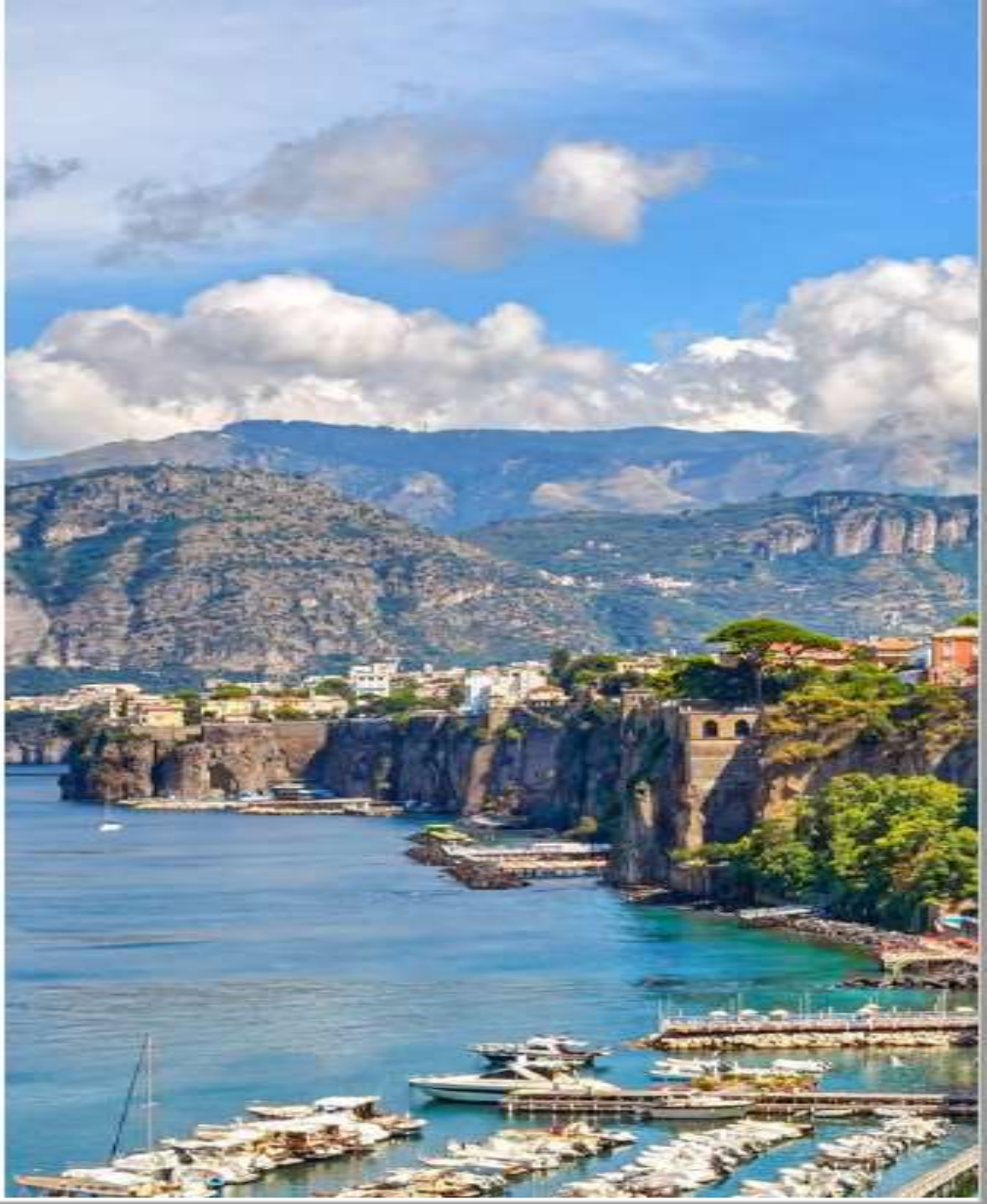
XXIX CONGRESSO NAZIONALE ANCE



10 - 13 Ottobre 2019

Centro Congressi
Hilton Sorrento Palace
Sorrento (NA)

UNIVERSITÀ DEGLI STUDI DI PALERMO

A.O.U.P.
«Paolo Giaccone»

«Scuola di Medicina

LETTURA

La Valutazione del Danno Subclinico Cardiaco e Vascolare nel Paziente Iperteso e i Target Pressori raccomandati dalle Linee Guida AHA-ACC 2017 ed ESC-ESH 2018

Salvatore Novo (Palermo)

Presenta: M. Di Franco (Palermo)

Centro Congressi Hilton Sorrento Palace, Sabato 12 Ottobre 2019, ore 18.45-19.15

2018 ESC/ESH GUIDELINES ON ARTERIAL HYPERTENSION

Hypertension is defined as office SBP ≥ 140 mmHg and/or DBP ≥ 90 mmHg. This statement is based on evidence from multiple RCTs demonstrating that treatment of patients with these BP values is beneficial.

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

2017 ACC/AHA GUIDELINES ON ARTERIAL HYPERTENSION

Table 6. Categories of BP in Adults*

BP Category	SBP		DBP
Normal	<120 mm Hg	and	<80 mm Hg
Elevated	120–129 mm Hg	and	<80 mm Hg
Hypertension			
Stage 1	130–139 mm Hg	or	80–89 mm Hg
Stage 2	≥140 mm Hg	or	≥90 mm Hg

2017 ACC/AHA GUIDELINES ON ARTERIAL HYPERTENSION

Table 7. Prevalence of Hypertension Based on 2 SBP/DBP Thresholds*†

	SBP/DBP ≥130/80 mm Hg or Self-Reported Antihypertensive Medication†		SBP/DBP ≥140/90 mm Hg or Self-Reported Antihypertensive Medication‡	
Overall, crude	46%		32%	
	Men (n=4717)	Women (n=4906)	Men (n=4717)	Women (n=4906)
Overall, age-sex adjusted	48%	43%	31%	32%
Age group, y				
20–44	30%	19%	11%	10%
45–54	50%	44%	33%	27%
55–64	70%	63%	53%	52%
65–74	77%	75%	64%	63%
75+	79%	85%	71%	78%
Race-ethnicity§				
Non-Hispanic white	47%	41%	31%	30%
Non-Hispanic black	59%	56%	42%	46%
Non-Hispanic Asian	45%	36%	29%	27%
Hispanic	44%	42%	27%	32%

VI SONO EVIDENZE CLINICHE CHE GIUSTIFICANO UN ABBASSAMENTO DEI LIVELLI DI PRESSIONE ARTERIOSA PER INIZIARE UN TRATTAMENTO?

SUB-CLINICAL CARDIOVASCULAR DAMAGE IN ARTERIAL HYPERTENSION

Really, the evolution of BP from normal level to hypertension has been found to be associated with increased CV events and other risk factors.

Both office and home BP have an independent and continuous relationship with the incidence of CV events (haemorrhagic or ischaemic stroke, myocardial infarction, sudden death, heart failure, and PAD), as well as end-stage renal disease.

Moreover, recent studies show that also newly diagnosed arterial hypertension can be associated with subclinical CV organ damage.

SUB-CLINICAL VASCULAR DAMAGE IN ARTERIAL HYPERTENSION

Morning BP is associated with carotid IMT in pre-hypertensive patients.
Alpaydin S et al. Blood Press Monit. 2017; 22: 131-6

Pre-Hypertension is associated with increased carotid ATS plaque in the community population of Southern China.
Hong H et al. BMC Cardiovasc Disord. 2013; 13-20.

Body Mass Index impact on Arterial Stiffness in Young Pre-hypertensives: A Cross Sectional Study
Deepika V et al. J Res Health Sci. 2017; 18: e00402.

Pre-hypertension and high serum uric acid increase arterial stiffness.
Thitiwuthikiat Pet al. Scand J Clin Lab Invest. 2017; 77: 673-8.

SUB-CLINICAL VASCULAR DAMAGE IN ARTERIAL HYPERTENSION

High Central Aortic rather than Brachial BP is Associated with Carotid Wall Remodeling and Increased Arterial Stiffness in Childhood.
Peluso G et al. High Blood Press Cardiovasc Prev. 2017; 24: 49-60

Ascending Aorta Elasticity is related to Pre-hypertension.
Jia CF et al. Am J Hypertens 2017; 30: 61-6.

