ICD bij non-ischemisch hartfalen

Dr. Alexander Maass – cardioloog
UMC Groningen

HARTFALEN ACADEMIE NEDERLAND

CVGK

Disclosures

Potentiële belangenverstrengeling	
Voor presentatie mogelijk relevante relaties:	
Sponsoring of onderzoeksgeld	Medtronic/Boston Scientific (naar de afdeling)
Honorarium of andere (financiële) vergoeding	
Aandeelhouder	
Andere relatie, namelijk …	Projectleider zorgevaluatie project ICDs

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Wat zeggen de ESC-richtlijnen?

Recommendations for device therapy in HFrEF			
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.	IIa	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), and an LVEF ≤35% despite ≥3 months of OMT, provided they are expected to survive substantially longer than 1 year with good functional status, and they have DCM.	I

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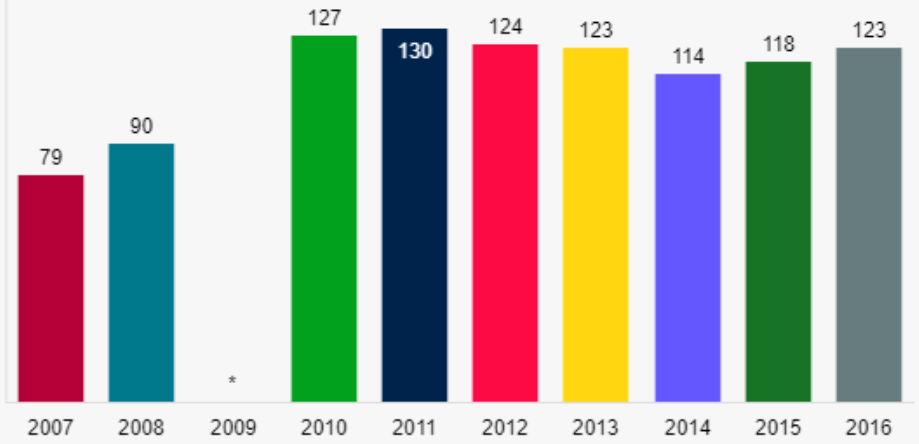
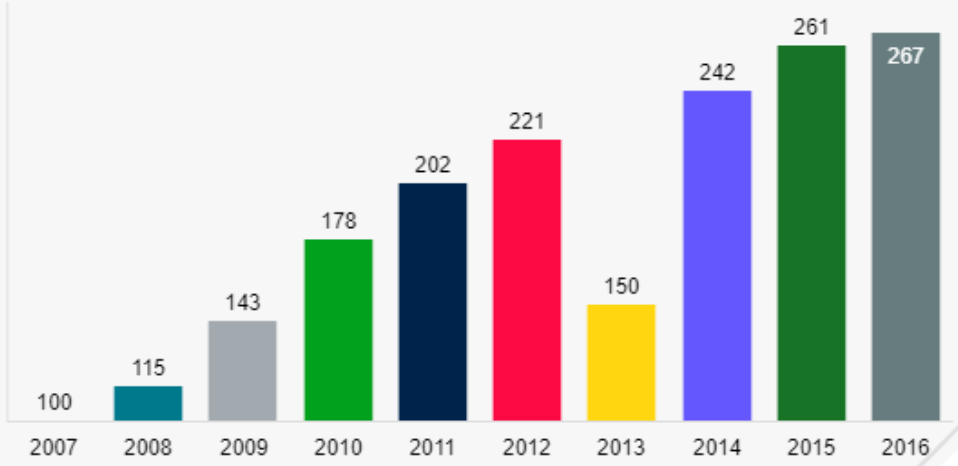
Implantaties NL/Duitsland (per miljoen inwoners)

ICD

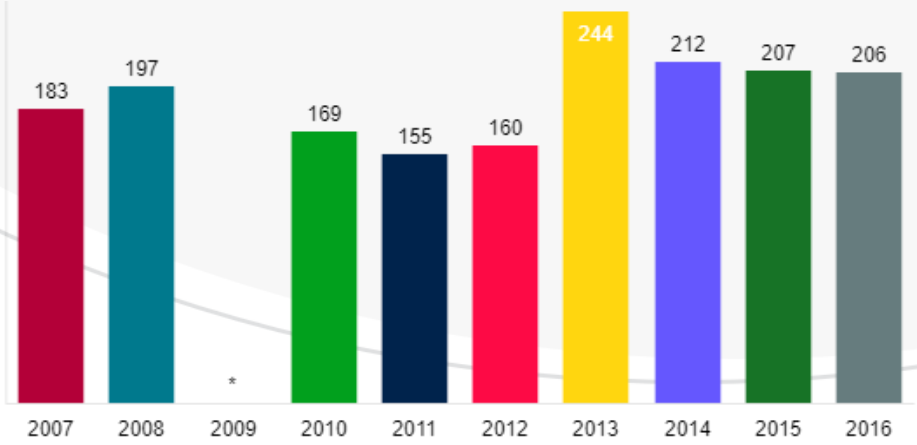
CRT

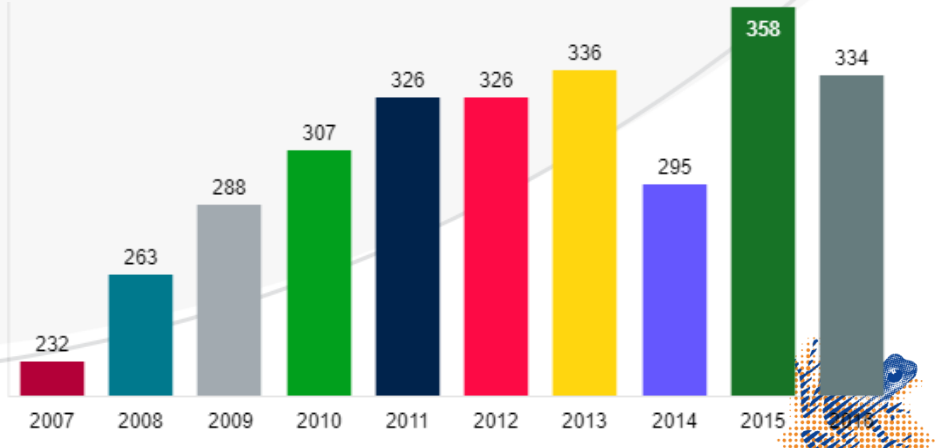
NL





D





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The NEW ENGLAND JOURNAL of MEDICINE

ORIGINAL ARTICLE

Defibrillator Implantation in Patients with Nonischemic Systolic Heart Failure

Lars Køber, M.D., D.M.Sc., Jens J. Thune, M.D., Ph.D.,
Jens C. Nielsen, M.D., D.M.Sc., Jens Haarbo, M.D., D.M.Sc.,
Lars Videbæk, M.D., Ph.D., Eva Korup, M.D., Ph.D., Gunnar Jensen, M.D., Ph.D.,
Per Hildebrandt, M.D., D.M.Sc., Flemming H. Steffensen, M.D.,
Niels E. Bruun, M.D., D.M.Sc., Hans Eiskjær, M.D., D.M.Sc., Axel Brandes, M.D.,
Anna M. Thøgersen, M.D., Ph.D., Finn Gustafsson, M.D., D.M.Sc.,
Kenneth Egstrup, M.D., D.M.Sc., Regitze Videbæk, M.D.,
Christian Hassager, M.D., D.M.Sc., Jesper H. Svendsen, M.D., D.M.Sc.,
Dan E. Høfsten, M.D., Ph.D., Christian Torp-Pedersen, M.D., D.M.Sc., and
Steen Pehrson, M.D., D.M.Sc., for the DANISH Investigators*

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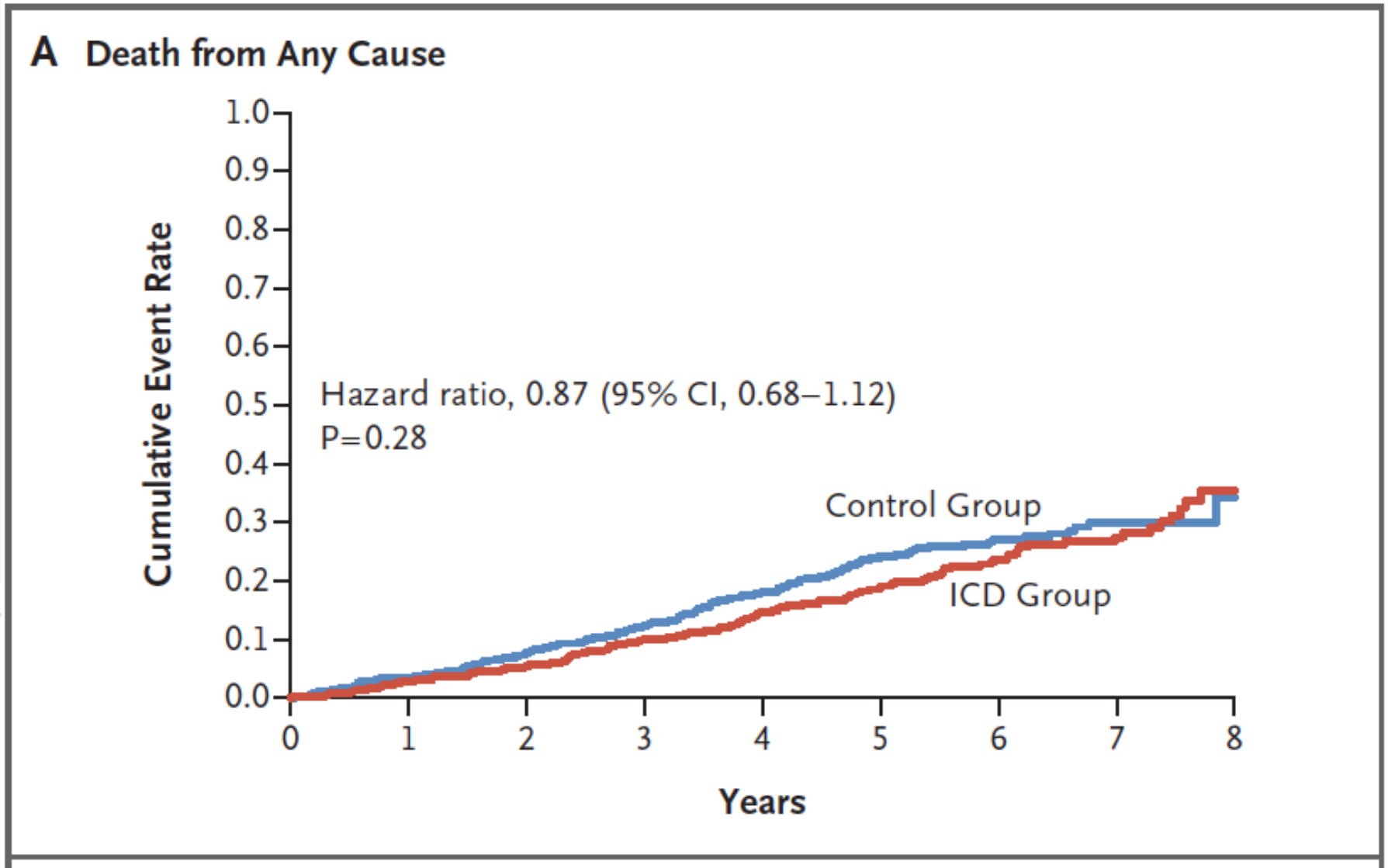
Geen reductie in all-cause mortaliteit



