

# Hypertoni – diagnostik, kardiovaskulär riskbedömning och behandling

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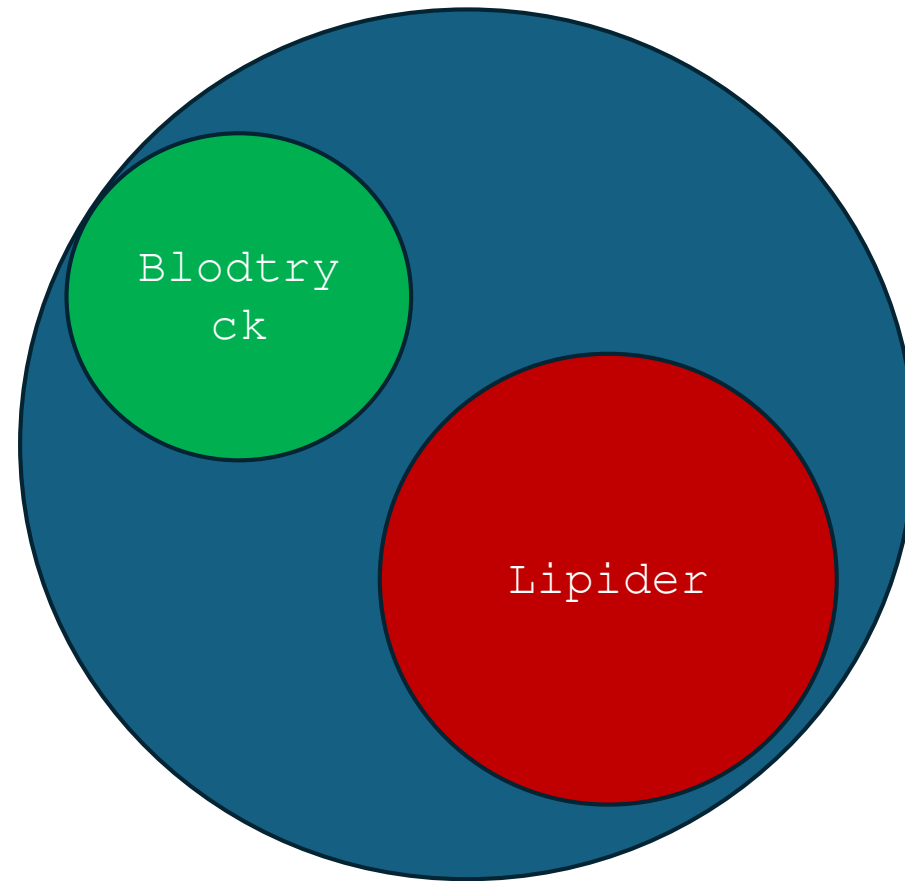
# Potentiella jäv

- Föreläsararvode från Amarin, AstraZeneca och Medtronic
- Advisory board Amarin och AstraZeneca
- Ordf. NAG Hypertoni
- Styrgruppsmedlem ESH guidelines 2023

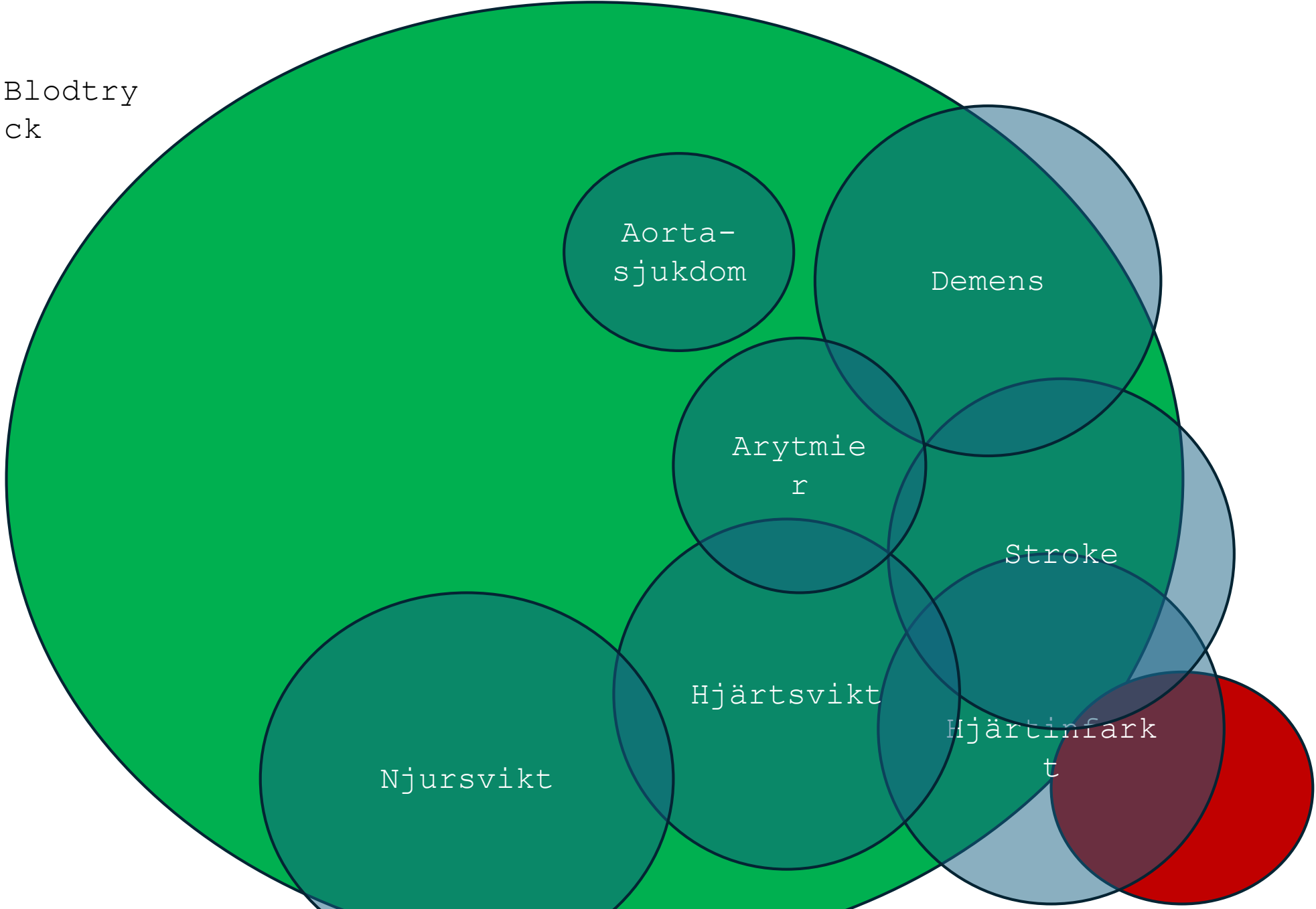
# Agenda

- Varför prata om blodtryck och risk?
- Blodtrycksmätning idag och i framtiden?
- Riskskattning i olika kliniska situationer
- Behandling - BT eller risk?

# Hjärtinfarkt



Blodtryck



Aorta-sjukdom

Demens

Arytmier

Stroke

Hjärtsvikt

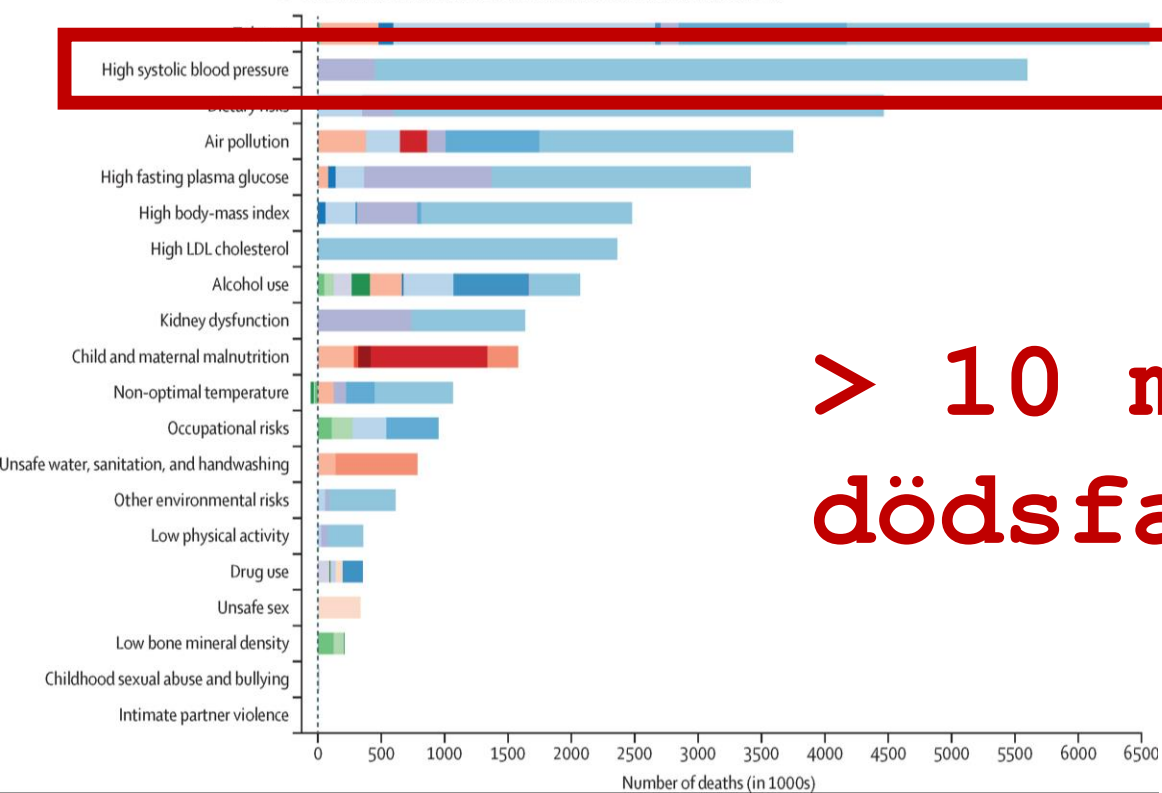
Hjärtinfarkt

Njursvikt

Lipider

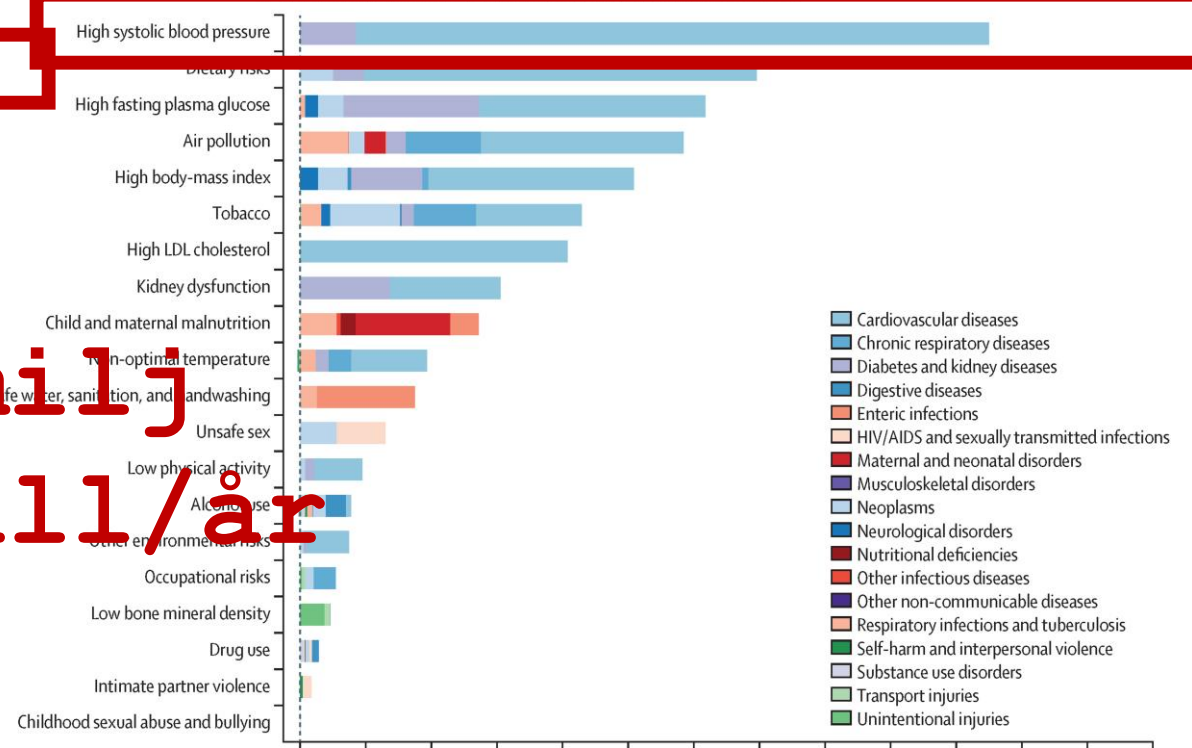
# Vår viktigaste riskfaktor!