Pulse pressure increase reduce LV global longitudinal strain in normotensive and newly diagnosed, untreated, hypertensive patients.
Lembo M et al. J Hypertens. 2016; 34: 1201-7

ASYMPTOMATIC CAROTID LESIONS IN A SAMPLE OF 755 SUBJECTS IN RELATION WITH A SINGLE RISK FACTOR

	NORMALS (%)	IMT (%)	A.C.P. (%)	IMT+ACP (%)
R.F. -	83,87	10,75	5,37	16,2
R.F. +	52,9	32,5 *	14,7 *	47,2 *
HYPERTENS.	34,48	44,82 *	20,68 *	65,5 *
NIDDM	58,30	25,00 *	16,7 *	41,7 *
HYPER-C	73,33	13,33	13,33 *	26,6 *
FAMILY H. CVD	80,64	12,90	6,46	19,4
HYPER-TG	75,00	25,00	0	25,00
SMOKING	66,66	33,33 *	0	33,3 *
OBESITY	95,23	4,76	0	4,7

Novo S.: Adv. Vasc. Pathol. 1997; Excerpta Medica, Amsterdam 1997: pp. 36-46

A LIVELLO VASCOLARE L'IPERTENSIONE ARTERIOSA, ANCHE LA PRE-IPERTENSIONE E L'IPERTENSIONE ARTERIOSA DI RECENTE DIAGNOSI, SI ASSICIA AD UN AUMENMTO DELL'ARTERIAL STIFFNESS E DELL'INCIDENZA DI IMT/PLACCA CAROTIDEA

IMT INDICATOR OF CARDIOVASCULAR EVENTS

- Increased IMT is an independent RF for MI and stroke
  - Finnish study (1257 men)

    ↑IMT for 0.1mm→↑11% risk for AMI
  - ARIC study (15800 m,w)

    ↑IMT is associated with 2-4 fold increase of coronary events
  - Rotterdam study (7983 m, w)

    ↑ IMT – 1SD (0.163 mm) → MI – OR - 1.57

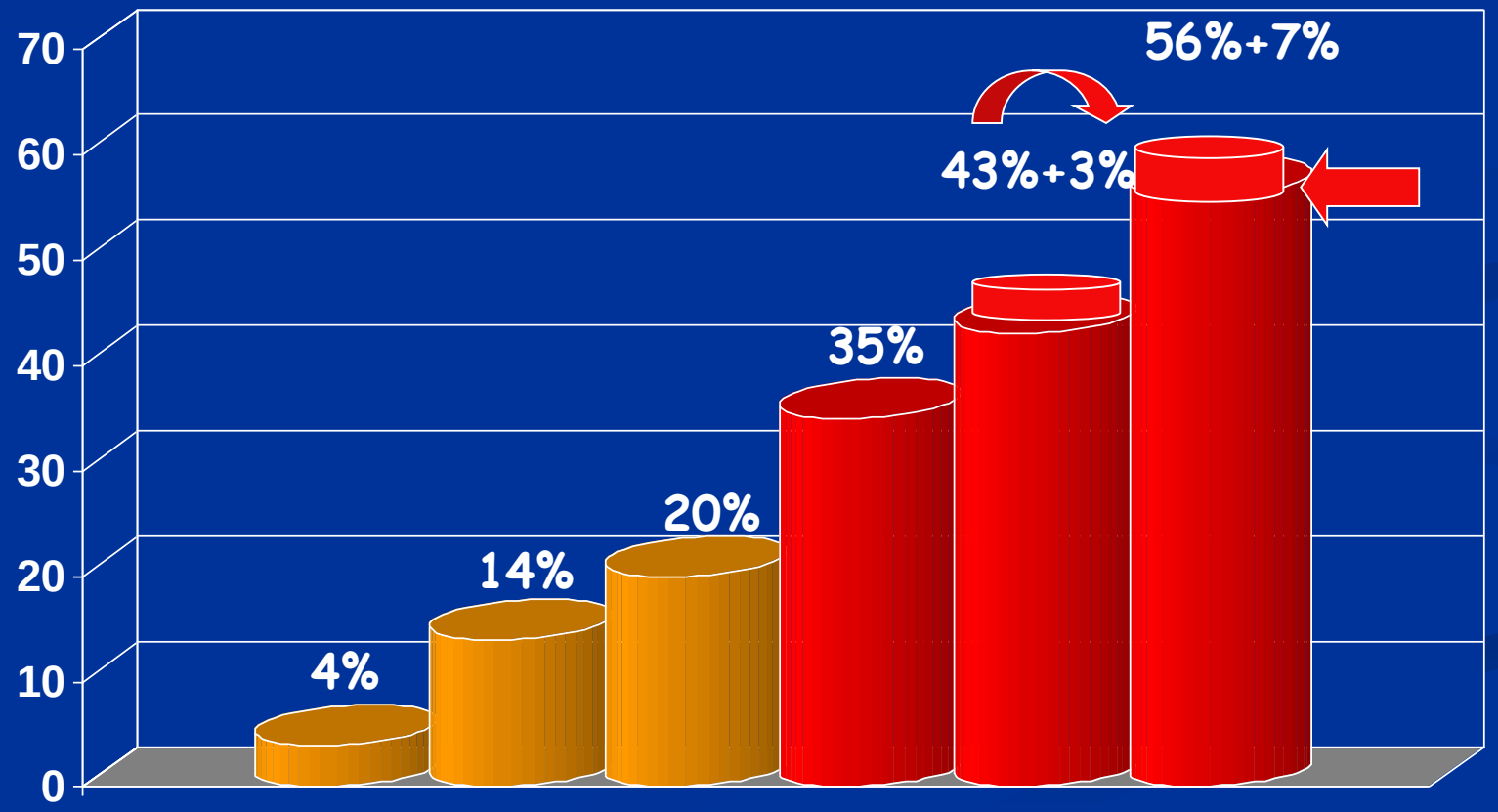
    Stroke – OR -1.51
  - CHS study (4776 m,w)

    ↑IMT →4 fold increase of risk for AMI and stroke in highest quintile

SUB-CLINICAL ATS ADD TO PREDICTION OF CV RISK: A TEN YEARS FOLLOW-UP STUDY IN 558 PATIENTS

Novo S, Visconti C, Amoroso GR, Corrado E, Muratori I, Fazio G, Novo G

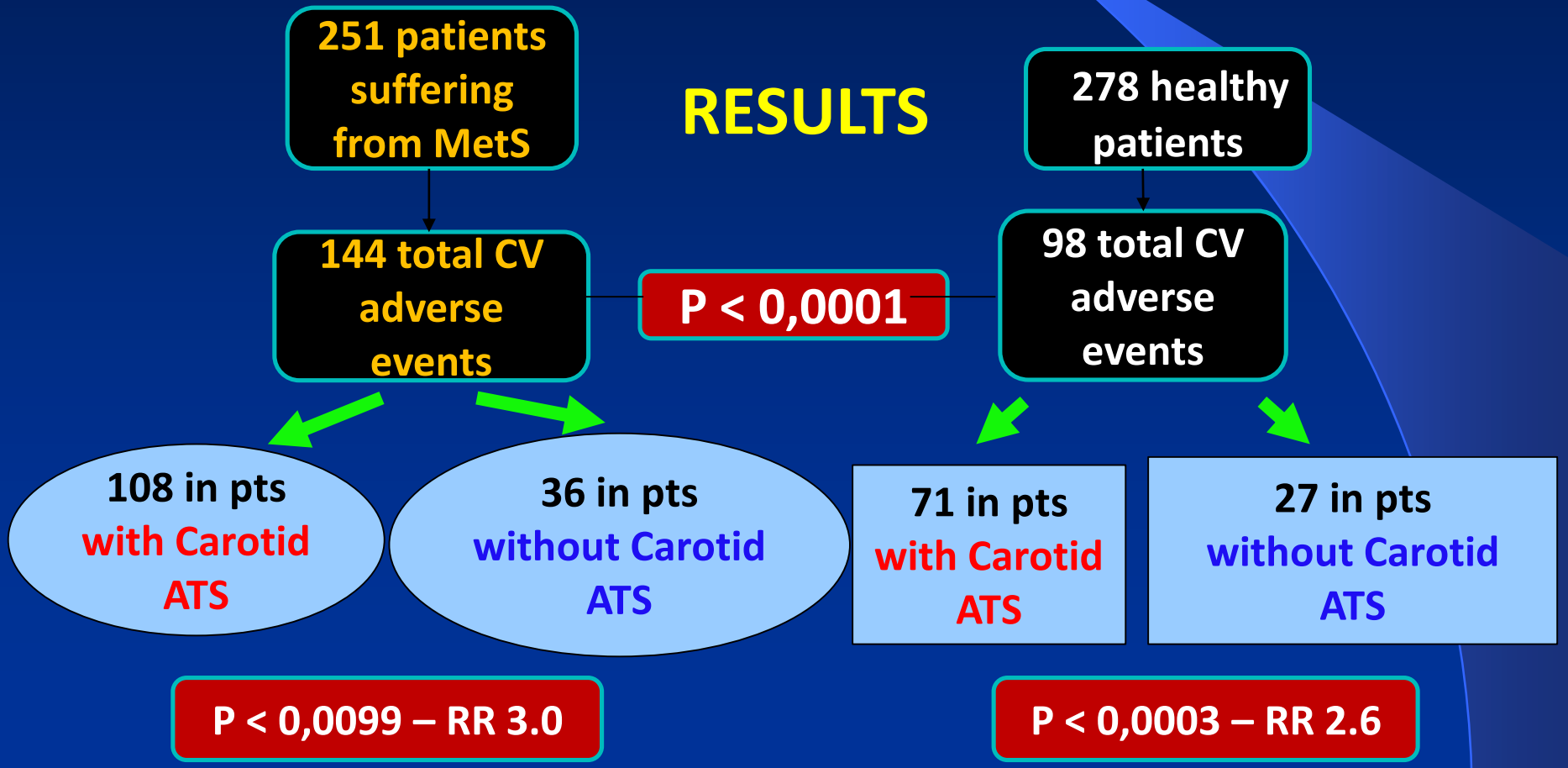
Eur J Cardiovasc Prev & Rehabiltation 2010; 17: 514-8



43 e 56% Non fatal events
3% e 7% Fatal events

SUB-CLINICAL ATS AND METS INCREASE CARDIO- AND CEREBRO-VASCULAR EVENTS RATE: A 20-YEAR FOLLOW UP.

