Riziko NSS – pomohou nám zobrazovací metody?

U SRDEČNÍHO SELHÁNÍ

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The NEW ENGLAND JOURNAL of MEDICINE

ORIGINAL ARTICLE

Declining Risk of Sudden Death in Heart Failure

Li Shen, M.B., Ch.B., Pardeep S. Jhund, M.B., Ch.B., Ph.D., Mark C. Petrie, M.B., Ch.B., Brian L. Claggett, Ph.D., Simona Barlera, M.Sc., John G.F. Cleland, M.D., Ph.D., Henry J. Dargie, M.B., Ch.B., Christopher B. Granger, M.D., John Kjekshus, M.D., Ph.D., Lars Køber, M.D., D.M.Sc., Roberto Latini, M.D., Aldo P. Maggioni, M.D., Milton Packer, M.D., Bertram Pitt, M.D., Scott D. Solomon, M.D., Karl Swedberg, M.D., Ph.D., Luigi Tavazzi, M.D., Ph.D., John Wikstrand, M.D., Ph.D., Faiez Zannad, M.D., Ph.D., Michael R. Zile, M.D., and John J.V. McMurray, M.D.

- 40 195 pac
- 12 studií
- 1995 – 2014
- 3583 pac NSS

Table 2. Annual Rates and Cumulative Incidence Rates of Sudden Death in the Clinical Trials Included in this Study, with Randomized Groups Combined.*

Variable	RALES (N=1663)	BEST (N=2617)	CIBIS-II (N=2647)	MERIT-HF (N=3991)	Val-HeFT (N=5010)	SCD-HeFT (N=1692)	CHARM-Alternative (N=1960)	CHARM-Added (N=2448)	CORONA (N=4875)	GISSI-HF (N=3820)	EMPHASIS-HF (N=2316)	PARADIGM-HF (N=7156)
No. of patients with sudden death	192	294	131	211	442	168	186	311	631	367	125	525
No. of patients with death from any cause	670	839	384	362	979	484	540	762	1452	1055	342	1344
Percent of sudden deaths in total mortality	28.7	35.0	34.1	58.3	45.1	34.7	34.4	40.8	43.5	34.8	36.5	39.1
Annual rate of sudden death per 100 patient-yr (95% CI)	6.5 (5.6–7.4)	5.6 (5.0–6.3)	3.8 (3.2–4.5)	5.3 (4.6–6.1)	4.7 (4.3–5.2)	3.0 (2.6–3.5)	3.7 (3.2–4.2)	4.3 (3.8–4.8)	5.2 (4.8–5.6)	2.7 (2.5–3.0)	2.9 (2.4–3.4)	3.3 (3.1–3.6)

Počet NSS pokles o **44%**

Li Shen et al. Declining Risk of Sudden Death in Heart Failure; NEJM 2017; 377:41-51

Ejekční frakce levé komory

ESC European Society of Cardiology
European Heart Journal (2021) 42, 3599–3726
doi:10.1093/eurheartj/ehab368
ESC GUIDELINES

2021 ESC Guidelines for the diagnosis and treatment of acute and chronic heart failure

Developed by the Task Force for the diagnosis and treatment of acute and chronic heart failure of the European Society of Cardiology (ESC)

With the special contribution of the Heart Failure Association (HFA) of the ESC

6 Cardiac rhythm management for heart failure with reduced ejection fraction

This section provides recommendations on the use of implantable cardioverter-defibrillators (ICD) and cardiac resynchronization therapy (CRT). Other implantable devices will be discussed at the end of this section.

6.1 Implantable cardioverter-defibrillator

A high proportion of deaths among patients with HF, especially in those with milder symptoms, occur suddenly and unexpectedly. Many of these may be due to electrical disturbances, including ventricular arrhythmias, bradycardia, and asystole, although some are due to other acute vascular events. Treatments that improve or delay the progression of CV disease have been shown to reduce the annual rate of sudden death,[105,160] but they do not treat arrhythmic events when they occur. ICDs are effective at correcting potentially lethal ventricular arrhythmias, and in the case of transvenous systems, also

Primary prevention		
An ICD is recommended to reduce the risk of sudden death and all-cause mortality in patients with symptomatic HF (NYHA class II–III) of an ischaemic aetiology (unless they have had a MI in the prior 40 days—see below), and an LVEF ≤35% despite ≥3 months of OMT, provided they are expected to survive substantially longer than 1 year with good functional status.[161,165]	I	A

An ICD should be considered to reduce the risk of sudden death and all-cause mortality in patients with symptomatic HF (NYHA class II–III) of a non-ischaemic aetiology and an LVEF ≤35% despite ≥3 months of OMT, provided they are expected to survive substantially longer than 1 year with good functional status.[161,166,167]	IIa	A

DKMP

- DKMP 1:2500 [1]
- Roční incidence NSS 2-4% [2]
- NSS tvoří ½ všech úmrtí u DKMP
- NSS – 10-19% při DKMP [3]
- 20-25% pac. s ICD má adekvátní výboj během 5 let [4]

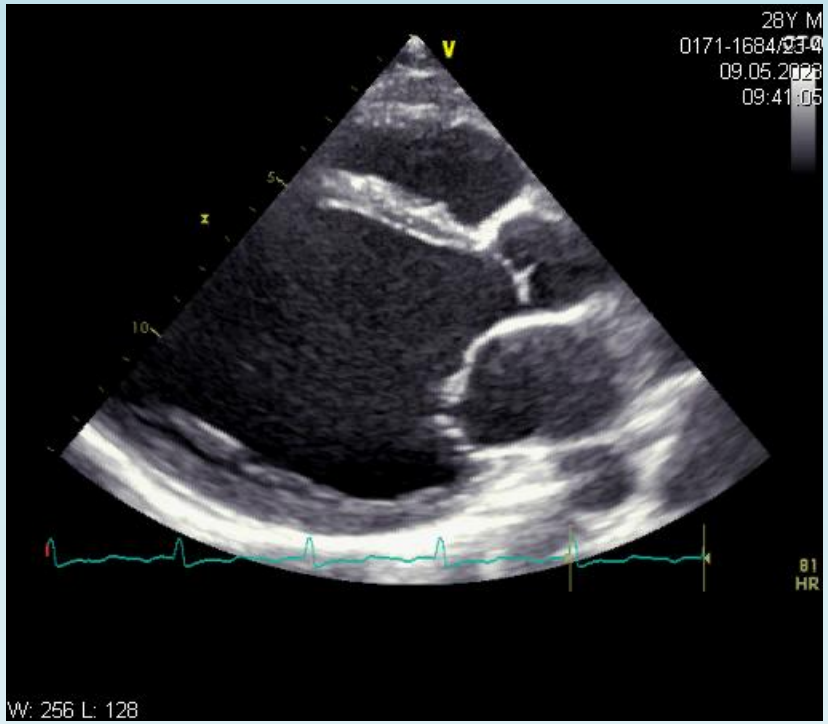
[1] *McNally et al. Dilated Cardiomyopathy: genetic determinants and mechanisms. Circ Res 2017;121 (7): 731-48*

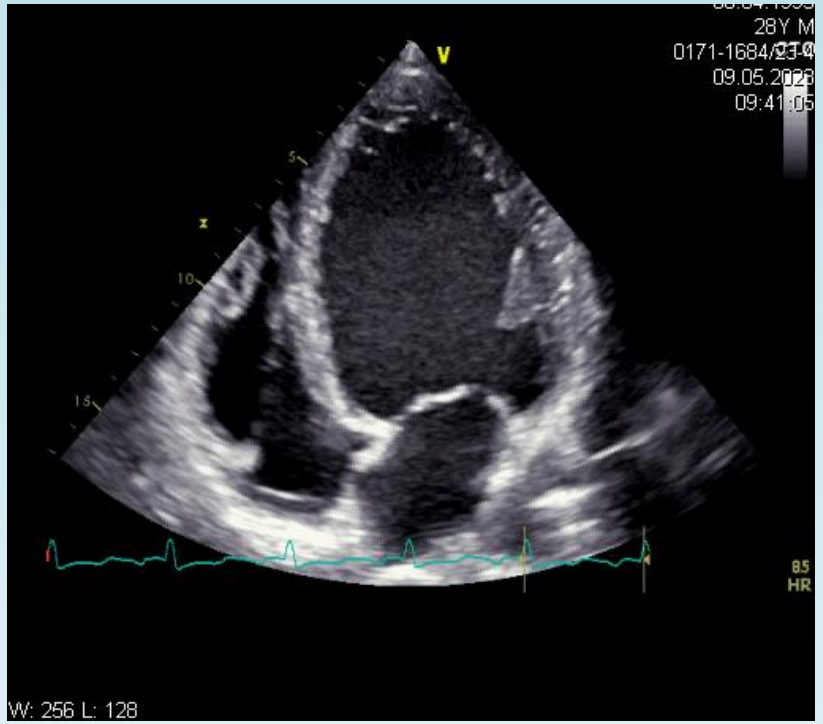
[2] *Kadish et al. Prophylactic defibrilátor implantation in patients with nonischemic dilatated cardiomyopathy. N Engl J. Med. 2004;350 (21) 2151-8*

[3] *Deo R et al. Epidemiology and genetics of sudden cardiac death. Circulation. 2012;125(4):620-327*

[4] *Levy et al. Maximizing survival benefit with primary prevention ICD therapy in a heart failure population. Circ 2009;120(10):835-42*