B Global attributable deaths from Level 2 risk factors for males in 2019

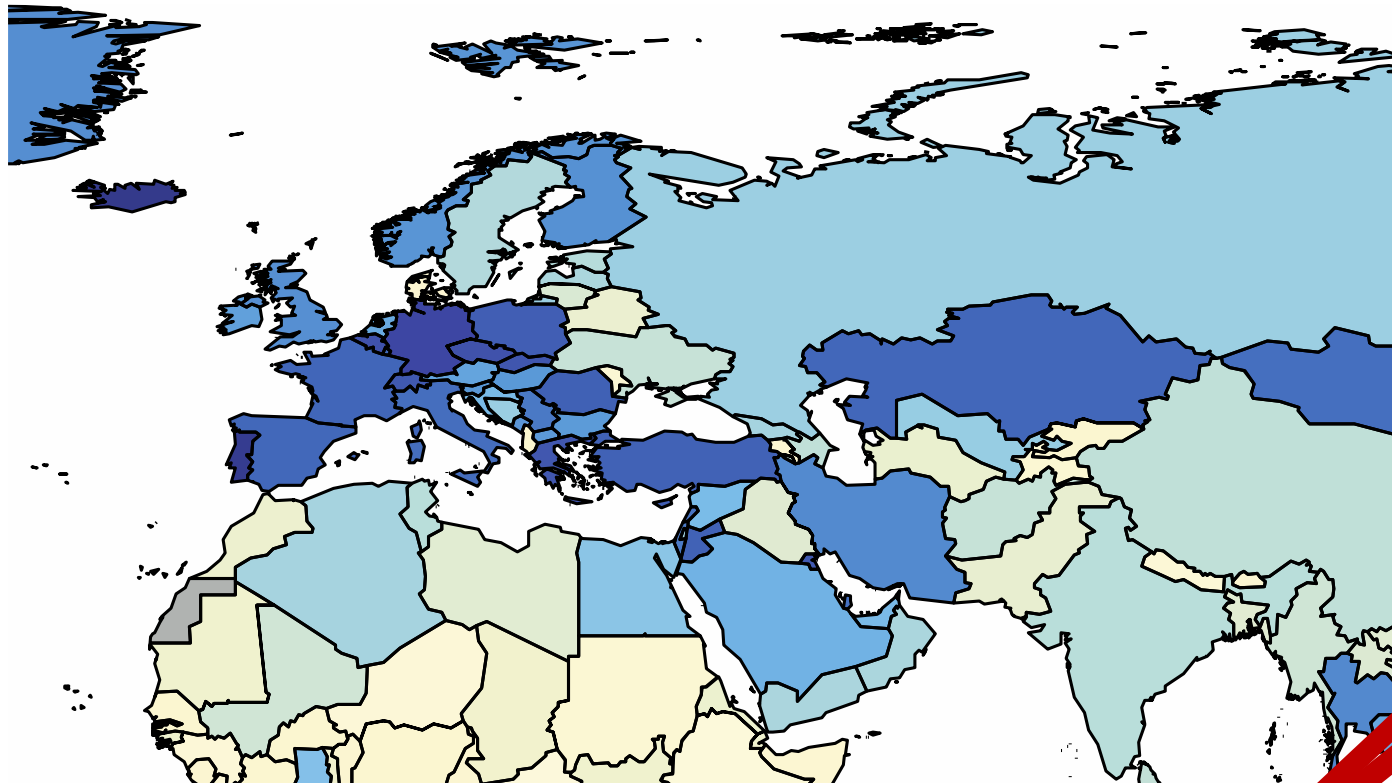


> 10 milj  
dödsfall/år

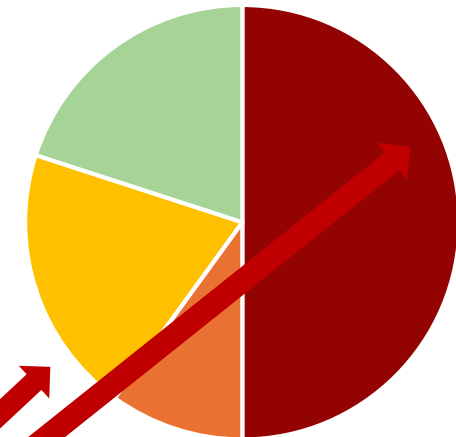
A Global attributable deaths from Level 2 risk factors for females in 2019



# Bakgrund – blodtryck under målvärde



2,9 milj hypertoniker i  
Sverige idag



■ Okänt  
■ Känd, ej behandlad  
■ Behandlad, ej vid mål  
■ Under målvärde

**2,3 milj svenskar behöver bättre hypertoni-vård!!**

# PSV - Hypertoni

## VIKTIGASTE PUNKTERNA

### Blodtrycksmätning:

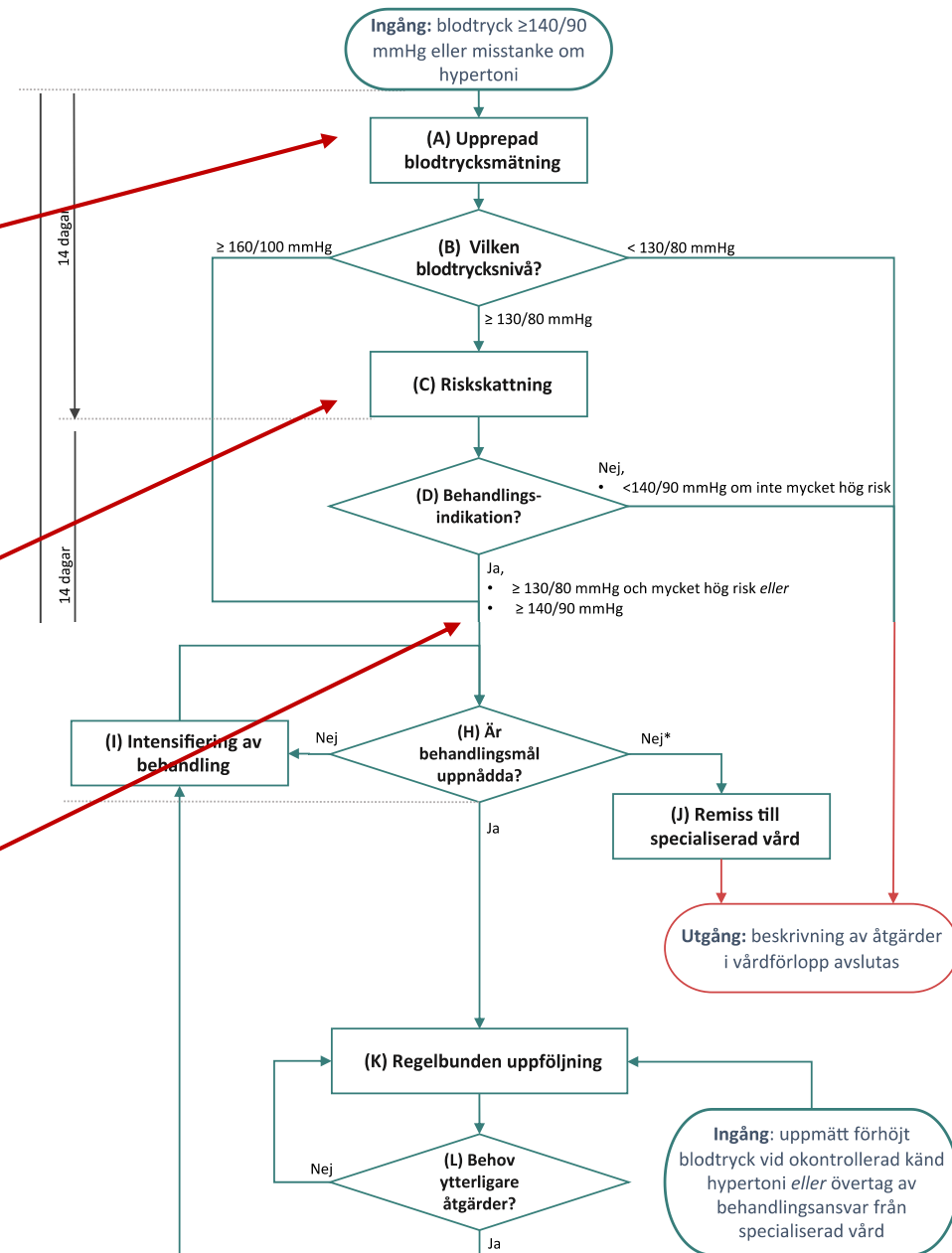
- Blodtrycksmätning på mottagning
- Hemblodtrycksmätning
- 24-timmars blodtrycksmätning.

### Riskskattning:

- SCORE2/-OP/-DM
- WHO CVD risk (BMI ist f lipider)

### Behandlingsmål:

- <130/80 för de flesta
- <140/90 vid låg risk/svåra biverkn.





# Hur mäter vi blodtrycket idag?

- Blodtryck på mottagningen
  - (Office Blood Pressure)
- Hemblodtryck
  - (Home Blood Pressure Measurement HBPM)
- 24-timmars blodtrycksmätning
  - (Ambulatory Blood Pressure Measurement ABPM)

# Vad säger guidelines?

## ESH 2023

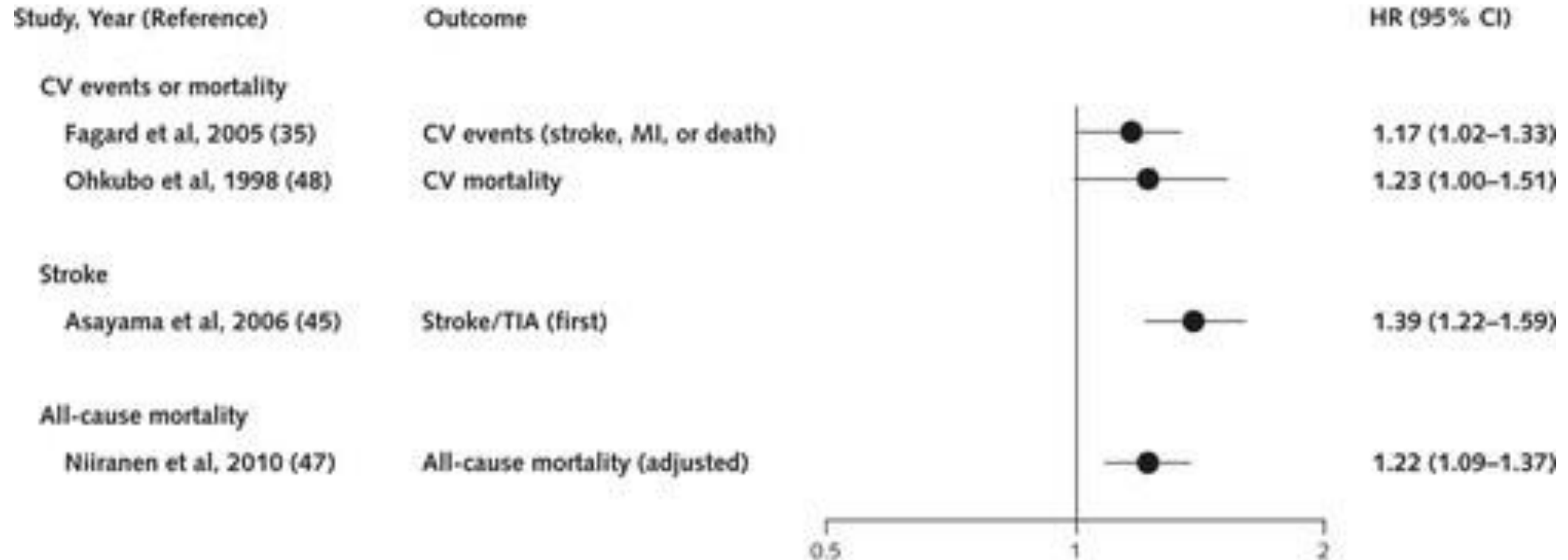
Office BP is recommended for diagnosis of hypertension, because <u>it is the one method by which hypertension-related risk, benefits of antihypertensive treatment, and treatment-related BP thresholds and goals are based.</u>	I	A
HBPM can be considered in addition to OBPM <u>to improve CV risk prediction due to better reproducibility and prognostic value than OBPM</u>	II	B

