index >35 mm, or R in aVL ≥11 mm; Cornell voltage duration product >2440 mms, or Cornell voltage >28 mm in men or >20 mm in women)
Echocardiographic LVH (LV mass index: men >50 g/m ^{2.7} ; women >47 g/m ^{2.7} (height in m ^{2.7}); indexation for BSA may be used in normal-weight patients; LV mass/BSA g/m ^{2.7} >115 (men) and >95 (women))
Microalbuminuria (30–300 mg/24 h), or elevated albumin-creatinine ratio (30–300 mg/g; 3.4–34 mg/mmol) (preferentially on morning spot urine) ^b
Moderate CKD with eGFR >30–59 mL/min/1.73 m ² (BSA) or severe CKD eGFR <30 mL/min/1.73 m ² ^b
Ankle-brachial index <0.9
Advanced retinopathy: haemorrhages or exudates, papilloedema
Established CV or renal disease
Cerebrovascular disease: ischaemic stroke, cerebral haemorrhage, TIA
CAD: myocardial infarction, angina, myocardial revascularization
Presence of atheromatous plaque on imaging
Heart failure, including HFpEF
Peripheral artery disease
Atrial fibrillation

Not applicable:

- Secondary prevention
- Diabetic patients



3. Estimation of cardiovascular risk

New (simplified ?) approach



Hypertension disease staging	Other risk factors, TOD, or disease	BP (mmHg) grading			
		High normal	Grade 1	Grade 2	Grade 3
Stage 1 (uncomplicated)	No other RF	Low risk	Low risk	Moderate risk	High risk
	1 or 2 RF	Low risk	Moderate risk	Moderate to high risk	High risk
	≥3 RF	Low to moderate risk	Moderate to high risk	High risk	High risk
Stage 2 (asymptomatic)	TOD, CKD grade 3, DM without organ damage	Moderate to high risk	High risk	High risk	High to very high risk
Stage 3 (symptomatic)	Symptomatic CVD, CKD grade ≥4, DM with organ damage	Very high risk	Very high risk	Very high risk	Very high risk

Mr T., *1973 – where are we so far ?

