

CRT-D VƏYA CRT-P NƏ VAXT?

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DOS. DR. FƏRID ƏLİYEV, FESC  
BAKI SAĞLAMLIQ MƏRKƏZİ


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CRT-D VƏYA CRT-P ?  
BU SUAL NIYƏ  
ORTAYA ÇIXIR?



1. DÜNYADAKI  
TREND NƏ  
YÖNDƏDİR?
2. MADDİ  
QARŞILIĞI  
NƏDİR?
3. XƏSTƏYƏ  
XEYRİ NƏDİR?

# Trends in the use of implantable cardioverter-defibrillator and cardiac resynchronization therapy device in advancing age: Analysis of the Japan cardiac device treatment registry database

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 Members of the Implantable Cardioverter-Defibrillator (ICD) Committee of the Japanese Heart Rhythm Society

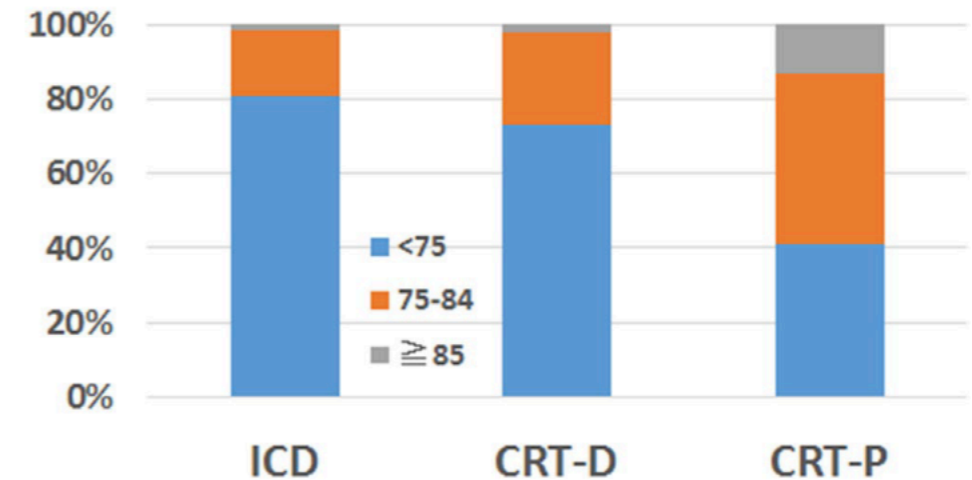
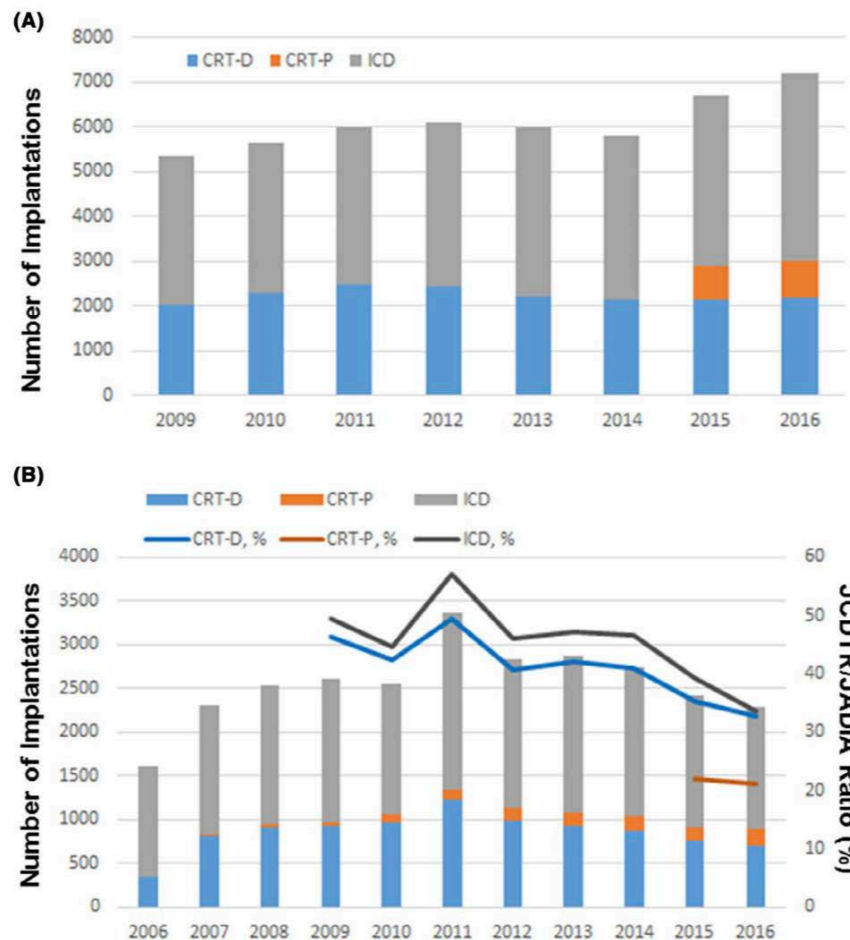
	ICD	CRT-D	CRT-P	P value
Number of patients	17564	9470	1087	
Age (y)	60.8 ± 15.4	66.9 ± 11.2	74.3 ± 11.1	<.0001
Male	13745 (78.2)	7172 (75.7)	671 (61.7)	<.0001
Underlying heart disease				<.0001
Ischemic	6394 (36.4)	2959 (31.2)	280 (25.8)	
Nonischemic	111170 (63.6)	6511 (68.8)	807 (74.2)	
Primary prevention <sup>a</sup>	4502 (25.6)	6317 (66.7)	1048 (96.4)	
LVEF (%)	50.0 ± 17.1	27.6 ± 9.2	32.6 ± 11.3	<.0001
NYHA class				<.0001
I	9822 (55.9)	344 (3.6)	35 (3.2)	
II	5742 (32.7)	2370 (25.0)	259 (23.8)	
III	1735 (9.9)	5648 (59.7)	705 (64.9)	
IV	265 (1.5)	1108 (11.7)	88 (8.1)	

Note: Values are means ± SD, or number (%).

Abbreviation: ICD, implantable cardioverter-defibrillator; LVEF, left ventricular ejection fraction; NYHA, New York Heart Association.

