

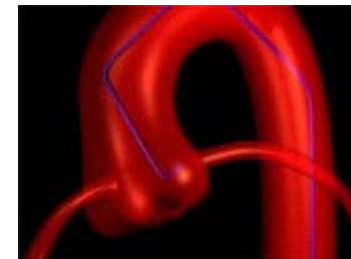
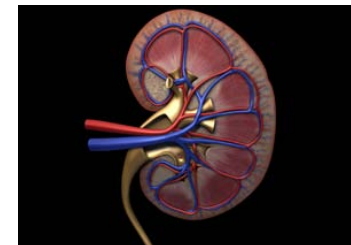
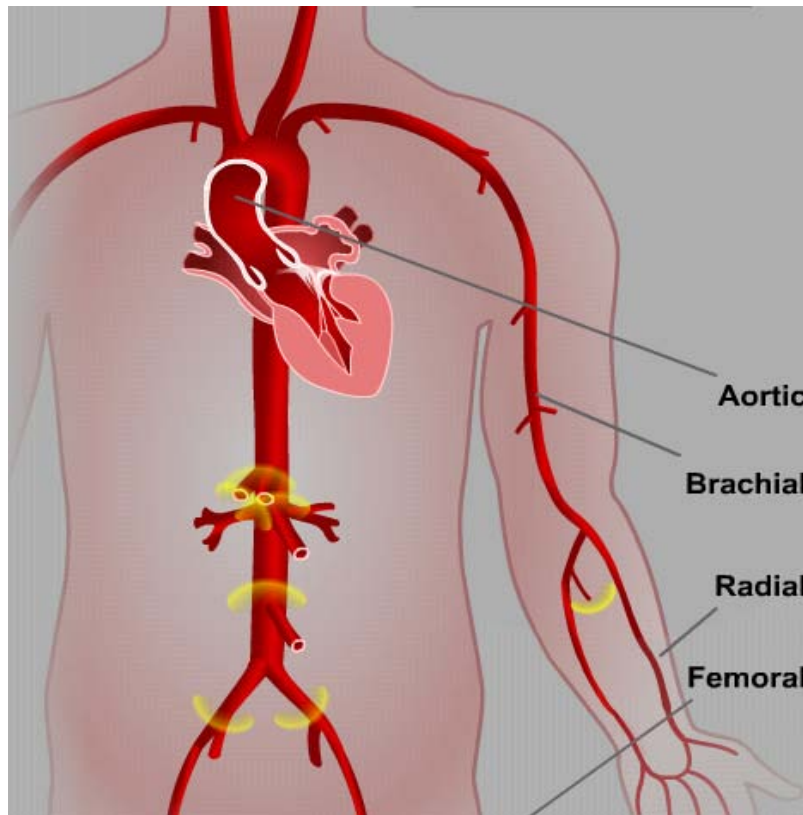
Υπέρταση και όργανα-στόχος.
Οι βλάβες, η διάγνωση, η θεραπεία:

« *ΑΡΤΗΡΙΕΣ* »

Α. Πρωτογέρου
Παθολόγος, Επιστημονικός Συνεργάτης Κέντρου Υπέρτασης,
Γ' Πανεπιστημιακής Παθολογικής Κλινικής

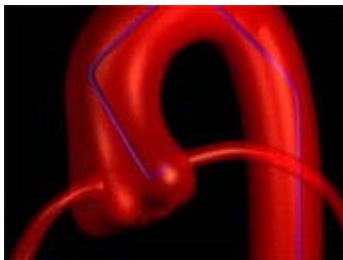
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Όργανα στόχοι της υπέρτασης



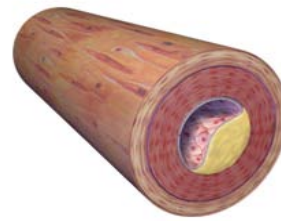
Υπέρταση και όργανα-στόχος. Οι βλάβες, η διάγνωση, η θεραπεία: **ΑΡΤΗΡΙΕΣ**

cm



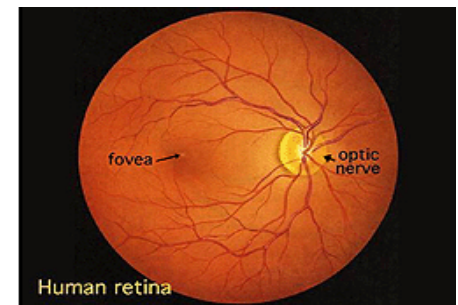
Ελαστικότητα/σκληρία

mm



3D SCIENCE.COM

μm



Αντιστάσεις

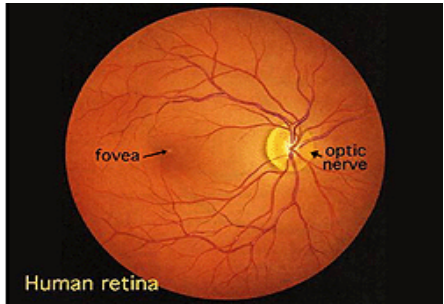
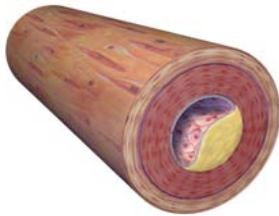
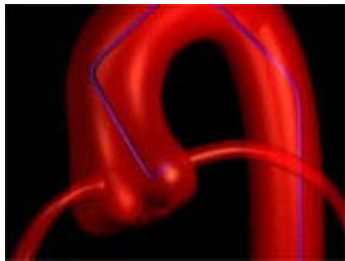
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ΠΙΕΣΗ ↑

cm

mm

μm



Καρδιακή
παροχή

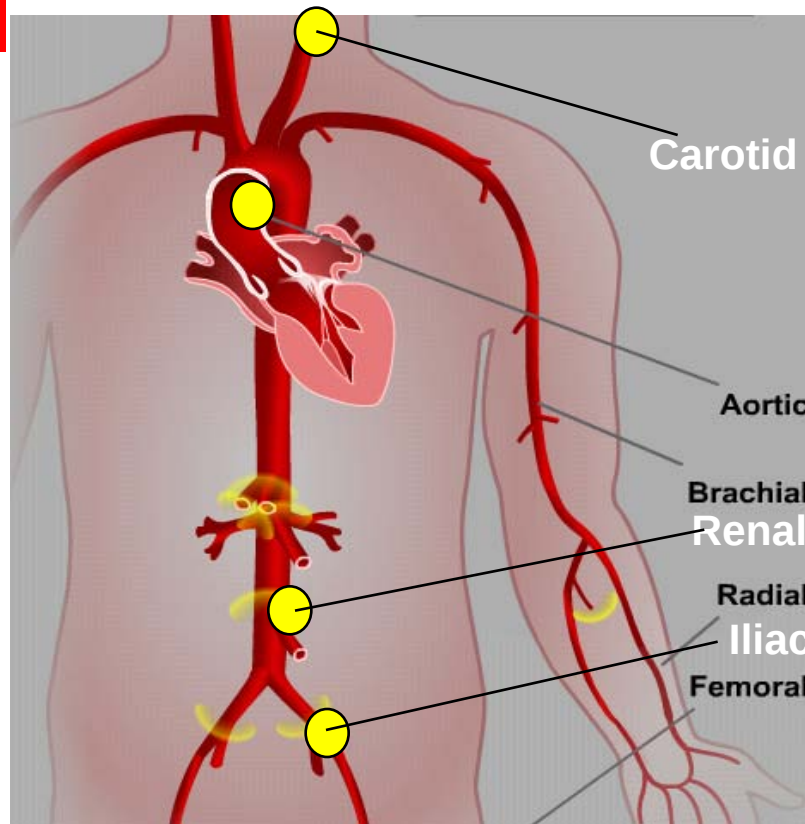
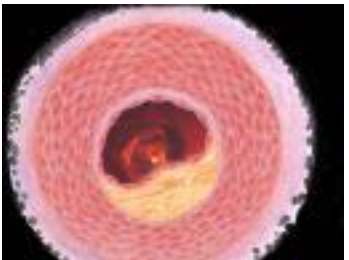
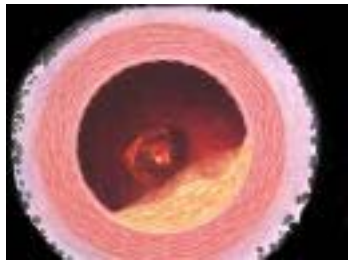
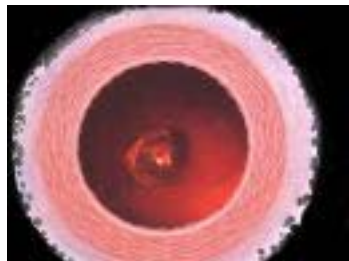
Ελαστικότητα/σκληρία

Αντιστάσεις



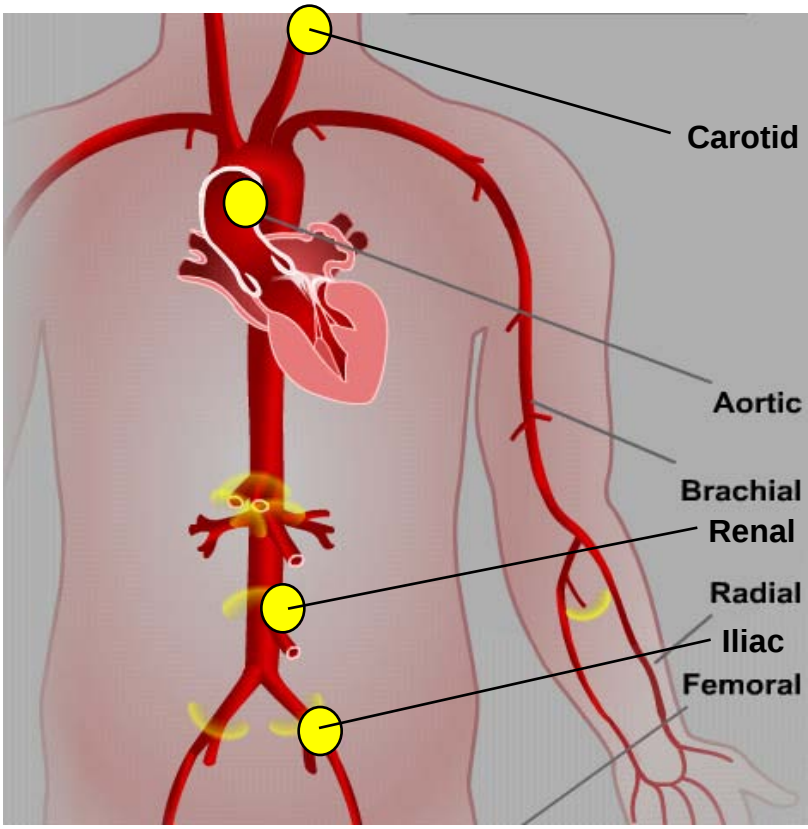
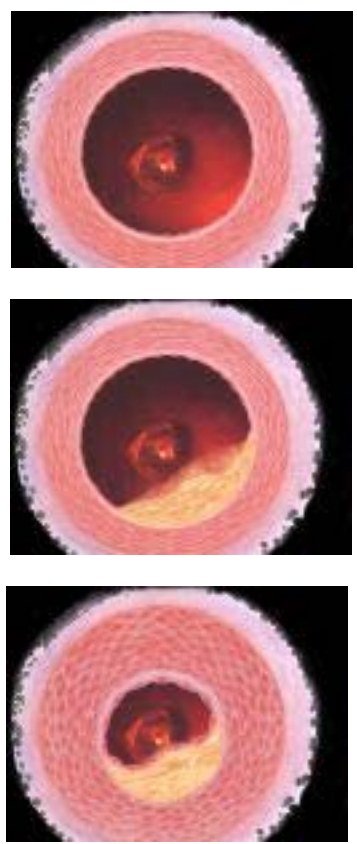
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Αθηρωμάτωση - πλάκα