## ESC 2024

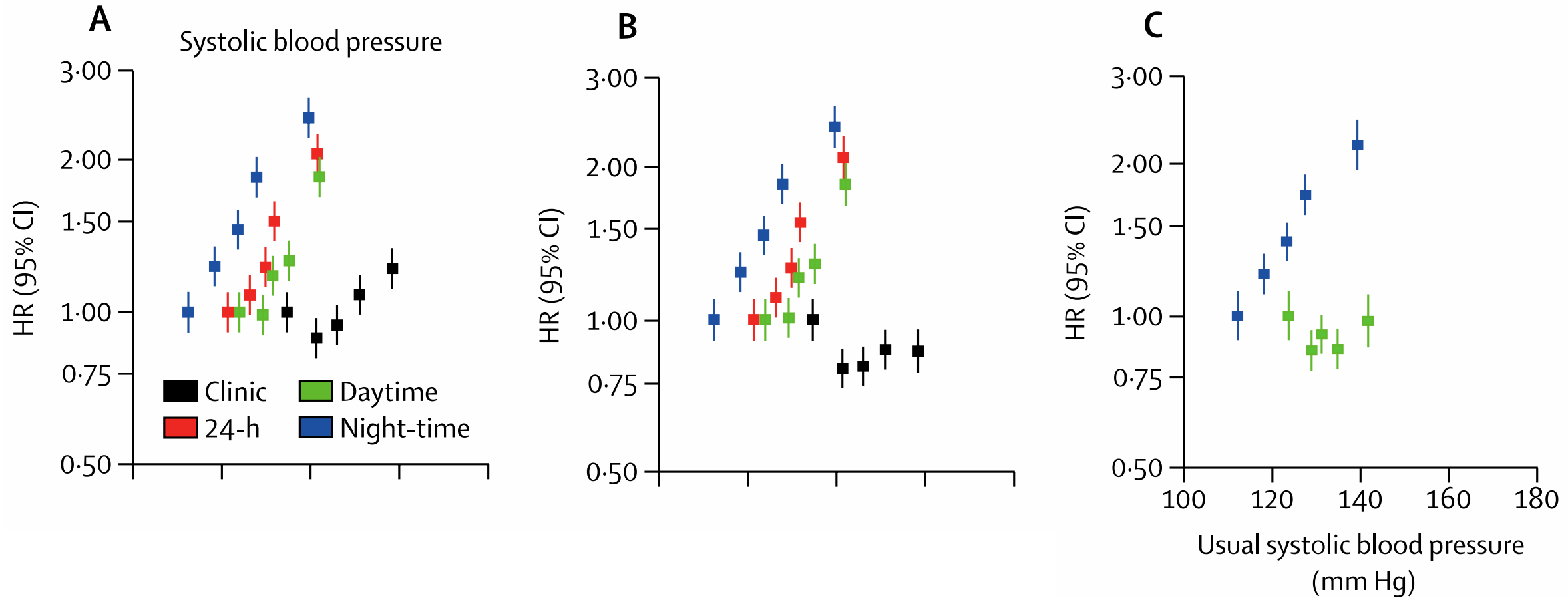
Out-of-office BP measurement is recommended for diagnostic purposes, particularly because it can detect both white-coat hypertension and masked hypertension. Where out-of-office measurements are not logistically and/or economically feasible, then it is recommended that the diagnosis be confirmed with a repeat office BP measurement using the correct standardized measurement technique.<sup>70</sup>

I	B
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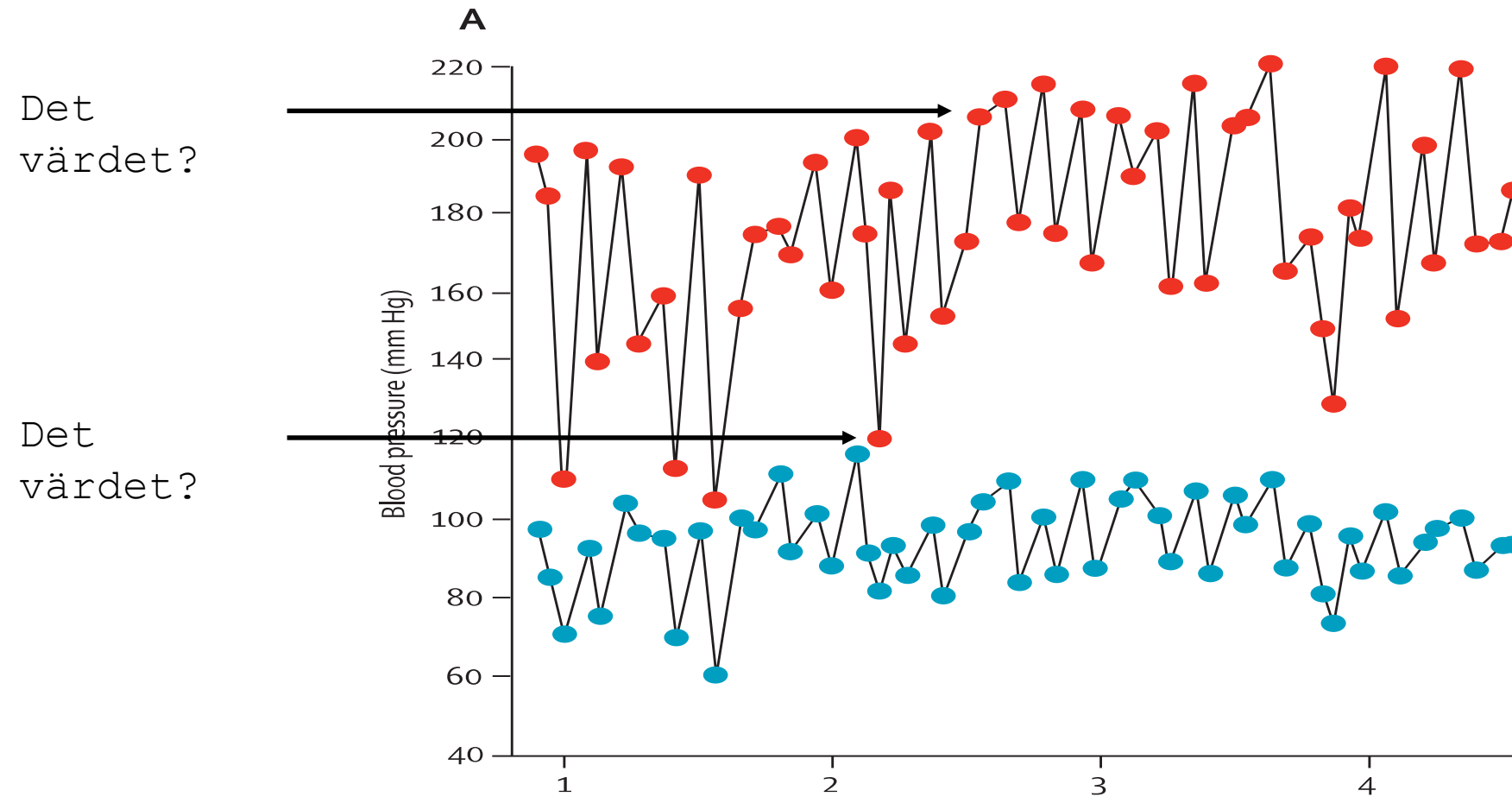
# Hem blodtryck och CV risk



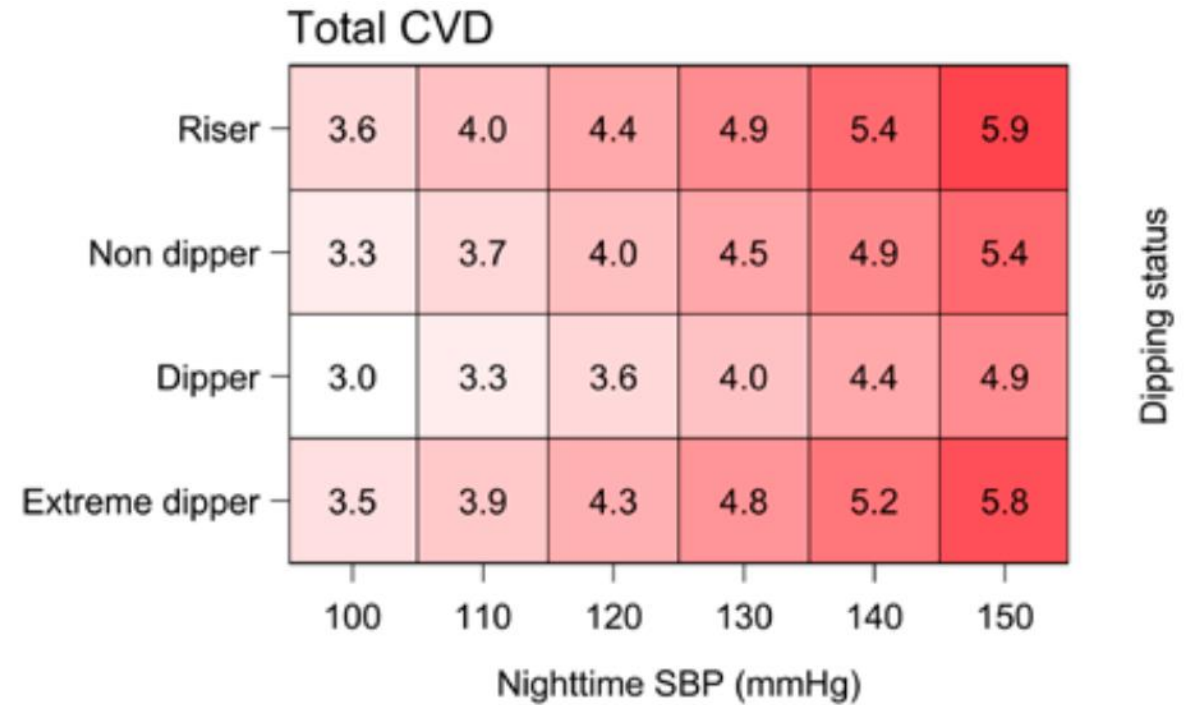
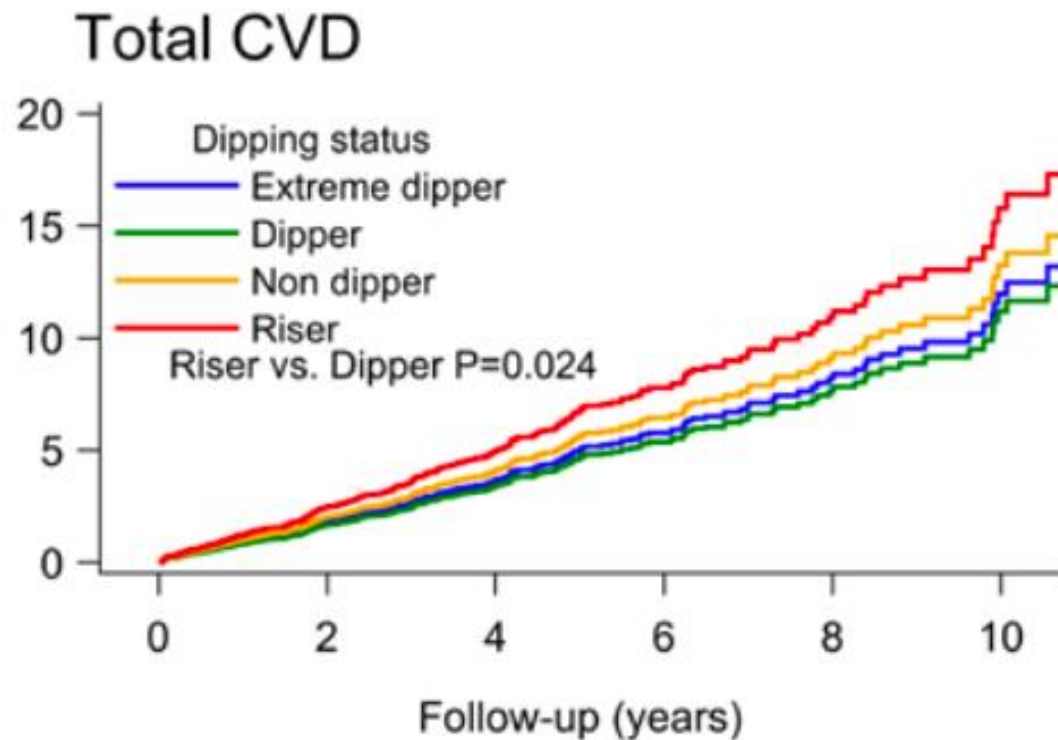
# 24 tim BT och CV risk