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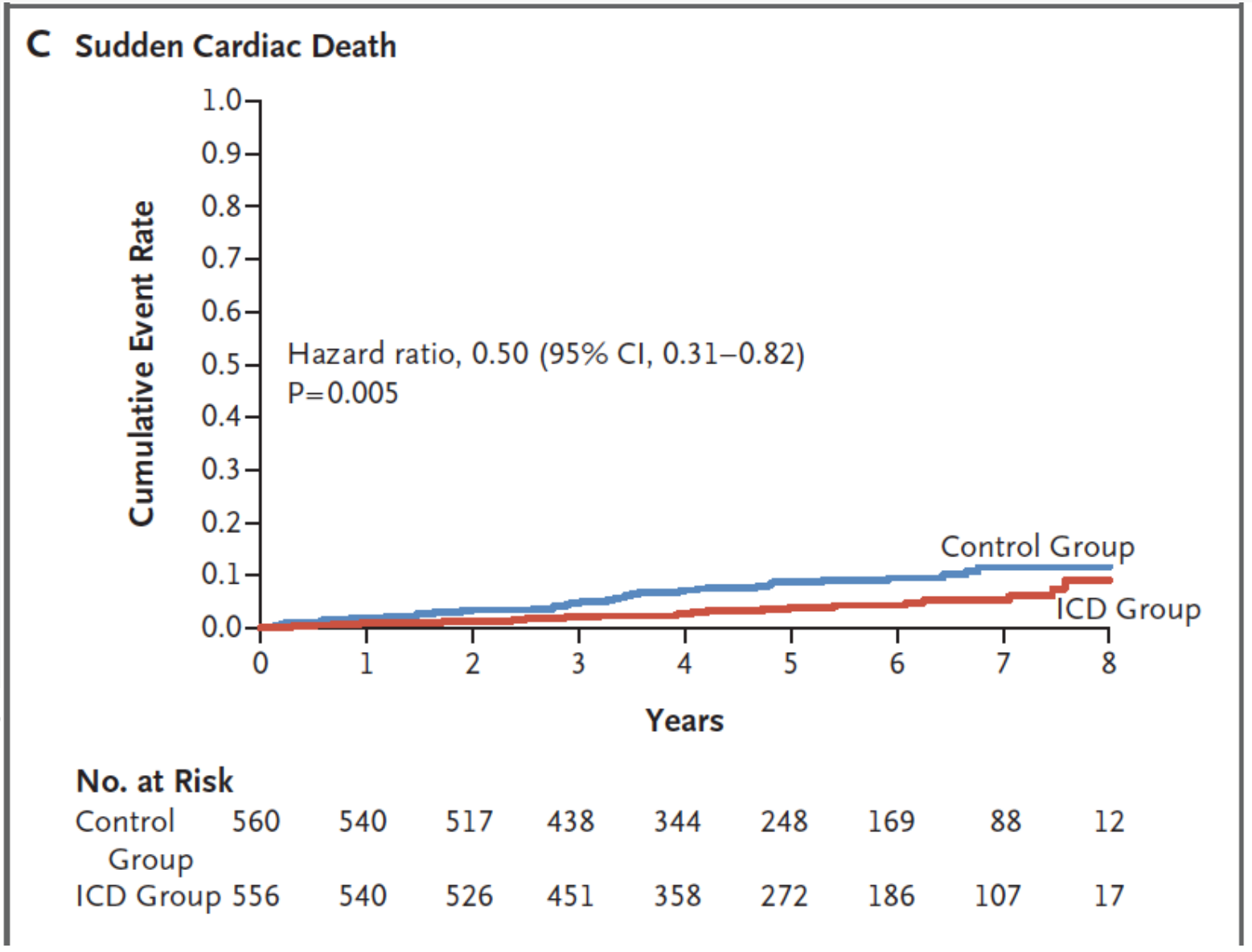
Wel reductie van plotse dood



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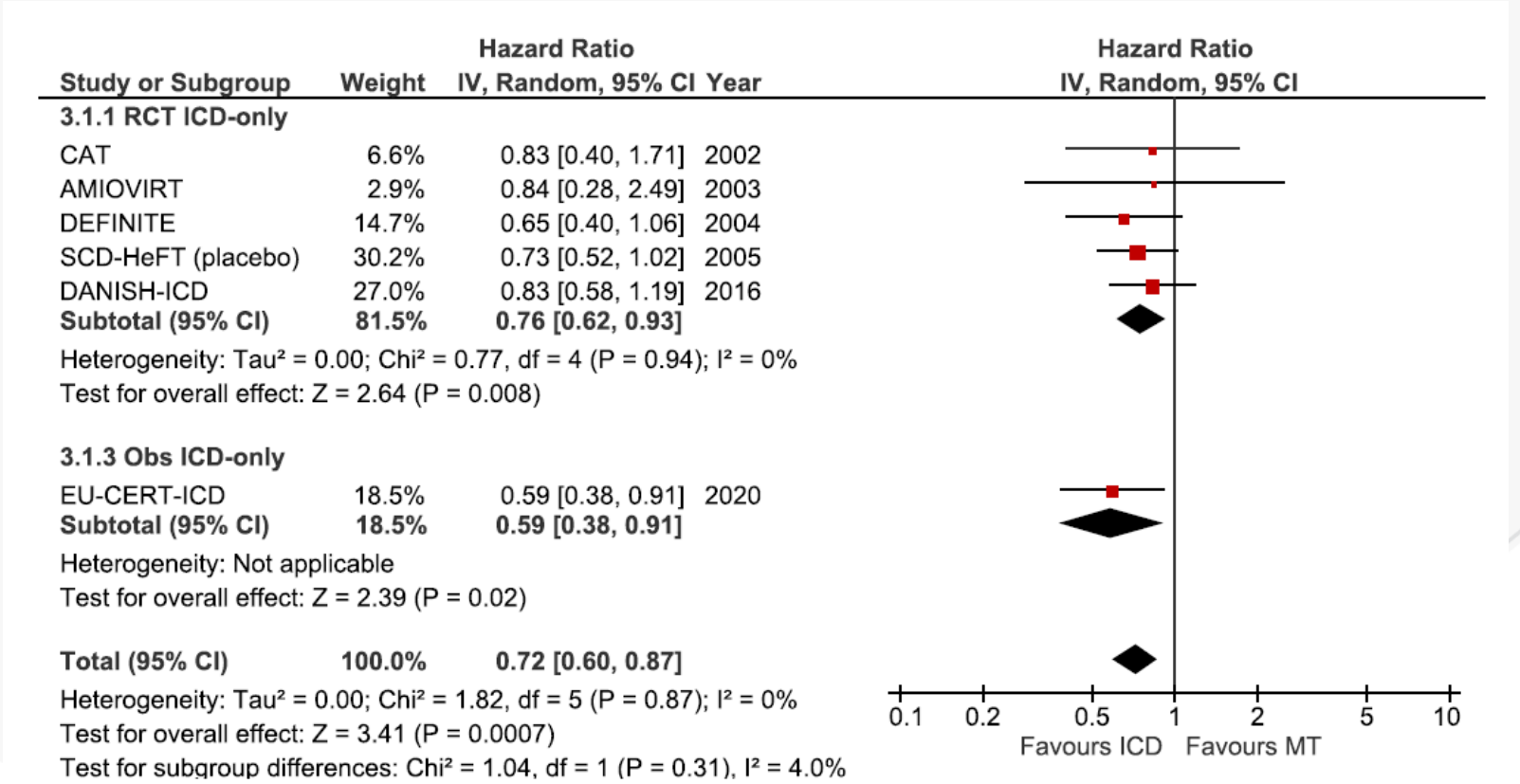
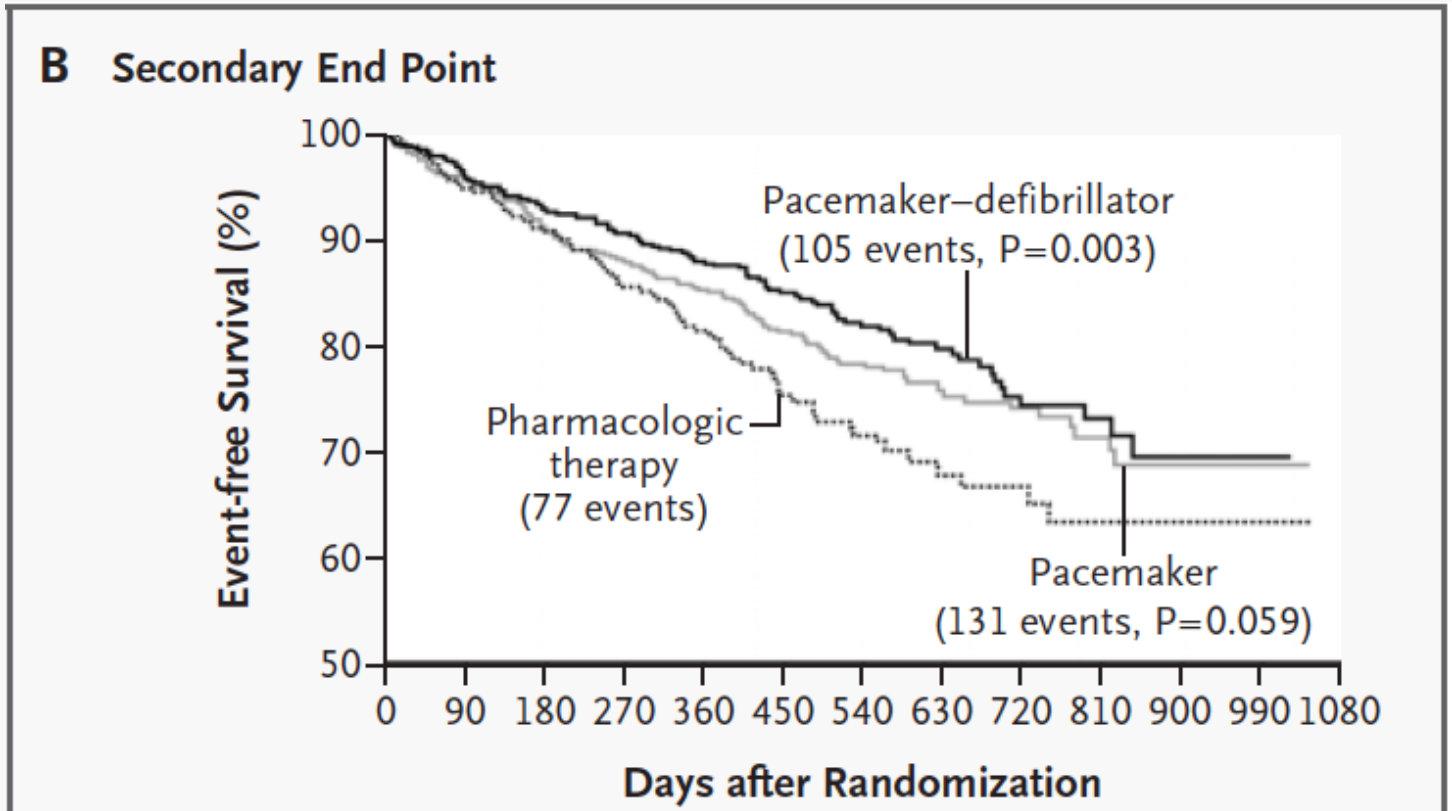
Meta-analysis demonstrates advantage of ICD in DCM