DKMP



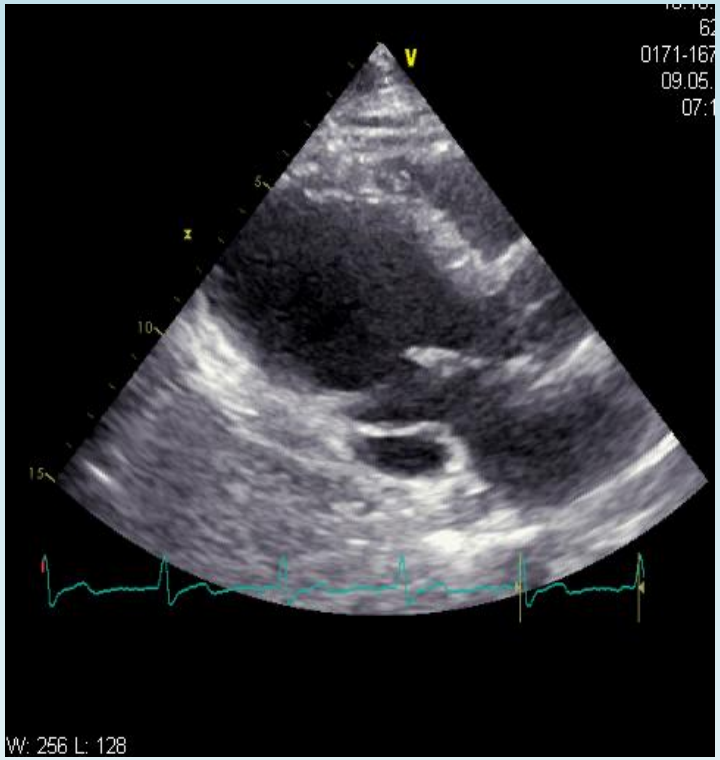


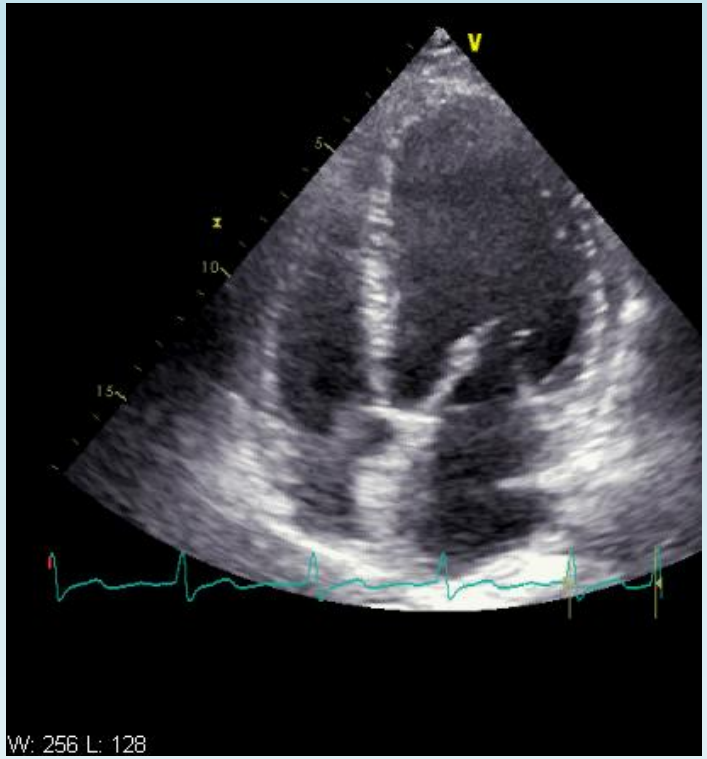
Archiv autora

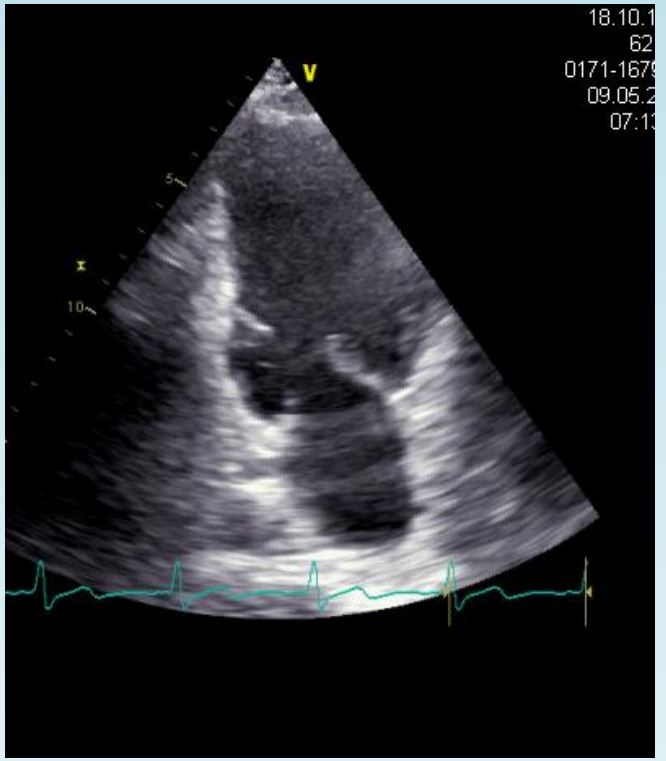
ICHS

- NSS – 50-80% ICHS
- 300 tis pac./rok

[1] *Granni CH. et al. Sudden Cardiac Death in Ischemic Heart Diseases. JACC 2019;Vol 13 (10): 2223-38*







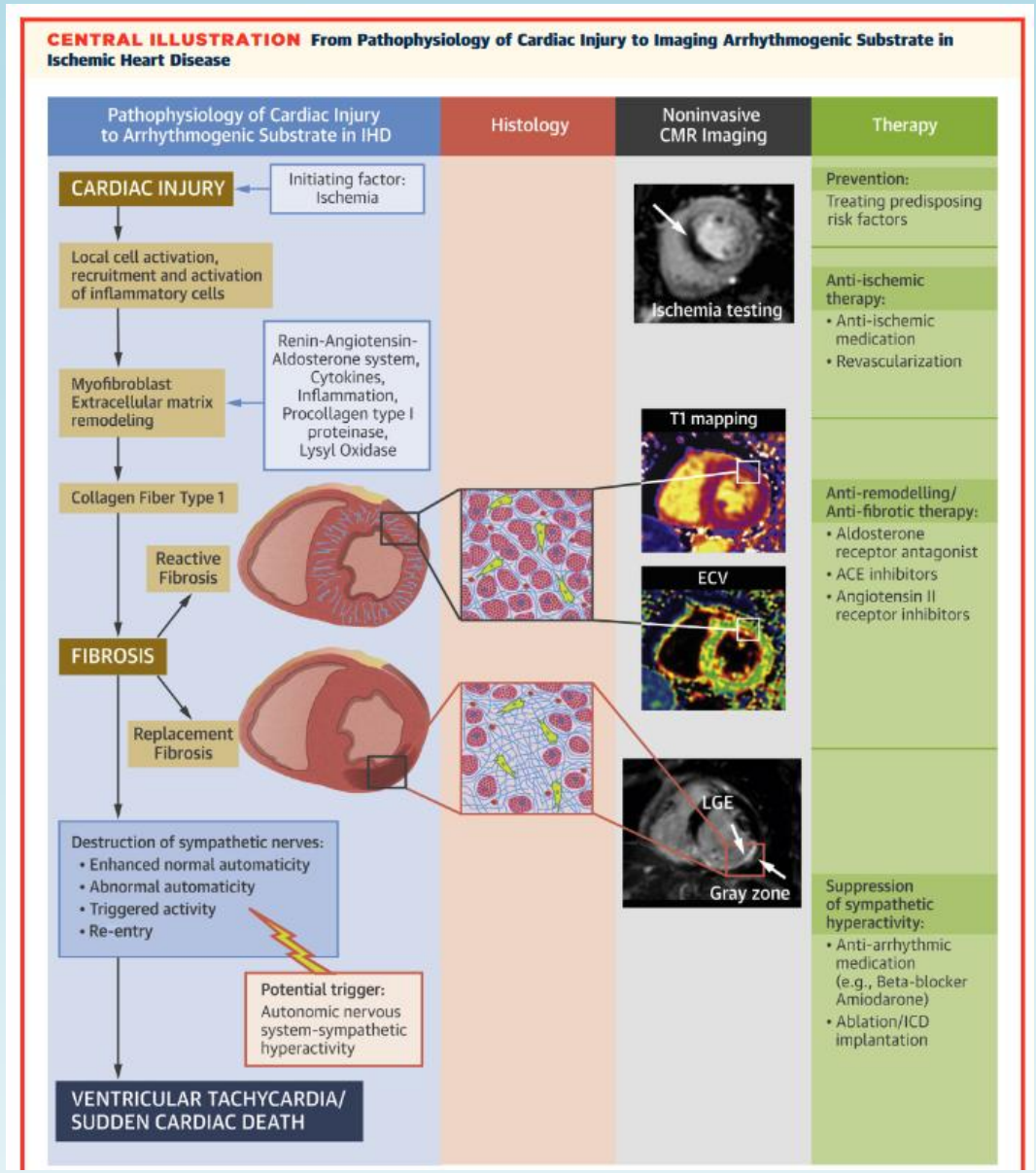
ICHS

STATE-OF-THE-ART REVIEW

Sudden Cardiac Death in Ischemic Heart Disease

From Imaging Arrhythmogenic Substrate to Guiding Therapies

Christoph Gräni, MD, PhD,[a,b] Dominik C. Benz, MD,[c] Sumit Gupta, MD,[a] Stephan Windecker, MD,[b] Raymond Y. Kwong, MD, MPH[a]



Ejekční frakce levé komory

LV function and parameter	Subclinical Dysfunction	HFpEF	HFrEF
LVEF	Normal	Normal	↓↓
Longitudinal Function GLS	↓	↓↓	↓↓↓
Circumferential Function GCS	Normal	↑	↓↓

Initiators and Accelerators: Increasing age, Hypertension, Diabetes, Ischemic disease, Obesity, Renal insufficiency, Valvular disease

Modin et al, Echo and heart failure:when do people need an echo, and when do they need natriuretic peptides? Echorespract 2018, R65-79.

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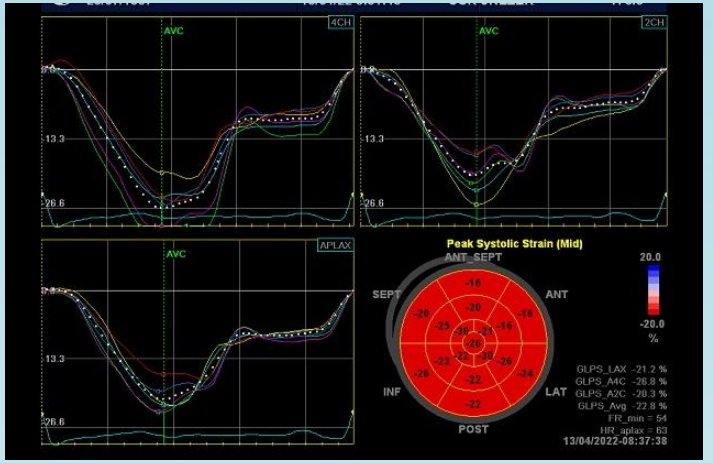
ORIGINAL INVESTIGATIONS

Global Longitudinal Strain to Predict Mortality in Patients With Acute Heart Failure

Jin Joo Park, MD, PhD,[a] Jun-Bean Park, MD, PhD,[b] Jae-Hyeong Park, MD, PhD,[c] Goo-Yeong Cho, MD, PhD[a]



4312 pts
2009-2016
Median 31,7m

- *HFrEF (< 40%)*
- *HFmrEF (40-49%)*
- *HFpEF (≥ 50%)*

- GLS normal > - 20%
- T1 -Severely reduced ≤ -8%
- T2- Moderately reduced -8,1% - 12,5%
- T3- reduced ≥ -12,6%

Global Longitudinal Strain to Predict Mortality in Patients With Acute Heart Failure

Jin Joo Park, MD, PhD,[a] Jun-Bean Park, MD, PhD,[b] Jae-Hyeong Park, MD, PhD,[c] Goo-Yeong Cho, MD, PhD[a]

TABLE 1 Baseline Characteristics of the Study Population According to Ejection Fraction and GLS Tertiles