# Varför skiljer sig det prognostiska värdet?



# Nattligt blodtryck och CV risk



# Olika mätmetoder ger olika värden

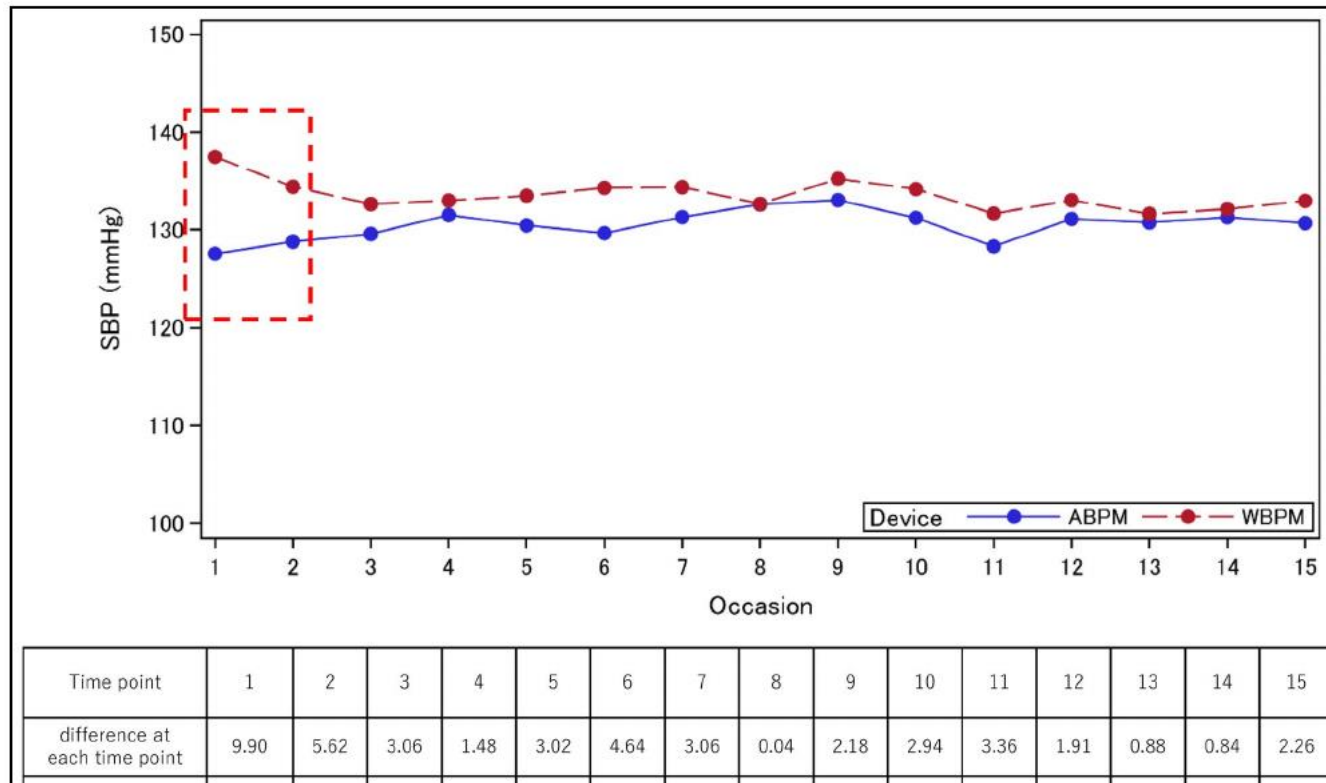
**Table 11. Corresponding Values of SBP/DBP for Clinic, HBPM, Daytime, Nighttime, and 24-Hour ABPM Measurements**

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

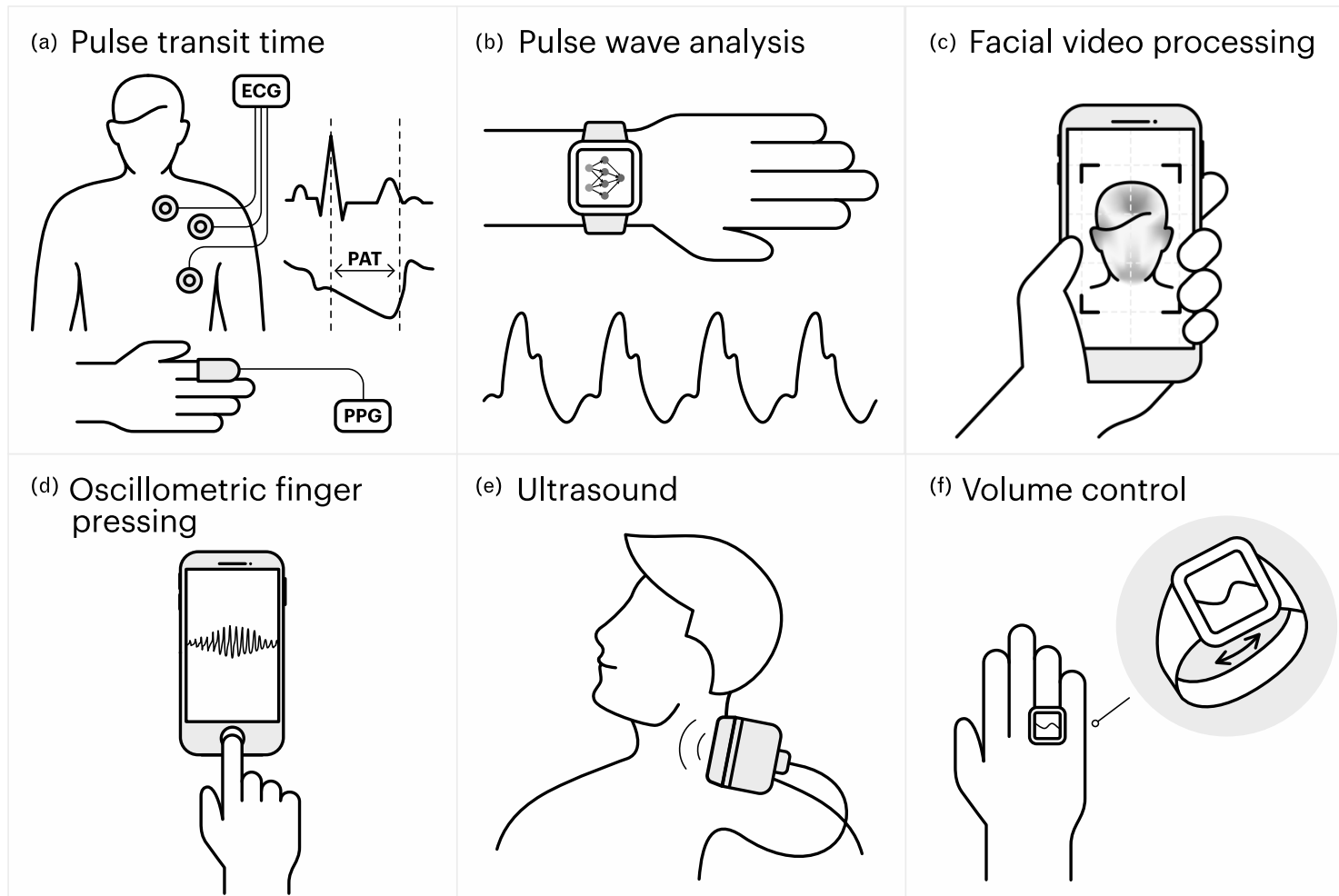
ABPM indicates ambulatory blood pressure monitoring; BP, blood pressure; DBP diastolic blood pressure; HBPM, home blood pressure monitoring; and SBP, systolic blood pressure.

Hur kommer vi att mäta  
blodtrycket?

# BT-mätning i klockan?



# BT-mätning utan kuff?



**FIGURE 2** Example illustrations of cuffless blood pressure technologies on the market (a and b), or in early research stage (c–f). ECG, electrocardiography; PAT, pulse arrival time; PPG, photoplethysmography.

**Statements:** Cuffless BP monitors constitute a wide and heterogeneous group of novel technologies and devices with different intended uses. Cuffless BP devices have specific accuracy issues, which render the established validation protocols for cuff BP devices inadequate for their validation.

**Conclusion:** Cuffless BP devices have considerable potential for changing the diagnosis and management of hypertension. However, fundamental questions regarding their accuracy, performance, and implementation need to be carefully addressed before they can be recommended for clinical use.

# PSV - Hypertoni

## VIKTIGASTE PUNKTERNA

### Blodtrycksmätning:

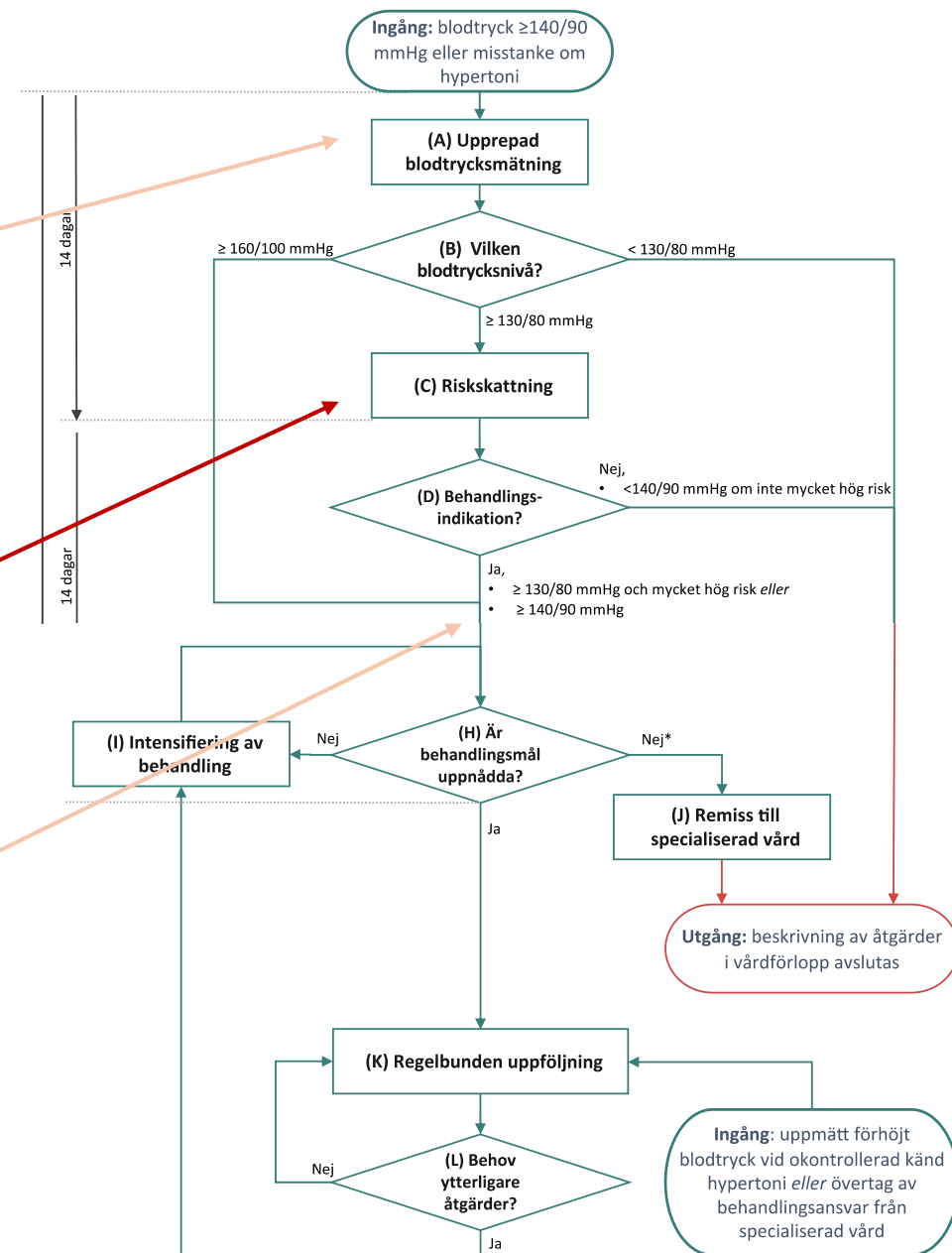
- Blodtrycksmätning på mottagning
- Hemblodtrycksmätning
- 24-timmars blodtrycksmätning.

