Guidelines

2007 Guidelines for the Management of Arterial Hypertension

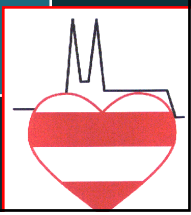
The Task Force for the Management of Arterial Hypertension of the European Society of Hypertension (ESH) and of the European Society of Cardiology (ESC)

Authors/Task Force Members: Giuseppe Mancia, Co-Chairperson (Italy), Guy De Backer, Co-Chairperson (Belgium), Anna Dominiczak (UK), Renata Cifkova (Czech Republic), Robert Fagard (Belgium), Giuseppe Germano (Italy), Guido Grassi (Italy), Anthony M. Heagerty (UK), Sverre E. Kjeldsen (Norway), Stephane Laurent (France), Krzysztof Narkiewicz (Poland), Luis Ruilope (Spain), Andrzej Rynkiewicz (Poland), Roland E. Schmieder (Germany), Harry A.J. Struijker Boudier (Netherlands), Alberto Zanchetti (Italy)

Journal of Hypertension 2007, 25, 1105-1187

ESH/ESC Guidelines: Definition and classification (mmHg)

Cathegory	BPs	BPd
Optimal	< 120	< 80
Normal	120-129	80-84
High normal	130-139	85-89
Hypertension		
grade 1 (mild)	140-159	90-99
grade 2 (moderate)	160-179	100-109
grade 3 (severe)	≥ 180	≥ 110
Izolated systolic hypertension	≥ 140	< 90

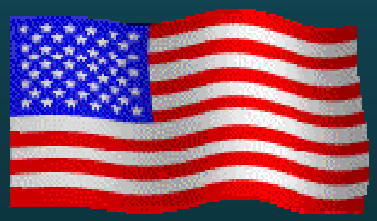


2007 ESH/ESC Guidelines: NORMAL VALUES

Office	140/90 mmHg
Self monitoring	135/85 mmHg
24 hod monitoring	125/80 mmHg
Daily	135/85 mmHg
Night	120/70 mmHg

Classification according BP

	BPs (mmHg)	BPd (mmHg)
Normal	< 120	< 80
Prehypertension	120-139	80-89
grade 1	140-159	90-99
grade 2	> 160	> 100



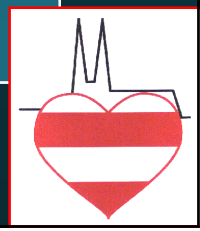
JNC 7 vs. ESC

	BPs (mmHg)	BPd (mmHg)
Optimal	< 120	< 80
normal	120-129	80-84
High normal	130-139	85-89
Mild – grade 1	140-159	90-99
Moderate - grade 2	160-179	100-109
Severe - grade 3	> 180	> 110
ISH	> 140	< 90

Healthy → "Prediseased"