		According to LVEF				Patients According to Strain			
	All Patients	HFrEF (n = 2,195)	HFmrEF (n = 642)	HFpEF (n = 1,335)	p Value	T1 (Severe) (n = 1,404)	T2 (Moderate) (n = 1,389)	T3 (Mild) (n = 1,387)	p Value
Follow-up, months	31.7 (11.6-54.4)	30.6 (10.3-53.2)	34.0 (14.5-55.7)	33.1 (13.5-55.5)	0.002	27.6 (7.5-51.5)	33.1 (12.3-55.4)	34.3 (15.9-56.4)	<0.001
Age, yrs	70.8 ± 13.8	68.5 ± 14.1	72.9 ± 12.3	73.5 ± 13.1	<0.001	69.6 ± 13.9	70.6 ± 13.7	71.9 ± 13.7	<0.001
Men	52.8	61.0	51.5	53.4	<0.001	61.0	51.5	46.6	<0.001
BMI, kg/m^2	23.5 ± 5.9	23.3 ± 6.9	23.5 ± 5.7	23.8 ± 4.1	0.042	23.4 ± 6.5	23.3 ± 5.8	23.6 ± 5.4	0.515
Past medical history									
Hypertension	57.2	56.3	57.7	57.3	0.631	56.3	57.7	57.9	0.631
Diabetes mellitus	34.3	38.6	34.3	29.7	<0.001	38.6	34.3	29.7	<0.001
Ischemic heart disease	32.5	33.5	33.2	30.4	0.157	33.5	33.2	30.4	0.157
Atrial fibrillation	30.0	35.1	29.3	25.2	<0.001	35.1	29.3	25.2	<0.001
NYHA functional class					0.132				<0.001
I/II	7.1	7.0	5.3	8.0		5.5	8.3	7.8	
III	50.3	48.8	52.7	50.6		42.3	51.6	56.8	
IV	42.7	44.2	41.9	41.3		52.2	40.2	35.4	
Physical examination									
Systolic BP, mm Hg	128.4 ± 27.2	126.3 ± 26.0	130.8 ± 28.0	131.6 ± 28.2	<0.001	126.8 ± 26.9	129.7 ± 27.7	129.1 ± 26.9	0.012
Diastolic BP, mm Hg	74.2 ± 16.6	75.0 ± 16.8	74.6 ± 17.0	72.9 ± 16.4	0.001	76.3 ± 17.6	74.3 ± 16.7	72.2 ± 15.4	<0.001
Laboratory findings									
Hemoglobin, mg/dl	12.1 ± 2.3	12.5 ± 2.3	11.9 ± 2.5	11.7 ± 2.3	<0.001	12.7 ± 2.3	12.0 ± 2.3	11.6 ± 2.3	<0.001
BUN, mg/dl	27.7 ± 18.3	26.9 ± 17.6	25.1 ± 15.0	24.9 ± 15.7	0.001	27.8 ± 18.2	25.6 ± 16.0	24.8 ± 16.2	<0.001
Creatinine, mg/dl	1.07 (0.83-1.54)	1.11 (0.86-1.60)	1.05 (0.83-1.44)	1.01 (0.79-1.47)	<0.001	1.14 (0.90-1.60)	1.05 (0.81-1.60)	1.02 (0.79-1.42)	<0.001
BNP, pg/ml (n = 885)	980 (461-2,092)	1,299 (506-2,305)	869 (620-2,672)	639 (251-1,281)	<0.001	1,190 (687-2,632)	981 (427-1,985)	644 (225-1,315)	<0.001
NT-proBNP, pg/ml (n = 2,681)	4,583 (1,720-11,397)	5,924 (2,419-1,429)	4,419 (1,574-10,416)	2,732 (1,055-6,656)	<0.001	7,278 (3,502-15,751)	4,627 (1,879-11,990)	2,685 (891-6,791)	<0.001
Echocardiographic parameters									
E-wave, m/s	0.88 ± 0.38	0.90 ± 0.44	0.87 ± 0.45	0.95 ± 0.45	<0.001	0.95 ± 0.38	0.90 ± 0.50	0.88 ± 0.43	0.001
A-wave, m/s	0.91 ± 3.83	1.07 ± 6.52	1.14 ± 5.00	0.88 ± 0.45	0.653	0.93 ± 6.81	1.10 ± 4.64	1.01 ± 4.14	0.833
DT, ms	188 ± 79	160 ± 69	193 ± 92	211 ± 93	<0.001	149 ± 70	180 ± 76	212 ± 92	<0.001
E/e'	18.9 ± 11.0	20.5 ± 11.8	17.4 ± 10.5	16.9 ± 9.5	<0.001	22.1 ± 12.8	19.1 ± 10.9	15.9 ± 8.4	<0.001
LVEF, %	40.5 ± 15.6	27.7 ± 7.3	45.0 ± 2.6	59.3 ± 6.0	<0.001	28.9 ± 11.4	38.8 ± 12.6	53.4 ± 11.5	<0.001
GLS, %	10.8 ± 5.0	8.1 ± 3.3	11.3 ± 3.8	15.2 ± 4.6	<0.001	5.6 ± 1.6	10.2 ± 1.3	16.6 ± 3.2	<0.001
Medication at discharge									
ACE inhibitor or ARB	69.1	68.3	74.3	65.7	<0.001	68.3	74.3	65.7	<0.001
Beta-blocker	62.0	59.4	66.4	60.2	<0.001	59.4	66.4	60.2	<0.001
MRA	45.7	48.2	46.9	41.7	0.001	48.2	46.9	41.7	0.001

1740 pac. (40.4%) zemřelo během 5 let

Medián follow up 31.7m (11.6-54.4m)

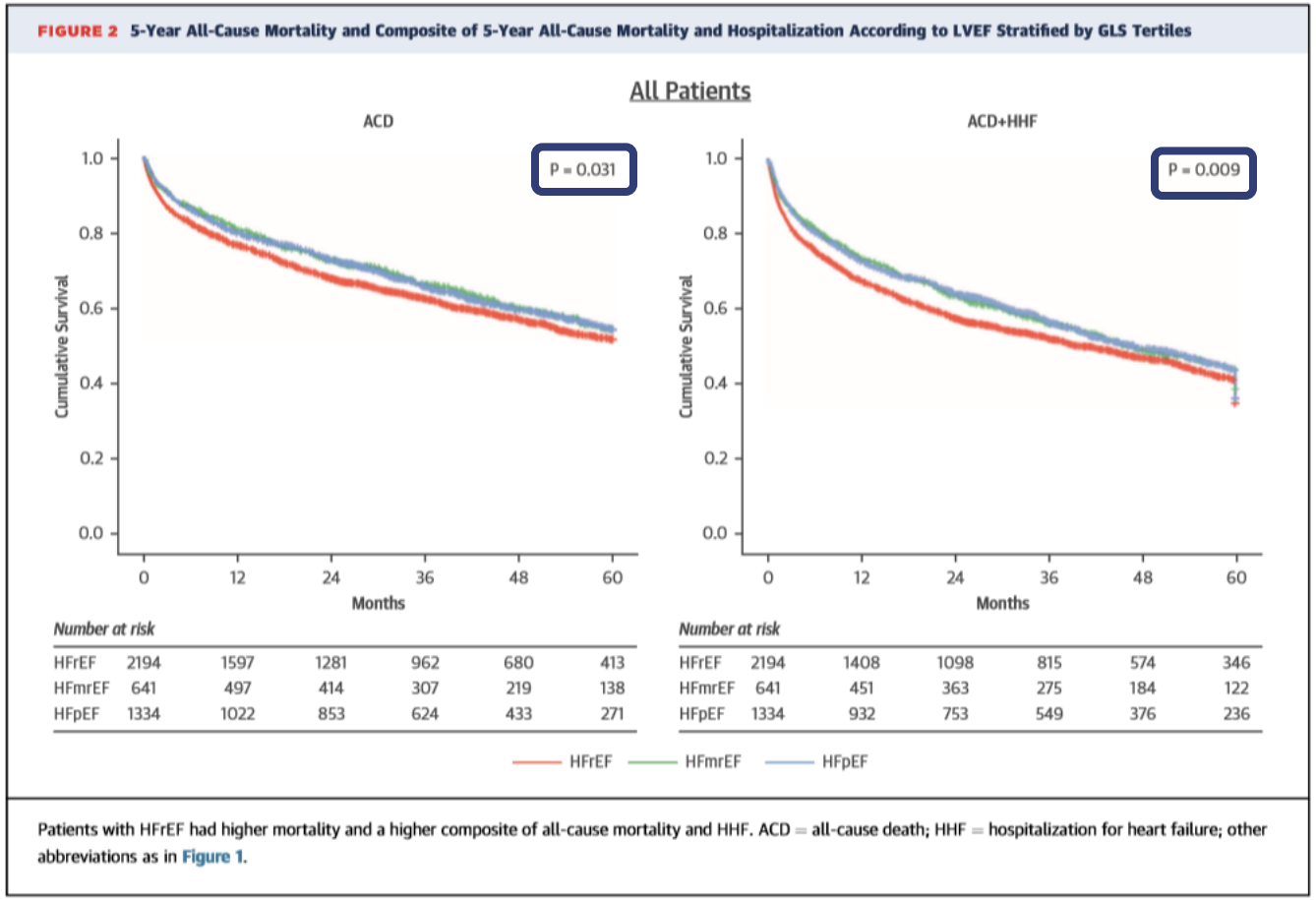


FIGURE 2 5-Year All-Cause Mortality and Composite of 5-Year All-Cause Mortality and Hospitalization According to LVEF Stratified by GLS Tertiles

Patients with HFrEF had higher mortality and a higher composite of all-cause mortality and HHF. ACD = all-cause death; HHF = hospitalization for heart failure; other abbreviations as in Figure 1.

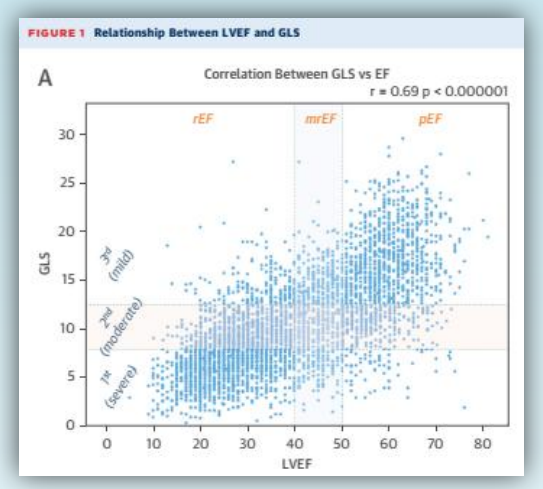
PARK et al. GLS to Predict Mortality in Patients with Acute Heart Failure; JACC Vol. 71, No18, 2018:1947-57

Global Longitudinal Strain to Predict Mortality in Patients With Acute Heart Failure

Jin Joo Park, MD, PhD,[a] Jun-Bean Park, MD, PhD,[b] Jae-Hyeong Park, MD, PhD,[c] Goo-Yeong Cho, MD, PhD[a]

In multivariable analysis, each 1% absolute increase in GLS was associated with a 5% decreased risk for mortality (hazard ratio [HR]: 0.95; 95% confidence interval [CI]: 0.93 to 0.96; p < 0.001) (Online Table 1).