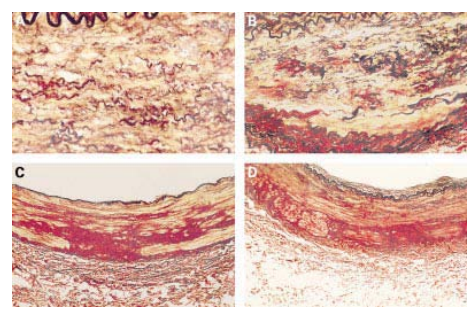


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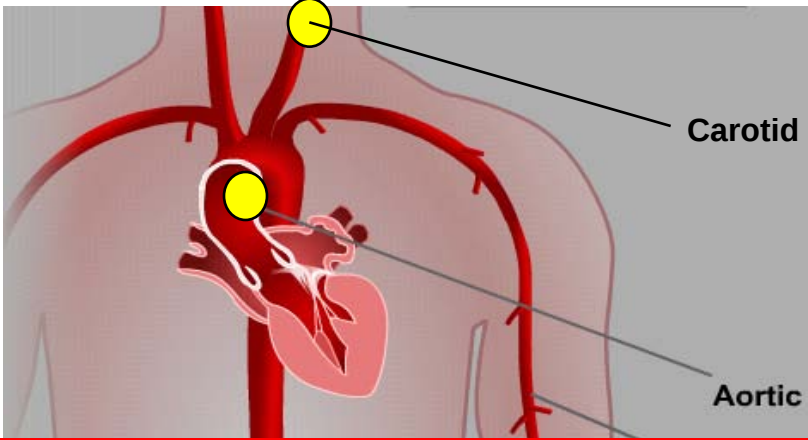
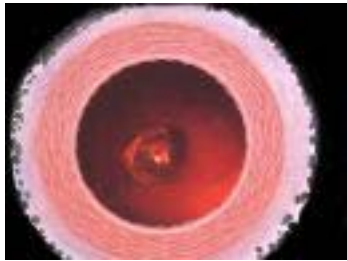


Αρτηριοσκληρυνση

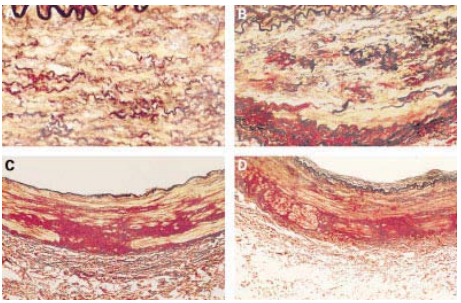


Υπέρταση και όργανα-στόχος. Οι βλάβες, η διάγνωση, η θεραπεία: **ΑΡΤΗΡΙΕΣ**

Αθηρωμάτωση - πλάκα



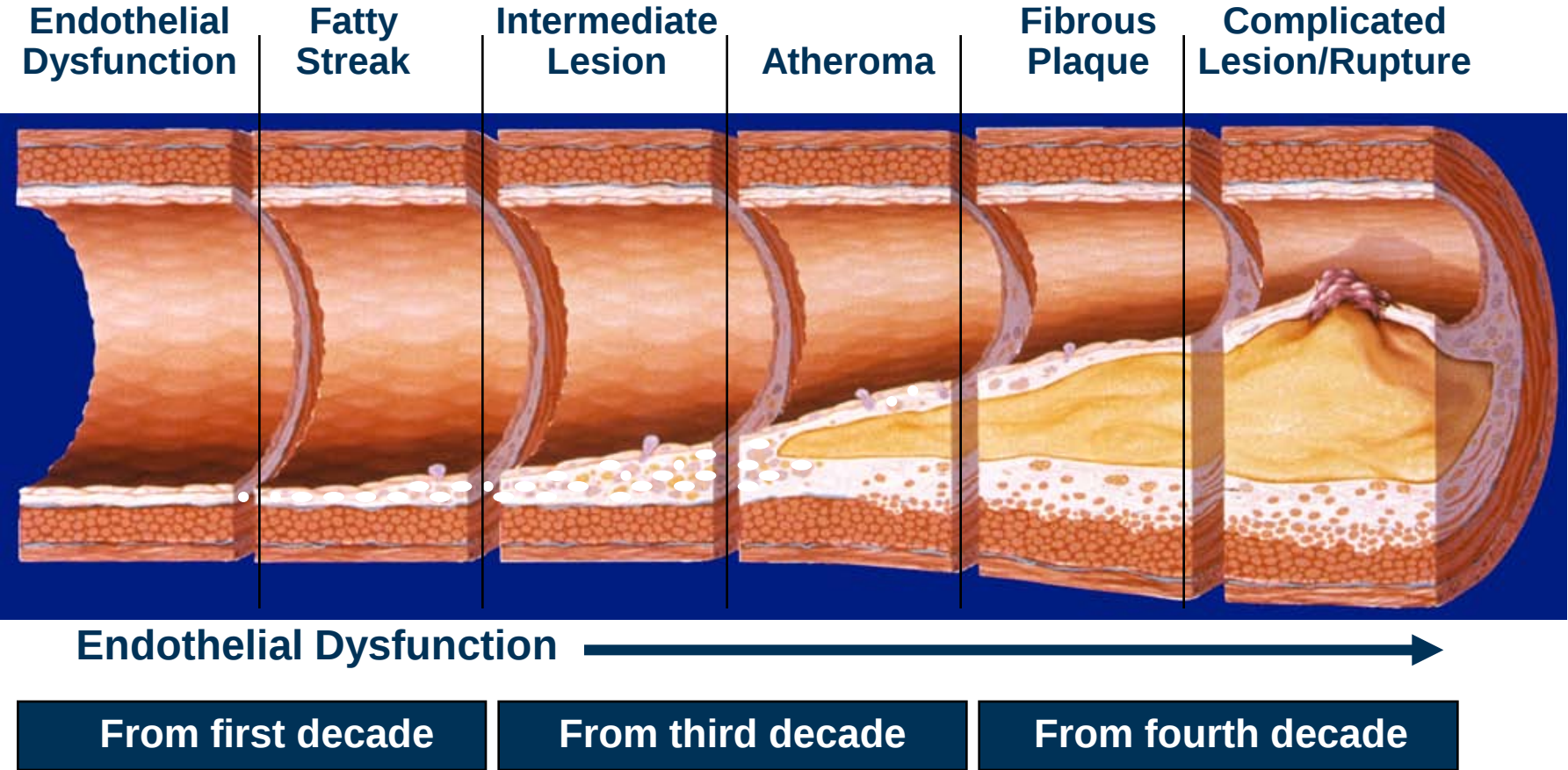
Αρτηριοσκλήρυνση



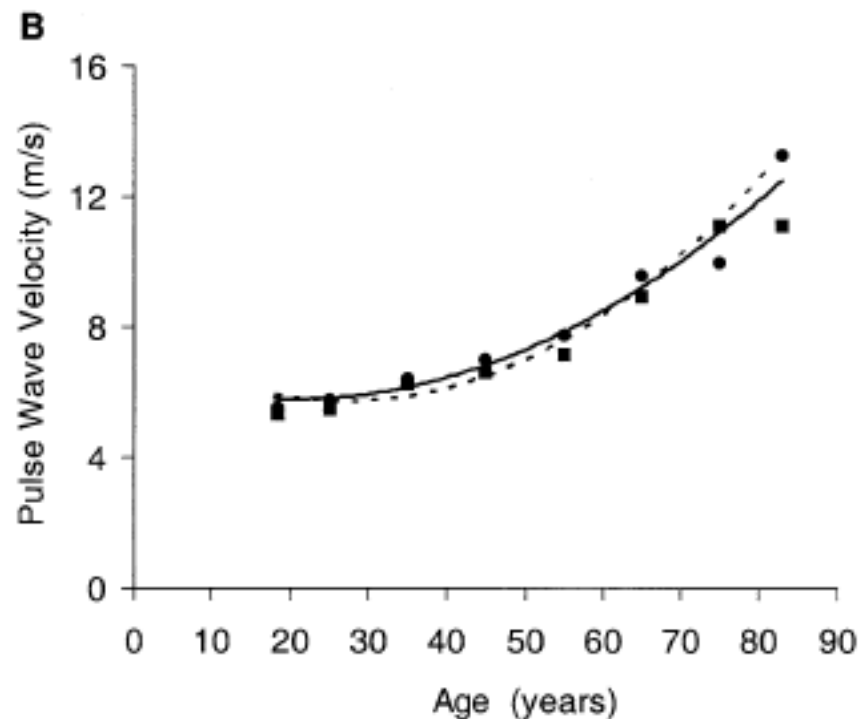
ΠΟΛΥΠΑΡΑΓΟΝΤΙΚΕΣ ΔΙΑΔΙΚΑΣΙΕΣ



Atherosclerosis is a chronic disease which may progress silently over many years



Arteriosclerosis progress silently over the years



ΠΡΩΙΜΗ (ΥΠΟΚΛΙΝΙΚΗ) ΔΙΑΓΝΩΣΗ ΑΡΤΗΡΙΑΚΗΣ ΒΛΑΒΗΣ

ΠΡΩΙΜΗ (ΥΠΟΚΛΙΝΙΚΗ) ΔΙΑΓΝΩΣΗ ΑΡΤΗΡΙΑΚΗΣ ΒΛΑΒΗΣ

- Επιλογή ασθενών υψηλού κινδύνου
- Φαρμακολογικές μελέτες

Υπέρταση και όργανα-στόχος. Οι βλάβες, η διάγνωση, η θεραπεία: **APTHPIES**

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Table 4 Availability, prognostic value and cost of some markers of organ damage (scored from 0 to 4 pluses)

Markers	CV predictive value	Availability	Cost
Electrocardiography	++	++++	+
Echocardiography	+++	+++	++
Carotid Intima-Media Thickness	+++	+++	++
Arterial stiffness (Pulse wave velocity)	+++	+	++
Ankle-Brachial index	++	++	+
Coronary calcium content	+	+	++++
Cardio/Vascular tissue composition	?	+	++
Circulatory collagen markers	?	+	++
Endothelial dysfunction	++	+	+++
Cerebral lacunae/White matter lesions	?	++	++++
Est. Glomerular Filtration Rate or Creatinine Clearance	+++	++++	+
Microalbuminuria	+++	++++	+

	Predictive value	Availability	Cost
ECG	++	++++	+
ECHOCARDIOGRAPHY	+++	+++	++
CAROTID IMT	+++	+++	++
ANKLE BRACHIAL INDEX	+++	++	+
ARTERIAL STIFFNESS	+++	+	++
CORONARY CALCIUM CONTENT	+	+	++++
CARDIO/VASCULAR TISSUE COMP.	?	+	++
ENDOTHELIAL DYSFUNCTION	++	+	+++
WHITE MATTER LESSIONS	?	++	++++
GFR	+++	++++	+
MICROLBUMINUREA	+++	++++	+

Υπέρταση και όργανα-στόχος. Οι βλάβες, η διάγνωση, η θεραπεία: **APTHPIES**

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CARDIO/VASCULAR TISSUE COMP.	?	+	++
ENDOTHELIAL DSYFUNCTION	++	+	+++
WHITE MATTER LESSIONS	?	++	++++
GFR	+++	++++	+
MICROLBUMINUREA	+++	++++	+

Υπέρταση και όργανα-στόχος. Οι βλάβες, η διάγνωση, η θεραπεία: **APTHPIES**

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Table 2 Factors influencing prognosis

