

ΕΛΛΗΝΙΚΗ
ΚΑΡΔΙΟΛΟΓΙΚΗ
ΕΤΑΙΡΕΙΑ

ΠΑΝΕΛΛΗΝΙΑ ΣΕΜΙΝΑΡΙΑ ΟΜΑΔΩΝ ΕΡΓΑΣΙΑΣ

20-22 ΦΕΒΡΟΥΑΡΙΟΥ 2020
THE MET HOTEL | **ΘΕΣΣΑΛΟΝΙΚΗ**

WWW.HCS.GR



Ο ΡΟΛΟΣ ΤΗΣ ΑΠΕΙΚΟΝΙΣΗΣ ΣΤΟ SCREENING ΑΣΥΜΠΤΩΜΑΤΙΚΩΝ ΑΣΘΕΝΩΝ ΓΙΑ ΣΤΕΦΑΝΙΑΙΑ ΝΟΣΟ

ΛΑΚΚΑΣ ΛΑΜΠΡΟΣ, MD, PhD
ΕΠΙΚΟΥΡΙΚΟΣ ΕΠΙΜΕΛΗΤΗΣ Β'
Β' ΚΑΡΔΙΟΛΟΓΙΚΗ ΚΛΙΝΙΚΗ ΠΓΝΙ



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- **ΔΕΝ ΕΧΩ ΚΑΜΙΑ ΣΥΓΚΡΟΥΣΗ ΣΥΜΦΕΡΟΝΤΩΝ ΠΑΡΑ ΜΟΝΟ ΜΕ ΤΟΝ ΕΑΥΤΟ ΜΟΥ**



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ΕΙΣΑΓΩΓΗ - ΕΡΩΤΗΜΑΤΑ



- **ΥΠΑΡΧΟΥΝ ΠΡΑΓΜΑΤΙΚΑ ΑΣΥΜΠΤΩΜΑΤΙΚΟΙ ΑΣΘΕΝΕΙΣ;**
- **ΑΝ ΥΠΑΡΧΟΥΝ ΓΙΑΤΙ ΠΡΕΠΕΙ ΝΑ ΚΑΝΟΥΜΕ SCREENING ΓΙΑ ΣΤΕΦΑΝΙΑΙΑ ΝΟΣΟ;**



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ΕΙΣΑΓΩΓΗ

- **ΑΣΘΕΝΕΙΣ ΜΕ ΣΤΑΘΕΡΗ ΣΤΕΦΑΝΙΑΙΑ ΝΟΣΟ;**
- **ΑΣΥΜΠΤΩΜΑΤΙΚΟΙ ΑΣΘΕΝΕΙΣ ΜΕ ΠΑΡΑΓΟΝΤΕΣ ΚΙΝΔΥΝΟΥ
ΓΙΑ ΚΑΡΔΙΑΓΓΕΙΑΚΑ ΝΟΣΗΜΑΤΑ**
- **ΠΡΑΓΜΑΤΙΚΑ ΑΣΥΜΠΤΩΜΑΤΙΚΟΙ ΑΣΘΕΝΕΙΣ**



SCREENING ΑΣΘΕΝΩΝ

TABLE 1 Criteria for an Effective Screening Test

Criterion	Fulfilled by Coronary Imaging
The condition should be an important health problem	+
There should be a specific treatment for the condition (that would be applied on the basis of the test results)	±
Facilities for diagnosis and treatment should be widely available	±
There should be a latent stage of the disease	±
There should be a test or examination for the condition	+
The test should be acceptable to the population	+
The natural history of the disease should be adequately understood	+
There should be an agreed policy on whom to treat	±
The total cost of finding a case should be economically balanced in relation to medical expenditure as a whole	±
Case finding should be a continuous process, not just a "once and for all" project	±

ΜΕΛΕΤΗ COURAGE ΚΑΙ BARI-2D

JACC: CARDIOVASCULAR IMAGING, VOL. 10, NO. 3, 2017

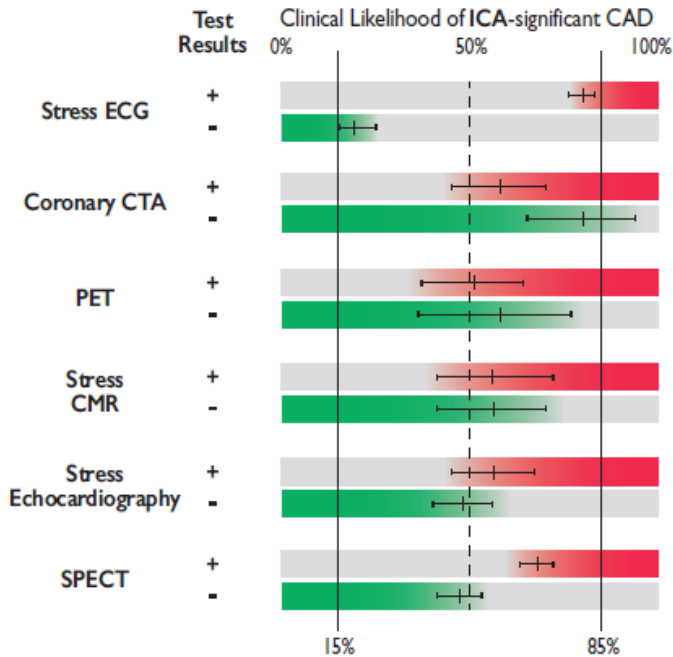


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ΑΣΘΕΝΕΙΣ ΜΕ ΣΤΑΘΕΡΗ ΣΤΕΦΑΝΙΑΙΑ ΝΟΣΟ



ΔΕΝ ΑΝΑΦΕΡΟΝΤΑΙ:

1. ΗΚΓ

2. ΤΤΕ

It is recommended that selection of the initial non-invasive diagnostic test is done based on the clinical likelihood of CAD and other patient characteristics that influence test performance,^d local expertise, and the availability of tests.

I

C

Functional imaging for myocardial ischaemia is recommended if coronary CTA has shown CAD of uncertain functional significance or is not diagnostic.^{4,55,73}

I

B

European Heart Journal (2020) **41**, 407–477



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ΠΑΡΑΓΟΝΤΕΣ ΚΙΝΔΥΝΟΥ ΓΙΑ ΚΑΡΔΙΑΓΓΕΙΑΚΑ ΝΟΣΗΜΑΤΑ

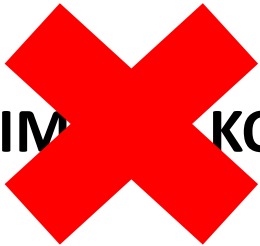


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ΜΗ ΕΠΕΜΒΑΤΙΚΟΣ ΕΛΕΓΧΟΣ ΓΙΑ ΣΤΕΦΑΝΙΑΙΑ ΝΟΣΟ

• ΔΟΚΙΜΗ  ΚΟΠΩΣΗΣ

• DSE

• SPECT

• CTA

• STRESS CMR

• PET

ΔΕΝ ΠΡΑΓΜΑΤΟΠΟΙΟΥΝΤΑΙ ΣΤΟ ΚΕΝΤΡΟ ΜΑΣ



ΑΠΕΙΚΟΝΙΣΤΙΚΟΣ ΕΛΕΓΧΟΣ ΓΙΑ ΣΤΕΦΑΝΙΑΙΑ ΝΟΣΟ

- **ΑΡΧΙΚΑ ΞΕΚΙΝΑΜΕ ΜΕ ΕCHO (ΤΤΕ)**
 - **ΔΙΑΤΑΡΑΧΕΣ ΚΙΝΗΤΙΚΟΤΗΤΑΣ => ΣΤΕΦΑΝΙΟΓΡΑΦΙΑ**
 - **ΒΑΛΒΙΔΟΠΑΘΕΙΕΣ**
 - **ΔΙΑΣΤΟΛΙΚΗ ΔΥΣΛΕΙΤΟΥΡΓΙΑ**

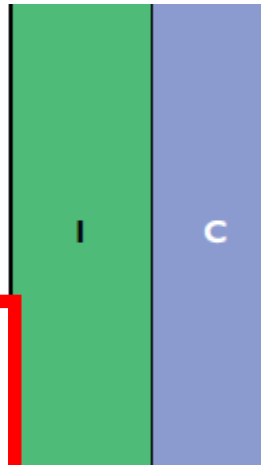


ΒΑΛΒΙΔΟΠΑΘΕΙΕΣ

Coronary angiography is indicated for the assessment of CAD when surgery or an intervention is planned, to determine if concomitant coronary revascularization is indicated (see following table of recommendations).¹⁶ Alternatively, coronary computed tomography (CT) can be used to rule out CAD in patients at low risk for the condition.