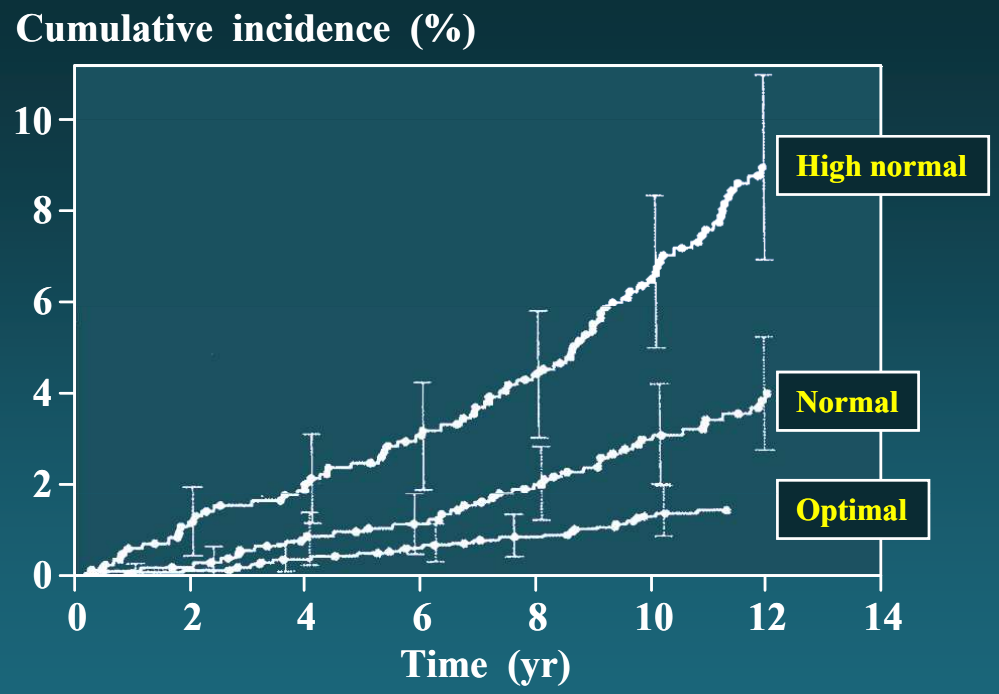
→ Hypertension

→ Hypertension with complications



Cardiovascular events in patients with „normal“ blood pressure

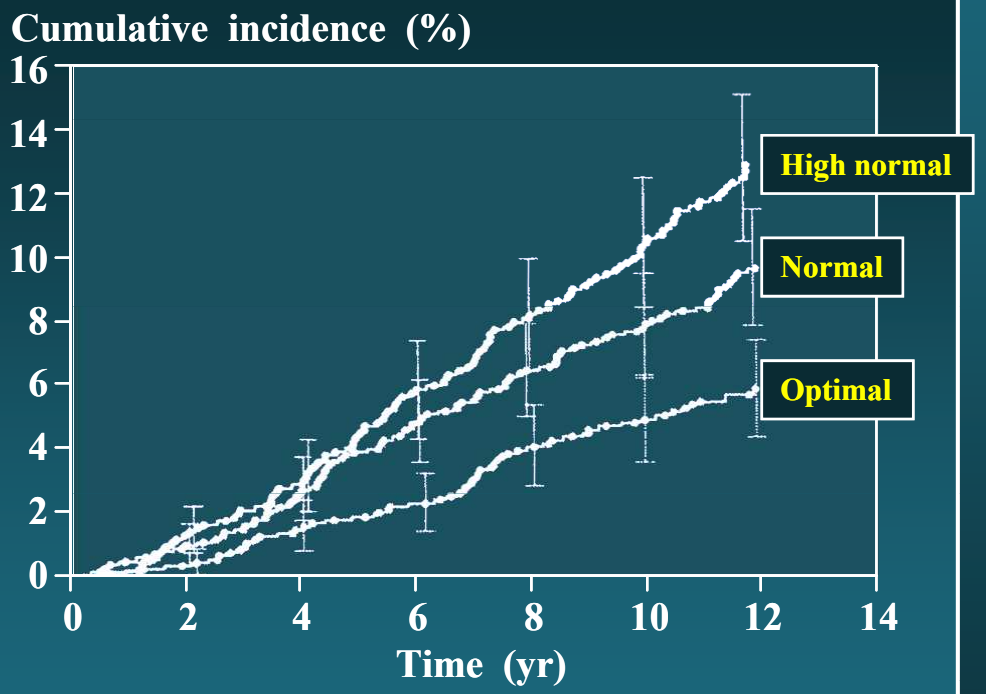
Female



No. at risk

Optimal	1875	1867	1851	1839	1821	1734	887
Normal	1126	1115	1097	1084	1061	974	649
High-normal	891	874	859	840	812	722	520

Male



No. at risk

Optimal	1005	995	973	962	934	892	454
Normal	1059	1039	1012	982	952	892	520
High-normal	903	879	857	819	795	726	441

Vasan et al., N Engl J Med 2001; 345: 1291-7

ESH/ESC Guidelines – Risc factors

- BPs / BPd
- Age: male > 55 years, female > 65 years
- Smoking
- Dyslipidemia
  - total chol. > 6,5 mmol/l
  - LDL-chol. > 4,0 mmol/l
  - HDL-chol. < 1,0 (male) or < 1,2 (female) mmol/l
- Family history CVD (male < 55 years; female < 65 years)
- Abdominal obesity (waist ≥ 102 cm male, ≥ 88 cm female)
- C-reactiv protein ≥ 1 mg/l

ESH/ESC Guidelines – organ demage

- LVH
  - ECG (Sokolow-Lyon > 38 mm / Cornell > 2440 mm x ms)
  - Echo: LVMI ≥ 125 g/m² (male)
    ≥ 110 g/m² (female)
- Intima/media carotid thickness (IMT ≥ 9 mm)
  Or plake
- Increased S-cr (115 - 133 µmol/l male,
  107 – 124 µmol/l u žen)
- Mikroalbuminuria
  - 30-300 mg/24 hour
  - albumin / creatinin
    - male: ≥ 22 mg/g
    - female: ≥ 31 mg/g

2007 ESH/ESC Guidelines: Greades for treated HT

- I = without changes
- II = with changes
- III = with end organ damage

2007 ESH/ESC Guidelines: Organ damage

- Heart - IHD
- Brain - Stroke
- Kidney - Nefropathy, MIA
- Periphery - ID of LE
- Eyesi - hemorhagy