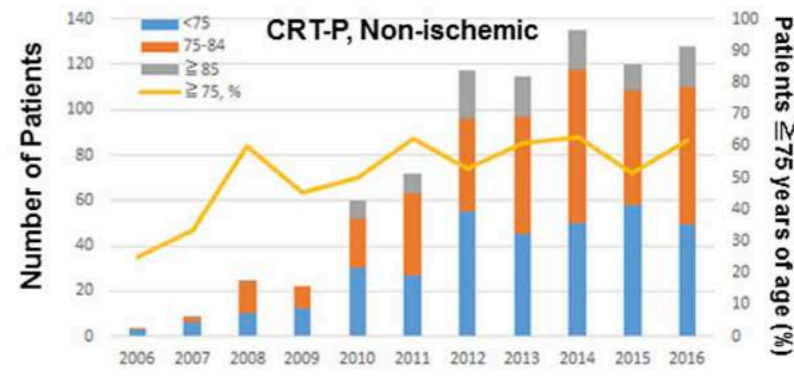
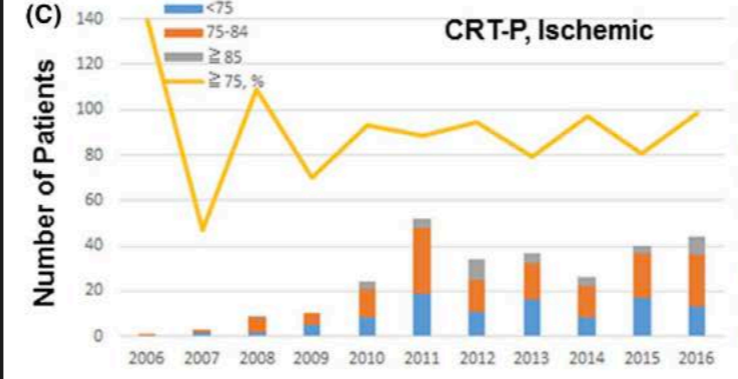
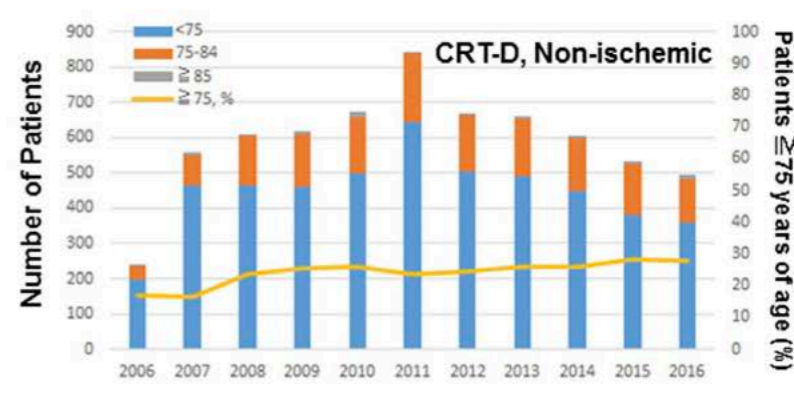
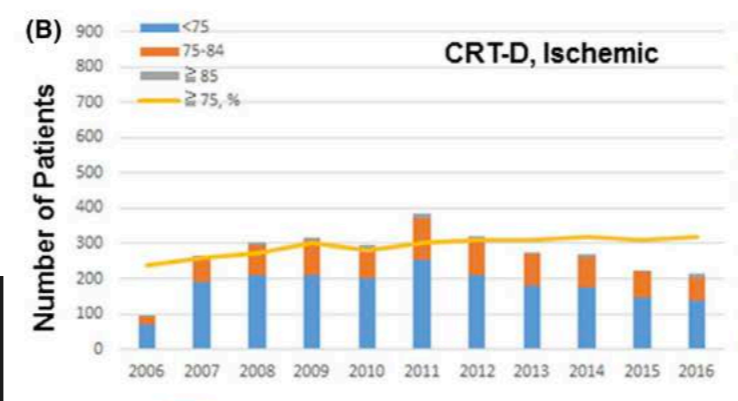
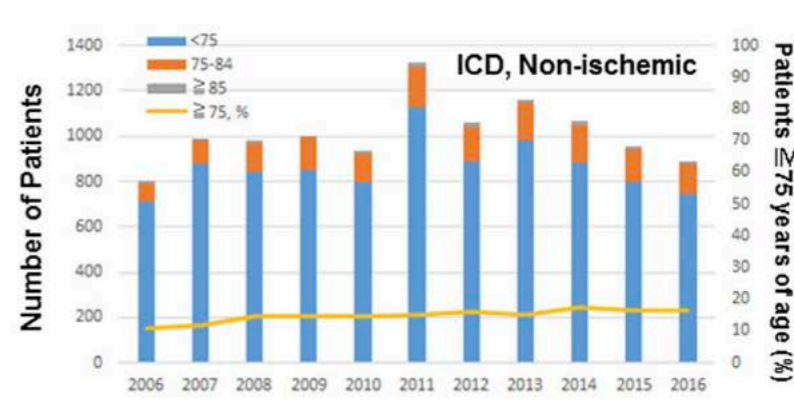
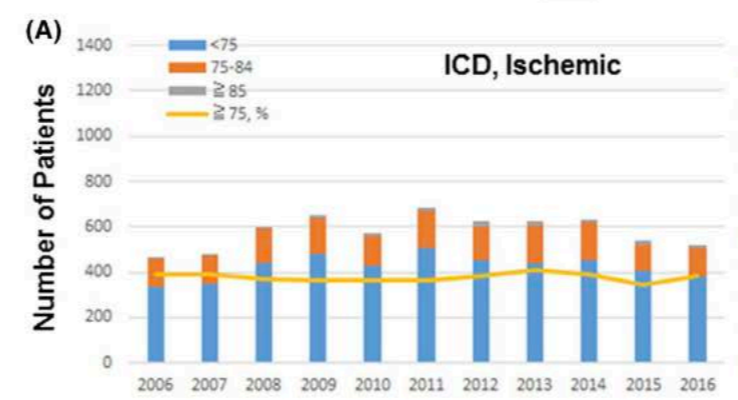