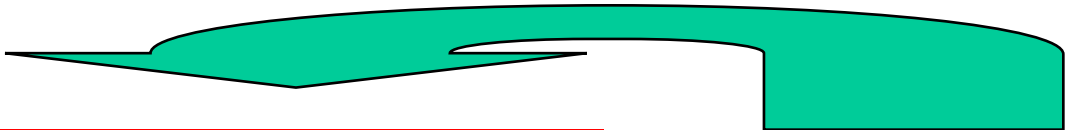
Risk factors	Subclinical Organ Damage
• Systolic and diastolic BP levels • Levels of pulse pressure (in the elderly) • Age (M > 55 years; W > 65 years) • Smoking • Dyslipidaemia - TC > 5.0 mmol/l (190 mg/dl) or: - LDL-C > 3.0 mmol/l (115 mg/dl) or: - HDL-C: M < 1.0 mmol/l (40 mg/dl), W < 1.2 mmol/l (46 mg/dl) or: - TG > 1.7 mmol/l (150 mg/dl) • Fasting plasma glucose 5.6–6.9 mmol/L (102–125 mg/dl) • Abnormal glucose tolerance test • Abdominal obesity (Waist circumference > 102 cm (M), > 88 cm (W)) • Family history of premature CV disease (M at age < 55 years; W at age < 65 years)	• Electrocardiographic LVH (Sokolow-Lyon > 38 mm; Cornell > 2440 mm²) or: • Echocardiographic LVH* (LVMI M ≥ 125 g/m², W ≥ 110 g/m²) • Carotid wall thickening (IMT > 0.9 mm) or plaque • Carotid-femoral pulse wave velocity > 12 m/s • Ankle-brachial BP index < 0.9 • Slight increase in plasma creatinine: - M: 115–133 μmol/l (1.3–1.5 mg/dl); - W: 107–124 μmol/l (1.2–1.4 mg/dl) • Low estimated glomerular filtration rate[†] (< 60 ml/min/1.73 m²) or creatinine clearance[‡] (< 60 ml/min) • Microalbuminuria 30–300 mg/24 h or albumin-creatinine ratio: ≥ 22 (M); or ≥ 31 (W) mg/g creatinine
Diabetes Mellitus	Established CV or renal disease
• Fasting plasma glucose ≥ 7.0 mmol/l (126 mg/dl) on repeated measurement, or • Postload plasma glucose > 11.0 mmol/l (198 mg/dl)	• Cerebrovascular disease: ischaemic stroke; cerebral haemorrhage; transient ischaemic attack • Heart disease: myocardial infarction; angina; coronary revascularization; heart failure • Renal disease: diabetic nephropathy; renal impairment (serum creatinine M > 133, W > 124 μmol/l); proteinuria (> 300 mg/24 h) • Peripheral artery disease • Advanced retinopathy: haemorrhages or exudates, papilloedema

Note: the cluster of three out of 5 risk factors among abdominal obesity, altered fasting plasma glucose, BP ≥ 130/85 mmHg, low HDL-cholesterol and high TG (as defined above) indicates the presence of metabolic syndrome

M: men; W: women; CV: cardiovascular disease; IMT: intima-media thickness; BP: blood pressure; TG: triglycerides; C: cholesterol; [‡]Cockcroft Gault formula; [†]MDRD formula; *Risk maximal for concentric LVH (left ventricular hypertrophy): increased LVMI (left ventricular mass index) with a wall thickness/radius ratio ≥ 0.42.

Υπέρταση και όργανα-στόχος. Οι βλάβες, η διάγνωση, η θεραπεία: **APTHPIES**

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Carotid wall intima-media thicknes –
IMT>0.9 mm or plaque

Carotid-femoral pulse wave velocity –
PWV >12 m/sec

Ankle-brachial index –
ABI <0.9

Subclinical Organ Damage
• Bedrocardiographic LVH (Sokolow-Lyon > 38 mm; Cornell > 2440 mm²) or: • Echocardiographic LVH* (LVMI M ≥ 125g/m², W ≥ 110g/m²) • Carotid wall thickening (IMT > 0.9 mm) or plaque • Carotid-femoral pulse wave velocity > 12m/s • Ankle-brachial BP index < 0.9 • Slight increase in plasma creatinine: M: 115–133 μmol/l (1.3–1.5mg/dl); W: 107–124 μmol/l (1.2–1.4 mg/dl) • Low estimated glomerular filtration rate[†] (< 60 ml/min/1.73m²) or creatinine clearance[‡] (< 60ml/min) • Microalbuminuria 30–300 mg/24h or albumin-creatinine ratio: ≥ 22 (M); or ≥ 31(W) mg/g creatinine
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Fig. 1

Other risk factors, OD or Disease	Blood pressure (mmHg)				
	Normal SBP 120–129 or DBP 80–84	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 risk factors	Average risk	Average risk	Low added risk	Moderate added risk	High added risk
1–2 risk factors	Low added risk	Low added risk	Moderate added risk	Moderate added risk	Very high added risk
3 or more risk factors, MS, OD or Diabetes	Moderate added risk	High added risk	High added risk	High added risk	Very high added risk
Established CV or renal disease	Very high added risk	Very high added risk	Very high added risk	Very high added risk	Very high added risk

Stratification of CV Risk in four categories. SBP: systolic blood pressure; DBP: diastolic blood pressure; CV: cardiovascular; HT: hypertension. Low, moderate, high and very high risk refer to 10 year risk of a CV fatal or non-fatal event. The term "added" indicates that in all categories risk is greater than average. OD: subclinical organ damage; MS: metabolic syndrome. The dashed line indicates how definition of hypertension may be variable, depending on the level of total CV risk.

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ACC - www.acc.org
AHA - www.americanheart.org

Hirsch et al. 2005
ACC/AHA Practice Guidelines e495

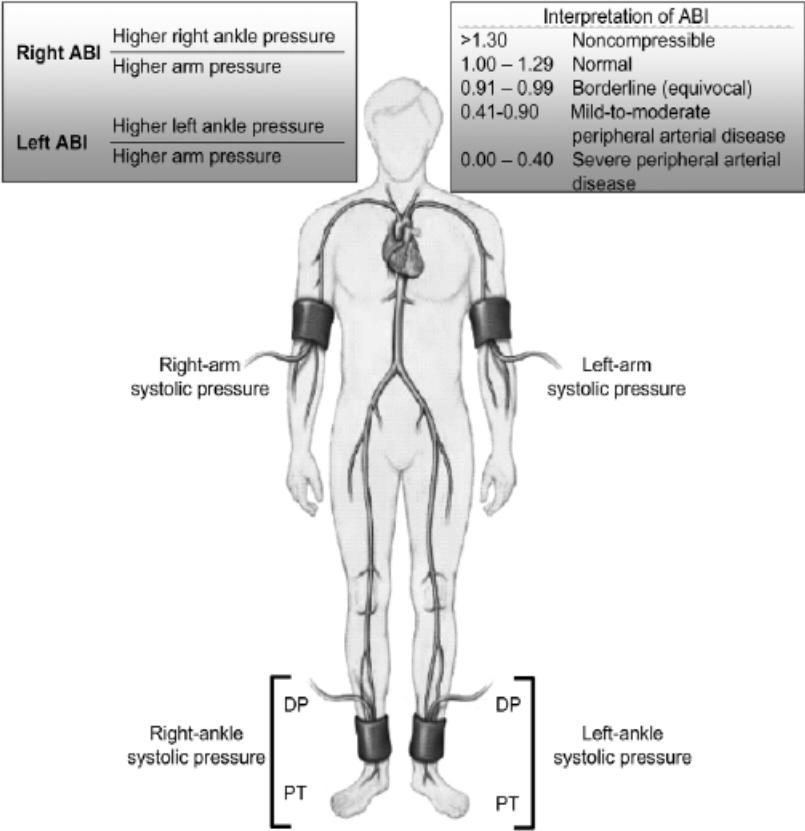


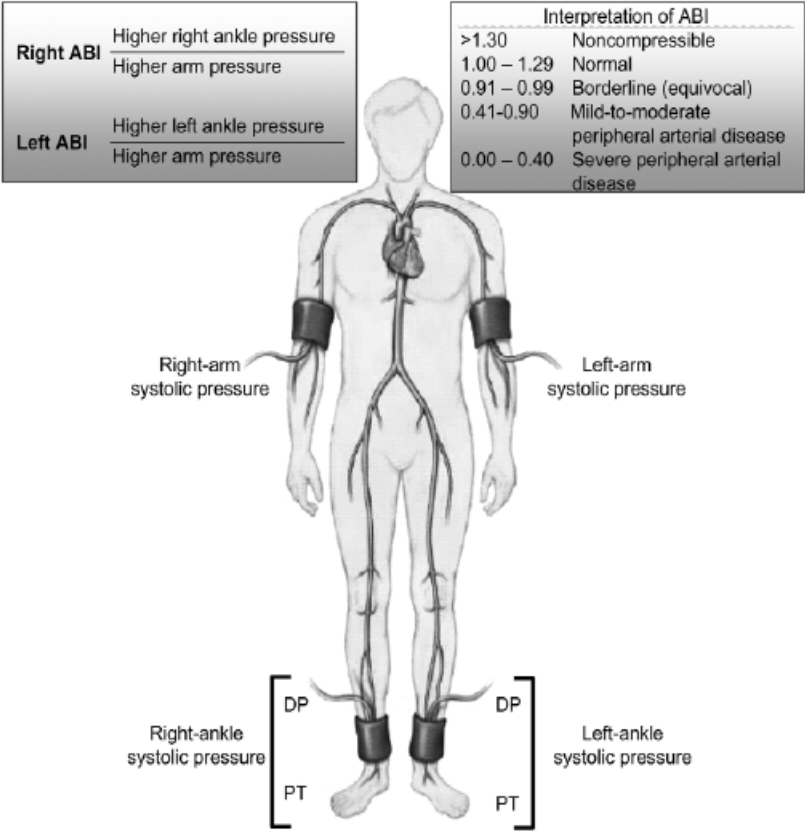
Figure 6. Ankle-brachial index. DP indicates dorsalis pedis; and PT, posterior tibial artery. Adapted with permission from Hiatt WR. Medical treatment of peripheral arterial disease and claudication. N Engl J Med 2001;344:1608-21 (158a). Copyright © 2001 Massachusetts Medical Society. All rights reserved.

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ABI

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Συσχετίζεται με την ύπαρξη:

- Περιφερικής αγγειοπάθειας
- Στεφανιαίας νόσου

Figure 6. Ankle-brachial index. DP indicates dorsalis pedis; and PT, posterior tibial artery. Adapted with permission from Hiatt WR. Medical treatment of peripheral arterial disease and claudication. N Engl J Med 2001;344:1608-21 (158a). Copyright © 2001 Massachusetts Medical Society. All rights reserved.