Coronary angiography^c is recommended before valve surgery in patients with severe VHD and any of the following:

- history of cardiovascular disease
- suspected myocardial ischaemia^d
- LV systolic dysfunction
- in men >40 years of age and postmenopausal women
- one or more cardiovascular risk factors.



The use of stress tests to detect CAD associated with severe valvular disease is discouraged because of their low diagnostic value and potential risks. A summary of the management of associated CAD is _____

European Heart Journal (2017) 00, 1–53



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ΒΑΛΒΙΔΟΠΑΘΕΙΕΣ

The clinical use of stress echocardiography in non-ischaemic heart disease: recommendations from the European Association of Cardiovascular Imaging and the American Society of Echocardiography

Patrizio Lancellotti^{1,2*}, Patricia A. Pellikka³, Werner Budts⁴, Farooq A. Chaudhry⁵, Erwan Donal⁶, Raluca Dulgheru¹, Thor Edvardsen⁷, Madalina Garbi⁸, Jong-Won Ha⁹, Garvan C. Kane³, Joe Kreeger¹⁰, Luc Mertens¹¹, Philippe Pibarot¹², Eugenio Picano¹³, Thomas Ryan¹⁴, Jeane M. Tsutsui¹⁵, and Albert Varga¹⁶

European Heart Journal – Cardiovascular Imaging (2016) 17, 1191–1229



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ΔΙΑΣΤΟΛΙΚΗ ΔΥΣΛΕΙΤΟΥΡΓΙΑ

	CAC 0 N = 111	CAC 1-99 N = 50	CAC 100-399 N = 16	CAC ≥ 400 N = 14	P-value
Age and diastolic function					<.0001
Age <65 and normal diastolic function	81 (73%)	27 (54%)	8 (50%)	2 (14%)	
Age ≥65 or diastolic dysfunction	17 (15%)	19 (38%)	6 (37%)	2 (14%)	
Age ≥65 and diastolic dysfunction	13 (12%)	4 (8%)	2 (13%)	10 (71%)	

Echocardiography. 2020;00:1-7.

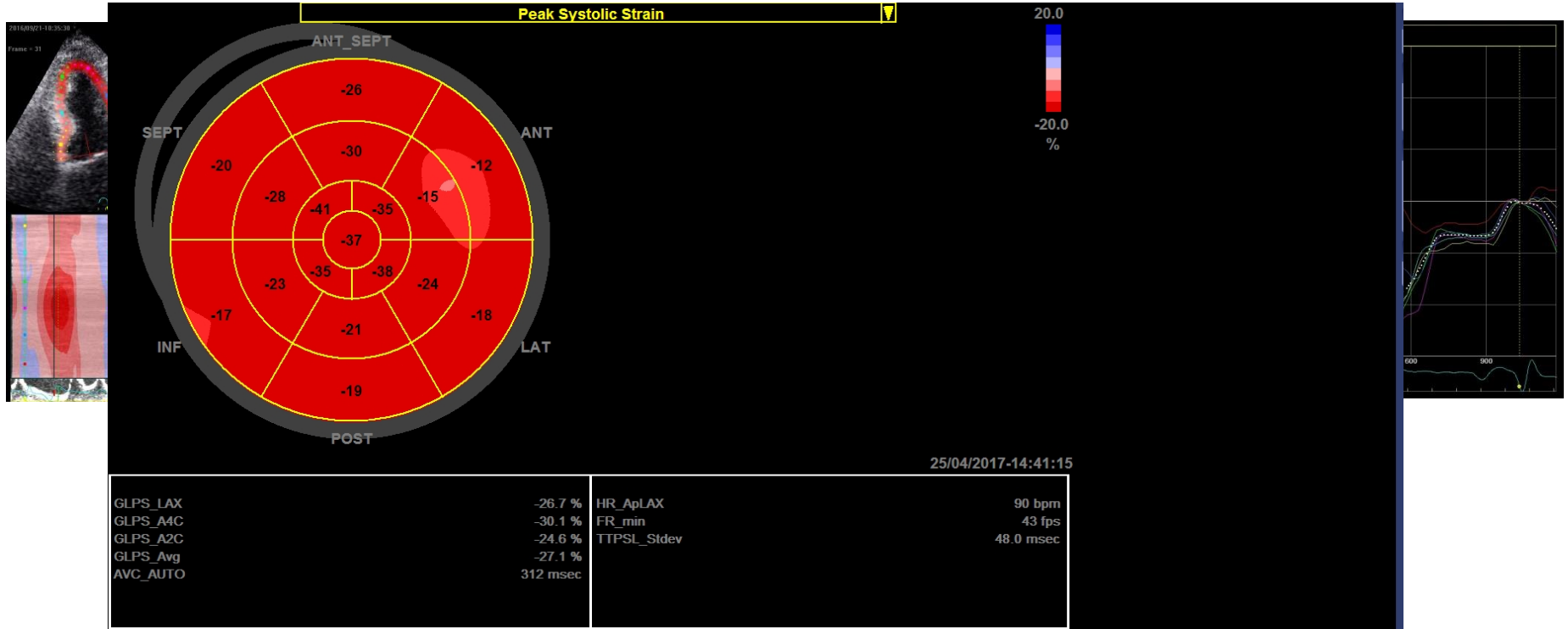


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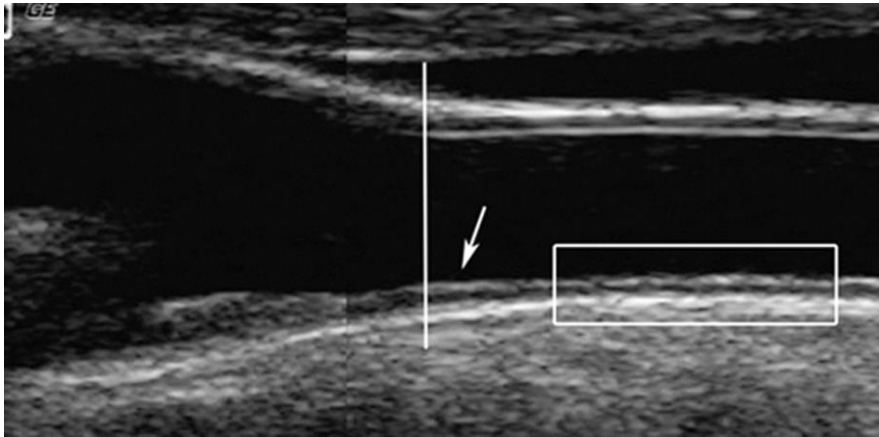


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IMT



Stroke. 2011;42:3017-3021

Table II. Waist Circumference and High Carotid IMT

Variable	Men			Women		
	OR	95% CI	P-value	OR	95% CI	P-value
Waist circumference						
< 79 cm		(reference)			(reference)	
≥ 79 cm	2.6	1.7-4.1	< 0.001	1.8	1.2-2.7	0.002

IMT indicates intima-media thickness; OR, odds ratio; and CI, confidence interval.