FIGURE 1 Relationship Between LVEF and GLS



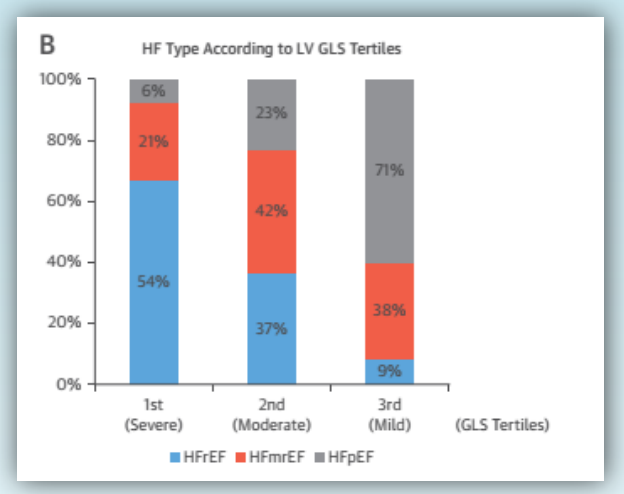
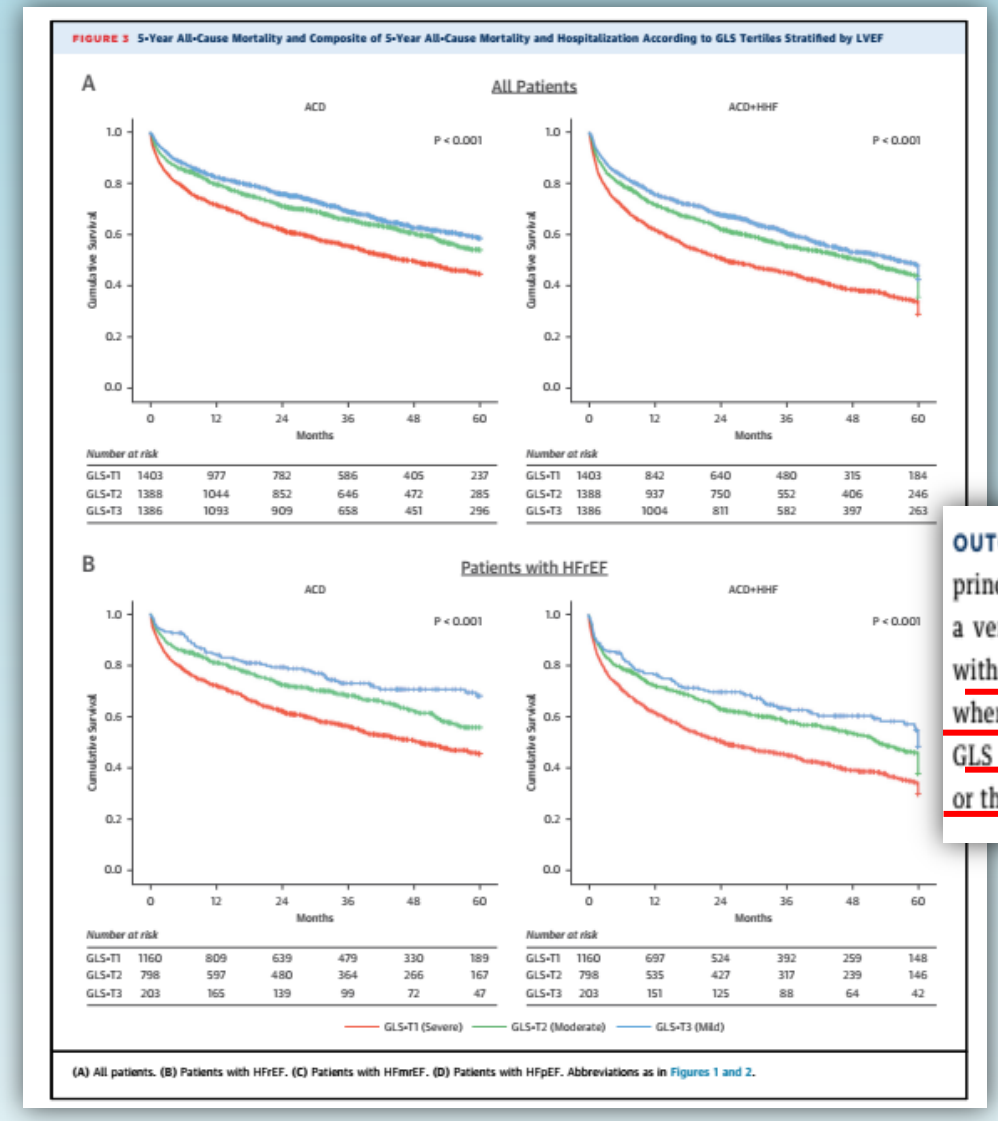


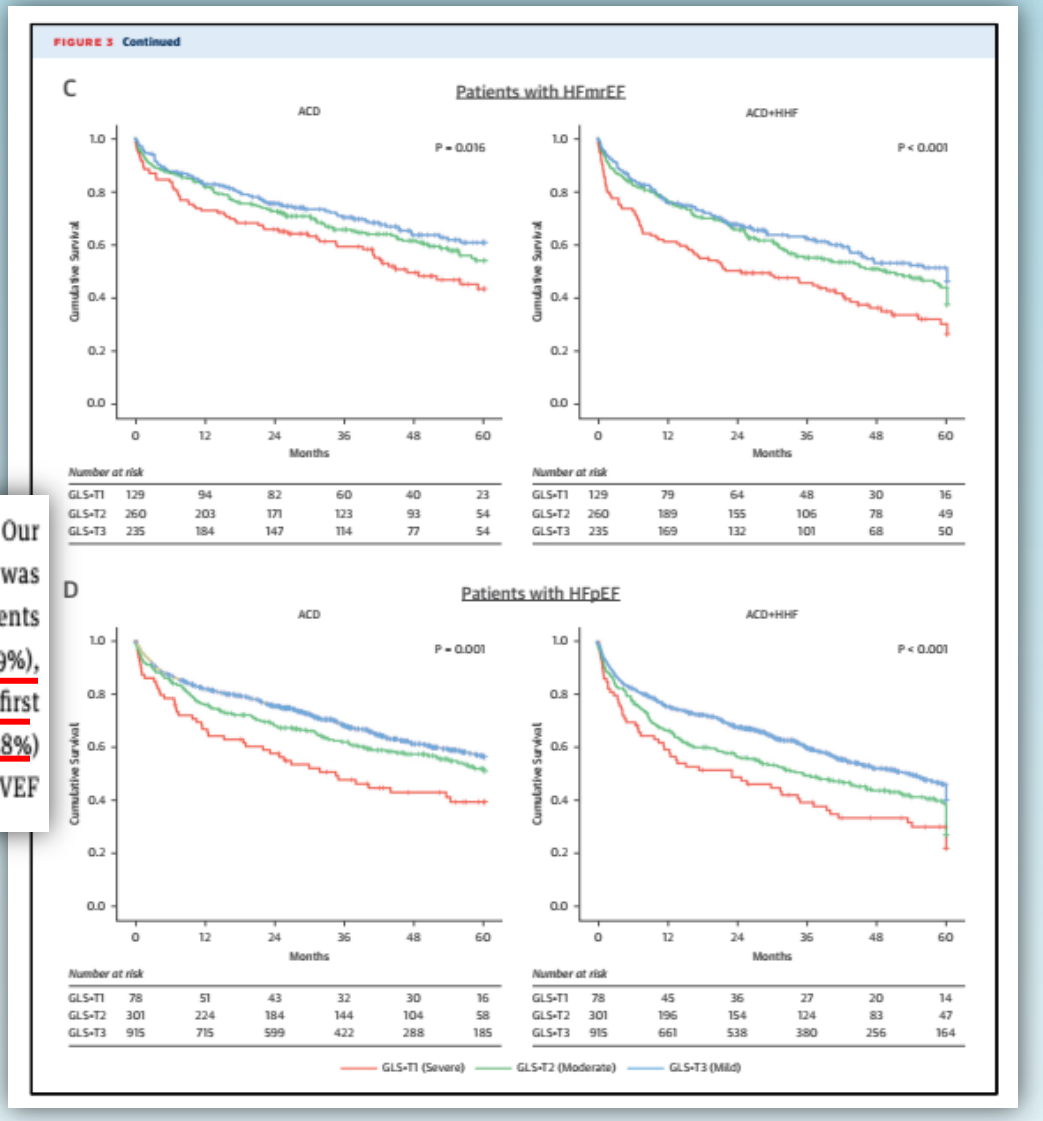
TABLE 2 Baseline Characteristics of the Study Population According to 5-Year All-Cause Death

	Alive (n = 2,572; 59.6%)	Dead (n = 1,740; 40.4%)	p Value
Age, yrs	67.3 ± 14.3	75.9 ± 11.3	<0.001
Men	52.5	53.2	0.683
BMI, kg/m²	24.0 ± 5.0	22.6 ± 7.0	<0.001
Follow-up duration, months	46.1 (11.6-54.4)	11 (2.5-30.3)	<0.001
Past medical history			
Hypertension	54.3	61.6	<0.001
Diabetes mellitus	30.9	39.2	<0.001
Ischemic heart disease	30.2	35.7	<0.001
Atrial fibrillation	29.5	30.8	0.382
NYHA functional class			<0.001
I/II	8.3	5.2	
III	54.8	43.7	
IV	36.9	51.1	
Physical examination			
Systolic BP, mm Hg	128.8 ± 26.4	127.8 ± 28.3	266
Diastolic BP, mm Hg	75.4 ± 16.5	72.3 ± 16.8	<0.001
Laboratory findings			
Hemoglobin, mg/dl	12.6 ± 2.3	11.6 ± 2.3	<0.001
BUN, mg/dl	23.4 ± 14.9	30.4 ± 18.9	<0.001
Creatinine, mg/dl	1.00 (0.80-1.34)	1.25 (0.90-1.86)	<0.001
BNP, pg/ml (n = 885)	890 (411-1,719)	1,114 (530-2,647)	<0.001
NT-proBNP, pg/ml (n = 2,681)	3,368 (1,323-7,517)	7,600 (2,881-18,608)	<0.001
Echocardiographic parameters			
E-wave	0.9 ± 0.4	0.9 ± 0.4	0.03
A-wave	1.1 ± 6.2	0.9 ± 2.5	0.405
DT, ms	186.8 ± 87.9	177.5 ± 82.8	0.002
E/e'	17.8 ± 10.1	20.5 ± 12.2	<0.001
LVEF, %	40.9 ± 15.6	39.9 ± 15.5	0.054
GLS, %	11.4 ± 5.0	10.0 ± 4.9	<0.001

PARK et al. GLS to Predict Mortality in Patients with Acute Heart Failure; JACC Vol. 71, No18, 2018:1947-57



OUTCOMES ACCORDING TO GLS AND LVEF. Our principal findings are related to mortality. There was a very small difference in mortality among patients with HFrEF (41%), HFmrEF (38%), and HFpEF (39%), whereas morality was higher in patients in the first GLS tertile (49%) than in those in the second (38%) or third GLS tertile (34%). It is noteworthy that LVEF



PARK et al. GLS to Predict Mortality in Patients with Acute Heart Failure;
JACC Vol. 71, No18, 2018:1947-57

Global Longitudinal Strain is Incremental to Left Ventricular Ejection Fraction for the Prediction of Outcome in Optimally Treated Dilated Cardiomyopathy Patients

Anne G. Raafs, MD*; Andrea Boscutti, MD*; Michiel T. H. M. Henkens, MD; Wout W. A. van den Broek, MD; Job A. J. Verdonschot, MD, PhD, MSc; Jerremy Weerts, MD; Davide Stolfo, MD; Vincenzo Nuzzi, MD; Paolo Manca, MD; Mark R. Hazebroek, MD, PhD; Christian Knackstedt, MD, PhD;† Marco Merlo, MD;† Stephane R. B. Heymans, MD, PhD†; Gianfranco Sinagra, FESC, MD†

- 2 centra (Holandsko a Itálie)
- medián folow up 5.6 let (3.7-8.9)
- 323 pac. s DKMP
- 66% muži
- 55 +/- 14 let
- NSS/úmrtí/život ohrožující arytmie/hospitalizace pro SS/OTS/LVAD
- EF LK 42 +/- 11%
- GLS -15% +/-4%

Raafs AG. et al. Global Longitudinal Strain is Incremental to Left Ventricular Ejection Fraction for the Prediction of Outcome in Optimally Treated Dilated Cardiomyopathy Patients; J Am Heart Assoc. 2022:11,e024505

Global Longitudinal Strain is Incremental to Left Ventricular Ejection Fraction for the Prediction of Outcome in Optimally Treated Dilated Cardiomyopathy Patients

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Table 1. Clinical Characteristics of Total Population With DCM and in Patients With DCM With and Without Events Upon OMT