Theuns et al. NHJ 2023

COMPANION: geen significant verschil tussen CRT-D en CRT-P



No. at Risk

Pharmacologic therapy	308	284	255	217	186	141	94	57	45	25	4	2
Pacemaker	617	579	520	488	439	355	251	164	104	60	25	5
Pacemaker–defibrillator	595	555	517	470	420	331	219	148	95	47	21	1

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Geen reductie van all-cause mortaliteit CRT-D vs CRT-P in DANISH

CRT				
No	58/234	65/237	0.83 (0.58–1.19)	0.31
Yes	62/322	66/323	0.91 (0.64–1.29)	0.59

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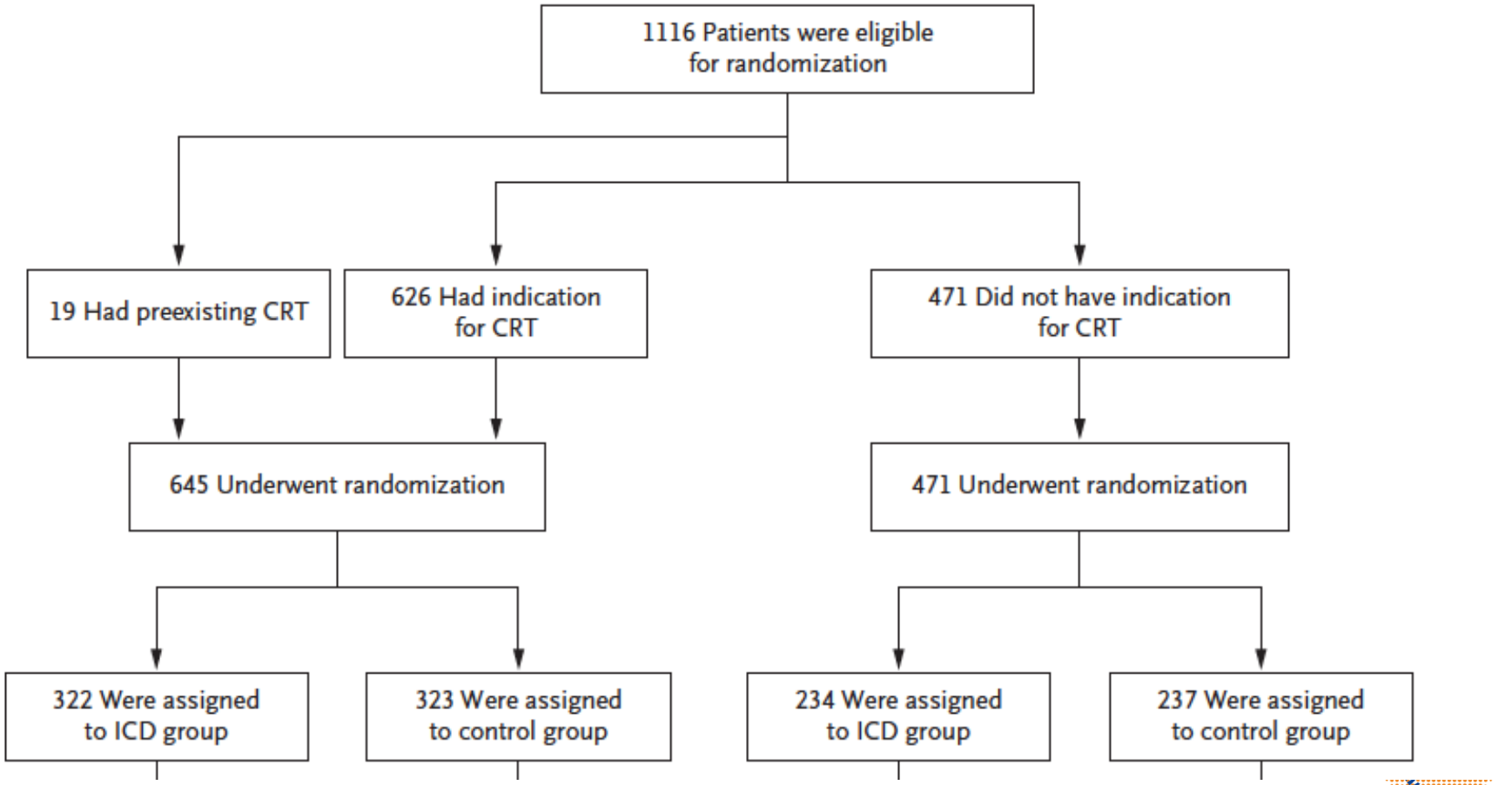
DANISH voornamelijk CRT



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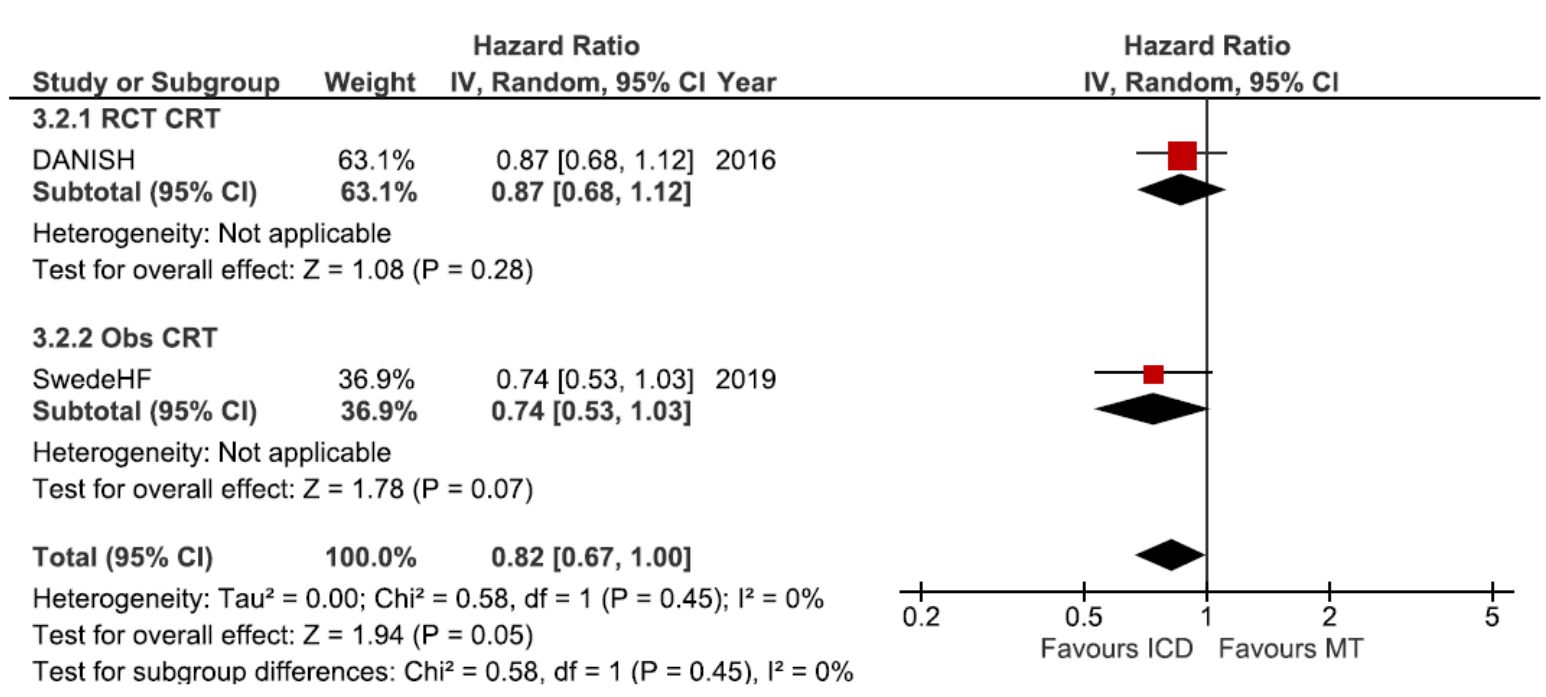
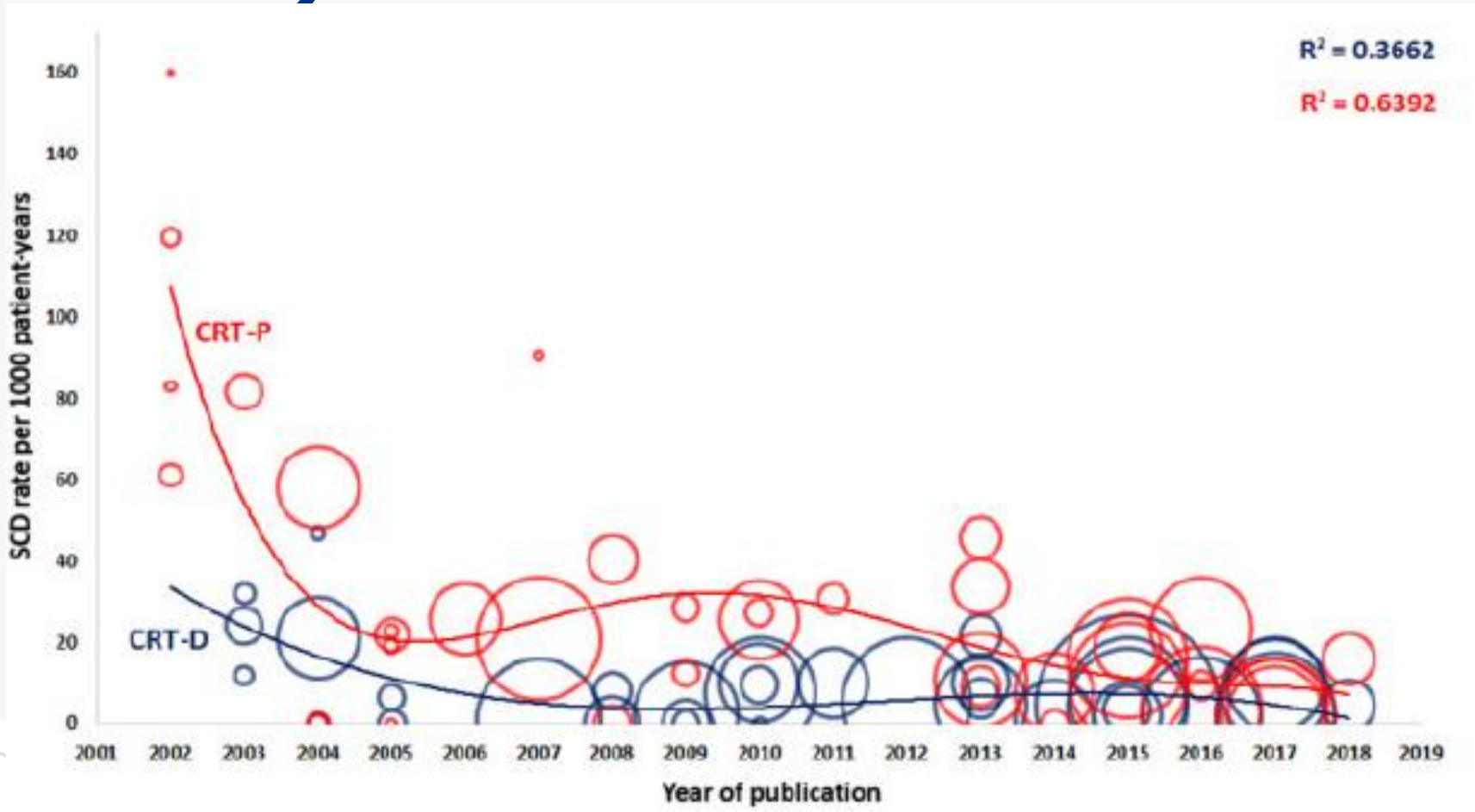
Meta-analysis demonstrates advantage of CRT-D vs CRT-P in DCM