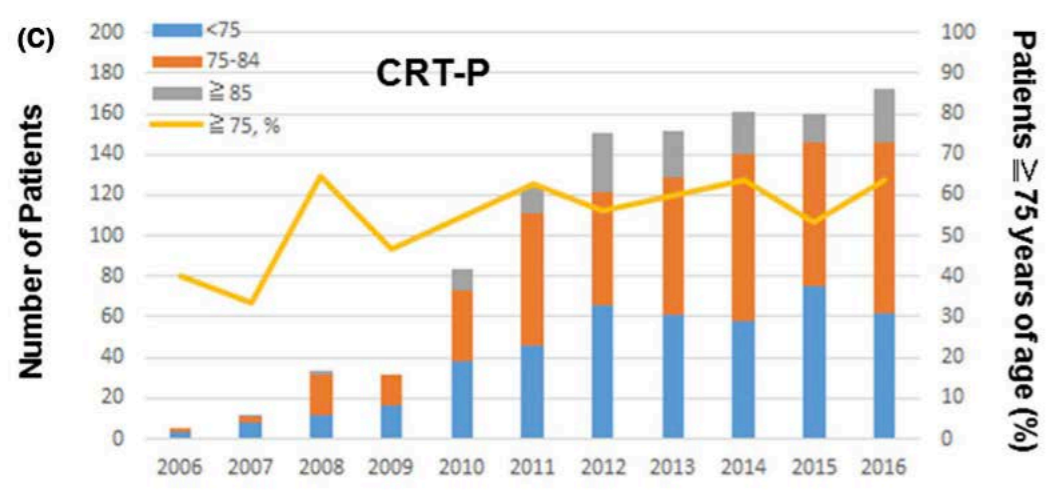
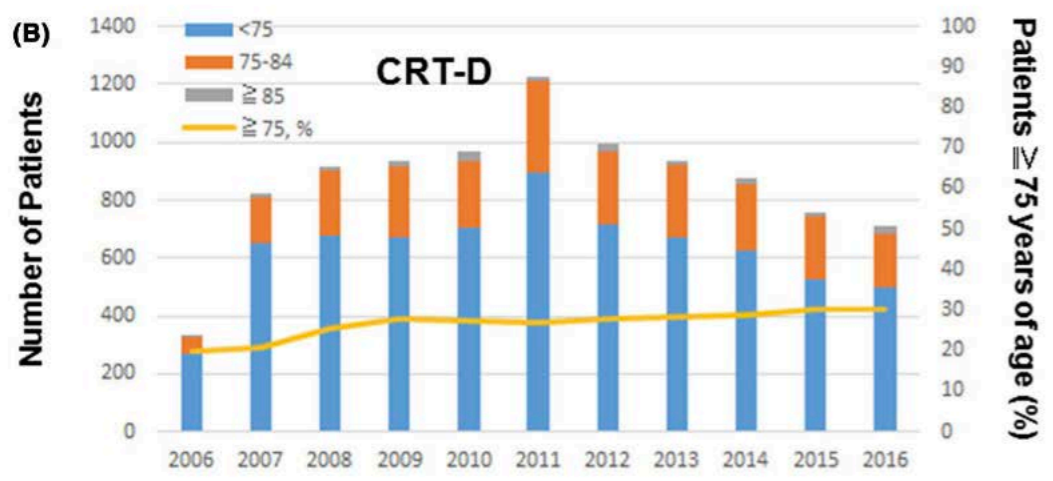
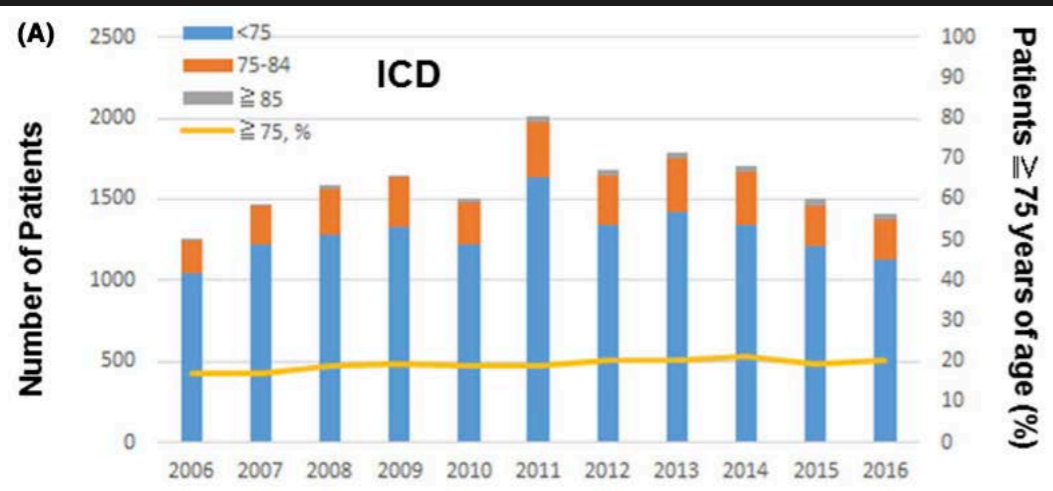
<sup>a</sup>Patients without a prior history of sustained ventricular arrhythmias are defined as primary prevention.