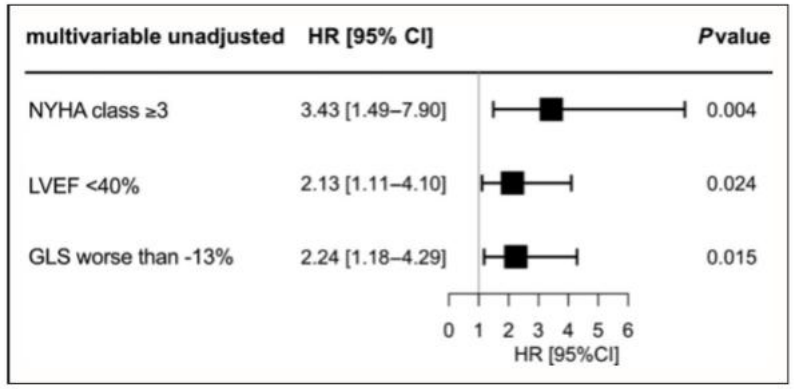
	All (N=323)	Maastricht (N=192)	Trieste (N=131)	*P* value
Age, y	56±14	55±13	56±15	0.62
Male sex	212 (66)	120 (63)	92 (70)	0.16
Echocardiographic parameters				
LVEF (%)	43 [35 to 50]	43 [35 to 50]	43 [35 to 50]	0.88
LVEF ≥50%	92 (28)	57 (30)	35 (27)	
LVEF 40%–50%	109 (34)	57 (30)	52 (40)	
LVEF <40%	121 (38)	78 (40)	43 (33)	
LV end-diastolic diameter, indexed by BSA, mm/m^2	29 [26 to 32]	28 [25 to 31]	30 [28 to 33]	<0.01
GLS				
GLS (%)	–15 [–12 to –17]	–15 [–13 to –18]	–14 [–12 to –16]	<0.01
Delta GLS (%)	2.6 [0.0 to 5.8]	3.0 [0.3 to 6.3]	2.4 [–0.2 to 5.1]	0.19
Separately				
Death/heart transplantation/LV assist device	37 (11)	26 (14)	11 (8)	0.21
Life threatening arrhythmias	20 (6)	11 (6)	9 (7)	0.82
Heart failure hospitalization	20 (6)	11 (6)	9 (7)	0.82

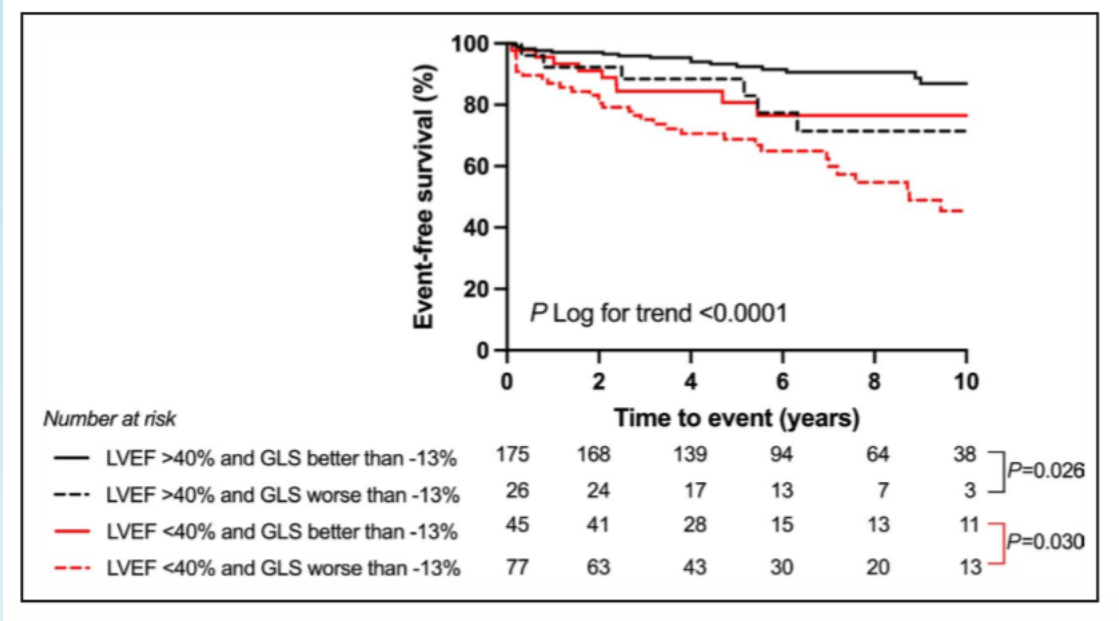
Raafs AG. et al. Global Longitudinal Strain is Incremental to Left Ventricular Ejection Fraction for the Prediction of Outcome in Optimally Treated Dilated Cardiomyopathy Patients; J Am Heart Assoc. 2022:11,e024505

- 92 pac (28%) recovery (EF LK > 50%)
- 64 pac (20%) (NSS 23, OTS/LVAD 2, LTA 20, SS 19)

Global Longitudinal Strain is Incremental to Left Ventricular Ejection Fraction for the Prediction of Outcome in Optimally Treated Dilated Cardiomyopathy Patients

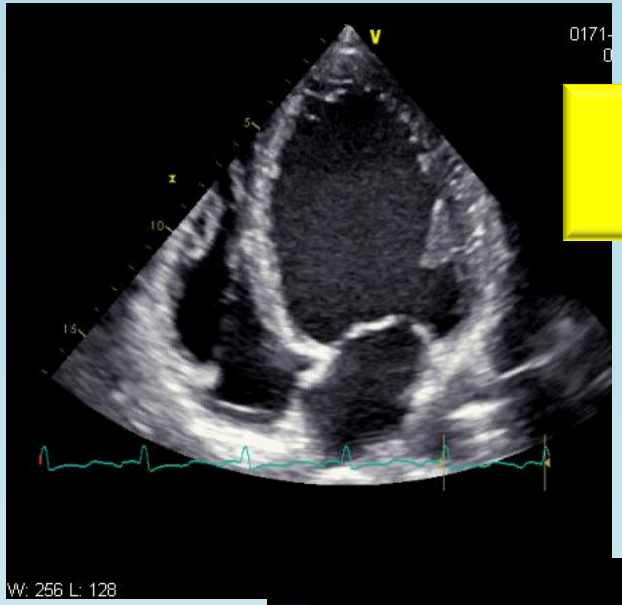
Anne G. Raafs, MD*; Andrea Boscutti, MD*; Michiel T. H. M. Henkens, MD; Wout W. A. van den Broek, MD; Job A. J. Verdonschot, MD, PhD, MSc; Jeremy Wesarts, MD; Davide Stolfo, MD; Vincenzo Nuzzi, MD; Paolo Manca, MD; Mark R. Hazebroek, MD, PhD; Christian Knackstedt, MD, PhD; Marco Merlo, MD; Stephane R. B. Heymans, MD, PhD; Gianfranco Sinagra, FESC, MD





Raafs AG. et al. Global Longitudinal Strain is Incremental to Left Ventricular Ejection Fraction for the Prediction of Outcome in Optimally Treated Dilated Cardiomyopathy Patients; J Am Heart Assoc. 2022:11,e024505

Pac 1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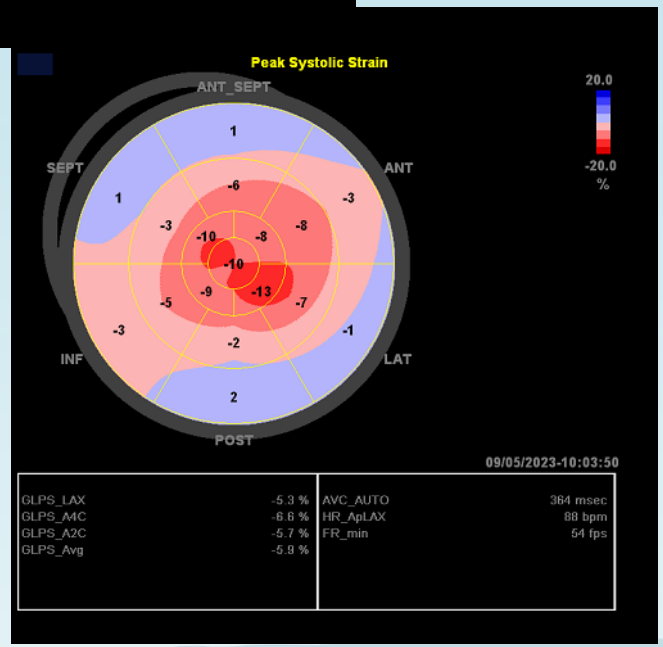
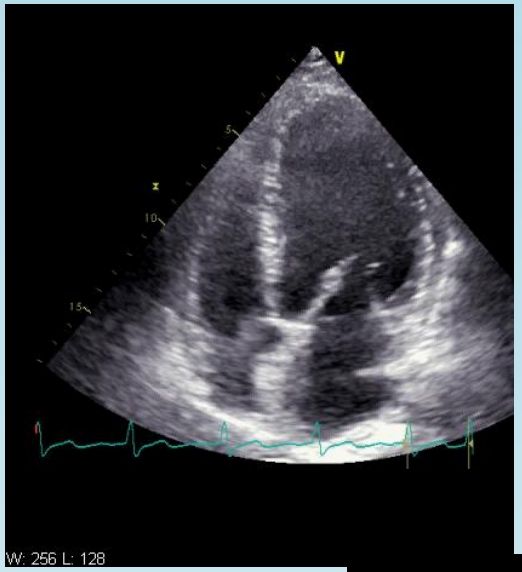

Peak Systolic Strain
ANT_SEPT
SEPT
ANT
INF
LAT
POST
20.0
-20.0
%
09/05/2023-10:03:50
GLPS_LAX -5.3 %
GLPS_A4C -6.6 %
GLPS_A2C -5.7 %
GLPS_Avg -5.9 %
AVC_AUTO 384 msec
HR_ApLAX 88 bpm
FR_min 54 fps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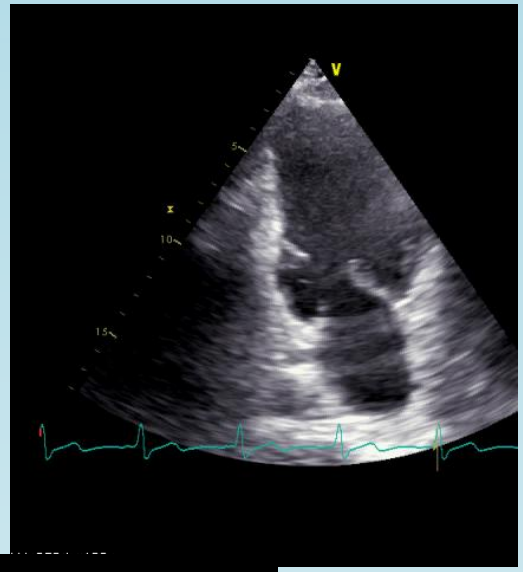
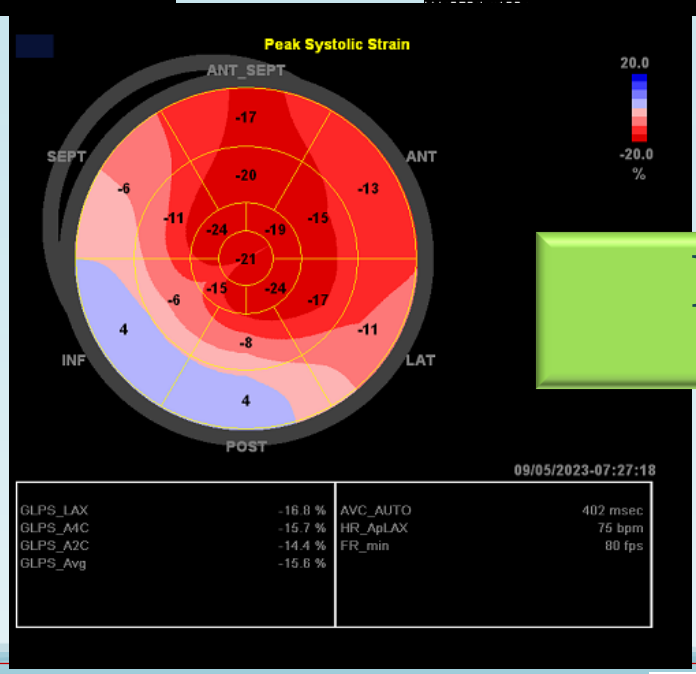