2007 ESH/ESC Guidelines: Examinations

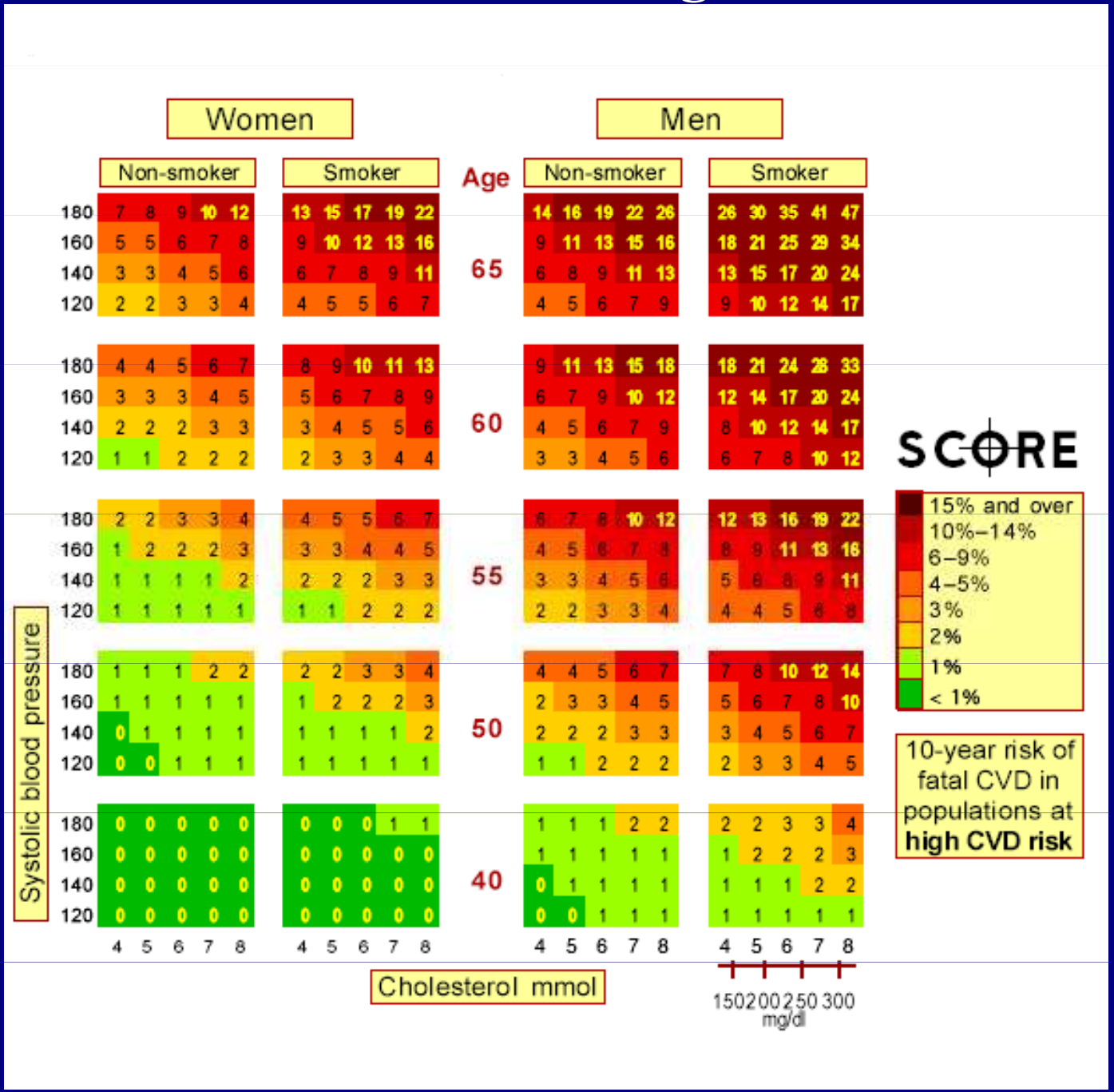
ALL

- Pers. and fam. hist
- Fysical exam
- BP on both upper ex
- Urine + MIA
- Kreat, U, Na, K, gly, UA
- Lipids
- ECG

SELECTED

- USD carotid
- USD heart
- MIA (DM)
- Creat clear, proteinuria
- Retinopathy

Countries with high risk

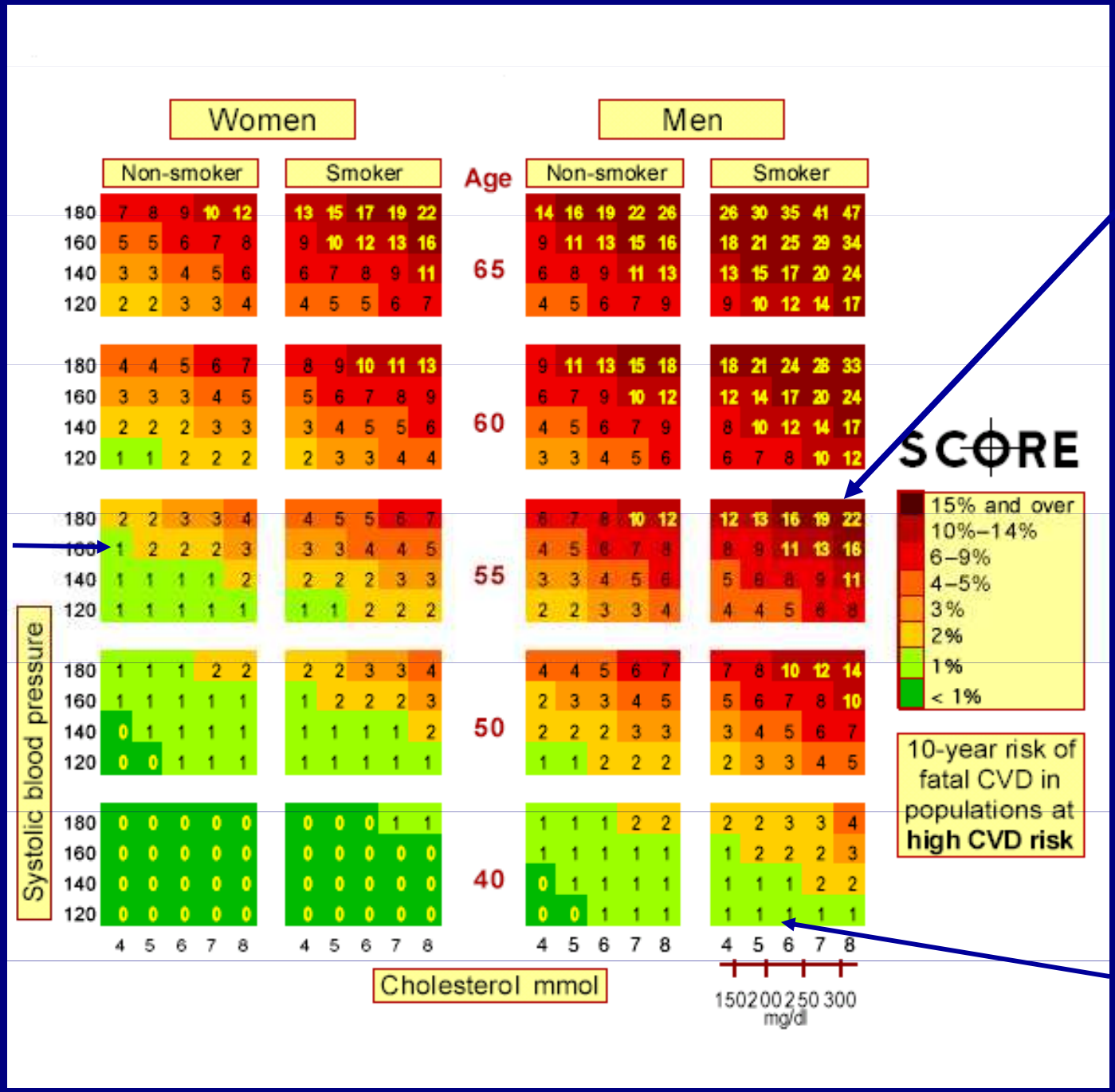


2007 ESH-ESC Guidelines

Expected risk	*10-year risk IHD*	*10-year risk death*
Low	**< 15%**	**< 4%**
Moderate	**15-20%**	**4-5%**
High	**20-30%**	**5-8%**
Very high	**> 30%**	**> 8%**