**FIGURE 1** Japanese trends in de novo CIEDs implantation. The number of new implantations of ICD (gray bar)/CRT-D (blue bar)/CRT-P (orange bar) in each year is shown based on the data from (A) Japan Arrhythmia Device Industry Association (JADIA) and (B) Japan cardiac device treatment registry (JCDTR). Percentage of registration of the JCDTR to that of JADIA (JCDTR/JADIA ratio) is given as line graphs (B).



**FIGURE 2** Proportion of different age groups in CIED implantation. Groups of patients aged <75 y (blue bar), aged 75-84 y (orange bar) and aged ≥85 y (gray bar) are shown as the percentages for ICD, CRT-D and CRT-P implantation. The age distribution was significantly different among CIED implantations ( $P < .0001$ ).

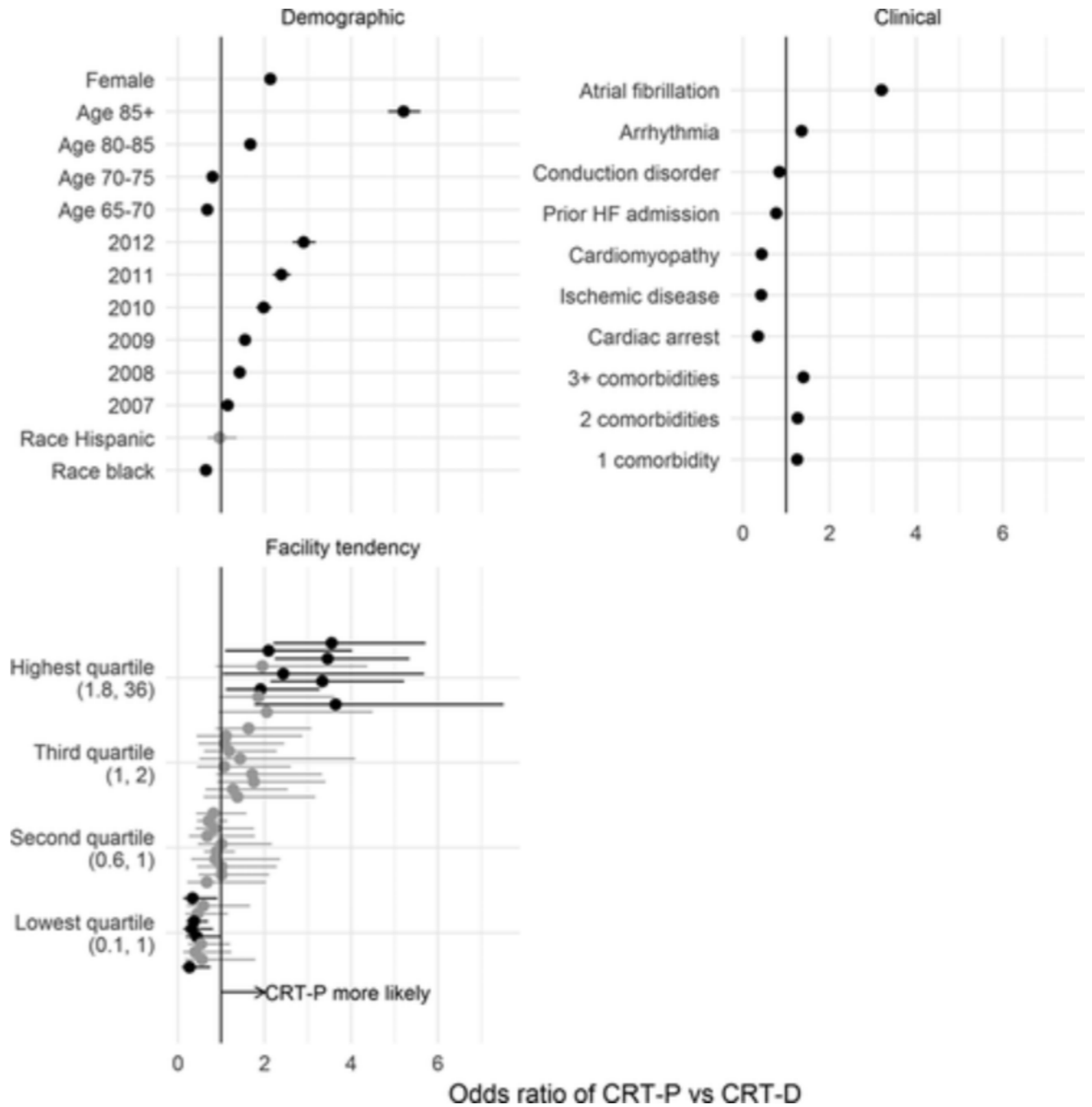
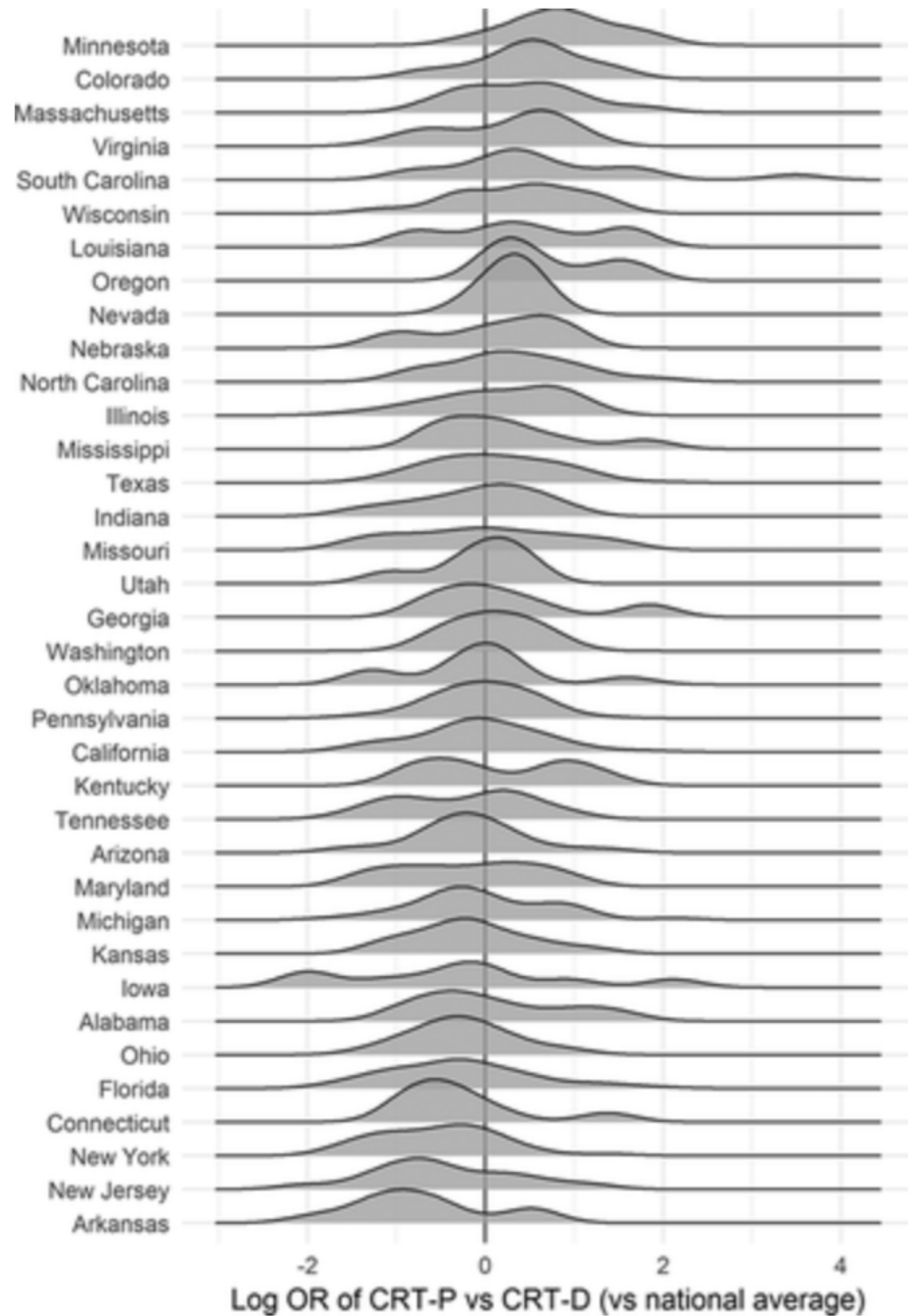




# Facility-Level Variation and Clinical Outcomes in Use of Cardiac Resynchronization Therapy With and Without an Implantable Cardioverter-Defibrillator

Daniel B. Kramer, Sharon-Lise T. Normand, Rita Volya and Laura A. Hatfield 

Originally published 13 Dec 2018 | <https://doi.org/10.1161/CIRCOUTCOMES.118.004763> | Circulation: Cardiovascular Quality and Outcomes. 2018;11:e004763



# Device runtime and costs of cardiac resynchronization therapy pacemakers – a health claims data analysis

Gerätelaufzeit und Kosten von kardialen Resynchronisationsschrittmachern – eine Routinedatenanalyse