Peak Systolic Strain
ANT_SEPT
SEPT
ANT
INF
LAT
POST
20.0
-20.0
%
09/05/2023-07:27:18
GLPS_LAX -16.8 %
GLPS_A4C -15.7 %
GLPS_A2C -14.4 %
GLPS_Avg -15.6 %
AVC_AUTO 402 msec
HR_ApLAX 75 bpm
FR_min 80 fps

Pac 2

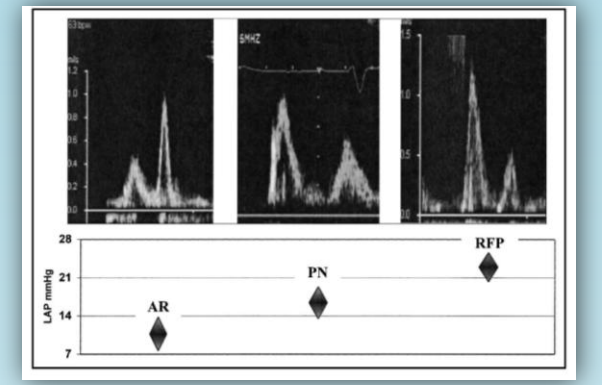
Journal of the American College of Cardiology
Volume 24, Issue 1, July 1994, Pages 132-139

Clinical study

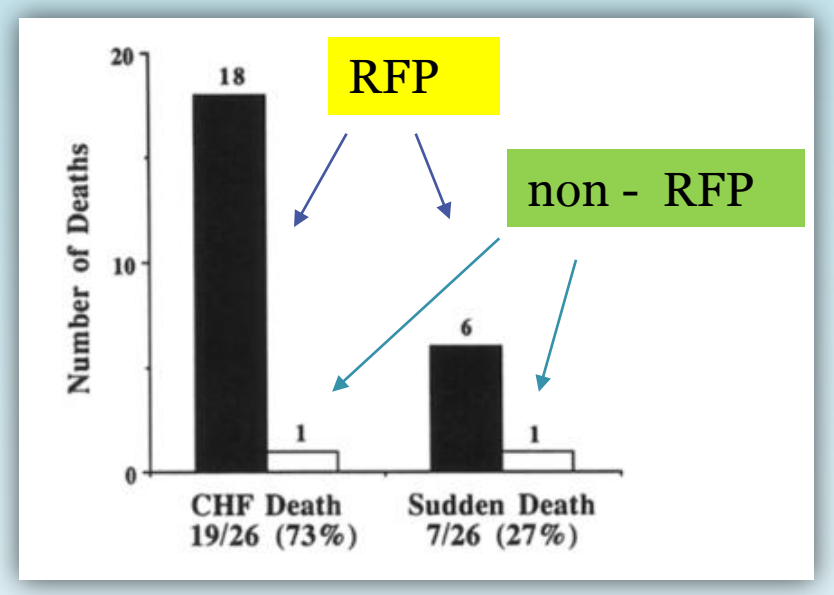
Prognostic value of Doppler transmitral flow patterns in patients with congestive heart failure ☆

Gong-Yuan Xie MD, Martin R. Berk MD, FACC, Mikel D. Smith MD, FACC, John C. Gurley MD, FACC, Anthony N. DeMaria MD, FACC

Diastolická funkce



- 1 – roční mortalita 5% vs 19% (p< 0.05)
- 2 – letá mortalita 5% vs 51% (p< 0.01)



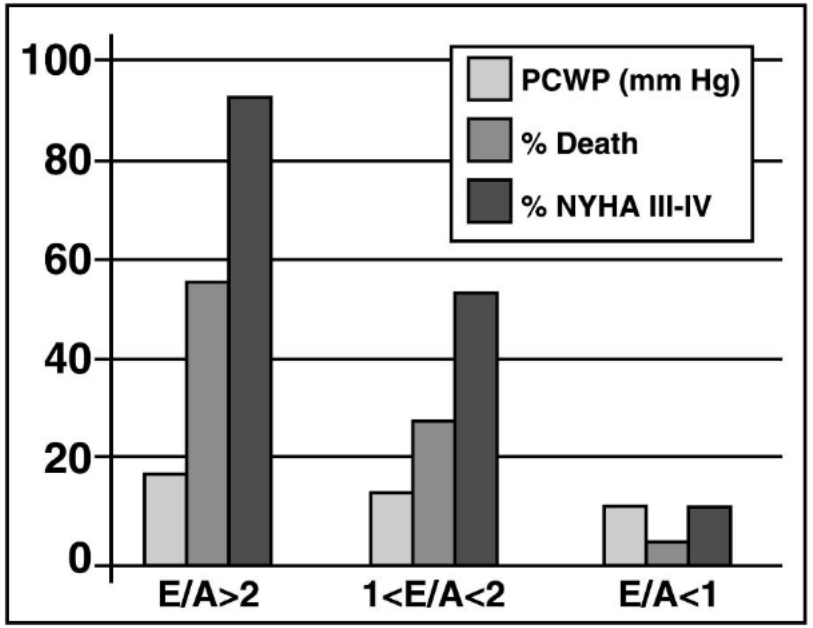
Diastolická funkce

Comparative Study > J Am Soc Echocardiogr. 2003 Apr;16(4):333-9.
doi: 10.1016/s0894-7317(02)74537-9.

Prognostic value of the atrial systolic mitral annular motion velocity in patients with left ventricular systolic dysfunction

Takashi Yamamoto [1], Takashi Oki, Hirotsugu Yamada, Hideji Tanaka, Takeo Ishimoto, Tetsuzo Wakatsuki, Tomotsugu Tabata, Susumu Ito

Figure 5. Relation of mitral inflow to clinical measures of outcome



Diastolická funkce

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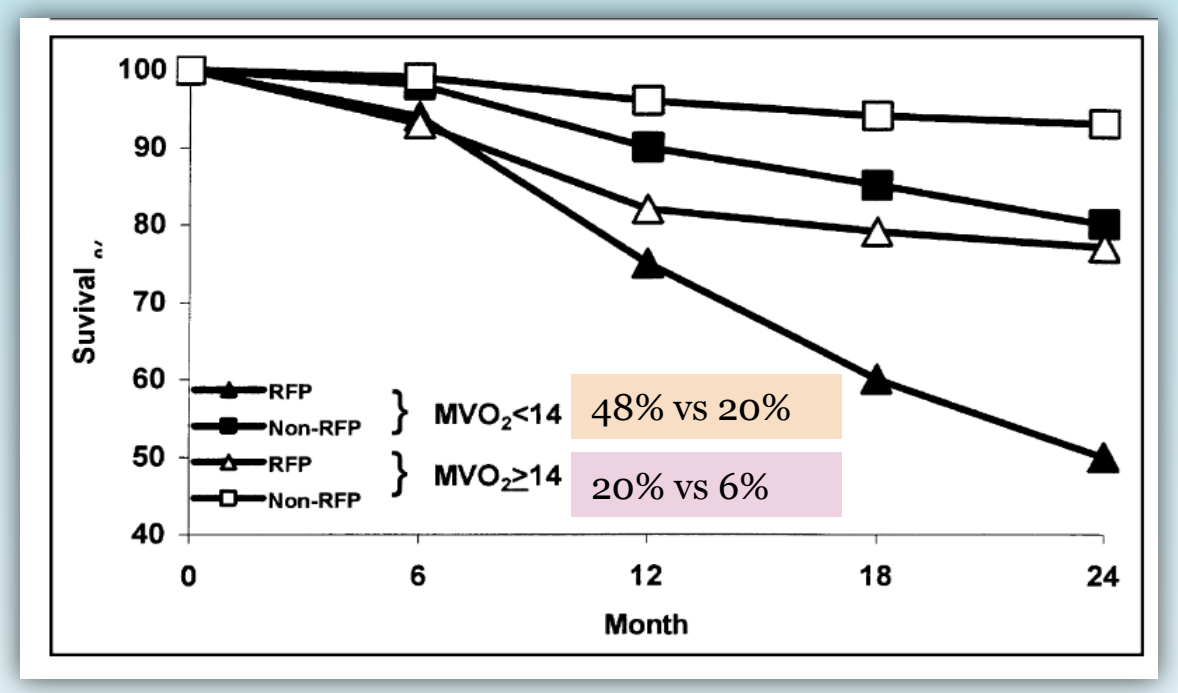
Prognostic Value of Doppler Echocardiographic Mitral Inflow Patterns: Implications for Risk Stratification in Patients With Chronic Congestive Heart Failure

Alexander Hansen, MD,* Markus Haass, MD,* Christian Zugck, MD,* Carsten Krueger, MD,* Kristina Unnebrink, PHD,† Rainer Zimmermann, MD,* Wolfgang Kuebler, MD, FACC,* Helmut Kuecherer, MD*