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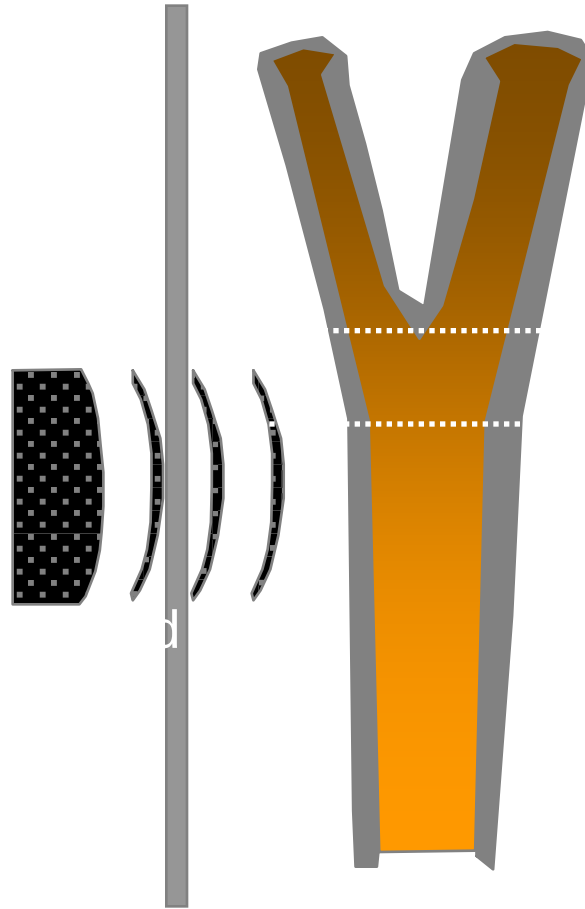
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Endothelial dysfunction	++	+	+++
Cerebral lacunae/White matter lesions	?	++	++++
Est. Glomerular Filtration Rate or Creatinine Clearance	+++	++++	+
Microalbuminuria	+++	++++	+

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ECG	++	++++	+
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CAROTID IMT	+++	+++	++
ANKLE BRACHIAL INDEX	+++	++	+
ARTERIAL STIFFNESS	+++	+	++
CORONARY CALCIUM CONTENT	+	+	++++
CARDIO/VASCULAR TISSUE COMP.	?	+	++
ENDOTHELIAL DSYFUNCTION	++	+	+++
WHITE MATTER LESSIONS	?	++	++++
GFR	+++	++++	+
MICROLBUMINUREA	+++	++++	+

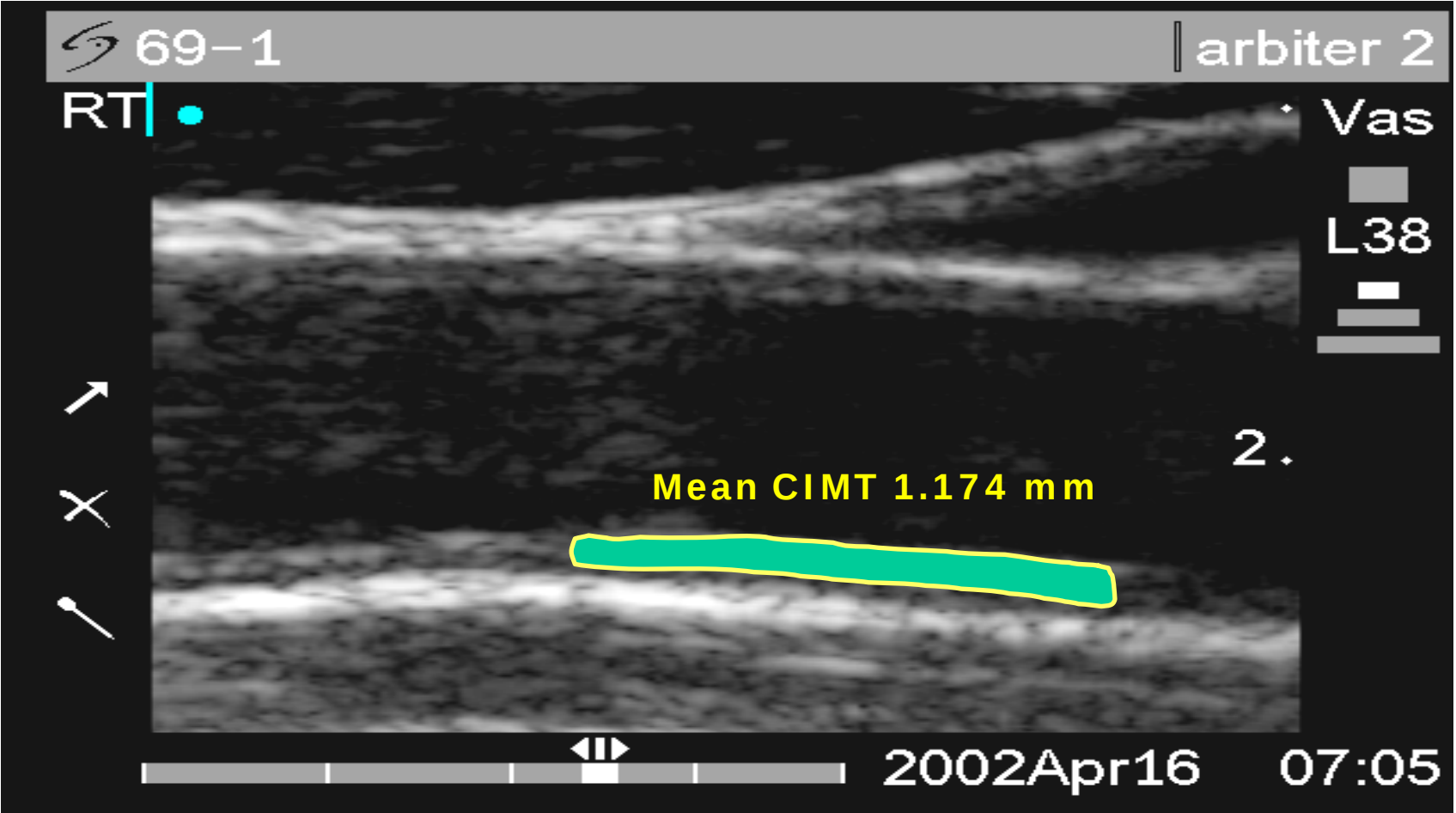
Carotid IMT

Carotid Ultrasound



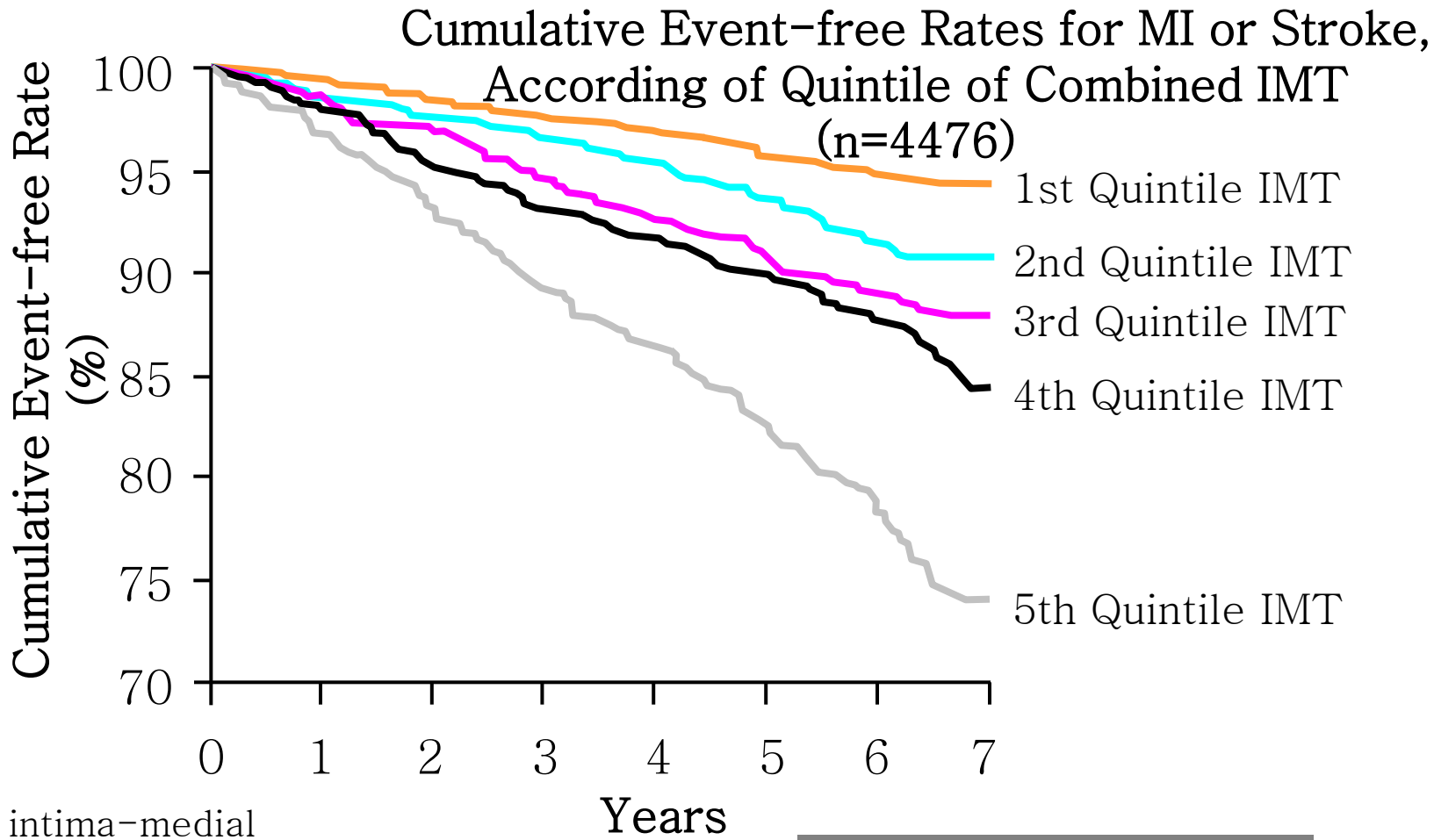
Carotid IMT

What is Carotid Intima–Media Thickness (CIMT)?



Carotid IMT

Systemic Atherosclerosis: Carotid Disease as a Marker of Cardiovascular Risk



IMT = intima-medial thickness

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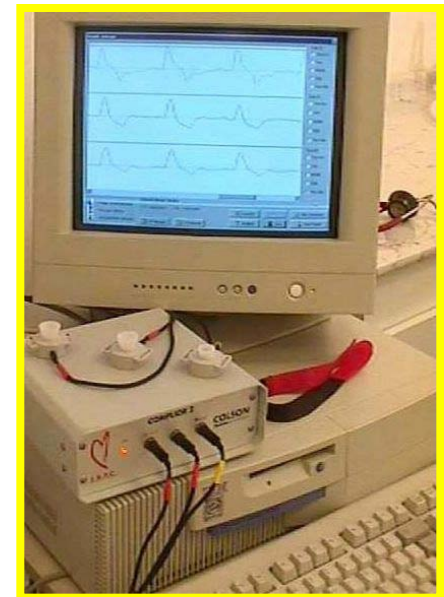
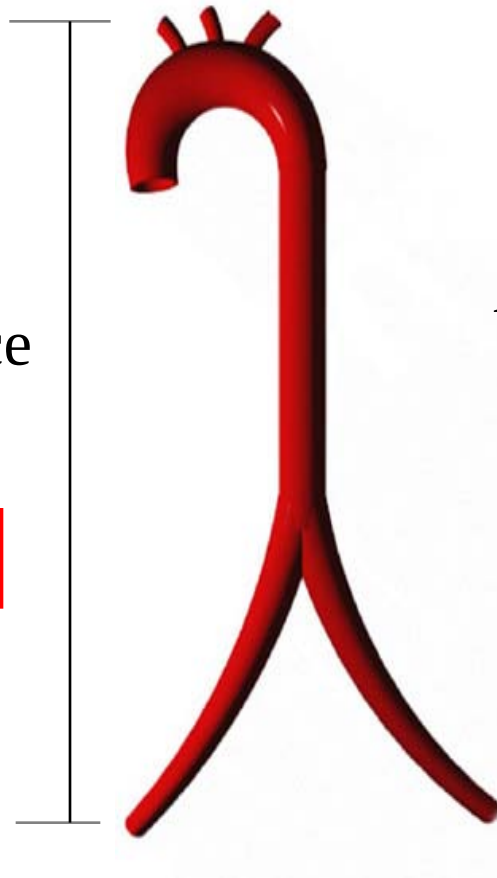
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CARDIO/VASCULAR TISSUE COMP.	?	+	++
ENDOTHELIAL DYSFUNCTION	++	+	+++
WHITE MATTER LESIONS	?	++	++++
GFR	+++	++++	+
MICROALBUMINURIA	+++	++++	+