Theuns et al. NHJ 2023

Overzicht van mortaliteit grote hartfalen (medicatie) studies



Barra et al. EHJ 2020

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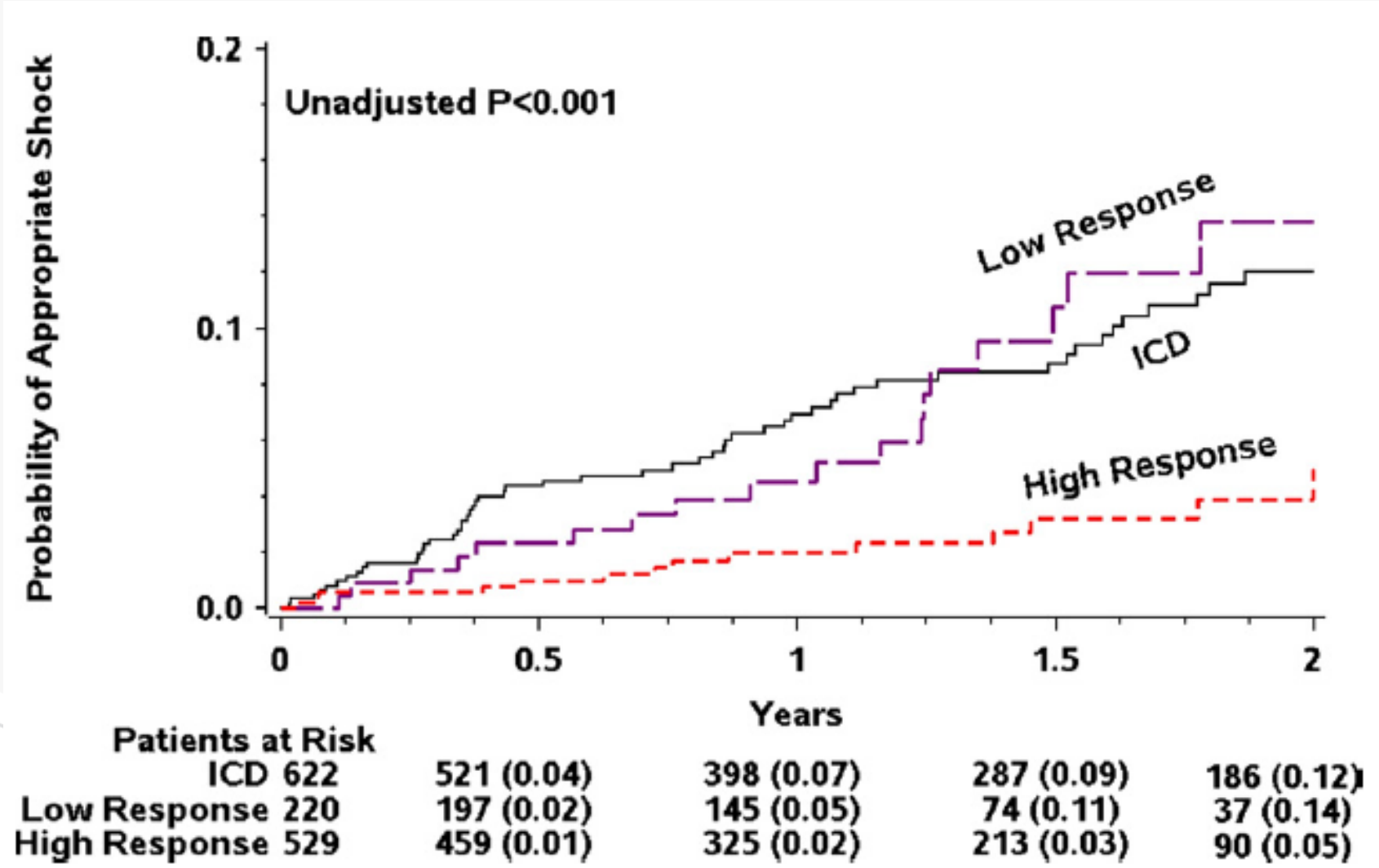
MADIT-CRT subanalyse



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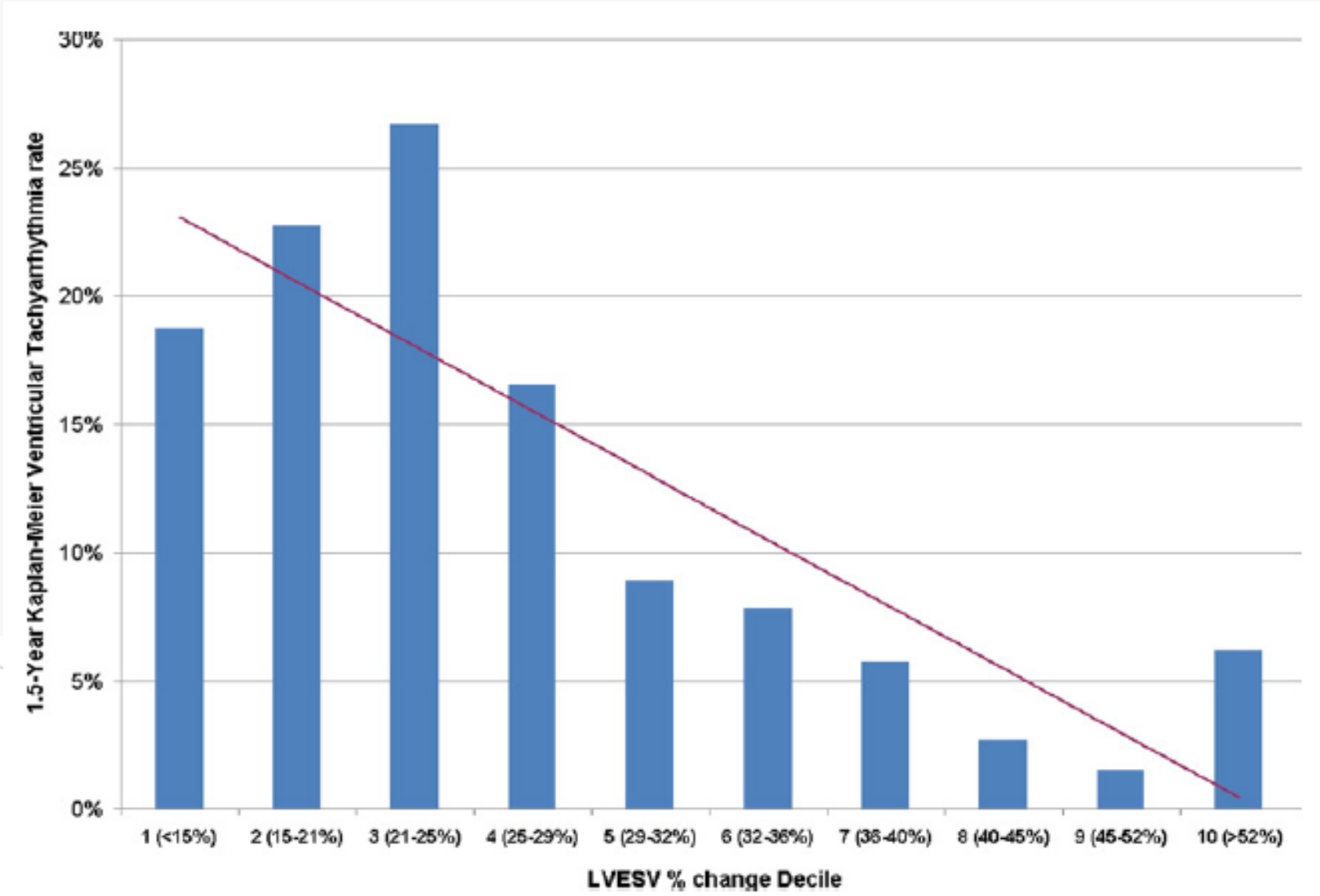
Barshenet et al. JACC 2011