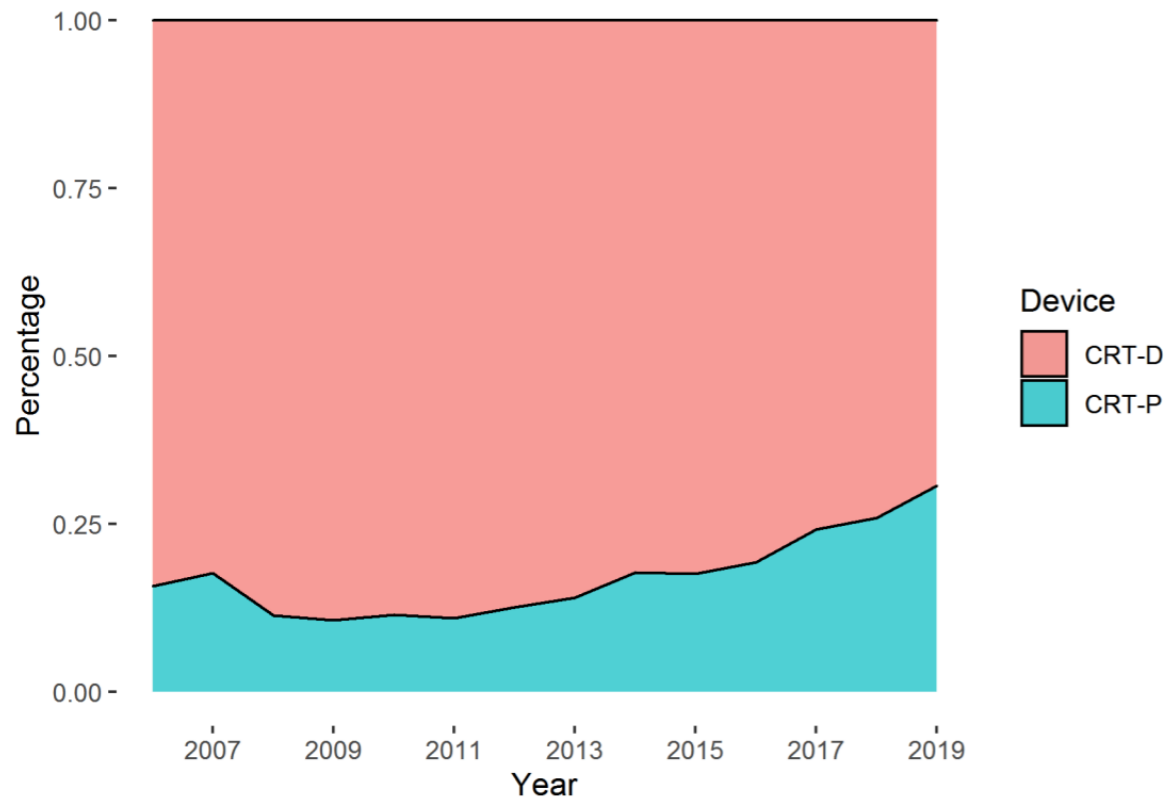
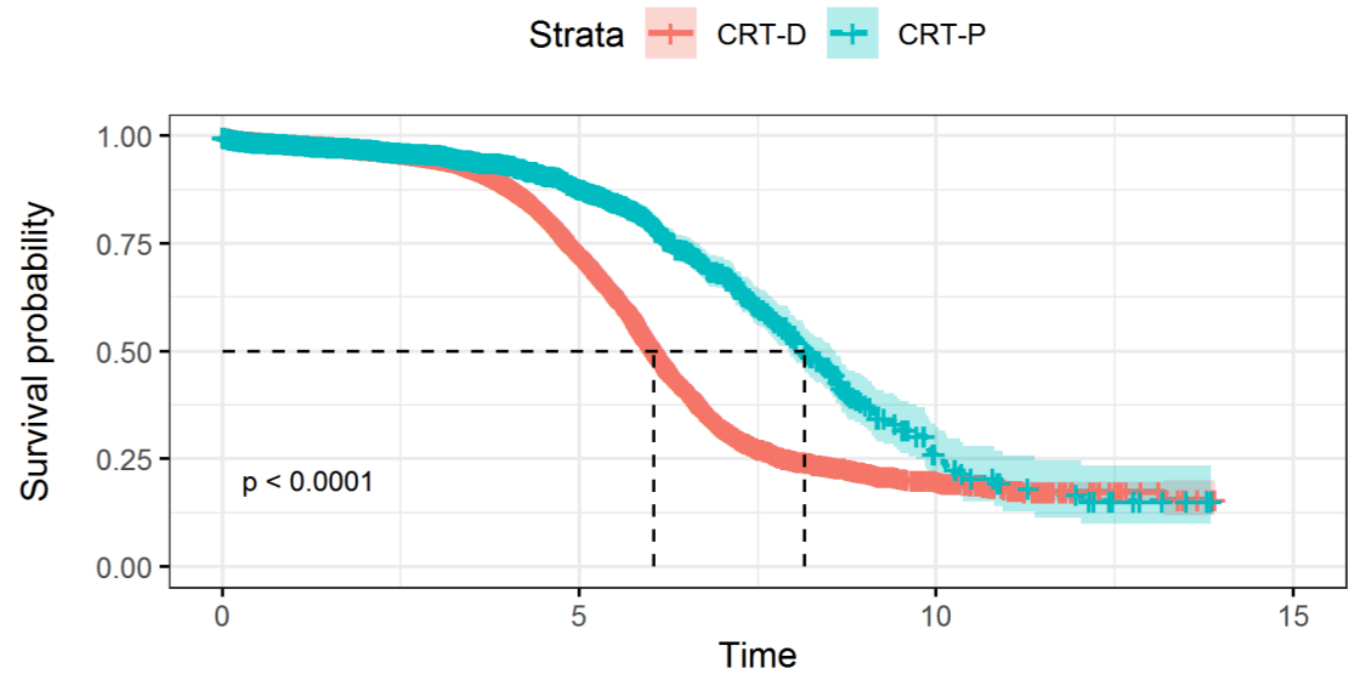


Figure 2: Proportion of CRT-D and CRT-P implantations per year out of all CRT implantations