Heidelberg, Germany

- 311 pts



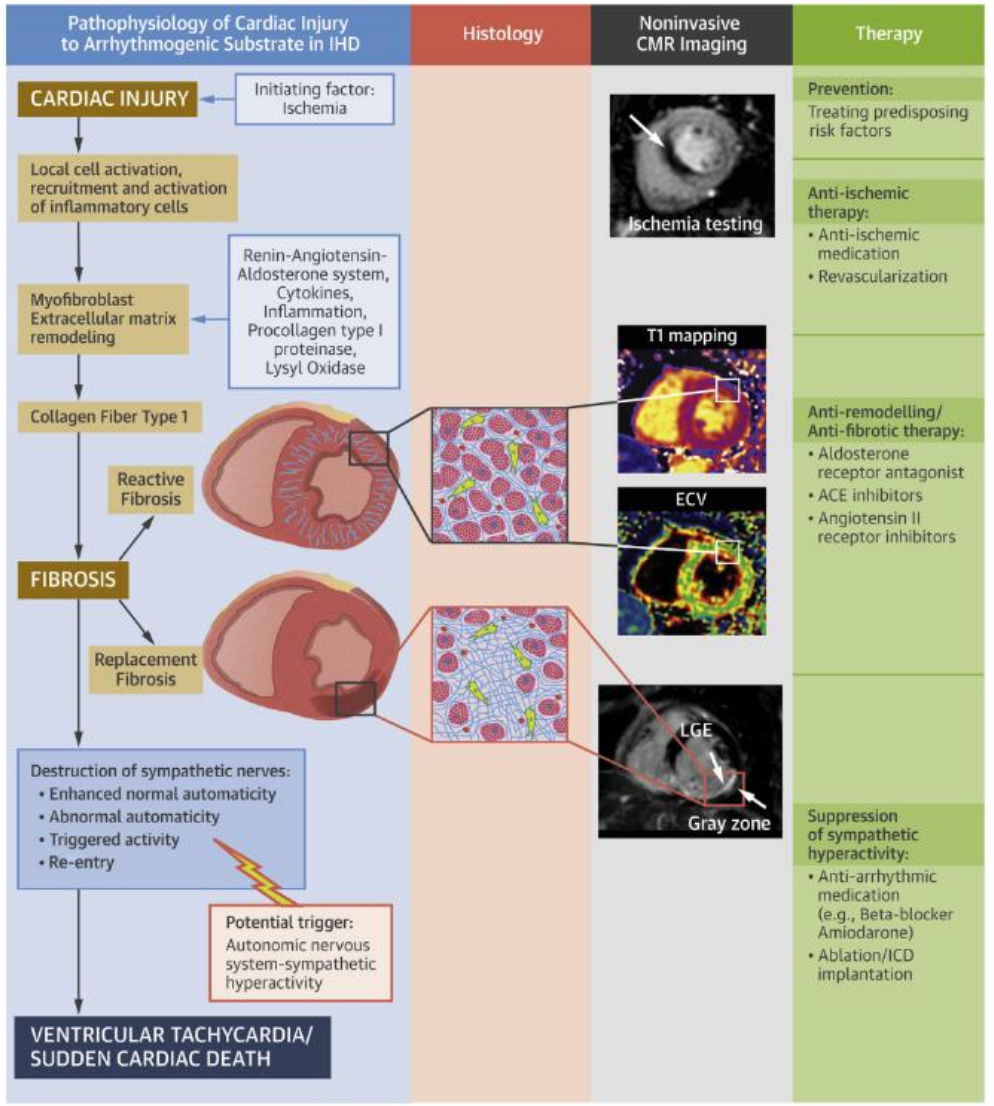
STATE-OF-THE-ART REVIEW

Sudden Cardiac Death in Ischemic Heart Disease

From Imaging Arrhythmogenic Substrate to Guiding Therapies

Christoph Gräni, MD, PhD,[a,b] Dominik C. Benz, MD,[c] Sumit Gupta, MD,[a] Stephan Windecker, MD,[b] Raymond Y. Kwong, MD, MPH[a]

CENTRAL ILLUSTRATION From Pathophysiology of Cardiac Injury to Imaging Arrhythmogenic Substrate in Ischemic Heart Disease



Improved Risk Stratification for Ventricular Arrhythmias and Sudden Death in Patients With Nonischemic Dilated Cardiomyopathy

Andrea Di Marco, MD, PhD,[a,b,c] Pamela Frances Brown, MD,[d] Joshua Bradley, BSc MRes,[d] Gaetano Nucifora, MD, PhD,[d] Eduard Claver, MD,[a,b] Fernando de Frutos, MD,[a,b] Paolo Domenico Dallaglio, MD,[a,b] Josep Comin-Colet, MD, PhD,[a,b] Ignasi Anguera, MD, PhD,[a,b] Christopher A. Miller, MD, PhD,[c,e,f] Matthias Schmitt, MD, PhD[c,d]

- 1165 pac s DKMP
- Medián follow up 36m
- 2008-2018 – Manchester a 2013-2018 Barcelona
- PE – adekvátní terapie ICD, sKT, NSS

Marco et al. Improved Risk Stratification for Ventricular Arrythmias and Sudden Death in Patients with Nonischemic Dilated Cardiomyopathy; JACC Vol. 77, No10, 2021:2890-905

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TABLE 1 Baseline Characteristics of the Study Population, Analyzed Separately According to the Presence or Absence of LGE

	All Patients (N = 1,165)	LGE- (n = 679)	LGE+ (n = 486)	p Value
Male	768 (66.0)	400 (59.0)	368 (76.0)	<0.001
Age, yrs	58 (48-68)	57 (46-66)	60 (50-69)	<0.001
Neuromuscular disease	14 (1.0)	6 (0.9)	8 (1.7)	0.28
Alcohol excess	30 (2.6)	19 (3.0)	11 (2.0)	0.57
Previous chemotherapy	47 (4.0)	32 (5.0)	15 (3.0)	0.17
Atrial fibrillation	318 (27.0)	179 (26.0)	139 (29.0)	0.40
NYHA functional class				0.005
I	465 (40.0)	291 (43.0)	174 (36.0)	
II	402 (34.0)	237 (35.0)	165 (34.0)	
III	251 (22.0)	121 (18.0)	130 (27.0)	
IV	47 (4.0)	30 (4.0)	17 (3.0)	
NYHA functional class >II	298 (26.0)	151 (22.0)	147 (30.0)	0.002
Wide QRS (>120 ms)	517 (44.0)	308 (45.0)	209 (43.0)	0.42
CMR parameters				
LVEF, %	39 (30-46)	42 (34-47)	35 (26-44)	<0.001
LVEDVi, ml/m^2	118 (99-142)	110 (96-133)	129 (106-158)	<0.001
LVESVi, ml/m^2	69 (55-95)	63 (52-83)	82 (61-110)	<0.001
RVEF, %	54 (46-61)	55 (47-61)	53 (42-61)	0.002
Medical treatment				
Beta-blockers	943 (81.0)	536 (79.0)	407 (83.0)	0.04
ACE inhibitors/ARBs	969 (83.0)	555 (82.0)	414 (85.0)	0.12
MRA	572 (49.0)	293 (43.0)	279 (57.0)	<0.001
Loop diuretics	505 (41.0)	265 (39.0)	240 (49.0)	<0.001
Devices				
ICD	246 (21.0)	73 (11.0)	173 (36.0)	<0.001
ICD primary prevention	218 (19.0)	71 (10.0)	147 (30.0)	<0.001
ICD secondary prevention	28 (2.0)	2 (0.3)	26 (5.0)	<0.001
CRT-D or CRT-P	204 (18.0)	90 (13.0)	114 (23.0)	<0.001
Follow-up, months	36 (20-58)	36 (20-58)	36 (19-58)	0.26

Marco et al. Improved Risk Stratification for Ventricular Arrythmias and Sudden Death in Patients with Nonischemic Dilated Cardiomyopathy; JACC Vol. 77, No10, 2021:2890-905

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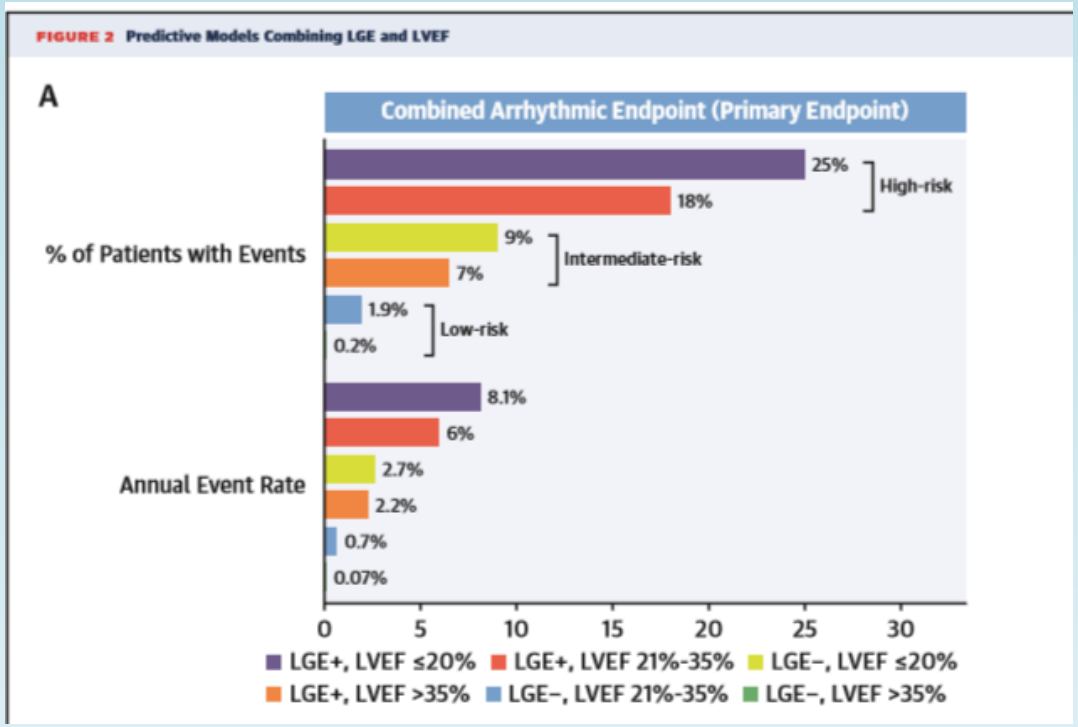