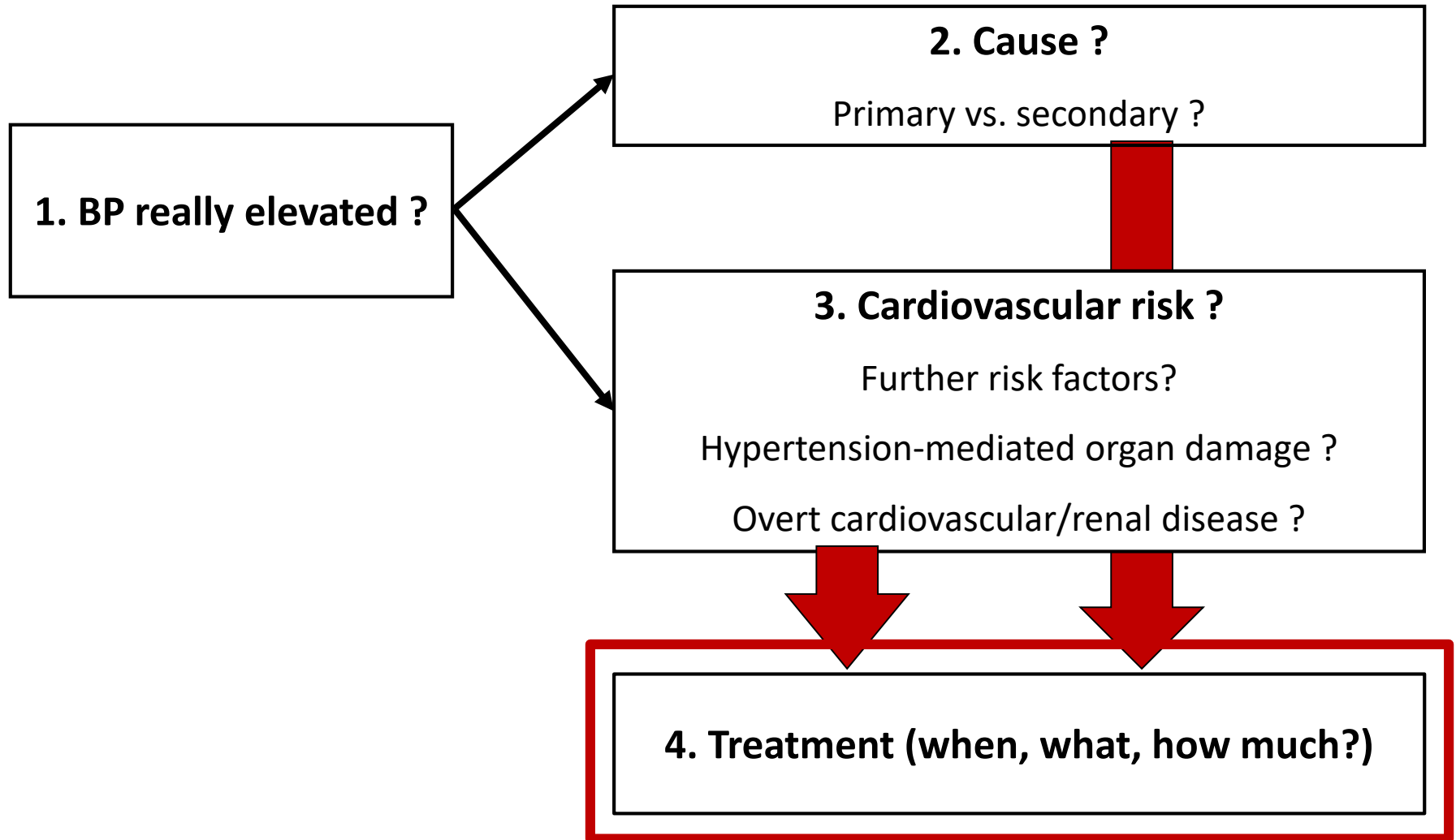
Signs/symptoms of secondary hypertension ?

clinical:	very high BP rapid BP increase (young patient) «gut feeling»
laboratory:	pathologic Aldosterone-Renin ratio

Cardiovascular risk ?

Additional risk factors:	Hypercholesterolemia, Hypertriglyceridemia
HMOD:	Left ventricular hypertrophy (ECG)
10-year risk (SCORE):	1%
10-year risk (ESC/ESH):	HIGH

Newly detected high BP: what should be considered ?



Herr T., *1973 – Follow-up 2

- BP with Lercanidipin 20 mg after 2 weeks: 143/100 mmHg
- What next ?

- **When should BP be lowered ?**
- **Which BP should be targeted ?**
- **How aggressive should BP be lowered ?**

When should BP be lowered ?