Lineaire relatie verbetering LV functie en VA



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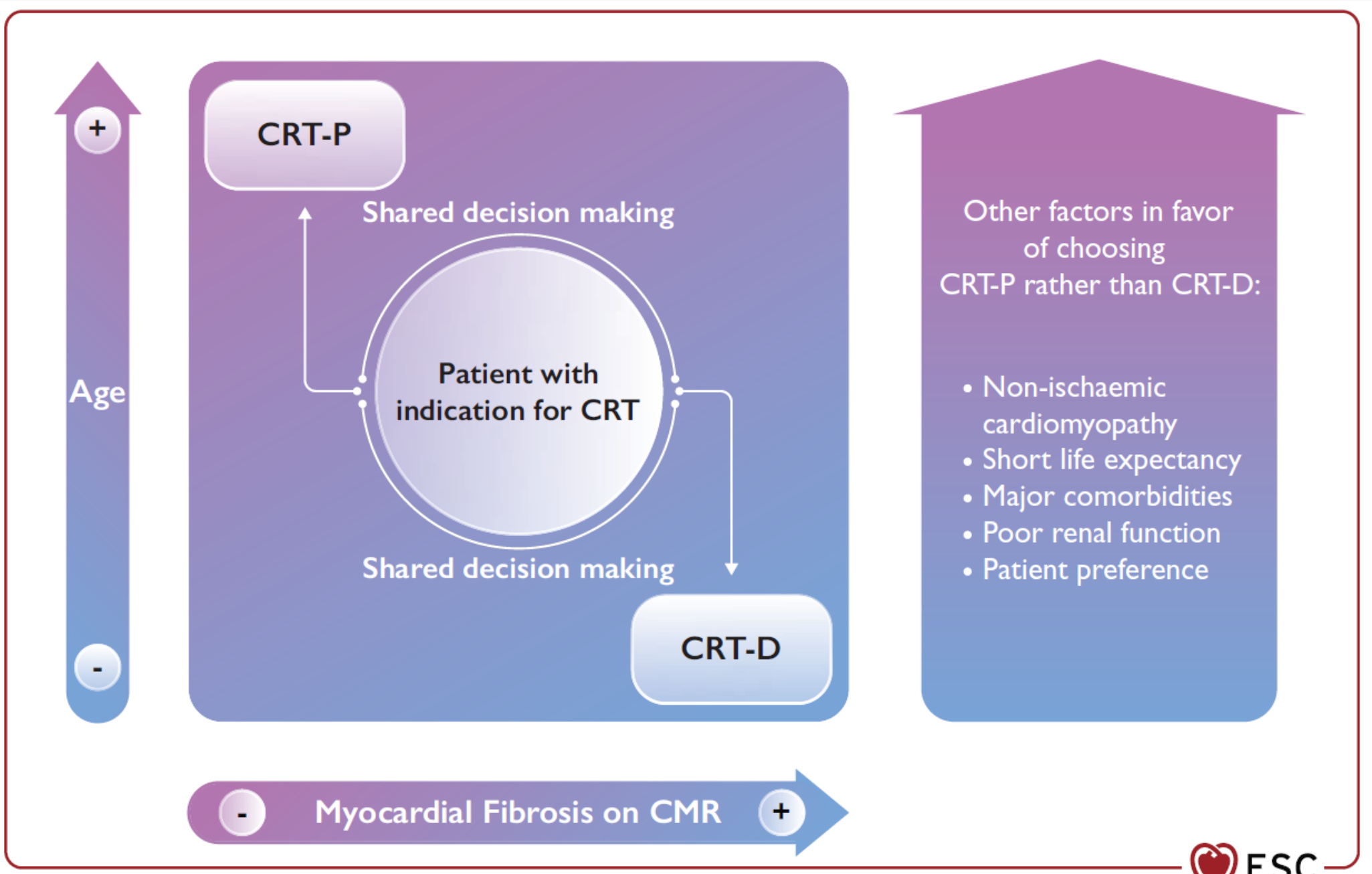
+
Age
-
CRT-P
Shared decision making
Patient with indication for CRT
Shared decision making
CRT-D
Other factors in favor of choosing CRT-P rather than CRT-D:
• Non-ischaemic cardiomyopathy
• Short life expectancy
• Major comorbidities
• Poor renal function
• Patient preference
-
Myocardial Fibrosis on CMR
+

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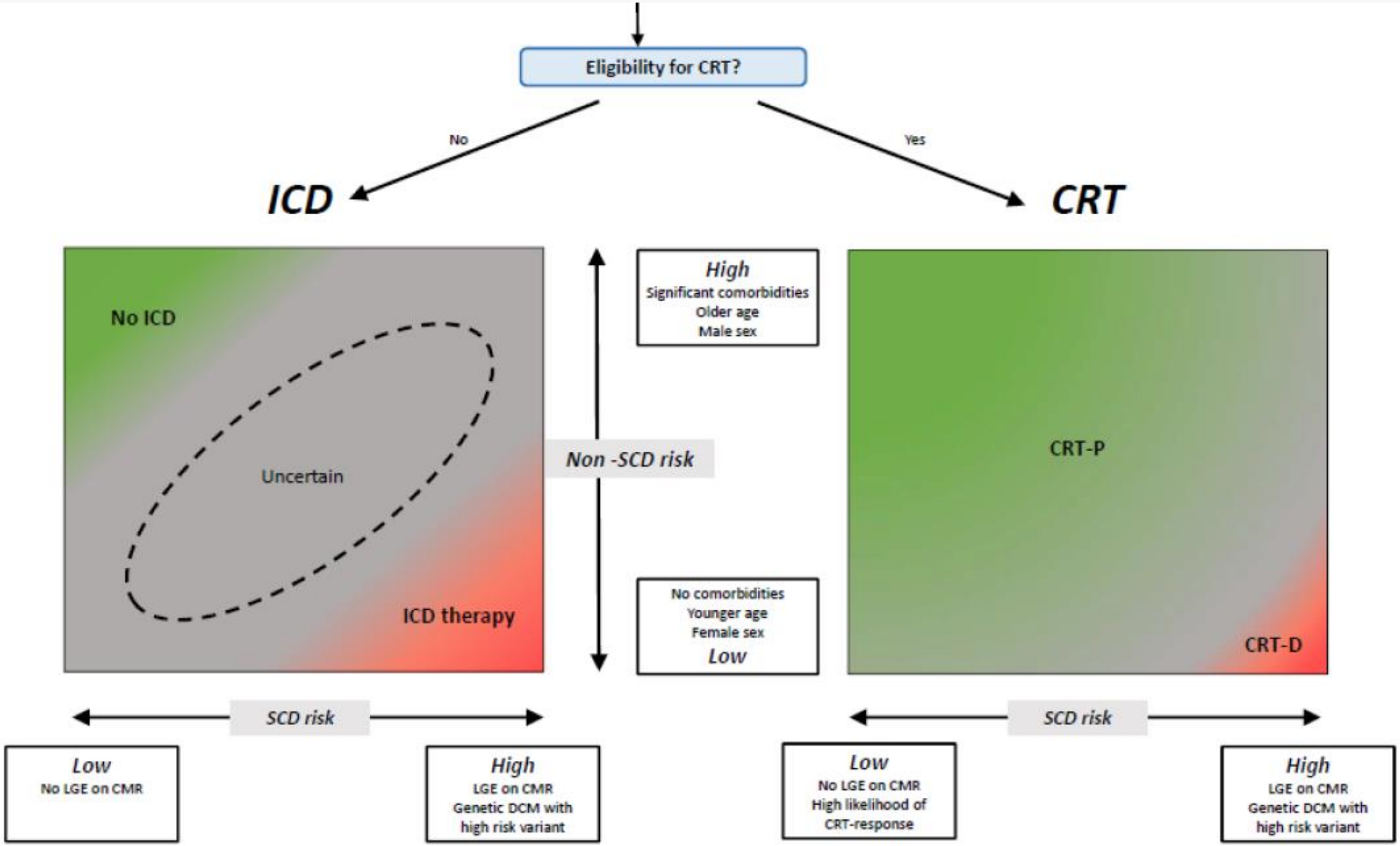
ESC


Eligibility for CRT?
No
Yes
ICD
CRT
No ICD
Uncertain
ICD therapy
High
Significant comorbidities
Older age
Male sex
Non -SCD risk
No comorbidities
Younger age
Female sex
Low
CRT-P
CRT-D
SCD risk
SCD risk
Low
No LGE on CMR
High
LGE on CMR
Genetic DCM with
high risk variant
Low
No LGE on CMR
High likelihood of
CRT-response
High
LGE on CMR
Genetic DCM with
high risk variant

ESC European Society of Cardiology

Europace (2021) **23**, 1072–1083
doi:10.1093/europace/euaa401

CLINICAL RESEARCH
Sudden death and ICDs

CarDiac magnEtic Resonance for prophylactic Implantable-cardioVerter defibrillAtor ThErapy in Non-Ischaemic dilated CardioMyopathy: an international Registry

Andrea Igoren Guaricci[1†], Pier Giorgio Masci[2†], Giuseppe Muscogiuri[3‡], Marco Guglielmo[3‡], Andrea Baggiano[3‡], Laura Fusini[3], Valentina Lorenzoni[4], Chiara Martini[5§], Daniele Andreini[3‡], Anna Giulia Pavon[6], Giovanni D. Aquaro[7], Andrea Barison[7], Giancarlo Todiere[7], Mark G. Rabbat[8], Emily Tat[8], Claudia Raineri[9], Adele Valentini[10], Akos Varga-Szemes[11], U. Joseph Schoepf[11], Carlo N. De Cecco[11,12], Jan Bogaert[13], Monica Dobrovie[13], Rolf Symons[13], Marta Focardi[14], Annalaura Gismondi[14], Jordi Lozano-Torres[15], Josè F. Rodriguez-Palomares[15,16], Chiara Lanzillo[17], Mauro Di Roma[17], Claudio Moro[18], Gabriella Di Giovine[19], Davide Margonato[19], Manuel De Lazzari[20], Martina Perazzolo Marra[20], Alberto Nese[21], Grazia Casavecchia[22], Matteo Gravina[23], Francesca Marzo[24], Samuela Carigi[24], Silvia Pica[25], Massimo Lombardi[25], Stefano Censi[26], Angelo Squeri[26], Alessandro Palumbo[5], Nicola Gaibazzi[27], Giovanni Camastra[28], Stefano Sbarbati[29], Patrizia Pedrotti[30], Ambra Masi[30], Nazario Carrabba[31], Silvia Pradella[32], Mauro Timpani[33], Gloria Cicala[5§], Cristina Presicci[5§], Sara Puglisi[5§], Nicola Sverzellati[5§], Vincenzo Ezio Santobuono[1], Mauro Pepi[3], Juerg Schwitter[6,34†], and Gianluca Pontone[3,*,†,‡]

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Dilatatie en fibrose voorspellen ICD-therapie

Table 4 Multivariable predictors of primary and secondary endpoint in the derivation cohort

	Primary endpoint		Secondary endpoint	
	HR (95%CI)	*P*-value	HR (95%CI)	*P*-value
Demographic characteristics				
Age (years) (per 1 year)	1.036 (1.017–1.056)	<0.001	–	–
Male	–	–	2.131 (1.231–3.690)	0.007
TTE				
LVEF <35%	–	–	1.336 (0.806–2.215)	0.261
CMR functional evaluation				
LVEDVi > 120.5 mL/m^2	–	–	3.161 (1.750–5.709)	<0.001
CMR LGE evaluation				
Prevalence of midwall LGE in >3 segments	2.077 (1.211–3.562)	0.008	1.693 (1.084–2.644)	0.021

CMR, cardiac magnetic resonance; LGE, late gadolinium enhancement; LVEF, left ventricle ejection fraction; LVESVi, left ventricle end-systolic volume index; TTE, transthoracic echocardiography.