Case report

• Demography	Male, 55 years
• Total cholesterol	6,2 mmol/l
• HDL	1,3 mmol/l
• BP	160/95 mm Hg
• LDL	4,2 mmol/l
• TG	3,4 mmol/l
• Smoking, LVH, DM	YES
• **10year risk IHD**	

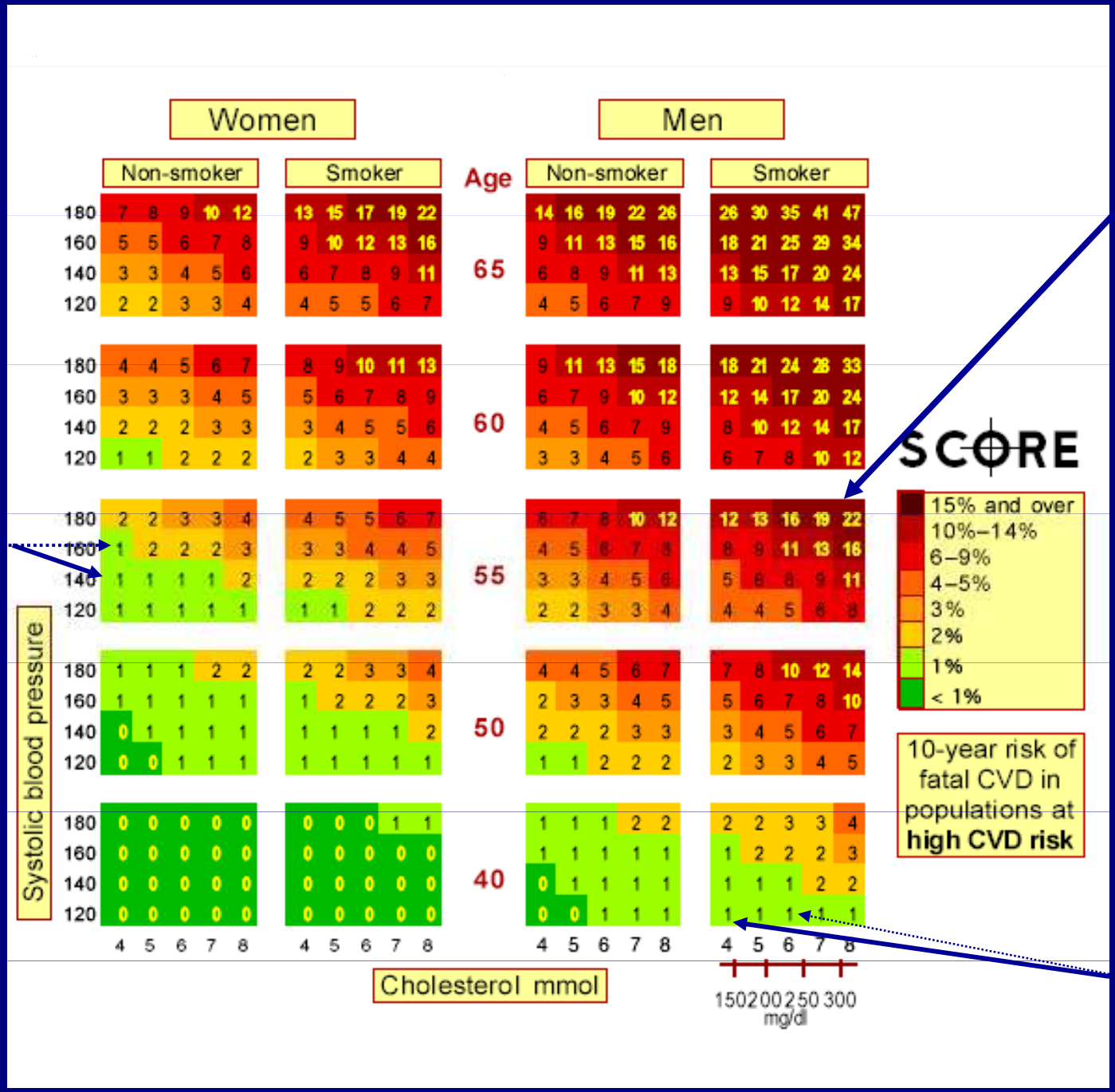

Women
Men
Non-smoker
Smoker
Age
65
60
55
50
40
Systolic blood pressure
180
160
140
120
4 5 6 7 8
Cholesterol mmol
150 200 250 300
mg/dl
SCORE
15% and over
10%–14%
6–9%
4–5%
3%
2%
1%
< 1%
10-year risk of fatal CVD in populations at high CVD risk
Male, 55 smoker
BPs 160
Chol 6,2

Case report

• Demography	Male, 55 years
• Total cholesterol	6,2 mmol/l
• HDL	1,3 mmol/l
• BP	160/95 mm Hg
• LDL	4,2 mmol/l
• TG	3,4 mmol/l
• Smoking, LVH, DM	YES
• **10year risk IHD**	11%