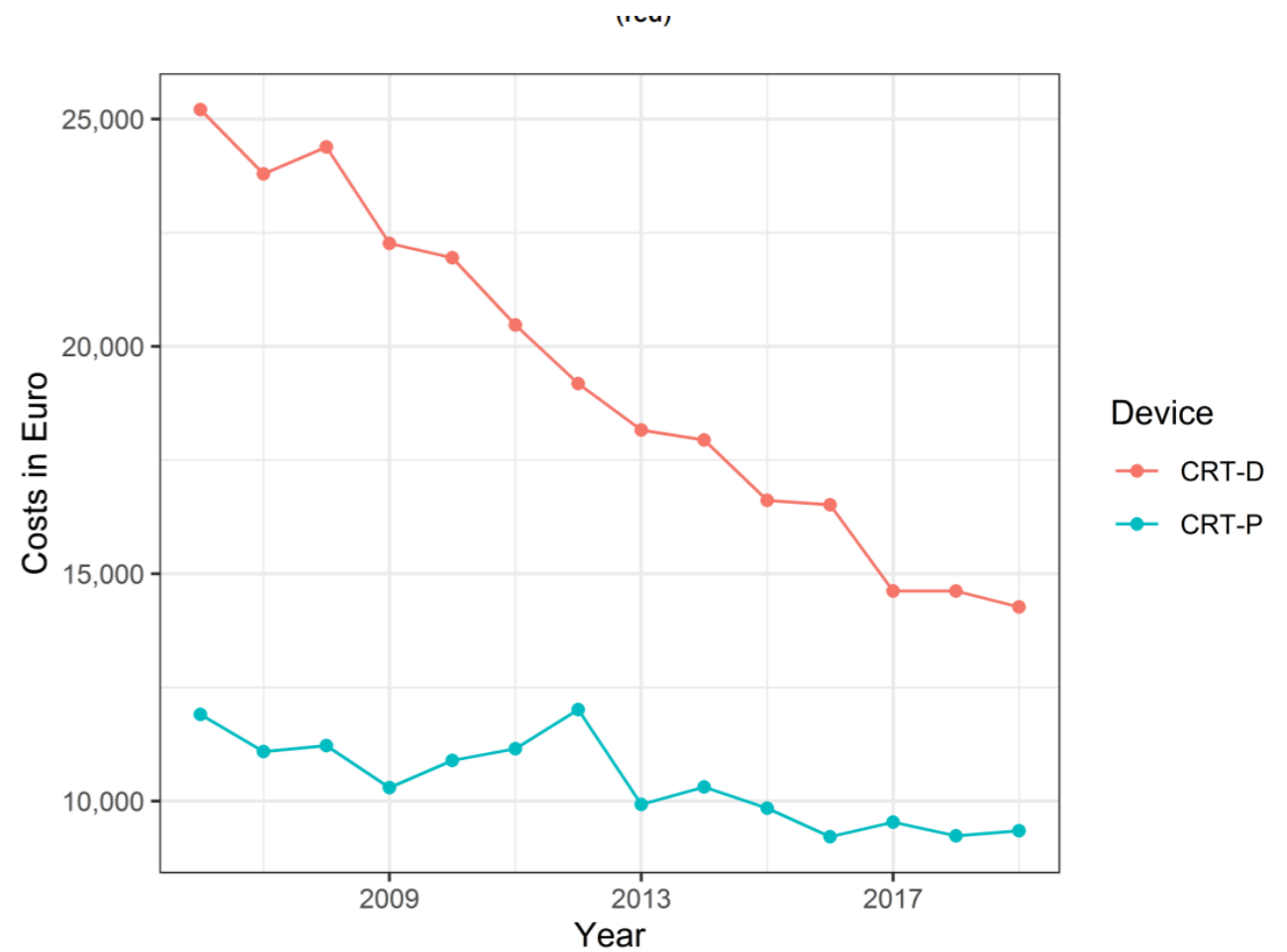


Figure 4: Development of the median implantation cost of the CRT devices



Original research

# Predicting outcome after cardiac resynchronisation therapy defibrillator implantation: the cardiac resynchronisation therapy defibrillator Futility score

Baptiste Maille <sup>1,2</sup>, Alexandre Bodin, <sup>3</sup> Arnaud Bisson, <sup>3</sup> Julien Herbert, <sup>3</sup> Bertrand Pierre, <sup>3</sup> Nicolas Clementy, <sup>3</sup> Victor Klein, <sup>1</sup> Frédéric Franceschi <sup>1,2</sup>, Jean-Claude Deharo, <sup>1,2</sup> Laurent Fauchier <sup>4,5</sup>

**Table 2** Logistic regression model variables for death at 1 year in patients treated with CRT-D

	OR (95% CI)	P value	Points
Age (quartile)	1.361 (1.261 to 1.470)	<0.0001	1, 2 or 3*
Sex (male)	1.317 (1.063 to 1.632)	0.01	
Hypertension	0.895 (0.749 to 1.069)	0.22	
Diabetes mellitus	1.350 (1.146 to 1.589)	<0.0001	2
History of hospitalisation with cardiac congestion	1.696 (1.298 to 2.218)	<0.0001	2
History of pulmonary oedema	1.630 (1.294 to 2.053)	<0.0001	2
Dilated cardiomyopathy	0.962 (0.812 to 1.140)	0.66	
Coronary artery disease	1.269 (1.036 to 1.555)	0.02	
Previous myocardial infarction	0.848 (0.659 to 1.092)	0.20	
Previous PCI	0.989 (0.822 to 1.190)	0.90	
Previous CABG	1.108 (0.900 to 1.363)	0.33	
Aortic stenosis	1.502 (1.153 to 1.957)	0.003	2
Aortic regurgitation	0.914 (0.660 to 1.265)	0.59	
Mitral regurgitation	1.380 (1.150 to 1.655)	0.001	2
Atrial fibrillation	1.694 (1.448 to 1.981)	<0.0001	2
Left BBB	0.767 (0.653 to 0.900)	0.001	-1
Right BBB	0.991 (0.718 to 1.366)	0.95	
Vascular disease	1.215 (1.010 to 1.462)	0.04	
Ischaemic stroke	1.089 (0.755 to 1.570)	0.65	
Intracranial bleeding	1.548 (0.819 to 2.927)	0.18	
Smoker	1.127 (0.919 to 1.382)	0.25	
Dyslipidaemia	0.808 (0.681 to 0.960)	0.02	
Obesity	0.957 (0.789 to 1.162)	0.66	
Alcohol-related diagnoses	1.251 (0.955 to 1.638)	0.10	
Undernutrition	1.699 (1.298 to 2.224)	<0.0001	2
Chronic kidney disease	1.540 (1.258 to 1.886)	<0.0001	2
Lung disease	1.166 (0.970 to 1.401)	0.10	
Sleep apnoea syndrome	0.740 (0.572 to 0.959)	0.02	
Liver disease	1.562 (1.177 to 2.073)	0.002	2
Thyroid diseases	1.297 (1.037 to 1.622)	0.02	
Inflammatory disease	1.280 (0.990 to 1.655)	0.06	
Anaemia	1.357 (1.099 to 1.676)	0.005	2
Previous cancer	1.070 (0.848 to 1.349)	0.57	
Cognitive impairment	1.447 (0.853 to 2.453)	0.17	

\*Age quartile: 1 point if age >61 years; 2 points if age >69 years; 3 points if age >75 years.

BBB, bundle branch block; CABG, coronary artery bypass graft; CRT-D, cardiac resynchronisation therapy defibrillator; PCI, percutaneous coronary intervention.