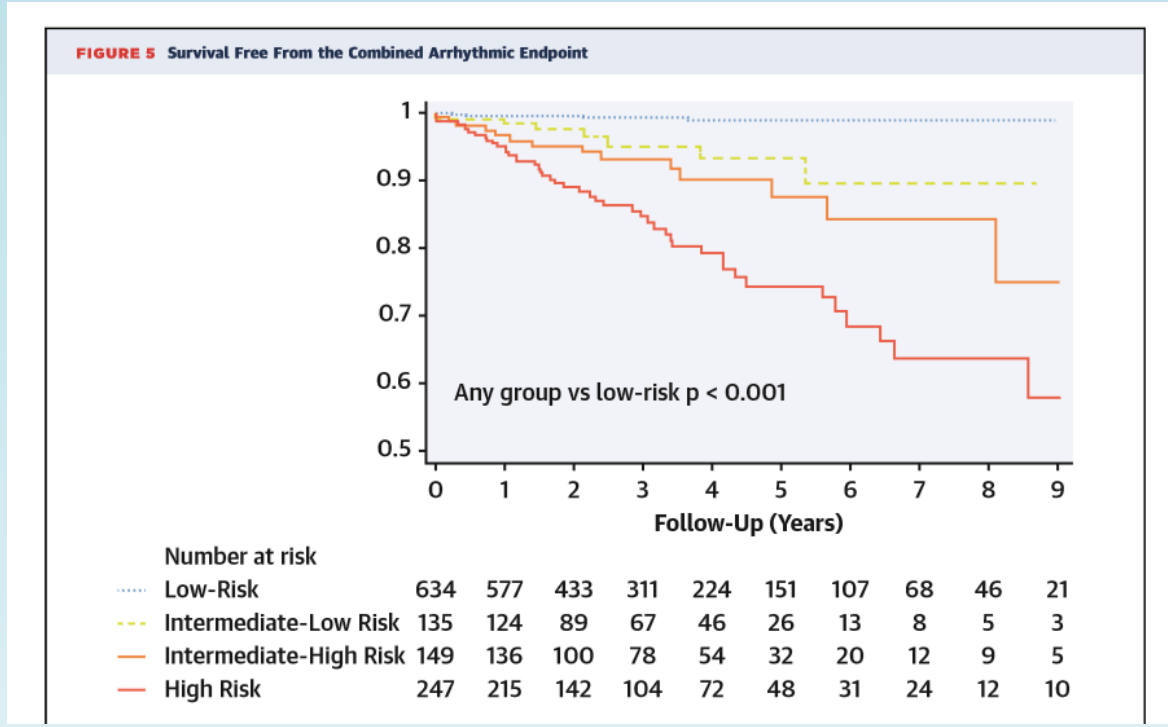

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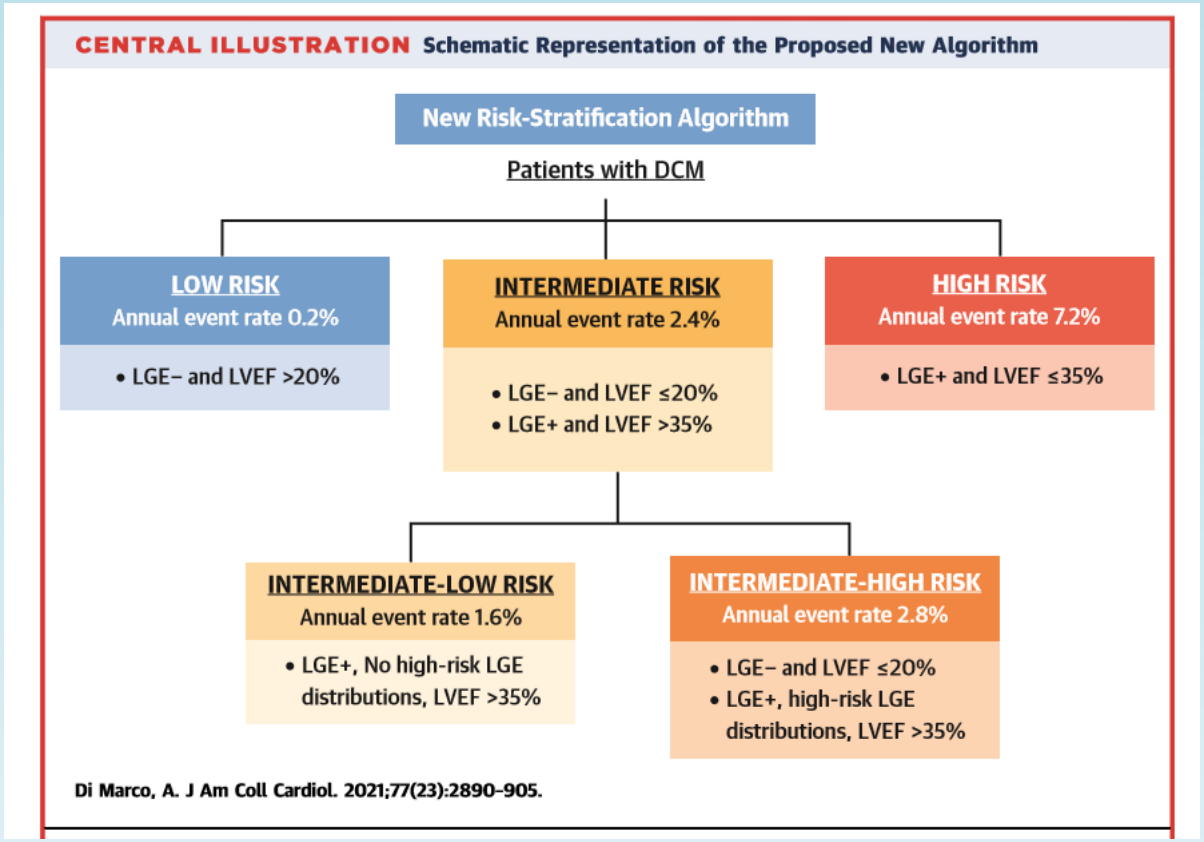


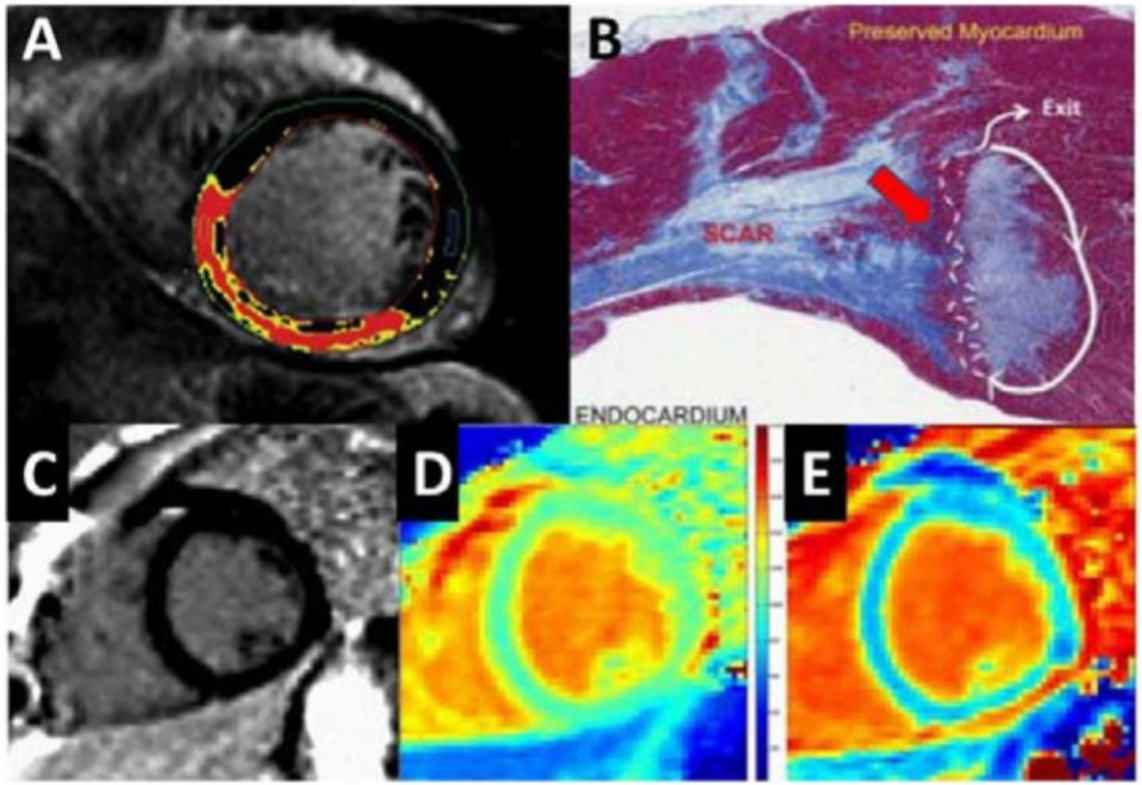
Imaging for sudden cardiac death risk stratification: Current perspective and future directions☆

Pieter van der Bijl, Victoria Delgado, Jeroen J. Bax *

Department of Cardiology, Heart Lung Center, Leiden University Medical Center

Table 1
Summary of cardiac imaging techniques employed for risk-stratification of sudden cardiac death, with clinical examples. Only examples which are specifically relevant to target groups discussed in the section on Future Directions, are listed here.

Substrate	Imaging modality	Technique	Clinical example
Fibrosis (direct)	CMR	LGE	HCM
		Grey zone	ICM
		T_1 mapping	NICM
		ECV	NICM
		Strain	NICM
Fibrosis (indirect)	Echocardiography	MD	ICM
		Strain	ICM
		LVMD	ICM



ZÁVĚRY

- Serologie – trop T, NT pro BNP, CRP [1]
- EKG – SAECG, trvání QRS, T –wave alternans.. [2]
- ECHO – GLS [3]
- MRI – LGE, T1 mapping, ECV [4]
- Genetické vyšetření (titin, lamin,filamin..)

1 Nakamura et al, Cardiac troponin T as a predictor of cardiac death in patients with left ventricular dysfunction. J Arrhythm. 2017;33(4): 463-8

2 Marume et al. Mortality and Sudden Cardiac Death Risk Stratification Using the Noninvasive Combination of Wide QRS Duration and Late Gadolinium Enhancement in Idiopathic Dilated Cardiomyopathy. Circ Arrythm Electrophysiol. 2018;11(4):e006233.

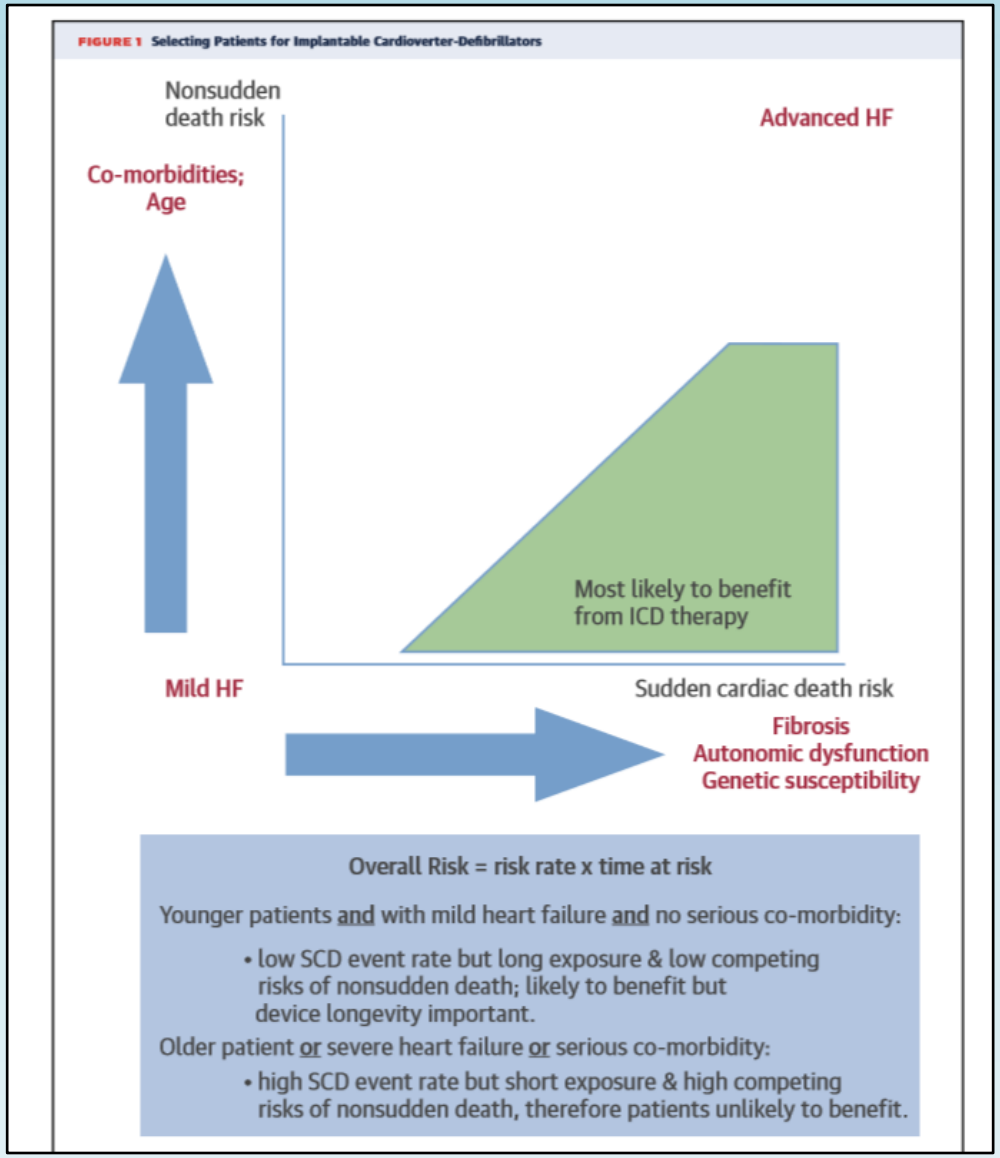
[3] PARK et al. GLS to Predict Mortality in Patients with Acute Heart Failure; JACC Vol. 71, No18, 2018:1947-57

[4] Pieter van der Bijl et al. Imaging for sudden cardiac death risk stratification: current perspective and future directions; Progress in CV Disease 62 (2019) 205-2011

Selecting Patients With Nonischemic Dilated Cardiomyopathy for ICDs

Myocardial Function, Fibrosis, and What's Attached?*

John G.F. Cleland, MD,[a,b] Brian P. Halliday, MBChB,[c] Sanjay K. Prasad, MD[c]



DĚKUJI ZA POZORNOST