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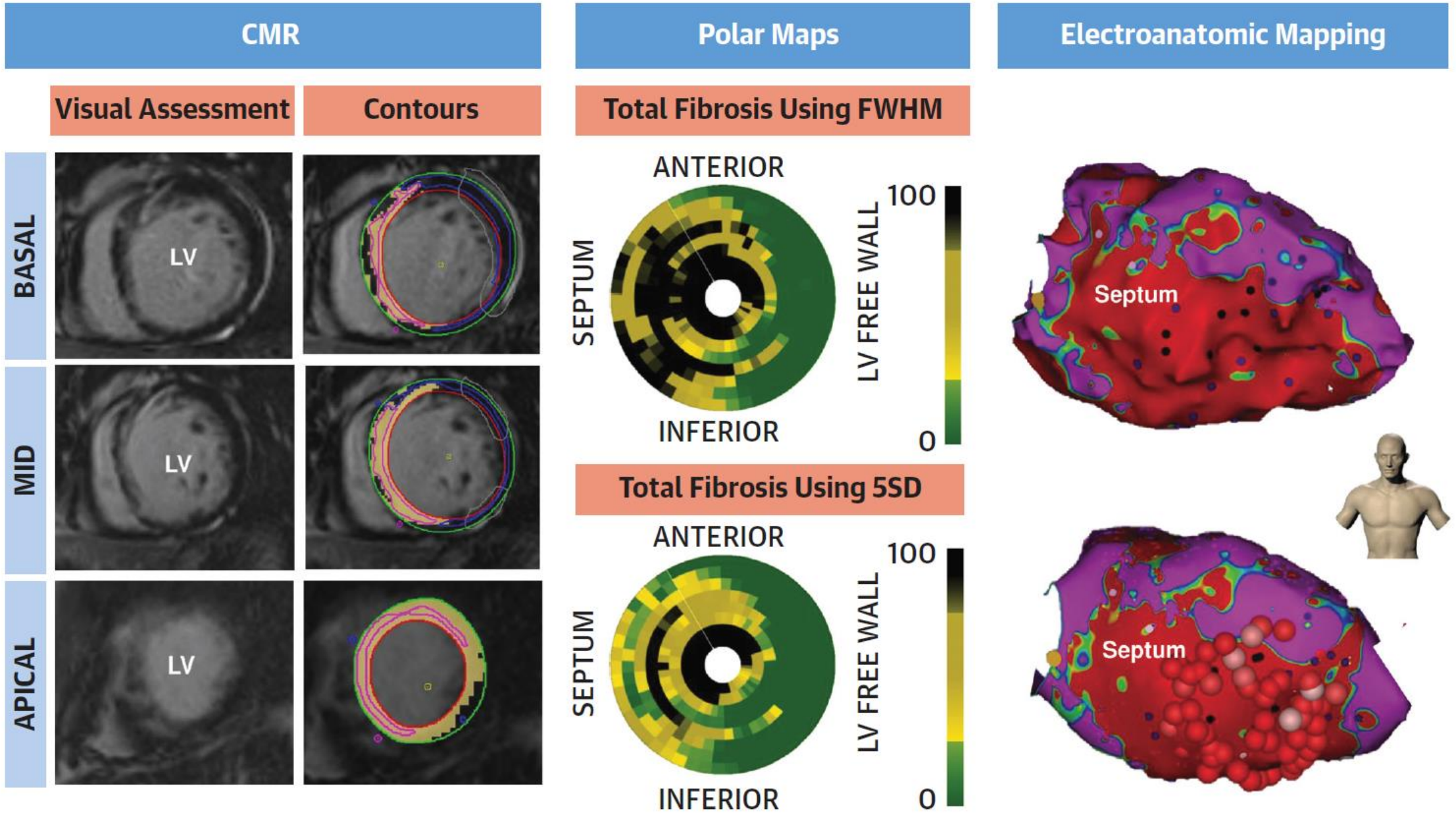
JOURNAL OF THE AMERICAN COLLEGE OF CARDIOLOGY VOL. 79, NO. 7, 2022

PUBLISHED BY ELSEVIER

Myocardial Fibrosis Predicts Ventricular Arrhythmias and Sudden Death After Cardiac Electronic Device Implantation

Francisco Leyva, MD,[a] Abbasin Zegard, MBChB,[a,b] Osita Okafor, MBChB,[a,b] Paul Foley, MD,[c] Fraz Umar, MBChB,[d] Robin J. Taylor, MD,[e] Howard Marshall, MD,[b] Berthold Stegemann, PhD,[a] William Moody, MD,[b] Richard P. Steeds, PhD,[b] Brian P. Halliday, MD,[f] Daniel J. Hammersley, MBChB,[f] Richard E. Jones, MBChB,[f] Sanjay K. Prasad, MD,[f] Tian Qiu, PhD[b]

FIGURE 1 Cardiovascular Magnetic Resonance



Visuele en greyzone fibrose voorspellen

FIGURE 3 Events: Primary and Secondary Endpoints

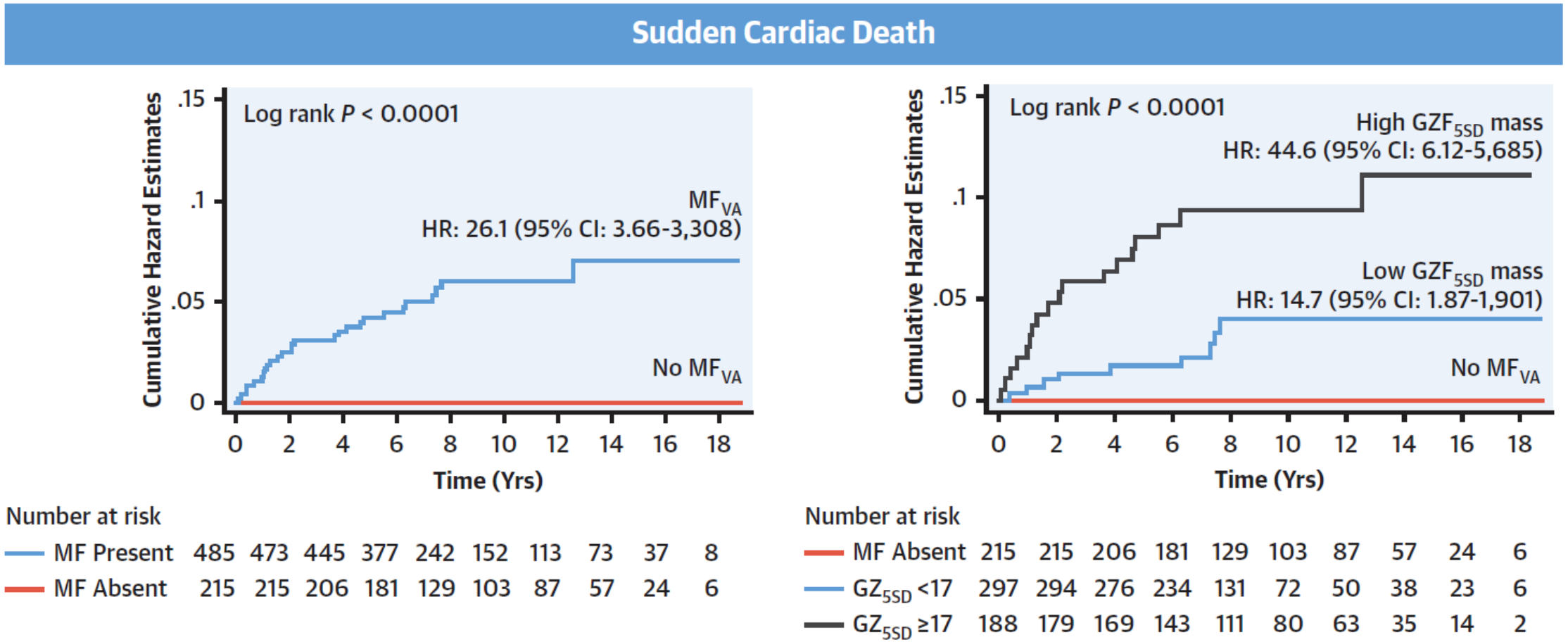
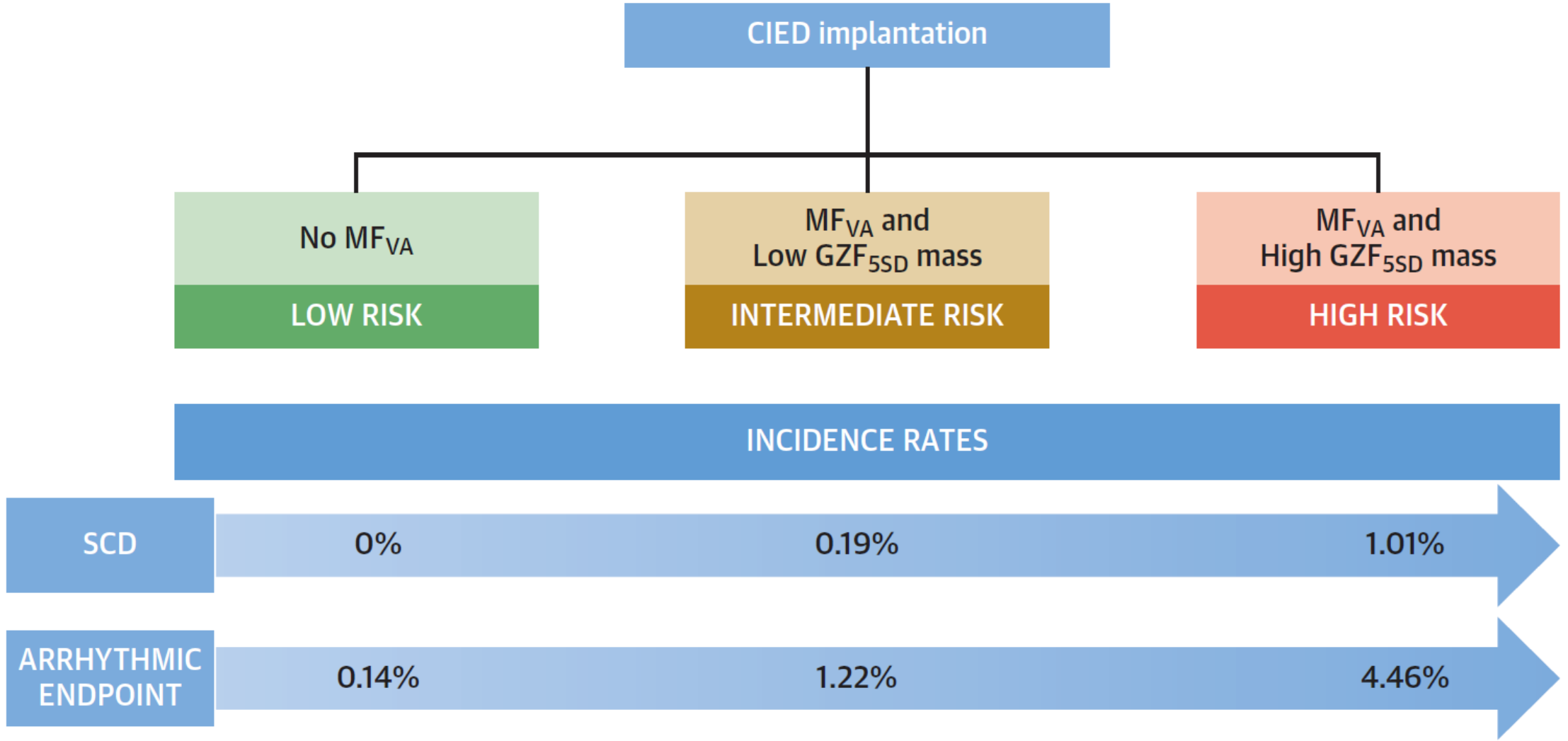


FIGURE 4 Risk Stratification



A gray zone fibrosis mass according to the 5-SD method (GZF_{5SD}) ≥17 g was considered high and a GZF_{5SD} >0 and <17 g was considered low. CIED = cardiac implantable electronic device; GZF_{5SD} = gray zone fibrosis mass using the 5 SD method; MF_{VA} = myocardial fibrosis presence on visual assessment; SCD = sudden cardiac death.