## A CRT-D FUtiLity ScORe

- Age
- Congestion
- Renal failure
- Transfusion anaemia
- Diabetes mellitus
- atrial Fibrillation
- Undernutrition
- Left bundle branch block
- Liver disease
- aortic Stenosis
- pulmonary Oedema
- mitral Regurgitation

**Advanced heart failure**

- History of pulmonary oedema **+2**
- History of hospitalization with cardiac congestion **+2**
- Mitral regurgitation **+2**
  - Anaemia **+2**
  - Aortic stenosis **+2**

**Predictors of non-response / response of CRT**

- Atrial fibrillation **+2**
- Left bundle branch block **-1**

CRT-D Futility Score	0-3	4-7	8-11	≥ 12
1-year mortality	1.7%	3.9%	8.1%	16.6%

**Frailty**

- > 61 years **+1**
- > 69 years **+2**
- > 75 years **+3**
- Undernutrition **+2**

**Comorbidities**

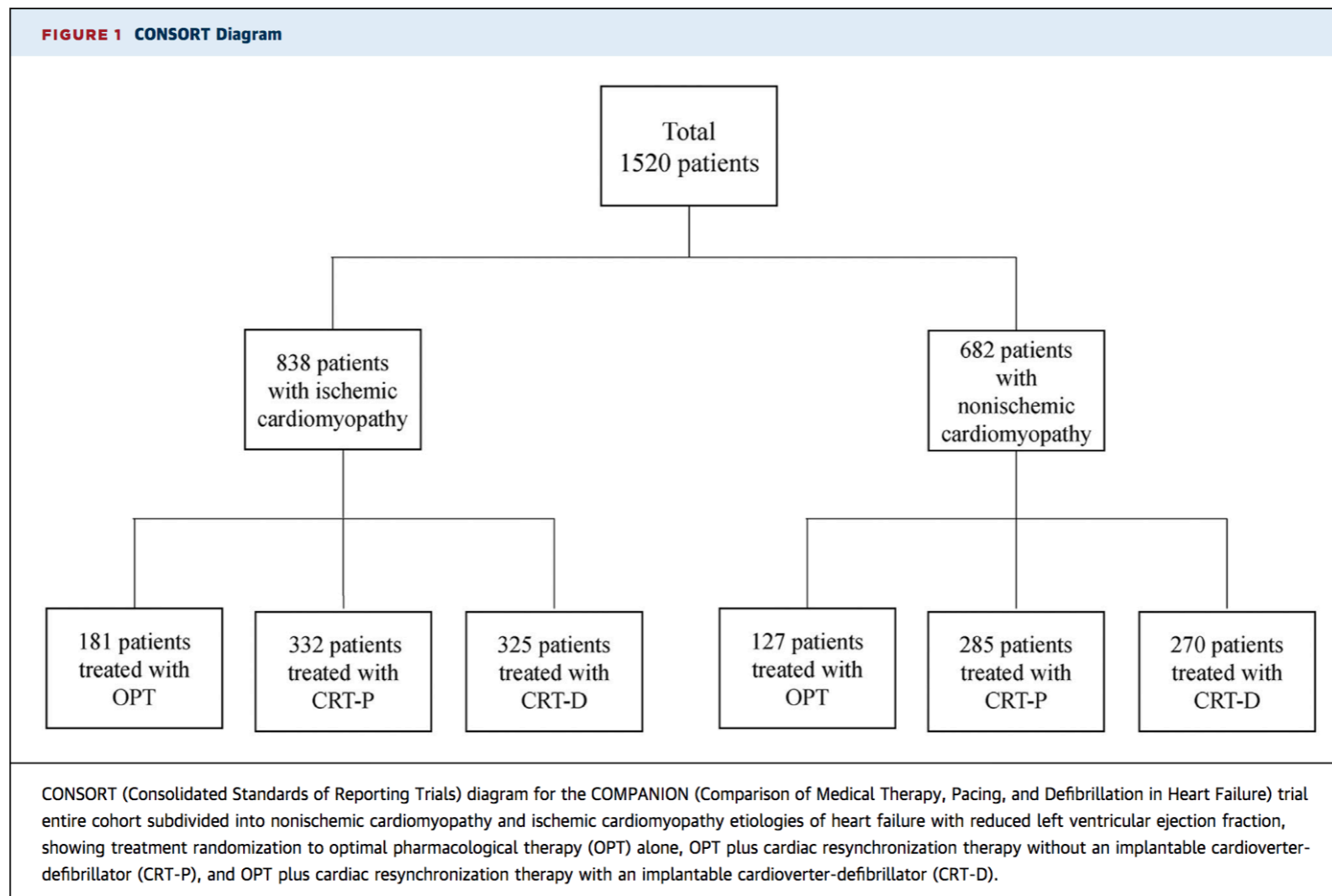
- Liver disease **+2**
- Renal disease **+2**
- Diabetes mellitus **+2**



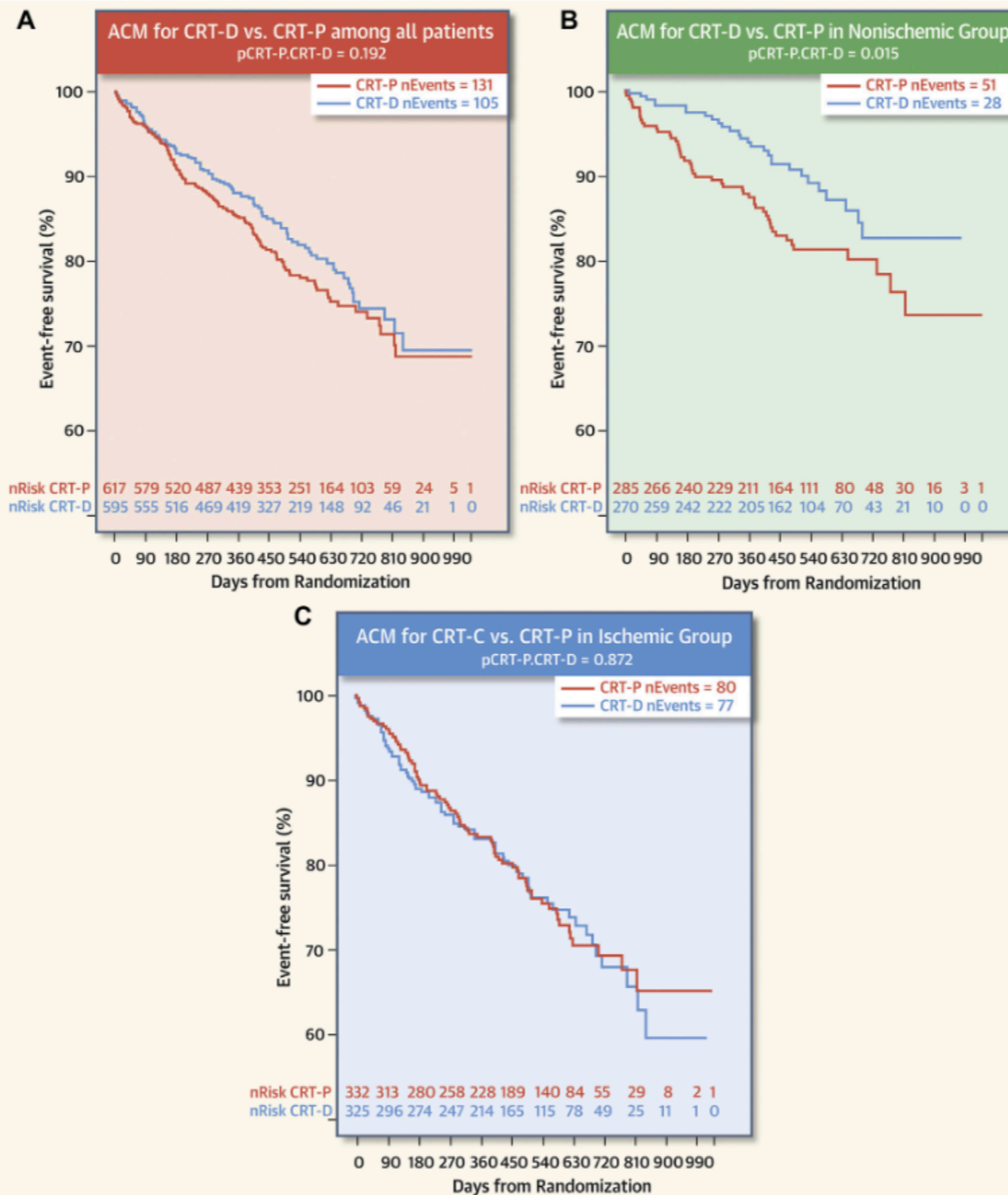
# The Addition of a Defibrillator to Resynchronization Therapy Decreases Mortality in Patients With Nonischemic Cardiomyopathy