Case report

• Demography	Male, 55 years	Male, 55 years
• Total cholesterol	6,2 mmol/l	4,1 mmol/l
• HDL	1,3 mmol/l	1,4 mmol/l
• BP	160/95 mm Hg	140/83 mm Hg
• LDL	4,2 mmol/l	2,7 mmol/l
• TG	3,4 mmol/l	3,0 mmol/l
• Smoking, LVH, DM	YES	YES
• **10year risk IHD**	11%	

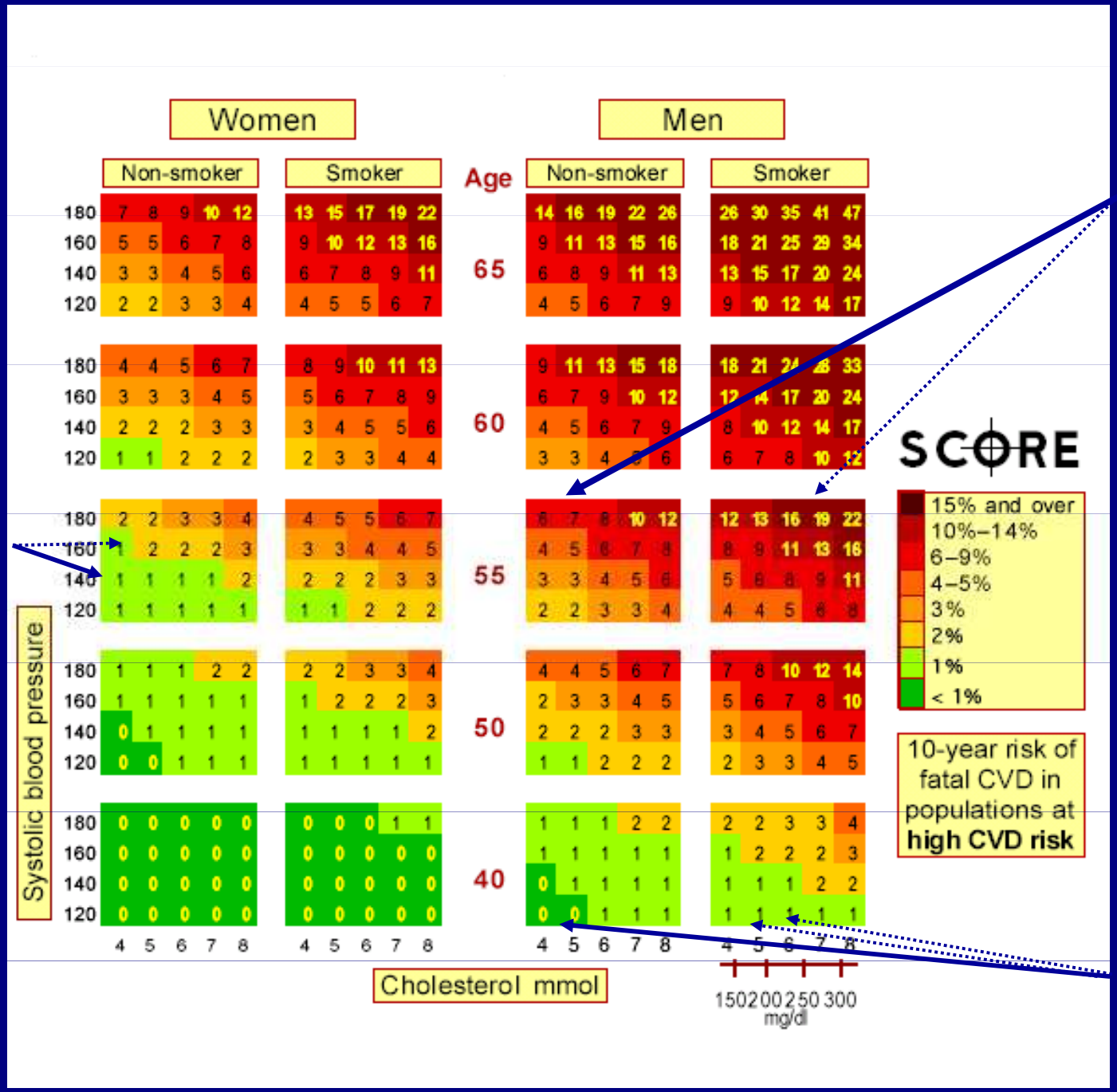

Women
Men
Non-smoker
Smoker
Non-smoker
Smoker
Age
65
60
55
50
40
Systolic blood pressure
180
160
140
120
4 5 6 7 8
Cholesterol mmol
150 200 250 300
mg/dl
SCORE
15% and over
10%–14%
6–9%
4–5%
3%
2%
1%
< 1%
10-year risk of fatal CVD in populations at high CVD risk
Male, 55 smoker
BPs 140
Chol 4,1

Case report

• Demography	Muž, 55 let	Muž, 55 let
• Total cholesterol	6,2 mmol/l	4,1 mmol/l
• HDL	1,3 mmol/l	1,4 mmol/l
• BP	160/95 mm Hg	140/83 mm Hg
• LDL	4,2 mmol/l	2,7 mmol/l
• TG	3,4 mmol/l	3,0 mmol/l
• Smoking, LVH, DM	YES	YES
• **10year risk IHD**	11%	5%

Case report

• Demography	MALE, 55	MALE, 55	MALE, 55
• Total cholesterol	6,2 mmol/l	4,1 mmol/l	4,1 mmol/l
• HDL	1,3 mmol/l	1,4 mmol/l	1,4 mmol/l
• BP	160/95 mm Hg	140/83 mm Hg	140/83 mm Hg
• LDL	4,2 mmol/l	2,7 mmol/l	2,7 mmol/l
• TG	3,4 mmol/l	3,0 mmol/l	3,0 mmol/l
• Smoking, LVH, DM	YES	YES	NO !!!
• **10year risk IHD**	11%	5%	