ZIN heeft ons de opdracht gegeven om een nieuwe indicatierichtlijn op te stellen

Zorginstituut Nederland

Verbetersignalement
Zinnige Zorg Implanteerbare
Cardioverter-Defibrillator (ICD)

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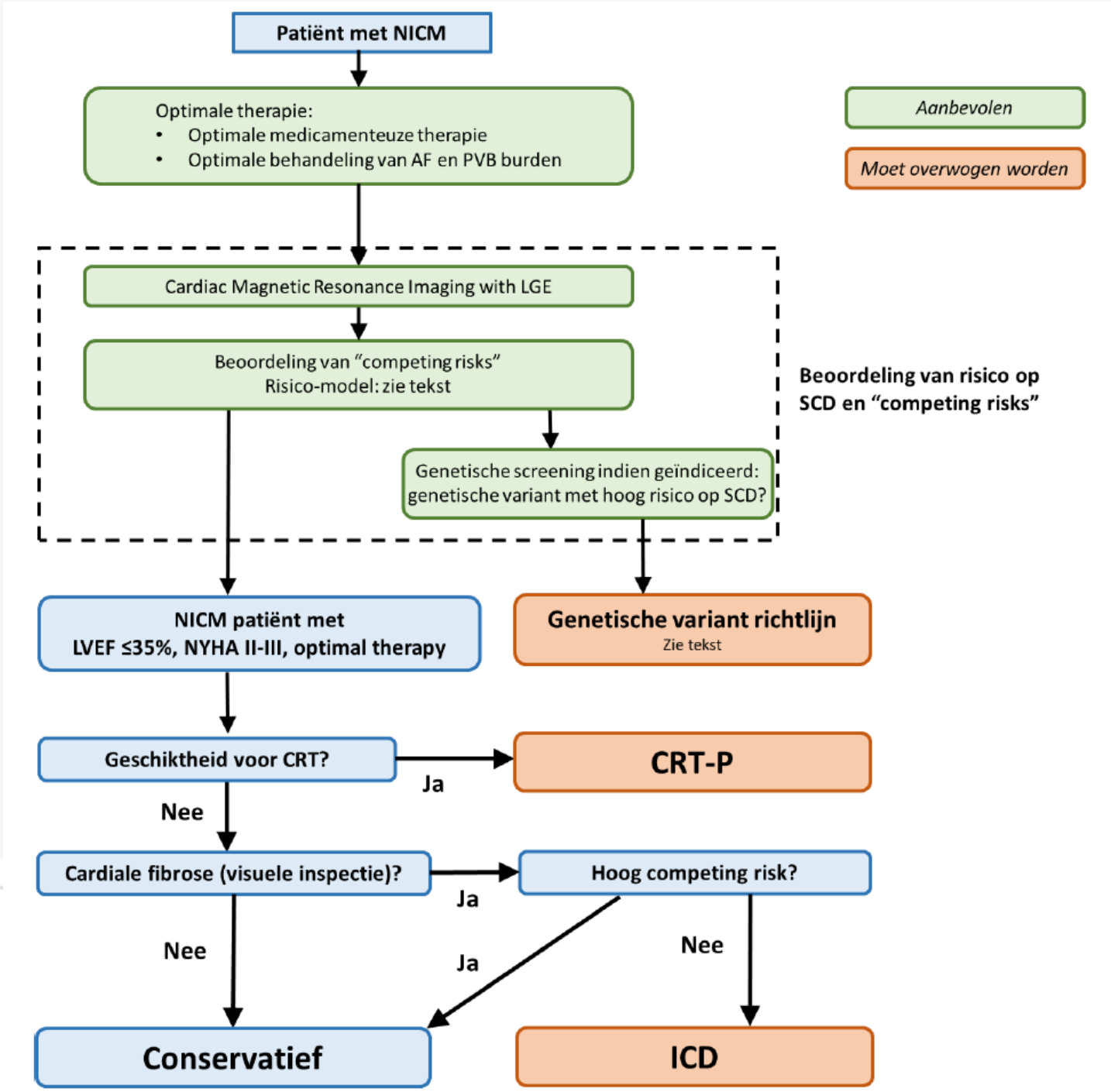
Patiënt met NICM
Optimale therapie:
• Optimale medicamenteuze therapie
• Optimale behandeling van AF en PVB burden
Aanbevolen
Moet overwogen worden
Cardiac Magnetic Resonance Imaging with LGE
Beoordeling van "competing risks"
Risico-model: zie tekst
Genetische screening indien geïndiceerd: genetische variant met hoog risico op SCD?
Beoordeling van risico op SCD en "competing risks"
NICM patiënt met LVEF ≤35%, NYHA II-III, optimal therapy
Genetische variant richtlijn
Zie tekst
Geschiktheid voor CRT?
Ja
CRT-P
Nee
Cardiale fibrose (visuele inspectie)?
Ja
Hoog competing risk?
Nee
Ja
Nee
Conservatief
ICD

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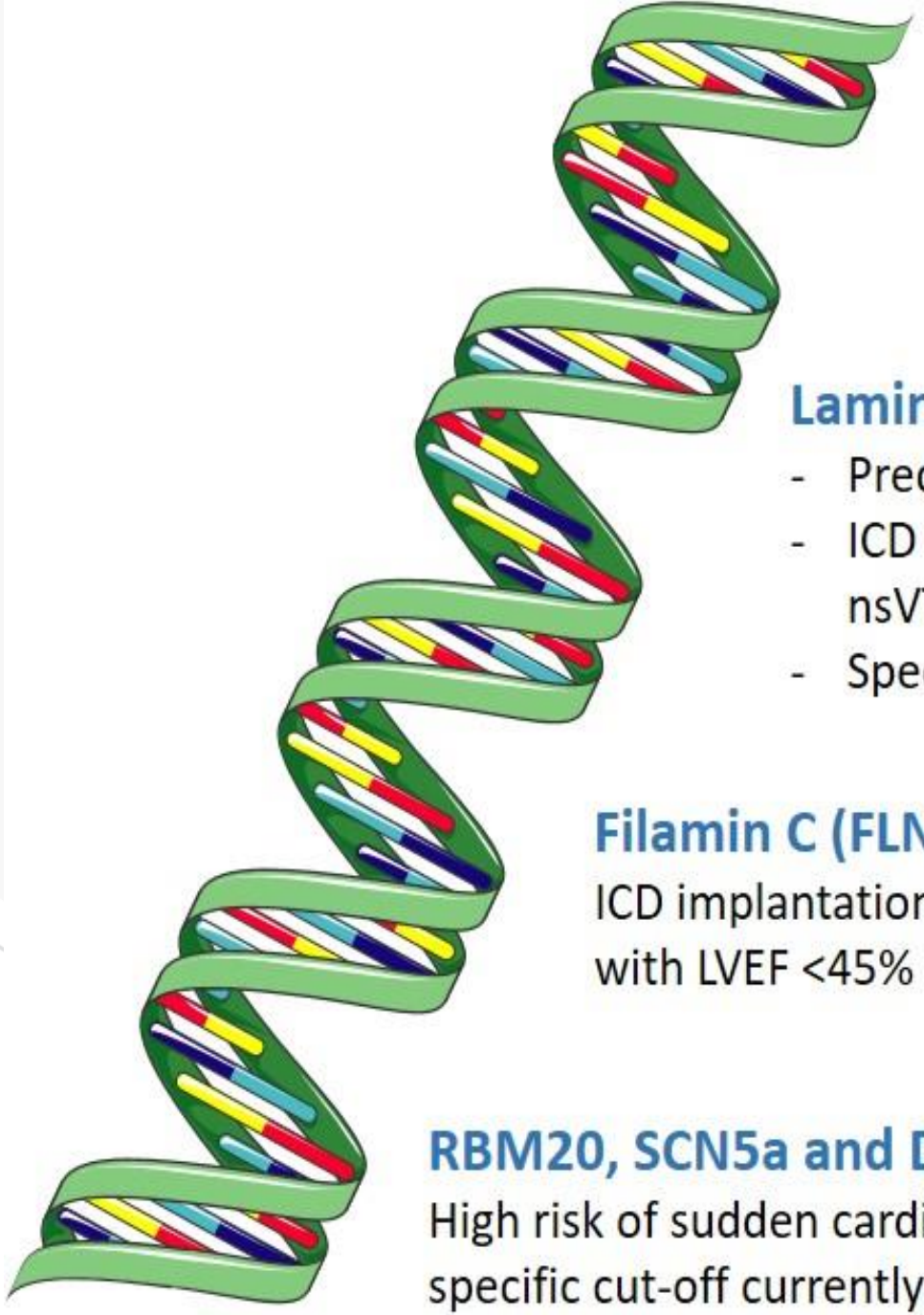


Phosophlamban (PLN) mutation

- Both right and left ventricular involvement
- Specific PLN p.Arg14del carriers SCD risk model available [27]

Lamin A/C (LMNA) mutation

- Predominantly left ventricular involvement
- ICD indicated if 2 of more are present: LVEF <45%; nsVT; non-missense mutation or male sex
- Specific LMNA SCD risk model available [29]

Filamin C (FLNC) mutation

ICD implantation recommended in patients with LVEF <45%

RBM20, SCN5a and DSP mutation

High risk of sudden cardiac death; no specific cut-off currently exists

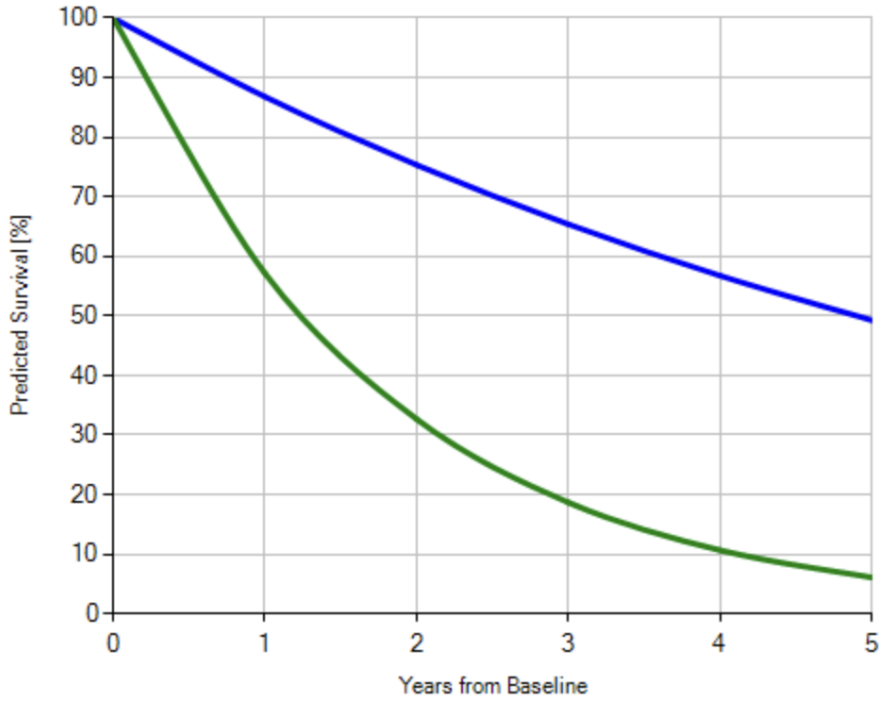
HF metascore om risico op overlijden te bepalen