2013 ESH/ESC guidelines

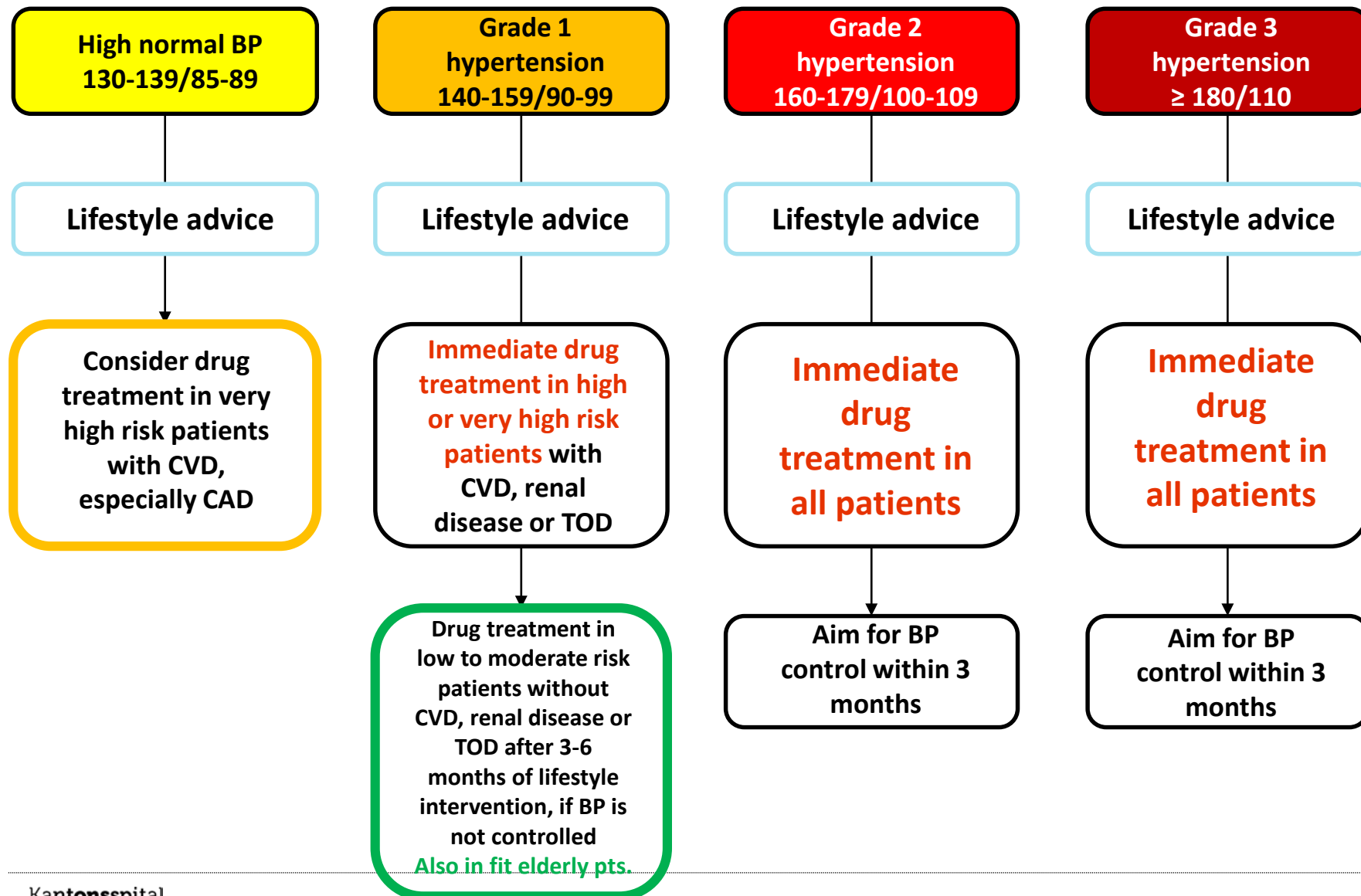
Other risk factors, asymptomatic organ damage or disease	Blood pressure (mmHg)			
	High normal SBP 130–139 or DBP 85–89	Grade 1 HT SBP 140–159 or DBP 90–99	Grade 2 HT SBP 160–179 or DBP 100–109	Grade 3 HT SBP ≥180 or DBP ≥110
No other RF	• No BP intervention	• Lifestyle changes for several months • Then add BP drugs targeting <140/90	• Lifestyle changes for several weeks • Then add BP drugs targeting <140/90	• Lifestyle changes • Immediate BP drugs targeting <140/90
1–2 RF	• Lifestyle changes • No BP intervention	• Lifestyle changes for several weeks • Then add BP drugs targeting <140/90	• Lifestyle changes for several weeks • Then add BP drugs targeting <140/90	• Lifestyle changes • Immediate BP drugs targeting <140/90
≥3 RF	• Lifestyle changes • No BP intervention	• Lifestyle changes for several weeks • Then add BP drugs targeting <140/90	• Lifestyle changes for several weeks • BP drugs targeting <140/90	• Lifestyle changes • Immediate BP drugs targeting <140/90
OD, CKD stage 3 or diabetes	• Lifestyle changes • No BP intervention	• Lifestyle changes • BP drugs targeting <140/90	• Lifestyle changes • BP drugs targeting <140/90	• Lifestyle changes • Immediate BP drugs targeting <140/90
Symptomatic CVD, CKD stage ≥4 or diabetes with OD/RFs	• Lifestyle changes • No BP intervention	• Lifestyle changes • BP drugs targeting <140/90	• Lifestyle changes • BP drugs targeting <140/90	• Lifestyle changes • Immediate BP drugs targeting <140/90

Lifestyle modification for weeks - months, then drug treatment

Immediate drug treatment

When should BP be lowered ?