doi: 10.1536/ihj.19-470

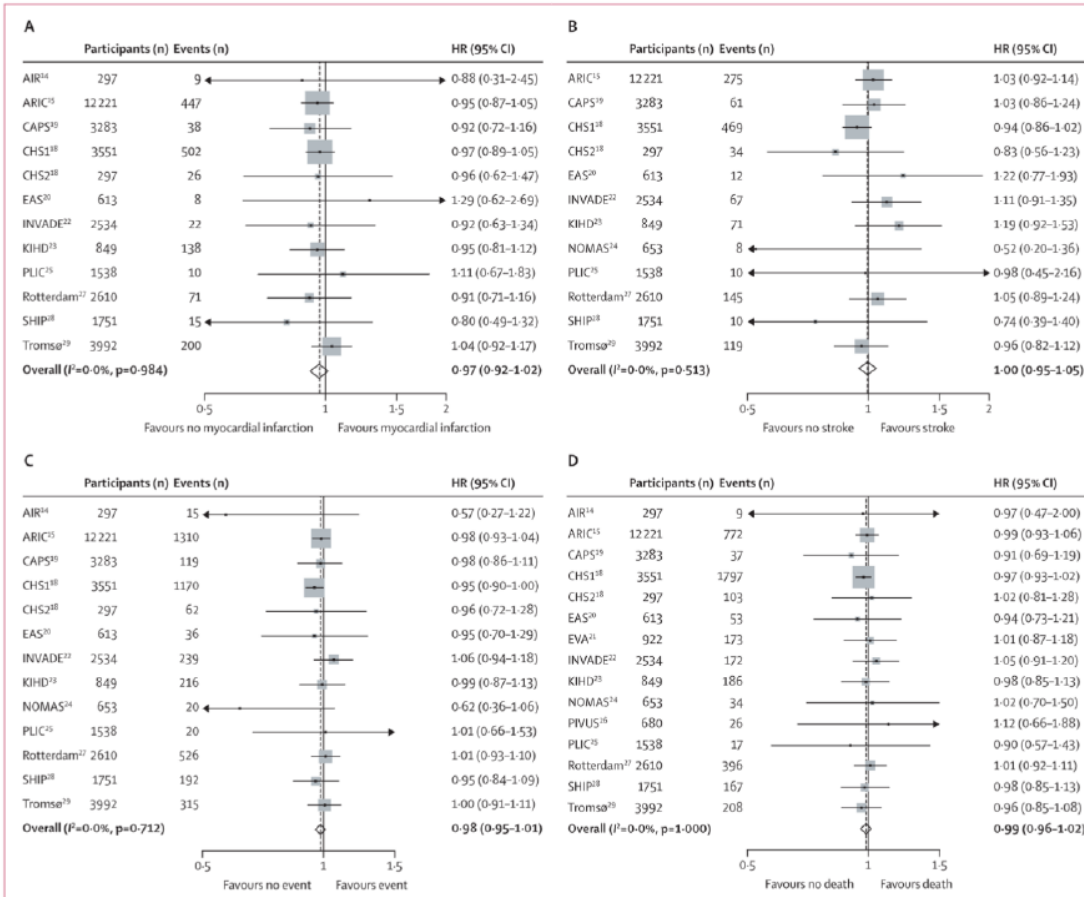


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IMT



Lancet. 2012 June 2; 379(9831): 2053–2062



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DSE - GUIDELINES

Guidelines for Performance, Interpretation, and Application of Stress Echocardiography in Ischemic Heart Disease: From the American Society of Echocardiography

Patricia A. Pellikka, MD, FASE, Chair, Adelaide Arruda-Olson, MD, PhD, FASE,
Farooq A. Chaudhry, MD, FASE,* Ming Hui Chen, MD, MMSc, FASE, Jane E. Marshall, RDCS, FASE,
Thomas R. Porter, MD, FASE, and Stephen G. Sawada, MD, *Rochester, Minnesota; New York, New York; Boston,
Massachusetts; Omaha, Nebraska; Indianapolis, Indiana*

In asymptomatic adults with diabetes, peripheral vascular disease, or a strong family history of CAD, or when previous risk assessment testing suggests high risk of CAD, such as a coronary artery calcium score of ≥ 400 , a stress imaging test, such as stress echocardiography, may be considered for advanced cardiovascular risk assessment.²⁰⁸

IIb

B

J Am Soc Echocardiogr. 2020 Jan;33(1):1-41.e8



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DSE - ΛΕΙΤΟΥΡΓΙΚΑ ΖΗΤΗΜΑΤΑ - ΜΕΘΟΔΟΛΟΓΙΑ

Accelerated Dobutamine Stress Testing: Safety and Feasibility in Patients with Known or Suspected Coronary Artery Disease

DAVID LU, M.D., MICHAEL D. GREENBERG, M.D.,* RAYMOND LITTLE, M.D., QUDSIA MALIK, M.D., DANIEL J. FERNICOLA, M.D., NEIL J. WEISSMAN, M.D.†

Clin. Cardiol. 24, 141–145 (2001)

- Pharmacokinetics (IV)
 - ✓ Onset of action – 1 min
 - ✓ Duration of action < 10 min

The Value of β -Blockers Administration during Recovery Phase of Dobutamine Stress Echocardiography: A Review

James Nguyen, M.D.,** Elizabeth Juneman, M.D.,**† and Mohammad Reza Movahed, M.D., Ph.D.**‡

- Α - ΔΙΕΓΕΡΣΗ
- ΥΠΕΡΣΥΣΠΑΣΤΙΚΟΤΗΤΑ ΣΤΟ ΡΕΑΚ
- Ι.Υ. ΧΟΡΗΓΗΣΗ
- ΚΥΡΙΩΣ ΓΙΑ ΝΟΣΟ ΕΝΟΣ ΑΓΓΕΙΟΥ

DOI: 10.1111/echo.12201



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DSE - STRAIN - PSS

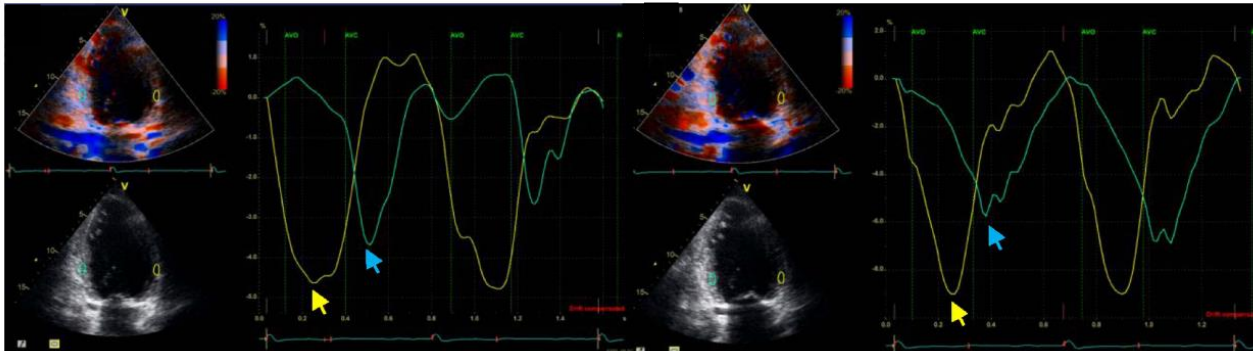
Table 1 Summary of longitudinal deformation characteristics at rest and during dobutamine stress for each ischaemic substrate

	Rest			Dobutamine stress					
	PSSR	SS	PSS	Low dose			Peak dose		
				PSSR	SS	PSS	PSSR	SS	PSS
Control	N	N	0*	/	/	0	//	/\	0
Acute ischaemia	↓	↓	↑	\	\	/	\	\	//
Stunning	↓	↓	↑	/	/	\	//	/\	0
Chronic ischaemia/hibernation	↓	↓	↑	/	/	/	\	\	//
Non-transmural infarction	↓↓	↓↓	↑	\	\	/	\	\	//
Transmural infarction	0	0	0	→	→	→	→	→	→

Adapted from Bijmens *et al.*⁷

*May be present in up to two-fifths of the normal population at rest but if present is of low magnitude.
 0 Absent; ↓ Reduced; ↑ Increased; / Increased vs rest; \ Decreased vs rest; /\ Initial increase followed by decrease; // Further increasing; \\ Further decreasing.

PSS, post-systolic shortening; PSSR, peak systolic strain rate, SS, systolic strain.



Heart 2015;**101**:72–81



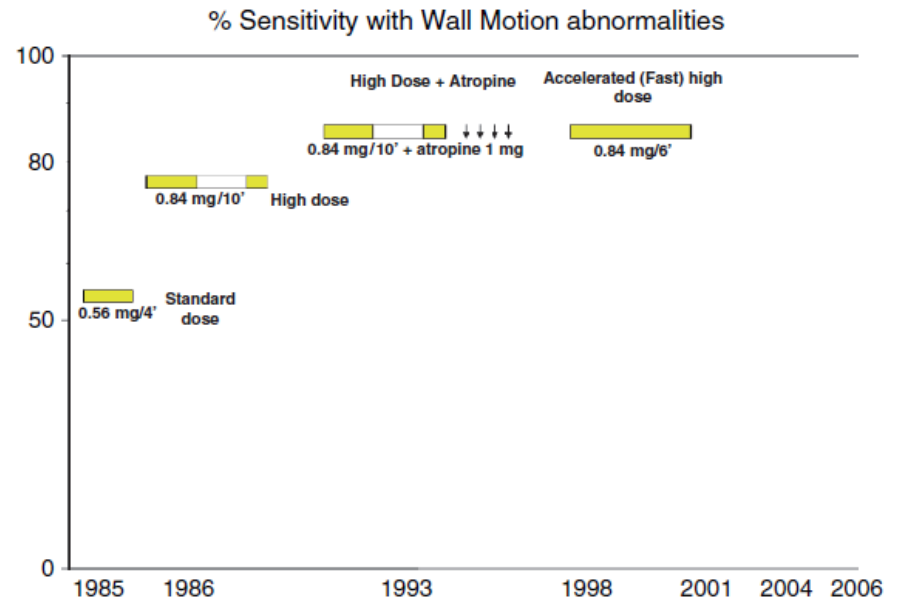
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DIPSE