Muž, 55 nonsmoker

BPs 140

Chol 4,1

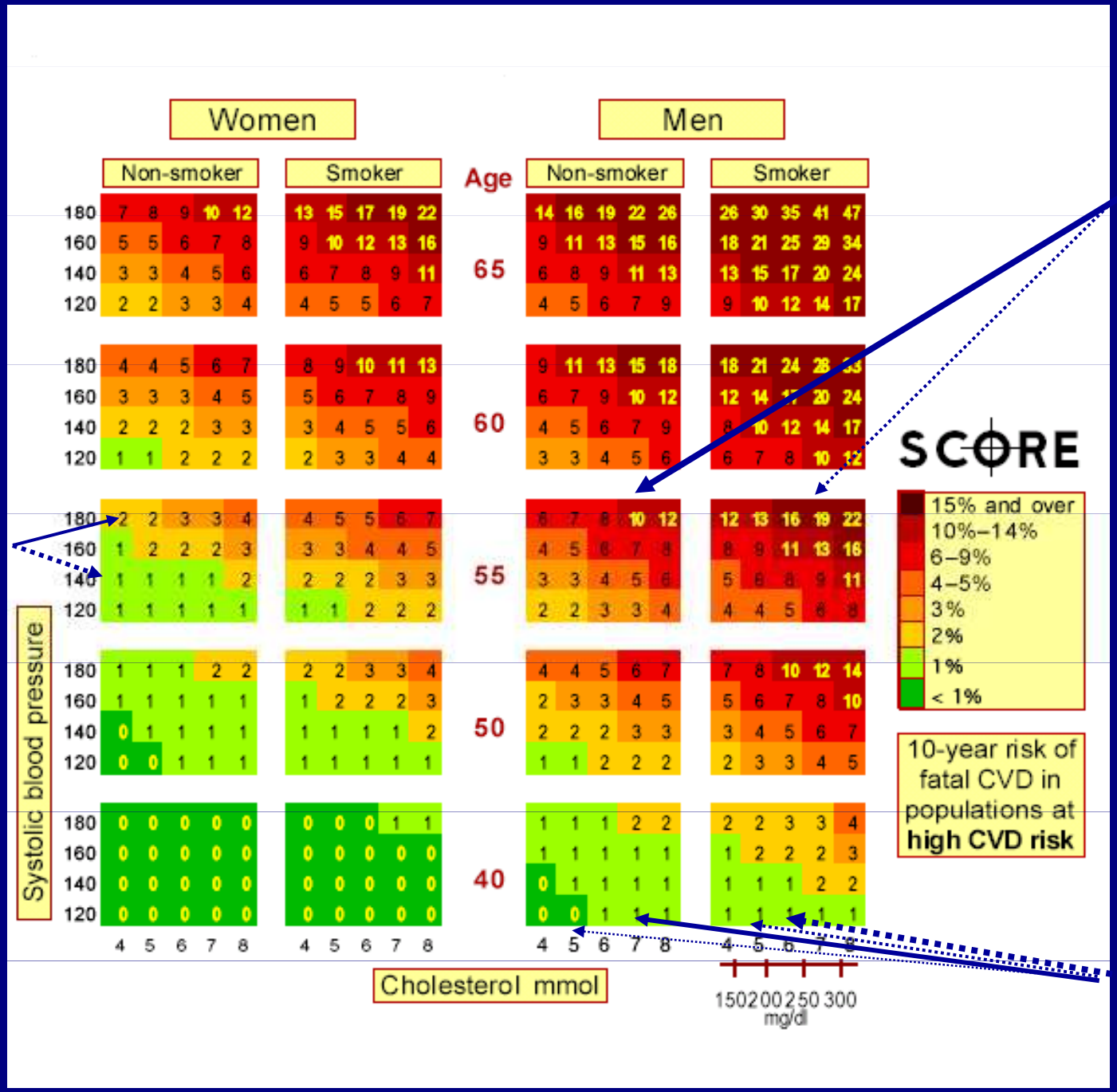
Case report

• Demography	Male, 55	Male, 55	Male, 55
• Total cholesterol	6,2 mmol/l	4,1 mmol/l	4,1 mmol/l
• HDL	1,3 mmol/l	1,4 mmol/l	1,4 mmol/l
• BP	160/95 mm Hg	140/83 mm Hg	140/83 mm Hg
• LDL	4,2 mmol/l	2,7 mmol/l	2,7 mmol/l
• TG	3,4 mmol/l	3,0 mmol/l	3,0 mmol/l
• Smoking, LVH, DM	YES	YES	NO !!!
• **10year risk IHD**	11%	5%	2%

Case report

• Demography	Male, 55	Male, 56
• Total cholesterol	4,1 mmol/l	6,8 mmol/l
• HDL	1,4 mmol/l	1,4 mmol/l
• BP	140/83 mm Hg	175/90 mm Hg
• LDL	2,7 mmol/l	2,7 mmol/l
• TG	3,0 mmol/l	3,0 mmol/l
• Smoking, LVH, DM	NO !!!	NO !!!
• **10year risk IHD**	2%	

Because he did not smoke, he overweight 15 kg



TKs 175

Male, 56 nonsmoker

Chol 6,8

Case report

• Demography	Male, 55 let	Male, 56 let
• Total cholesterol	4,1 mmol/l	6,8 mmol/l
• HDL	1,4 mmol/l	1,4 mmol/l
• BP	140/83 mm Hg	175/90 mm Hg
• LDL	2,7 mmol/l	3,9 mmol/l
• TG	3,0 mmol/l	4,2 mmol/l
• Smoking, LVH, DM	NE !!!	NE !!!
• **10year risk IHD**	2%	10%