Arterial stiffness: Pulse wave velocity

d: distance

t: time

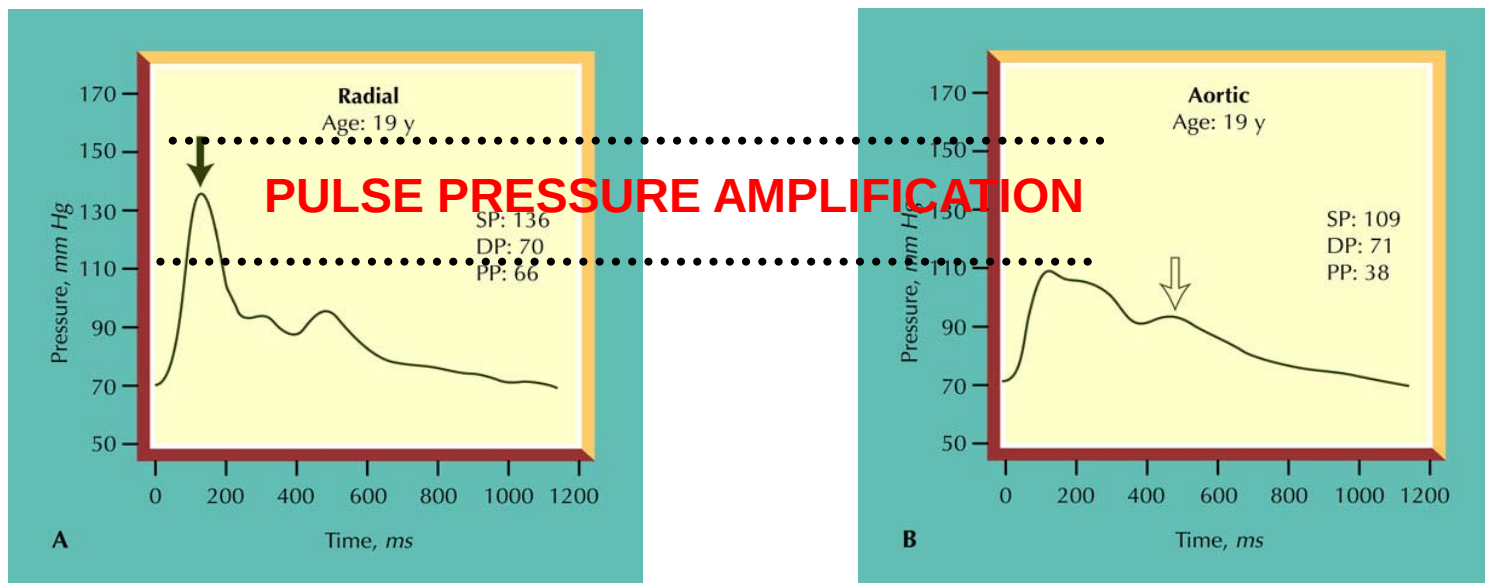
$$PWV = d/t \text{ (m/sec)}$$



Arterial stiffness: Pulse wave velocity

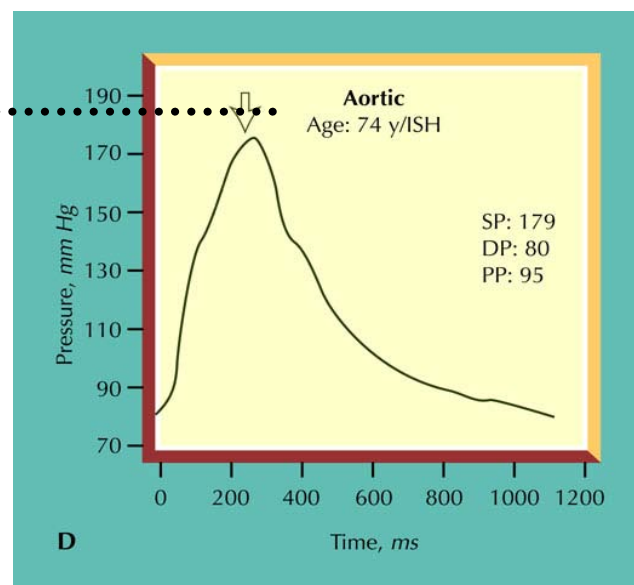
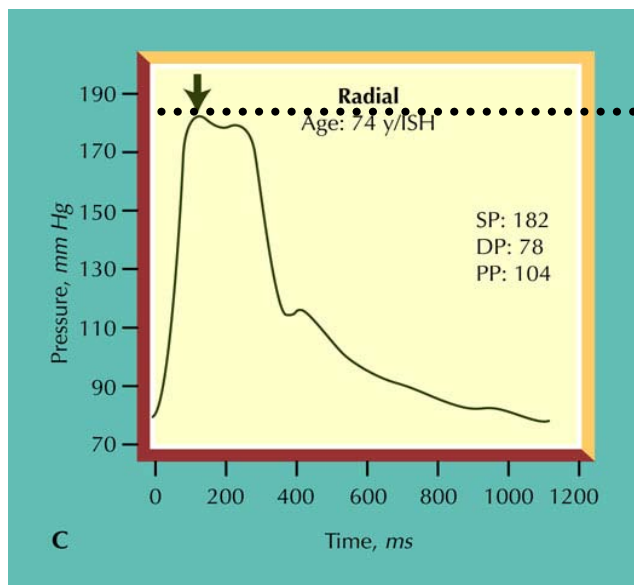
- ☐ Έχει άμεσες αιμοδυναμικές συνέπειες
- ☐ Καθορίζει τον φαινότυπο της ΑΥ

Pathophysiological link



Pathophysiological link

Isolated systolic hypertension: aortic stiffness & increased wave reflections



Arterial stiffness: Pulse wave velocity

- ☐ Έχει άμεσες αιμοδυναμικές συνέπειες
- ☐ Καθορίζει τον φαινότυπο της ΑΥ
- ☐ Είναι σημαντικός προγνωστικός δείκτης για την εμφάνιση ΑΥ

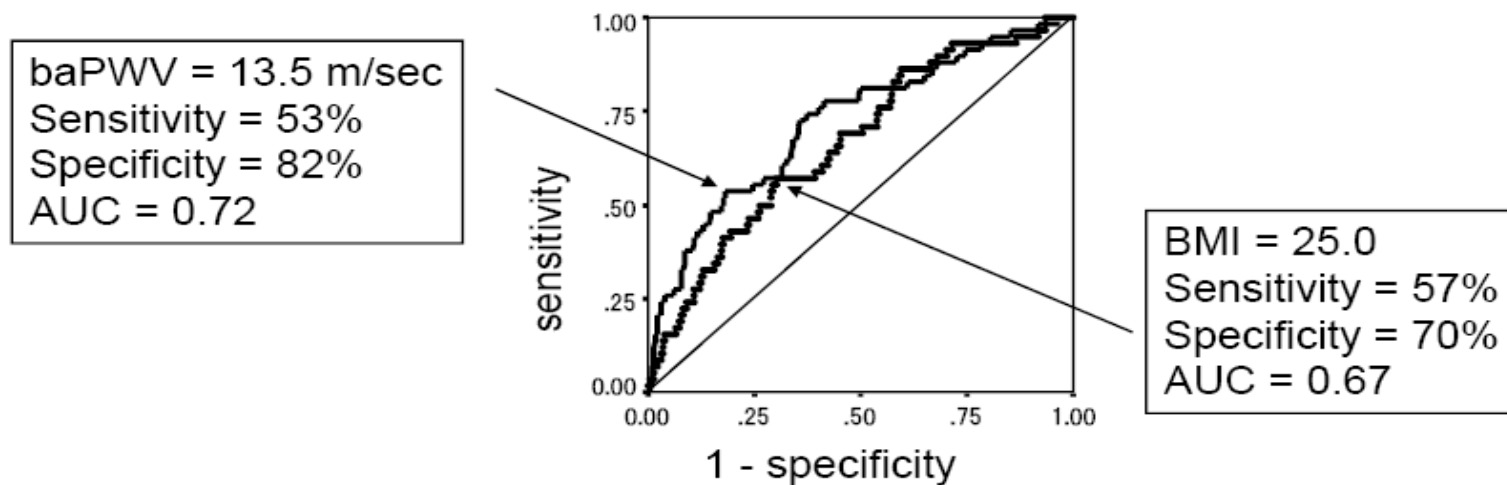


Figure 1

Υπέρταση και όργανα-στόχος. Οι βλάβες, η διάγνωση, η θεραπεία: **APTHPIES**

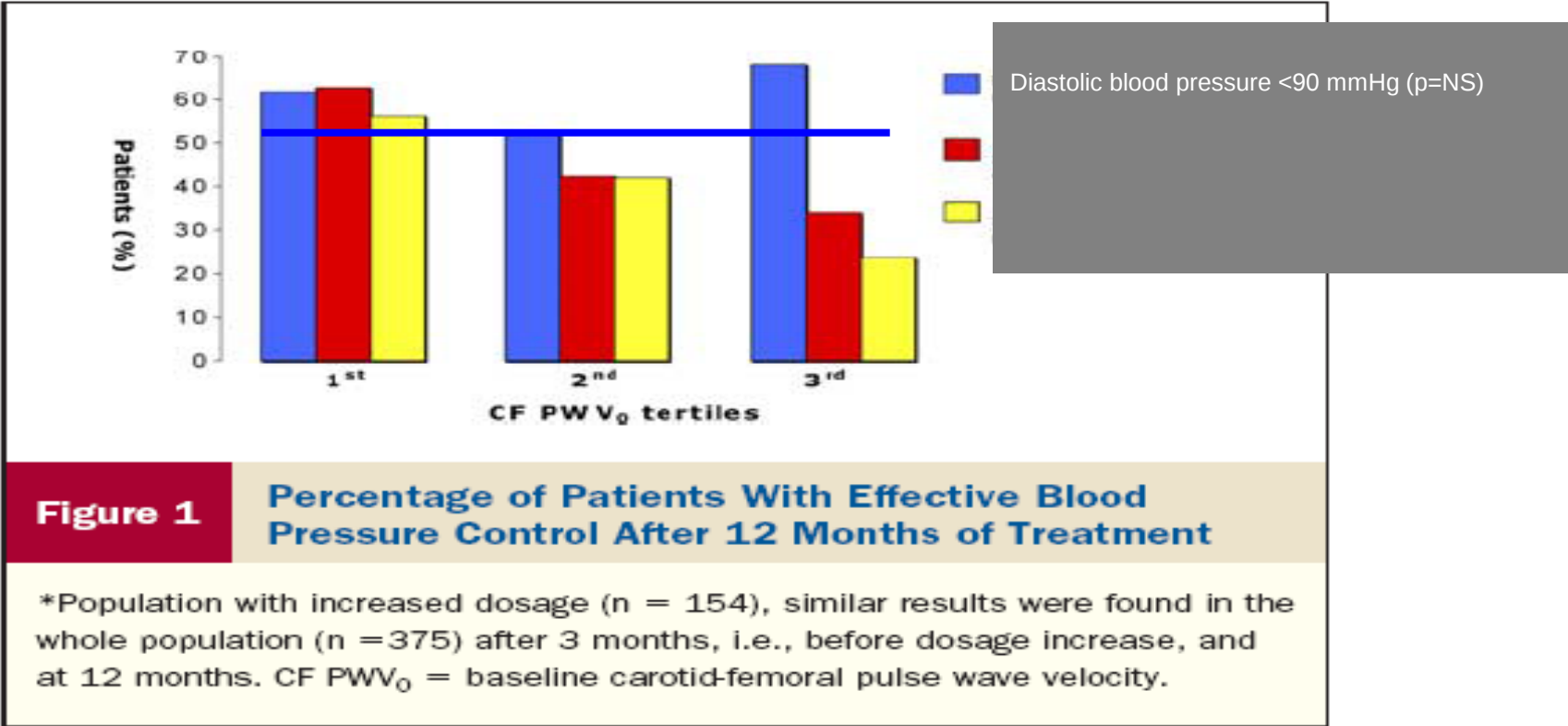
Classification	No. subjects developing hypertension	No. subjects not developing hypertension	
baPWV 1st $\geq$ 13.5 m/sec (n=161)	30	131	Positive predictive value = 18%
baPWV 1st <13.5 m/sec (n=616)	28	588	Negative predictive value = 95%
BMI 1st $\geq$ 25.0 (n=271)	33	238	Positive predictive value = 12%
BMI 1st <25.0 (n=506)	25	481	Negative predictive value = 95%
baPWV 1st $\geq$ 13.5 plus BMI 1st $\geq$ 25.0 (n=63)	18	45	Positive predictive value = 29%
Other than baPWV 1st $\geq$ 13.5 plus BMI 1st $\geq$ 25.0 (n=714)	40	674	Negative predictive value = 94%