### Riskskattning:

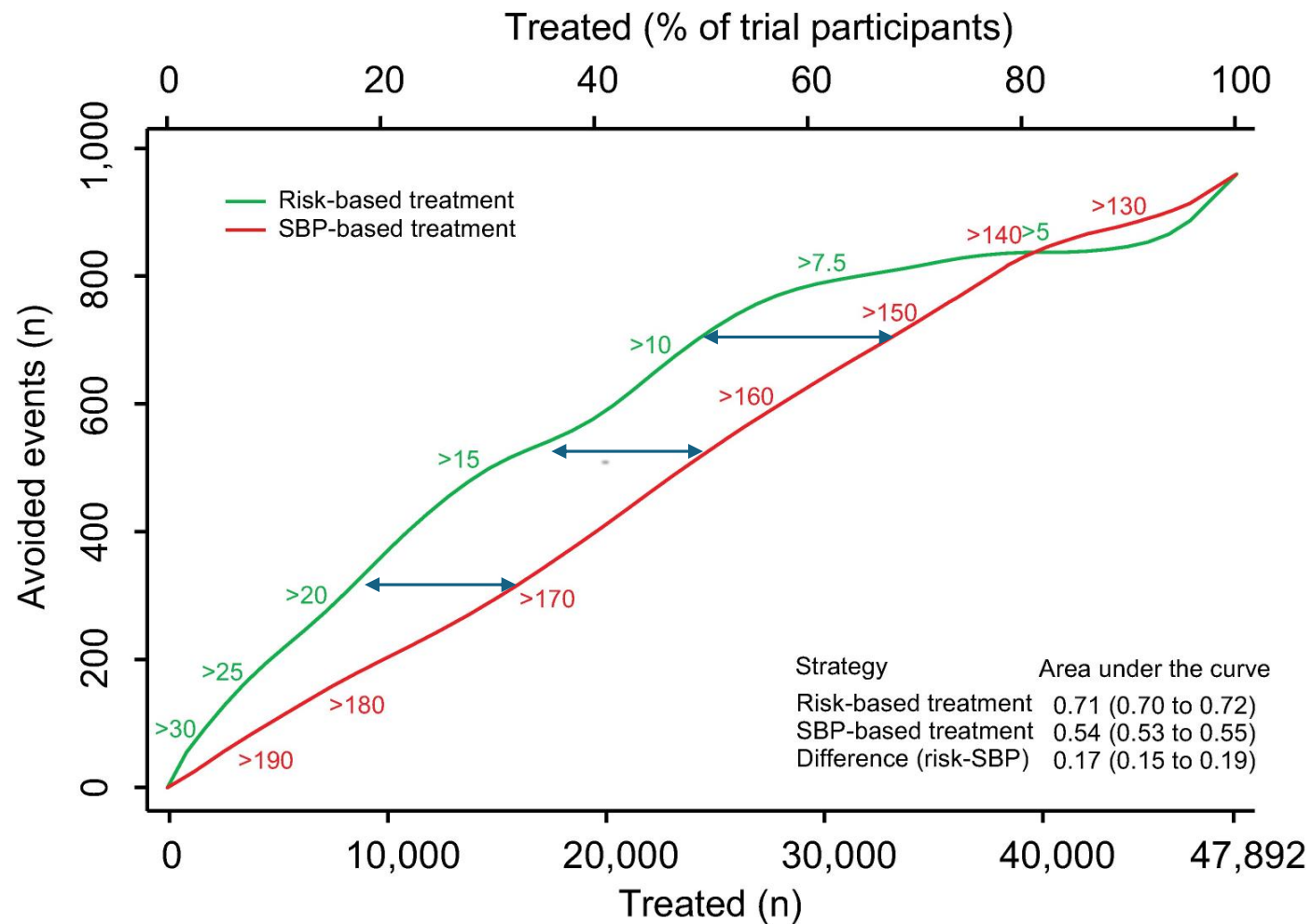
- SCORE2/-OP/-DM
- WHO CVD risk (BMI ist f lipider)

### Behandlingsmål:

- <130/80 för de flesta
- <140/90 vid låg risk/svåra biverkn.



# Varför skatta risk?

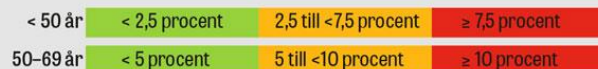
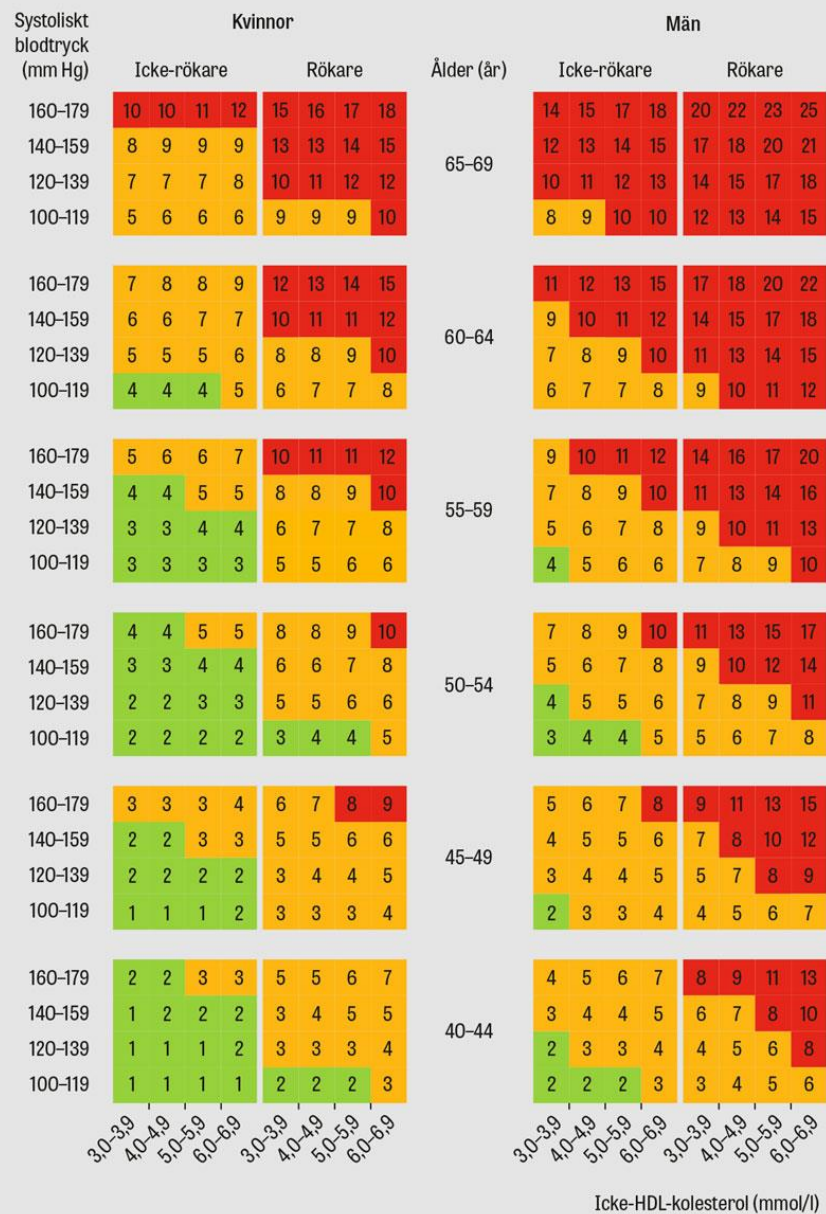


Färre behandlade  
för samma vinst

Eller

Större vinst för  
samma antal  
behandlade

FIGUR 1. SCORE2 för skattning av 10-årsrisken för kardiovaskulär händelse



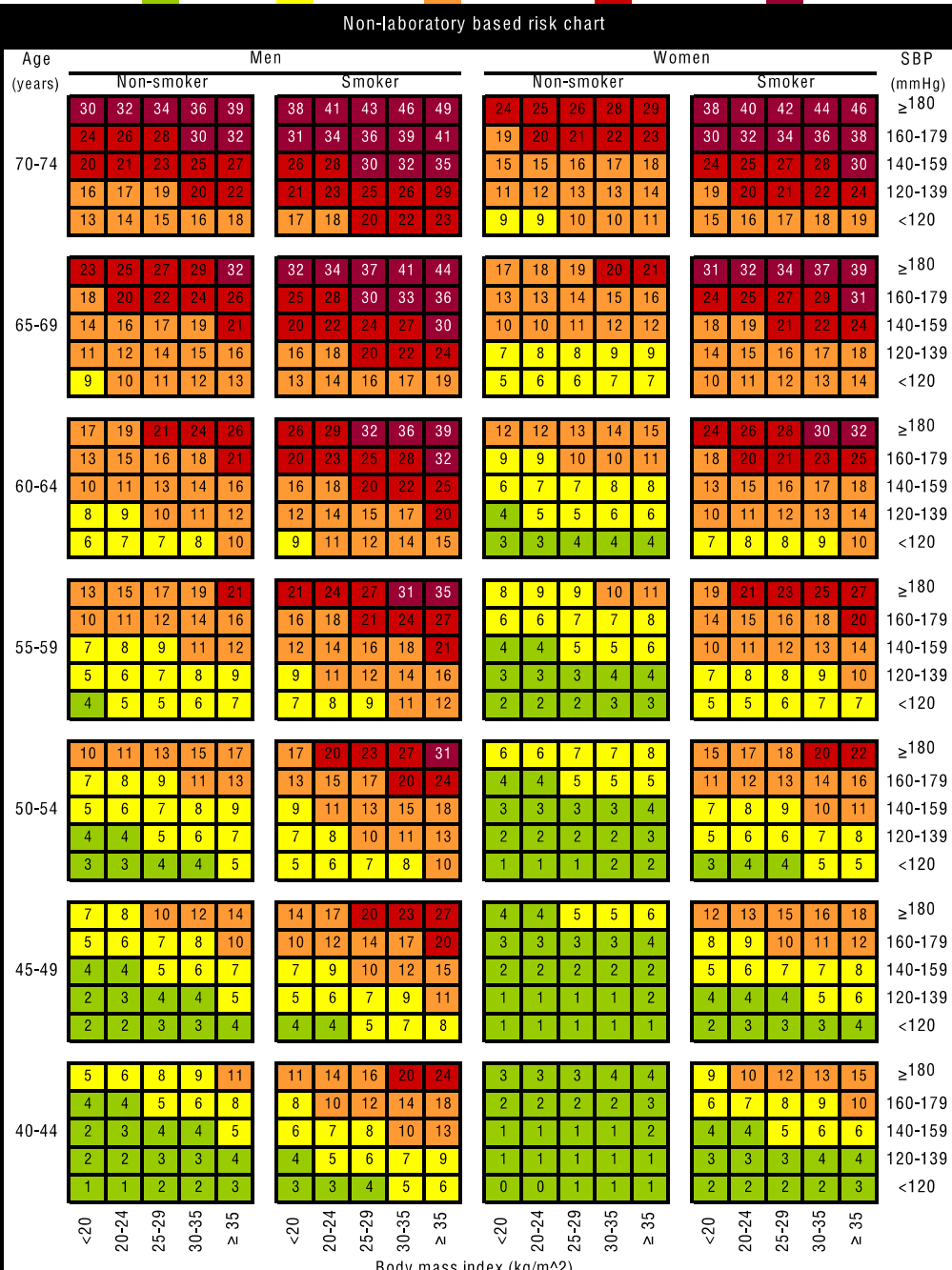
# Hur skatta risk?

- SCORE2 /SCORE2-OP /SCORE2-DM
- 10-årsrisk att drabbas av:
  - Kardiovaskulär död
  - Hjärtinfarkt
  - Stroke
- Tar hänsyn till
  - Ålder
  - Kön
  - Rökning
  - SBT
  - Non-HDL

# WHO risk score

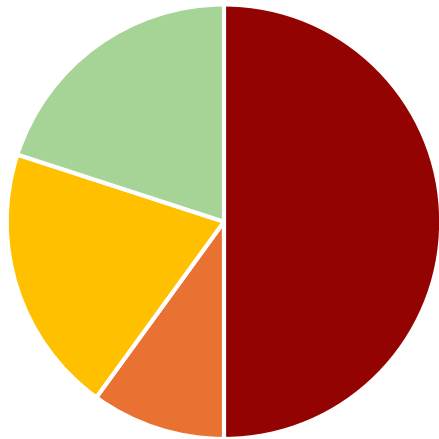
<https://www.who.int/news/item/02-09-2019-who-updates-cardiovascular-risk-charts>