Because he did not smoke, he overweight 15 kg

Case report

• Demography	Muž, 55 let	Muž, 56 let
• Total cholesterol	4,1 mmol/l	6,8 mmol/l
• HDL	1,4 mmol/l	1,4 mmol/l
• BP	140/83 mm Hg	175/90 mm Hg
• LDL	2,7 mmol/l	3,9 mmol/l
• TG	3,0 mmol/l	4,2 mmol/l
• Smoking, LVH, DM	NE !!!	NE !!!
• **10year risk IHD**	2%	20%

Because he did not smoke, he overweight 15 kg and got DM

JNC - ESC/ESH (2007)

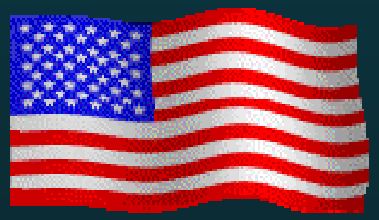
Basic antihypertensives are:

- **Diuretics**
- **ACE inhibitors**
- **Betablockers**
- **Ca antagonists**
- **AII antagonists**

These groups are equal.

If BP > 20/10 mmHg above normal value

We can start the treatment with combinations !!!



Diuretics (thiazid)

Indication	**Heart failure** **Old age** **Izolated systolic hypertension** **HT of Afroamericans**
KI absolut	Goat
KI relativ	gravidity

Diuretics (thiazid and K sparing)

hydrochlorothiazid	12,5-25 mg	
chlorthalidon	12,5 či 25 mg ob den	
indapamid	2,5 - 5 mg	
metipamid	1,25 – 2,5 mg	
amilorid	2,5-5 mg	

Diuretics (loop)

Indication	**Renal insuficiency** **Heart failure**
KI absolut	**---**
KI relativ	**---**

Diuretics (loop)

furosemid	20-40 mg	
torasemid	10–20 mg	

Diuretics (aldosteron antagonists)

Indication	**Heart failure** **Post MI**
KI absolut	Renal ins. Hyperkalemia
KI relativ	**---**

Diuretics (aldosteron antagonists)

spironolakton	**25-50 mg**	
eplerenon	**25-50 mg**	

Betablockers

Indications	**Angina pectoris**
	Post MI
	Heart failure
	Gravidity
	Tachyarytmia
KI absolut	Asthma
	Lung obstructive disease
	A–V blockade II. a III. stupně
KI relativ	Periferal arterial disease
	Glukose intolerans
	Atlets

Betablockers

acetabutolol	1 x 400 mg	Selectiv with ISA	
atenolol	1 x 100mg	Selectiv with ISA	
betaxolol	1 x 20 mg	Selectiv without ISA	
bopindolol	1 x 2 mg	Neselectiv with ISA	
celiprolol	1 x 400 mg	Selectiv with ISA	
metipranol	3 x 40 mg	Nonselectiv without ISA	
metoprolol	2 x 100 mg	Selectiv with ISA	
bisoprolol	1 x 10 mg	Selectiv without ISA	
carvedilol	2 x 50 mg	Noselective without ISA, VD	
metoprolol ZOK	1 x 200 mg	Selective without ISA	

ACE inhibitors

Indications	**Heart failure** **LV dysfunction** **Post MI** **Nondiabetic nefropathy** **DM 1. type** **Proteinuria**
KI absolut	Gravidity Hyperkalémia Bilateral renal artery stenosis
KI relativ	**---**

ACE inhibitors

captopril	3 x 50mg	
cilazapril	1 x 5 mg	
enalapril	2 x 20mg	
fosinopril	1 x 20mg	
lisinopril	1 x 35mg	
moexipril	1 x 15mg	
perindopril	1 x 4mg	
quinapril	1 x 40mg	
ramipril	2 x 5mg	
spirapril	1 x 6mg	
trandolapril	1 x 4mg	

AIIA - ARB

Indications	**DM 2. type** **DM mikroalbuminuria** **Proteinuria** **LVH** **Cough post ACE-I**
KI absolut	Gravidity Hyperkalémia Bilateral renal artery stenosis
KI relativ	**---**

AIIA - ARB

candesartan	1x 16- 32 mg	
eprosartan	1-2 x 200-400 mg	
irbesartan	1 x 150-300 mg	
losartan	1 x 50-100 mg	
telmisartan	1 x 40-80 mg	
valsartan	2 x 80-160 mg	

Ca blockers (dihydropyridin)

Indications	**Older** **ISH** **Angina pectoris** **Periferal artery disease** **Aterosis of carotid art.** **Gravidity**
KI absolut	**---**
KI relativ	Tachyarytmia Heart failure

Ca blockers (dihydropyridin)

nifedipin GITS	1 x l0-20 mg	
amlodipin	**1 x 5-10 mg**	
barnidipin	1 x 10-20 mg	
felodipin	**1 x 5-10 mg**	
isradipin SRO	**1 x 5- 10 mg**	
lacidipin	**1 x 2-6 mg**	
lercanidipin	1 x 10-20 mg	
nilvadipin	1 x 8 –16 mg	
nisoldipin	2 x 5-20 mg	
nitrendipin	1 x 10-20 mg	

Ca blocker (diltiazem, verapamil)

Stavy podporující užití	**Angina pectoris** **Aterosclerosis of carotid art.** **Supraventrikular tachykardia**
KI absolut	A–V blockade II. a III. Grade Heart failure
KI relativ	**---**