Arterial stiffness: Pulse wave velocity

- ☐ Έχει άμεσες αιμοδυναμικές συνέπειες
- ☐ Καθορίζει τον φαινότυπο της ΑΥ
- ☐ Είναι σημαντικός προγνωστικός δείκτης για την εμφάνιση ΑΥ
- ☐ Είναι σημαντικός προγνωστικός δείκτης της ανταπόκρισης στην αντιυπερτασική φαρμακευτική αγωγή

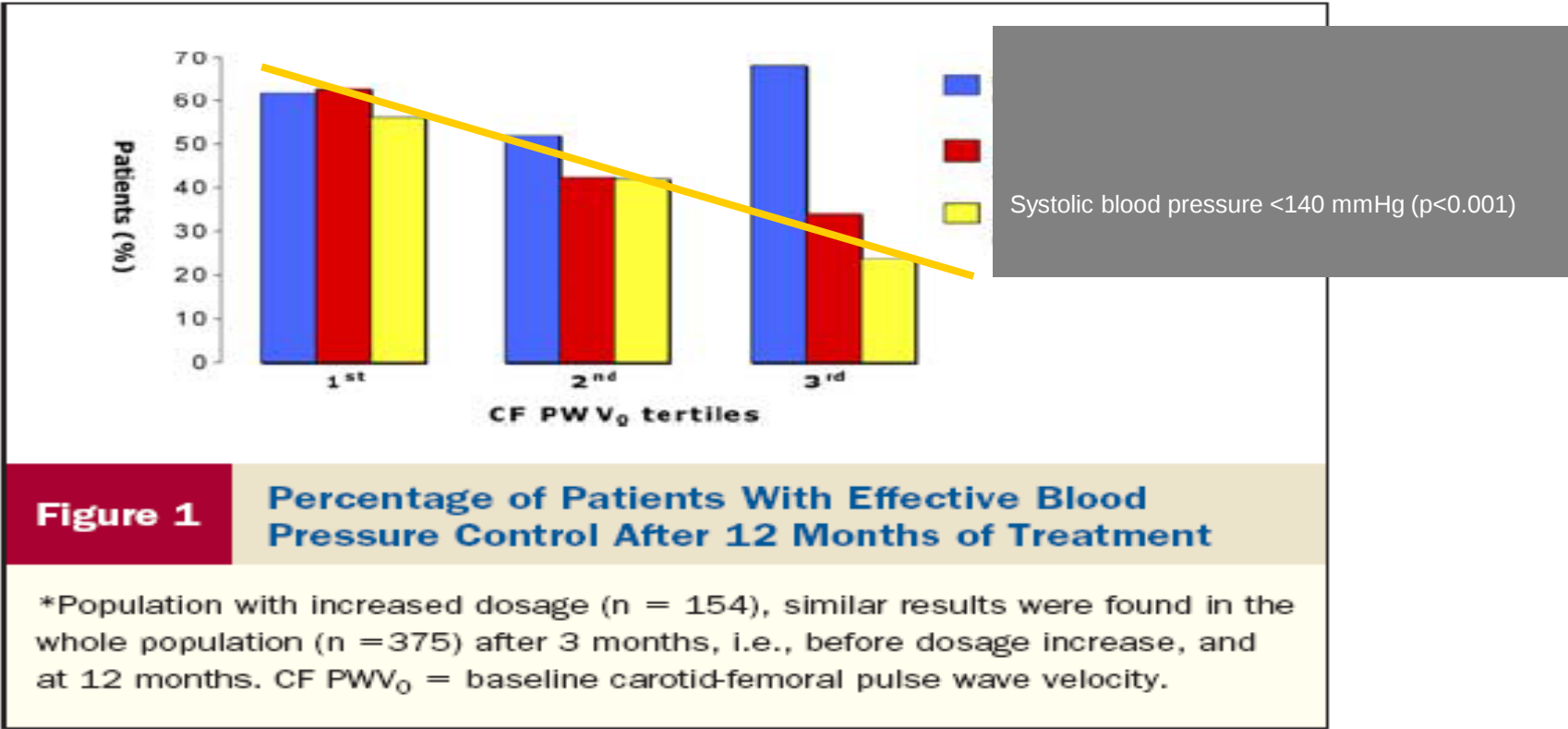
Υπέρταση και όργανα-στόχος. Οι βλάβες, η διάγνωση, η θεραπεία: **APTHPIES**

REASON study



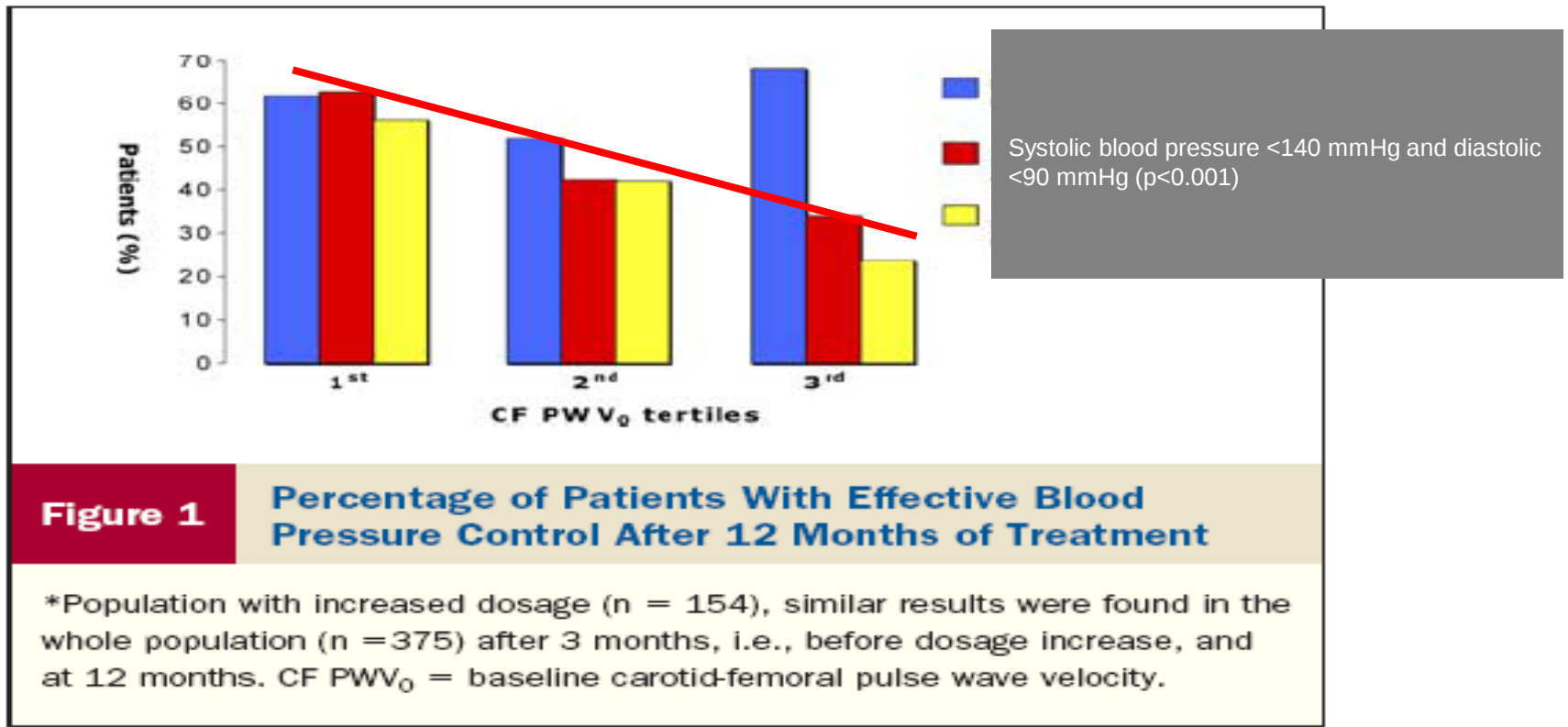
Υπέρταση και όργανα-στόχος. Οι βλάβες, η διάγνωση, η θεραπεία: **ΑΡΤΗΡΙΕΣ**

REASON study



Υπέρταση και όργανα-στόχος. Οι βλάβες, η διάγνωση, η θεραπεία: **ΑΡΤΗΡΙΕΣ**

REASON study

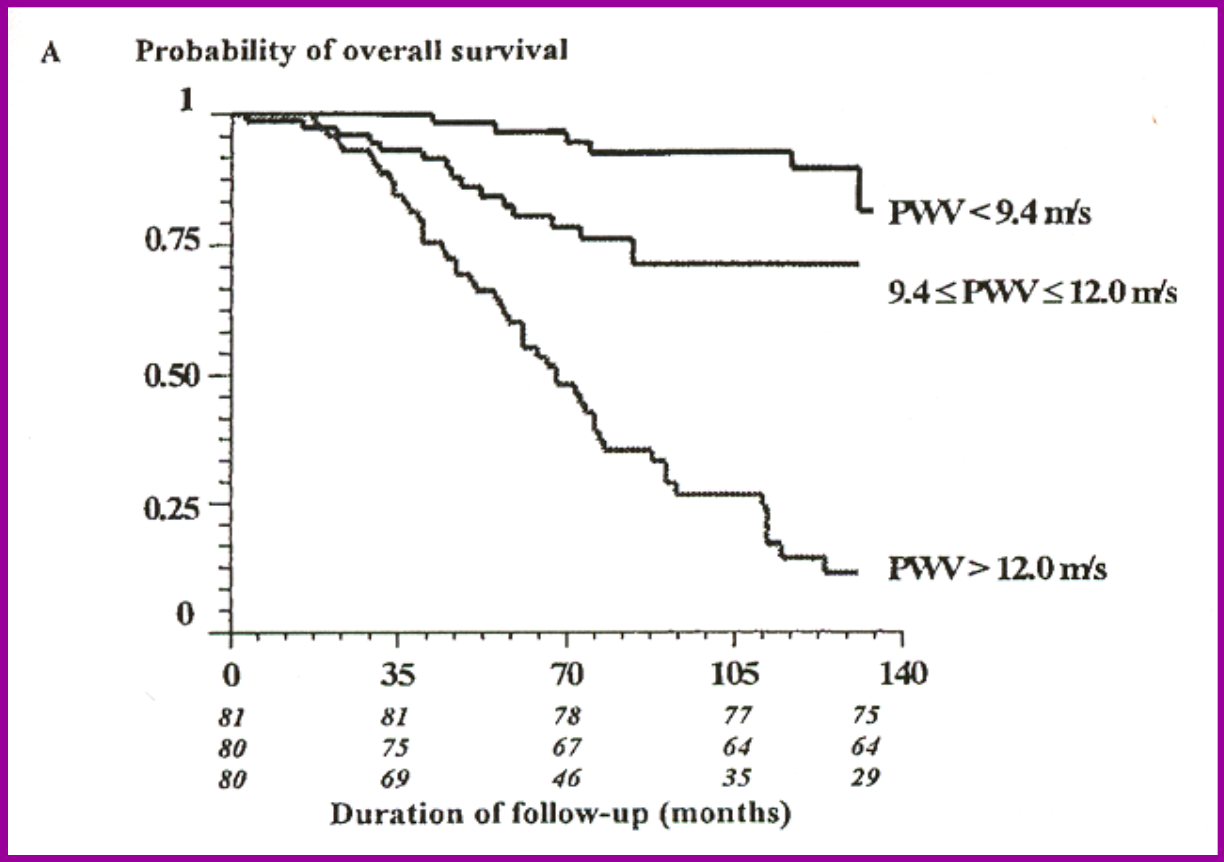


Arterial stiffness: Pulse wave velocity

- ☐ Έχει άμεσες αιμοδυναμικές συνέπειες
- ☐ Καθορίζει τον φαινότυπο της ΑΥ
- ☐ Είναι σημαντικός προγνωστικός δείκτης για την εμφάνιση ΑΥ
- ☐ Είναι σημαντικός προγνωστικός δείκτης της ανταπόκρισης στην αντιυπερτασική φαρμακευτική αγωγή
- ☐ Είναι σημαντικός προγνωστικός δείκτης θνησιμότητας και νοσηρότητας