Risk Level ■ <5% ■ 5% to <10% ■ 10% to <20% ■ 20% to <30% ■ ≥30%

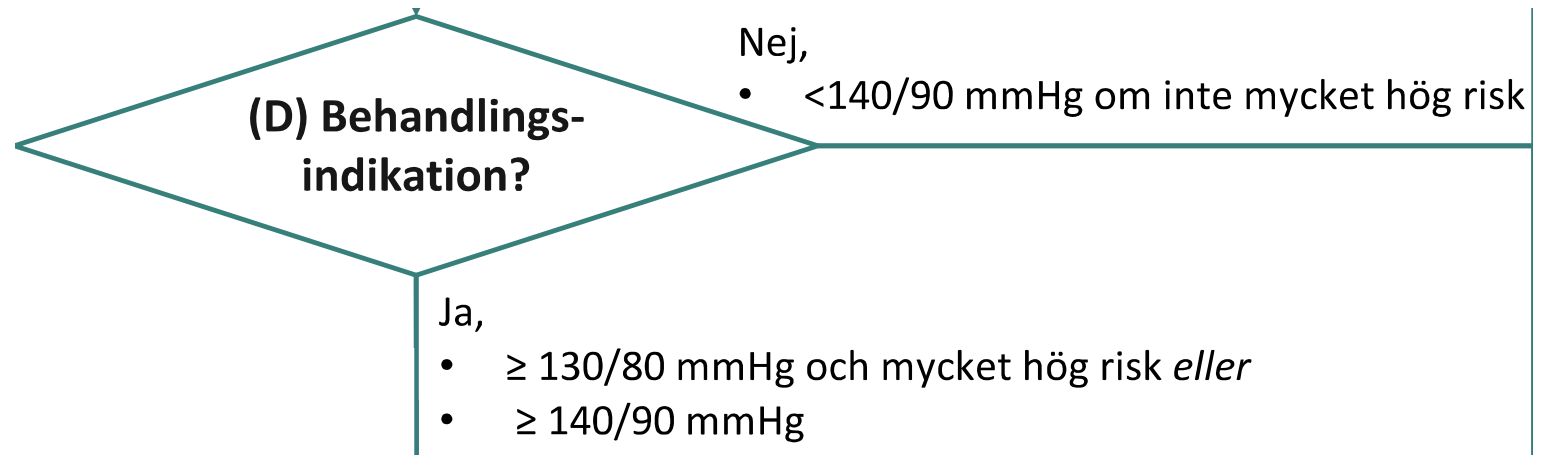


# Spelar roll inom kardiologin?

2,9 milj hypertoniker i Sverige idag



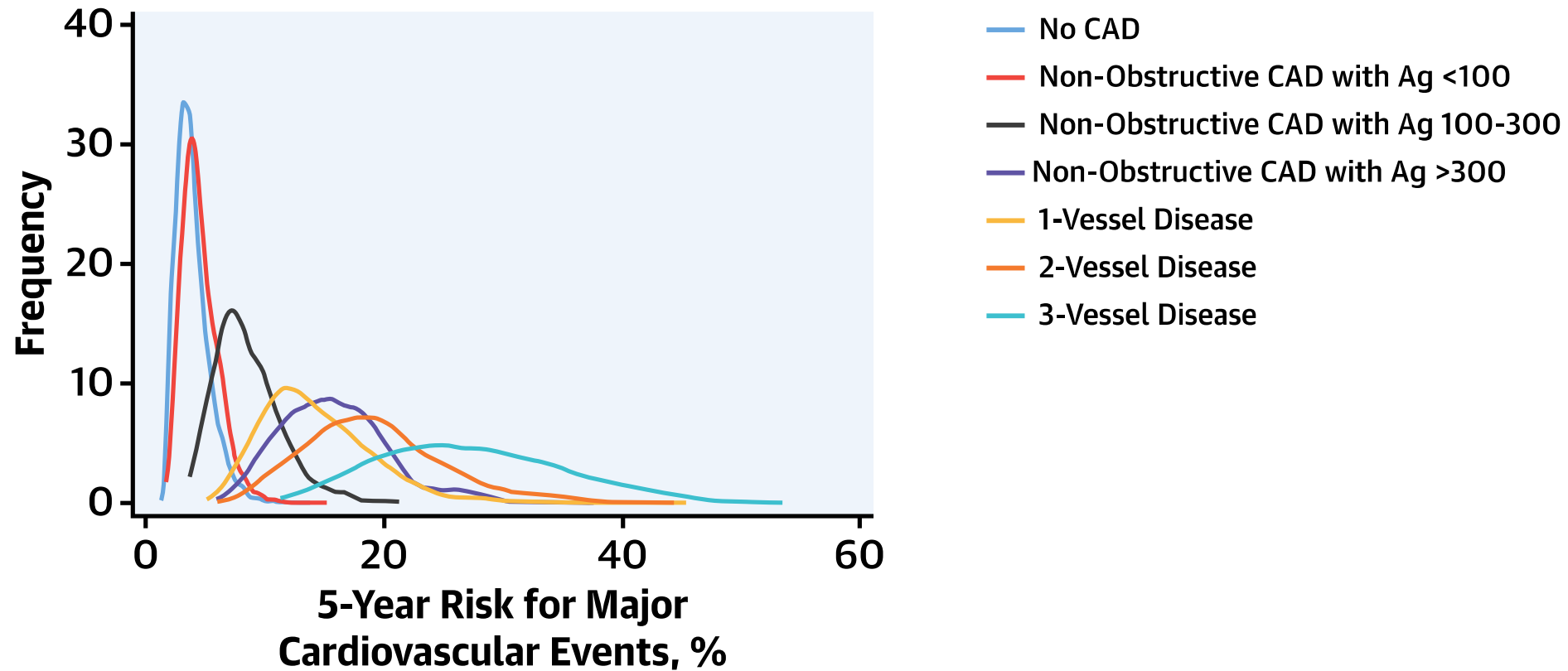
- Okänd
- Känd, ej behandlad
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- Under målvärde



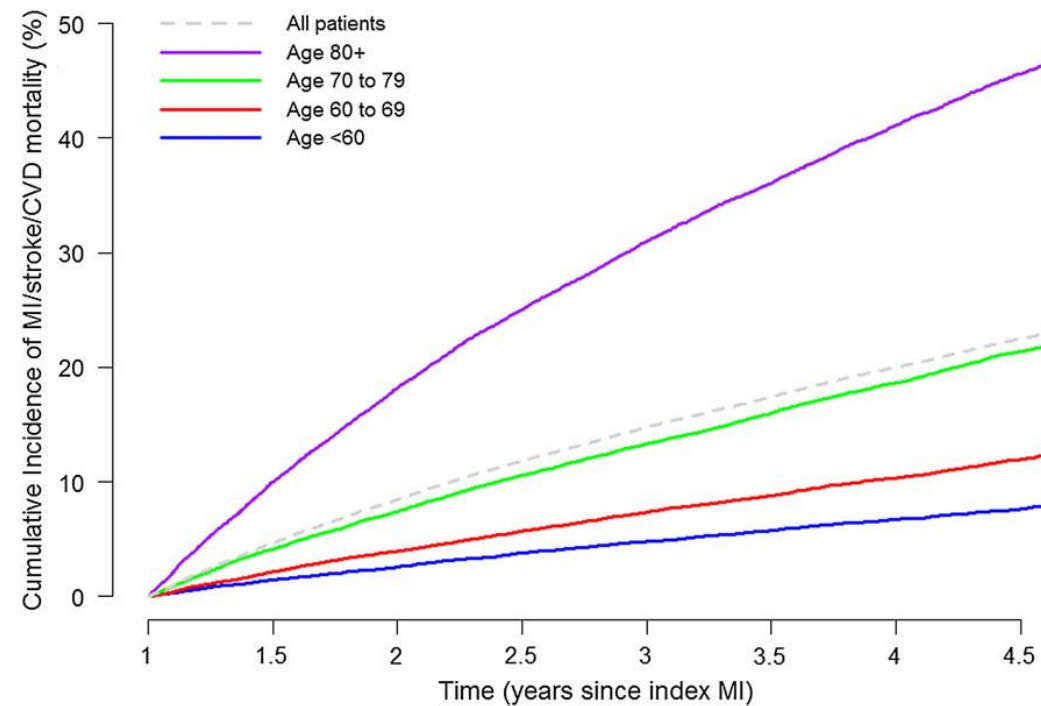
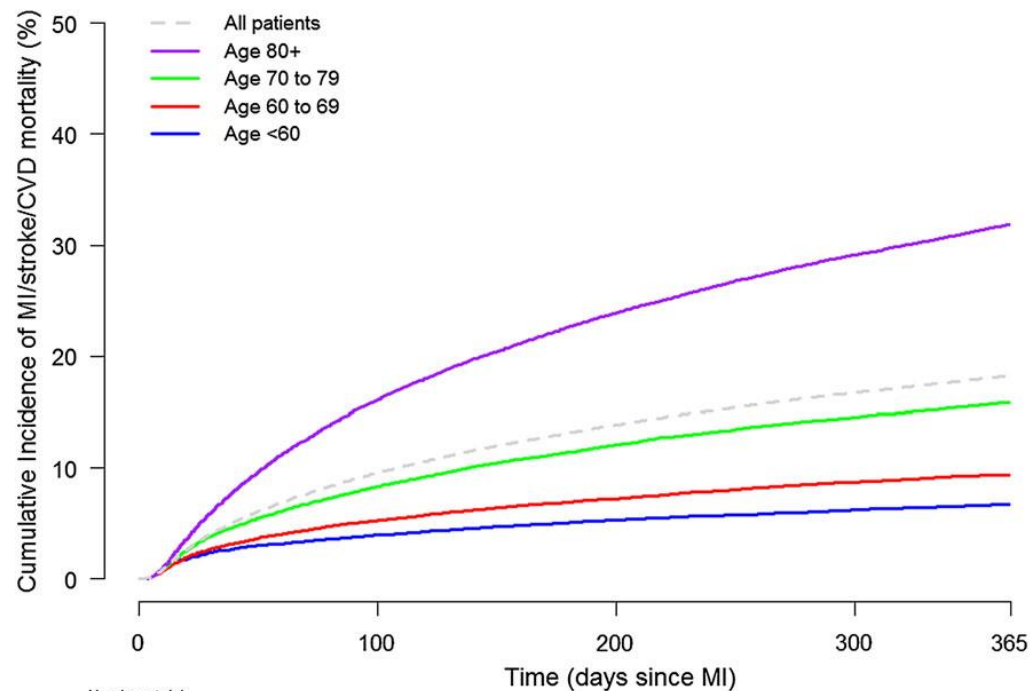
**=> Spelar stor roll inom kardiologin!**

Etablerad CVD = mycket hög  
risk!?