	Dobutamine	Dipyridamole
% Submaximal tests	10%	5%
Side effects	1/300 exams	1/1,000
VT, VF	++	+
High-grade AV block	+	++
Death	1/5,000	1/10,000



Picano et al, 2009

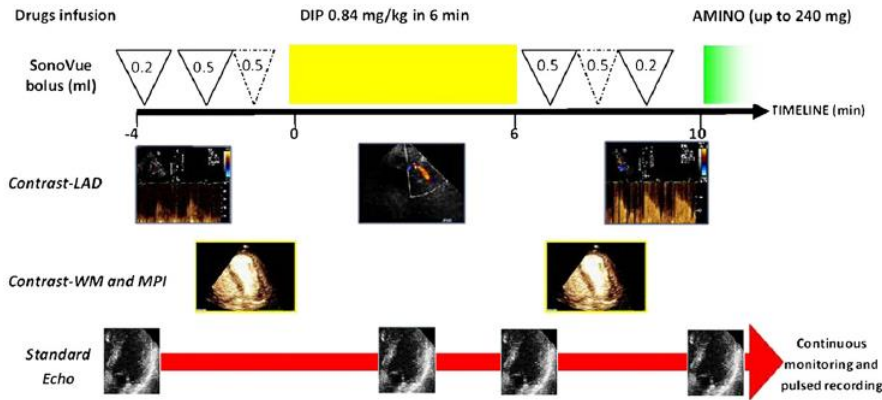


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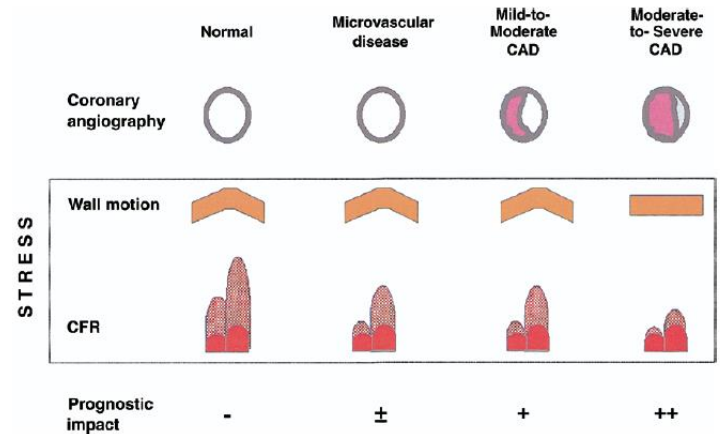
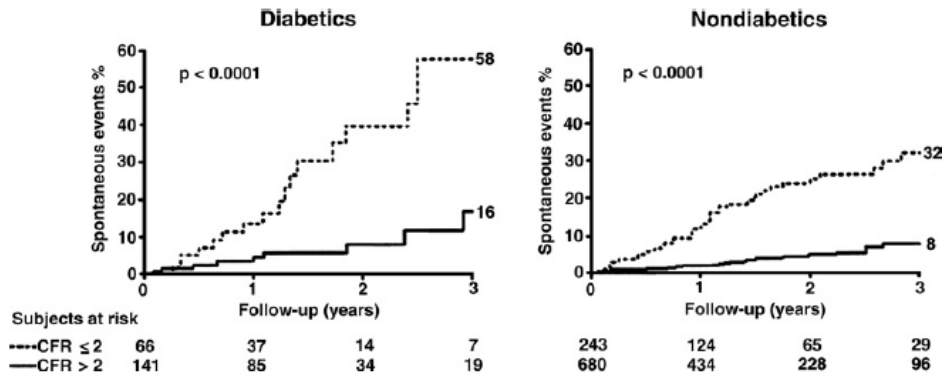
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DIPSE - CFR



J Am Soc Echocardiogr 2010;23:1242-50



doi:10.1016/j.jacc.2007.06.027

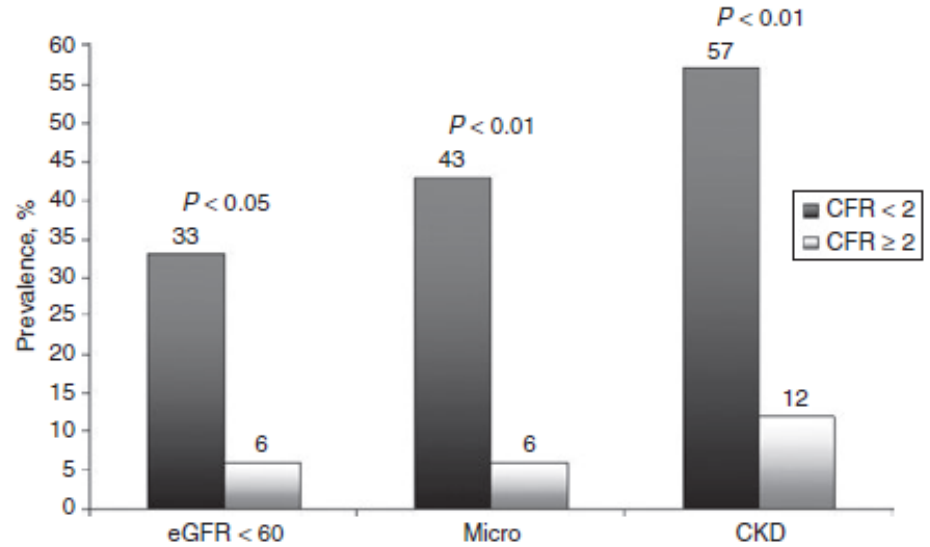
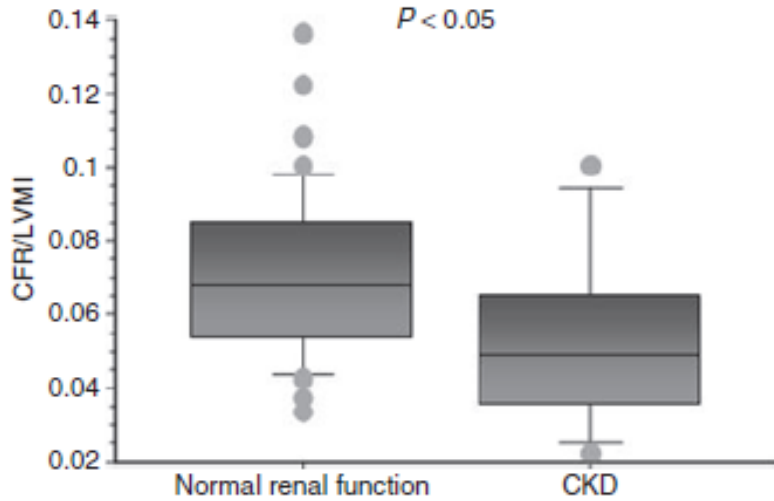