Novo S et al. Cardiovasc Diabetol. 2013; 23: 155-62



Risk categories

Very high-risk	Subjects with any of the following: • Documented CVD, clinical or unequivocal on imaging. Documented clinical CVD includes previous AMI, ACS, coronary revascularization and other arterial revascularization procedures, stroke and TIA, aortic aneurysm and PAD. Unequivocally documented CVD on imaging includes significant plaque on coronary angiography or carotid ultrasound. It does NOT include some increase in continuous imaging parameters such as intima–media thickness of the carotid artery. • DM with target organ damage such as proteinuria or with a major risk factor such as smoking or marked hypercholesterolaemia or marked hypertension. • Severe CKD (GFR <30 mL/min/1.73 m²). • A calculated SCORE =/>10%.
High-risk	Subjects with: • Markedly elevated single risk factors, in particular cholesterol >8 mmol/L (>310 mg/dL) (e.g. in familial hypercholesterolaemia) or BP ≥180/110 mmHg. • Most other people with DM (with the exception of young people with type 1 DM and without major risk factors that may be at low or moderate risk). • Moderate CKD (GFR 30–59 mL/min/1.73 m²). • A calculated SCORE ≥5% and <10%.
Moderate-risk	SCORE is ≥1% and <5% at 10 years. Many middleaged subjects belong to this category.
Low-risk	SCORE <1%.

European Heart Journal 2016 - doi:10.1093/eurheartj/ehv272

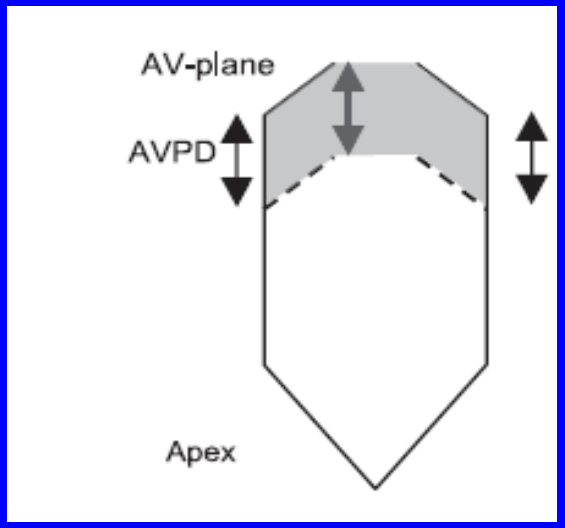
SUB-CLINICAL CARDIAC DAMAGE

Abnormal LV geometry of hypertensive patients is frequently associated with diastolic dysfunction which can be further evaluated by a combination of transmitral flow and tissue Doppler studies.

LA size is also frequently increased in hypertensive patients; it is related to diastolic dysfunction and associated with the incidence of Atrial Fibrillation and CV events.

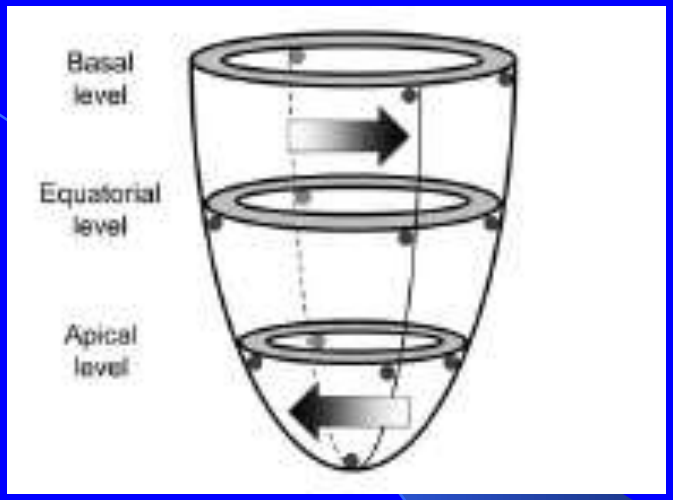
CARDIAC MECHANIC

Longitudinal function



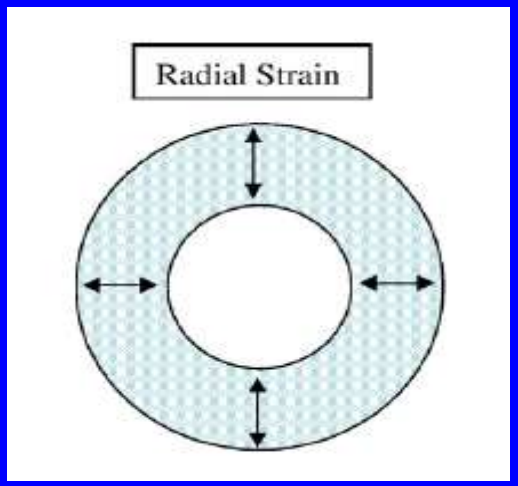
Movement of base versus apex

TWIST



Clockwise rotation of the base and anticlockwise rotation of the apex

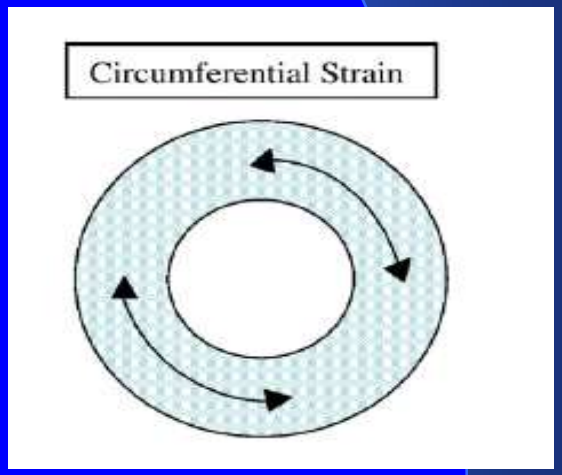
Radial function

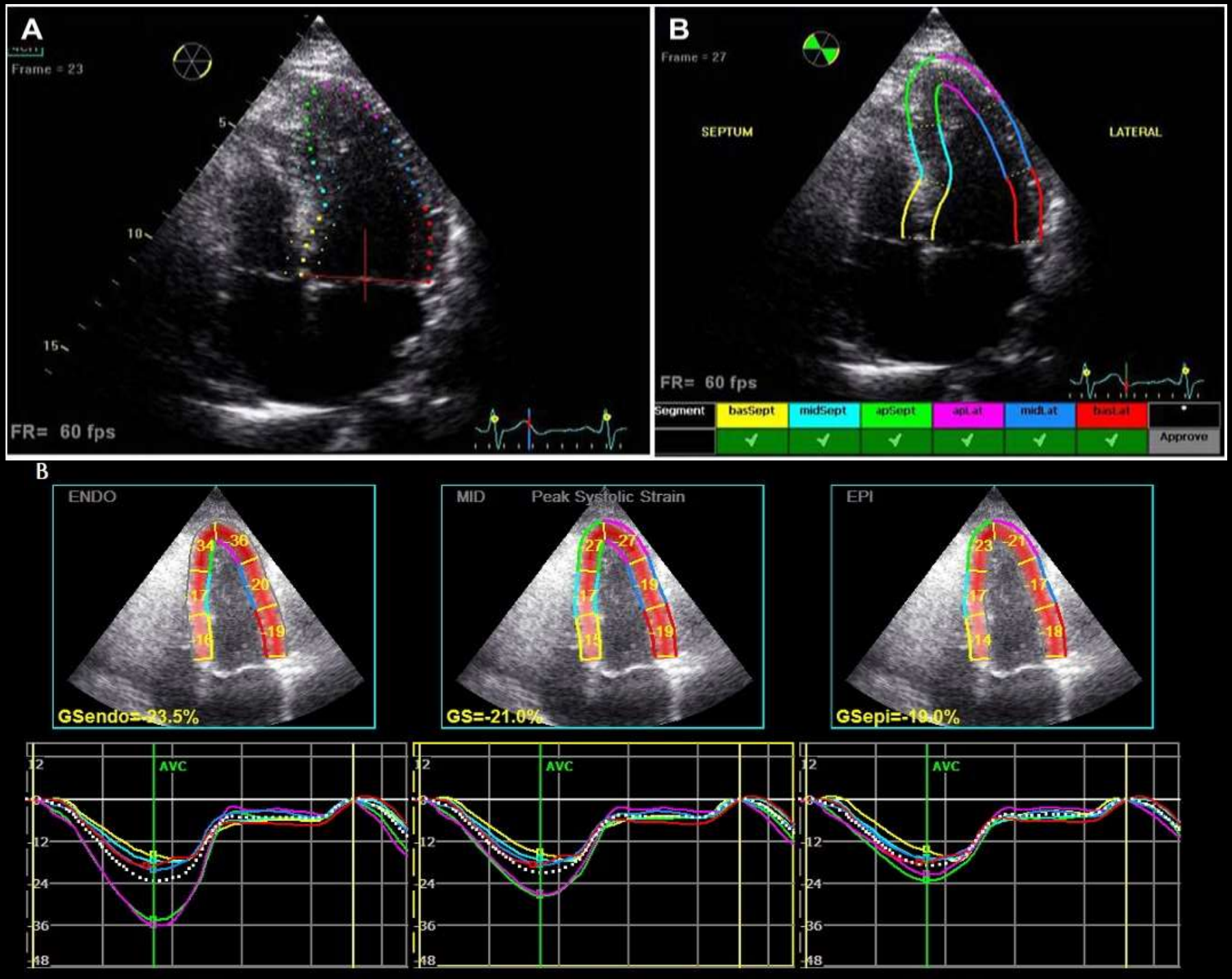


Thickening of myocardium

Length variation along the circular perimeter

Circumferential function




A
Frame = 23
5
10
15
FR= 60 fps
B
Frame = 27
SEPTUM
LATERAL
FR= 60 fps
Segment
basSept
midSept
apSept
apLat
midLat
basLat
Approve
B
ENDO
MID
Peak Systolic Strain
EPI
GSendo=-23.5%
GS=-21.0%
GSepi=-10.0%
AVC
AVC
AVC

The increase of Clinic and 24-h systolic BP is associated with LV reduced GLS evaluated with 3DE strain analysis, independently of LV structure and diastolic function.