# Risk för MACE vid olika grader av CAD

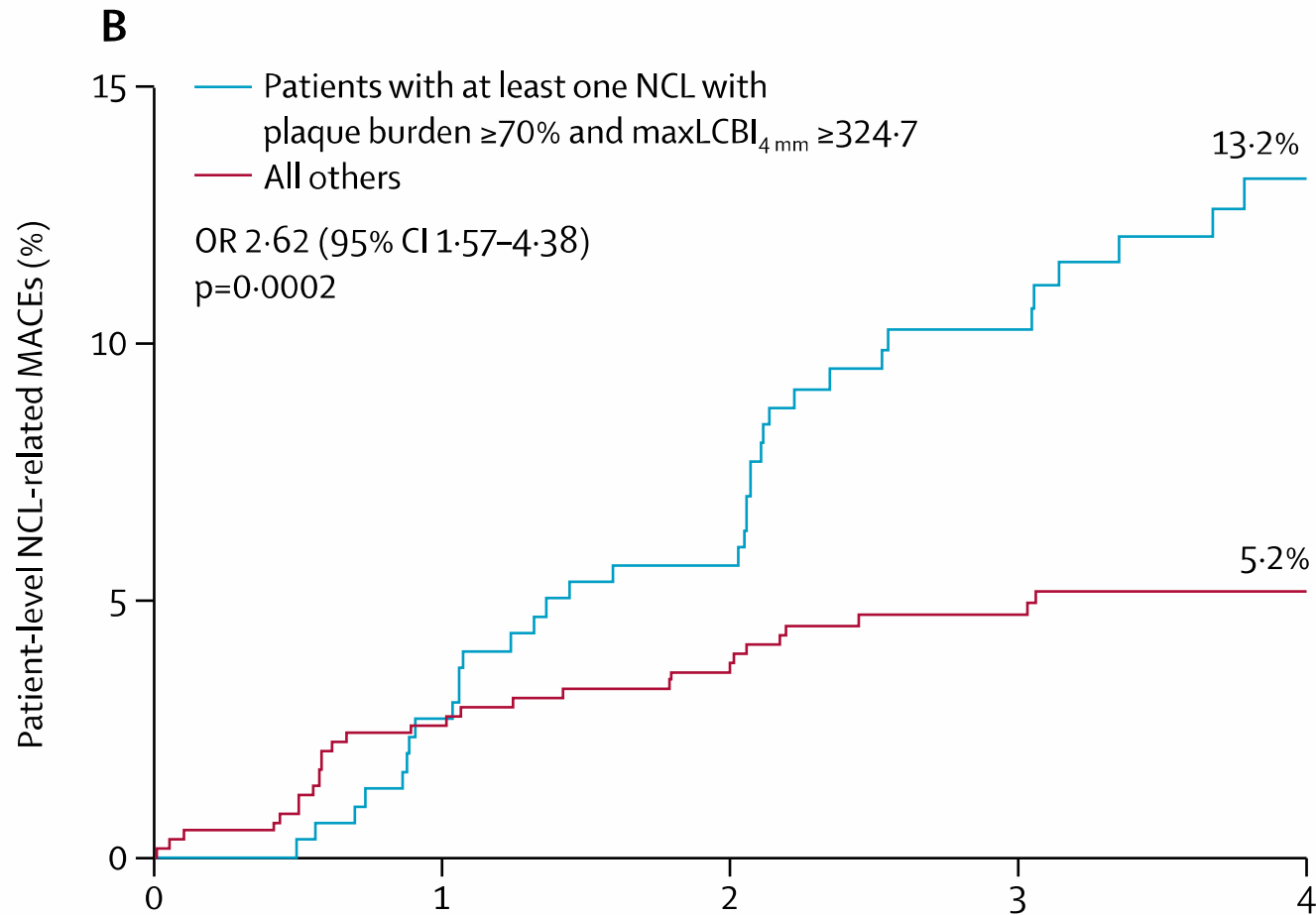


# Risk för MACE efter hjärtinfarkt



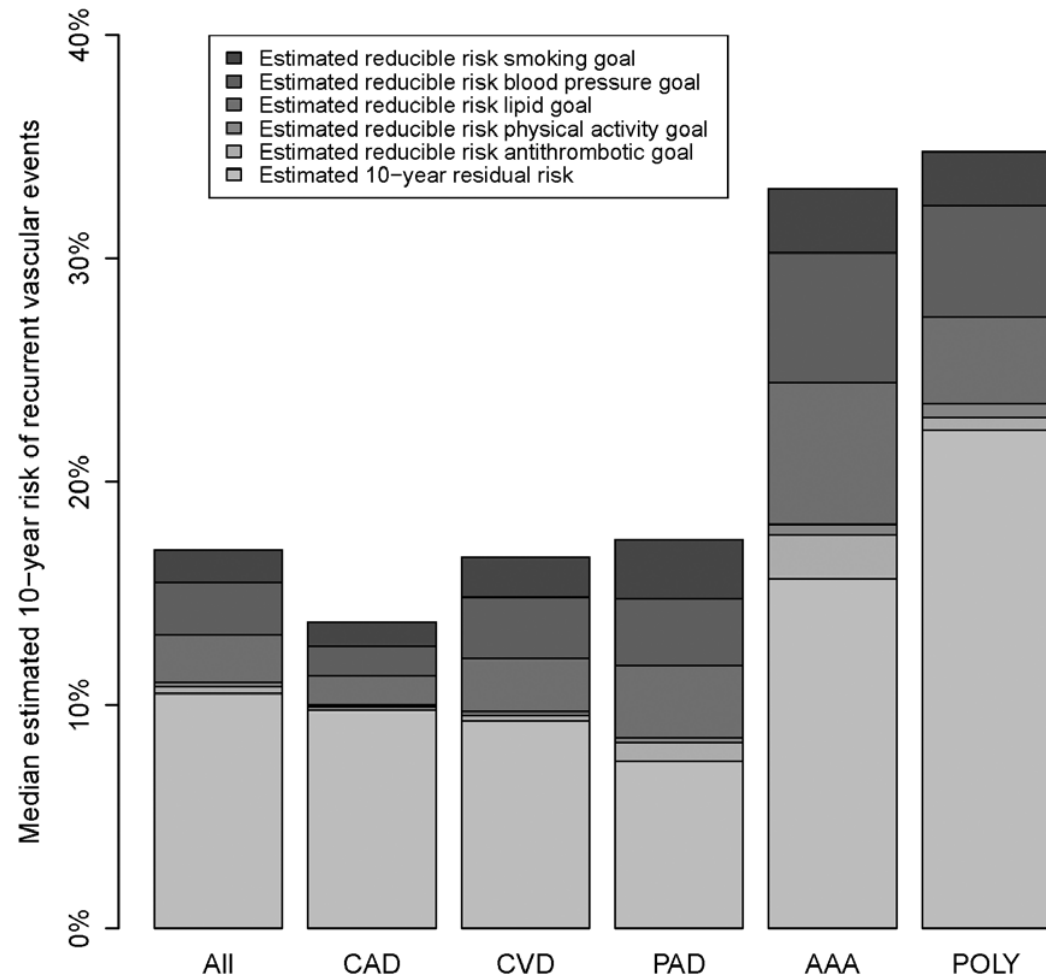
=> Totalt ca 40% risk för MACE inom 5 år!!

# Vulnerabla plack



Plackbörda = plackarea/kärlare  
LCBI = lipidhalt

# Olika CVD manifestationer



**Figure 2. Estimated reductions in estimated 10-year risks by attaining guideline-recommended risk factor control in patients with clinically manifest vascular disease.**

AAA indicates abdominal aortic aneurysm; CAD, coronary artery disease; CVD, cerebrovascular disease; PAD, pulmonary artery disease; and POLY, polyvascular disease.

# SCORE2 vs SMART

Risk of geographic region	...	Systolic blood pressure	<b>130</b>	mmHg
Gender	<b>M*</b>	Total cholesterol	<b>3.6</b>	mmol/L
Age	<b>65</b>	HDL-cholesterol	<b>2</b>	mmol/L
Current smoking	-	LDL-cholesterol	<b>1.4</b>	mmol/L

Klinisk situation: 10-

års risk för MACE

Primärprevention	=	5.9 %
CAD	=	9.5 %
AAA	=	14.1%
CAD + AAA + CVS	=	39.6 %

# PSV - Hypertoni

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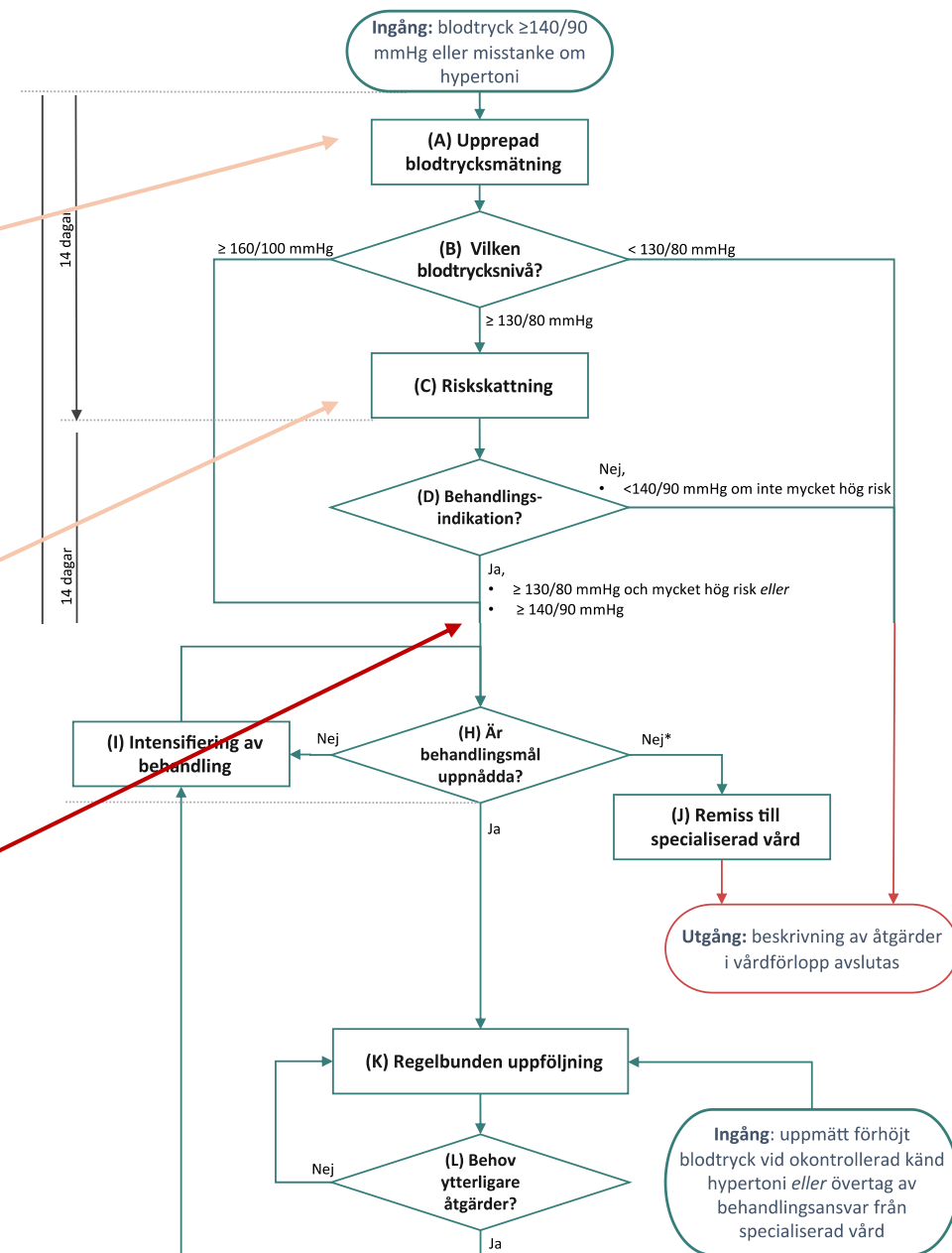
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# Nytt blodtrycksmål <130/80 för de flesta

- ESH 2023

Patients 18 to 64 years old		
The goal is to lower office BP to <130/80mmHg.	I	A
Patients 65 to 79 years old		
The primary goal of treatment is to lower BP to <140/80mmHg.	I	A
However, lowering BP to below 130/80mmHg can be considered if treatment is well tolerated.	II	B

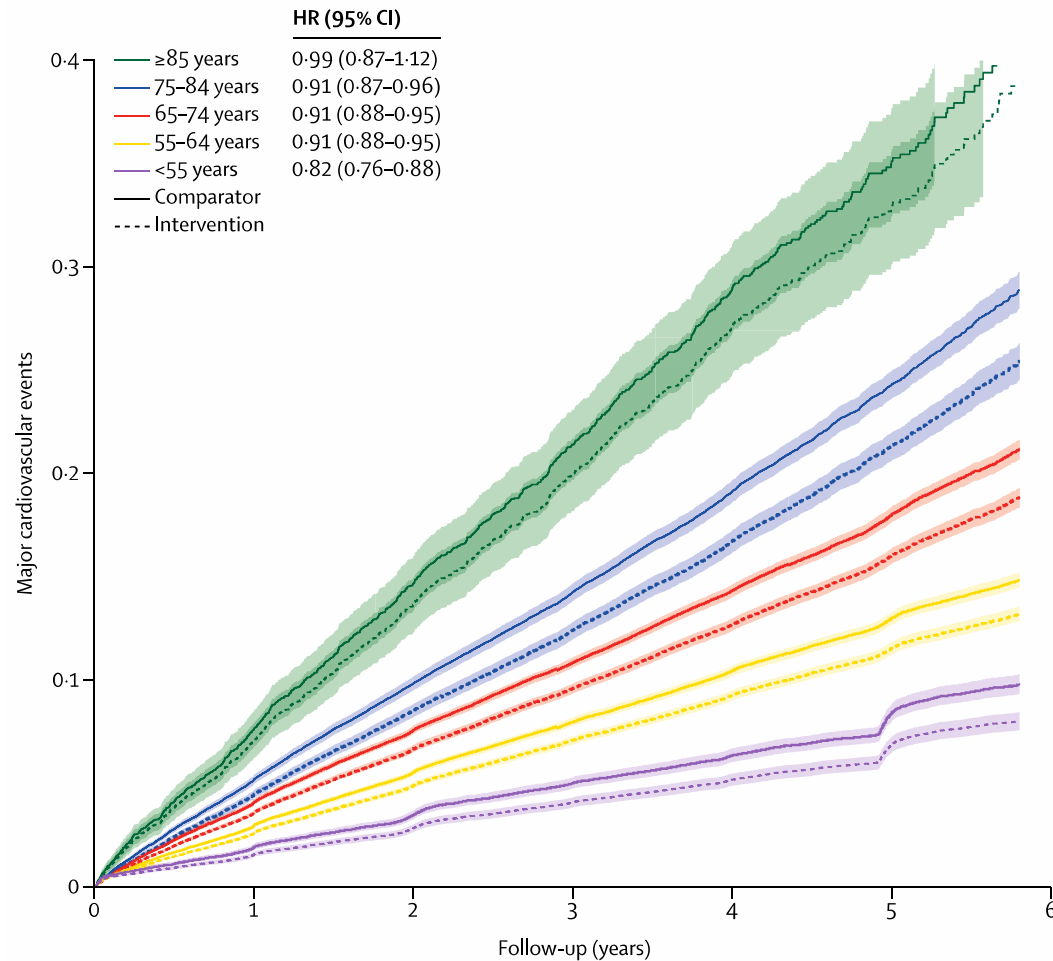
- ESC 2024

To reduce CVD risk, it is recommended that treated systolic BP values in most adults be targeted to 120–129 mmHg, provided the treatment is well tolerated.<sup>22,122,131,523,541</sup>