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DIPSE - CFR



Am J Hypertens 2009; 22:191-196

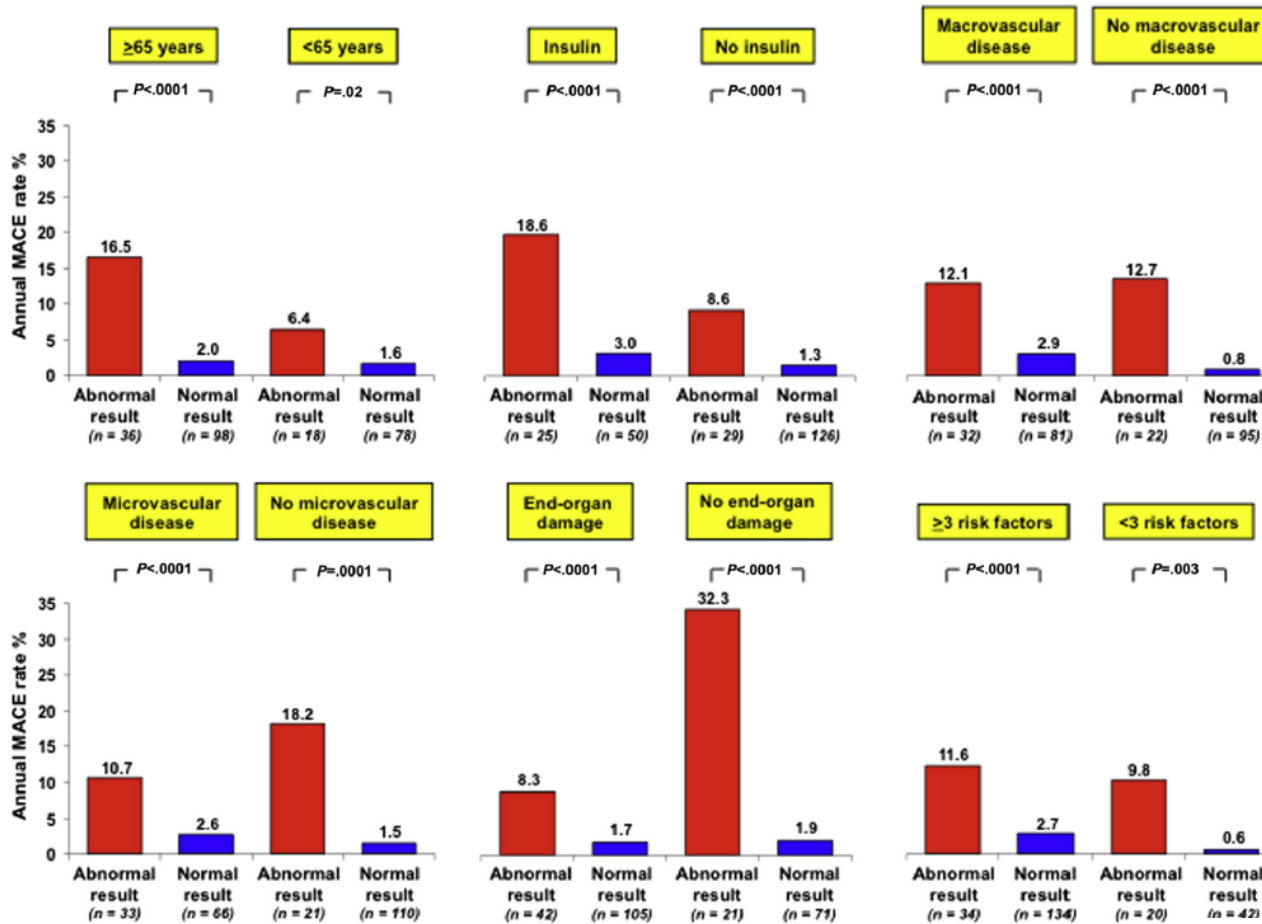


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DIPSE - CFR



<http://dx.doi.org/10.1016/j.echo.2016.10.003>

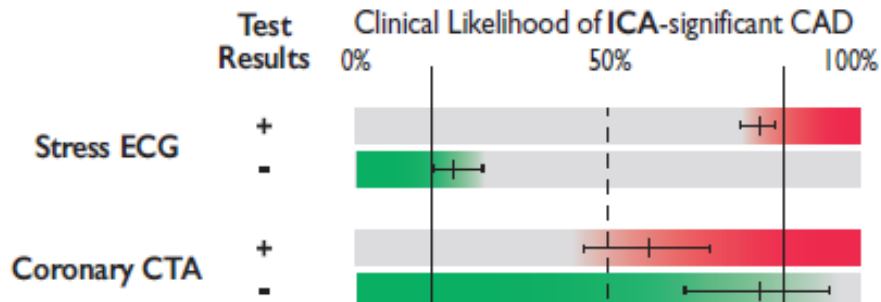


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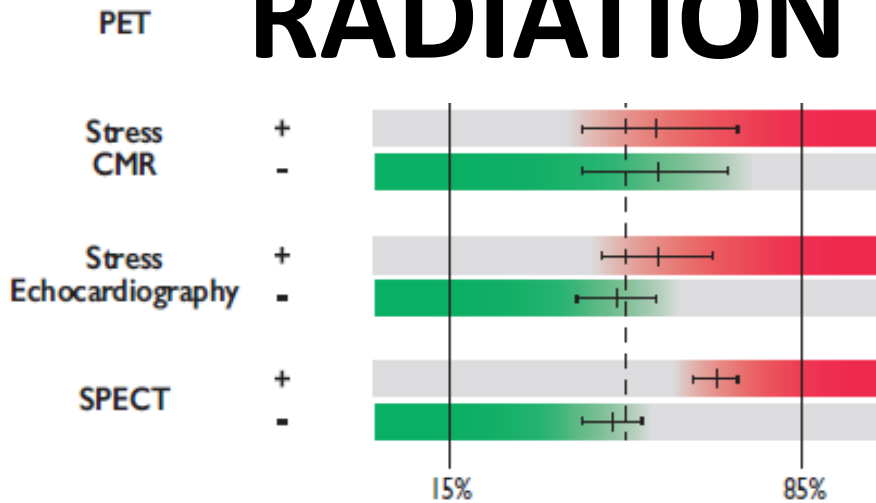
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SPECT



RADIATION SAFETY!!!



European Heart Journal (2020) 41, 407–477

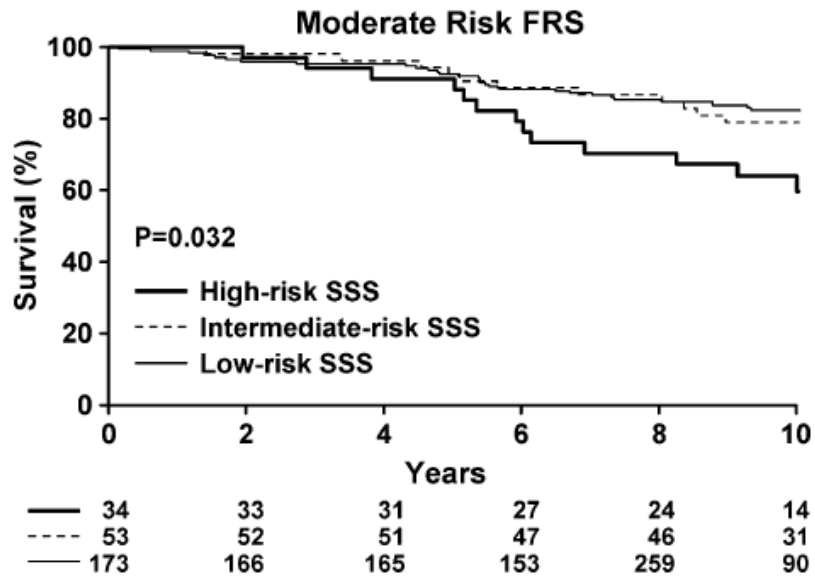


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SPECT



SPECT SSS risk category	n	Left main, 3-vessel, 1- or 2-vessel with proximal LAD	Other 1- or 2-vessel	0-Vessel
High	16	7	5	4
Intermediate	7	2	1	4
Low	4	1	2	1