Tadic et al. Int J Cardiovasc Imaging 2014; 30: 699-711

Early LA strain alterations could be linked to exertional dyspnea, often present in newsly diagnosed arterial hypertension.

Braunauer et al. Int J Cardiovasc Imaging 2018; 34: 701-11

Finally, RV structure, function, and deformation are significantly changed in subjects with subclinical hypertension.

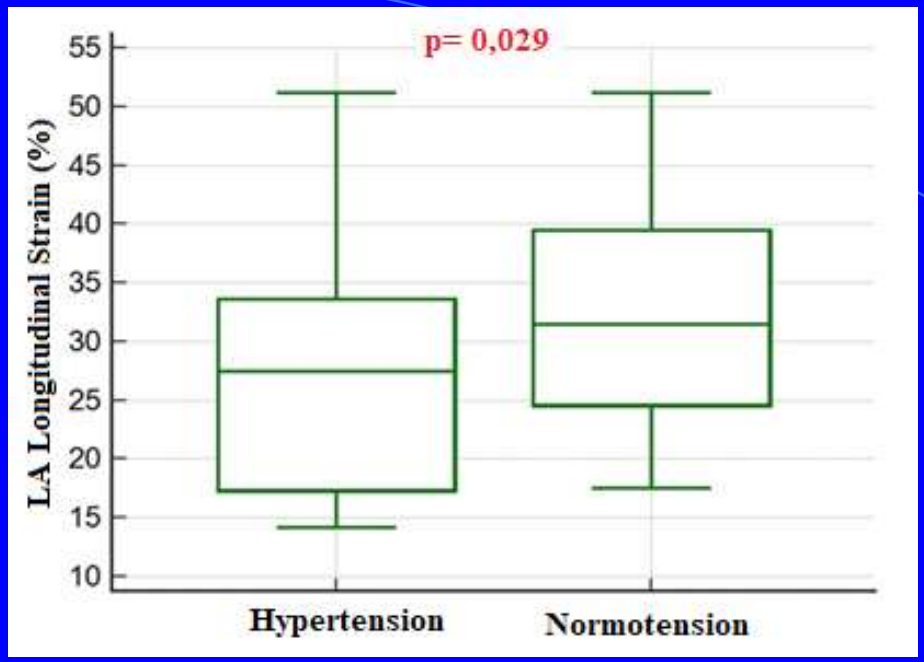
Tadic et al. J Clin Hypertens 2018; 20: 400-7

OUR RECENT EXPERIENCE

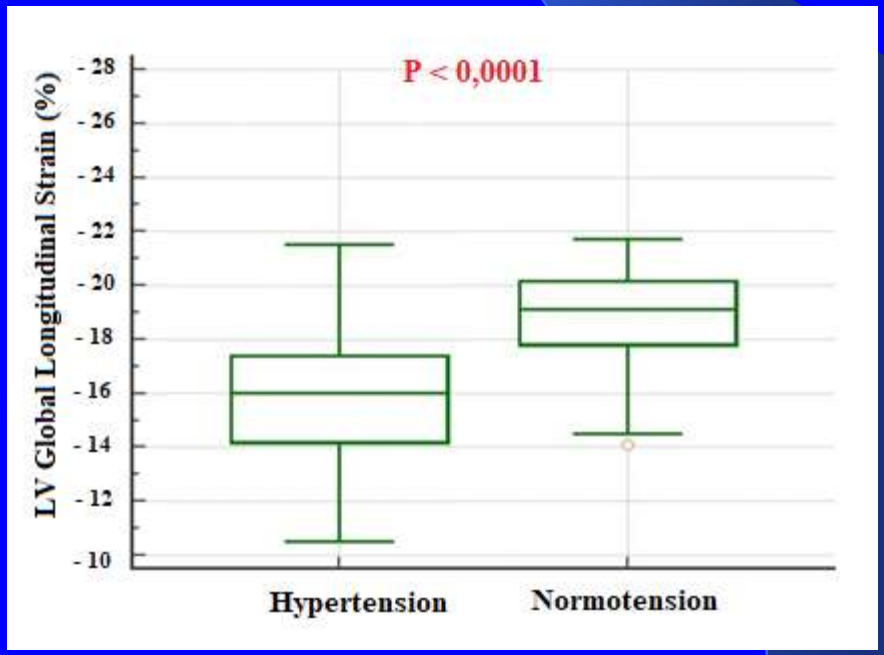
49 Patients with newsly diagnosed Arterial Hypertension

* Asymptomatic
* Recent diagnosis (< 1 month)
* ABPM confirmed diagnosis of hypertension
* No LA dilatation – LVH – IHD – Valvulopathies – Cardiomyopathies – Nephropaty – COLD – Other diseases

43 Normotensive Control Subjects



Anche i soggetti ipertesi di recente diagnosi mostrano una riduzione dello strain longitudinale dell'Asin. e dello strain longitudionale globale del VS!!



NEWSLY DIAGNOSED ARTERIAL HYPERTENSION AND BEHAVIOR OF PAP

In early stage of uncomplicated arterial hypertension, increased pulmonary vascular resistance (PVR) has been reported at rest and more rarely during exercise.

Vriz (Can J Cardiol. 2015; 31: 537-43) decribed that resting and exercise Pulmonary Vascular Resistance are increased in uncomplicated hypertension, without this being related to increased Pulmonary Venous Pressure or resistive vessel stiffness, suggesting an early increase in pulmonary vascular tone.

OUR STUDY ON THE BEHAVIOR OF PAP IN UNCOMPLICATED HYPERTENSIVES

* 69 patients with hypertension, with (n=24) or without (n=45) LV diastolic dysfunction, and BP > 140/90 mm Hg.

* All patients underwent physical ecostress, using an ergometer bed, increasing the work load of 25 watt every 2 min.

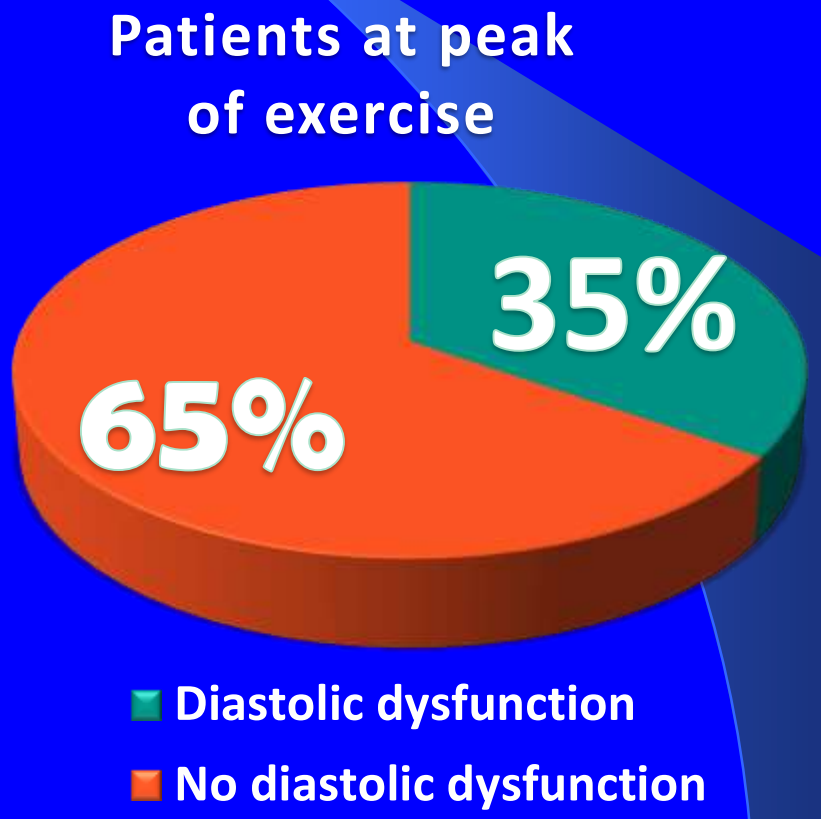
* Echocardiograhic parameters, BP, and ECG were registered at rest and during each step of the exercise until the maximal HR or muscle exhaustion or symptoms.