- Geen ICD bij voorspelde 1 jaars mortaliteit >35%

Heart Failure Meta-Score

Home | About

Predictors	Values 1st Scenario	Values 2nd Scenario
Age:	75 years	75 years
Sex:	Male / Female	Male / Female
Black Race:	Yes / No	Yes / No
Ischemic cardiomyopathy:	Yes / No	Yes / No
Left Ventricular Ejection Fraction:	25 %	25 %
Creatinine:	1,4 mg/dL	1,8 mg/dL
NYHA class (Only 1, 2, 3 or 4):	2	3
Atrial fibrillation:	Yes / No	Yes / No
Previous HF admission:	Yes / No	Yes / No
Chronic Obstructive Pulmonary Disease:	Yes / No	Yes / No
Peripheral Vascular Disease:	Yes / No	Yes / No
Diabetes:	Yes / No	Yes / No
Wide QRS (>120 millisec):	Yes / No	Yes / No
Secundary Prevention ICD:	Yes / No	Yes / No
ICD shock:	Yes / No	Yes / No
Score:	3.26	4.63
	Reset	1st Scenario	2nd Scenario



Years from baseline	1	2	3	4	5
1st Scenario	87	75	65	57	49
2nd Scenario	57	33	19	11	6

 Version: 1.0.3 Last Update: May 21, 2019.

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hfmetascore.org

Wat te doen bij batterijdepletie van een ICD or CRT-D

- Vaak LVEF >35% op dit moment
- Vaak geen terechte ICD-therapieën
- Patiënt 5-10 jaar ouder dan bij implantatie…

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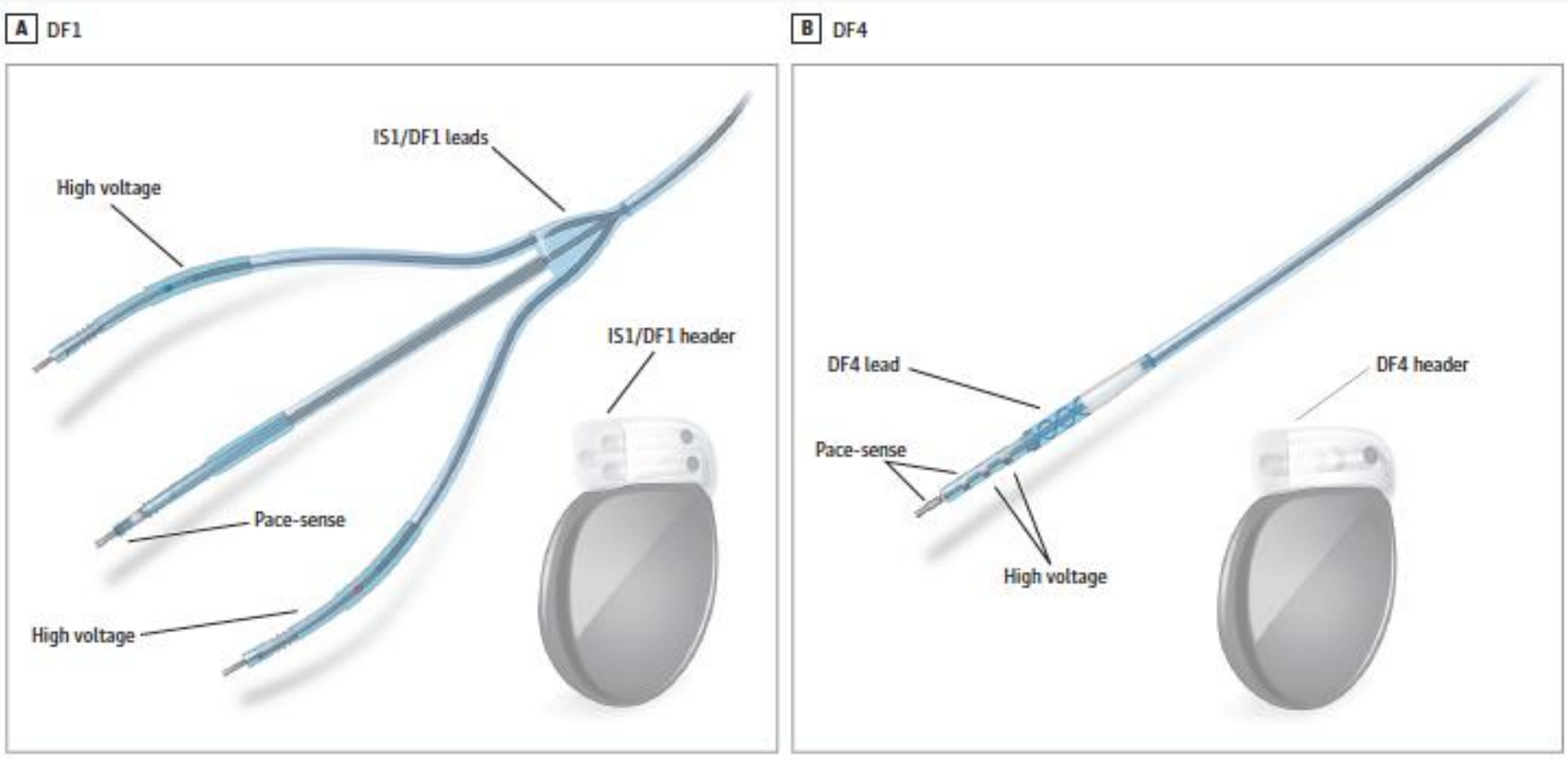
Mogelijkheid tot downgrade moet je bij implantatie plannen



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Review Article

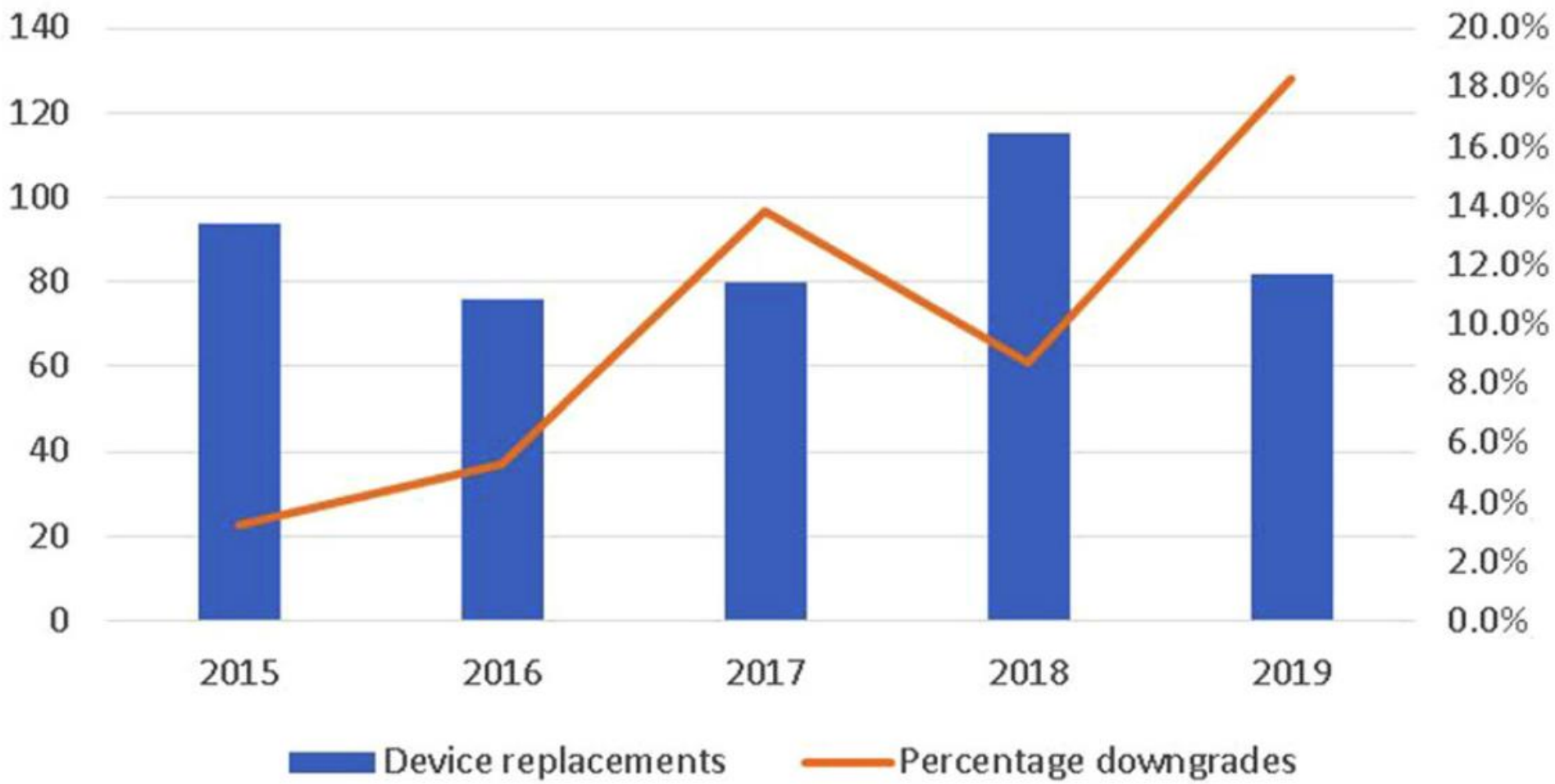
Neth Heart J (2021) 29:243–252
https://doi.org/10.1007/s12471-021-01555-w

Check for updates

Downgrade of cardiac defibrillator devices to pacemakers in elderly heart failure patients: clinical considerations and the importance of shared decision-making

H. F. Groenveld · J. E. Coster · D. J. van Veldhuisen · M. Rienstra · Y. Blaauw · A. H. Maass

Fig. 1 Number of implantable cardioverter defibrillator and cardiac resynchronisation therapy defibrillator replacements as well as the percentage of downgrades at the University Medical Centre in Groningen



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Take to work

- Nieuwe ICD indicatierichtlijn non-ischemisch hartfalen
- i.p. CRT-P bij DCM
- MRI fibrose en laag ‘competing’ risico voorwaarde voor ICD-implantatie
- Bespreek explantatie of downgrade met patiënt tijdig voor batterijdepletie

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