J Nucl Cardiol 2009;16:516-23

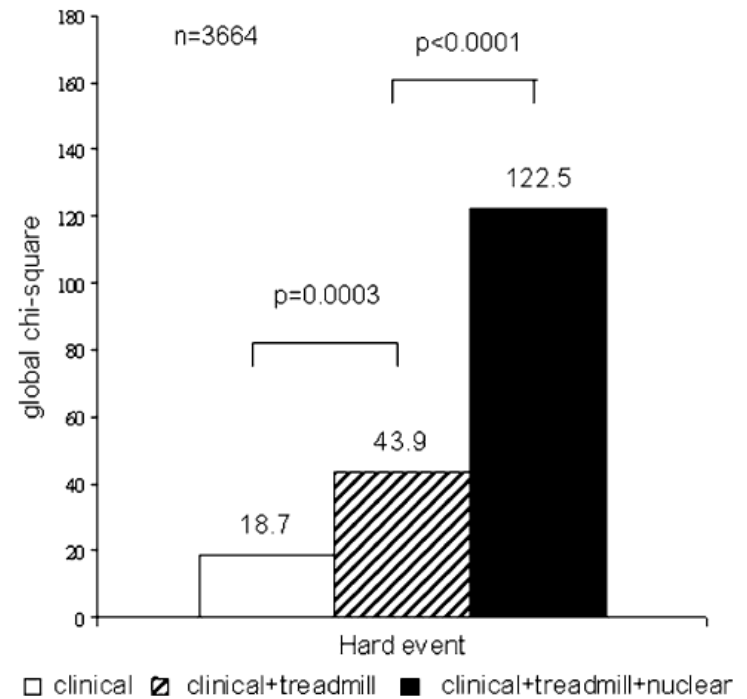
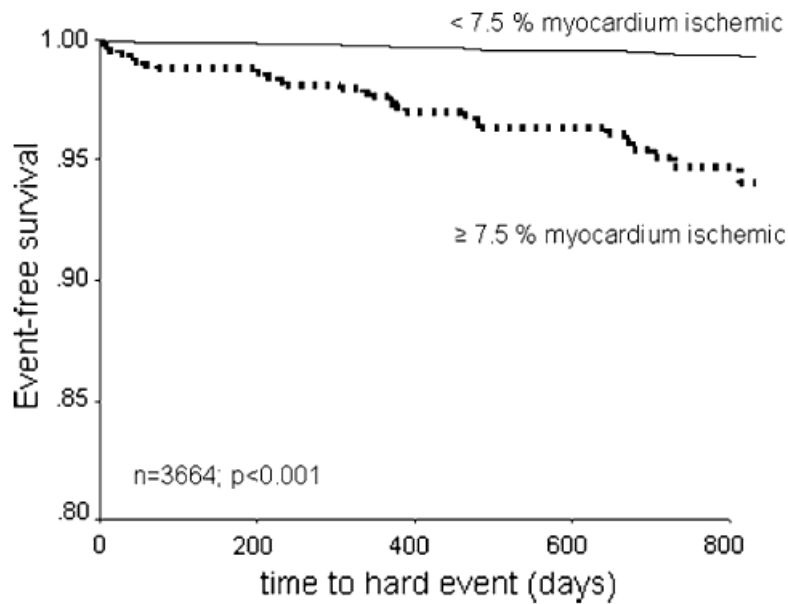


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SPECT



J Nucl Cardiol 2009;16:193-0.



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CALCIUM SCORE - CCTA

Image acquisition. All studies were performed using an Imatron C-100 ultrafast computed tomographic scanner. Coronary visualization was achieved without contrast by using the high resolution volume mode of the ultrafast computed tomographic scanner in conjunction with a 100 ms scan time, a 3 mm slice thickness, ECG triggering and breath holding (Fig. 1). The image slices were obtained with the patient supine. ECG monitoring electrodes were applied and a scout localization image was obtained to determine the level of the carina as a guide to the location of the main pulmonary artery. The scanner configuration was then switched to the 3 mm, single slice mode. Twenty contiguous slices (60 mm) were acquired with the most cephalad at the lower margin of the bifurcation of the main pulmonary artery. There were no interslice gaps (Fig. 2). Each image slice was triggered at 80% of the patient's RR interval, so

- AGATSTON SCORE
- VOLUME SCORE
- MASS SCORE

J Am Coll Cardiol 1990;15:827-32



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CALCIUM SCORE - CCTA

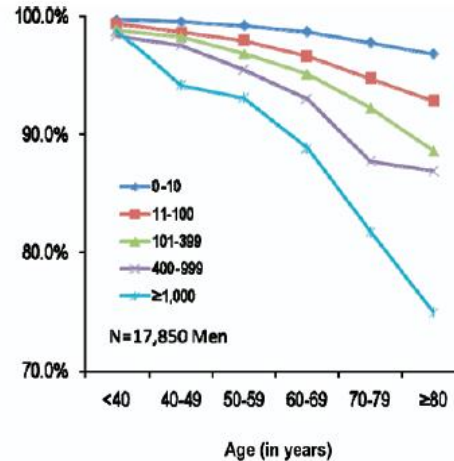
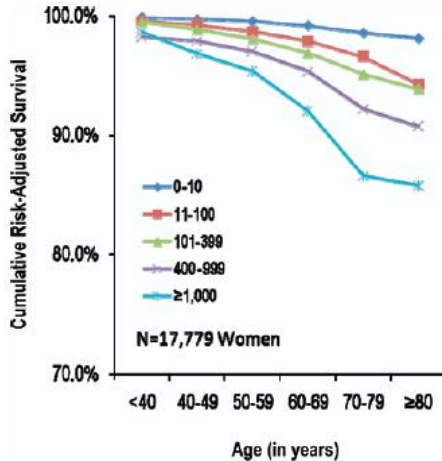


Table 2

Risk-Adjusted Hazard Ratios (95% Confidence Intervals) for Death According to CAC Scores Within Separate Models by Age Decile

	CAC 11 to 100	CAC 101 to 400	CAC >400
Age <40 yrs	0.71 (0.09–5.47) p = 0.75	11.20 (3.16–36.66) p < 0.0001	13.11 (2.68–64.22) p = 0.002
Age 40–49 yrs	2.81 (1.40–5.67) p = 0.004	5.91 (2.74–12.72) p < 0.0001	14.73 (6.75–32.17) p < 0.0001
Age 50–59 yrs	2.60 (1.68–4.02) p < 0.0001	2.67 (1.64–4.35) p < 0.0001	7.81 (5.02–12.15) p < 0.0001
Age 60–69 yrs	2.58 (1.65–4.04) p < 0.0001	3.95 (2.57–6.07) p < 0.0001	7.86 (5.21–11.87) p < 0.0001
Age 70–79 yrs	2.94 (1.64–5.27) p < 0.0001	3.92 (2.26–6.80) p < 0.0001	6.19 (3.64–10.51) p < 0.0001
Age ≥80 yrs	6.26 (1.39–28.30) p = 0.017	5.32 (1.20–23.49) p = 0.028	11.71 (2.83–48.46) p = 0.001

Hazard ratios compared with coronary artery calcium (CAC) scores from 0 to 10.

J Am Coll Cardiol 2008;52:17–23



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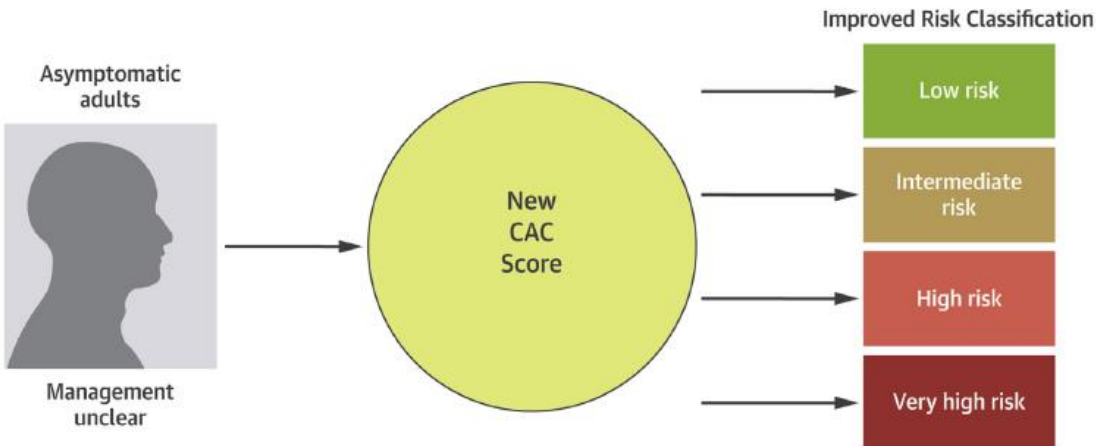
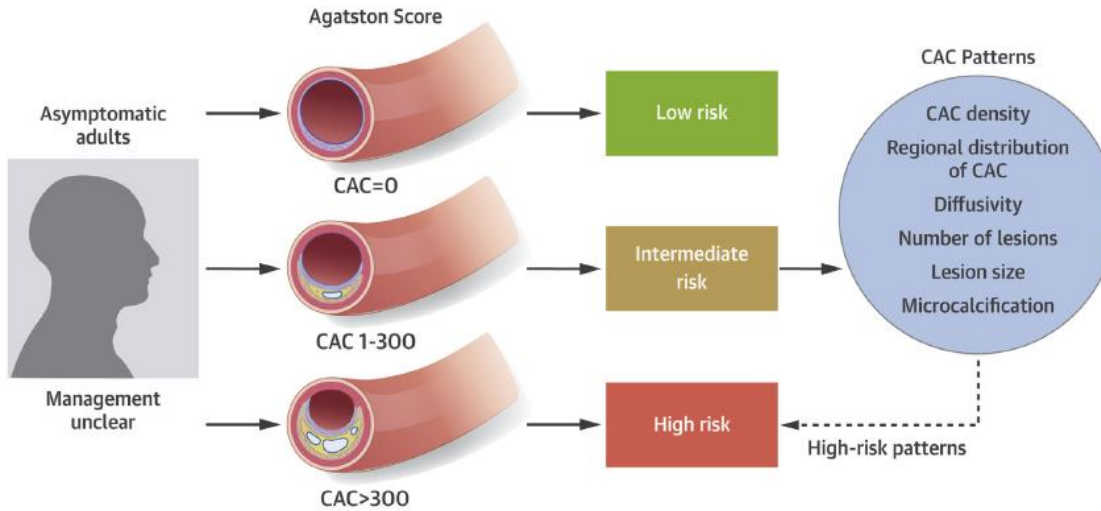