CARACTERISTICS OF PATIENTS WITH OR WITHOUT DIASTOLIC DYSFUNCTION

	Diastolic Dysfunction	No Diastolic Dysfunction	P <
Patients	24 (34,8%)	45 (65,2%)	0,16
Age	63,04±10	60,4±8,5	0,16
Female Gender	9 (13%)	14 (20,3%)	0,6
Pressure/Rate Product	25024	22729	0,03
ACE-I /ARBs	18 (26%)	30 (43,4%)	0,38
B-blockers	14 (20,3%)	25 (36,2%)	0,75
Ca++ channel blockers	7 (10,1%)	11 (15,9%)	0,63
Diuretics	6 (8,6%)	13 (18,8%)	0,84
Hypercolesterolemia	14 (20,3%)	29 (42%)	0,62
Smoking	5 (7,25%)	20 (29%)	0,05
Diabetes	4 (5,8%)	8 (11,5%)	0,9

Patients divided in two groups:

1) With increase of the E/E' ratio > 14 during exercise (index of diastolic dysfunction (EACVI/ASE);
2) With the ratio E/E' < 14 during exercise as index of normal LV function.



RESULTS

Mean values registered at rest in the two Groups, with or without LV dysfunction

	DIASTOLIC DYSFUNCTION	NO DIASTOLIC DYSFUNCTION	P
E/E’	11,86 [11,18;14,57]	7,33 [5,85;8,9]	<0,0001
E/A	0,87 [0,76;1,25]	0,81 [0,75;1,01]	0,20
HR	69,7±14	70,5±11	0,16
SBP	128,7±14,4	127,9±15,8	0,8
DBP	80,8±7,4	70,5±11,1	0,043
E’	0,06 [0,04;0,07]	0,08 [0,07;0,1]	<0,0001
PAPS	29,5 [23,5;33]	24 [20;29]	0,01
VMAXIT	2,4±0,4	2,1±0,3	0,4
TAPSE	23,2±3,7	24,1±3,6	0,9
WALL THICKENING	21 (30,4%)	16 (23,1%)	<0,0001

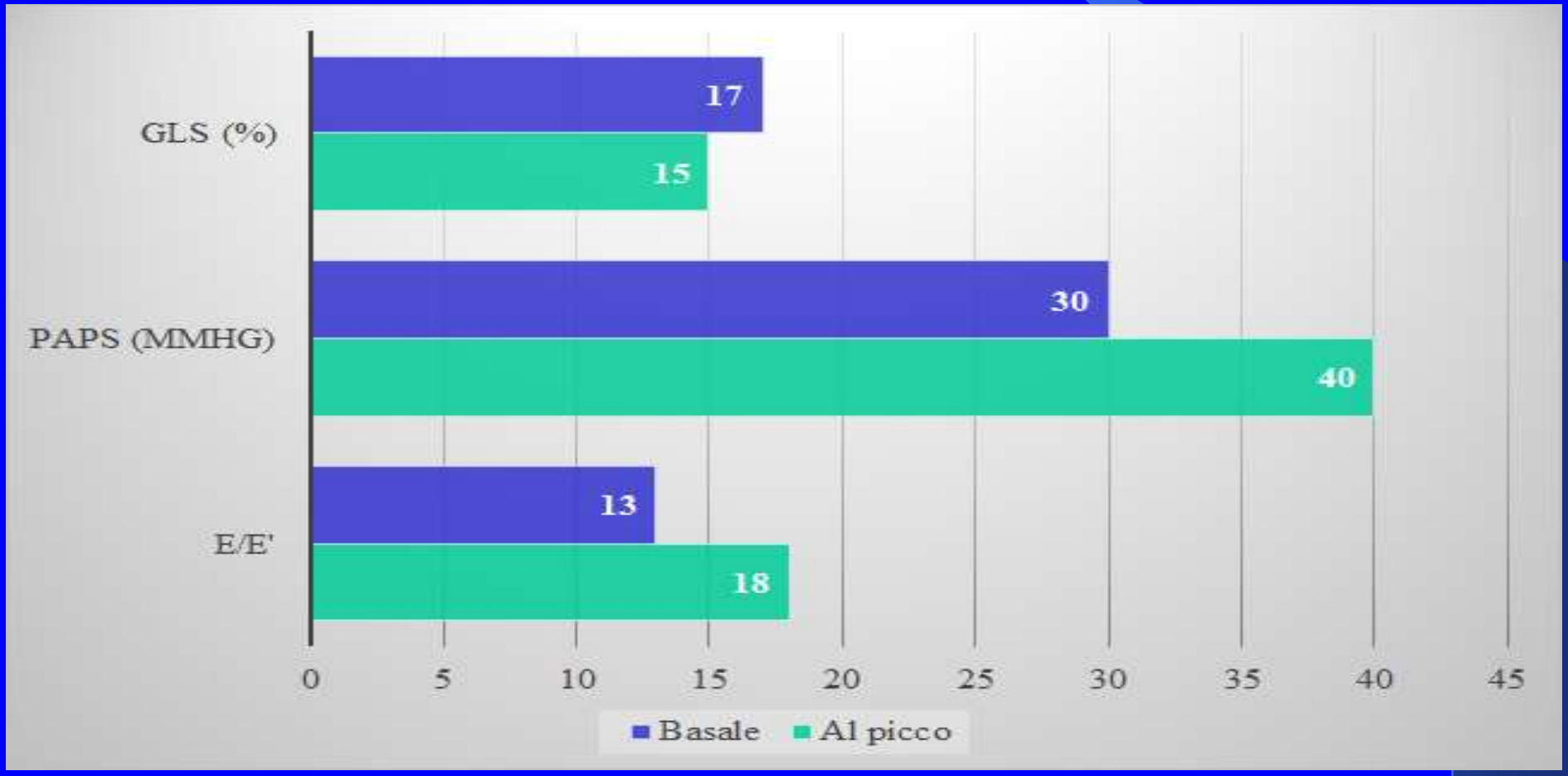
Mean values registered in the two Groups, with or without LV dysfunction, at peak of exercise

	DIASTOLIC DYSFUNCTION	NO DIASTOLIC DYSFUNTION	P
E/E’	16,1 [15;20,5]	11,2 [8,4;12,8]	<0,0001
E/A	0,93 [0,79;1,19]	0,85 [0,75;1,06]	0,3
HR	122±19	123±14	0,08
SBP	204,3±17,3	183,1±18,1	<0,0001
DBP	90,2±9,8	83,3±11,5	0,01
E’	0,07 [0,05;0,08]	0,09 [0,08;0,12]	<0,0001
PAP_S	46,12±8,84	36,13±10,09	0,0001
$V_{MAX}IT$	3,24±0,38	2,73±0,49	<0,0001
TAPSE	26,2±4,6	26,3±4,4	0,9

STRESSECHO 2020

Feasibility and Utility of the Ecostress, beyond the Coronaropathy

In a preliminary sample of patients with newsly diagnosed hypertension and diastolic dysfunction we observed a reduction in GLS under stress and a simultaneous increase in PAPs and LV filling pressures



CONSIDERAZIONI

Nell'Ipertensione Arteriosa modificazioni della Stiffness arteriosa e della morfologia di parete (IMT/Placca) possono vrificarsi anche precocemente.

Analogamente, cambiamenti della deformazione miocardica, sia ventricolare che atriale, possono svilupparsi in una fase precoce.

L'utilita clinica della valutazione degli indici di deformazione miocardica è sicuramente meritevole di ulteriore attenzione e ricerca.