I

A

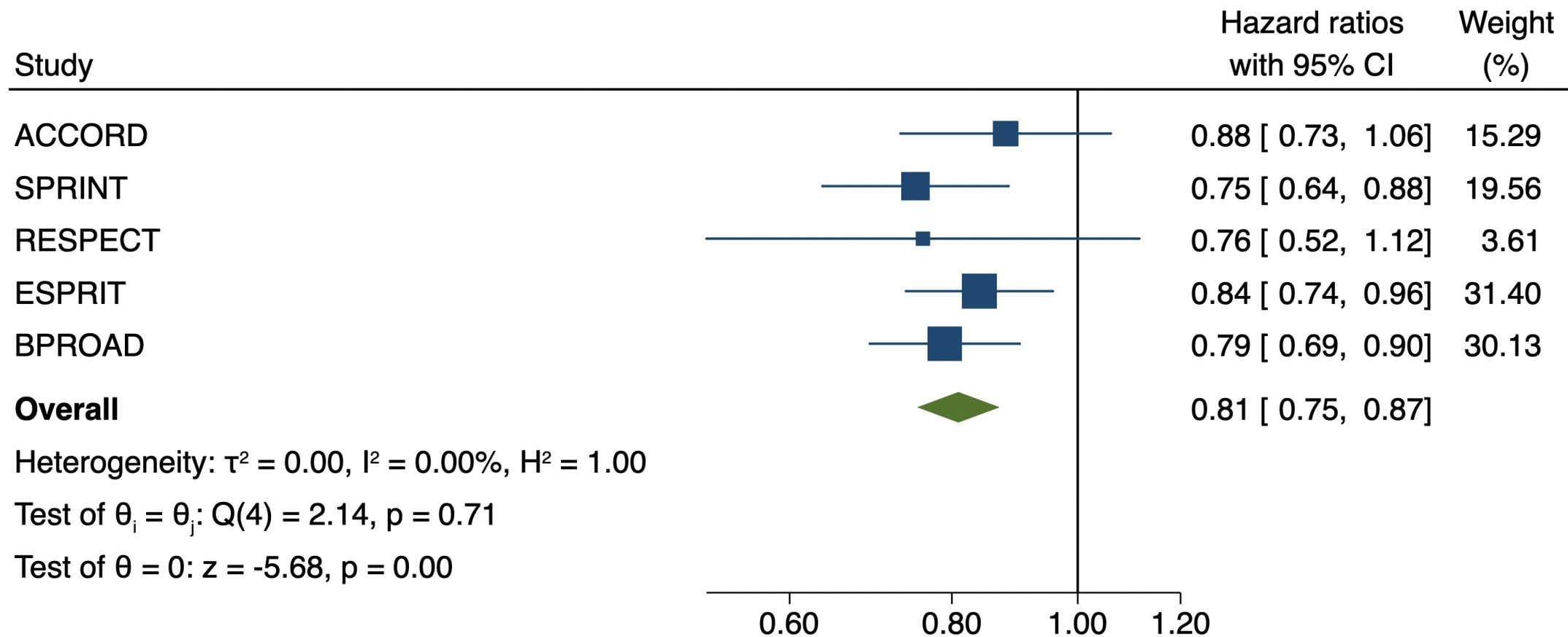
# Behandlingseffekt



Meta-analys av individuella pat  
 - 50 studier  
 - 350 000 patienter

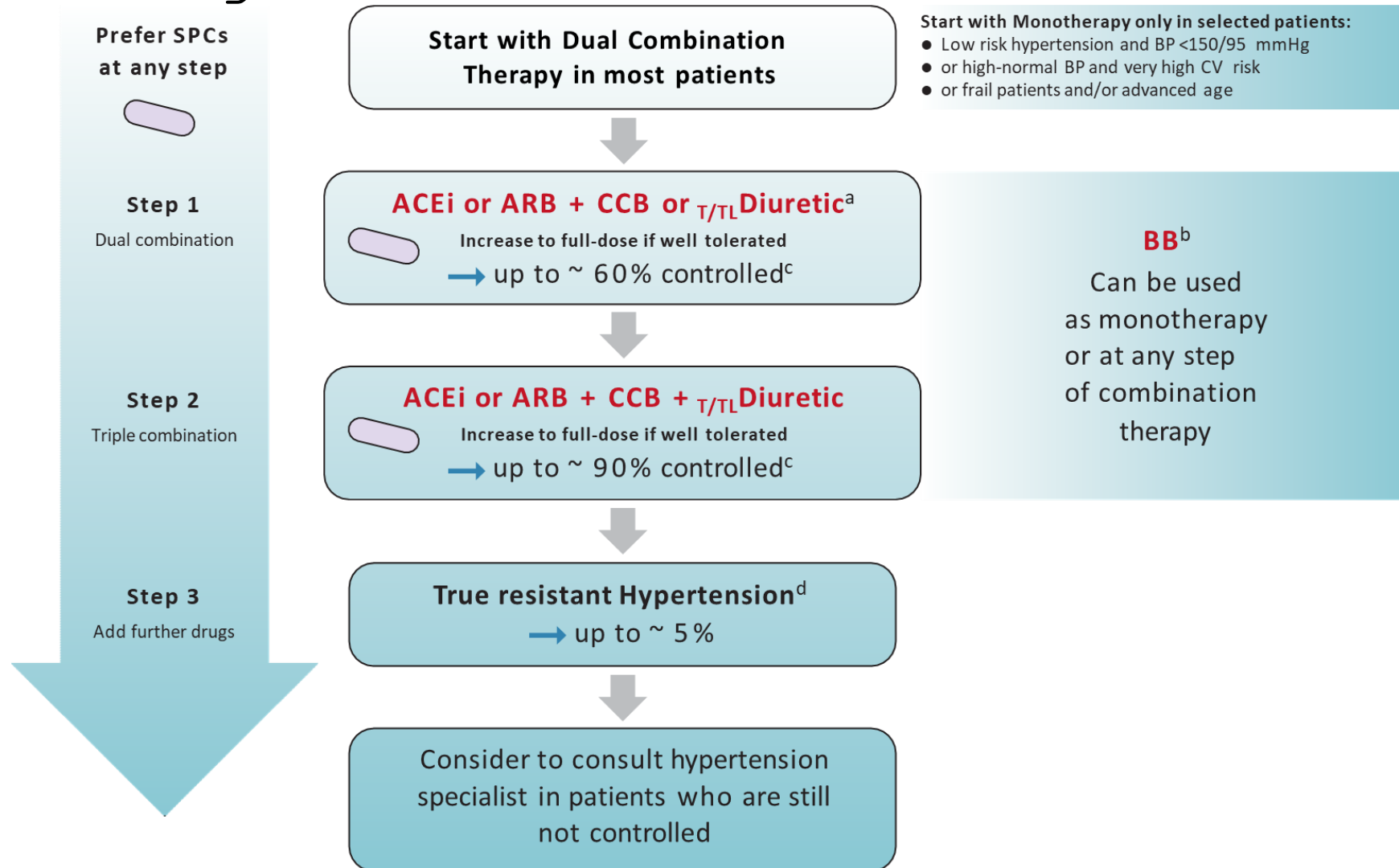
≈ 10% relative riskreduktion pe  
 - Oberoende av kön  
 - Oberoende av ålder  
 - Oberoende av tidigare CV

# Nya RCT <120 vs <140

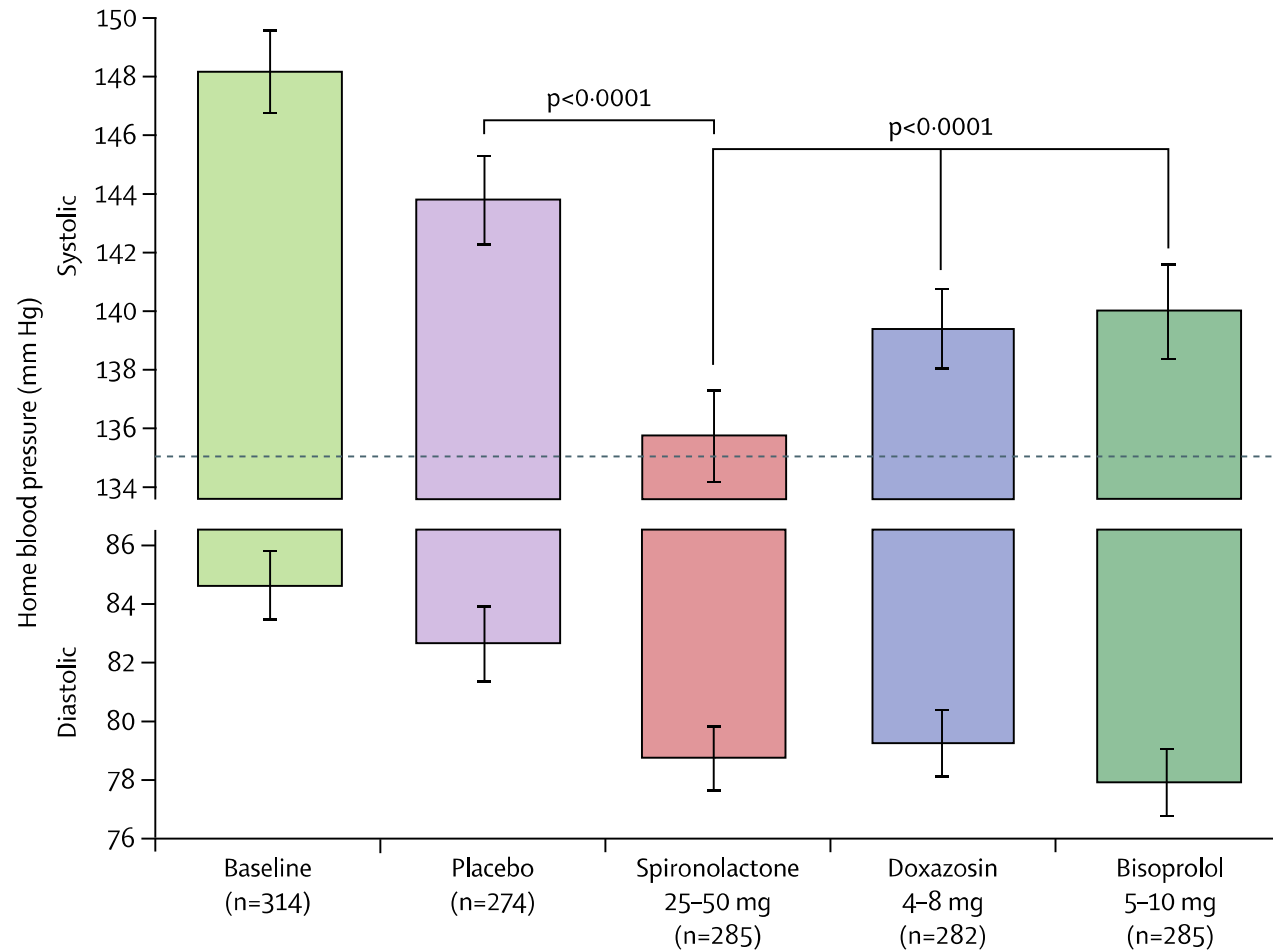


# Läkemedelsbehandling hypertoni 2023

## ESH guidelines



# Om sann resistent hypertoni – behandlad med A+C+D



# Hur angripa särskilt hög risk?

Adding a second antithrombotic agent to aspirin for extended long-term secondary prevention should be considered in patients at enhanced ischaemic risk<sup>c</sup> and without high bleeding risk<sup>d</sup> (options and definitions in [Table 8](#) and in the [Supplementary data](#) online, [Tables S2 and S3](#)).<sup>592–594</sup>

IIa

A

For patients with a recurrent atherothrombotic event (not necessarily of the same type as the first event) while taking maximally tolerated statin therapy, an LDL-C goal of <1.0 mmol/L (<40 mg/dL) may be considered.<sup>675,676</sup>

IIb

B

The GLP-1 receptor agonist semaglutide should be considered in overweight (BMI >27 kg/m<sup>2</sup>) or obese CCS patients without diabetes to reduce CV mortality, MI, or stroke.<sup>465</sup>

IIa

B

In CCS patients with atherosclerotic CAD, low-dose colchicine (0.5 mg daily) should be considered to reduce myocardial infarction, stroke, and need for revascularization.<sup>714–716</sup>

IIa

A

In high-risk patients with PAAD and triglycerides >1.5 mmol/L despite lifestyle measures and statin therapy, icosapent ethyl 2 g b.i.d. may be considered in addition to a statin.<sup>368</sup>

IIb

B

# Blodtrycket då?

**Results:** Age was  $62.0 \pm 8.4$  years, 74% male, 54% had NSTEMI and 46% STEMI. The follow-up visit and ABPM were performed at median 7 and 11 weeks, respectively, after hospital discharge. Among 90 patients with complete data and ABPM recordings, 31 had mean 24-h BP above target levels, of which 18 were identified with MUCH. Patients with MUCH had lower eGFR ( $68 \pm 11$  vs  $76 \pm 12$  ml/min/1.73m<sup>2</sup>,  $P=0.009$ ), and more often a history of hypertension (89 vs 53%,  $P=0.005$ ) and diabetes mellitus (44 vs 11%,  $P=0.003$ ). In total, 65 variables were eligible for machine learning after filtering. Boruta and LASSO identified pulse pressure at the follow-up visit, serum creatinine, diabetes mellitus and history of hypertension as important predictors. Random forest, logistic regression and LASSO showed mean AUC 0.826, 0.822, and 0.822, respectively, in cross validation using these predictors.

# AHA/ACC 2025

COR	LOE	RECOMMENDATIONS
1	A	1. In adults with confirmed hypertension who are at increased risk* for CVD, an SBP goal of at least <130 mm Hg, with encouragement to achieve SBP <120 mm Hg, is recommended to reduce the risk of cardiovascular events and total mortality. <sup>1-4</sup>

# Slutsatser

- Högt blodtryck är den viktigaste riskfaktorn för kardiovaskulär sjukdom och död globalt och nationellt
- Det finns stor underdiagnostik och underbehandling i Sverige idag
- Riskskattning gör att vi kan lägga mest resurser där vi gör mest nytta
- Glöm inte blodtrycket, inkl 24 tim kontroll, hos våra hjärtpatienter

Tack!