ΒΕΛΤΙΩΜΕΝΟ CALCIUM SCORE

- **ΧΑΡΑΚΤΗΡΙΣΤΙΚΑ ΕΝΟΣ ΒΕΛΤΙΩΜΕΝΟΥ CAC SCORE**
 - **ΣΥΝΟΛΙΚΗ ΠΟΣΟΤΗΤΑ ΑΘΗΡΩΜΑΤΟΣ**
 - **ΠΛΑΚΑ ΑΥΞΗΜΕΝΟΥ ΚΙΝΔΥΝΟΥ ΓΙΑ ΡΗΞΗ**
 - **ΠΥΚΝΟΤΗΤΑ ΑΣΒΕΣΤΙΟΥ**
 - **ΚΑΤΑΝΟΜΗ ΑΣΒΕΣΤΙΟΥ**



ΒΕΛΤΙΩΜΕΝΟ CALCIUM SCORE



J Am Coll Cardiol Img. 2017;10(8):923-37.



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CALCIUM SCORE - CCTA - LOW DOSE

Table 3 Comparison of coronary calcium categories: standard vs. low dose

	Calcium score	Total Agatston score (low dose)					Total
		0	1–10	11–100	101–400	400+	
Total Agatston score (standard dose)	0	24	0	0	0	0	24
	1–10	2	5	0	0	0	7
	11–100	0	3	31	1	0	35
	101–400	0	0	2	17	0	19
	400+	0	0	0	0	17	17
	Total	26	8	33	18	17	102
		95% CI					
Simple kappa		0.90	(0.83–0.97)				
Weighted kappa		0.95	(0.91–0.98)				

Table 4 Comparison of standard- and low-dose Agatston scores within CAC risk groups

	N	Standard (HU) Mean ± SD	Low (HU) Mean ± SD	Standard–low (HU) Mean ± SD	
Total Agatston score (standard dose)	0	24	0.0 ± 0.0	0.0 ± 0.0	0.0 ± 0.0
	1–10	7	3.6 ± 2.4	3.4 ± 3.5	–0.1 ± 2.7
	11–100	35	51.2 ± 26.6	47.7 ± 26.3	–3.4 ± 12.4
	101–400	19	231.4 ± 78.2	212.9 ± 87.7	–18.5 ± 36.4
	400+	17	1124.8 ± 728.8	1089.9 ± 736.5	–34.9 ± 50.7
Standard–low Mean ± SD		17.4 ± 25.8			
Variability Mean ± SD		–4.3% ± 37.7%			

European Heart Journal – Cardiovascular Imaging (2015) **16**, 358–363



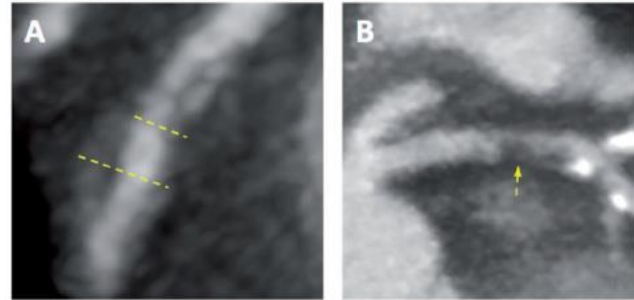
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Imaging parameters	CT calcium scan	CT coronary angiography
Image acquisition		
Scan duration	0.5–10 s	0.5–10 s
Spatial resolution	1.5–3.0 mm	0.5–1.0 mm
Temporal resolution	240–420 ms	240–420 ms (65 ms with dual-source CT)
Radiation exposure	<1 mSv	1–10 mSv (protocol dependent)
Advantages		
	Wide availability	Short scan time
	Low cost	Wide availability
	Low radiation exposure	Best spatial resolution

CAC SCORE - MSCT

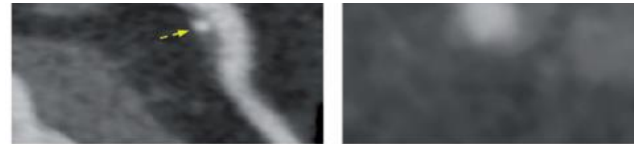


RADIATION SAFETY!!!

Limitations

Highly plaque not detectable

Risk of contrast-induced nephropathy
Imaging limited by dense coronary calcification and stents
Radiation exposure



Indications

Risk stratification in primary prevention for individuals at low-intermediate risk of cardiovascular events

Non-invasive assessment of suspected stable angina in patients with intermediate pre-test probability of coronary artery disease

- A. POSITIVE REMODELLING
- B. LOW ATTENUATION PLAQUE
- C. FOCAL CALCIFICATION
- D. NAPKIN RING SIGN

European Heart Journal (2018) 0, 1–11



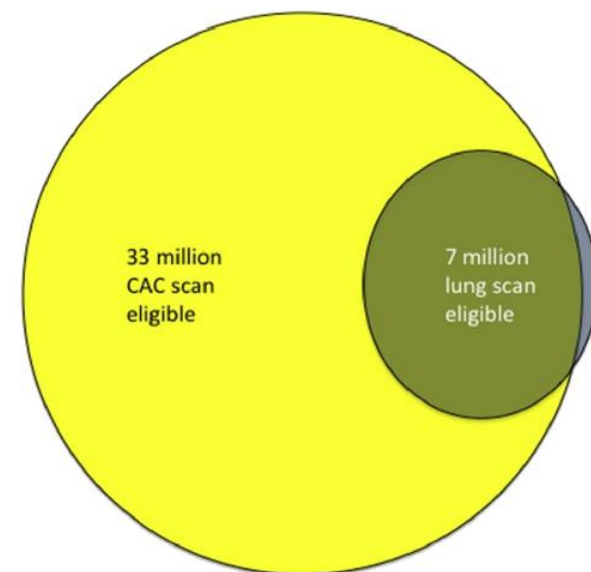
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2016 SCCT/STR guidelines for coronary artery calcium scoring of noncontrast noncardiac chest CT scans: A report of the Society of Cardiovascular Computed Tomography and Society of Thoracic Radiology

Harvey S. Hecht ^a, Paul Cronin ^b, Michael J. Blaha ^c, Matthew J. Budoff ^d,
Ella A. Kazerooni ^b, Jagat Narula ^e, David Yankelevitz ^f, Suhny Abbara ^{g,*}



Coronary artery calcium scoring techniques.

Technique	Advantages	Disadvantages
ECG gated Agatston scoring	Very large database Standard of care >1250 articles Guidelines Computer analysis Suitable for tracking progression	Software required EKG gating required
Nongated Agatston scoring	No EKG gating required Computer analysis Good correlation with gated	Software required Fewer articles Less reproducible
Nongated Ordinal scoring	No software required	No database Few articles Manual analysis
Visual assessment	Quickest analysis No software required	No database 1 article Eyeball analysis