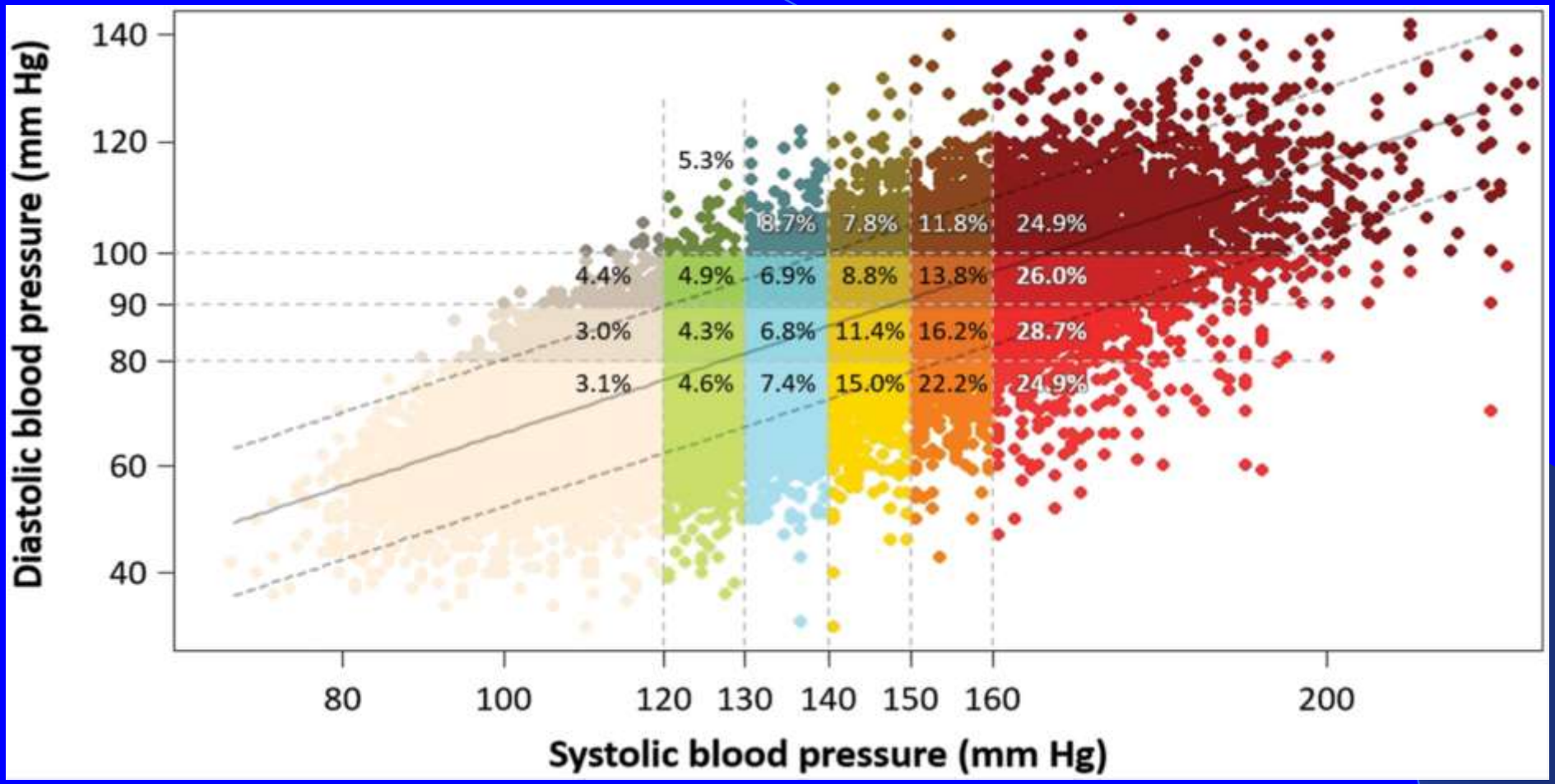
Lo scopo è quello di otttenere indicatori più precoci, sensibili e affidabili attraverso I quali delineare razionalmente il profile prognostico e terapeutico del pazienti ipertesi.

TAKE HOME MESSAGE

Le Linee Guida ESC/ESH 2018 sull'Ipertensione Arteriosa e, soprattutto, le Linee Guida ACC/AHA 2017, quando analizzano gli aspetti terapeutici, suggeriscono più attenzione agli stadi iniziali dell'Ipertensione Arteriosa e una strategia terapeutica più precoce al fine di prevenire o ridurre il danno a carico degli organi bersaglio.

L'uso delle tecniche di imaging vascolare e cardiaco, note (eco vascolare) e meno note (ecocardio-GLS) possono migliorare la stratificazione del rischio dei pazienti e guidare nella scelta dei pazienti che devono essere trattati più precocemente e nei target di pressione arteriosa da raggiungere con il trattamento.

DISTRIBUTION OF SYSTOLIC AND DIASTOLIC BLOOD PRESSURE AND 10-YEAR RATES OF MAJOR CV EVENTS



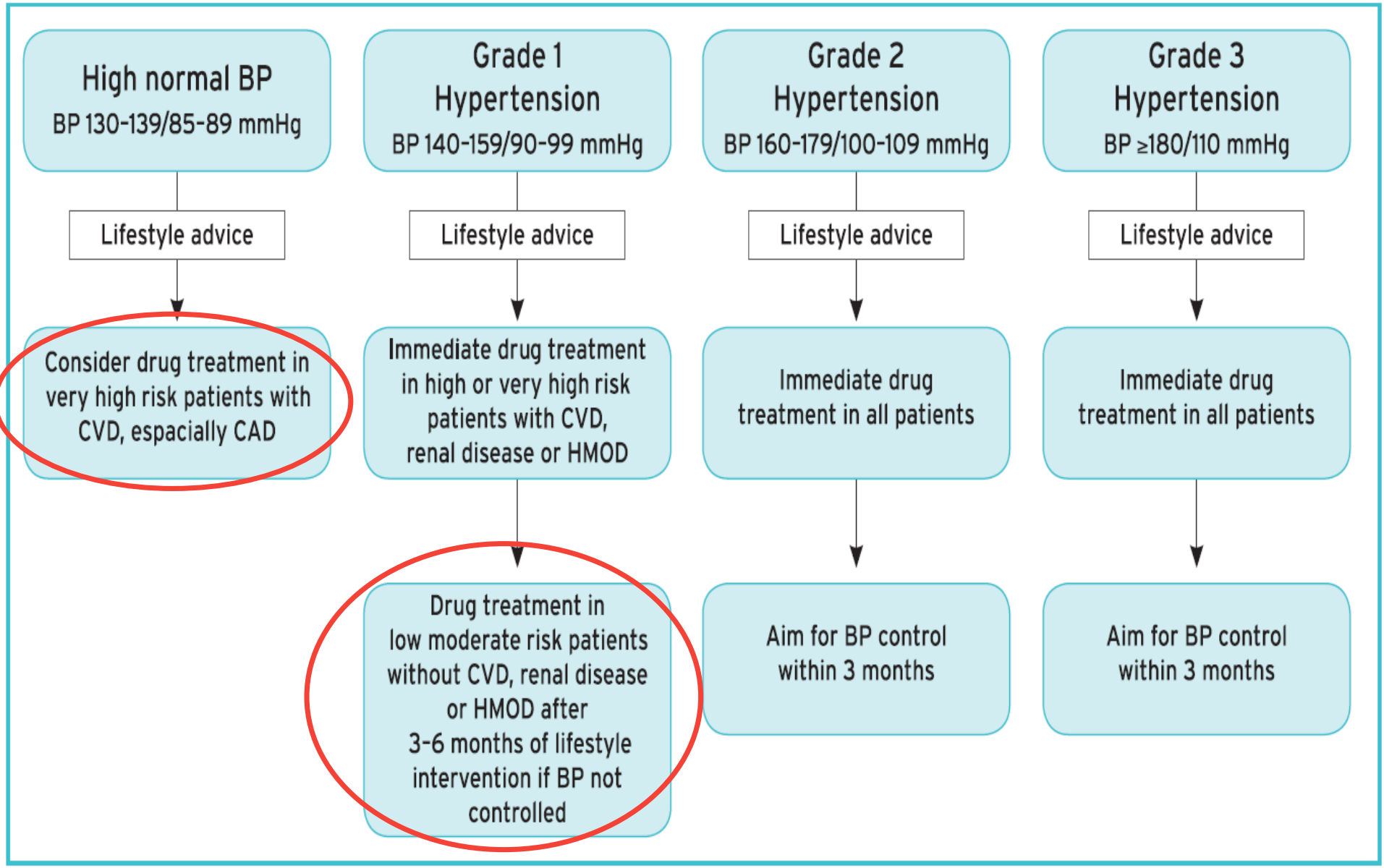
Every coin has its reversse!!!
(Worsening of Mood)