Ca blocker (diltiazem, verapamil)

diltiazem retard	2 x 90-180 mg	
verapamil SR	1x 120 – 480 mg	

α- blocker

Indications	**Benign hyperplasia prostatae** **Hyperlipidemia**
KI absolut	Ortostatic hypotension
KI relativ	Heart failure

α- blokcker

prazosin	3x2 mg	
doxazosin	1 x 4-8 mg	
terazosin	1 x 5 mg	

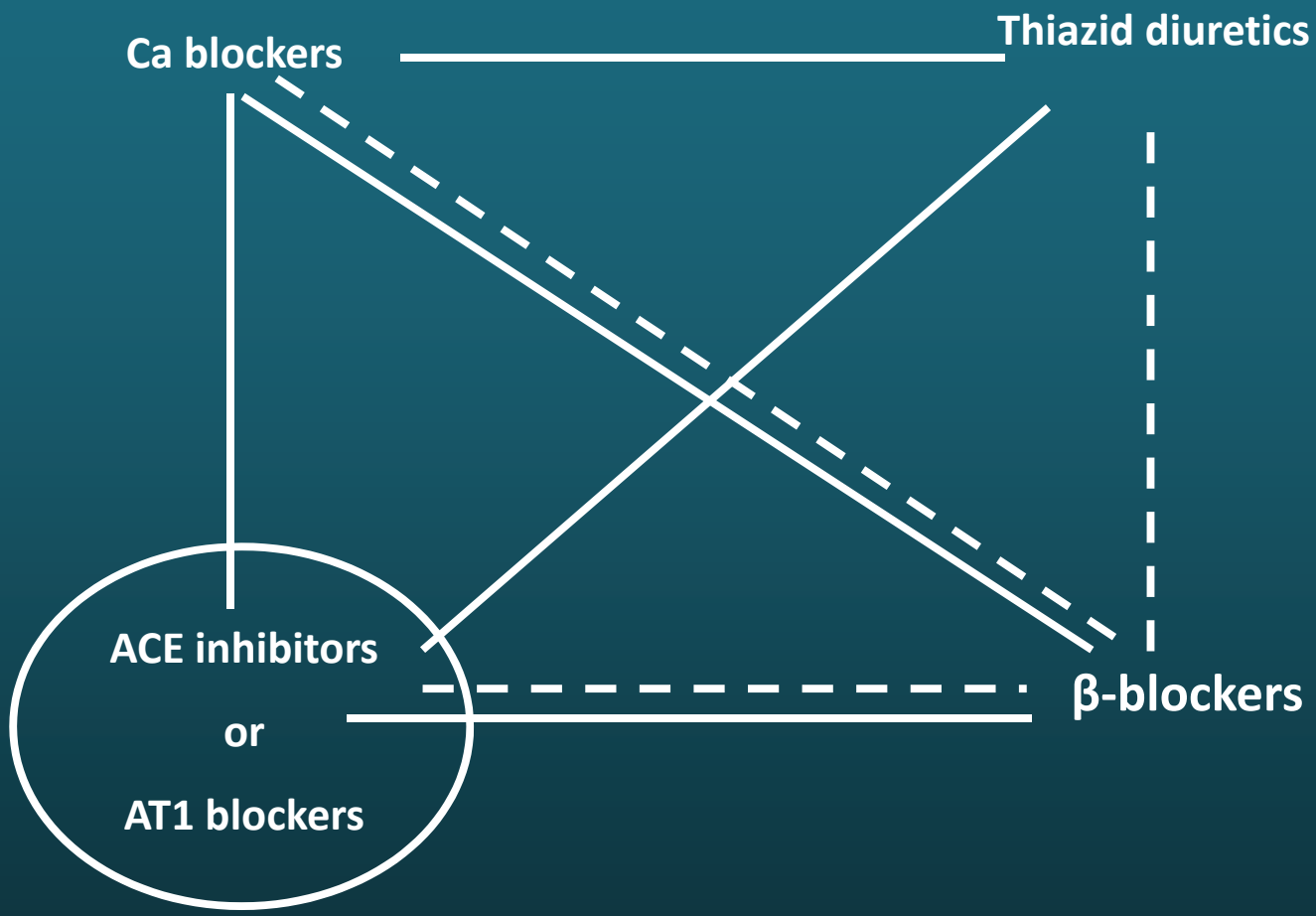
Other

Central agonist of presynaptic alfa 2 receptors		
metyldopa **guanfacin** **clonidin**	**2-3 x 250 mg gravidity** **1 x 1-2 mg** **HT krize 0,1-0,3 mg**	♥
Central agonist of imidazolin receptors		
moxonidin **rilmenidin**	**1 x 0,2 až 2 x 0,3 mg** **1 x 1 mg**	♥
Peripheral alfa 1 blockers and a central serotonin receptor agonists		
urapidil	**HT crises 10-20 mg i.v.**	♥

ESH/ESC Guidelines – Indications

Thiazids	Heart failure / Older / ISH / Afroamericanns
Loop diuretics	Renal insuficienci / Heart failure
Aldosteron antagonists	Heart failure /post MI
βB	AP / post MI / Heart failure / Pregnancy / Tachyarytmias
Ca antagonists (DHP)	Older personc / ISH /AP / Aterosklerosis / Pregnancy
Ca antagonists (non-DHP)	AP / Aterosklerosis / Suprav. Tachykardias
ACEI	Heart failure / LV dysfunction / post MI / DM / Proteinurie
ARB	DM / microalbuminuria / proteinuria / LVH / ACEI-caugh

Combination treatment



Non DHP Ca blocker + betablocker = clear contraindication
ACE-I/AT1 blocker + betablocker = combination - CHF, ICD
ACE-I + AT1 blocker = combination - proteinuria