Bethany Doran, MD, MPH,<sup>a</sup> Chaoqun Mei, PhD,<sup>b</sup> Paul D. Varosy, MD,<sup>a,c</sup> David P. Kao, MD,<sup>a,d</sup> Leslie A. Saxon, MD,<sup>e</sup> Arthur M. Feldman, MD, PhD,<sup>f</sup> David DeMets, PhD,<sup>b</sup> Michael R. Bristow, MD, PhD<sup>a,d</sup>

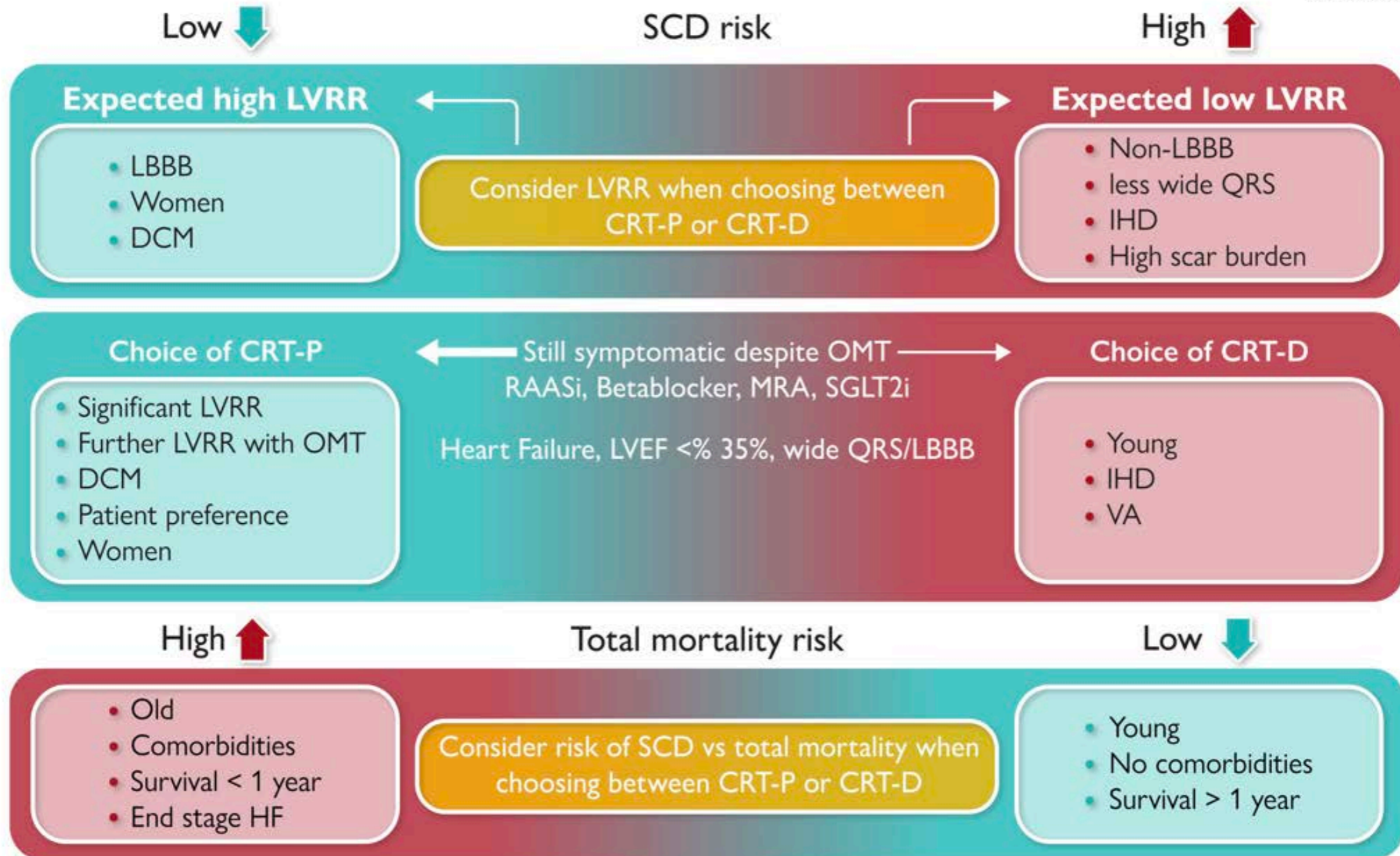


**CENTRAL ILLUSTRATION** Kaplan-Meier Curves for All-Cause Mortality in Patients Undergoing Cardiac Resynchronization Therapy With or Without an Implantable Cardioverter-Defibrillator in the Comparison of Medical Therapy, Pacing, and Defibrillation in Heart Failure Trial, by Etiology of Heart Failure



Doran, B. et al. *J Am Coll Cardiol HF*. 2021;9(6):439-49.

Among all patients randomized to CRT devices (N = 1,212), including those with nonischemic cardiomyopathy (NICM) and those with ischemic cardiomyopathy (ICM), the hazard ratio for all-cause mortality (ACM) between cardiac resynchronization therapy with and without an implantable cardioverter-defibrillator in the unadjusted model was 0.84 (95% confidence interval [CI]: 0.65 to 1.09; p = 0.19) (A). Among device patients with NICM (n = 555), the ACM hazard ratio was 0.57 (95% CI: 0.36 to 0.90; p = 0.015) (B). Among patients with ICM (n = 657), the ACM hazard ratio was 1.03 (95% CI: 0.75 to 1.40; p = 0.87) (C). CRT = cardiac resynchronization therapy.





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