Υπέρταση και όργανα-στόχος. Οι βλάβες, η διάγνωση, η θεραπεία: **ΑΡΤΗΡΙΕΣ**

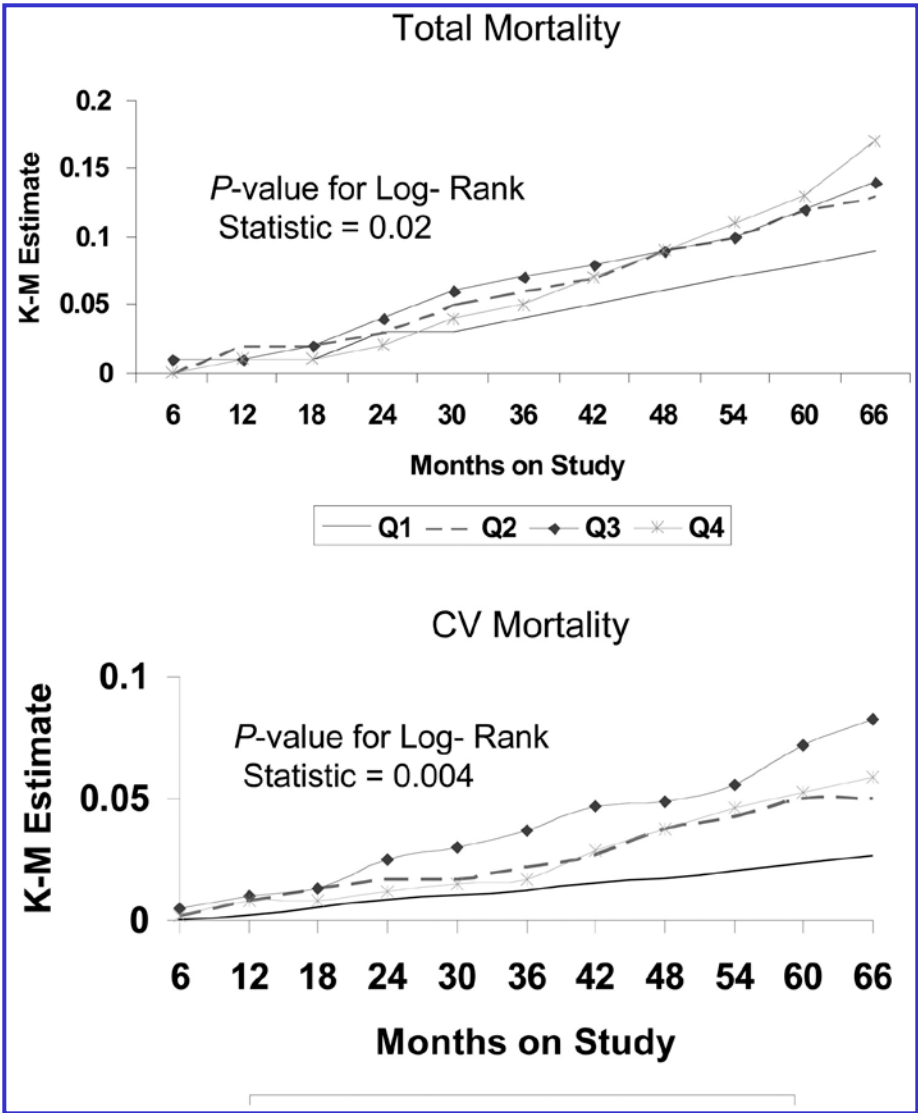
Arterial stiffness: Pulse wave velocity



PWV is an independent predictor of mortality in pts with end-stage renal disease

Υπέρταση και όργανα-στόχος. Οι βλάβες, η διάγνωση, η θεραπεία: **APTHPIES**

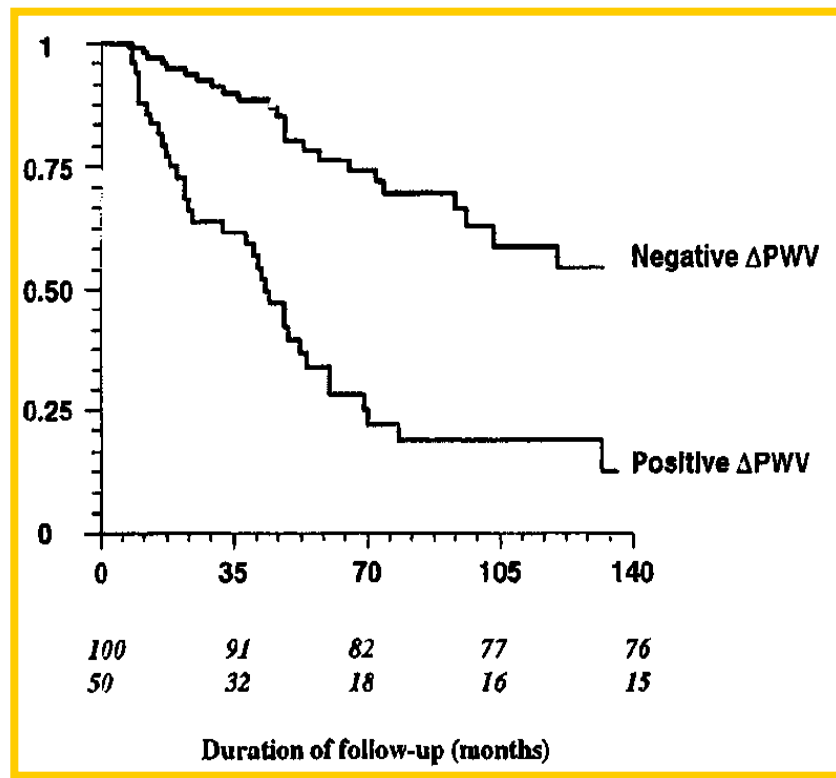
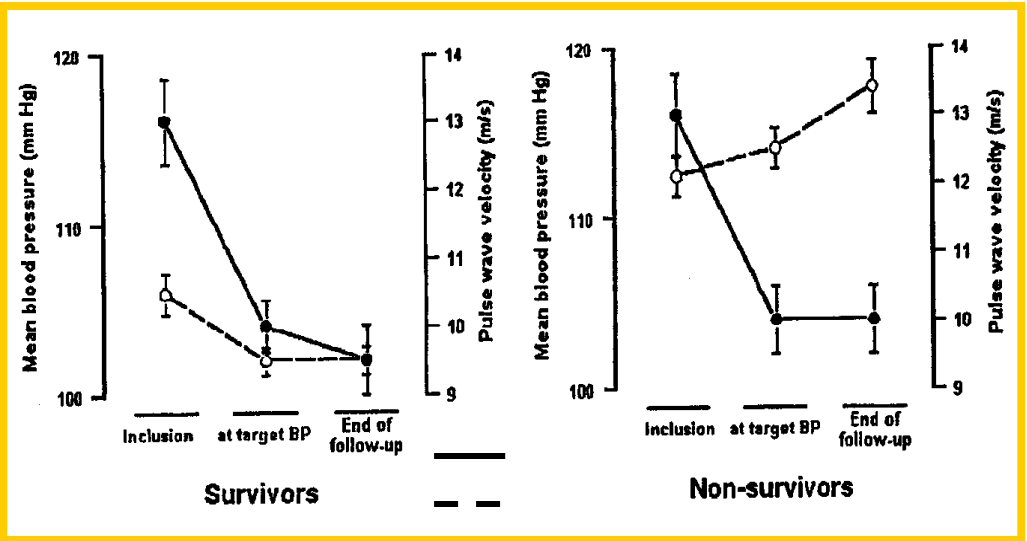
Arterial stiffness: Pulse wave velocity



In general healthy older adults, aortic PWV is associated with increased CV and total mortality

Υπέρταση και όργανα-στόχος. Οι βλάβες, η διάγνωση, η θεραπεία: **APTHPIES**

In pts with end-stage renal disease, a decrease in stiffness was independently associated with a survival benefit



Υπέρταση και όργανα-στόχος. Οι βλάβες, η διάγνωση, η θεραπεία: **APTHPIES**

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Table 4 Availability, prognostic value and cost of some markers of organ damage (scored from 0 to 4 pluses)

Markers	CV predictive value	Availability	Cost
Electrocardiography	++	++++	+
Echocardiography	+++	+++	++
Carotid Intima-Media Thickness	+++	+++	++
Arterial stiffness (Pulse wave velocity)	+++	+	++
Ankle-Brachial index	++	++	+
Coronary calcium content	+	+	++++
Cardio/Vascular tissue composition	?	+	++
Circulatory collagen markers	?	+	++
Endothelial dysfunction	++	+	+++
Cerebral lacunae/White matter lesions	?	++	++++
Est. Glomerular Filtration Rate or Creatinine Clearance	+++	++++	+
Microalbuminuria	+++	++++	+

	Predictive value	Availability	Cost
ECG	++	++++	+
ECHOCARDIOGRAPHY	+++	+++	++
CAROTID IMT	+++	+++	++
ANKLE BRACHIAL INDEX	+++	++	+
ARTERIAL STIFFNESS	+++	+	++
CORONARY CALCIUM CONTENT	+	+	++++
CARDIO/VASCULAR TISSUE COMP.	?	+	++
ENDOTHELIAL DSYFUNCTION	++	+	+++
WHITE MATTER LESSIONS	?	++	++++
GFR	+++	++++	+
MICROLBUMINUREA	+++	++++	+

Υπέρταση και όργανα-στόχος. Οι βλάβες, η διάγνωση, η θεραπεία: **ΑΡΤΗΡΙΕΣ**

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Table 6 Conditions favouring use of some antihypertensive drugs versus others

Thiazide diuretics ● Isolated systolic hypertension (elderly) ● Heart failure ● Hypertension in blacks	Beta-blockers ● Angina pectoris ● Post-myocardial infarction ● Heart failure ● Tachyarrhythmias ● Glaucoma ● Pregnancy	Calcium antagonists (dihydropyridines) ● Isolated systolic hypertension (elderly) ● Angina pectoris ● LV hypertrophy ● Carotid/Coronary Atherosclerosis ● Pregnancy ● Hypertension in blacks	Calcium antagonists (verapamil/diltiazem) ● Angina pectoris ● Carotid atherosclerosis ● Supraventricular tachycardia
ACE inhibitors ● Heart failure ● LV dysfunction ● Post-myocardial infarction ● Diabetic nephropathy ● Non-diabetic nephropathy ● LV hypertrophy ● Carotid atherosclerosis ● Proteinuria/Microalbuminuria ● Atrial fibrillation ● Metabolic syndrome	Angiotensin receptor antagonists ● Heart failure ● Post-myocardial infarction ● Diabetic nephropathy ● Proteinuria/Microalbuminuria ● LV hypertrophy ● Atrial fibrillation ● Metabolic syndrome ● ACEI-induced cough	Diuretics (antialdosterone) ● Heart failure ● Post-myocardial infarction	Loop diuretics ● End stage renal disease ● Heart failure

ACEI: ACE inhibitors; LV: Left Ventricle.