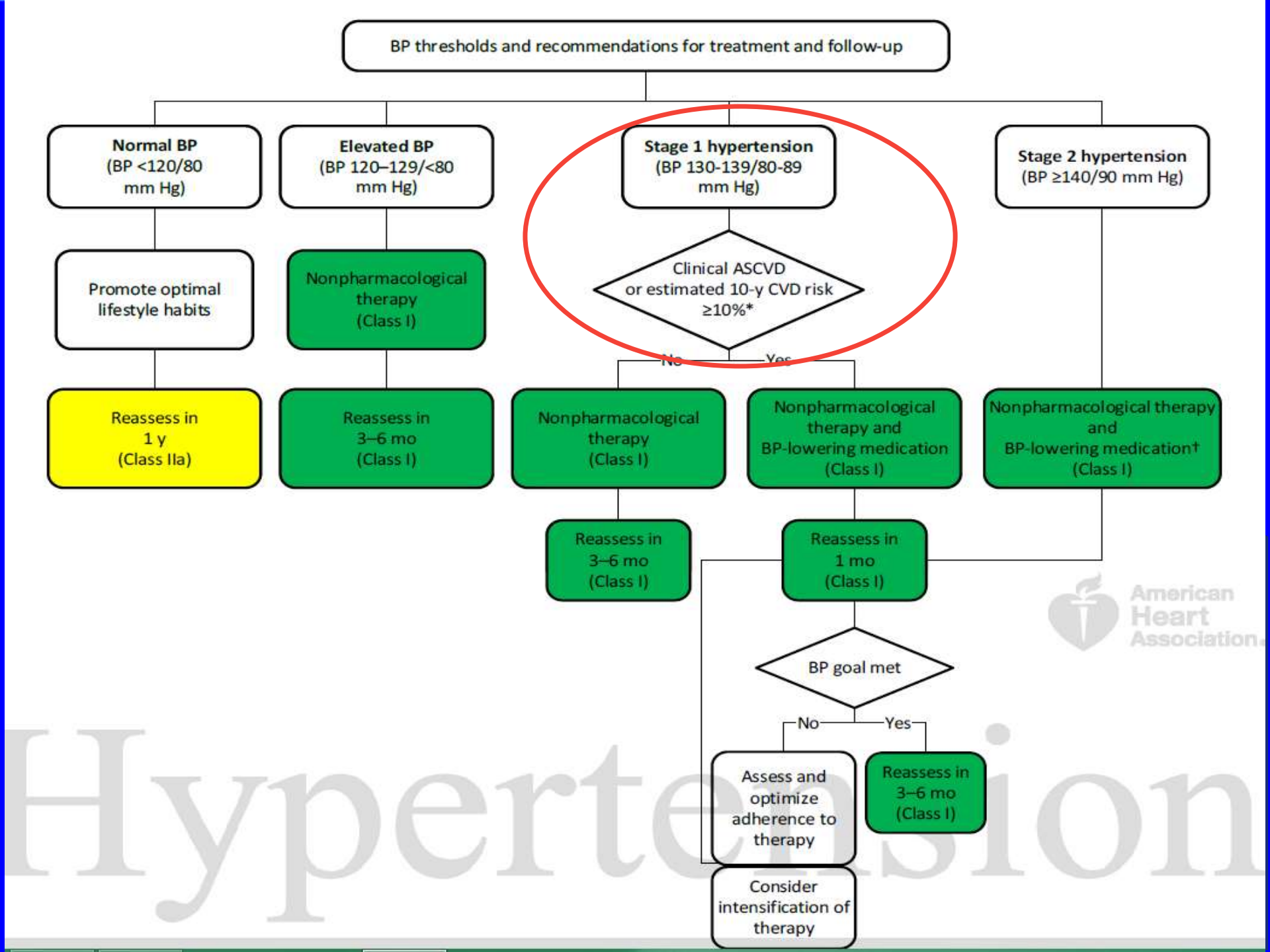
ESC European Society of Cardiology

OXFORD UNIVERSITY PRESS

You Joung Koi et al. Eur Heart J 2019; 40: 707–710

ESC/ESH 2018 GUIDELINES ON MANAGEMENT OF ARTERIAL HYPERTENSION




BP thresholds and recommendations for treatment and follow-up
Normal BP (BP <120/80 mm Hg)
Elevated BP (BP 120–129/<80 mm Hg)
Stage 1 hypertension (BP 130-139/80-89 mm Hg)
Stage 2 hypertension (BP ≥140/90 mm Hg)
Promote optimal lifestyle habits
Nonpharmacological therapy (Class I)
Clinical ASCVD or estimated 10-y CVD risk ≥10%*
No
Yes
Reassess in 1 y (Class IIa)
Reassess in 3–6 mo (Class I)
Nonpharmacological therapy (Class I)
Nonpharmacological therapy and BP-lowering medication (Class I)
Nonpharmacological therapy and BP-lowering medication† (Class I)
Reassess in 3–6 mo (Class I)
Reassess in 1 mo (Class I)
BP goal met
No
Yes
Assess and optimize adherence to therapy
Reassess in 3–6 mo (Class I)
Consider intensification of therapy
American Heart Association
Hypertension

2017 ACC/AHA GUIDELINES ON ARTERIAL HYPERTENSION

8.1.5. BP Goal for Patients With Hypertension

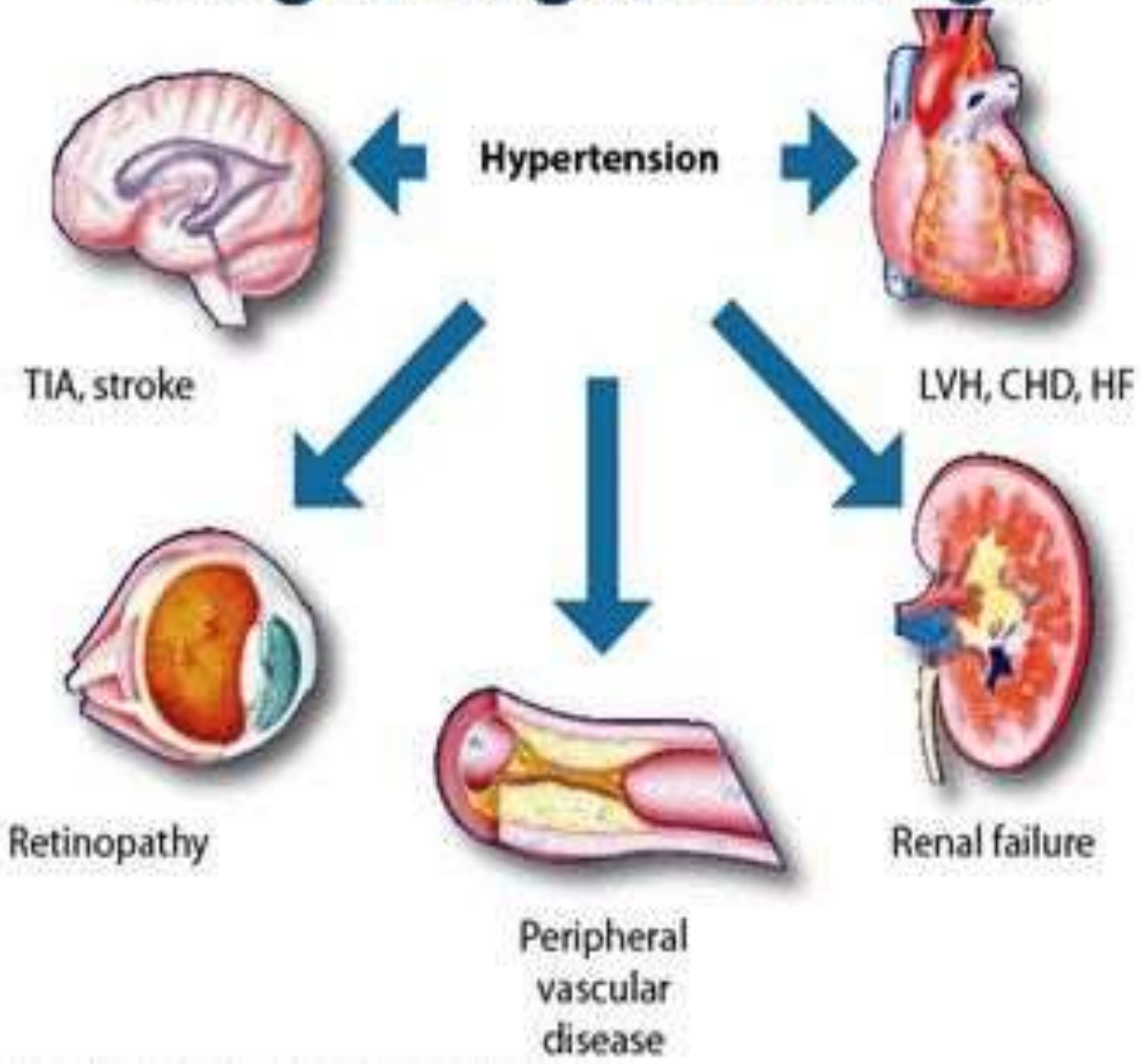
Recommendations for BP Goal for Patients With Hypertension

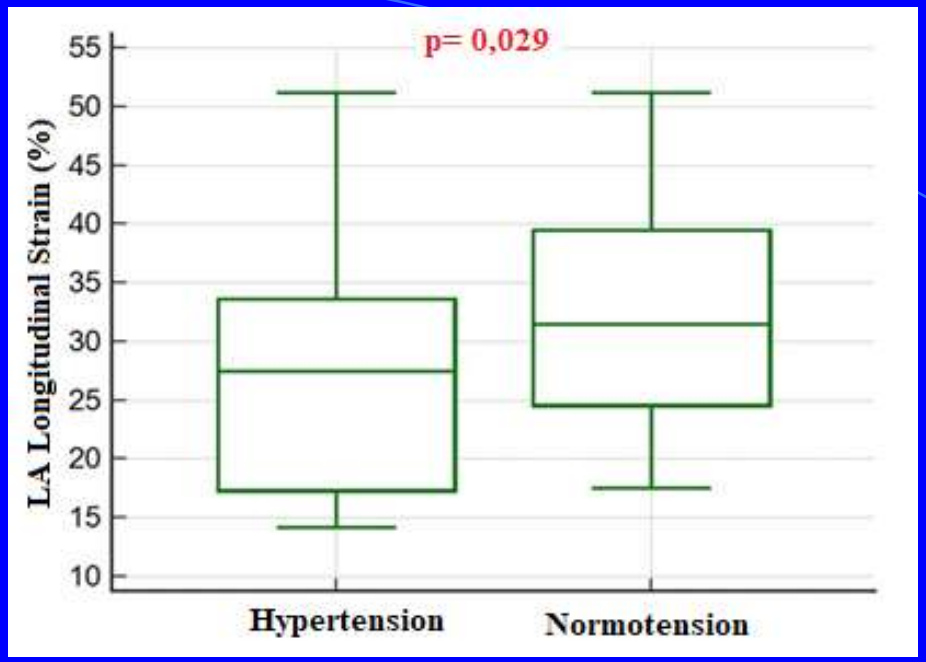
References that support recommendations are summarized in Online Data Supplement 26 and Systematic Review Report.