<http://dx.doi.org/10.1016/j.jcct.2016.11.003>



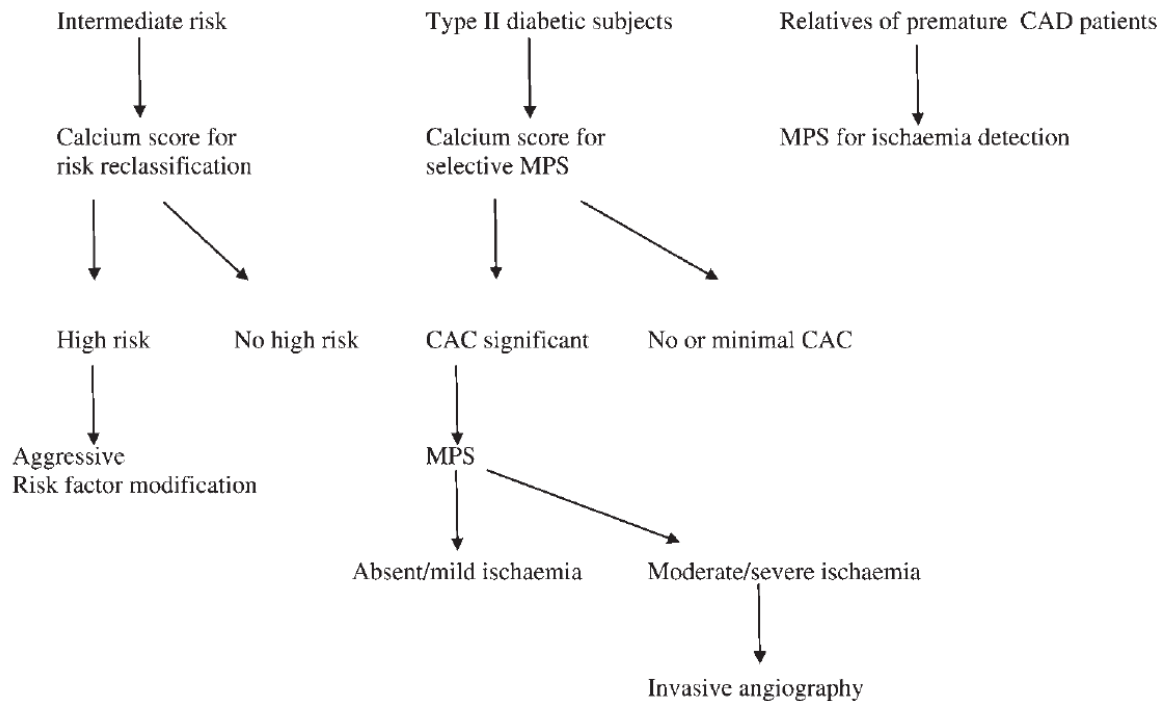
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CCTA - SPECT - ESC (NC - CCT) POSITION STATEMENT

Table 2 Applications of CCT and myocardial perfusion scintigraphy in asymptomatic subjects without previous cardiovascular events



European Heart Journal (2011) **32**, 1986–1993



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ΚΟΣΤΟΣ???

Hospital and Executive Screening Program	2019 USNWR Rank	Cardiovascular Test	Total Cost With Appointment Fee, \$
Cleveland Clinic	1		
Executive Health Program (1-d examination)		Cardiac calcium score; cardiac stress test; ECG (resting); vascular screening	5000-15 000
Premier Executive Health Program		Cardiac calcium score; cardiac stress test; ECG (resting); vascular screening	5000-25 000
Mayo Clinic	2		
Executive Health Program		Cardiac calcium score; cardiac stress test; ECG (resting); vascular screening	5000-11 000
Cedars-Sinai Medical Center	3		
Comprehensive Evaluation		Abdominal aortic ultrasonography; carotid artery ultrasonography; coronary artery CT scan; ECG (resting); C-reactive protein/homocysteine; lipid panel	3800 (men), 4200 (women)
Essential Evaluation		Abdominal aortic ultrasonography; coronary artery CT scan; ECG (resting); C-reactive protein/homocysteine; lipid panel	2400 (men), 2700 (women)
New York-Presbyterian Hospital - Columbia	4		
Executive Health		Abdominal aortic ultrasonography; carotid artery ultrasonography; ECG (exercise); ECG (resting); lipid panel	5000

		ACC/AHA ³	USPSTF ⁵	ACPM ⁶
Cardiac calcium score	4 (14)	Reasonable for cardiovascular risk assessment in asymptomatic adults at intermediate risk	The current evidence is insufficient to assess the balance of benefits and harms	Does not recommend routine screening of the general adult CT scanning
Cardiac stress test (including exercise electrocardiography or echocardiography)	19 (68)	May be considered for cardiovascular risk assessment in intermediate-risk asymptomatic adults	Recommends against screening with resting or exercise electrocardiography	Does not recommend routine screening of the general adult population
Coronary artery CT scan	8 (29)	Recommends against screening the general population	Recommends against routine screening	Does not recommend routine screening of the general adult population

doi:10.1001/jamainternmed.2019.6607



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ΓΙΑ ΝΑ ΜΗΝ ΞΕΧΝΑΜΕ!!!

Recommendations	Class ^a	Level ^b
Coronary artery calcium scoring may be considered as a risk modifier in CV risk assessment.	IIb	B
Atherosclerotic plaque detection by carotid artery scanning may be considered as a risk modifier in CV risk assessment.	IIb	B
ABI may be considered as a risk modifier in CV risk assessment.	IIb	B
Carotid ultrasound IMT screening for CV risk assessment is not recommended.	III	A

Gaps in evidence

- Currently, most imaging techniques have not been rigorously tested as screening tools in CV risk assessment; more evidence on calibration, reclassification and cost-effectiveness is still needed.
- The reduction of CVD risk in patients treated with lipid- or BP-lowering drugs because of reclassification with, for example, CAC or ABI remains to be demonstrated.

European Heart Journal (2016) **37**, 2315–2381



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Ο,ΤΙ ΓΝΩΡΙΖΕΙ ΚΑΛΥΤΕΡΑ ΚΑΘΕ ΚΕΝΤΡΟ



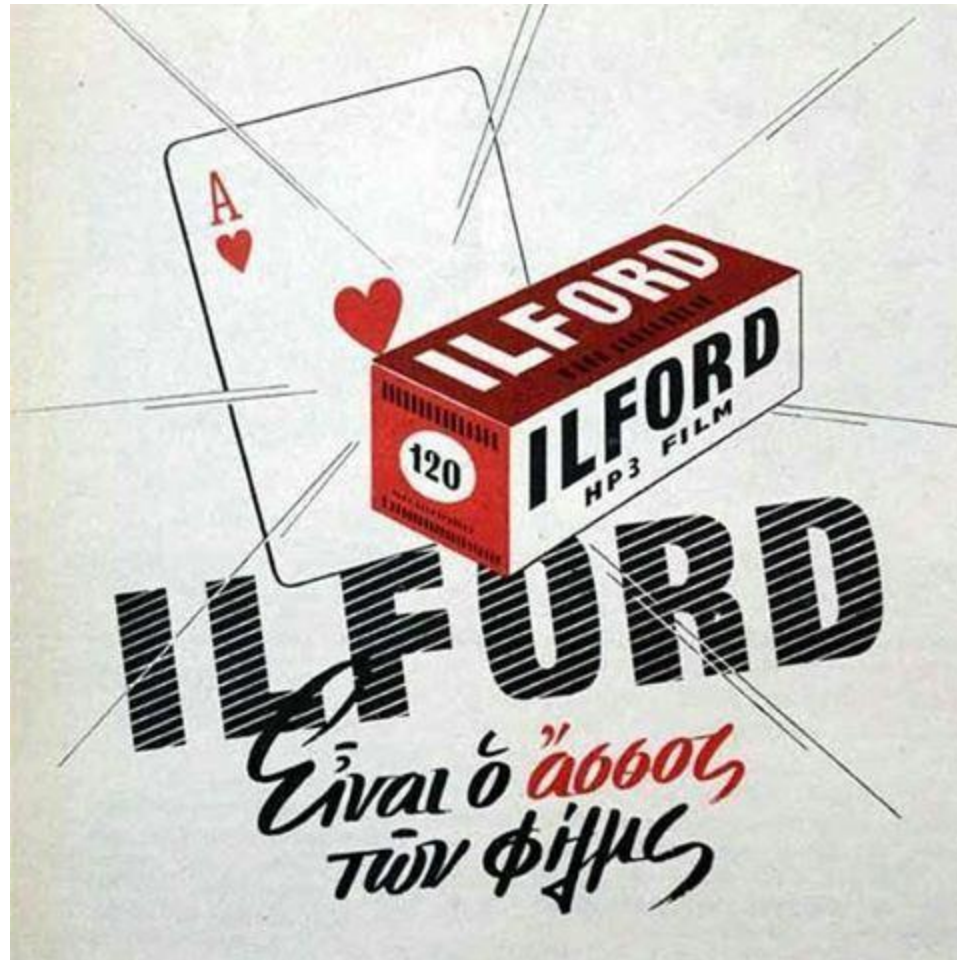
CALCIUM SCORE / CCTA



± ΣΤΕΦΑΝΙΟΓΡΑΦΙΑ



ΕΥΧΑΡΙΣΤΩ



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