Υπέρταση και όργανα-στόχος. Οι βλάβες, η διάγνωση, η θεραπεία: **APTHPIES**

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ACE inhibitors ● Heart failure ● LV dysfunction	Angiotensin receptor antagonists ● Heart failure ● Post-myocardial infarction ● Nephropathy ● Microalbuminuria ● LV hypertrophy ● Metabolic syndrome ● ACEI-induced cough	Diuretics (antialdosterone) ● Heart failure ● Post-myocardial infarction	Loop diuretics ● End stage renal disease ● Heart failure

ACEI:
Asymptomatic atherosclerosis

ACEI: ACE inhibitors; LV: Left Ventricle.

Υπέρταση και όργανα-στόχος. Οι βλάβες, η διάγνωση, η θεραπεία: **APTHPIES**

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Table 6 Conditions favouring use of some antihypertensive drugs versus others

Thiazide diuretics • Isolated systolic hypertension (elderly) • Heart failure • Hypertension in blacks	Beta-blockers • Angina pectoris • Post-myocardial infarction • Heart failure • Tachyarrhythmias • Glaucoma • Pregnancy	Calcium antagonists (dihydropyridines) • Isolated systolic hypertension (elderly) • Angina pectoris • LV hypertrophy • Carotid/Coronary Ather • Pregnancy • Hypertension in blacks	Calcium antagonists (verapamil/diltiazem)
ACE inhibitors • Heart failure • LV dysfunction	Angiotensin receptor antagonists • Heart failure • Post-myocardial infarction • Nephropathy • Microalbuminuria • Hypertrophy • Left ventricular dysfunction • Metabolic syndrome	Diuretics (antialdosterone) • Heart failure • Post-myocardial infarction	Loop diuretics • End stage renal disease • Heart failure

ACEI:
Asymptomatic atherosclerosis

CCB:
Asymptomatic atherosclerosis

ACEI: ACE inhibitors; LV: Left Ventricle.

Υπέρταση και όργανα-στόχος. Οι βλάβες, η διάγνωση, η θεραπεία: **ΑΡΤΗΡΙΕΣ**

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Box 11 Position statement: Antihypertensive treatment: Preferred drugs	
Subclinical organ damage	
LVH	ACEI, CA, ARB
Asymptomatic atherosclerosis	CA, ACEI
Microalbuminuria	ACEI, ARB
Renal dysfunction	ACEI, ARB
Clinical event	
Previous stroke	any BP lowering agent
Previous MI	BB, ACEI, ARB
Angina pectoris	BB, CA
Heart failure	diuretics, BB, ACEI, ARB, antialdosterone agents
Atrial fibrillation	
Recurrent	ARB, ACEI
Permanent	BB, non-dihydropiridine CA
ESRD/proteinuria	ACEI, ARB, loop diuretics
Peripheral artery disease	CA
Condition	
ISH (elderly)	diuretics, CA
Metabolic syndrome	ACEI, ARB, CA
Diabetes mellitus	ACEI, ARB
Pregnancy	CA, methyldopa, BB
Blacks	diuretics, CA
Abbreviations: LVH: left ventricular hypertrophy; ISH: isolated systolic hypertension; ESRD: renal failure; ACEI: ACE inhibitors; ARB: angiotensin receptor antagonists; CA: calcium antagonists; BB: β-blockers	

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Box 11 Position statement: Antihypertensive treatment: Preferred drugs	
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Asymptomatic atherosclerosis	
ACEI, CCB	
Clinical event	
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Υπέρταση και όργανα-στόχος. Οι βλάβες, η διάγνωση, η θεραπεία: **APTHPIES**

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No comment on arterial stiffness

Box 11 Position statement: Antihypertensive treatment: Preferred drugs	
Subclinical organ damage	
Asymptomatic atherosclerosis	
ACEI, CCB	
Clinical event	
Previous stroke	any BP lowering agent
Previous MI	BB, ACEI, ARB
Angina pectoris	BB, CA
Heart failure	diuretics, BB, ACEI, ARB, antialdosterone agents
Atrial fibrillation	
Recurrent	ARB, ACEI
Permanent	BB, non-dihydropiridine CA
ESRD/proteinuria	ACEI, ARB, loop diuretics
Peripheral artery disease	CA
Condition	
ISH (elderly)	diuretics, CA
Metabolic syndrome	ACEI, ARB, CA
Diabetes mellitus	ACEI, ARB
Pregnancy	CA, methyldopa, BB
Blacks	diuretics, CA
Abbreviations: LVH: left ventricular hypertrophy; ISH: isolated systolic hypertension; ESRD: renal failure; ACEI: ACE inhibitors; ARB: angiotensin receptor antagonists; CA: calcium antagonists; BB: β-blockers	

Υπέρταση και όργανα-στόχος. Οι βλάβες, η διάγνωση, η θεραπεία: **ΑΡΤΗΡΙΕΣ**

How to restore: PWV

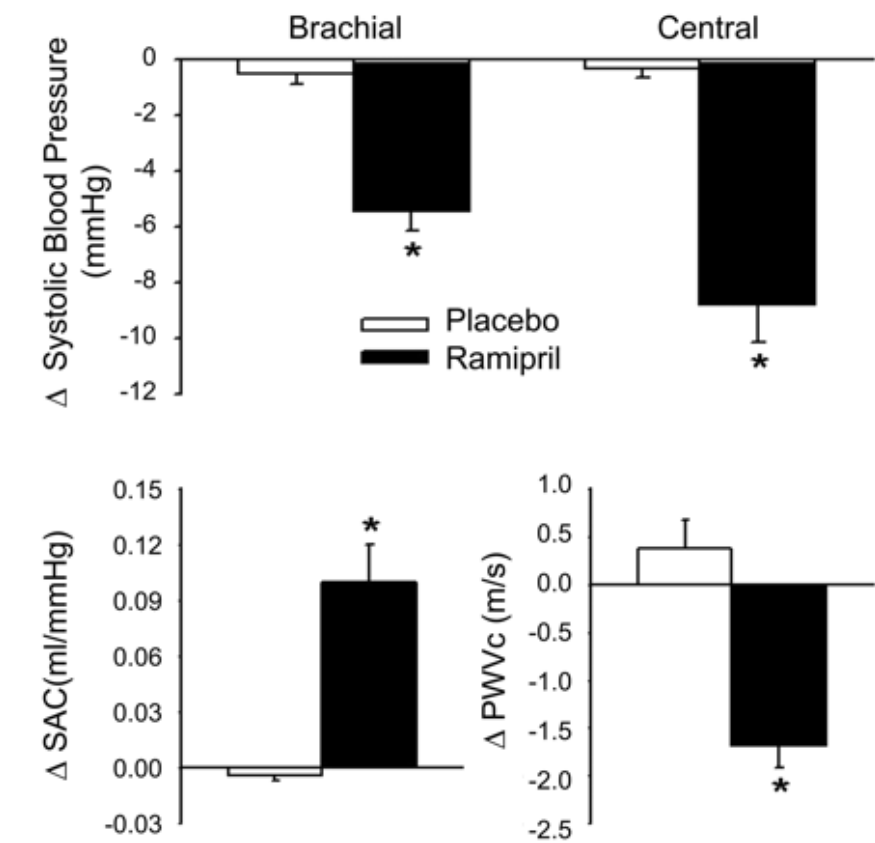
	cf-PWV*	cAI	CBP**
Nitrates	↓ / -	↓ ↓ ↓	↓ ↓ ↓
CCB	↓	↓ ↓ ↓	↓ ↓ ↓
β-blockers†	↓	↓ / ↑	↓ / ↑
ACEI	↓ ↓ ↓	↓ ↓ ↓	↓ ↓ ↓

Arterial stiffness reduction: dose dependent – pressure independent
- related to increased survival

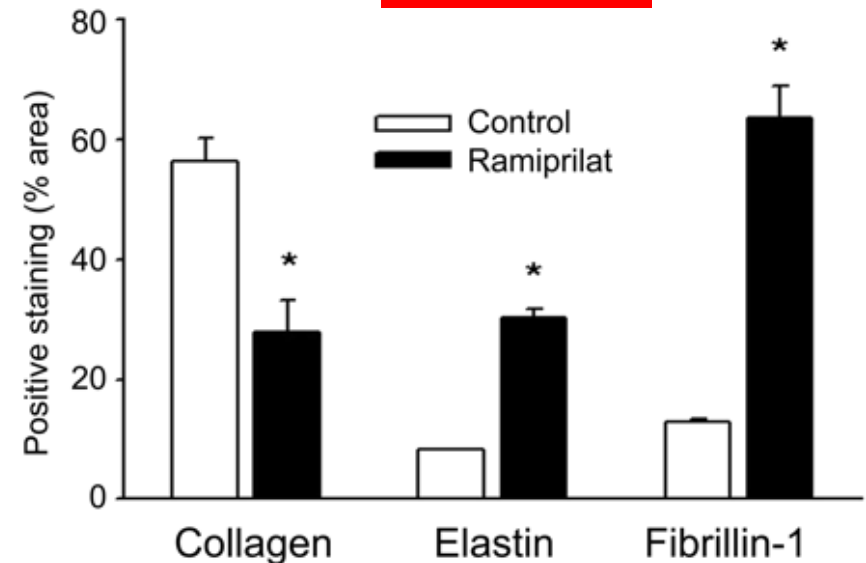
†: heterogeneous class

- : no effect, ↓ : reduction, *: passive or active, ** even in the absence of PBP decrease or more (PBP/CBP)

How to restore: PWV



RAMIPRIL



Without reducing BP significantly

Υπέρταση και όργανα-στόχος. Οι βλάβες, η διάγνωση, η θεραπεία: **ΑΡΤΗΡΙΕΣ**

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Fig. 2

Blood pressure (mmHg)					
Other risk factors OD or disease	Normal SBP 120–129 or DBP 80–84	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 risk factors	No BP intervention	No BP intervention	Lifestyle changes for several months then drug treatment if BP uncontrolled	Lifestyle changes for several weeks then drug treatment if BP uncontrolled	Lifestyle changes + Immediate drug treatment
1–2 risk factors	Lifestyle changes	Lifestyle changes	Lifestyle changes for several weeks then drug treatment if BP uncontrolled	Lifestyle changes for several weeks then drug treatment if BP uncontrolled	Lifestyle changes + Immediate drug treatment
≥3 risk factors, MS or OD	Lifestyle changes	Lifestyle changes and consider drug treatment	Lifestyle changes + Drug treatment	Lifestyle changes + Drug treatment	Lifestyle changes + Immediate drug treatment
Diabetes	Lifestyle changes	Lifestyle changes + Drug treatment			
Established CV or renal disease	Lifestyle changes + Immediate drug treatment	Lifestyle changes + Immediate drug treatment	Lifestyle changes + Immediate drug treatment	Lifestyle changes + Immediate drug treatment	Lifestyle changes + Immediate drug treatment

Initiation of antihypertensive treatment.

ΣΥΜΠΕΡΑΣΜΑΤΑ – ΘΕΜΑΤΑ ΠΟΥ ΠΡΕΠΕΙ ΝΑ ΛΥΘΟΥΝ

Υπάρχουν δείκτες οι οποίοι μπορούν να ανιχνεύσουν πρώιμη υποκλινική αρτηριακή βλάβη

Οι δείκτες αυτοί μπορούν να βοηθήσουν στην καλύτερη σταδιοποίηση του καρδιαγγειακού κινδύνου

Δεν υπάρχουν ακόμα ειδικά φάρμακα

Δεν έχουν ακόμα βρεθεί τα βέλτιστα φυσιολογικά όρια

Οι τεχνικές είναι απλές αλλά δεν είναι αρκετά διαδεδομένες