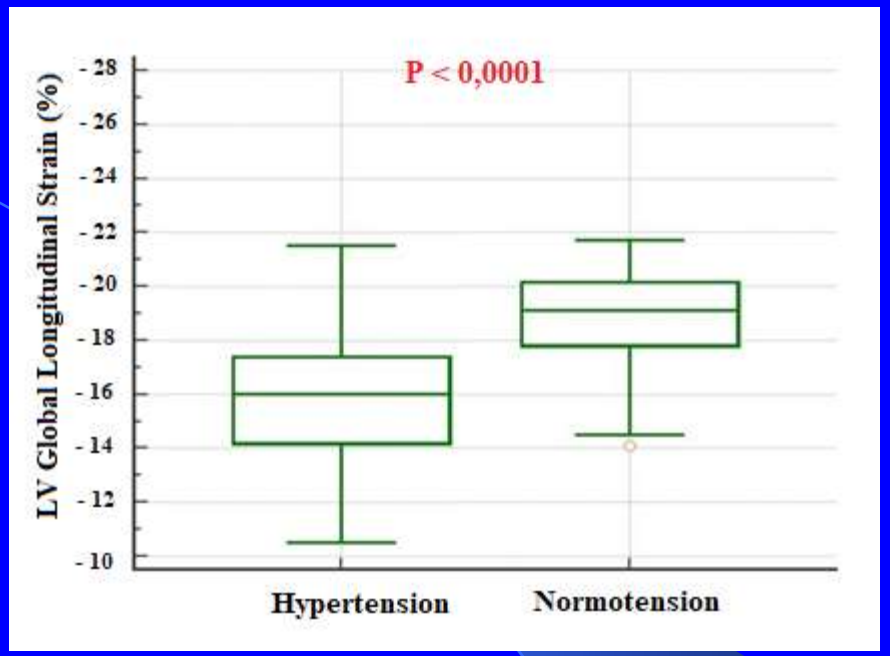
COR	LOE	Recommendations
I	SBP: B-R[SR] DBP: C-EO	1. For adults with confirmed hypertension and known CVD or 10-year ASCVD event risk of 10% or higher (see Section 8.1.2), a BP target of less than 130/80 mm Hg is recommended (1-5).
IIb	SBP: B-NR DBP: C-EO	2. For adults with confirmed hypertension, without additional markers of increased CVD risk, a BP target of less than 130/80 mm Hg may be reasonable (6-9).

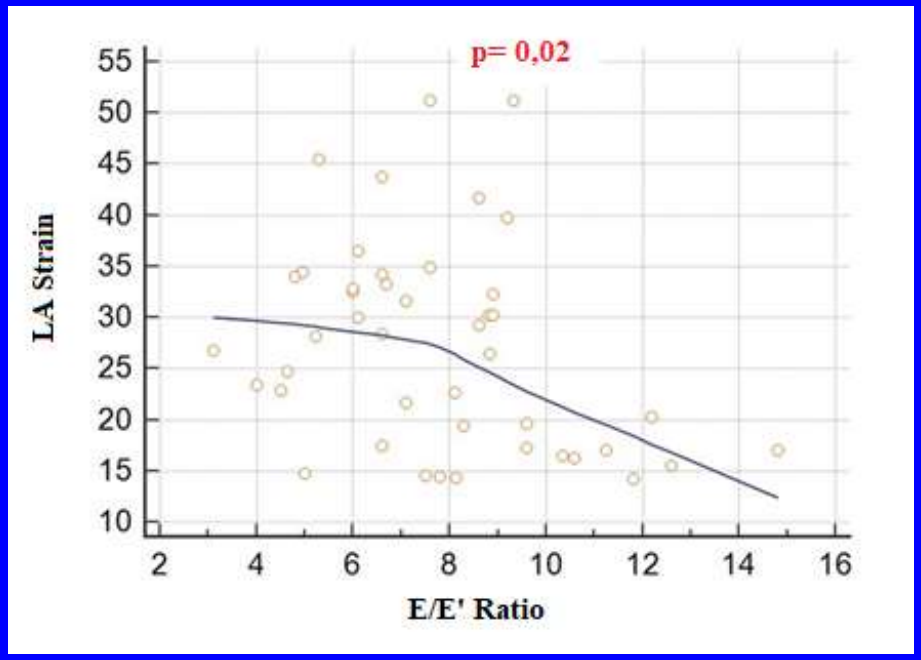
SR indicates systematic review.

Complications of Hypertension: Target-Organ Damage




p= 0,029
LA Longitudinal Strain (%)
55
50
45
40
35
30
25
20
15
10
Hypertension
Normotension

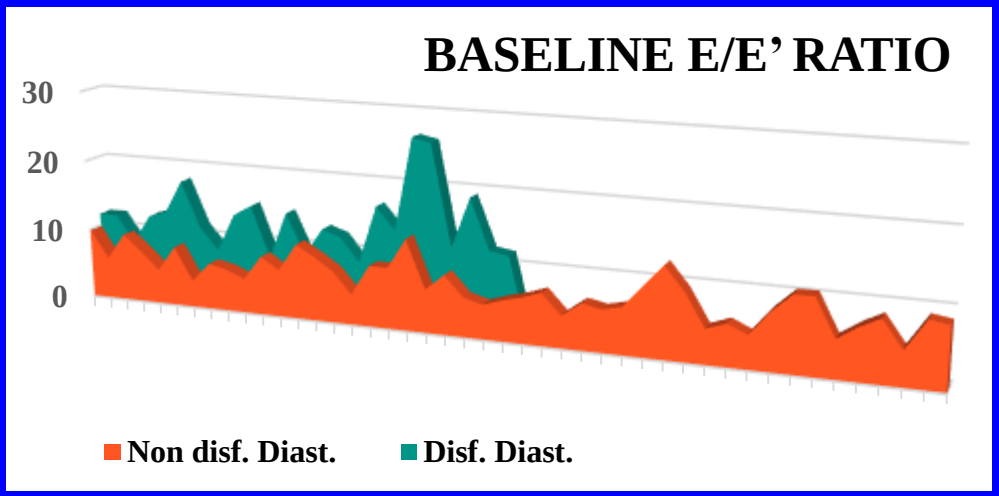

P < 0,0001
LV Global Longitudinal Strain (%)
- 28
- 26
- 24
- 22
- 20
- 18
- 16
- 14
- 12
- 10
Hypertension
Normotension

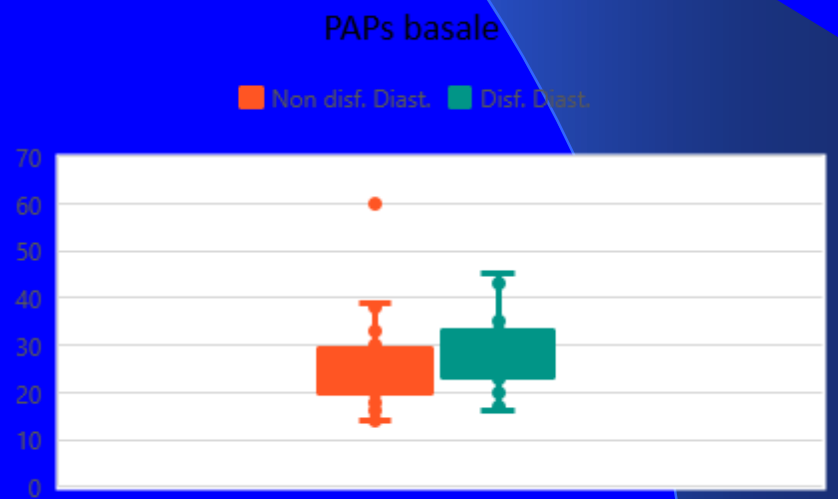

p= 0,02
LA Strain
55
50
45
40
35
30
25
20
15
10
2
4
6
8
10
12
14
16
E/E' Ratio

RESULTS

Groups, with or without LV dysfunction

	DIASTOLIC DYSFUNCTION	NO DIASTOLIC DYSFUNCTION	P
E/E'	11,86[11,18;14,57]	7,33[5,85;8,9]	<0,0001
E/A	0,87[0,76;1,25]	0,81[0,75;1,01]	0,20
HR	69,7±14	70,5±11	0,16
SBP	128,7±14,4	127,9±15,8	0,8
DBP	80,8±7,4	70,5±11,1	0,043
E'	0,06[0,04;0,07]	0,08[0,07;0,1]	<0,0001
PAPs	29,5[23,5;33]	24[20;29]	0,01
VmaxIT	2,4±0,4	2,1±0,3	0,4
TAPSE	23,2±3,7	24,1±3,6	0,9
WALL THICKENING	21 (30,4%)	16(23,1%)	<0,0001





Mean values registered in the two Groups, with or without LV dysfunction, at peak of exercise

	DIASTOLIC DYSFUNCTION	NO DIASTOLIC DYSFUNTION	P
E/E’	16,1[15;20,5]	11,2[8,4;12,8]	<0,0001
E/A	0,93[0,79;1,19]	0,85[0,75;1,06]	0,3
HR	122±19	123±14	0,08
SBP	204,3±17,3	183,1±18,1	<0,0001
DBP	90,2±9,8	83,3±11,5	0,01
E’	0,07[0,05;0,08]	0,09[0,08;0,12]	<0,0001
PAPs	46,12±8,84	36,13±10,09	0,0001
VMAXIT	3,24±0,38	2,73±0,49	<0,0001
TAPSE	26,2±4,6	26,3±4,4	0,9