2018 ESH/ESC guidelines

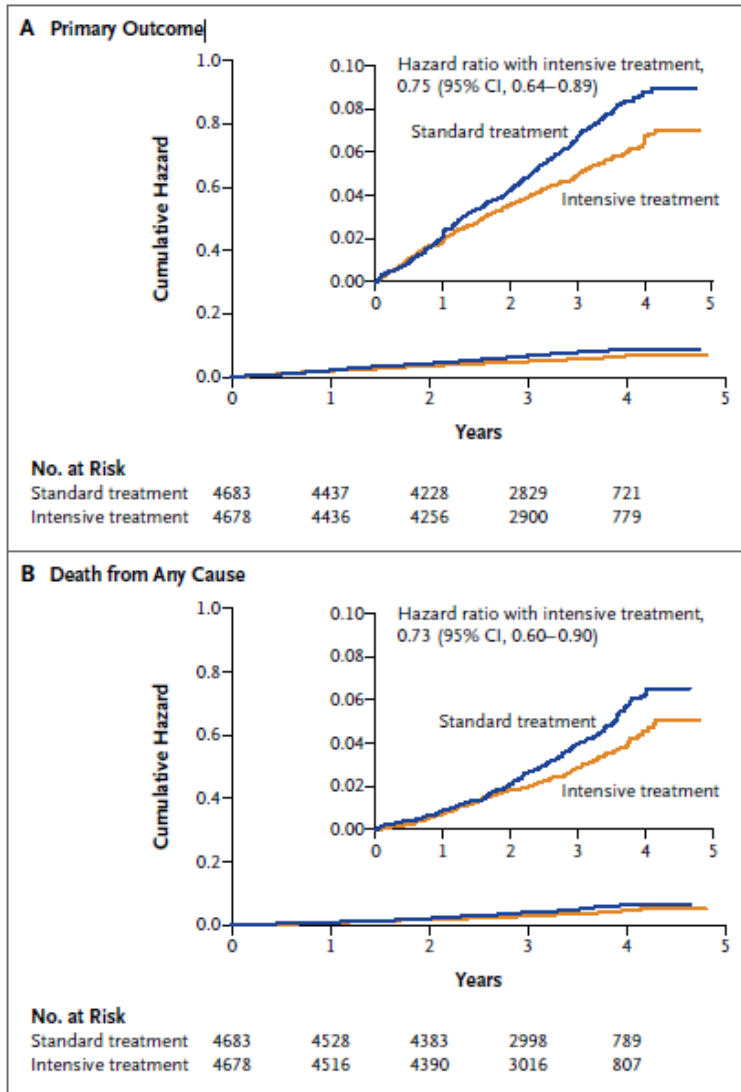


When should BP be lowered ?

2018 ESH/ESC guidelines

Age group	Office SBP treatment threshold (mmHg)					Office DBP treatment threshold (mmHg)
	Hypertension	+ Diabetes	+ CKD	+ CAD	+ Stroke/TIA	
18 - 65 years	≥140	≥140	≥140	≥140 ^a	≥140 ^a	≥90
65 - 79 years	≥140	≥140	≥140	≥140 ^a	≥140 ^a	≥90
≥80 years	≥160	≥160	≥160	≥160	≥160	≥90
Office DBP treatment threshold (mmHg)	≥90	≥90	≥90	≥90	≥90	

Which BP should be targeted ?



Primary Outcome
(MI, ACS, Stroke, HF, CV Death)

-25%

Death
(all cause)

-27%

Death
(cardiovascular cause)

-43%

Heart failure

-38%

SPRINT Research Group, New Engl J Med, 2015.

Which BP should be targeted ?

Should we really target lower BP values ?

- **SPRINT data are useless for clinical practice ?!**
- **Incremental benefit of BP lowering decreases as target BP is lowered**
- **Lower on-treatment BP values associated with higher incidence of serious adverse events and treatment discontinuation**
- **Less than 50% of treated patients currently achieve a target SBP of < 140 mmHg**
- **Evidence in favor of lower BP targets less strong in several important hypertensive subgroups (older patients, diabetes, CKD, CAD)**

Williams B. et al., Eur Heart J, 2018.

Which BP should be targeted ?

Why we should target lower BP values !

- **Risk reduction (%) per 10 mmHg reduction of SBP, initial SBP 130-139 mmHg**
 - CHD -12%
 - Stroke -27%
 - HF -25%
 - Major CV events -13%
 - All-cause mortality -11%

- **Risk reduction (%) when SBP < 130 mmHg / DBP < 80 mmHg achieved vs. less intense BP lowering (122/73 vs. 135/76 mmHg)**

• Stroke	-21%	-27%
• CHD	-16%	-16%
• HF	-19%	-23%
• Stroke + CHD + HF	-22%	-18%
• CV death	-20%	-27%
• All-cause death	-12%	-22%

Ettehad et al., Lancet, 2015, Thomopoulos et al., J Hypertens, 2016

Which BP should be targeted ?

Recommendations 2018

Age group	Office SBP treatment target ranges (mmHg)					Office DBP treatment target range (mmHg)
	Hypertension	+ Diabetes	+ CKD	+ CAD	+ Stroke ^a /TIA	
18 - 65 years	Target to 130 <i>or lower if tolerated</i> Not <120	Target to 130 <i>or lower if tolerated</i> Not <120	Target to <140 to 130 <i>if tolerated</i>	Target to 130 <i>or lower if tolerated</i> Not <120	Target to 130 <i>or lower if tolerated</i> Not <120	70–79
65 - 79 years ^b	Target to 130-139 <i>if tolerated</i>	Target to 130-139 <i>if tolerated</i>	Target to 130-139 <i>if tolerated</i>	Target to 130-139 <i>if tolerated</i>	Target to 130-139 <i>if tolerated</i>	70–79
≥80 years ^b	Target to 130-139 <i>if tolerated</i>	Target to 130-139 <i>if tolerated</i>	Target to 130-139 <i>if tolerated</i>	Target to 130-139 <i>if tolerated</i>	Target to 130-139 <i>if tolerated</i>	70–79
Office DBP treatment target range (mmHg)	70–79	70–79	70–79	70–79	70–79	

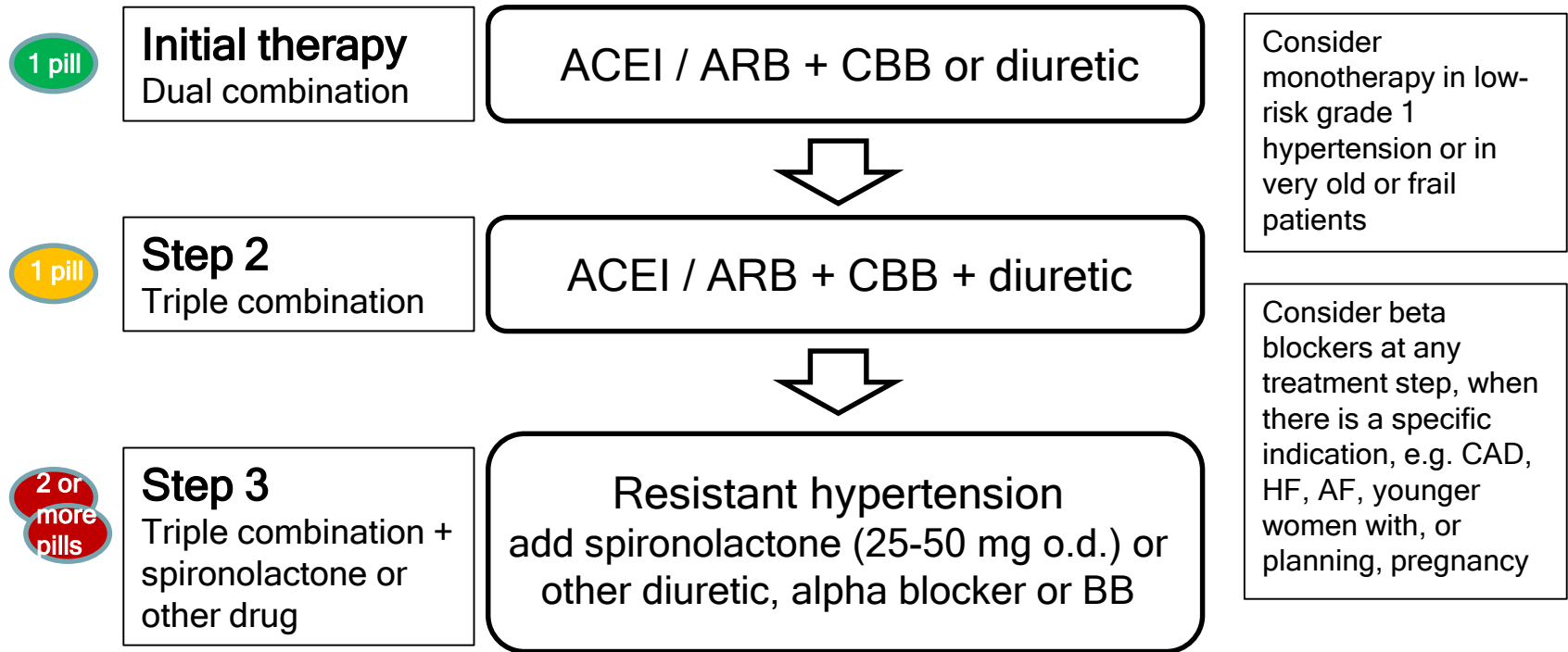
How aggressive should BP be lowered ?

- BP control rates remain poor - typically <50% of treated patients
- BP control will be even more challenging with new treatment targets
- Most patients require drug combinations - monotherapy usually ineffective
- Initial monotherapy and stepped-care approach leaves too many patients on monotherapy
- Poor compliance with multiple pill treatment
- Dual therapy combination treatment provides fast, efficient, well tolerated, more consistent, and more effective BP control
- Single-pill combination (SPC) therapy provides better compliance with therapy - patients prefer to take one pill (SPC are available as dual/triple therapy)

Williams B. et al., Eur Heart J, 2018.

How aggressive should BP be lowered ?

Recommendations in uncomplicated hypertension 2018



What is new ?

- **Start treatment in most patients with two drugs, not one**
- **Single pill strategy to treat hypertension**
- **No more compelling indications, but compelling contraindications**

Herr T., *1973 – Follow-up 3

- **Following comprehensive laboratory analysis switch to Azilsartan 40 mg / Chlorthalidon 12.5 mg**
- **Three weeks later: Home BP around 90/60 mmHg (with dizziness)**
- **Office BP now: 125/80 mmHg**

Summary

The most relevant changes in the 2018 guidelines

Diagnosis/Screening:

- Definition of hypertension unchanged
- Diagnosis may be based on OBPM and/or ABPM/ HBPM
- Risk stratification based on SCORE charts



Treatment:

- Start therapy when BP $\geq 140 / 90$ mmHg (≥ 80 years: $\geq 160 / 90$ mmHg)
- Therapy remains based on lifestyle modifications, but drug therapy must not be delayed
- BP targets: $< 130 / 80$ mmHg (uncomplicated hypertension), elderly patients: SBP 130 - < 140 mmHg
- Start therapy with 2-drug combination and single-pill strategy
- Ideal combination: ACEI or Sartan + CCB or Diuretic

Back to the first question:

Do we have to approach hypertension in a different way ?

NO, but we should do more !!

THANK YOU !!

Questions, comments ?

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Phone: 061 – 925 – 3230